Copyright © 1998-2018 Dell Inc. or its subsidiaries. All rights reserved.

Published April 2018

Dell believes the information in this publication is accurate of its publication date. The information is subject to change without notice.

THE INFORMATION IN THIS PUBLICATION IS PROVIDED “AS-IS”. DELL MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO THE INFORMATION IN THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. USE, COPYING, AND DISTRIBUTION OF ANY DELL SOFTWARE DESCRIBED IN THIS PUBLICATION REQUIRES AN APPLICABLE SOFTWARE LICENSE.

Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be the property of their respective owners. Published in the USA.
## Chapter 4  The get and set Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>get_attributes</td>
<td>118</td>
</tr>
<tr>
<td>set_attributes</td>
<td>124</td>
</tr>
</tbody>
</table>

## Chapter 5  The nas Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>nas_acl</td>
<td>131</td>
</tr>
<tr>
<td>nas_automountmap</td>
<td>134</td>
</tr>
<tr>
<td>nas_ca_certificate</td>
<td>136</td>
</tr>
<tr>
<td>nas cel</td>
<td>139</td>
</tr>
<tr>
<td>nas_checkup</td>
<td>155</td>
</tr>
<tr>
<td>nas_ckpt_schedule</td>
<td>160</td>
</tr>
<tr>
<td>nas_connecthome</td>
<td>167</td>
</tr>
<tr>
<td>nas_config</td>
<td>175</td>
</tr>
<tr>
<td>nas_copy</td>
<td>179</td>
</tr>
<tr>
<td>nas_cs</td>
<td>184</td>
</tr>
<tr>
<td>nas_dbtable</td>
<td>191</td>
</tr>
<tr>
<td>nas_devicegroup</td>
<td>195</td>
</tr>
<tr>
<td>nas_disk</td>
<td>199</td>
</tr>
<tr>
<td>nas_diskmark</td>
<td>207</td>
</tr>
<tr>
<td>nas_emailuser</td>
<td>211</td>
</tr>
<tr>
<td>nas_environment</td>
<td>214</td>
</tr>
<tr>
<td>nas_event</td>
<td>222</td>
</tr>
<tr>
<td>nas_fs</td>
<td>229</td>
</tr>
<tr>
<td>nas_fsck</td>
<td>268</td>
</tr>
<tr>
<td>nas_halt</td>
<td>272</td>
</tr>
<tr>
<td>nas_inventory</td>
<td>277</td>
</tr>
<tr>
<td>nas_license</td>
<td>281</td>
</tr>
<tr>
<td>nas_logviewer</td>
<td>283</td>
</tr>
<tr>
<td>nas_message</td>
<td>286</td>
</tr>
<tr>
<td>nas_migrate</td>
<td>287</td>
</tr>
<tr>
<td>nas_mview</td>
<td>305</td>
</tr>
<tr>
<td>nas_pool</td>
<td>314</td>
</tr>
<tr>
<td>nas_quotas</td>
<td>331</td>
</tr>
<tr>
<td>nas_rdf</td>
<td>348</td>
</tr>
<tr>
<td>nas_reclaim_schedule</td>
<td>369</td>
</tr>
<tr>
<td>nas_replicate</td>
<td>372</td>
</tr>
<tr>
<td>nas_rp</td>
<td>391</td>
</tr>
<tr>
<td>nas_server</td>
<td>399</td>
</tr>
<tr>
<td>nas_slice</td>
<td>414</td>
</tr>
<tr>
<td>nas_stats</td>
<td>418</td>
</tr>
<tr>
<td>nas_storage</td>
<td>425</td>
</tr>
<tr>
<td>nas_storage</td>
<td>441</td>
</tr>
</tbody>
</table>
Chapter 6 The server Commands

server_archive .................................................................................. 469
server_arp ......................................................................................... 483
server_certificate ............................................................................. 485
server_cdms ..................................................................................... 491
server_cepp ...................................................................................... 497
server_checkup ................................................................................ 500
server_cifssupport ........................................................................... 517
server_cpu ........................................................................................ 545
server_date ....................................................................................... 559
server_dbms ..................................................................................... 561
server_devconfig ............................................................................. 566
server_dns ........................................................................................ 573
server_df ........................................................................................... 581
server_device ................................................................................. 583
server_export ................................................................................... 585
server_file ....................................................................................... 589
server_fileresolve ............................................................................ 600
server_ftp ........................................................................................ 604
server_http ....................................................................................... 620
server_ifconfig ................................................................................. 626
server_ip ........................................................................................... 633
server_kerberos .............................................................................. 638
server_ldap ........................................................................................ 645
server_log ......................................................................................... 657
server_mount ................................................................................... 664
server_mountpoint .......................................................................... 673
server_mpfs ..................................................................................... 675
server_mt .......................................................................................... 678
server_name ..................................................................................... 680
server_netstat ................................................................................... 681
server_nfs ........................................................................................ 685
server_nis ........................................................................................ 694
server_nsdomains ........................................................................... 698
server_param ................................................................................... 701
server_pax ......................................................................................... 709
Contents

server_ping ........................................................................................... 713
server_ping6 .................................................................................... 715
server_reclaim .................................................................................. 717
server_rip ........................................................................................... 719
server_route ...................................................................................... 720
server_security .................................................................................. 723
server_setup ..................................................................................... 726
server_snmpd .................................................................................... 729
server_ssh .......................................................................................... 733
server_standby ................................................................................... 745
server_stats ....................................................................................... 748
server_sysconfig ............................................................................. 795
server_sysstat ................................................................................... 804
server_tftp ......................................................................................... 806
server_umount ................................................................................... 809
server_uptime ................................................................................... 811
server_user ....................................................................................... 812
server_usermapper .......................................................................... 815
server_version .................................................................................. 819
server_viruschk .............................................................................. 820
server_vtlu ........................................................................................ 824

Appendix A  Using Command Scripts for VNX
Scripting guidelines ........................................................................... 834

Appendix B  GNU General Public License
GNU General Public License ............................................................. 842

Appendix C  The migrate Commands
migrate_system_conf ......................................................................... 850
Roll back script ................................................................................. 854

Index .................................................................................................... 857
As part of an effort to improve and enhance the performance and capabilities of its product line, EMC periodically releases revisions of its hardware and software. Therefore, some functions described in this document may not be supported by all revisions of the software or hardware currently in use. For the most up-to-date information on product features, refer to your product release notes.

If a product does not function properly or does not function as described in this document, please contact your EMC representative.

**Audience**

This guide is part of the VNX documentation set, and is intended for use by administrators and users of the EMC VNX system.

**Related documentation**

Other VNX system publications are available on the EMC Online Support website. To search for technical documentation, go to [http://Support.EMC.com](http://Support.EMC.com). After logging in to the website, click the VNX Support by Product page to locate information for the specific feature required.

**Conventions used in this guide**

EMC uses the following conventions for notes, cautions, warnings, and danger notices.

**Note:** A note presents information that is important, but not hazard-related.

**CAUTION**

A caution contains information essential to avoid data loss or damage to the system or equipment. The caution may apply to hardware or software.
WARNING

A warning contains information essential to avoid a hazard that can cause severe personal injury, death, or substantial property damage if you ignore the warning.

DANGER

A danger notice contains information essential to avoid a hazard that will cause severe personal injury, death, or substantial property damage if you ignore the message.

Typographical conventions

EMC uses the following type style conventions in this guide:

**Bold**
- User actions (what the user clicks, presses, or selects)
- Interface elements (button names, dialog box names)
- Names of keys, commands, programs, scripts, applications, utilities, processes, notifications, system calls, services, applications, and utilities in text

*italic*
- Book titles
- New terms in text
- Emphasis in text

*Courier*
- Prompts
- System output
- Filenames
- Pathnames
- URLs
- Syntax when shown in command line or other examples

*Courier, bold*
- User entry
- Options in command-line syntax

*Courier italic*
- Arguments in examples of command-line syntax
- Variables in examples of screen or file output
- Variables in pathnames

<> Angle brackets for parameter values (variables) supplied by user.

[] Square brackets for optional values.

| Vertical bar symbol for alternate selections. The bar means or.

... Ellipsis for nonessential information omitted from the example.
Where to get help

EMC support, product, and licensing information can be obtained as follows.

**Product information** — For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Online Support website (registration required) at

http://Support.EMC.com

**Technical support** — For technical support and service requests, go to EMC Customer Service on the EMC Online Support website. After logging in, locate the applicable Support by Product page, and select either **Live Chat** or **Create a service request**. To open a service request through EMC Online Support, you must have a valid support agreement. Contact your EMC Sales Representative for details about obtaining a valid support agreement or with any questions about your account.

Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send your opinion of this guide to:

techpubcomments@EMC.com
This chapter provides a brief description of the commands that can be used to configure and manage the VNX. Topics included are:

- VNX System ................................................................................................................. 12
- Control Station ............................................................................................................. 13
- Role-based access ........................................................................................................ 15
- Command set conventions ............................................................................................ 16
- General notes .................................................................................................................. 18
VNX System

The EMC® VNX® is a dedicated file server solution that is easily integrated into existing networks by using standard network interface protocols.

Main components

The VNX hardware platform is the VNX cabinet that works with a system to produce shared network-attached storage. The VNX cabinet:

- Contains up to eight Data Movers available as dedicated file servers that provide access to file systems resident on the system to a requesting client on the network.
- Includes a Control Station that manages all Data Mover functions both locally and remotely.
Control Station

The Control Station provides utilities for managing, configuring, and monitoring of the Data Movers in the VNX.

As the system administrator, you may type commands through the Control Station to perform tasks that include the following:

- Managing and Configuring the database and Data Movers
- Monitoring statistics of the VNX cabinet components

Accessing the Control Station

You may use either local or remote access to the Control Station.

Note: To access locally a connection to serial port have to be established.

Local

Local access to the command line interface is available directly at the Control Station console.

Remote

Remote access to the command line interface by using a secure, encrypted login application allows the use of the VNX command set.

Accessing the command line interface

A description of how to gain local or remote access to the command line interface for the VNX follows.

Note: For a local connection, connect a client to the Control Station serial port.

Local

For local access to the command line interface, at the prompt, log in with your administrative username and password.

Establish the connection to the Control Station with the following settings:

Table 1 Control Station serial port connection settings (1 of 2)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bits per second</td>
<td>19200</td>
</tr>
<tr>
<td>Data bits</td>
<td>8</td>
</tr>
<tr>
<td>Parity</td>
<td>None</td>
</tr>
</tbody>
</table>
# Table 1  Control Station serial port connection settings (2 of 2)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop bits</td>
<td>1</td>
</tr>
<tr>
<td>Flow control</td>
<td>None</td>
</tr>
<tr>
<td>Emulation</td>
<td>Auto Detect</td>
</tr>
<tr>
<td>Telnet terminal ID</td>
<td>ANSI</td>
</tr>
</tbody>
</table>

## Remote

For remote access to the command line interface:

1. Use a secure, encrypted, remote login application capable of SSH. Type the IP address of the Control Station.
2. Log in with your administrative username and password.
Role-based access

The administrative user account you use to access the command line interface is associated with specific privileges, also referred to as roles. A role defines the privileges (operations) a user can perform on a particular VNX object. The ability to select a predefined role or define a custom role that gives a user certain privileges is supported for users who access VNX through the CLI, EMC Unisphere™, and the XML API.

The Security Configuration Guide for VNX provides detailed information about how role-based access is used to determine the commands a particular user can execute. You create and manage user accounts and roles in Unisphere by using Settings > User Management.
Command set conventions

This manual uses commonly known command set conventions for the VNX for file man pages. Each man page presents the command name at the top of the man page followed by a brief overview of what the command does. The synopsis contains the actual command usage. The description contains a more detailed breakdown of the features of the command, and the options describe what each switch or option does specifically.

The ‘See Also’ section refers to the technical modules that support the feature, in addition to any other commands that interact with the command. The examples are at the end of the command.

The naming convention for the Data Mover variable in the command line interface is <movername> (default = server_2 to server_9).

The commands are prefixed, then appear in alphabetical order.

Synopsis

The synopsis is usage of each command. The synopsis appears in courier typeface, with variables such as movername, filename, and device name enclosed by angle brackets, with the command name appearing in bold. The switches and other options also appear in bold and, in most cases, are prefixed by a minus sign:

server_umount {<movername>|ALL}[-perm][-temp]{-all|<fs_name>|<pathname>}

Required entries

A switch or variable enclosed with curly brackets, or not enclosed at all, indicates a required entry:

{<movername>|ALL}

Optional entries

A switch or variable enclosed with square brackets indicates an optional entry:

[-perm][-temp]

Formatting

The variable name enclosed by angle brackets indicates the name of a specified object:

{<movername>|ALL}

Options

An option is prefixed with a minus (-) sign: -perm

If the option is spelled out, for example, -perm, in the command syntax, you may use just the first letter: -p
Options and names are case-sensitive. If an uppercase letter is specified in the syntax, a lowercase letter is not accepted.

The vertical bar symbol ( | ) represents or, meaning an alternate selection:

{-all|<fs_name>|<pathname>}

**Command prefixes**

Commands are prefixed depending on what they are administering. For example, commands prefixed with:

- `cel_` execute to the remotely linked VNX system.
- `cs_` execute to the Control Station.
- `fs_` execute to the specified file system.
- `nas_` execute directly to the Control Station database.
- `server_` require a movername entry and execute directly to a Data Mover.
General notes

- If a command is interrupted by using Ctrl-C, then the following messages or traces on the console are expected:
  - nas_cmd: system execution failed.
  - nas_cmd: PANIC: caught signal #11 (Segmentation fault) -- Giving up.
- Use VNX CLI for file to add IPv6 addresses to the NFS export host list. Enclose the IPv6 address in { } or square brackets in the CLI. The IPv6 addresses added to the NFS export list by using the CLI are displayed as read-only fields in the Unisphere software.
This chapter lists the VNX Command Set provided for managing, configuring, and monitoring of Data Movers. The commands are prefixed with `cel` or `cs`, and appear alphabetically. The prefix assigned to a command indicates what the command is administering. The `cel` prefix administers to the remote VNX, and `cs` administers to the local Control Station. The command line syntax (Synopsis), a description of the options, and an example of usage are provided for each command. Commands included are:

- `cel_fs` ................................................................. 20
- `clariion_mgmt` ....................................................... 25
- `cs_standby` ............................................................ 32
The cel and cs Commands

**cel_fs**

Manages file systems residing on a remotely linked VNX in an RDF FarCopy or NearCopy environment.

**SYNOPSIS**

cel_fs <cel_name>
  -list
  -info [-size] {-all|{<fs_name>|id=<fs_id>},...}
  -Extract {-all|{<fs_name>|id=<fs_id>},...}
  -Import {{<fs_name>,...}|-file <filename>}

**DESCRIPTION**

From the remotely linked VNX, cel_fs imports and enables the definition of a remote file system known as the R2 onto the local system known as the R1. The <cel_name> is the default hostname of the remote Control Station active during installation, or when performing a nas_rdf-init to set up the remote data facility (RDF) environment. To find the <cel_name>, go to nas_cel and execute the -list option. The local VNX, by default, has an ID of zero.

cel_fs displays a listing of the file systems residing on the remote VNX including their attributes.

This command is used in FarCopy and NearCopy environments.

**OPTIONS**

-list
Lists all of the file systems residing on the remote VNX as specified by its <cel_name>.

-Note: The ID of the object is an integer and is assigned automatically. The name of a file system may be truncated if it is too long for the display. To display the full name, use the -info option with a file system ID.

-info [-size] {-all|{<fs_name>|id=<fs_id>},...}
Displays the attributes and size of the file system residing on the <cel_name>. The <fs_name> can be a file system name or a group name and can be up to 16 characters.

-Extract {-all|{<fs_name>|id=<fs_id>},...}
Extracts all file system attributes that can be redirected for import into the VNX. The second <fs_name> specifies a file system where the attributes can be imported.
**-Import** {{<fs_name>,...}}|-file <filename>

Imports file system attributes obtained from the extraction of a file system definition either from the specified <fs_name> or <filename>.

**SEE ALSO** *Using SRDF/S with VNX for Disaster Recovery*, nas_cel, nas_fs, nas_rdf, and fs_group.

**EXAMPLE #1** To display a listing of the file systems residing on the remote VNX cs30, type:

```
$ cel_fs cs30 -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>type</th>
<th>acl</th>
<th>volume</th>
<th>name</th>
<th>server</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>66</td>
<td>root_fs_1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>68</td>
<td>root_fs_2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>70</td>
<td>root_fs_3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>72</td>
<td>root_fs_4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>74</td>
<td>root_fs_5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>76</td>
<td>root_fs_6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>78</td>
<td>root_fs_7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>80</td>
<td>root_fs_8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>82</td>
<td>root_fs_9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>84</td>
<td>root_fs_10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>86</td>
<td>root_fs_11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>88</td>
<td>root_fs_12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>90</td>
<td>root_fs_13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>92</td>
<td>root_fs_14</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>94</td>
<td>root_fs_15</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>96</td>
<td>root_fs_common_4,3,2,1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>145</td>
<td>root_fs_ufslog</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>156</td>
<td>ufs1</td>
<td>1</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of a file system (assigned automatically).</td>
</tr>
<tr>
<td>inuse</td>
<td>Whether a file system has been registered into the mount table.</td>
</tr>
<tr>
<td>type</td>
<td>What type of file system. nas_fs provides information.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for a file system. nas_fs provides information.</td>
</tr>
<tr>
<td>volume</td>
<td>ID of the volume on which a file system resides.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to a file system.</td>
</tr>
<tr>
<td>server</td>
<td>Server associated with a file system.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2** To display the attributes and the size for ufs1 on cs30, type:

```
$ cel_fs cs30 -info -size ufs1
```

id = 18  
name = ufs1  
ac1 = 0  
in_use = True  
type = uxfs  

*cel_fs* 21
The cel and cs Commands

volume    = mtv1
pool      =
rw_servers= server_2
ro_servers= 
rw_vdms   = 
ro_vdms   =
size      = total = 22660 avail = 22659 used = 0 ( 0% ) (sizes in MB)
volume: total = 23012 (sizes in MB)
stor_devs =
    002804000190-0034, 002804000190-0035, 002804000190-0036, 002804000190-0037
disks    = d3,d4,d5,d6
  disk=d3 stor_dev=002804000190-0034 addr=c0t3l8-15-0 server=server_2
  disk=d4 stor_dev=002804000190-0035 addr=c0t3l9-15-0 server=server_2
  disk=d5 stor_dev=002804000190-0036 addr=c0t3l10-15-0 server=server_2
  disk=d6 stor_dev=002804000190-0037 addr=c0t3l11-15-0 server=server_2

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of a file system (assigned automatically).</td>
</tr>
<tr>
<td>name</td>
<td>Name of the imported file system.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for a file system. nas_fs provides information.</td>
</tr>
<tr>
<td>inuse</td>
<td>Whether a file system has been registered into the mount table.</td>
</tr>
<tr>
<td>type</td>
<td>What type of file system. nas_fs provides information.</td>
</tr>
<tr>
<td>volume</td>
<td>Name of the volume on which a file system resides.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool for the file system.</td>
</tr>
<tr>
<td>rw_servers</td>
<td>Servers with read-write access.</td>
</tr>
<tr>
<td>ro_servers</td>
<td>Servers with read-only access.</td>
</tr>
<tr>
<td>rw_vdms</td>
<td>VDM servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_vdms</td>
<td>VDM servers with read-only access to a file system.</td>
</tr>
<tr>
<td>size</td>
<td>Total size, available size, and amount used in MB.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume size that is used.</td>
</tr>
<tr>
<td>stor_devs</td>
<td>ID of the system device and the serial number.</td>
</tr>
<tr>
<td>disks</td>
<td>The disks on which a file system resides. - dd indicates a remote disk.</td>
</tr>
</tbody>
</table>

EXAMPLE #3 To extract a file system definition for ufs1 from cs30, type:
$ cel_fs cs30 -Extract ufs1

0:bofs:18
18:ufs1:0:y:1:164:1:::0:::
164:mtv1:0:y:3:2:18:156:
156:stv1:0:y:2:1:164:64:3,4,5,6:
6:d6:0:y:4:1:156:6:
6:d6:0:y:5753:002804000190:1,2,3,4:6:0037:5:
5:d5:0:y:4:1:156:5:
5:d5:0:y:5753:002804000190:1,2,3,4:5:0036:5:
4:d4:0:y:4:1:156:4:
4:d4:0:y:5753:002804000190:1,2,3,4:4:0035:5:
The cel and cs Commands

Where:
The output is the extracted file system definition.

EXAMPLE #4 To extract a file system definition for ufs1 from cs30 into the extract-file, type:

```
$ cel_fs cs30 -Extract ufs1 > extract-file
```

EXAMPLE #5 To import a remote file system definition for ufs1 from cs30 onto the current VNX, type:

```
$ cel_fs cs30 -Import ufs2
```

id        = 18
name      = ufs2
acl       = 0
in_use    = False
type      = uxfs
volume    = mtv2
pool      =
rw_servers=
ro_servers=
rw_vdms   =
ro_vdms   =
backup_of = 1901 Fri Apr 23 15:25:59 EDT 2004
remainder = 0 MB (0%)
stor_devs = 002804000218-0038,002804000218-0039,002804000218-003A,002804000218-003B
disks     = dd7,dd8,dd9,dd10

EXAMPLE #2 provides an output description of all values except those which are unique to the -Import option.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>backup_of</td>
<td>System ID of the remote file system.</td>
</tr>
<tr>
<td>remainder</td>
<td>Number of MB copied from the file system on the remote VNX.</td>
</tr>
</tbody>
</table>

EXAMPLE #6 To import a remote file system definition from the file, extract-file, from cs30 into the current VNX, type:

```
$ cel_fs cs30 -Import -file extract-file
```

id        = 19
name      = ufs1
acl       = 0
in_use    = False
type      = uxfs
volume    = mmtv1
The cel and cs Commands

```
pool     =
rw_servers=
ro_servers=
rw_vdms   =
ro_vdms   =
backup_of = 18@1 Fri Apr 23 15:26:25 EDT 2004
remainder = 0 MB (0%)
stor_devs =
002804000218-0034,002804000218-0035,002804000218-0036,002804000218-0037
disks     = dd3,dd4,dd5,dd6
```

EXAMPLE #2 and EXAMPLE #5 provide a description of command output.
SPA and SPB public/private IP address management.

SYNOPSIS

clariion_mgmt
-start { -spa_ip <Public IPv4 address for SPA> -spb_ip <Public IPv4 address for SPB> | -spa_ip6 <Public IPv6 address for SPA> -spb_ip6 <Public IPv6 address for SPB> | -use_proxy_nd } [-retry]
| -modify { -spa_ip <Public IPv4 address for SPA> -spb_ip <Public IPv4 address for SPB> } | { -spa_ip6 <Public IPv4 address for SPA> -spb_ip6 <Public IPv6 address for SPB> } [-retry]
| -recover [-o]
| -stop [-use_proxy_nd][-retry]
| -info [-use_proxy_nd]

DESCRIPTION
Sets up routing information so that the SPs can be accessed from the public network by means of the Control Station.

OPTIONS
-start
Changes IP address of both SPA and SPB from private to public IP address.

-spa_ip
Indicates the parameter is used to provide SPA public IPv4 address.

-spb_ip
Indicates the parameter is used to provide SPB public IPv4 address.

-spa_ip6
Indicates the parameter is used to provide SPA public IPv6 address.

-spb_ip6
Indicates the parameter is used to provide SPB public IPv6 address.

-use_proxy_nd
Uses proxy Neighbor Discovery (ND) protocol as an option changing IP addresses of SPA and SPB.

-retry
Indicates the parameter is used to bypass health checks.

-modify
Changes IP address of SPA and SPB at a time. Modifies existing public IP address to other public IP address.

-recover
Rebuilds and restores the damaged configuration files.
-o Indicates the parameter is used to bypass any prompting of questions.

-stop Changes public IP address to default private IP address of both SPA and SPB.

-info Displays all information of proxy ARP services. It includes public IP address of SPA and SPB, status of services, proxy ARP implementation type and booting enable, and so on.

TROUBLESHOOTING

If a system is not properly configured, here are some ways to get the state back. If the configuration files become damaged, use the -recover option. This will rebuild and restore the configuration files (if possible). Run the -info command and confirm that the system is now OK:

◆ If the system is halfway setup, where one IP address is on the public network and one is on the internal network due to a failure in the initial setups, the ARP settings will be rolled back during a -start or -modify operation. To continue, run the operation again with the -retry flag. This will retry the task and not attempt to run the health check before resuming.

◆ If it fails to successfully complete, there may be underlying problems with the Storage Processors. Verify that you can communicate with them through naviseccli. Because the operation is not fully complete, and the security case has not been updated, the credentials must be manually specified to naviseccli to use the commands.

◆ If unable to ping the storage processors because ARP settings are rolled back, the parameters -ip_already_set can be supplied to a partial command to restore ARP access.

Example:

```
clarion_mgmt -start -spa_ip <IP address> -ip_already_set
```

◆ If unable to change SPA and SPB to public because of initialize security, following command steps may resolve the issue.

Example:

```
cd /nas/tools/
tar zxvf tftpboot.tar.gz
cd tftpboot//setupbackend
```
The cel and cs Commands

./setup_clariion_security <spa_ip> <spb_ip> <username> <password> -initialize

EXAMPLE #1 To use the -start option, type:

$ /nas/sbin/clariion_mgmt -start -spa_ip 10.6.2.80
   -spb_ip 10.6.2.81

Sets SPA and SPB IP address from private to public:

Checking if running as root...yes
Checking if model is supported...yes
Checking for integrated system...yes
Checking if interface eth3 is configured...yes
Checking if interface eth3:1 is configured...no
Checking if interface eth3:2 is configured...no
Checking if IP (10.6.2.80) is available...yes
Checking if IP (10.6.2.81) is available...yes
Checking if SP (128.221.252.200) is up...yes
Checking if SP (128.221.253.201) is up...yes
Checking if a gateway is setup for eth3...yes
Step 1/12 [28185788431]: Setting up Proxy ARP for SPA on Control Station
   Adding host specific route for SPA
   Adding rules to allow outbound traffic from SPA
   Adding ARP entry for SPA
   Updating /etc/hosts entry for SPA
Step 2/12 [28185788417]: Changing SPA IP address.
   Changing SPA IP from 128.221.252.200 to 10.6.2.80 (subnetmask 255.255.255.0, gateway 10.6.2.1)
Step 3/12 [28185788421]: Waiting for SPA to restart.
   Waiting for SPA to go down.....done (18 secs)
Step 4/12 [28185788425]: Waiting for ping response from SPA.
   Waiting for 10.6.2.80 to respond.....done (15 secs)
Step 5/12 [28185788427]: Waiting for CLARiiON software to start on SPA.
   Waiting for CLARiiON software to start on SPA...done (37 secs)
   Waiting until SPB sees 10.6.2.80 in the domain...done (3 secs)
Step 6/12 [28185788429]: Updating NAS database with SPA IP address.
   Updating SYMAPI database with new CLARiiON IP addresses...done (21 secs)
Step 7/12 [28185788432]: Setting up Proxy ARP for SPB on Control Station
   Adding host specific route for SPB
   Adding rules to allow outbound traffic from SPB
   Adding ARP entry for SPB
Step 8/12 [28185788418]: Changing SPB IP address.
   Changing SPB IP from 128.221.253.201 to 10.6.2.81 (subnetmask 255.255.255.0, gateway 10.6.2.1)
Step 9/12 [28185788422]: Waiting for SPB to restart.
   Waiting for SPB to go down.....done (18 secs)
Step 10/12 [28185788426]: Waiting for ping response from SPB.
   Waiting for 10.6.2.81 to respond......done (20 secs)
Step 11/12 [28185788428]: Waiting for CLARiiON software to start on SPB.
EXAMPLE #2  To modify already existing public IP address of SPB, type:

$ /nas/sbin/clariion_mgmt -modify -spb_ip 10.6.2.84

Note: SPA and SPB must be set to public IP to use this command.

Output:
Checking if running as root...yes
Checking if model is supported...yes
Checking for integrated system...yes
Checking if interface eth3 is configured...yes
Checking if interface eth3:1 is configured...no
Checking if interface eth3:2 is configured...no
Checking if IP (10.6.2.84) is available...yes
Checking if SP (10.6.2.80) is up...yes
Checking if SP (10.6.2.81) is up...yes
Checking if a gateway is setup for eth3...yes
Step 1/7 [28185788432]: Setting up Proxy ARP for SPB on Control Station
Adding host specific route for SPB
Adding rules to allow outbound traffic from SPB
Adding ARP entry for SPB
Updating /etc/hosts entry for SPB
Step 2/7 [28185788418]: Changing SPB IP address.
Changing SPB IP from 10.6.2.81 to 10.6.2.84 (subnetmask 255.255.255.0, gateway 10.6.2.1)
Step 3/7 [28185788422]: Waiting for SPB to restart.
Waiting for SPB to go down.....done (19 secs)
Step 4/7 [28185788426]: Waiting for ping response from SPB.
Waiting for 10.6.2.84 to respond.....done (14 secs)
Step 5/7 [28185788428]: Waiting for CLARiiON software to start on SPB.
Waiting for CLARiiON software to start on SPB...done (37 secs)
Waiting until SPA sees 10.6.2.84 in the domain...done (1 secs)
Step 6/7 [28185788430]: Updating NAS database with SPB IP address.
Updating SYMAPI database with new CLARiiON IP addresses...done (18 secs)
Step 7/7 [28185788436]: Removing old Proxy ARP setup for SPB on Control Station
Removing host specific route for SPB
Removing rules that allow outbound traffic from SPB
Removing ARP entry for SPB
FINISH: Operation took a total time of 1 minute 49 seconds to complete.

EXAMPLE #3  To modify already existing public IP address of SPA and SPB, type:
The cel and cs Commands

$ /nas/sbin/clariion_mgmt -modify -spa_ip 10.6.2.79
   -spb_ip 10.6.2.81 { -o }

Output:
Checking if running as root...yes
Checking if model is supported...yes
Checking for integrated system...yes
Checking if interface eth3 is configured...yes
Checking if interface eth3:1 is configured...no
Checking if interface eth3:2 is configured...no
Checking if IP (10.6.2.84) is available...yes
Checking if SP (10.6.2.80) is up...yes
Checking if SP (10.6.2.81) is up...yes
Checking if a gateway is setup for eth3...yes
Step 1/7 [28185788432]: Setting up Proxy ARP for SPB on Control Station
   Adding host specific route for SPB
   Adding rules to allow outbound traffic from SPB
   Adding ARP entry for SPB
   Updating /etc/hosts entry for SPB
Step 2/7 [28185788418]: Changing SPB IP address.
   Changing SPB IP from 10.6.2.81 to 10.6.2.84 (subnetmask 255.255.255.0, gateway
   10.6.2.1)
Step 3/7 [28185788422]: Waiting for SPB to restart.
   Waiting for SPB to go down.....done (19 secs)
Step 4/7 [28185788426]: Waiting for ping response from SPB.
   Waiting for 10.6.2.84 to respond.....done (14 secs)
Step 5/7 [28185788428]: Waiting for CLARiiON software to start on SPB.
   Waiting for CLARiiON software to start on SPB...done (37 secs)
Step 6/7 [28185788430]: Waiting until SPA sees 10.6.2.84 in the domain...done (1 secs)
Step 7/7 [28185788436]: Updating NAS database with SPB IP address.
   Updating SYMAPI database with new CLARiiON IP addresses...done (17 secs)
FINISH: Operation took a total time of 1 minute 49 seconds to complete.

EXAMPLE #4
To recover configuration files related to proxy ARP configuration, type:

$ /nas/sbin/clariion_mgmt -recover

Validating primary configuration file
Restored configuration files

$ /nas/sbin/clariion_mgmt -recover -o

Note: Output is the same as the above command, but with no prompting of questions.

Validating primary configuration file
Restored configuration files
**EXAMPLE #5** To use the `stop` option, type:

```bash
$ /nas/sbin/clariion_mgmt -stop
```

Sets default private IP address of SPA (128.221.252.200) and SPB (128.221.253.201).

Checking if running as root...yes
Checking if model is supported...yes
Checking for integrated system...yes
Checking if interface eth3 is configured...yes
Checking if SP (10.6.2.80) is up...yes
Checking if SP (10.6.2.84) is up...yes
Step 1/12 [28185788417]: Changing SPA IP address.
Changing SPA IP from 10.6.2.80 to 128.221.252.200 (subnetmask 255.255.255.0, gateway 128.221.252.104)
Step 2/12 [28185788421]: Waiting for SPA to restart.
Waiting for SPA to go down.....done (18 secs)
Step 3/12 [28185788425]: Waiting for ping response from SPA.
Waiting for 128.221.252.200 to respond.....done (15 secs)
Step 4/12 [28185788427]: Waiting for CLARiiON software to start on SPA.
Waiting for CLARiiON software to start on SPA...done (37 secs)
Waiting until SPB sees 128.221.252.200 in the domain...done (5 secs)
Step 5/12 [28185788429]: Updating NAS database with SPA IP address.
Adding rules to allow outbound traffic from SPB
Updating SYMAPI database with new CLARiiON IP addresses...done (21 secs)
Step 6/12 [28185788433]: Removing Proxy ARP for SPA on Control Station
Removing host specific route for SPA
Removing rules that allow outbound traffic from SPA
Removing ARP entry for SPA
Updating /etc/hosts entry for SPA
Step 7/12 [28185788418]: Changing SPB IP address.
Changing SPB IP from 10.6.2.84 to 128.221.253.201 (subnetmask 255.255.255.0, gateway 128.221.253.104)
Step 8/12 [28185788422]: Waiting for SPB to restart.
Waiting for SPB to go down.....done (20 secs)
Step 9/12 [28185788426]: Waiting for ping response from SPB.
Waiting for 128.221.253.201 to respond.....done (14 secs)
Step 10/12 [28185788428]: Waiting for CLARiiON software to start on SPB.
Waiting for CLARiiON software to start on SPB...done (24 secs)
Waiting until SPA sees 128.221.253.201 in the domain...done (22 secs)
Step 11/12 [28185788430]: Updating NAS database with SPB IP address.
Updating SYMAPI database with new CLARiiON IP addresses...done (18 secs)
Step 12/12 [28185788434]: Removing Proxy ARP for SPB on Control Station
Removing host specific route for SPB
Removing rules that allow outbound traffic from SPB
Removing ARP entry for SPB
Updating /etc/hosts entry for SPB
FINISH: Operation took a total time of 4 minutes 12 seconds to complete.
EXAMPLE #6

To display the default information of proxy ARP services, type:

```
$ /nas/sbin/clariion_mgmt -info
```

Displays default information of proxy ARP services.

**Note:** The command will not display anything if there is nothing configured.

Public IP address for SPA: 10.6.2.80
Public IP address for SPB: 10.6.2.81
Start on boot: yes
Current implementation: Proxy-ARP
Status: Started
**cs_standby**

Initiates a takeover and failover of a Control Station on a VNX with dual Control Stations.

### SYNOPSIS

```
cs_standby
{-takeover | -failover}
```

### DESCRIPTION

The `cs_standby` command initiates a Control Station takeover and failover. When a Control Station is activated, the name of the primary Control Station is displayed.

This command must be executed from the `/nas/sbin` or `/nasmd/sbin` directory. `su` to root to execute this command.

**Note:** EMC SRDF® is not supported on the secondary Control Station.

### OPTIONS

**-takeover**

Executed from the standby Control Station, initiates a reboot of the primary Control Station, then changes the state of the standby to that of the primary. The original primary Control Station now becomes the standby Control Station. The `-takeover` option can be used to failback Control Station 0 to the role of primary Control Station after a failover, or to set Control Station 1 to the role of primary Control Station on demand.

**CAUTION**

When executing a takeover or failover, Data Movers performing functions such as RDF, EMC TimeFinder®/FS, file system extends, or quotas may be interrupted.

**CAUTION**

If a primary Control Station fails over to a standby Control Station, the remote replication service continues to run, but replication management capabilities are no longer available.

**Note:** After executing a takeover or failover, a few minutes may be needed to stop Linux and other services active on the Control Station.
The `cel` and `cs` Commands

- **-failover**
  Executed from the primary Control Station, initiates a reboot of the primary Control Station, then activates the standby to take over the role of the primary Control Station. The `-failover` option can be used to complete a failback by forcing a failover from Control Station 1 back to Control Station 0 after Control Station 0 had failed over, or to set Control Station 1 to the role of primary Control Station on demand.

To display the primary Control Station, type:

```
$ nas/sbin/getreason
```

**EXAMPLE #1**

To change the state of the standby Control Station to primary, `cd` to the `/nasmcd/sbin` directory of the standby Control Station, then type:

```
#.cs_standby -takeover
```

Taking over as Primary Control Station............done

If the **takeover** command is executed on the primary Control Station, the following error message appears:

The `-takeover` option is only valid on a standby Control Station

**EXAMPLE #2**

To initiate a failover from the primary Control Station to the standby Control Station, `cd` to the `/nas/sbin` directory of the primary Control Station, then type:

```
#.cs_standby -failover
```

The system will reboot, do you wish to continue [yes or no]: y

Failing over from Primary Control Station
This chapter lists the VNX Command Set provided for managing, configuring, and monitoring the specified file system. The commands are prefixed with `fs` and appear alphabetically. The command line syntax (Synopsis), a description of the options, and examples of usage are provided for each command. Commands included are:

- `fs_ckpt` .................................................................................................. 36
- `fs_dedupe` ............................................................................................ 49
- `fs_dhsm` ............................................................................................... 65
- `fs_group` ............................................................................................... 94
- `fs_rdf` .................................................................................................... 98
- `fs_timefinder` ..................................................................................... 105
The fs Commands

fs_ckpt

Manages checkpoints using the EMC SnapSure™ functionality.

SYNOPSIS

fs_ckpt  {<fs_name>|id=<fs_id>}
       -list [-all]
       | [-name <name>] -Create [-readonly {y|n}] [<volume_name>]
       | [-fixed_block_dedup {n|y}][-option <options>]
       | [-name <name>] -Create [-readonly {y|n}] [size=<integer>[T|G|M|%]]
       | [-pool=<pool>][storage=<system_name>][-option <options>]
       | -refresh [-option <options>]
       | [-name <name>] -Restore [-Force][-option <options>]
       | -modify [%full=<value>][maxsavsize=<integer>[T|G|M]][-fixed_block_dedup {n|y}]

DESCRIPTION

The fs_ckpt command creates a checkpoint of a Production File System (PFS), lists associated checkpoints, refreshes a checkpoint to the current time, and restores a PFS back to a specific point in time using a checkpoint. Checkpoints are deleted using nas_fs.

What is a checkpoint file system?

A PFS is made up of blocks. When a block within a PFS is modified, a copy containing the original contents of that block is saved to a metavolume called the SavVol. Subsequent changes made to the same block in the PFS are not copied into the SavVol. The original blocks from the PFS (in the SavVol) and the unchanged PFS blocks (that remain in the PFS) are read according to a bitmap and blockmap data tracking structure. These blocks combine to provide a complete point-in-time file system image which is called a checkpoint.

OPTIONS

-list
Displays all of the associated checkpoints for the specified file system. The -all option displays system-generated Replication checkpoints in addition to checkpoints created by the user.

[-name <name>] -Create
Creates, mounts, and optionally assigns a name to the checkpoint of the PFS. The checkpoint must be unmounted prior to unmounting the PFS. Names assigned to a checkpoint cannot be all numeric. If a name is not chosen, one is assigned by default.

[-readonly {y|n}]
Specifies whether a checkpoint is read only or not. y (default) sets the checkpoint as read only; n sets the checkpoint as writeable.
The fs Commands

[<volume_name>]
Specifies an unused metavolume for the checkpoint.

**Note:** A volume can be specified for only the first checkpoint of a PFS since all of the subsequent checkpoints share the same SavVol. The minimum size required for a SavVol is 64 MB. The volume size is 10 GB unless the PFS is less than 10 GB, then the volume is the same size as the file system.

[-fixed_block_dedup {n|y}]
Specifies whether fixed-block deduplication is enabled on the checkpoint. n is the default. This option is only valid if the checkpoint was created from a metavolume.

[-option <options>]
Specifies the following comma-separated options:

%full=<value>
Specifies a value as the percentage threshold permitted for the SavVol. When that value is reached, a warning is sent to the server_log and the syslog files. The Control Station acknowledges the event and automatically extends the checkpoint. The SavVol is automatically extended by 10 GB if its default %full value is reached. If the %full value is set to zero, the option is disabled.

maxsavsize=<integer>[T|G|M]
Limits the final size to which the SavVol can be automatically extended when the high watermark value specified in %full has been reached. Automatic extension of the SavVol stops when the size of the SavVol reaches the value specified in maxsavsize. The range for maxsavsize is 64 MB to 16 TB.

automount=no
Stops the checkpoint from being automatically mounted.

[-name <name>] -Create
Creates, mounts, and optionally assigns a name to the checkpoint of the PFS. The checkpoint must be unmounted prior to unmounting the PFS. Names assigned to a checkpoint cannot be all numeric. If a name is not chosen, one is assigned by default.

[-readonly {y|n}]
Specifies whether a checkpoint is read only or not. y (default) sets the checkpoint as read only; n sets the checkpoint as writeable.
The fs Commands

[size=<integer>[T|G|M%]]
Specifies a size for the checkpoint file system. Type an integer between 1 and 1024, specify T for terabytes, G for gigabytes (default), or M for megabytes, or type an integer representing the percentage of a file system’s size, followed by the percent sign.

[pool=<pool>]
Specifies the storage pool to be used for the checkpoint. Storage pools can either be user-defined or system-defined. The nas_pool-list command displays a listing of available pool types.

[storage=<system_name>]
Specifies the attached system for the checkpoint SavVol to reside.

[-option <options>]
Specifies the following comma-separated options:

%full=<value>
Specifies a value as the percentage threshold permitted for the SavVol. When that value is reached, a warning is sent to the server_log and the syslog files. The Control Station acknowledges the event and automatically extends the checkpoint. The SavVol is automatically extended by 10 GB if its default %full value is reached. If the %full value is set to zero, the option is disabled. The default for <value> is 90 and it can be within the range of 10 to 99.

automount=no
Stops the checkpoint from being automatically mounted.

-refresh
Initiates an immediate update of a checkpoint, thereby allowing the SavVol space to be reused. Refreshing a checkpoint does not add to the number of checkpoints of the PFS.

[-option <options>] %full=<value>
Specifies a value as the percentage threshold permitted for the metavolume. When that value is reached, a warning is sent to the server_log and the syslog files. The Control Station acknowledges the event and automatically extends the checkpoint. The SavVol is automatically extended by 10 GB if its default %full value is reached. If the %full value is set to zero, the option is disabled. The default for <value> is 90.

-modify
Modifies one or all of the following options:
The fs Commands

Note: The -modify action works only on the PFS and not on the checkpoint.

[%full=<value>]
Modifies the value of the percentage threshold permitted for the metavolume.

[maxsavsize=<integer> [T|G|M]]
Modifies the final size to which the SavVol can be automatically extended, when the size specified in %full is reached.

[-fixed_block_dedup {n|y}]
Specifies whether fixed-block deduplication is enabled on the checkpoint. n is the default. This option is only valid if the checkpoint was created from a metavolume.

[-name <name>] -Restore
Restores the PFS from the specified checkpoint and optionally assigns a name to the automatically created checkpoint. If a name is not chosen, one is assigned by default.

Note: As part of the restore, a new checkpoint is automatically created to capture the latest point-in-time image of the PFS. This is for protection in the event that the restored image is discarded.

[-Force]
The -Force option must be used when restoring a production file system with File-Level Retention enabled.

CAUTION
Forcing a restore of a production file system with File-Level Retention enabled from a checkpoint will delete or overwrite files that were written after this checkpoint was created or refreshed.

[-option <options>]
Specifies the following comma-separated options:

%full=<value>
Specifies a value as the percentage threshold permitted for the SavVol. When that value is reached, a warning is sent to the server_log and the syslog files. The Control Station acknowledges the event and automatically extends the checkpoint. The SavVol is
automatically extended by 10 GB if its default %full value is reached. If the %full value is set to zero, the option is disabled. The <value> can be an integer between 10 and 75 (default).

    automount=no
    Stops the checkpoint from being automatically mounted.

SEE ALSO Using VNX Snapsure, nas_fs, and nas_pool.

SYSTEM OUTPUT The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM or CK before a set of integers, for example, APM00033900124-0019. For example, EMC Symmetrix® systems display as 002804000190-003C. The outputs displayed in the examples use a VNX for block.

EXAMPLE #1 To display the checkpoint for the file system fs4, type:

    $ fs_ckpt fs4 -list

    id ckpt_name creation_time inuse fullmark total_savvol_used ckpt_usage_on_savvol
    1406 fs4_ckpt1 05/26/2008-16:22:19-EDT y 90% 51% 0%
    id wckpt_name inuse fullmark total_savvol_used base ckpt_usage_on_savvol

EXAMPLE #2 To display all checkpoints including internal checkpoints for the file system fs4, type:

    $ fs_ckpt fs4 -list -all

    id ckpt_name creation_time inuse fullmark total_savvol_used ckpt_usage_on_savvol
    1401 root_rep_ckpt_1398_21625_1 05/26/2008-16:11:10-EDT y 90% 51% 0%
    1402 root_rep_ckpt_1398_21625_2 05/26/2008-16:11:22-EDT y 90% 51% 0%
    1406 fs4_ckpt1 05/26/2008-16:22:19-EDT y 90% 51% 0%
    id wckpt_name inuse fullmark total_savvol_used base ckpt_usage_on_savvol

EXAMPLE #3 To create a checkpoint of ufs1, on the volume, ssmtv1, type:

    $ fs_ckpt ufs1 -Create ssmtv1

    operation in progress (not interruptible)...id        = 22
    name      = ufs1
    acl       = 0
    in_use    = True
    type      = uxfs
    worm      = off
    volume    = mtv1
    pool      =
    rw_servers= server_2
    ro_servers=
    rw_vdms   =
    ro_vdms   =
    ckpts     = ufs1_ckpt1
    stor_devs = APM00043807043-0010,APM00043807043-0014
    disks     = d7,d9
    disk=d7    stor_dev=APM00043807043-0010 addr=c0t1l0         server=server_2
The fs Commands

```
disk=d7    stor_dev=APM00043807043-0010 addr=c16t110 server=server_2
disk=d9    stor_dev=APM00043807043-0014 addr=c0t114 server=server_2
disk=d9    stor_dev=APM00043807043-0014 addr=c16t114 server=server_2

id        = 24
name      = ufs1_ckpt1
acl       = 0
in_use    = True
type      = ckpt
worm      = off
volume    = vp132
pool      =
member_of =
rw_servers=
ro_servers= server_2
rw_vdms   =
ro_vdms   =
checkpt_of= ufs1 Wed Oct 13 18:01:04 EDT 2004
used      = 0%
full(mark)= 90%
stor_devs = APM00043807043-0011,APM00043807043-0017
disks     = d12,d15
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Automatically assigned ID of a file system or the checkpoint.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the file system or the checkpoint.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for a file system. nas_acl provides information.</td>
</tr>
<tr>
<td>in_use</td>
<td>If a file system is registered into the mount table of a Data Mover.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system. -list provides a description of the types.</td>
</tr>
<tr>
<td>worm</td>
<td>Whether the feature is enabled.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which a file system resides.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool for the file system.</td>
</tr>
<tr>
<td>member_of</td>
<td>Group to which the file system belongs.</td>
</tr>
<tr>
<td>rw_servers</td>
<td>Servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_servers</td>
<td>Servers with read-only access to a file system.</td>
</tr>
<tr>
<td>rw_vdms</td>
<td>VDM servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_vdms</td>
<td>VDM servers with read-only access to a file system.</td>
</tr>
<tr>
<td>ckpts</td>
<td>Associated checkpoints for the file system.</td>
</tr>
<tr>
<td>checkpt_of</td>
<td>Name of the PFS related to the existing checkpoints.</td>
</tr>
<tr>
<td>used</td>
<td>Percentage of SavVol space used by the checkpoints of the PFS.</td>
</tr>
</tbody>
</table>
### EXAMPLE #4

To create a checkpoint of `ufs1` named `ufs1_ckpt2` with a size of 2 GB by using the `clar_r5_performance` pool, with the specified system, with the `%full` set to 95, type:

```bash
$ fs_ckpt ufs1 -name ufs1_ckpt2 -Create size=2G pool=clar_r5_performance storage=APM00043807043 -option %full=95
```

```
operation in progress (not interruptible)...id        = 27
name      = ufs1
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = mtv1
pool      =
    rw_servers= server_2
    ro_servers=
    rw_vdms =
    ro_vdms =
ckpts     = ufs1_ckpt1,ufs1_ckpt2
stor_devs = APM00043807043-0010,APM00043807043-0014
    disks = d7,d9
        disk=d7  stor_dev=APM00043807043-0010 addr=c0t1l0  server=server_2
        disk=d7  stor_dev=APM00043807043-0010 addr=c16t1l0  server=server_2
        disk=d9  stor_dev=APM00043807043-0014 addr=c0t1l4  server=server_2
        disk=d9  stor_dev=APM00043807043-0014 addr=c16t1l4  server=server_2
id         = 30
name      = ufs1_ckpt2
acl       = 0
in_use    = True
type      = ckpt
worm      = off
volume    = vp145
pool      =
    member_of =
    rw_servers=
    ro_servers= server_2
    rw_vdms =
    ro_vdms =
checkpt_of= ufs1 Wed Nov 10 14:00:20 EST 2004
used      = 0%
full(mark)= 95%
stor_devs = APM00043807043-0011,APM00043807043-0017
    disks = d12,d15
        disk=d12  stor_dev=APM00043807043-0011 addr=c16t1l1  server=server_2
```

<table>
<thead>
<tr>
<th>full(mark)</th>
<th>SavVol usage point which, when reached, sends a warning message to the system log, and auto-extends the SavVol as system space permits.</th>
</tr>
</thead>
<tbody>
<tr>
<td>stor_devs</td>
<td>System devices associated with a file system.</td>
</tr>
<tr>
<td>disks</td>
<td>Disks on which the metavolume resides.</td>
</tr>
</tbody>
</table>
EXAMPLE #3 provides a description of command output.

EXAMPLE #5 To create a checkpoint of ufs2 named ufs2_ckpt1 with a size of 2 GB by using the clar_mapped_pool VNX mapped pool, with the specified system, with the %full set to 95, type:

```
$ fs_ckpt ufs2 -name ufs2_ckpt1 -Create size=2G pool=clar_mapped_pool storage=APM00043807043 -option %full=95
```

```
operation in progress (not interruptible)...id        = 435
name      = ufs2
acl       = 0
in_use    = True
type      = uxfs

worm      = off
volume    = v731
pool      = clar_mapped_pool
member_of = root_avm_fs_group_50
rw_servers= server_2
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
fast_clone_level = 1
deduplication = Off
thin_storage = False
tiering_policy = N/A/ Optimize Pool
compressed= False
mirrored  = False
ckpts     = ufs2_ckpt1
stor_devs  =
            FNM00103400314-0036,FNM00103400314-0037,FNM00103400314-0038,FNM00103400314-0039
disks     = d60,d61,d62,d63
```

```
disk=d60  stor_dev=FM00103400314-0036 addr=c0t110  server=server_2
disk=d60  stor_dev=FM00103400314-0036 addr=c16t110  server=server_2
disk=d61  stor_dev=FM00103400314-0037 addr=c0t111  server=server_2
disk=d61  stor_dev=FM00103400314-0037 addr=c16t111  server=server_2
disk=d62  stor_dev=FM00103400314-0038 addr=c0t112  server=server_2
disk=d62  stor_dev=FM00103400314-0038 addr=c16t112  server=server_2
disk=d63  stor_dev=FM00103400314-0039 addr=c0t113  server=server_2
disk=d63  stor_dev=FM00103400314-0039 addr=c16t113  server=server_2
```
type = ckpt
worm = off
volume = vp735
pool = clar_mapped_pool
member_of =
rw_servers =
ro_servers = server_2
rw_vdms =
ro_vdms =
checkpt_of = ufs2 Fri Jan 4 01:43:20 EST 2013
deduplication = Off
thin_storage = False
tiering_policy = N/A/Optimize Pool
compressed = False
mirrored = False
used = 13%
full (mark) = 95%
stor_devs =
FM00103400314-0036, FM00103400314-0037, FM00103400314-0038, FM00103400314-0039
disks = d60, d61, d62, d63
disk=d60 stor_dev=FM00103400314-0036 addr=c0t1l0 server=server_2
disk=d60 stor_dev=FM00103400314-0036 addr=c16t1l0 server=server_2
disk=d61 stor_dev=FM00103400314-0037 addr=c0t1l1 server=server_2
disk=d61 stor_dev=FM00103400314-0037 addr=c16t1l1 server=server_2
disk=d62 stor_dev=FM00103400314-0038 addr=c0t1l2 server=server_2
disk=d62 stor_dev=FM00103400314-0038 addr=c16t1l2 server=server_2
disk=d63 stor_dev=FM00103400314-0039 addr=c0t1l3 server=server_2
disk=d63 stor_dev=FM00103400314-0039 addr=c16t1l3 server=server_2

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>thin_storage</td>
<td>Indicates whether the VNX for block system uses thin provisioning. Values are: True, False, Mixed.</td>
</tr>
<tr>
<td>tiering_policy</td>
<td>Indicates the tiering policy is in effect. If the initial tier and the tiering policy are the same, the values are: Auto-Tier, Highest Available Tier, Lowest Available Tier. If the initial tier and the tiering policy are not the same, the values are: Auto-Tier/No Data Movement, Highest Available Tier/No Data Movement, Lowest Available Tier/No Data Movement.</td>
</tr>
<tr>
<td>compressed</td>
<td>Indicates whether data is compressed. Values are True, False, Mixed (indicates some of the LUNs, but not all, are compressed).</td>
</tr>
<tr>
<td>mirrored</td>
<td>Indicates whether the disk is mirrored.</td>
</tr>
</tbody>
</table>

**EXAMPLE #6**  
To create a writeable checkpoint of baseline checkpoint ufs1_ckpt1, type:

```
$ fs_ckpt ufs1_ckpt1 -Create -readonly n
```

operation in progress (not interruptible)...id = 45
name = ufs1_ckpt1
acl = 0
in_use = False
type = ckpt
worm = off
volume = vp145
pool = clar_r5_performance
member_of =
rw_servers =
ro_servers =
rw_vdms =
ro_vdms =
checkpt_of = ufs1 Tue Nov 6 14:56:43 EST 2007
ckpts = ufs1_ckpt1_writeable1
used = 38%
full (mark) = 90%
stor_devs = APM00042000814-0029, APM00042000814-0024, APM00042000814-0021, APM00042000814-001C
disks = d34, d17, d30, d13

id = 46
name = ufs1_ckpt1_writeable1
acl = 0
in_use = True
type = wckpt
worm = off
volume = vp145
pool = clar_r5_performance
member_of =
rw_servers = server_2
ro_servers =
rw_vdms =
ro_vdms =
checkpt_of = ufs1
baseline_ckpt = ufs1_ckpt1 Tue Nov 6 14:56:43 EST 2007
used = 38%
full (mark) = 90%
stor_devs = APM00042000814-0029, APM00042000814-0024, APM00042000814-0021, APM00042000814-001C
disks = d34, d17, d30, d13
disk=d34stor_dev=APM00042000814-0029 addr=c16t219 server=server_2
disk=d34stor_dev=APM00042000814-0029 addr=c32t219 server=server_2
disk=d34stor_dev=APM00042000814-0029 addr=c0t219 server=server_2
disk=d34stor_dev=APM00042000814-0029 addr=c48t219 server=server_2
disk=d17stor_dev=APM00042000814-0024 addr=c0t214 server=server_2
disk=d17stor_dev=APM00042000814-0024 addr=c48t214 server=server_2
disk=d17stor_dev=APM00042000814-0024 addr=c16t214 server=server_2
disk=d17stor_dev=APM00042000814-0024 addr=c32t214 server=server_2
disk=d30stor_dev=APM00042000814-0021 addr=c16t211 server=server_2
disk=d30stor_dev=APM00042000814-0021 addr=c32t211 server=server_2
disk=d30stor_dev=APM00042000814-0021 addr=c0t211 server=server_2
disk=d30stor_dev=APM00042000814-0021 addr=c48t211 server=server_2
disk=d13stor_dev=APM00042000814-001C addr=c0t1112 server=server_2
The fs Commands

```
disk=d13  stor_dev=APM00042000814-001C  addr=c48t1l12  server=server_2
disk=d13  stor_dev=APM00042000814-001C  addr=c16t1l12  server=server_2
disk=d13  stor_dev=APM00042000814-001C  addr=c32t1l12  server=server_2
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>baseline_cckpt</td>
<td>Name of the read-only checkpoint from which the writeable checkpoint is created.</td>
</tr>
</tbody>
</table>

EXAMPLE #3 provides a description of command output.

EXAMPLE #7 To list checkpoints for ufs1, type:

```
$ fs_ckpt ufs1 -list
id   ckpt_name                creation_time            inuse full(mark) used
29   ufs1_ckpt1               11/04/2004-14:54:06-EST    n   95%        0%
30   ufs1_ckpt2               11/10/2004-14:00:20-EST    y   95%        0%
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Automatically assigned ID of a file system or checkpoint.</td>
</tr>
<tr>
<td>ckpt_name</td>
<td>Name assigned to the checkpoint.</td>
</tr>
<tr>
<td>creation_time</td>
<td>Date and time the checkpoint was created.</td>
</tr>
<tr>
<td>inuse</td>
<td>If a checkpoint is registered into the mount table of a Data Mover.</td>
</tr>
<tr>
<td>full(mark)</td>
<td>SavVol-usage point which, when reached, sends a warning message to the system log, and auto-extends the SavVol as system space permits.</td>
</tr>
<tr>
<td>used</td>
<td>Percentage of SavVol space used by checkpoints of the PFS.</td>
</tr>
</tbody>
</table>

EXAMPLE #8 To refresh ufs1_ckpt2 by using the %full at 85, type:

```
$ fs_ckpt ufs1_ckpt2 -refresh -option %full=85
```

```
operation in progress (not interruptible)...id    = 30
name     = ufs1_ckpt2
acl       = 0
in_use    = True
type      = ckpt
worm      = off
volume    = vp145
pool      =
member_of =
rw_servers=
ro_servers= server_2
rw_vdms   =
ro_vdms   =
checkpoint= ufs1 Wed Nov 10 14:02:59 EST 2004
used      = 0%
full(mark) = 85%
stor_devs = APM00043807043-0011,APM00043807043-0017
disks     = d12,d15
disk=d12  stor_dev=APM00043807043-0011 addr=c16t1l1 server=server_2
```

```
EXAMPLE #9  Using root command, to restore ufs1_ckpt2 and capture the latest point-in-time image of the PFS on ufs1_ckpt3, type:

```
$ /nas/sbin/rootfs_ckpt ufs1_ckpt2 -name ufs1_ckpt3
```

EXAMPLE #3 provides a description of command output.

EXAMPLE #10  To modify the %full value of the SavVol associated with the file system ufs1 and set it to 95, type:

```
$ fs_ckpt ufs1 -modify %full=95
```

EXAMPLE #3 provides a description of command output.
auto_ext = no,virtual_provision=no
ckpts = wipckpt
stor_devs = APM00062400708-0014,APM00062400708-0016
disks = d26,d27
disk=d26 stor_dev=APM00062400708-0014 addr=c0t1l4 server=server_2
disk=d26 stor_dev=APM00062400708-0014 addr=c16t1l4 server=server_2
disk=d27 stor_dev=APM00062400708-0016 addr=c0t1l6 server=server_2
disk=d27 stor_dev=APM00062400708-0016 addr=c16t1l6 server=server_2

EXAMPLE #11   To modify the maxsavsize value of the SavVol associated with the file system ufs1 and set it to 65 GB, type:

$ fs_ckpt ufs1 -modify maxsavsize=65G

operation in progress (not interruptible)...id = 33
name = ufs1
acl = 0
in_use = True
type = uxfs
worm = off
volume = vp145
pool =

rw_servers= server_2
ro_servers=
rw_vdms =
ro_vdms =
auto_ext = no,virtual_provision=no
ckpts = wipckpt
stor_devs = APM00062400708-0014,APM00062400708-0016
disks = d26,d27
disk=d26 stor_dev=APM00062400708-0014 addr=c0t1l4 server=server_2
disk=d26 stor_dev=APM00062400708-0014 addr=c16t1l4 server=server_2
disk=d27 stor_dev=APM00062400708-0016 addr=c0t1l6 server=server_2
disk=d27 stor_dev=APM00062400708-0016 addr=c16t1l6 server=server_2

DIAGNOSTICS   The fs_ckpt command returns one of the following return codes:
◆ 0 — Command completed successfully
◆ 1 — Usage error
◆ 2 — Invalid object error
◆ 3 — Unable to acquire lock
◆ 4 — Permission error
◆ 5 — Communication error
◆ 6 — Transaction error
◆ 7 — Dart error
◆ 8 — Backend error
**fs_dedupe**

Manages file system deduplication state.

**SYNOPSIS**

```
fs_dedupe {
  -list
  | -info {-all|<fs_name>|id=<fs_id>}
  | -modify {<fs_name>|id=<fs_id>} [-state {off|suspended|on}]
    [-minimum_scan_interval <days>][-minimum_size <KB>]
    [-maximum_size <MB>][-access_time <days>][-modification_time <days>]
    [-case_sensitive {yes|no}][-pathname_exclude_list <path_list>]
    [-file_ext_exclude_list <ext_list>]
    [-duplicate_detection_method {sha1|byte|off}]
    [-savvol_threshold <percent>][-backup_data_threshold <percent>]
    [-cifs_compression_enabled {yes|no}][-compression_method {fast|deep}]
  | -clear {<fs_name>|id=<fs_id>}
    [-minimum_scan_interval][-minimum_size]
    [-maximum_size][-access_time][-modification_time][-case_sensitive]
    [-pathname_exclude_list][-file_ext_exclude_list]
    [-duplicate_detection_method][-savvol_threshold][-backup_data_threshold]
    [-cifs_compression_enabled][-compression_method]
  | -default {
    -info {<mover_name>|-all}
    | -set {<mover_name>|-all}[-minimum_scan_interval <days>]
      [-minimum_size <KB>][-maximum_size <MB>][-access_time
      <days>][-modification_time <days>][-case_sensitive
      {yes|no}][-file_ext_exclude_list <ext_list>]
      [-duplicate_detection_method {sha1|byte|off}][-savvol_threshold
      <percent>][-cpu_usage_low_watermark <percent>]
      [-cpu_usage_high_watermark <percent>][-backup_data_threshold
      <percent>]
      [-cifs_compression_enabled]
    | -clear {<mover_name>|-all}
      [-minimum_scan_interval][-minimum_size][-maximum_size][-access_time]
      [-modification_time][-case_sensitive][-file_ext_exclude_list]
      [-duplicate_detection_method][-savvol_threshold]
      [-cpu_usage_low_watermark][-cpu_usage_high_watermark]
      [-backup_data_threshold][-cifs_compression_enabled]
  }
}
```

**DESCRIPTION**

`fs_dedupe` allows the VNX administrator to enable, suspend, and undo all deduplication processing on a file system or a Data Mover. The Data Mover settings are the global settings that can be used for both the Data Mover and the file system. If a user sets a value for a specific file system, then that value overrides the Data Mover global value. If a user clears a value set for a specific file system, then that value is reset to the Data Mover global value.
The fs Commands

OPTIONS

-list
Lists all deduplication-enabled file systems on the VNX.

-info {-all|<fs_name>|id=<fs_id>}
Lists the existing file systems and provides information on the state of deduplication processing.

-all
Lists all file systems and provides detailed information on the state of deduplication processing.

<fs_name>
Lists the file system information for the specified file system name.

id=<fs_id>
Lists the file system information for the specified identifier.

The file system state and status information displayed includes:

- If the state is off and the status is not reduplicating:
  - ID
  - Name
  - Deduplication state

- If the state is off and the status is reduplicating:
  - ID
  - Name
  - Deduplication state
  - Progress information (the percentage of files scanned)

- If the state of the file system is on or suspended, and the status is Idle or Scanning:
  - ID
  - Name
  - Reduplication state
  - Status
  - The percentage of files scanned
  - Last system scan time
  - Number of files scanned
  - Number of files deduplicated
  - The percentage of files deduplicated
  - File system capacity
  - Logical data size
- The fs Commands
  - Percentage of file system usage
  - Space saved (in MB and percent)

```
-modify {<fs_name>|id=<fs_id>} [-state {off|suspended|on}]
```

Modifies the deduplication state of the file system for each specified file system identifier or file system name. The state can be set to off, on, or suspended.

```
[-minimum_scan_interval <days>]
```

Defines the minimum number of days between completing one scan of a file system and before scanning the same file system again. The values range from 1 to 365 and the default value is 7 days.

```
[-minimum_size <KB>]
```

Defines the file size in KB that limits deduplication. File sizes equal to this value or smaller will not be deduplicated. Setting this value to zero disables it. This value should not be set lower than 24 KB. The values range from 0 to 1000 and the default value is 24 KB.

```
[-maximum_size <MB>]
```

Defines the file size in MB of the largest file to be processed for deduplication. Files larger than this size in MB will not be deduplicated. Setting this value to zero disables it. The values range from 0 to 8388608 and the default value is 8388608 MB.

```
[-access_time <days>]
```

Defines the minimum required file age in days based on read access time. Files that have been read within the specified number of days will not be deduplicated. This setting does not apply to files with FLR locked state. Setting this value to zero disables it. The values range from 0 to 365 and the default value is 15 days.

```
[-modification_time <days>]
```

Defines the minimum required file age in days based on modification time. Files updated within the specified number of days will not be deduplicated. Setting this value to zero disables it. The values range from 0 to 365 and the default value is 15 days.

```
[-case_sensitive {yes|no}]
```

Defines whether case-sensitive (for NPS environments) or case-insensitive (for CIFS environments) string comparisons will
be used during scans. By default, case-insensitive comparisons will be done to be consistent for CIFS environments. The default value is zero (false).

\[[-\text{pathname\_exclude\_list}\ <\text{path\_list}>]\]

This is a file system setting only (no global setting). It is empty by default.

Defines a semicolon-delimited list of relative pathnames, in UTF-8 format, to be excluded from deduplication. Any directory below a specified pathname will be excluded from deduplication. You can specify a maximum of 10 pathnames and each one can be up to 1024 bytes. The default value is '' (empty).

\[[-\text{file\_ext\_exclude\_list}\ <\text{ext\_list}>]\]

Specifies a colon-delimited list of filename extensions to be excluded from deduplication. Each extension must include the leading dot. The default value is '' (empty).

\[[-\text{duplicate\_detection\_method}\ \{\text{sha1}|\text{byte}|\text{off}\}]\]

  0 (off) — This means that duplicate data detection is disabled. With this setting, every deduplicated file is considered unique and the only space savings made are accomplished with compression.

  1 (sha1) — The SHA-1 hash is used to detect duplicate data. It is faster than a byte comparison. This is the default method.

  2 (byte) — This will use a byte-by-byte comparison to detect duplicate data. This adds considerable overhead especially for large files.

\[[-\text{savvol\_threshold}\ <\text{percent}>]\]

Represents the percentage of the configured save volume (SavVol) auto extension threshold that can be used during deduplication. When the specified amount of SavVol is used, deduplication stops on this file system. By default, this value is 90 percent and the SavVol auto extension is also 90 percent; this option will apply when the SavVol is 81 percent full (90 * 90). Setting this value to zero disables it. The values range from 0 to 100.
[-backup_data_threshold <percent>]  
Indicates the full percentage that a deduplicated file has to be below in order to trigger space-reduced backups for NDMP. For example, when set to 90, any deduplicated file whose physical size (compressed file plus changed blocks) is greater than 90 percent of the logical size of the file will have the entire file data backed up without attempting to back it up in a space-reduced format. Setting this value to zero disables it. The values range from 0 to 200 and the default value is 90 percent.

[-cifs_compression_enabled {yes|no}]  
This option controls whether CIFS compression is allowed. When the default is yes, enable CIFS compression is allowed. When set to yes and the deduplication state of the file system is either on or suspended, then CIFS compression is enabled. If the deduplication state is either off or in the process of being turned off, then CIFS compression is not allowed, regardless of whether this option is set to yes.

[-compression_method {fast|deep}]  
Indicates whether the compression algorithm is set to fast (default setting) or deep. This option is valid for VNX systems that use version 7.1 and later. You can set this value for file systems only. You cannot set it as a Data Mover global value.

The fast option is the default compression algorithm that achieves the original compression ratios and performance.

The deep option is the compression algorithm that achieves space savings up to 30% greater than the fast method. For example, if a file is 50% compressible then the deep algorithm can compress the same file up to 65%. However, the compression and decompression time when using this deep option is longer than when using the fast option. You obtain more storage space at the cost of slower access. Selecting this deep compression method applies only to new files that are subsequently compressed, and not to existing compressed files.

When using VNX Replicator™, VNX systems that use version 7.0 and earlier cannot read the deep compression format and will return an I/O error if a read operation is attempted. Select the deep compression format only if downstream replication sessions are using compatible software or are scheduled to be upgraded soon.
-clear {<fs_name>|id=<fs_id>}
Sets the file system setting back to the Data Mover setting, which is
the default setting.

[-minimum_scan_interval]
Sets the minimum scan interval back to the default value of 7
days.

[-minimum_size]
Sets the minimum size back to the default value of 24 KB.

[-maximum_size]
Sets the maximum size back to the default value of 8388608 MB.

[-access_time]
Sets the access time back to the default value of 15 days.

[-modification_time]
Sets the minimum required file age in days back to the default
value of 15 days.

[-case_sensitive]
Sets the case sensitivity option (for NFS environments) or
case-insensitivity option (for CIFS environments) back to the
default value of zero (false).

[-pathname_exclude_list]
Sets the pathname exclusion list option back to the default value
of '' (empty).

[-file_ext_exclude_list]
Sets the filename extension exclusion list option back to the
default value of '' (empty).

[-duplicate_detection_method]
Sets the duplication detection method back to the default of 1
(sha1).

[-savvol_threshold]
Sets the SavVol threshold back to the default value of 90 percent.
When used with the default SavVol auto extension of 90 percent,
this option will apply when the SavVol is 81 percent full (90
percent of 90 percent).

[-backup_data_threshold]
Sets the full percentage that a deduplicated file has to be below in
order to trigger space-reduced backups for NDMP back to the
default of 90 percent.
[-cifs_compression_enabled]
Sets the CIFS compression option back to the default of yes, enable CIFS compression.

[-compression_method]
Sets the compression algorithm back to the default of fast.

| -default  {-info {<mover_name>| -all} | -set {<mover_name>| -all} | -minimum_scan_interval <days>}
Manages the Data Mover settings. The -info option provides information for a specific Data Mover or all Data Movers. The -set option lets you specify Data Mover settings.

[-minimum_scan_interval <days>]
Defines the minimum number of days between completing one scan of a file system and before scanning the same file system again. The values range from 1 to 365 and the default value is 7 days.

[-minimum_size <KB>]
Defines the file size in KB that limits deduplication. File sizes equal to this value or smaller will not be deduplicated. File sizes greater than this value will be candidates for deduplication. Setting this value to zero disables it. This value should not be set lower than 24 KB. The values range from 0 to 1000 and the default value is 24 KB.

[-maximum_size <MB>]
Defines the file size in MB of the largest file to be processed for deduplication. Files larger than this size in MB will not be deduplicated. Setting this value to zero disables it. The values range from 0 to 8388608 and the default value is 8388608 MB.

[-access_time <days>]
Specifies the minimum required file age in days based on read access time. Files that have been read within the specified number of days will not be deduplicated. This setting does not apply to files with FLR locked state. Setting this value to zero disables it. The values range from 0 to 365 and the default value is 15 days.

[-modification_time <days>]
Specifies the minimum required file age in days based on modification time. Files updated within the specified number of days will not be deduplicated. Setting this value to zero disables it. The values range from 0 to 365 and the default value is 15 days.
The fs Commands

[-case_sensitive {yes|no}]
Defines whether case-sensitive (for NPS environments) or case-insensitive (for CIFS environments) string comparisons will be used during scans. By default, case-insensitive comparisons will be done to be consistent for CIFS environments. The default value is zero (false).

[-file_ext_exclude_list <ext_list>]
Specifies a colon-delimited list of filename extensions to be excluded from deduplication. Each extension must include the leading dot. The default value is '' (empty).

[-duplicate_detection_method {sha1|byte|off}]
0 (off) — This means that duplicate data detection is disabled. With this setting, every deduplicated file is considered unique and the only space savings made are accomplished with compression.

1 (sha1) — The SHA-1 hash is used to detect duplicate data. It is faster than a byte comparison. This is the default method.

2 (byte) — This will use a byte-by-byte comparison to detect duplicate data. This adds considerable overhead especially for large files.

[-savvol_threshold <percent>]
Represents the percentage of the configured save volume (SavVol) auto extension threshold that can be used during deduplication. After the specified amount of SavVol is used, deduplication stops on this file system. By default, this value is 90 percent and the SavVol auto extension is also 90 percent; this option will apply when the SavVol is 81 percent full (90 * 90). Setting this value to zero disables it. The values range from 0 to 100.

WARNING
If you set the SavVol threshold option to 0 to disable it, be aware that the SavVol may grow up to the size of the compressed version of the data, consuming disk space that cannot be reclaimed unless you delete all checkpoints.
[\texttt{-cpu\_usage\_low\_watermark} \texttt{<percent>}] 
Defines the average percent of CPU usage that can be used during the deduplication process at which full throttle mode is re-entered. The values range from 0 to 100 and the default value is 40 percent. This is a global setting only.

[\texttt{-cpu\_usage\_high\_watermark} \texttt{<percent>}] 
Defines the average percent of CPU usage that can be used during the deduplication process which should trigger a slow throttle mode. The system starts in full throttle mode. The values range from 0 to 100 and the default value is 75 percent. This is a global setting only.

[\texttt{-backup\_data\_threshold} \texttt{<percent>}] 
Defines the full percentage that a deduplicated file has to be below in order to trigger space-reduced backups for NDMP. For example, when set to 90, any deduplicated file whose physical size (compressed file plus changed blocks) is greater than 90 percent of the logical size of the file will have the entire file data backed up without attempting to back it up in a space-reduced format. Setting this value to zero disables it. The values range from 0 to 200 and the default value is 90 percent.

[\texttt{-cifs\_compression\_enabled} \{\texttt{yes}\mid\texttt{no}\}] 
This option controls whether CIFS compression is allowed. When the default is yes, enable CIFS compression. When set to yes and the deduplication state of the file system is either on or suspended, then CIFS compression is allowed. If the deduplication state is either off or in the process of being turned off, then CIFS compression is not allowed, regardless of whether this option is set to yes.

| \texttt{-clear} \{\texttt{<mover\_name>}\mid\texttt{-all}\} |
The \texttt{-clear} option sets the global setting back to the default value.

[\texttt{-minimum\_scan\_interval}] 
Sets the minimum scan interval back to the default value of 7 days.

[\texttt{-minimum\_size}] 
Sets the minimum size back to the default value of 24 KB.

[\texttt{-maximum\_size}] 
Sets the maximum size back to the default value of 8388608 MB.

[\texttt{-access\_time}] 
Sets the access time back to the default value of 15 days.
The fs Commands

[-modification_time]
Sets the minimum required file age in days back to the default value of 15 days.

[-case_sensitive]
Sets the case sensitivity option (for NFS environments) or case-insensitivity option (for CIFS environments) back to the default value of zero (false).

[-file_ext_exclude_list]
Sets the filename extension exclusion list option back to the default value of '' (empty).

[-duplicate_detection_method]
Sets the duplication detection method back to the default of 1 (sha1).

[-savvol_threshold]
Sets the SavVol threshold back to the default value of 90 percent. When used with the default SavVol auto extension of 90 percent, this option will apply when the SavVol is 81 percent full (90 percent of 90 percent).

[-cpu_usage_low_watermark]
Sets the average percent of CPU usage that can be used during the deduplication process at which full throttle mode is re-entered back to the default value of 25 percent. This is a global setting only.

[-cpu_usage_high_watermark]
Sets the average percent of CPU usage that can be used during the deduplication process which should trigger a slow throttle mode back to the default value of 75 percent. This is a global setting only.

[-backup_data_threshold]
Sets the full percentage that a deduplicated file has to be below in order to trigger space-reduced backups for NDMP back to the default of 90 percent.

[-cifs_compression_enabled]
Sets the CIFS compression option back to the default of yes, enable CIFS compression.

SEE ALSO: nas_fs

EXAMPLE #1 To list the file systems and their deduplication states, type:
The fs Commands

$ fs_dedupe -list

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>state</th>
<th>status</th>
<th>time_of_last_scan</th>
<th>original_data_size</th>
<th>usage</th>
<th>space_saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>141</td>
<td>ranap1_repa</td>
<td>Suspended</td>
<td>Idle</td>
<td>Wed Nov 12 09:04:45</td>
<td>5 MB</td>
<td>0%</td>
<td>0 MB (0%)</td>
</tr>
<tr>
<td>104</td>
<td>ds850gb_replica</td>
<td>On</td>
<td>Idle</td>
<td>Fri Nov 21 10:31:15</td>
<td>875459 MB</td>
<td>84%</td>
<td>341590 MB (39%)</td>
</tr>
<tr>
<td>495</td>
<td>cworm</td>
<td>On</td>
<td>Idle</td>
<td>Thu Nov 20 09:14:09</td>
<td>3 MB</td>
<td>0%</td>
<td>0 MB (0%)</td>
</tr>
<tr>
<td>33</td>
<td>chrisfs1</td>
<td>On</td>
<td>Idle</td>
<td>Sat Nov 22 10:04:33</td>
<td>1100 MB</td>
<td>18%</td>
<td>424 MB (38%)</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>File system identifier.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the file system.</td>
</tr>
<tr>
<td>state</td>
<td>Deduplication state of the file system. The file data is transferred to the storage which performs the deduplication and compression on the data. The states are:</td>
</tr>
<tr>
<td></td>
<td>• On — Deduplication on the file system is enabled.</td>
</tr>
<tr>
<td></td>
<td>• Suspended — Deduplication on the file system is suspended. Deduplication does not perform any new space reduction but existing space-reduced files remain the same.</td>
</tr>
<tr>
<td></td>
<td>• Off — Deduplication on the file system is disabled. Deduplication does not perform any new space reduction and the data is now reduplicated, which is the process used to restore a file that was deduplicated to its original condition.</td>
</tr>
<tr>
<td>status</td>
<td>Current state of the deduplication-enabled file system. The progress statuses are:</td>
</tr>
<tr>
<td></td>
<td>• Idle — Deduplication process is currently idle.</td>
</tr>
<tr>
<td></td>
<td>• Scanning — File system is being scanned for deduplication. It displays the percentage of scanned files in the file system.</td>
</tr>
<tr>
<td></td>
<td>• Reduplicating — File system files are being reduplicated from the deduplicated files. It displays the percentage of reduplicated files.</td>
</tr>
<tr>
<td>time_of_last_scan</td>
<td>Time when the file system was last scanned.</td>
</tr>
<tr>
<td>original_data_size</td>
<td>Original size of the file system before deduplication.</td>
</tr>
<tr>
<td>usage</td>
<td>The current space usage of the file system.</td>
</tr>
<tr>
<td>space_saved</td>
<td>The file system space saved after deduplication.</td>
</tr>
</tbody>
</table>

EXAMPLE #2  

To list the file systems and provide detailed reports on the state of the deduplication processing, type:

$ fs_dedupe -info -all

Id = 53
Name = svr2fs1
Deduplication = Off
File system parameters:
  Case Sensitive = no
  Duplicate Detection Method = shal
  Access Time = 15
### The fs Commands

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification Time</td>
<td>15</td>
</tr>
<tr>
<td>Minimum Size</td>
<td>24 KB</td>
</tr>
<tr>
<td>Maximum Size</td>
<td>8388608 MB</td>
</tr>
<tr>
<td>File Extension Exclude List</td>
<td></td>
</tr>
<tr>
<td>Minimum Scan Interval</td>
<td>7</td>
</tr>
<tr>
<td>Savevol Threshold</td>
<td>90</td>
</tr>
<tr>
<td>Backup Data Threshold</td>
<td>90</td>
</tr>
<tr>
<td>Cifs Compression Enabled</td>
<td>yes</td>
</tr>
<tr>
<td>Pathname Exclude List</td>
<td></td>
</tr>
<tr>
<td>Compression Method</td>
<td>fast</td>
</tr>
</tbody>
</table>

**Id** = 2040  
**Name** = server_2_fsltest2  
**Deduplication** = Suspended  
**As of the last file system scan (Mon Aug 17 11:33:38 EDT 2009):**  
  - Files scanned = 4  
  - Files deduped = 3 (75% of total files)  
  - File system capacity = 2016 MB  
  - Original data size = 6 MB (0% of current file system capacity)  
  - Space saved = 0 MB (0% of original data size)  

**File system parameters:**  
  - Case Sensitive = no  
  - Duplicate Detection Method = sha1  
  - Access Time = 15  
  - Modification Time = 15  
  - Minimum Size = 24 KB  
  - Maximum Size = 8388608 MB  
  - File Extension Exclude List =  
  - Minimum Scan Interval = 7  
  - Savevol Threshold = 90  
  - Backup Data Threshold = 90  
  - Cifs Compression Enabled = yes  
  - Pathname Exclude List =  
  - Compression Method = fast

**Id** = 506  
**Name** = demofs  
**Deduplication** = Off  
**File system parameters:**  
  - Case Sensitive = no  
  - Duplicate Detection Method = sha1  
  - Access Time = 15  
  - Modification Time = 15  
  - Minimum Size = 24 KB  
  - Maximum Size = 8388608 MB  
  - File Extension Exclude List =  
  - Minimum Scan Interval = 7  
  - Savevol Threshold = 90  
  - Backup Data Threshold = 90  
  - Cifs Compression Enabled = yes  
  - Pathname Exclude List =  
  - Compression Method = fast
<table>
<thead>
<tr>
<th>Id</th>
<th>2113</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>testrdefs</td>
</tr>
<tr>
<td>Deduplication</td>
<td>Suspended</td>
</tr>
</tbody>
</table>

As of the last file system scan (Thu Aug 13 14:22:31 EDT 2009):
- Files scanned = 1
- Files deduped = 0 (0% of total files)
- File system capacity = 1008 MB
- Original data size = 0 MB (0% of current file system capacity)
- Space saved = 0 MB (0% of original data size)

File system parameters:
- Case Sensitive = no
- Duplicate Detection Method = sha1
- Access Time = 15
- Modification Time = 15
- Minimum Size = 24 KB
- Maximum Size = 8388608 MB
- File Extension Exclude List =
- Minimum Scan Interval = 7
- Savevol Threshold = 90
- Backup Data Threshold = 90
- Cifs Compression Enabled = yes
- Pathname Exclude List =
- Compression Method = deep

<table>
<thead>
<tr>
<th>Id</th>
<th>2093</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>kfs_ckpt1</td>
</tr>
<tr>
<td>Deduplication</td>
<td>Off</td>
</tr>
</tbody>
</table>

File system parameters:
- Case Sensitive = no
- Duplicate Detection Method = sha1
- Access Time = 15
- Modification Time = 15
- Minimum Size = 24 KB
- Maximum Size = 8388608 MB
- File Extension Exclude List =
- Minimum Scan Interval = 7
- Savevol Threshold = 90
- Backup Data Threshold = 90
- Cifs Compression Enabled = yes
- Pathname Exclude List =
- Compression Method = fast

<table>
<thead>
<tr>
<th>Id</th>
<th>2095</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>ranap-test3</td>
</tr>
<tr>
<td>Deduplication</td>
<td>On</td>
</tr>
<tr>
<td>Status</td>
<td>Idle</td>
</tr>
</tbody>
</table>

As of the last file system scan (Tue Aug 11 17:37:58 EDT 2009):
- Files scanned = 30
- Files deduped = 2 (7% of total files)
- File system capacity = 5041 MB
- Original data size = 1109 MB (22% of current file system capacity)
Space saved = 0 MB (0% of original data size)

File system parameters:
- Case Sensitive = no
- Duplicate Detection Method = sha1
- Access Time = 15
- Modification Time = 15
- Minimum Size = 24 KB
- Maximum Size = 8388608 MB
- File Extension Exclude List =
- Minimum Scan Interval = 7
- Savevol Threshold = 90
- Backup Data Threshold = 90
- Cifs Compression Enabled = yes
- Pathname Exclude List =
- Compression Method = deep

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deduplication</td>
<td>Current deduplication state of the file system.</td>
</tr>
<tr>
<td>Status</td>
<td>Progress status of the files being scanned.</td>
</tr>
<tr>
<td>Name</td>
<td>Name of the file system.</td>
</tr>
<tr>
<td>Id</td>
<td>File system identifier.</td>
</tr>
<tr>
<td>Files scanned</td>
<td>Number of files scanned.</td>
</tr>
<tr>
<td>Files deduped</td>
<td>Number of files in the file system that has been deduplicated.</td>
</tr>
<tr>
<td>Original data size</td>
<td>Proportion of space in use with respect to the file system capacity.</td>
</tr>
<tr>
<td>Filesystem capacity</td>
<td>Current space usage of the file system.</td>
</tr>
<tr>
<td>Space saved</td>
<td>Proportion of space saved with respect to the original data size.</td>
</tr>
<tr>
<td>Case Sensitive</td>
<td>Method of string comparison: case-sensitive or case-insensitive.</td>
</tr>
<tr>
<td>Duplicate Detection Method</td>
<td>Method of duplication detection: 0, sha-1, or byte-by-byte.</td>
</tr>
<tr>
<td>Access Time</td>
<td>Minimum required file age in days based on read access time.</td>
</tr>
<tr>
<td>Modification Time</td>
<td>Minimum required file age in days based on modification time.</td>
</tr>
<tr>
<td>Minimum Size</td>
<td>Minimum file size to be processed for deduplication.</td>
</tr>
<tr>
<td>Maximum Size</td>
<td>Maximum file size to be processed for deduplication.</td>
</tr>
<tr>
<td>File Extension Exclude List</td>
<td>Lists filename extensions to be excluded from the deduplication.</td>
</tr>
<tr>
<td>Minimum Scan Interval</td>
<td>Minimum number of days between completing one scan of a file system and</td>
</tr>
<tr>
<td></td>
<td>before scanning the same file system again.</td>
</tr>
<tr>
<td>SaveVol Threshold</td>
<td>Percentage of SavVol space that can be used during deduplication.</td>
</tr>
<tr>
<td>Backup Data Threshold</td>
<td>Percentage below which a deduplicated file has to be in order to trigger</td>
</tr>
<tr>
<td></td>
<td>space-reduced NDMP backups.</td>
</tr>
<tr>
<td>Cifs Compression Enabled</td>
<td>Controls whether CIFS permission is enabled.</td>
</tr>
<tr>
<td>Pathname Exclude List</td>
<td>Lists relative pathnames to be excluded from the deduplication.</td>
</tr>
<tr>
<td>Compression Method</td>
<td>Compression algorithm used: fast or deep.</td>
</tr>
</tbody>
</table>
The fs Commands

**Note:** If reduplication fails, then the state transitions to the suspended state and a CCMD message will be sent to the server’s event log. If reduplication succeeds, then it remains in the off state.

**EXAMPLE #3**  To list the file systems for a given file system name, type:

```
$ fs_dedupe -info server3_fs3
```

```
Id = 98
Name = server3_fs3
Deduplication = On
Status = Idle
As of the last file system scan on Tue Sep 23 13:28:01 EDT 2008:
Files deduped = 30 (100%)
File system capacity = 413590 MB
Original data size = 117 MB (0% of current file system capacity)
Space saved = 106 MB (90% of original data size)
File system parameters:
   Case Sensitive = yes
   Duplicate Detection Method = sha1
   Access Time = 30
   Modification Time = 30
   Minimum Size = 20
   Maximum Size = 200
   File Extension Exclude List = .jpg:.db:.pst
   Minimum Scan Interval = 1
   SavVol Threshold = 90
   Backup Data Threshold = 90
   Pathname Exclude List = root;etc
   Compression Method = fast
```

**EXAMPLE #2** provides a description of command output.

**EXAMPLE #4**  To list the duplication properties of a given Data Mover, type:

```
$ fs_dedupe -default -info server_2
```

```
Server parameters:
   Case Sensitive = yes
   Duplicate Detection Method = sha1
   Access Time = 30
   Modification Time = 30
   Minimum Size = 20
   Maximum Size = 200
   File Extension Exclude List = .jpg:.db:.pst
   Minimum Scan Interval = 1
   SavVol Threshold = 90
   Backup Data Threshold = 90
   CPU % Usage Low Water Mark = 25
   CPU % Usage High Water Mark = 90
   Cifs Compression Enabled = yes
```
### The fs Commands

#### Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU % Usage Low Water Mark</td>
<td>Average percentage of CPU usage which should trigger full throttle mode.</td>
</tr>
<tr>
<td>CPU % Usage High Water Mark</td>
<td>Average percentage of CPU usage which should trigger slow throttle mode.</td>
</tr>
</tbody>
</table>

- **EXAMPLE #2** provides a description of additional command output.

**EXAMPLE #5**
To modify the file system, type:

```
$ fs_dedupe -modify testrdefs -state on
```

Done

**EXAMPLE #6**
To modify the file system settings to the user-specified values, type:

```
$ fs_dedupe -modify testrdefs -maximum_size 100
-file_extension_exclude_list .jpg:.db:.pst
```

Done

**EXAMPLE #7**
To modify specific Data Mover settings, type:

```
$ fs_dedupe -default -set server_2 -maximum_size 100
-minimum_size 20 -duplicate_detection_method sha1
```

server_2: Done

**EXAMPLE #8**
To reset the file system settings to the default settings (which are the Data Mover settings), type:

```
$ fs_dedupe -clear testrdefs -maximum_size -minimum_size
-duplicate_detection_method
```

Done

**EXAMPLE #9**
To reset specific Data Mover settings to the default settings, type:

```
$ fs_dedupe -default -clear server_2 -maximum_size
-minimum_size -duplicate_detection_method
```

server_2: Done

**EXAMPLE #10**
To reset all options for a specific Data Mover to the default settings, type:

```
$ fs_dedupe -default -clear server_2
```

server_2: Done

**EXAMPLE #11**
To reset all options on all Data Movers to the default settings, type:

```
$ fs_dedupe -default -clear -all
```

server_2: Done
server_3: Done
The fs Commands

**fs_dhsm**

Manages the VNX FileMover file system connections.

**SYNOPSIS**

```
fs_dhsm
  -list
  | -info [<fs_name>|id=<fs_id>]
  | -modify {<fs_name>|id=<fs_id>}'[-state enabled]
    |[-backup {offline|passthrough}]'
    |[-log {on|off}][-max_log_size <mb>][-offline_attr {on|off}]
    |[-read_policy_override {none|full|passthrough|partial}]}
  | -modify {<fs_name>|id=<fs_id>}'[-state disabled]
  | -connection {<fs_name>|id=<fs_id>}
    | -list
    | -info [cid]
    | -create -type {nfsv3|nfsv2} -secondary <nfs_server>:<path> [-read_policy_override {full|passthrough|partial|none}]
    | [-useRootCred {true|false}] [-proto {UDP|TCP}] [-nfsPort <port>]
    | [-mntPort <port>][-mntVer {3|2|1}][-localPort <port>]
    | -create -type cifs -admin [<fqdn]>\<admin_name>
    | -secondary \\<fqdn>\<share>\<path> [-read_policy_override {full|passthrough|partial|none}]
    | -create -type http -secondary http://<host><url_path> [-read_policy_override {full|passthrough|partial|none}]
    | [-httpPort <port>][-localPort <port>]
    | [-user <username> [-password <password>]]
    | [-timeout <seconds>][-cgi {y|n}]
    | -create -type https -secondary https://<host><url_path> [-read_policy_override {full|passthrough|partial|none}]
    | [-httpsPort <port>][-localPort <port>]
    | [-user <username> [-password <password>]]
    | [-timeout <seconds>][-cgi {y|n}]
    | -delete {all|<cid>[,<cid>...]} [-recall_policy {check|no|yes}]
    | -modify {all|<cid>[,<cid>...]} [-state {enabled|disabled|recallonly}]
    |[-read_policy_override {full|passthrough|partial|none}]
    ||[[-nfs_server <address>] [-localPort <port>]
    ||-proto {TCP|UDP} |-useRootCred {true|false})
    ||[[-cifs_server <fqdn>][-local_server <host_name>]
    ||-password <password>][-admin [<fqdn]>\<admin_name>]
    ||-wins <address>]
    ||[[-http_server <host>][-httpPort <port>][-httpsPort <port>]
    ||-localPort <port>)[-user <username>]
    ||-password <password][-timeout <seconds>]
```


The fs Commands

DESCRIPTION

The `fs_dhsm` command modifies the properties on file systems enabled for VNX FileMover. The `fs_dhsm` command creates, deletes, and modifies NFS, CIFS, and HTTP connections to remote hosts, lists VNX FileMover file systems, and provides information on the connections.

OPTIONS

- **-list**
  Lists all file systems enabled with the VNX FileMover.

- **-info** `<fs_name> | id=<fs_id>`
  Displays information for the specified VNX FileMover file systems.

- **-modify** `<fs_name> | id=<fs_id>`
  Sets VNX FileMover parameters for the specified file system.

**Note:** When specifying the `-modify` option on a disabled file system, the state is automatically changed to `enabled`. When specifying the `-state disabled` option, it is not possible to specify any other parameter to modify.

- **[-state enabled]**
  Enables VNX FileMover operations on the specified file system. The file system must be `enabled` to accept other options.

- **[-state disabled]**
  Disables VNX FileMover operations on the specified file system. New FileMover attributes cannot be specified as part of a disable command, nor can be specified for a file system that is in the disabled state. The attributes persist. If the file system is enabled after a disable command, then the attributes prior to the disable command take effect.

- **[-popup_timeout <sec>]**
  Specifies the Windows popup timeout value in seconds. If a CIFS I/O request cannot be processed within the specified time, then a popup notification of the delay is sent to the CIFS client. The default for `<sec>` is 0 (zero) which disables Windows popups.

  **Note:** It may take up to 10 seconds before the popup is displayed.

- **[-backup {offline|passthrough}]**
  Specifies the nature of CIFS network backups. The `offline` option backs up the stub file only. The `passthrough` (default) option backs up all of the file data by using passthrough read.
The fs Commands

[-log {on|off}]
Enables or disables VNX FileMover logging. The default log filename is dhsm.log; it resides in the /etc directory on the FileMover-enabled file system.

[-max_log_size <mb>]
Specifies the maximum size of the log file. The current log file, in addition to four old log files, is saved. The minimum log file size is 10 MB.

[-offline_attr {on|off}]
Specifies whether the Data Mover should set the CIFS offline file attributes on the stub files. The default is on.

CAUTION
It is recommended that you do not disable the CIFS offline attributes.

[-read_policy_override {none|full|passthrough|partial}]
Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. none (default) specifies no override, full recalls the whole file to the VNX on a read request before the data is returned, passthrough retrieves data without recalling the data to the VNX, and partial recalls only the blocks required to satisfy the client read request.

Note: The full migration may take several minutes or hours if the file is very large.

-connection {<fs_name>|id=<fs_id>} -list
Lists all connections for the specified file system.

-connection {<fs_name>|id=<fs_id>} -info [<cid>]
Displays details on all connections for the specified file system. If the <cid> is specified, only information for that connection is displayed.

Note: A connection ID is automatically created when a connection is established. The connection ID is displayed using the -list and is referred to as the <cid> in other commands.
NFS CONNECTIONS

-connection {<fs_name>|id=<fs_id>} -create -type {nfsv3|nfsv2} -secondary <nfs_server>:/<path>

Creates a connection using the NFS protocol between the specified file system and the secondary file system. The secondary file system stores migrated data. The -type option specifies the NFS version that the Data Mover should use when connecting to the secondary server.

**Note:** VNX FileMover does not currently support NFSv4 protocol.

The -secondary option specifies the location of the remote file system.

**Note:** Although an IP address can be specified for an <nfs_server>, EMC strongly suggests using the hostname of the server, which allows you to take advantage of Domain Name System (DNS) failover capability.

[-read_policy_override {full|passthrough|partial |none}]

Specifies the migration method for data recall in response to client read requests. full migrates the whole file before it returns the requested blocks. passthrough leaves the stub file, but retrieves the requested data from the secondary file system. partial migrates only the blocks required to satisfy the client read request. none (default) defaults to the read method option specified in the stub file.

**Note:** The full migration may take several minutes or hours if the file is very large.

[-useRootCred {true|false}]

Specifies the user credentials that the Data Mover uses when requesting data from the secondary VNX. When set to true, the Data Mover requests data as the root user (UID 0). When set to false (default), the Data Mover requests data as the owner of the file as specified in the stub file.

**Note:** If the -useRootCred option is set to true, the secondary storage NFS server must grant the Data Mover root privilege for NFS traffic.

[-proto {TCP|UDP}]

Specifies the protocol for the Data Movers to use for communication to the secondary <nfs_server>. TCP is the default.
The fs Commands

[-nfsPort <port>]
Specifies an NFS port on the secondary <nfs_server>. A default port is discovered automatically.

[-mntPort <port>]
Specifies a mount port on the secondary <nfs_server>. A default mount port is discovered automatically.

Note: The -nfsPort and -mntPort options are used for secondary servers that do not have the Portmapper running. The admin starts the nfsd and mountd daemons on specific ports to avoid hackers.

[-mntVer {1|2|3}]
Specifies the mount version for the NFS connection. If the -type is nfsv3, then the -mntVer must be 3. If the -type is nfsv2, then 1 or 2 can be specified. The default for nfsv2 is 2.

[-localPort <port>]
Overrides the default port that the Data Mover uses during connection to be compatible with firewalls. The default for UDP is 1020. By default, TCP uses a random port over 1024 to make the connection.

-connection {<fs_name>|id=<fs_id>} -modify {-all | <cid> [, <cid> ...]}
Changes parameters on an existing NFS VNX FileMover connection. Either all connections can be removed or just the specified <cid> connection can be removed.

[-state {enabled|disabled|recallonly}]
Sets the state of VNX FileMover operations on the specified file system. enabled (default) allows both the creation of stub files and data migration through reads and writes. If the state is disabled, neither stub files nor data migration is possible. Data currently on the VNX can be read and written to in the disabled state.

If the state is recallonly, the policy engine is not allowed to create stub files, but the user is still able to trigger data migration using a read or write request from the secondary file system to the VNX.

[-read_policy_override {full|passthrough|partial | none}]
Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. none (default) specifies no
override, full recalls the whole file to the VNX on read request before the data is returned, passthrough retrieves data without recalling the data to the VNX, and partial recalls only the blocks required to satisfy the client read request.

**Note:** The full migration may take several minutes or hours if the file is very large.

\[-nfs_server <address>\]
Specifies the name or IP address of the secondary NFS server.

**Note:** Although an IP address can be specified for the <nfs_server>, EMC strongly suggests using the hostname of the server, which allows use of the DNS failover capability.

\[-localPort <port>\]
Specifies a port to override the default port used by the Data Mover during connection for compatibility with firewalls.

\[-proto {TCP|UDP}\]
Specifies the protocol for the Data Mover to use for NFS communications to the secondary <nfs_server>. TCP is the default.

\[-useRootCred {true|false}\]
Specifies the user credentials that the Data Mover uses when requesting data from the secondary VNX. When set to true, the Data Mover requests data as the root user (UID 0). When set to false (default), the Data Mover requests data as the owner of the file as specified in the stub file.

**Note:** If the -useRootCred option is set to true, the secondary storage NFS server must grant the Data Mover root privilege for NFS traffic.

\[-connection <fs_name> -delete {-all |<cid> [,<cid>...]}\]
Removes an existing NFS connection between the file system and the secondary file system. Either all connections can be removed or just the specified <cid> connection can be removed.

\[-recall_policy {check|no|yes}\]
Specifies the recall policy for any migrated file during the -delete. check (default) scans the file system for stub files that depend on the connection and fails on the first one. no deletes the connection without checking for stub files that depend on the connection,
and **yes** migrates the files back to the VNX before the connection is removed. If **no** is specified and stub files exist, an I/O error appears when the file is read because the connection no longer exists.

### CIFS CONNECTIONS

- **connection {<fs_name>|id=<fs_id>} -create -type cifs**
  Creates a connection using the CIFS protocol between the specified file system and a secondary file system. A connection ID is automatically created when a connection is established. The connection ID is seen using the `-list` and is referred to as the `<cid>` in other commands.

  - **-admin \[<fqdn>\]<admin_name>**
    Specifies the `<admin_name>` used to make the CIFS connection. If an optional `<fqdn>` is specified, it must be a fully qualified domain name. The \[<fqdn>\]<admin_name> entry must be enclosed within quotes as shown in **EXAMPLE #2**. If the `<fqdn>` is not specified, the **-local_server** domain is used.

  - **-secondary \[<fqdn>\]<share>[\<path>]**
    Specifies the CIFS server, the share, and path for the secondary server for connection. The `<fqdn>` `<share>` `<path>` entry must be enclosed within quotes. The domain must be fully qualified; an IP address will not work.

  - **-local_server <host_name>**
    Specifies the NetBIOS name or computer name of the local CIFS server on the Data Mover.

  - **[-wins <address>]**
    Specifies a WINS server to resolve names in a Windows domain.

  - **[-password <password>]**
    Allows the user to specify the admin password. The password is not recorded in the command log. If the **-password** option is given but no password is specified, the user is prompted interactively.

### CAUTION

When specifying the password with this option, be aware it is unmasked, and visible to other users. The command may also be read from the log of the shell.
The fs Commands

[-read_policy_override {full|passthrough|partial |none}]  
Specifies the migration method for data recall in response to client read requests. full migrates the whole file before it returns the requested blocks. passthrough leaves the stub file, but retrieves the requested data from the secondary file system. partial migrates only the blocks required to satisfy the client read request. none (default) defaults to the read method option specified in the stub file.

Note: The full migration may take several minutes or hours if the file is very large.

-connection {<fs_name>|id=<fs_id>} -modify {-all | <cid>[,<cid>...]}  
Changes parameters on an existing NFS VNX FileMover connection.

[-state {enabled|disabled|recallonly}]  
Sets the state of VNX FileMover operations on the specified file system. enabled (default) allows both the creation of stub files and data migration through reads and writes. If the state is disabled, neither stub files nor data migration is possible. Data currently on the VNX can be read and written to in the disabled state.

If the state is recallonly, the policy engine is not allowed to create stub files, but the user is still able to trigger data migration using a read or write request from the secondary file system to the VNX.

[-read_policy_override {full|passthrough|partial |none}]  
Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. none (default) specifies no override, full recalls the whole file to the VNX on read request before the data is returned, passthrough retrieves data without recalling the data to the VNX, and partial recalls only the blocks required to satisfy the client read request.

Note: The full migration may take several minutes or hours if the file is very large.
The fs Commands

[-cifs_server <fqdn>]
Specifies the fully qualified domain name of the secondary CIFS server.

[-local_server <host_name>]
Specifies the NetBIOS name or computer name of the local CIFS server on the Data Mover.

[-password <password>]
Allows the user to specify the admin password. The password is not recorded in the command log. If the -password option is given but no password is specified, the user is prompted interactively.

CAUTION

When specifying the password with this option, be aware it is unmasked, and visible to other users. The command may also be read from the log of the shell.

[[-admin [(<fqdn>\)<admin_name>]]
Specifies the <admin_name> used to make the CIFS connection. If an optional <fqdn> is specified, it must be a fully qualified domain name. If the <fqdn> is not specified, the -local_server domain is used.

[-wins <address>]]
Specifies a WINS server to resolve names in a Windows domain.

-connection <fs_name> -delete {-all|<cid> [,<cid>...]}]
Removes an existing CIFS connection between the file system and the secondary file system.

[-recall_policy {check|no|yes}]
Specifies the recall policy for any migrated file during the -delete option. check (default) scans the file system for stub files that depend on the connection and fails on the first one. no deletes the connection without checking for stub files that depend on the connection, and yes migrates the files back to the VNX before the connection is removed. If no is specified and stub files exist, an I/O error appears when the file is read because the connection no longer exists.

HTTP CONNECTIONS

-connection {<fs_name> | id=<fs_id>} -create -type http
-secondary http://<host><url_path>
The fs Commands

Creates a connection using the HTTP protocol between the specified primary file system and a secondary file system. There are two types of HTTP connections: CGI and non-CGI. For CGI connections, the value of the **-secondary** option specifies the hostname of the server running the secondary storage HTTP server and the location of the CGI application that provides access to a system. For non-CGI connections, the value for the **-secondary** option specifies the hostname and, optionally, a portion of the hierarchical namespace published by the web server.

**Note:** Although an IP address can be specified for a `<host>`, EMC strongly suggests using the hostname of the server, which allows the DNS failover capability.

```
[-read_policy_override {full|passthrough|partial
|none}] ]
```

Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. **none** (default) specifies no override, **full** recalls the whole file to the VNX on read request before the data is returned, **passthrough** retrieves data without recalling the data to the VNX, and **partial** recalls only the blocks required to satisfy the client read request.

**Note:** The full migration may take several minutes or hours if the file is very large.

```
-httpPort <port>
```

Specify the remote port number that the Data Mover delivers the HTTP request to. If not specified, the Data Mover issues HTTP requests to port 80 on the secondary storage HTTP server.

```
-localPort <port>
```

Specify the local port number the Data Mover uses to issue HTTP requests to the web server active on the secondary storage. The `<port>` specified should be an integer number less than 1024. If not specified, the Data Mover selects a port to issue the HTTP requests.
Note: The two end points of an HTTP connection are specified by the file system name and the value specified for the -secondary option. If multiple connections are created by using identical end points with different attributes such as -cgi, -user, -password, -localPort, -httpPort, the connection will fail.

[-user <username>]
Defines the username the HTTP client uses if digest authentication is required by the secondary storage HTTP server.

[-password <password>]
Allows the user to specify the admin password. The password is not recorded in the command log. If the -password option is given but no password is specified, the user is prompted interactively.

Use the -password option when digest authentication is required by the secondary storage HTTP server.

[-timeout <seconds>]
Specifies the timeout value in seconds. By default, the VNX HTTP client waits 30 seconds for a reply from the HTTP server and then retries the operation once.

[-cgi {y|n}]
Specifies the HTTP connection type: CGI or non-CGI. By default, FileMover assumes that the web server is using CGI connections to access migrated file data by using a CGI application. For non-CGI connections, set the -cgi option to n; FileMover then assumes the web server has direct access to migrated file content on secondary storage.

-connection {<fs_name>|id=<fs_id>} -modify {-all|<cid>[,<cid>...]}
Changes parameters on an existing NFS VNX FileMover connection.

[-state {enabled|disabled|recallonly}]}
Sets the state of VNX FileMover operations on the specified file system. enabled (default) allows both the creation of stub files and data migration through reads and writes. If the state is disabled, neither stub files nor data migration is possible. Data currently on the VNX can be read and written to in the disabled state.
If the state is **recallonly**, the policy engine is not allowed to create stub files, but the user is still able to trigger data migration by using a read or write request from the secondary file system to the VNX.

```
[-read_policy_override {full|passthrough|partial |none}]]
```

Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. **none** (default) specifies no override, **full** recalls the whole file to the VNX on read request before the data is returned, **passthrough** retrieves data without recalling the data to the VNX, and **partial** recalls only the blocks required to satisfy the client read request.

**Note:** The full migration may take several minutes or hours if the file is very large.

```
[-http_server <host>]
```

Specifies the hostname of the secondary storage HTTP server.

```
-httpPort <port>
```

Specifies the remote port number that the Data Mover delivers the HTTP request to. If not specified, the Data Mover issues HTTP requests to port 80 on the secondary storage HTTP server.

```
-localPort <port>
```

Specifies the local port number the Data Mover uses to issue HTTP requests to the web server active on the secondary storage. The <port> specified should be an integer number less than 1024. If not specified, the Data Mover selects a port to issue the HTTP requests.

**Note:** If you attempt to create multiple HTTP connections by using identical end points with different attributes such as **-cgi**, **-user**, **-password**, **-localPort**, **-httpPort**, the connection will fail.

```
[-user <username>]
```

An optional attribute used to define the username the HTTP client uses if digest authentication is required by the secondary storage HTTP server.
The fs Commands

[-password <password>]
Allows the user to specify the admin password. The password is not recorded in the command log. If the -password option is given but no password is specified, the user is prompted interactively.

[-timeout <sec>]
Specifies the timeout value in seconds. By default, VNX’s HTTP client waits 30 seconds for a reply from the HTTP server and then retries the operation once before commencing the failover operation.

-connection <fs_name> -delete {-all |<cid> [,<cid>...]}
Removes an existing HTTP connection between the file system and the secondary file system. Either all connections can be removed or just the specified <cid> connection can be removed.

[-recall_policy {check|no|yes}]
Specifies the recall policy for any migrated file during the -delete option. The check (default) argument scans the file system for stub files that depend on the connection and fails on the first one. no deletes the connection without checking for stub files that depend on the connection, and yes migrates the files back to the VNX before the connection is removed. If no is specified and stub files exist, an I/O error appears when the file is read because the connection no longer exists.

HTTPS CONNECTIONS

-connection {<fs_name>|id=<fs_id>} -create -type https
-secondary https://<host><url_path>
Creates a connection by using the HTTPS protocol between the specified primary file system and a secondary file system. There are two types of HTTPS connections: CGI and non-CGI. For CGI connections, the value of the -secondary option specifies the hostname of the server running the secondary storage HTTPS server and the location of the CGI application that provides access to a system. For non-CGI connections, the value for the -secondary option specifies the hostname and, optionally, a portion of the hierarchical namespace published by the web server.

Note: Although an IP address can be specified for a <host>, EMC strongly suggests using the hostname of the server, which allows the DNS failover capability.
The fs Commands

```
[-read_policy_override {full|passthrough|partial |none}]]
```

Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. **none** (default) specifies no override, **full** recalls the whole file to the VNX on read request before the data is returned, **passthrough** retrieves data without recalling the data to the VNX, and **partial** recalls only the blocks required to satisfy the client read request.

**Note:** The full migration may take several minutes or hours if the file is very large.

```
[-httpsPort <port> ]
```

Specifies the remote port number that the Data Mover delivers the HTTPS request to. If not specified, the Data Mover issues HTTPS requests to port 443 on the secondary storage HTTPS server.

```
[-localPort <port> ]
```

Specifies the local port number the Data Mover uses to issue HTTPS requests to the web server active on the secondary storage. The <port> specified should be an integer number less than 1024. If not specified, the Data Mover selects a port to issue the HTTPS requests.

**Note:** The two end points of an HTTPS connection are specified by the file system name and the value specified for the **-secondary** option. If multiple connections are created by using identical end points with different attributes such as **-cgi**, **-user**, **-password**, **-localPort**, **-httpsPort**, the connection will fail.

```
[-user <username>]
```

Defines the username the HTTPS client uses if digest authentication is required by the secondary storage HTTPS server.

```
[-password <password>]
```

Allows the user to specify the admin password. The password is not recorded in the command log. If the **-password** option is given but no password is specified, the user is prompted interactively.

Use the **-password** option when digest authentication is required by the secondary storage HTTPS server.
The fs Commands

[-timeout <seconds>]
Specifies the timeout value in seconds. By default, the VNX HTTPS client waits 30 seconds for a reply from the HTTPS server and then retries the operation once.

[-cgi {y|n}]
Specifies the HTTPS connection type: CGI or non-CGI. By default, FileMover assumes that the web server is using CGI connections to access migrated file data by using a CGI application. For non-CGI connections, set the -cgi option to n; FileMover then assumes the web server has direct access to migrated file content on secondary storage.

-connection {<fs_name>|id=<fs_id>} -modify {-all|<cid>[,<cid>...]}]
Changes parameters on an existing NFS VNX FileMover connection.

[-state {enabled|disabled|recallonly}]
Sets the state of VNX FileMover operations on the specified file system. enabled (default) allows both the creation of stub files and data migration through reads and writes. If the state is disabled, neither stub files nor data migration is possible. Data currently on the VNX can be read and written to in the disabled state.

If the state is recallonly, the policy engine is not allowed to create stub files, but the user is still able to trigger data migration by using a read or write request from the secondary file system to the VNX.

[-read_policy_override {full|passthrough|partial|none}]
Specifies the migration method option used by the VNX, in the connection level or file system level, to override the migration method specified in the stub file. none (default) specifies no override, full recalls the whole file to the VNX on read request before the data is returned, passthrough retrieves data without recalling the data to the VNX, and partial recalls only the blocks required to satisfy the client read request.

Note: The full migration may take several minutes or hours if the file is very large.

[-http_server <host>]
Specifies the hostname of the secondary storage HTTPS server.
-**httpsPort**  <port>
Specifies the remote port number that the Data Mover delivers the HTTPS request to. If not specified, the Data Mover issues HTTPS requests to port 443 on the secondary storage HTTPS server.

**Note:** Although the **-http_server** option is used to modify the name of the secondary storage HTTPS server, files that can be converted into a stub by using an HTTPS connection can be brought back online using only HTTPS and not using NFS, CIFS, or even HTTP.

-**localPort**  <port>
Specifies the local port number the Data Mover uses to issue HTTPS requests to the web server active on the secondary storage. The <port> specified should be an integer number less than 1024. If not specified, the Data Mover selects a port to issue the HTTPS requests.

**Note:** If you attempt to create multiple HTTPS connections by using identical end points with different attributes such as **-cgi**, **-user**, **-password**, **-localPort**, **-httpsPort**, the connection will fail.

[**-user**  <username>]
An optional attribute used to define the username the HTTPS client uses if digest authentication is required by the secondary storage HTTPS server.

[**-password**  <password>]
Allows the user to specify the admin password. The password is not recorded in the command log. If the **-password** option is given but no password is specified, the user is prompted interactively.

[**-timeout**  <sec>]
Specifies the timeout value in seconds. By default, VNX’s HTTPS client waits 30 seconds for a reply from the HTTPS server and then retries the operation once before commencing the failover operation.

-connection  <fs_name>  -delete  {**-all**|<cid> [,<cid>...]}
Removes an existing HTTPS connection between the file system and the secondary file system. Either all connections can be removed or just the specified <cid> connection can be removed.
The fs Commands

[-recall_policy (check|no|yes)]

Specifies the recall policy for any migrated file during the -delete. check (default) scans the file system for stub files that depend on the connection and fails on the first one. no deletes the connection without checking for stub files that depend on the connection, and yes migrates the files back to the VNX before the connection is removed. If no is specified and stub files exist, an I/O error appears when the file is read because the connection no longer exists.

SEE ALSO Using VNX FileMover, server_cifs, server_http, and server_nfs.

EXAMPLE #1 To enable VNX FileMover on a file system, type:

```
$ fs_dhsm -modify ufs1 -state enabled
```

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>state</td>
<td>Whether VNX FileMover is enabled or disabled on the file system.</td>
</tr>
<tr>
<td>offline attr</td>
<td>Whether CIFS clients should be notified that a file is migrated.</td>
</tr>
<tr>
<td>popup timeout</td>
<td>Timeout value in seconds, before Windows popup notification is sent to the CIFS client.</td>
</tr>
<tr>
<td>backup</td>
<td>Nature of CIFS network backups.</td>
</tr>
<tr>
<td>read policy override</td>
<td>Migration method option used to override the read method specified in the stub file.</td>
</tr>
<tr>
<td>log file</td>
<td>Whether FileMover logging is enabled or disabled.</td>
</tr>
<tr>
<td>max log size</td>
<td>Maximum size of the log file.</td>
</tr>
</tbody>
</table>

Done

Where:

EXAMPLE #2 To create a CIFS connection for ufs1 to the secondary file system \winserver2.nasdocs.emc.com\dhsm1 with a specified administrative account nasdocs.emc.com\Administrator and local server dm102-cge0:

```
$ fs_dhsm -connection ufs1 -create -type cifs -admin 'nasdocs.emc.com\Administrator' -secondary '\winserver2.nasdocs.emc.com\dhsm1' -local_server dm102-cge0
```

Enter Password:********

ufs1:
The fs Commands

state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB
cid = 0
type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1\nstate = enabled
read policy override = none
write policy = full
local_server = DM102-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\Administrator
wins =

Done

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>state</td>
<td>Whether VNX FileMover is enabled or disabled on the file system.</td>
</tr>
<tr>
<td>offline attr</td>
<td>Whether CIFS clients should be notified that a file is migrated.</td>
</tr>
<tr>
<td>popup timeout</td>
<td>Timeout value, in seconds, before a popup notification is sent to CIFS client.</td>
</tr>
<tr>
<td>backup</td>
<td>Nature of CIFS network backups.</td>
</tr>
<tr>
<td>read policy override</td>
<td>Migration method option used to override the read method specified in the stub file.</td>
</tr>
<tr>
<td>log file</td>
<td>Whether FileMover logging is enabled or disabled.</td>
</tr>
<tr>
<td>max log size</td>
<td>Maximum size of the log file.</td>
</tr>
<tr>
<td>cid</td>
<td>Connection ID.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system. The -list option provides information for a description of the types.</td>
</tr>
<tr>
<td>secondary</td>
<td>Hostname or IP address of the remote file system.</td>
</tr>
<tr>
<td>state</td>
<td>Specifies whether VNX FileMover is enabled or disabled on the file system.</td>
</tr>
<tr>
<td>read policy override</td>
<td>Migration method option used to override the read method specified in the stub file.</td>
</tr>
<tr>
<td>write policy</td>
<td>Write policy option used to recall data from secondary storage.</td>
</tr>
<tr>
<td>local_server</td>
<td>Name of the local CIFS server used to authenticate the CIFS connection.</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**

To create a CIFS connection for *ufs1* to the secondary file system \winserver2.nasdocs.emc.com\dhsm2 with a specified administrative account nasdocs.emc.com\Administrator, local server dm102-cge0, WINS server, and with the migration method set to *full*, type:

```
$ fs_dhsm -connection ufs1 -create -type cifs -admin 'nasdocs.emc.com\Administrator' -secondary '\winserver2.nasdocs.emc.com\dhsm1' -local_server dm102-cge0 -wins 172.24.102.25 -read_policy_override full
```
The fs Commands

Enter Password:********
ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB

EXAMPLE #2 provides a description of command output.

EXAMPLE #4
To display connection information for ufs1, type:
$ fs_dhsm -connection ufs1 -info 1

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB

EXAMPLE #2 provides a description of command output.

EXAMPLE #5
To modify the read_policy_override setting for connection 0 for ufs1, type:
$ fs_dhsm -connection ufs1 -modify 0
-read_policy_override passthrough

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB
cid = 0

type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1
state = enabled
read policy override = full
write policy = full
local_server = DM102-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\Administrator
wins = 172.24.102.25
Done
EXAMPLE #2 provides a description of command output.

EXAMPLE #6  To modify the VNX FileMover connection for ufs1, type:

```
$ fs_dhsm -connection ufs1 -modify 0 -nfs_server 172.24.102.115 -proto TCP
```

ufs1:
state = enabled
offline attr = on
popup timeout = 10
backup = offline
read policy override = full
log file = on
max log size = 25MB
cid = 0
type = NFSV3
secondary = 172.24.102.115:/export/dhsm1
state = enabled
write policy = full
options = useRootCred=true proto=TCP
cid = 1
type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1
state = enabled
read policy override = none
write policy = full
local_server = DM102-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\Administrator
wins = 172.24.102.25
cid = 2
type = HTTP
secondary = http://172.24.102.115/export/dhsm1
state = enabled
read policy override = none
write policy = full
user =
options = cgi=n
```

Done

EXAMPLE #2 provides a description of command output.
**EXAMPLE #7**  
To create the NFSv3 connection for ufs1 to the secondary file system 172.24.102.115:/export/dhsm1 with the migration method set to full, the -useRootCred set to true and the protocol set to UDP, type:

```
$ fs_dhsm -connection ufs1 -create -type nfsv3 -secondary 172.24.102.115:/export/dhsm1 -read_policy_override full -useRootCred true -proto UDP
```

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB
cid = 0
type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1\ state = enabled
read policy override = pass
write policy = full
local_server = DM102-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\Administrator
wins = 172.24.102.25
cid = 1
type = NFSV3
secondary = 172.24.102.115:/export/dhsm1
state = enabled
read policy override = full
write policy = full
options = useRootCred=true proto=UDP

Done

**EXAMPLE #2** provides a description of command output.

**EXAMPLE #8**  
To modify the VNX FileMover connection for ufs1, type:

```
$ fs_dhsm -connection ufs1 -modify 1 -proto TCP
```

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB
cid = 0
type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1\ state = enabled
The fs Commands

read policy override = pass
write policy        = full
local_server        = DM102-CGE0.NASDOCS.EMC.COM
admin               = nasdocs.emc.com\Administrator
wins                = 172.24.102.25
cid     = 1
type    = NFSV3
secondary = 172.24.102.115:/export/dhsm1
state    = enabled
read policy override = full
write policy        = full
options            = useRootCred=true proto=TCP

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #9
To display VNX FileMover connection information for ufs1, type:

```
$ fs_dhsm -info ufs1
```

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB

EXAMPLE #1 provides a description of command output.

EXAMPLE #10
To list VNX FileMover connections, type:

```
$ fs_dhsm -connection ufs1 -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>cid</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>ufs1</td>
<td>0</td>
</tr>
<tr>
<td>29</td>
<td>ufs1</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>ufs1</td>
<td>2</td>
</tr>
</tbody>
</table>

EXAMPLE #11
To modify the VNX FileMover connection for ufs1, type:

```
$ fs_dhsm -modify ufs1 -popup_timeout 10 -backup offline -log on -max_log_size 25 -offline_attr on -read_policy_override full
```

ufs1:
state = enabled
offline attr = on
popup timeout = 10
backup = offline
read policy override = full
log file = on
max log size = 25MB
cid = 0
### The fs Commands

<table>
<thead>
<tr>
<th>type</th>
<th>CIFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>secondary</td>
<td><code>\\winserver2.nasdocs.emc.com\dhsm1\</code></td>
</tr>
<tr>
<td>state</td>
<td>enabled</td>
</tr>
<tr>
<td>read policy override</td>
<td>pass</td>
</tr>
<tr>
<td>write policy</td>
<td>full</td>
</tr>
<tr>
<td>local_server</td>
<td>DM102-CGE0.NASDOCS.EMC.COM</td>
</tr>
<tr>
<td>admin</td>
<td>nasdocs.emc.com\Administrator</td>
</tr>
<tr>
<td>wins</td>
<td>172.24.102.25</td>
</tr>
<tr>
<td>cid</td>
<td>1</td>
</tr>
</tbody>
</table>

| type               | NFSV3                     |
| secondary          | 172.24.102.115:/export/dhsm1 |
| state              | enabled                   |
| read policy override | full                     |
| write policy       | full                      |
| options            | useRootCred=true proto=TCP |

Done

**EXAMPLE #2** provides a description of command output.

**EXAMPLE #12**

To modify the state of the VNX FileMover connection 0 for `ufs1`, type:

```
$ fs_dhsm -connection ufs1 -modify 0 -state disabled
```

| state              | enabled                   |
| offline attr       | on                        |
| popup timeout      | 10                        |
| backup             | offline                   |
| read policy override | full                     |
| log file           | on                        |
| max log size       | 25MB                      |
| cid                | 0                         |

| type               | CIFS                      |
| secondary          | `\\winserver2.nasdocs.emc.com\dhsm1\` |
| state              | disabled                  |
| read policy override | pass                     |
| write policy       | full                      |
| local_server       | DM102-CGE0.NASDOCS.EMC.COM |
| admin              | nasdocs.emc.com\Administrator |
| wins               | 172.24.102.25             |
| cid                | 1                         |

| type               | NFSV3                     |
| secondary          | 172.24.102.115:/export/dhsm1 |
| state              | enabled                   |
| read policy override | full                     |
| write policy       | full                      |
| options            | useRootCred=true proto=TCP |

Done

**EXAMPLE #2** provides a description of command output.
EXAMPLE #13 To modify the state of the VNX FileMover connection 1 for ufs1, type:

```
$ fs_dhsm -connection ufs1 -modify 1 -state recallonly
```

ufsl:
state = enabled
offline attr = on
popup timeout = 10
backup = offline
read policy override = full
log file = on
max log size = 25MB
cid = 0
type = CIFS
secondary = \winserver2.nasdocs.emc.com\dhsm1\state = enabled
read policy override = pass
write policy = full
local_server = DM102-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\Administrator
wins = 172.24.102.25
cid = 1
type = NFSV3
secondary = 172.24.102.115:/export/dhsm1state = recallonly
read policy override = full
write policy = full
options = useRootCred=true proto=TCP

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #14 To delete the VNX FileMover connections 1 and 2 for ufs1, and specify the recall policy for any migrated files during the delete, type:

```
$ fs_dhsm -connection ufs1 -delete 0,1 -recall_policy
```

ufsl:
state = enabled
offline attr = on
popup timeout = 10
backup = offline
read policy override = full
log file = on
max log size = 25MB

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #15 To change the state of the VNX FileMover connection for ufs1 to disabled, type:
EXAMPLE #1 provides a description of command output.

EXAMPLE #16 To create an HTTP connection for ufs1 to the secondary file system /export/dhsm1 on the web server http://172.24.102.115 that has direct access to the storage, type:

$ fs_dhsm -connection ufs1 -create -type http -secondary http://172.24.102.115/export/dhsm1 -cgi n

EXAMPLE #2 provides a description of command output.

EXAMPLE #17 To create an HTTP connection for ufs1 to the secondary file system using CGI connections to access migrated file data using a CGI application, type:

$ fs_dhsm -connection ufs1 -create -type http -secondary http://www.nasdocs.emc.com/cgi-bin/access.sh
The fs Commands

read policy override = none
log file = on
max log size = 10MB
cid = 0
type = HTTP
secondary = http://www.nasdocs.emc.com/cgi-bin/access.sh
state = enabled
read policy override = none
write policy = full
user =
options =

Done

EXAMPLE #18 provides a description of command output.

EXAMPLE #2 provides a description of command output.

EXAMPLE #19 provides a description of command output.

EXAMPLE #18

To create an HTTPS connection for server2_fs1 on the web server https://int16543 with read_policy_override set to full, type:

```
$ fs_dhsm -connection server2_fs1 -create -type https -secondary https://int16543 -read_policy_override full -cgi n
```

server2_fs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = passthrough
log file = on
max log size = 10MB
cid = 0
type = HTTPS
secondary = https://int16543
state = enabled
read policy override = full
write policy = full
user =
options =

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #19

To create an HTTPS connection for ufs1 to the secondary file system using CGI connections to access migrated file data using a CGI application, type:

```
$ fs_dhsm -connection ufs1 -create -type https -secondary https://www.nasdocs.emc.com/cgi-bin/access.sh
```

ufs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = none
log file = on
max log size = 10MB
cid = 0
type = HTTPS
secondary = https://www.nasdocs.emc.com/cgi-bin/access.sh
state = enabled
read policy override = none
write policy = full
user =
options =

EXAMPLE #20
To create an HTTPS connection on httpsPort 443 for server2_ufs1 on the web server https://int16543 with read_policy_override set to passthrough, type:

$ fs_dhsm -connection server2_fs1 -create -type https -secondary https://int16543 -read_policy_override passthrough -httpsPort 443 -cgi n

server2_fs1:
state = enabled
offline attr = on
popup timeout = 0
backup = passthrough
read policy override = passthrough
log file = on
max log size = 10MB
cid = 1
type = HTTPS
secondary = https://int16543
state = enabled
read policy override = pass
write policy = full
user =
options =

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #21
To create an HTTPS connection on localPort 80 for server2_ufs1 on the web server https://int16543 with read_policy_override set to passthrough, type:

$ fs_dhsm -connection server2_fs1 -create -type https -secondary https://int16543 -read_policy_override passthrough -localPort 80 -cgi n

server2_fs1:
state = enabled
offline attr = on
EXAMPLE #2 provides a description of command output.

EXAMPLE #22 To create an HTTPS connection on **httpsPort 443** for **server2_ufs1** on the web server **https://int16543** with a specified user **dhsm_user**, type:

```
$ fs_dhsm -connection server2_fs1 -create -type https -secondary https://int16543 -read_policy_override full -httpsPort 443 -user dhsm_user -password dhsm_user -cgi n
```

```
server2_fs1:
state  = enabled
offline attr  = on
popup timeout  = 0
backup  = passthrough
read policy override  = passthrough
log file  = on
max log size  = 10MB
cid  = 1
type  = HTTPS
secondary  = https://int16543
state  = enabled
read policy override  = full
write policy  = full
user  = dhsm_user
options  =
```

Done

EXAMPLE #2 provides a description of command output.

EXAMPLE #23 To modify the **read_policy_override** setting for connection 1 from **server2_fs1**, type:

```
$ fs_dhsm -connection server2_fs1 -modify 1 -read_policy_override passthrough
```

```
server2_fs1:
state  = enabled
```
EXAMPLE #2 provides a description of command output.

EXAMPLE #24

To delete the VNX FileMover connection 0 for ufs1, type:

$ fs_dhsm -connection ufs1 -delete 0

Done

EXAMPLE #1 provides a description of command output.
The fs Commands

fs_group

Creates a file system group from the specified file systems or a single file system.

SYNOPSIS

fs_group
- list
  - delete <fs_group_name>
  - info {<fs_group_name>|id=<fs_group_id>}
  [-name <name>] - create {<fs_name>,...}
  - xtend <fs_group_name> {<fs_name>,...}
  - shrink <fs_group_name> {<fs_name>,...}

DESCRIPTION

The fs_group command combines file systems to be acted upon simultaneously as a single group for TimeFinder/FS.

OPTIONS

- list
Displays a listing of all file system groups.

Note: The ID of the object is an integer and is assigned automatically. The name of a file system may be truncated if it is too long for the display. To display the full name, use the -info option with a file system ID.

- delete <fs_group_name>
Deletes the file system group configuration. Individual file systems are not deleted.

- info {<fs_group_name>|id=<fs_group_id>}
Displays information about a file system group, either by name or group ID.

[-name <name>] - create {<fs_name>,...}
Creates a file system group from the specified file systems. If a name is not specified, one is assigned by default.

- xtend <fs_group_name> {<fs_name>,...}
Adds the specified file systems or group to a file system group.

- shrink <fs_group_name> {<fs_name>,...}
Removes the specified file systems or group from a file system group. Individual file systems are not deleted.

SEE ALSO

Managing Volumes and File Systems for VNX Manually and Using TimeFinder/FS, NearCopy, and FarCopy on VNX for File, fs_timefinder, and nas_fs.
The fs Commands

SYSTEM OUTPUT
The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019. Symmetrix systems appear as 002804000190-003C.

EXAMPLE #1
To create a file system group named, ufsg1, and add ufs1, type:

```
$ fs_group -name ufsg1 -create ufs1
```

```
id        = 22
name      = ufsg1
acl       = 0
in_use    = False
type      = group
fs_set    = ufs1
pool      = 
stor_devs = 000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009
disks     = d3,d4,d5,d6
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the group that is automatically assigned.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the group.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for the group.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether a file system is used by a group.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system.</td>
</tr>
<tr>
<td>fs_set</td>
<td>File systems that are part of the group.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool given to the file system group.</td>
</tr>
<tr>
<td>stor_devs</td>
<td>System devices associated with the group.</td>
</tr>
<tr>
<td>disks</td>
<td>Disks on which the metavolume resides.</td>
</tr>
</tbody>
</table>

EXAMPLE #2
To list all file system groups, type:

```
$ fs_group -list
```

```
  id    name          acl in_use type member_of fs_set
     20  ufsg1         0   n      100             18
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>member_of</td>
<td>Groups which the file system group belong to.</td>
</tr>
</tbody>
</table>
EXAMPLE #3  To display information for the file system group, ufsg1, type:

$ fs_group -info ufsg1

id        = 22
name      = ufsg1
acl       = 0
in_use    = False
type      = group
fs_set    = ufs1
pool      =
estor_devs =
  000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009
disks     = d3,d4,d5,d6

EXAMPLE #1 provides a description of command output.

EXAMPLE #4  To add file system, ufs2, to the file system group, ufsg1, type:

$ fs_group -xtend ufsg1 ufs2

id        = 22
name      = ufsg1
acl       = 0
in_use    = False
type      = group
fs_set    = ufs1,ufs2
pool      =
estor_devs =
  000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009,00018794
  0268-000A,000187940268-000B,000187940268-000C,000187940268-000D
disks     = d3,d4,d5,d6,d7,d8,d9,d10

EXAMPLE #1 provides a description of command output.

EXAMPLE #5  To remove file system, ufs2, from the file system group, ufsg1, type:

$ fs_group -shrink ufsg1 ufs2

id        = 22
name      = ufsg1
acl       = 0
in_use    = False
type      = group
fs_set    = ufs1
pool      =
estor_devs =
  000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009

disks     = d3,d4,d5,d6

EXAMPLE #1 provides a description of command output.
To delete file system group, ufsg1, type:

```
$ fs_group -delete ufsg1
```

```
id        = 22
name      = ufsg1
acl       = 0
in_use    = False
type      = group
fs_set    =
stor_devs =
disks     =
```

EXAMPLE #1 provides a description of command output.
The fs Commands

**fs_rdf**

Manages the remote data facility (RDF) functionality for a file system residing on RDF drives.

**SYNOPSIS**

```
fs_rdf {<fs_name>|id=<fs_id>}
   -Mirror {on|off|refresh}
| -Restore [-Force]
| -info
```

**Note:** RDF is supported only on a VNX attached to a Symmetrix.

**DESCRIPTION**

The `fs_rdf` command turns mirroring on and off for an RDF file system and displays information about RDF relationships.

**OPTIONS**

- **-Mirror**
  - **{on|off|refresh}**
  The **on** option resumes the link between the RDF drives of a file system thereby enabling mirroring for the RDF file system. The **off** option halts mirroring between the file systems, and the **refresh** option does an immediate mirror **on** then **off** which refreshes the file system image.

- **-Restore**
  - **[-Force]**
  Restores a file system from the R2 side (remote) when remote TimeFinder/FS FarCopy is used. The **-Restore** can only be executed on the R1 side. The **-Force** option must be used when restoring a file system with enabled.

- **-info**
  Displays information about RDF relationships.

**SEE ALSO**


**EXAMPLE #1**

To turn on mirroring for **ufs1_snap1** from the R1 Control Station, type:

```
$ fs_rdf ufs1_snap1 -Mirror on
```

**id** = 20  
**name** = ufs1_snap1  
**acl** = 0  
**in_use** = False  
**type** = uxfs  
**volume** = v168
pool =
rw_servers=
ro_servers=
rw_vdms =
ro_vdms =
backup_of = ufs1 Fri Apr 23 16:29:23 EDT 2004
stor_devs =
002804000190-0052, 002804000190-0053, 002804000190-0054, 002804000190-0055
disks = rootd33, rootd34, rootd35, rootd36

RDF Information:
remote_symid = 0028040000218
remote_sym_devname =
ra_group_number = 2
dev_rdf_type = R1
dev_ra_status = READY
dev_link_status = READY
drdf_mode = SYNCHRONOUS
drdf_pair_state = SYNCINPROG
drdf_domino = DISABLED
adaptive_copy = DISABLED
adaptive_copy_skew = 65535
num_r1_invalid_tracks = 0
num_r2_invalid_tracks = 736440
dev_rdf_state = READY
remote_dev_rdf_state = WRITE_DISABLED
drdf_status = 0
link_domino = DISABLED
prevent_auto_link_recovery = DISABLED
link_config =
suspend_state = NA
consistency_state = DISABLED
adaptive_copy_wp_state = NA
prevent_ra_online_upon_pwron = ENABLED

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of a file system that is assigned automatically.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to a file system.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for a file system.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether a file system is registered into the mount table.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system. nas_fs provides a description of the types.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which a file system resides.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool for the file system.</td>
</tr>
<tr>
<td>rw_servers</td>
<td>Servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_servers</td>
<td>Servers with read-only access to a file system.</td>
</tr>
<tr>
<td>rw_vdms</td>
<td>VDM servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_vdms</td>
<td>VDM servers with read-only access to a file system.</td>
</tr>
</tbody>
</table>
### The fs Commands

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>backup_of</td>
<td>The remote RDF file system.</td>
</tr>
<tr>
<td>stor_devs</td>
<td>The system devices associated with a file system.</td>
</tr>
<tr>
<td>disks</td>
<td>The disks on which the metavolume resides.</td>
</tr>
<tr>
<td>remote_symid</td>
<td>The serial number of the system containing the target volume.</td>
</tr>
<tr>
<td>remote_sym_devname</td>
<td>The system device name of the remote device in an RDF pair.</td>
</tr>
<tr>
<td>ra_group_number</td>
<td>The RA group number (1-n).</td>
</tr>
<tr>
<td>dev_rdf_type</td>
<td>The type of RDF device. Possible values are: R1 and R2.</td>
</tr>
<tr>
<td>dev_ra_status</td>
<td>RA status. Possible values are: READY, NOT_READY, WRITE.Disabled, STATUS.NA, STATUS_MIXED.</td>
</tr>
<tr>
<td>dev_link_status</td>
<td>Link status. Possible values are: READY, NOT_READY, WRITE.Disabled.</td>
</tr>
<tr>
<td>rdf_mode</td>
<td>The RDF mode. Possible values are: SYNCHRONOUS, SEMI_SYNCHRONOUS, ADAPTIVE_COPY, MIXED.</td>
</tr>
<tr>
<td>rdf_pair_state</td>
<td>The composite state of the RDF pair. Possible values are: INVALID, SYNCPROG, SYNCHRONIZED, SPLIT, SUSPENDED, FAILED_OVER, PARTITIONED, R1_UPDATED, R1_UPDINPROG, MIXED.</td>
</tr>
<tr>
<td>rdf_domino</td>
<td>The RDF device domino. Possible values are: ENABLED, DISABLED, MIXED.</td>
</tr>
<tr>
<td>adaptive_copy</td>
<td>Possible values are: DISABLED, WP_MODE, DISK_MODE, MIXED.</td>
</tr>
<tr>
<td>adaptive_copy_skew</td>
<td>Number of invalid tracks when in Adaptive copy mode.</td>
</tr>
<tr>
<td>num_r1_invalid_tracks</td>
<td>Number of invalid tracks on the source (R1) device.</td>
</tr>
<tr>
<td>num_r2_invalid_tracks</td>
<td>Number of invalid tracks on the target (R2) device.</td>
</tr>
<tr>
<td>dev_rdf_state</td>
<td>Specifies the composite RDF state of the RDF device. Possible values are: READY, NOT_READY, WRITE.Disabled, NA, MIXED.</td>
</tr>
<tr>
<td>remote_dev_rdf_state</td>
<td>Specifies the composite RDF state of the remote RDF device. Possible values are: READY, NOT_READY, WRITE.Disabled, NA, MIXED.</td>
</tr>
<tr>
<td>rdf_status</td>
<td>Specifies the RDF status of the device. Possible values are: READY, NOT_READY, WRITE.Disabled, NA, MIXED.</td>
</tr>
<tr>
<td>link_domino</td>
<td>RDF link domino. Possible values are: ENABLED, DISABLED.</td>
</tr>
<tr>
<td>prevent_auto_link_recovery</td>
<td>When enabled, prevents the automatic resumption of data copy across the RDF links as soon as the links have recovered. Possible values are: ENABLED, DISABLED.</td>
</tr>
<tr>
<td>link_config</td>
<td>Possible values are: CONFIG_ESCON, CONFIG_T3.</td>
</tr>
<tr>
<td>suspend_state</td>
<td>Specifies the status of R1 devices in a consistency group. Possible states are: NA, OFFLINE, OFFLINE_PEND, ONLINE_MIXED.</td>
</tr>
<tr>
<td>consistency_state</td>
<td>Specifies state of an R1 device related to consistency groups. Possible states are: ENABLED, DISABLED.</td>
</tr>
<tr>
<td>adaptive_copy_wp_state</td>
<td>Specifies state of the adaptive copy mode. Possible states are: NA, OFFLINE, OFFLINE_PEND, ONLINE_MIXED.</td>
</tr>
<tr>
<td>prevent_ra_online_upon_pwron</td>
<td>Specifies the state of the RA director coming online after power on. Possible states are: ENABLED, DISABLED.</td>
</tr>
</tbody>
</table>
**EXAMPLE #2**  To display RDF-related information for **ufs1_snap1** from the R2 Control Station, type:

```
$ fs_rdf ufs1_snap1 -info
```

```
id        = 20
name      = ufs1_snap1
acl       = 0
in_use    = False
type      = uxfs
volume    = v168
pool      =
rw_servers= 
ro_servers= 
rw_vdms   =
ro_vdms   =
backup_of = ufs1 Fri Apr 23 16:29:23 EDT 2004
stor_devs = 002804000190-0052,002804000190-0053,002804000190-0054,002804000190-0055
disks     = rootd33,rootd34,rootd35,rootd36

RDF Information:
remote_symid                 = 002804000218
remote_sym_devname           =
ra_group_number              = 2
dev_rdf_type                 = R1
dev_ra_status                = READY
dev_link_status              = READY
rdf_mode                     = SYNCHRONOUS
rdf_pair_state               = SYNCINPROG
dev_rdf_type                  = DISABLED
adaptive_copy                = DISABLED
adaptive_copy_skew           = 65535
num_r1_invalid_tracks        = 0
num_r2_invalid_tracks        = 696030
dev_rdf_status               = READY
remote_dev_rdf_state         = WRITE_DISABLED
drdf_status                  = 0
link_domino                  = DISABLED
prevent_auto_link_recovery   = DISABLED
link_config                  =
suspend_state               = NA
consistency_state            = DISABLED
adaptive_copy_wp_state       = NA
prevent_ra_online_upon_pwron = ENABLED
```

**EXAMPLE #1** provides a description of command output.
**EXAMPLE #3**  To turn the mirroring off for ufs1_snap1 on the R1 Control Station, type:

```
$ fs_rdf ufs1_snap1 -Mirror off
```

```
remainder(MB) = 20548..17200..13110..8992..4870..746 0
id = 20
name = ufs1_snap1
acl = 0
in_use = False
type = uxfs
volume = v168
pool =
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
```
EXAMPLE #4 To perform a mirror refresh for ufs1_snap1 on the R1 Control Station, type:

```
$ fs_rdf ufs1_snap1 -Mirror refresh
```

```
remainder(MB) = 1 0
id = 20
name = ufs1_snap1
acl = 0
in_use = False
type = uxfs
volume = v168
pool =
rw_servers=
ro_servers=
 rw_vdms =
ro_vdms =
backup_of = ufs1 Fri Apr 23 16:29:23 EDT 2004
stor_devs =
002804000190-0052,002804000190-0053,002804000190-0054,002804000190-0055
disks = rootd33,rootd34,rootd35,rootd36

RDF Information:
remote_symid = 002804000218
remote_sym_devname =
ra_group_number = 2
dev_rdf_type = R1
dev_ra_status = READY
dev_link_status = NOT READY
rdf_mode = SYNCHRONOUS
drdf_pair_state = SUSPENDED
drdf_domino = DISABLED
adaptive_copy = DISABLED
adaptive_copy_skew = 65535
num_r1_invalid_tracks = 0
num_r2_invalid_tracks = 0
dev_rdf_state = READY
remote_dev_rdf_state = WRITE_DISABLED
rdf_status = 0
link_domino = DISABLED
prevent_auto_link_recovery = DISABLED
link_config =
suspend_state = OFFLINE
consistency_state = DISABLED
adaptive_copy_wp_state = NA
prevent_ra_online_upon_pwron = ENABLED
```

EXAMPLE #1 provides a description of command output.
**EXAMPLE #5**

To restore the file system **ufs1_snap1** from the R1 Control Station, type:

```
$ /nas/sbin/rootfs_rdf ufs1_snap1 -Restore
```

```
remainder(MB) = 1 0
id        = 20
name      = ufs1_snap1
acl       = 0
in_use    = False
type      = uxfs
volume    = v168
pool      =
  rw_servers=
  ro_servers=
  rw_vdms  =
  ro_vdms  =
backup_of = ufs1 Fri Apr 23 16:29:23 EDT 2004
stor_devs =
  002804000190-0052,002804000190-0053,002804000190-0054,002804000190-0055
disks     = rootd33,rootd34,rootd35,rootd36

RDF Information:
remote_symid         = 002804000218
remote_sym_devname   =
ra_group_number      = 2
dev_rdf_type         = R1
dev_ra_status        = READY
dev_link_status      = READY
rdf_mode             = SYNCHRONOUS
drdf_pair_state      = SYNCHRONIZED
drdf_domino          = DISABLED
adaptive_copy        = DISABLED
adaptive_copy_skew   = 65535
num_r1_invalid_tracks= 0
num_r2_invalid_tracks= 0
dev_rdf_state        = READY
remote_dev_rdf_state = WRITE_DISABLED
rdf_status           = 0
link_domino          = DISABLED
prevent_auto_link_recovery = DISABLED
link_config          =
suspend_state        = NA
consistency_state    = DISABLED
adaptive_copy_wp_state =
prevent_ra_online_upon_pwron = ENABLED
```

**EXAMPLE #1** provides a description of command output.
The fs Commands

fs_timefinder

Manages the TimeFinder/FS functionality for the specified file system or file system group.

SYNOPSIS

fs_timefinder {<fs_name>|id=<fs_id>}
-Mirror {on|off|refresh [-Force]}[-star]
   [-name <name>] -Snapshot [-volume <volume_name>] [-option <options>] [-star]
   -Restore [-Force] [-option <options>] [-star]

Note: TimeFinder/FS is supported only on a VNX attached to a Symmetrix.

DESCRIPTION

The fs_timefinder command creates a copy of a file system or file system group that can be placed into a mirrored mode with its original file system. The Symmetrix must already have business continuance volumes (BCVs) configured to the same size as the volumes on the VNX. After the copy of the file system has been made, it can be mounted on any Data Mover.

OPTIONS

-Mirror {on|off|refresh}

on places the unmounted file system copy, created by using the -Snapshot option, into a mirrored mode with its original file system. The file system copy is frozen and remains unavailable to users until mirrored mode is turned off.

The refresh option initiates an immediate -Mirror on then off for the unmounted file system copy, thereby refreshing the file system copy.

[-Force]

The file system copy should not be mounted read-write when placed into mirrored mode or when refreshed. If the file system copy is mounted read-write, the -Force option can be used to force a refresh if the metavolume is an STD type. The -Force option requires root command and must be executed by using /nas/sbin/rootfs_timefinder.

[-star]

The -star option allows the fs_timefinder command to run on STAR SRDF configuration.
**CAUTION**

Performing a mirror refresh may be time consuming, relative to the amount of data that has changed in the file system.

```
[-name <name>] -Snapshot [-star]
```

Creates a copy of a file system and assigns an optional name to the file system copy. If a name is not specified, one is assigned by default. If no options are provided, a name and metavolume are automatically assigned. Use `nas_fs` to delete the copy of the file system.

**CAUTION**

Creating a copy by using `-Snapshot` may be time consuming, relative to the size of a file system.

```
[-volume <volume_name>]
```

Assigns a metavolume to a file system copy. The metavolume must be created by using the `nas_volume -Clone` command prior to executing this option. The metavolume must be a BCV type and have the same characteristics as the metavolume of the original file system.

```
[-option <options>]
```

Specifies the following comma-separated options:

- **mirror=on**
  Leaves the file system copy in mirrored mode.

- **disktype=<disktype>**
  For systems with both local and R1BCVs, specifies the type of volume to use when creating a snapshot. In a TimeFinder/FS FarCopy configuration, use `disktype=R1BCV` for creating a snapshot of the PFS on the local VNX for file. For creating a snapshot of an imported FarCopy snapshot on the remote VNX for file, use `disktype=STD`. This option is supported only for RAID group based disk volumes and cannot be combined with the "mapped_pool=" option.

  By default, the system uses the first available R1BCV or BCV, or R1STD or STD device.

  Use the `disktype=` option to designate which to use if there are R1 devices in your configuration.
pool=<mapped_pool>
Specifies the mapped pool to use when creating a snapshot from that pool. This option is supported only for mapped pool disk volumes and cannot be combined with the disktype= option.

A mapped pool is a VNX for file storage pool that is dynamically generated when diskmark is run. It is a one-to-one mapping with either a VNX for block storage pool or a Symmetrix Storage Group.

**Note:** If the pool= option is used when creating a snapshot, the disk volume will be selected only from this pool. If the pool does not have enough disk volumes to create a snapshot for the source file system, the fs_timefinder command reports an error.

[-star]
Allows fs_timefinder command to run on STAR SRDF configuration.

-Restore
Restores a file system to its original location by using the unmounted file system copy created with the -Snapshot option. The original file system must not have any associated SnapSure checkpoints. The -star option allows the fs_timefinder command to run on STAR SRDF configuration.

**CAUTION**
Restoring a file system may be time consuming, relative to the amount of data that has changed in the file system.

[-Force]
Forces a restore of a file system copy that is mounted on the metavolume as read-only, or if the volume is an STD type.

[-option <options>]
Specifies the following comma-separated options:

mirror=on
Places the file system copy in mirrored mode.

[-star]
Allows fs_timefinder command to run on STAR SRDF configuration.
SEE ALSO  
Using TimeFinder/FS, NearCopy, and FarCopy on VNX for File, fs_ckpt, fs_group, and nas_fs.

EXAMPLE #1  
To create a TimeFinder/FS copy of the PFS, type:

```
$ fs_timefinder ufs1 -Snapshot
```

```
operation in progress (not interruptible)...remainder(MB) =
43688..37205..31142..24933..18649..12608..7115..4991..4129..3281..2457..1653..815..0
operation in progress (not interruptible)...id        = 18
name      = ufs1
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = mtv1
pool      =
    rw_servers= server_2
    ro_servers=
    rw_vdms  =
    ro_vdms  =
    backups  = ufs1_snap1
    stor_devs =
000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009
    disks    = d3,d4,d5,d6
    disk=d3  stor_dev=000187940268-0006 addr=c0t1l0-48-0 server=server_2
    disk=d3  stor_dev=000187940268-0006 addr=c16t1l0-33-0 server=server_2
    disk=d4  stor_dev=000187940268-0007 addr=c0t1l1-48-0 server=server_2
    disk=d4  stor_dev=000187940268-0007 addr=c16t1l1-33-0 server=server_2
    disk=d5  stor_dev=000187940268-0008 addr=c0t1l2-48-0 server=server_2
    disk=d5  stor_dev=000187940268-0008 addr=c16t1l2-33-0 server=server_2
    disk=d6  stor_dev=000187940268-0009 addr=c0t1l3-48-0 server=server_2
    disk=d6  stor_dev=000187940268-0009 addr=c16t1l3-33-0 server=server_2

id        = 19
name      = ufs1_snap1
acl       = 0
in_use    = False
type      = uxfs
worm      = off
volume    = v456
pool      =
    rw_servers=
    ro_servers=
    rw_vdms  =
    ro_vdms  =
    backup_of = ufs1 Thu Oct 28 14:13:30 EDT 2004
    stor_devs =
000187940268-0180,000187940268-0181,000187940268-0182,000187940268-0183
    disks    = rootd378,rootd379,rootd380,rootd381
```

```
```
The fs Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Name assigned to the file system.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value for a file system. nas_acl provides information.</td>
</tr>
<tr>
<td>in_use</td>
<td>If a file system is registered into the mount table of a Data Mover.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system. -list provides a description of the types.</td>
</tr>
<tr>
<td>worm</td>
<td>Whether is enabled.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which the file system resides.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool for the file system.</td>
</tr>
<tr>
<td>rw_servers</td>
<td>Servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_servers</td>
<td>Servers with read-only access to a file system.</td>
</tr>
<tr>
<td>rw_vdms</td>
<td>VDM servers with read-write access to a file system.</td>
</tr>
<tr>
<td>ro_vdms</td>
<td>VDM servers with read-only access to a file system.</td>
</tr>
<tr>
<td>backups</td>
<td>Name of associated backups.</td>
</tr>
<tr>
<td>backup_of</td>
<td>File system that the file system copy is made from.</td>
</tr>
<tr>
<td>stor_devs</td>
<td>System devices associated with a file system. The storage device output is the result of the Symmetrix hardware system.</td>
</tr>
<tr>
<td>disks</td>
<td>Disks on which the metavolume resides.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**  
To create a TimeFinder/FS copy of the PFS, `ufs1`, and leave a file system copy in mirrored mode, type:

```
$ fs_timefinder ufs1 -Snapshot -option mirror=on
```

```
operation in progress (not interruptible)...id       = 18
name       = ufs1
acl        = 0
in_use     = True
type       = uxfs
worm       = off
volume     = mtv1
pool       =
rw_servers= server_2
ro_servers=
rw_vdms    =
ro_vdms    =
backups    = ufs1_snap1
stor_devs  = 000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009
disks      = d3,d4,d5,d6
disk=d3    stor_dev=000187940268-0006   addr=c0t110-48-0   server=server_2
disk=d3    stor_dev=000187940268-0006   addr=c16t110-33-0   server=server_2
disk=d4    stor_dev=000187940268-0007   addr=c0t111-48-0   server=server_2
disk=d4    stor_dev=000187940268-0007   addr=c16t111-33-0   server=server_2
disk=d5    stor_dev=000187940268-0008   addr=c0t112-48-0   server=server_2
disk=d5    stor_dev=000187940268-0008   addr=c16t112-33-0   server=server_2
disk=d6    stor_dev=000187940268-0009   addr=c0t113-48-0   server=server_2
disk=d6    stor_dev=000187940268-0009   addr=c16t113-33-0   server=server_2
```
EXAMPLE #1 provides a description of command output.

EXAMPLE #3 To turn mirroring off for a file system copy, ufs1_snap1, type:

```
$ fs_timefinder ufs1_snap1 -Mirror off
```

operation in progress (not interruptible)...
remainder (MB) = 0
operation in progress (not interruptible)...

```
EXAMPLE #1 provides a description of command output.

EXAMPLE #3 To turn mirroring off for a file system copy, ufs1_snap1, type:

```
$ fs_timefinder ufs1_snap1 -Mirror off
```
EXAMPLE #4 To turn mirroring on for a file system copy, ufs1_snap1, type:

$ fs_timefinder ufs1_snap1Mirror on
EXAMPLE #1 provides a description of command output.

EXAMPLE #5 To perform a mirror refresh on ufs1_snap1, type:

```bash
$ fs_timefinder ufs1_snap1 -Mirror refresh
```

```bash
operation in progress (not interruptible)...
remainder (MB) = 4991..4129..3281..2457..1653..815..0
operation in progress (not interruptible)...id        = 18
name      = ufs1
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = mtv1
pool      =
rw_servers= server_2
ro_servers= rw_vdms =
ro_vdms =
backups   = ufs1_snap1
stor_devs =
000187940268-0006,000187940268-0007,000187940268-0008,000187940268-0009
disks     = d3,d4,d5,d6
disk=d3    stor_dev=000187940268-0006   addr=c0t1l0-48-0    server=server_2
disk=d4    stor_dev=000187940268-0006   addr=c16t1l0-33-0    server=server_2
disk=d5    stor_dev=000187940268-0007   addr=c0t1l1-48-0    server=server_2
disk=d6    stor_dev=000187940268-0008   addr=c0t1l1-48-0    server=server_2
disk=d3    stor_dev=000187940268-0006   addr=c16t1l1-33-0    server=server_2
disk=d4    stor_dev=000187940268-0007   addr=c16t1l1-33-0    server=server_2
disk=d5    stor_dev=000187940268-0008   addr=c16t1l1-33-0    server=server_2
disk=d6    stor_dev=000187940268-0009   addr=c16t1l1-33-0    server=server_2
id        = 19
name      = ufs1_snap1
acl       = 0
in_use    = False
type      = uxfs
worm      = off
volume    = v456
pool      =
```
EXAMPLE #1 provides a description of command output.

EXAMPLE #6 To restore the file system copy, ufs1_snap1, to its original location, type:

```
$ /nas/sbin/rootfs_timefinder ufs1_snap1 -Restore -Force
```

```
operation in progress (not interruptible)...
remainder(MB) = 0
operation in progress (not interruptible)...id = 19
name = ufs1_snap1
acl = 0
in_use = False
type = uXfs
worm = off
volume = v456
pool =
```
```
EXAMPLE #7 To create a snapshot for a mapped pool, type:

```bash
$ fs_timefinder ufs1 -name ufs1_snap1 -Snapshot -option
        pool=bcv_sg
```

```
operation in progress (not interruptible)...
remainder (MB) = 14184.0
operation in progress (not interruptible)...
id = 87
name = ufs1
acl = 0
in_use = False
type = uxfs
worm = off
volume = mtv1
pool =
 rw_servers=
 ro_servers=
 rw_vdms =
 ro_vdms =
 backups = ufs1_snap1
 auto_ext = no,thin=no
deduplication = unavailable
 stor_devs = 000194900546-0037
disks = d11

id = 88
name = ufs1_snap1
acl = 0
in_use = False
type = uxfs
worm = off
volume = v456
pool = bcv_sg
member_of = root_avm_fs_group_49
rw_servers=
 ro_servers=
 rw_vdms =
 ro_vdms =
 backup_of = ufs1 Fri Oct 1 12:03:10 EDT 2010
 auto_ext = no,thin=no
deduplication = unavailable
 thin_storage = False
tiering_policy = thickfp2
mirrored = False
 stor_devs = 000194900546-003C
```
disks = rootd16

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto_ext</td>
<td>Indicates whether auto-extension and thin provisioning are enabled.</td>
</tr>
<tr>
<td>deduplication</td>
<td>Deduplication state of the file system. The file data is transferred to the storage which performs the deduplication and compression on the data. The states are:</td>
</tr>
<tr>
<td></td>
<td>- On — Deduplication on the file system is enabled.</td>
</tr>
<tr>
<td></td>
<td>- Suspended — Deduplication on the file system is suspended. Deduplication does not perform any new space reduction but the existing files that were reduced in space remain the same.</td>
</tr>
<tr>
<td></td>
<td>- Off — Deduplication on the file system is disabled. Deduplication does not perform any new space reduction and the data is now reduplicated.</td>
</tr>
<tr>
<td>thin_storage</td>
<td>Indicates whether the block system uses thin provisioning. Values are: True, False, Mixed.</td>
</tr>
<tr>
<td>tiering_policy</td>
<td>Indicates the tiering policy in effect. If the initial tier and the tiering policy are the same, the values are:</td>
</tr>
<tr>
<td></td>
<td>Auto-Tier, Highest Available Tier, Lowest Available Tier. If the initial tier and the tiering policy are not the same, the values are:</td>
</tr>
<tr>
<td></td>
<td>Auto-Tier/No Data Movement, Highest Available Tier/No Data Movement, Lowest Available Tier/No Data Movement.</td>
</tr>
<tr>
<td>mirrored</td>
<td>Indicates whether the disk is mirrored.</td>
</tr>
</tbody>
</table>
The `ls` Commands

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ls</code></td>
<td>List directory contents</td>
</tr>
<tr>
<td><code>ls -l</code></td>
<td>Long listing format</td>
</tr>
<tr>
<td><code>ls -a</code></td>
<td>Include hidden files</td>
</tr>
<tr>
<td><code>ls -d</code></td>
<td>Directory entry only</td>
</tr>
<tr>
<td><code>ls -A</code></td>
<td>Show all files, including hidden ones</td>
</tr>
<tr>
<td><code>ls -R</code></td>
<td>Recursive listing</td>
</tr>
</tbody>
</table>

Example usage:

```
$ ls
ls: cannot access /dev/null: No such file or directory
$ ls -l
```

```
-rw-r--r-- 1 user group 4096 Mar 20 08:00 example.txt
```
This chapter lists the VNX Command Set provided for managing, configuring, and monitoring of File Movers. The commands are network protocol applications, prefixed with get or set, and appear alphabetically. The command line syntax (Synopsis), a description of the options, and an example of usage are provided for each command. Commands included are:

- `get_attributes` .............................................................. 118
- `set_attributes` ............................................................. 124
get_attributes

Reads the attributes of the specified file on the primary storage and verifies the VNX FileMover API configuration.

SYNOPSIS

get_attributes
[\(-u<\text{username}>\)] [-p<password>][\(-d\)][\(-h<\text{handle}>\)] [\(-w\)] [\(-a\)] [\(-S<\text{CA\_cert\_file}>\)]
[-V<http\_version>] <primary\_server> <primary\_file>

DESCRIPTION

get_attributes is executed on the Control Station after starting the VNX FileMover API service to return CIFS, NFS, and all vendor extended attributes in a text format. get_attributes uses the program "digest" to actually transport the command over the network.

Note: get_attributes is not part of Control Station CLI framework.

PREREQUISITES

Starts the HTTP server for VNX FileMover by using server_http, and creates user account for the specified VNX FileMover using server_user unless user authentication is set to none.

OPTIONS

-u <username>
Specifies the account name for digest or basic access authentication. If no authentication is used, just provides dhsm_user.

-p <password>
Specifies the password for the digest or the basic access authentication account. If no authentication is used, just provides dhsm_user.

-d
Displays offline attributes of a deduped file.

-h <handle>
Gets the status of files by handle instead of <primary_file>.

-w
Gets the status of Write Once Read Many (WORM) in file attribute data.

-a
Includes the Access Control List (ACL) information along with the standard file attributes.
**-S** <CA_cert_file>
Uses SSL to perform server certificate verification with the Certificate Authority (CA) certificated in <CA_cert_file>.

The file name that has the certificate of the CA used to create the Data Movers certificate for SSL authentication. This is only needed if SSL is turned on the FileMover API service.

**-v** <http_version>
Uses the specified version, HTTP/1.0 or HTTP/1.1. Default is HTTP/1.0.

*primary_server*
Specifies the IP address of the Data Mover, which is hosting the primary file. Must use IP address, not the NW host name.

*primary_file*
Specifies the full path to the file on the Data Mover.

**SEE ALSO** *Using VNX FileMover* and *server_http, server_user, and server_certificate*.

**EXAMPLE #1**
To verify offline status using VNX FileMover API, type:

```
$ /nas/tools/dhsm/get_attributes 10.5.8.111 /fs1/pax.tar
```

```xml
<?dhsm?>
<DHSM_GET_ATTRS PATH="nfs:/pfs/file1"/>
HTTP/1.0 200 OK
Date: Sat, 20 Aug 2005 16:36:31 GMT
Content-type: text/xml; charset=UTF-8

<?xml version="1.0" encoding="UTF-8"?>
<?dhsm?>
<RESPONSE>
<OFFLINE_ATTRS

  OFFLINE_PATH="http://dhsm-w2k/dir1/File4"
  OFFLINE_MTIME="1124555122"
  OFFLINE_ETAG="\08c0aea3a5c51:d6a"

/>

<STANDARD_ATTRS

  HANDLE="4294969278-19-1124494767"
  ONLINE_CTIME="1124555598000000"

  ... same as before.

/>

<RESULT SUCCESS="True" VALUE=""/>
</RESPONSE>
```
The get and set Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5.8.111</td>
<td>Indicates the IP address of the Data Mover which hosts the primary file.</td>
</tr>
<tr>
<td>/fs1/pax.tar</td>
<td>Indicates the path to the primary file.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**

To verify offline status of a deduped file with `-d` option, type:

```
$ /nas/tools/dhsm/get_attributes -d 128.221.252.2 /afs/3-1.log
```

New Command length is 65
spawn telnet 128.221.252.2 5080
Trying 128.221.252.2...
Connected to server_2 (128.221.252.2).
Escape character is '^]'.
POST /dhsm HTTP/1.0
Content-type: text/xml
Content-length: 65

```
<?dhsm?>
<DHSM_GET_ATTRS PATH="/afs/3-1.log" DEDUPE="True"/>
HTTP/1.1 200 OK
Connection: Close
Content-Type: text/xml; charset=UTF-8
Server: EMC File Mover service
Date: Mon, 28 Jan 2013 02:00:54 GMT

<?xml version="1.0" encoding="UTF-8"?>
<?dhsm?>
<RESPONSE>
<OFFLINE_ATTRS

OFFLINE_PATH="dart://rde/AQAAAA/cd/e1/Adl3gRkNrbbpS7+hdRX84qYoWvUAAAAAAAAAAA
AAAAAwAAAAAACtrGw;100143ab"
    OPTIMIZED_HANDLE="29-1359022552"
    ORIGINAL_BYTES_USED="2859008"
    DEDUPE_LINKCOUNT="1"
    DEDUPE_FSIZE="390821"
    OFFLINE_BLOCK_COUNT="348"
    BLOCKS_NEEDED_FOR_REINGEST="59"
    PE_ID="DHSM API"
/>
<STANDARD_ATTRS

HANDLE="4294968227-27-1359022531"
ONLINE_CTIME="1359022551000451"
UID="0"
GID="0"
ATIME="1359022531"
MTIME="1359022531"
CTIME="1359022551"
CREATE_TIME="1359022531"
```
DOS_ATTRS="2080"
PARENT_INODE="2"
FSIZE="2845467"
BLOCK_SIZE="8192"
BLOCKS="784"
BYTES_USED="401408"
INODE="27"
DEVICE="931"
NLINK="1"
MODE="0644"
FILE_TYPE="File"

<RESULT SUCCESS="True" VALUE=""/>
</RESPONSE>

**EXAMPLE #3** To verify offline status of a deduped file without `-d` option, type:

```
$ /nas/tools/dhsm/get_attributes 128.221.252.2 /afs/3-1.log
```

New Command length is 52
spawn telnet 128.221.252.2 5080
Trying 128.221.252.2...
Connected to server_2 (128.221.252.2).
Escape character is '^]'.
POST /dhsm HTTP/1.0
Content-type: text/xml
Content-length: 52

<?dhsm?>
<DHSM_GET_ATTRS PATH="/afs/3-1.log" />
HTTP/1.1 200 OK
Connection: Close
Content-Type: text/xml; charset=UTF-8
Server: EMC File Mover service
Date: Mon, 28 Jan 2013 02:01:35 GMT

<?xml version="1.0" encoding="UTF-8"?>
<?dhsm?>
<RESPONSE>
<STANDARD_ATTRS
HANDLE="4294968227-27-1359022531"
ONLINE_CTIME="1359022551000451"
UID="0"
GID="0"
ATIME="1359022531"
MTIME="1359022531"
CTIME="1359022551"
CREATE_TIME="1359022531"
DOS_ATTRS="2080"
PARENT_INODE="2"
FSIZE="2845467"
null
Did not get response - either the username and password were not presented for responding to a server challenge OR the response to the challenge was challenged again.

EXAMPLE #1 provides a description of command output.
**set_attributes**

Changes a file on primary storage into a Stub File or a WORM file.

### SYNOPSIS

```
set_attributes
[-m <migration_method[default|full|partial|read_pass_through]>]
[-u <username>][[-p <password>][[-v <offline_mtime>][[-i <info>][[-d <pe_id>]]
[-s <file_size>][[-c <online_ctime>][[-e <entity_tag>]
[-w <worm_expiration_time>][[-S <CA_cert_file>][[-V <http_version>]
<primary_server> <primary_file>
```

### DESCRIPTION

**set_attributes** uses the program “digest” to actually transport the command over the network to set EMC specific attributes, which are not available in CIFS or NFS.

**Note:** **set_attributes** is not part of Control Station CLI framework.

### PREREQUISITES

Before running the command, firstly enables VNX FileMover operations on a file system by using `fs_dhsm`, starts the HTTP server for VNX FileMover by using `pserver_http`, and creates user account for the specified VNX FileMover using `rserver_user` unless user authentication is set to none.

### OPTIONS

- **-m <migration_method>**  
  Chooses one of the methods Data Mover will use when a client accesses data on a stub file.

  The methods include the following: Full – on the first access to the stub file, the Data Mover will migrate all of the file’s data back from the secondary store. Partial – On every access to the stub file, the Data Mover will migrate 128k of data from the secondary store. Read_pass through – This is the default value. The data will be read from the secondary storage device and given to the client and no data blocks will be migrated back to the Data Mover.

- **-u <username>**  
  Specifies the account name for digest or basic access authentication. If no authentication is used, just provides dhsm_user.

- **-p <password>**  
  Specifies the password for the digest or the basic access authentication account. If no authentication is used, just provides dhsm_user.
The get and set Commands

-v <offline_mtime>
Sets <offline_mtime> verifier with an integer value. By default the script will search the mount command to find the stub file’s verifier value.

-i <info>
Sets offline attribute INFO.

-d <pe_id>
Sets offline attribute PE_ID.

-s <file_size>
Specifies the logical size of the file in bytes.

-c <online_ctime>
Sets <online_ctime> verifier with integer values. By default the script will call get_attributes to find the stub file’s verifier value.

-e <entity_tag>
Sets offline attribute ETAG. This should be used instead of the -v option for HTTP connections to a secondary server.

-w <worm_expiration_time>
Sets the stub file Write Once Read Memory (WORM) expiration time. <worm_expiration_time> is an integer in seconds since Jan 1, 1970 GMT. A <worm_expiration_time> value of 0 indicates infinite expiration time.

-S <CA_cert_file>
Uses SSL to perform server certificate verification with the Certificate Authority (CA) certificated in <CA_cert_file>.

The file name that has the certificate of the CA used to create the Data Movers’ certificate for SSL authentication. This is only needed if SSL is turned on the FileMover API service.

-V <http_version>
Uses the specified version, HTTP/1.0 or HTTP/1.1. Default is HTTP/1.0.

<primary_server>
Specifies the IP address of the Data Mover, which is hosting the primary file. Must use IP address, not the NW host name.

<primary_file>
Specifies the full path to the file on the Data Mover.

SEE ALSO Using VNX FileMover and server_http, server_user, and server_certificate.
EXAMPLE #1  
To create a stub file on the primary storage, type:

```
$ /nas/tools/dhsm/set_attributes -v 1191008770 10.5.8.111
/fsl/pax.tar nfs://io2/fslata/pax.tar
```

```xml
to_file pax.tar;
open_connection: server IP 10.5.8.111
open_connection: streaming socket open
open_connection: bind successful
open_connection: connect successful
open_connection: local port = 55315, local addr = 10.5.8.111
Sending 260 bytes ***
POST /dhsm HTTP/1.0
Content-type: text/xml
Content-length: 192

<?dhsm?>
<DHSM_SET_OFFLINE_ATTRS
  ONLINE_CTIME="1191008731000171"
  HANDLE="4294967320-16-1191008731"
  OFFLINE_PATH="nfs://io2/fslata/pax.tar"
  OFFLINE_MTIME="1191008770"
/>
```

Note: Make sure HTTP service for VNX FileMover is started by using 
server_http.

EXAMPLE #2  
To create a stub file on a secondary server for HTTP connections, type:

```
$ /nas/tools/dhsm/set_attributes -u dhsm_user -p dhsm_user -e f5040c-14a000-c986cd80 -V HTTP/1.1 10.5.8.111 /fs1/pax.tar http://linc57/pax.tar
```

FILE == /fs1/pax.tar
open_connection: server IP 10.5.8.111
open_connection: streaming socket open
open_connection: bind successful
open_connection: connect successful
open_connection: local port = 55315, local addr = 10.5.8.111
Sending 275 bytes ***
POST /dhsm HTTP/1.1
Host:10.5.8.111
Content-type: text/xml
Content-length: 190

<?dhsm?>
<DHSM_SET_OFFLINE_ATTRS
  ONLINE_CTIME="1191010323000002"
  HANDLE="4294967320-16-1191008731"
  OFFLINE_PATH="http://linc57/pax.tar"
  ETAG="f5040c-14a000-c986cd80"
/>

***
SENT 275 HEADER
HTTP/1.1 200 OK
Connection: Keep-Alive
Content-Type: text/xml; charset=UTF-8
Keep-Alive: max=299, timeout=60
Server: EMC File Mover service
Date: Tue, 02 Oct 2007 13:37:24 GMT
Transfer-Encoding: Chunked

<?xml version="1.0" encoding="UTF-8"?>
<?dhsm?>
<RESPONSE>
<RESULT SUCCESS="True" VALUE=""/>
</RESPONSE>
The get and set Commands
This chapter lists the VNX Command Set provided for managing, configuring, and monitoring of NAS database. The commands are prefixed with `nas` and appear alphabetically. The command line syntax (Synopsis), a description of the options, and an example of usage are provided for each command. Commands included are:

- `nas_acl` ................................................................. 131
- `nas_automountmap` ............................................... 134
- `nas_ca_certificate` ............................................. 136
- `nas_cel` ................................................................. 139
- `nas_checkup` ........................................................ 155
- `nas_ckpt_schedule` ........................................... 160
- `nas_connecthome` ............................................... 167
- `nas_config` ........................................................... 175
- `nas_copy` ............................................................... 179
- `nas_cs` ................................................................. 184
- `nas_dbtable` ........................................................ 191
- `nas_devicegroup` ............................................... 195
- `nas_disk` ............................................................... 199
- `nas_diskmark` .................................................... 207
- `nas_emailuser` ................................................... 211
- `nas_environment` ............................................... 214
- `nas_event` ........................................................... 222
- `nas_fs` ................................................................. 229
- `nas_fsck` ............................................................... 268
- `nas_halt` ............................................................... 272
- `nas_inventory` .................................................... 277
- `nas_license` ........................................................ 281
- `nas_logviewer` ................................................... 283
◆ nas_message .......................................................................................... 286
◆ nas_migrate.......................................................................................... 287
◆ nas_mview .......................................................................................... 305
◆ nas_pool ............................................................................................... 314
◆ nas_quotas .......................................................................................... 331
◆ nas_rdf ................................................................................................ 348
◆ nas_reclaim_schedule ....................................................................... 369
◆ nas_replicate ...................................................................................... 372
◆ nas_rp ................................................................................................ 391
◆ nas_server ........................................................................................... 399
◆ nas_slice ............................................................................................. 414
◆ nas_stats ............................................................................................. 418
◆ nas_storage ......................................................................................... 425
◆ nas_syncrep ....................................................................................... 441
◆ nas_syncrep_rr .................................................................................. 447
◆ nas_task ............................................................................................. 450
◆ nas_tls ................................................................................................ 454
◆ nas_version ......................................................................................... 457
◆ nas_volume ......................................................................................... 459
nas_acl

Manages the access control level table.

SYNOPSIS

nas_acl
   -list
   | -info {<user>|<group>|<owner>} <numerical_id>
   | -delete {<user>|<group>} <numerical_id>
   | [-name <name>] -create {<user>|<group>} <numerical_id> level=<acl_level>
   | -modify {<user>|<group>} <numerical_id>
     {[num_id=<numerical_id>],level=<acl_level>]

DESCRIPTION

nas_acl creates, lists, and displays information for access control level
entries within the table, and deletes the specified group or entries.

The access control level table is created and recognized in the NAS
database and contains assigned levels for users and groups. A user
must be defined in the /etc/passwd file prior to being assigned an
entry in the table. Creating an access control level entry defines the
access level allowed for the user or group once a value has been
established for an object.

Note: root privileges are required to create, modify, or delete the access
control level table. The root user is permitted access to all objects.

OPTIONS

-list
Lists the access control level table.

-info {<user>|<group>|<owner>} <numerical_id>
Displays information for the user, group, or index entry of the owner
as specified by the <numerical_id>.

-delete {<user>|<group>} <numerical_id>
Deletes the entry for the specified user or group from the access
control level table.

-create {<user>|<group>} <numerical_id> level=<acl_level>
Creates an access control level entry for the specified user or group.
The <numerical_id> can be a user ID (UID) or group ID (GID).

Note: Before executing this command, the user or group must exist in the
Control Station in the /etc/passwd file or the /etc/group file.
The `<acl_level>` is a single-digit (between numbers 2 and 9) input representing available access control levels. Levels 2, 3, and 4 which are established by default are:

2 — admin — Is the most privileged level and includes privileges allowed from the operator and observer levels.
3 — operator — Includes privileges from the observer level.
4 — observer — The least privileged.

Levels 5—9 are available for configuration.

```
[-name <name>]
The name is case-sensitive and indicates a name by which the entry is referred.
```

Once a value has been set, the level assigned the user or group is checked in the ACL table and the level of access to the object is determined.

```
-modify {-user|-group} <numerical_id>
{{num_id=<numerical_id> [level=<acl_level>]}
Modifies the <numerical_id> and level for an access control level entry.
```

SEE ALSO

*Controlling Access to System Objects on VNX, nas_fs, nas_volume, nas_rp, and nas_storage.*

**EXAMPLE #1**

Before creating access control level entries, `su` to `root`. To create entries in the access control level table, type:

```
# nas_acl -name user1 -create -user 211 level=3
done
# nas_acl -name user2 -create -user 212 level=2
done
# nas_acl -name user3 -create -user 213 level=4
done
# nas_acl -name user4 -create -user 214 level=2
done
# nas_acl -name user5 -create -user 215 level=3
done
# nas_acl -name user6 -create -user 216 level=4
done
```
EXAMPLE #2  To display the access control level table, type:

```
$ nas_acl -list
```

<table>
<thead>
<tr>
<th>index</th>
<th>type</th>
<th>level</th>
<th>num_id</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>user</td>
<td>admin</td>
<td>201</td>
<td>nasadmin</td>
</tr>
<tr>
<td>2</td>
<td>user</td>
<td>operator</td>
<td>211</td>
<td>user1</td>
</tr>
<tr>
<td>3</td>
<td>user</td>
<td>admin</td>
<td>212</td>
<td>user2</td>
</tr>
<tr>
<td>4</td>
<td>user</td>
<td>observer</td>
<td>213</td>
<td>user3</td>
</tr>
<tr>
<td>5</td>
<td>user</td>
<td>admin</td>
<td>214</td>
<td>user4</td>
</tr>
<tr>
<td>6</td>
<td>user</td>
<td>operator</td>
<td>215</td>
<td>user5</td>
</tr>
<tr>
<td>7</td>
<td>user</td>
<td>observer</td>
<td>216</td>
<td>user6</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>index</td>
<td>Access control level table index entry number.</td>
</tr>
<tr>
<td>type</td>
<td>User or group for the entry.</td>
</tr>
<tr>
<td>level</td>
<td>Level of access permitted.</td>
</tr>
<tr>
<td>num_id</td>
<td>Numerical ID for identifying the entry.</td>
</tr>
<tr>
<td>name</td>
<td>Name given to the entry.</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To display information for an access control level entry, type:

```
$ nas_acl -info -user 211
```

```
id = 2
name = user1
level = operator
user_id = 211
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Index entry.</td>
</tr>
<tr>
<td>name</td>
<td>Name given for the entry.</td>
</tr>
<tr>
<td>level</td>
<td>Level of access permitted.</td>
</tr>
<tr>
<td>user_id</td>
<td>Also known as the num_id.</td>
</tr>
</tbody>
</table>

EXAMPLE #4  To modify an access control level entry, type:

```
# nas_acl -modify -user 211 level=7
done
```

EXAMPLE #5  To delete an access control level entry, type:

```
# nas_acl -delete -user 211
done
```
**nas_automountmap**

Manages the automount map file.

**SYNOPSIS**

```
nas_automountmap
   -list_conflict <infile> [-out <outfile>]
| -create [-in <infile>] [-out <outfile>]
```

**DESCRIPTION**

```
nas_automountmap creates and displays an automount map that
contains all permanently exported file systems that are used by the
automount daemon.
```

**OPTIONS**

```
-list_conflict <infile>
   Prints a list of the mount points that are used more than once.
   [-out <outfile>]
```

```
-create
   Creates an automount map and prints it to the screen only.
   [-in <infile>] [-out <outfile>]
```

```
   [-out <outfile>]
```

```
   Creates an automount map and outputs it to an <outfile>.
```

**EXAMPLE #1**

To create an automount map, type:

```
$ nas_automountmap -create
ufs1 -rw,intr,nosuid 127.0.0.1,10.172.128.47,128.221.253.2,128.221.252.2:/ufs1
ufs2 -rw,intr,nosuid 127.0.0.1,10.172.128.47,128.221.253.2,128.221.252.2:/ufs2
```

**EXAMPLE #2**

To create an automount map and save it to a file, type:

```
$ nas_automountmap -create -out automountmap
$ more automountmap
ufs1 -rw,intr,nosuid 127.0.0.1,10.172.128.47,128.221.253.2,128.221.252.2:/ufs1
ufs2 -rw,intr,nosuid 127.0.0.1,10.172.128.47,128.221.253.2,128.221.252.2:/ufs2
```

**EXAMPLE #3**

To print a conflicting list, type:

```
$ nas_automountmap -list_conflict automountmap
Conflicting lists:
ufs1 -rw,intr,suid 172.16.21.202:/ufs1
ufs1_172.16.21.203 -rw,intr,suid 172.16.21.203:/ufs1
```
EXAMPLE #4  To merge an automount map file with an existing map file, type:

$ nas_automountmap -create -in automountmap -out automountmap1
nas_ca_certificate

Manages the Control Station as a Certificate Authority (CA) for VNX’s Public Key Infrastructure (PKI).

SYNOPSIS

nas_ca_certificate
  -display
  | -generate

DESCRIPTION

nas_ca_certificate generates a public/private key set and a CA certificate for the Control Station. When the Control Station is serving as a CA, it must have a private key with which to sign the certificates it generates for the Data Mover. The Control Station CA certificate contains the corresponding public key, which is used by clients to verify the signature on a certificate received from the Data Mover.

nas_ca_certificate also displays the text of the CA certificate so you can copy it and distribute it to network clients. In order for a network client to validate a certificate sent by a Data Mover that has been signed by the Control Station, the client needs the Control Station CA certificate (specifically the public key from the CA certificate) to verify the signature of the Data Mover’s certificate.

The initial Control Station public/private key set and CA certificate are generated automatically during a VNX software 5.6 install or upgrade. A new Control Station public/private key set and CA certificate is not required unless the CA key set is compromised or the CA certificate expires. The Control Station CA certificate is valid for 5 years.

You must be root to execute the -generate option from the /nas/sbin directory.

Once a Control Station CA certificate is generated, you must perform several additional tasks to ensure that the new certificate is integrated into VNX’s PKI framework. The Security Configuration Guide for File and the Unisphere online help for the PKI interface explain these tasks.

OPTIONS

-display
Displays the Control Station CA certificate. The certificate text is displayed on the terminal screen. Alternatively, you can redirect it to a file.
The nas Commands

-generate
Generates a new CA public/private key set and certificate for the Control Station. This certificate is valid for 5 years from the date it is generated.

SEE ALSO server_certificate.

EXAMPLE #1 To generate a new Control Station CA certificate, type:

```
# /nas/sbin/nas_ca_certificate -generate
```
New keys and certificate were successfully generated.

EXAMPLE #2 To display the Control Station’s CA certificate, type:

```
# /nas/sbin/nas_ca_certificate -display
```

Note: Clients need only the certificate text enclosed by BEGIN CERTIFICATE and END CERTIFICATE although most clients can handle the entire output.

Certificate:

Data:
Version: 3 (0x2)
Serial Number: 3 (0x3)
Signature Algorithm: sha1WithRSAEncryption
Issuer: O=Celerra Certificate Authority, CN=eng173100
Validity
Not Before: Mar 23 21:07:40 2007 GMT
Not After : Mar 21 21:07:40 2012 GMT
Subject: O=Celerra Certificate Authority, CN=eng173100
Subject Public Key Info:
  Public Key Algorithm: rsaEncryption
  RSA Public Key: (2048 bit)
  Modulus (2048 bit):
  b7:e6:f1:7f:21:f0:71:2d:c4:8a:8f:20:d1:ab:5a:
  22:29:00:11:e0:a1:12:4b:02:79:fb:0f:fc:54:90:
  00:15:04:77:47:03:ec:c5:7a:a2:bf:32:0e:4d:d8:
Exponent: 65537 (0x10001)

X509v3 extensions:

X509v3 Subject Key Identifier:

X509v3 Authority Key Identifier:

DirName:/O=Celerra Certificate Authority/OU=CN=eng173100
serial:00

X509v3 Basic Constraints:
CA:TRUE

X509v3 Subject Alternative Name:
DNS:eng173100

Signature Algorithm: sha1WithRSAEncryption

96:bf:ce:6f

-----BEGIN CERTIFICATE-----

MIIDoDCCAoigAwIBAgIBAzANBgkqhkiG9w0BAQUFADA8MSYwJAYDVQQKEEx1DZWxl
ccnJhIEJlc3Nlci5wcm9kdWN0aW9uLmNvbSsMB0M2NPECTA3MDMyMzA3MDMwNTE4MTA3
MTEyMjI1MDg4Mzc2MDMwMB4X

-----END CERTIFICATE-----
**nas_cel**

Performs management of remotely linked VNX or a linked pair of Data Movers.

**SYNOPSIS**

```
nas_cel
   -list
   -delete {<cel_name>|id=<cel_id>} [-Force]
   -info {<cel_name>|id=<cel_id>}
   -update {<cel_name>|id=<cel_id>}
   -modify {<cel_name>|id=<cel_id>}
   {{-passphrase <passphrase>][-name <new_name>][-ip <ipaddr>}}
   -create <cel_name> -ip <ipaddr> -passphrase <passphrase>
   -interconnect <interconnect_options>
   -syncrep <syncrep_options>
```

**DESCRIPTION**

`nas_cel` manages the linking of the remote VNX to the local VNX. `nas_cel` also creates the trusted relationship between source and destination VNX Control Stations in configurations such as EMC VNX Replicator™.

For VNX Replicator only, `nas_cel -interconnect` also builds the connection (interconnect) between a pair of Data Movers.

For VDM MetroSync, `nas_cel -syncrep` is used to enable the service between two VNX systems.

Linked VNX systems are acknowledged:

- Automatically during the installation
- When executing the `nas_cel -create`
- When performing a `nas_rdf -init` to set up the Symmetrix Remote Data Facility (SRDF) relationship between two VNX.

**OPTIONS**

```
-list
```

Lists all VNX linked to the current VNX. The hostname of the Control Station active during installation appears as the `<cel_name>`.

---

**Note**: The ID of the object is an integer and is assigned automatically. The name of the VNX might be truncated if it is too long for the display. To view the full name, use the `-info` option with the VNX ID.
The nas Commands

- **delete** `<cel_name> | id=<cel_id>` [-**Force**]
  Deletes the relationship of the remote VNX, and removes its entry from the NAS database on the local VNX.

  The **-Force** option applies to SRDF and EMC MirrorView™/S configurations only. If the VNX to be deleted is part of an SRDF or MirrorView/S configuration, **-delete** must be specified with the **-Force** option; otherwise, an error is generated. You cannot use **-Force** if the specified VNX is also being used by VNX Replicator, file system copy (for example, with **nas_copy**), or TimeFinder/FS NearCopy or FarCopy. If the deletion is necessary, clean up these configurations before performing the forced deletion.

  - **-info** `<cel_name> | id=<cel_id>`
  Displays information for the remote VNX. To view the `<cel_id>` of configured VNX, use **-list**.

  - **-update** `<cel_name> | id=<cel_id>`
  Updates the local VNX entry with the local Control Station’s hostname and IP address configuration. It also updates the local Data Mover-to-Data Mover authentication setup.

  For the remote VNX, updates all Data Movers that were down or experiencing errors during the **-create** or **-modify** and restores them to service by using the configuration required for Data Mover authentication.

  **Note:** Data Mover authentication is used in iSCSI replication as the mechanism enabling two Data Movers (local or remote) to authenticate themselves and perform the requested operations. The **-update** option communicates with each Data Mover and either updates the configuration, or creates the configuration if it is being done for the first time.

  - **-modify** `<cel_name> | id=<cel_id>`
    `([ -passphrase <passphrase> ] [ -name <new_name> ] [ -ip <ipaddr> ] )`
  Changes the current passphrase, name, or IP address of the remote VNX to the new passphrase, name, or IP address in the local VNX database and modifies the remote Data Mover authentication setup by communicating with each Data Mover in the cabinet. The passphrase must have 6 to 15 characters.

  - **-create** `<cel_name> -ip <ipaddr> -passphrase <passphrase>`
    Builds the trusted relationship between one VNX and another VNX in a configuration such as VNX Replicator, SRDF, and MirrorView/S.
The `create` must be executed twice to ensure communication from both sides, first on the source VNX (to identify the destination VNX) and then on the destination VNX (to identify the source VNX). You must assign a name when you create the relationship (for example, a name that identifies the remote VNX in a local entry). The IP address specified represents the appropriate remote VNX’s primary Control Station (in slot 0); the passphrase specified is used to manage the remote VNX. The passphrase must have 6 to 15 characters and be the same between the source and destination VNXs to enable communication.

**INTERCONNECT OPTIONS**

Type `nas_cel -interconnect` to display interconnect options:

```
-interconnect
 { -create <name>
   -source_server <movername>
   -destination_system {<cel_name>|id=<cel_id>}
   -destination_server <movername>
   -source_interfaces {<name_service_interface_name>|ip=<ipaddr>}
     [,(<name_service_interface_name>|ip=<ipaddr>),...]
   -destination_interfaces {<name_service_interface_name>|ip=<ipaddr>}
     [,(<name_service_interface_name>|ip=<ipaddr>),...]
   [-bandwidth <bandwidthSched>]
   [-modify {<name>|id=<interConnectId>}
     {[-source_interfaces {<name_service_interface_name>|ip=<ipaddr>},...]
     [-destination_interfaces
       {<name_service_interface_name>|ip=<ipaddr>},...]
     [-bandwidth <bandwidthSched>]
     [-name <newName>]
   }]
   [-pause {<name>|id=<interConnectId>}
   [-resume {<name>|id=<interConnectId>}
   [-delete {<name>|id=<interConnectId>}
   [-info {<name>|id=<interConnectId>|-all}
   [-list [-destination_system {<cel_name>|id=<cel_id>}]
   [-validate {<name>|id=<interConnectId>}]
```

An interconnect supports VNX Replicator sessions by defining the communications path between a given Data Mover pair located on the same cabinet or different cabinets. The interconnect configures a list of local (source) and peer (destination) interfaces (using IP addresses and interface names), and a bandwidth schedule for all replication sessions using the interconnect. Only one interconnect can be established for a given Data Mover pair in any direction.
Note: You must delete all user-defined interconnects configured for a Data Mover before you can rename it. After you rename the Data Mover, you must re-create the source and peer interconnects with the new Data Mover name and then restart any associated replication sessions.

To fully establish an interconnect, **nas_cel -interconnect** must be issued twice, once from each side (the local side and its peer side). Both sides of the interconnect must exist before VNX Replicator sessions for local or remote replication can use the interconnect. Only the local side of an interconnect on which the source replication object resides is specified when creating the replication session. Loopback interconnects are created and named automatically and can be viewed using **nas_cel -interconnect -list**. You cannot create, modify, or delete loopback interconnects.

**-create <name>**
Assigns a name, up to 255 characters, to the appropriate side of the interconnect. The name must be unique for each Data Mover. Make the name meaningful, identifying servers and, for remote replication, VNX names or sites.

Remote replication naming example:

\[-\text{s2CelA}_{-}\text{s3CelB} \text{ or NYs3}_{-}\text{LAs4} \text{ (local side)} \]
\[-\text{s3CelB}_{-}\text{s2CelA} \text{ or LAs4}_{-}\text{NYs3} \text{ (peer side)} \]

Local replication naming example:

\[-\text{s2}_{-}\text{s3} \text{ (source side on local system)} \]
\[-\text{s3}_{-}\text{s2} \text{ (peer side on the same system)} \]

**-source_server <moverName>**
Specifies the name of an available local Data Mover to use for the local side of the interconnect.

**-destination_system {<cel_name>|id=<cel_id>}**
Specifies the name or ID of the VNX where the peer Data Mover resides.

**-destination_server <movername>**
Specifies the name of an available Data Mover, on the same or different system, to use for the peer side of the interconnect.

**-source_interfaces**
\[\{<name_service_interface_name>|ip=<ipaddr>\}[,\{<name_service_interface_name>|ip=<ipaddr>\},...\]
Configures a list of interfaces available for the local side of the
interconnect. You can define the list by using IP addresses (IPv4 or IPv6) or name service interface names or a combination of both, but how you specify an interface determines how it must be specified by the replication session later (by name service interface name or IP address).

If you define an interface by using an IP address, ensure that the source interface list uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

For each network protocol type (IPv4/IPv6) specified in the source interface list, at least one interface from the same type must be specified in the destination interfaces list and vice versa. For example, if the source interface list includes one or more IPv6 addresses, the destination interface list must also include at least one IPv6 address.

The name service interface name is a fully qualified name given to a network interface that must resolve to a single IP address (for example, using a DNS server).

**Note:** To prevent potential errors during interface selection (especially after a failover/switchover), it is highly recommended that you specify the same local and peer interface lists when configuring each side of the interconnect.

```
-destination_interfaces
{<name_service_interface_name>| ip=<ipaddr>}
[,<{name_service_interface_name}>| ip=<ipaddr>},...]
```

Configures a list of interfaces available on the peer side of the interconnect. You can define the list by using IP addresses (IPv4 or IPv6) or name service interface names or a combination of both, but how you specify each interface determines how it is specified by the replication session.

If you define an interface using an IP address, ensure that the source interface list uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

For each network protocol type (IPv4/IPv6) specified in the destination interface list, at least one interface from the same type must be specified in the source interfaces list and vice versa. For example, if the source interface list includes one or more IPv6 addresses, the destination interface list must also include at least one IPv6 address.
one IPv6 address. The name service interface name is a fully qualified name given to a network interface that must resolve to a single IP address (for example, using a DNS server).

```
[-bandwidth <bandwidthSched>]
```

Specifies a schedule to control the interconnect bandwidth used on specific days, or times instead of using all available bandwidth at all times for the interconnect (the default).

**Note:** The bandwidth schedule executes based on Data Mover time, not Control Station time.

The schedule applies to all VNX Replicator sessions using the interconnect. Specify a schedule with one or more comma-separated entries, most specific to least specific, as follows:

```
[{Su\Mo|Tu|We|Th|Fr|Sa}][HH:00-HH:00] [/Kbps], [ <next_entry>], [...] 
```

Example:

MoTuWeThFr07:00-18:00/2000,/8000 means use a limit of 2000 Kb/s from 7 a.m. to 6 p.m. Monday through Friday; otherwise, use a bandwidth limit of 8000 Kb/s.

```
-interconnect -modify {<name> | id=<interConnectId>}
```

Modifies one or more of the following characteristics of an existing interconnect, as specified by the name or ID for the appropriate side of the interconnect.

**Note:** You cannot modify the peer side of an interconnect configured on a remote system; you must modify it from that system. Also, you cannot modify an interface in use by a replication session.

```
[-source_interfaces {<name_service_interface_name> | ip=<ipAddr>},... ]
```

Modifies the list of interfaces (name service interface name or IP addresses or both) available for use on the local side of an interconnect. The new list of interfaces completely replaces the previous list.

**Note:** To avoid problems with interface selection, any changes made to the interface lists should be reflected on both sides of an interconnect.
The nas Commands

[-destination_interfaces({<name_service_interface_name >|ip=<ipAddr>}),...]
Modifies the list of interfaces (name service interface name or IP addresses or both) available for use on the peer side of an interconnect. The new list of interfaces completely replaces the previous list.

[-bandwidth <bandwidth>]
Modifies the existing bandwidth schedule for the specified interconnect, or creates a schedule if none existed previously. The schedule allocates the interconnect bandwidth for specific days or times or both instead of using all available bandwidth at all times for the interconnect (the default). The schedule applies to all replication sessions using the interconnect. Specify a schedule with one or more comma-separated entries, most specific to least specific, as follows:

[{Su|Mo|Tu|We|Th|Fr|Sa}][HH:00-HH:00][/Kbps], [ <next_entry>],[...]

Example:
MoTuWeThFr07:00-18:00/2000,/8000 means use a limit of 2000 Kb/s from 7 a.m. to 6 p.m. Monday through Friday; otherwise, use a bandwidth limit of 8000 Kb/s.

[-name <newName>]
Changes the name of the specified interconnect to a new name.

-interconnect -pause {<name>|id=<interConnectId>}
Halts data transmission over the existing Data Mover interconnect until you resume transmission over the interconnect or delete the interconnect. This affects all replication sessions using the specified interconnect.

-interconnect -resume {<name>|id=<interConnectId>}
Resumes data transmission over the Data Mover interconnect, making the interconnect available for use by replication sessions.

-interconnect -delete {<name>|id=<interConnectId>}
Deletes the Data Mover interconnect, thereby making the interconnect unavailable for use by any replication sessions. You cannot delete an interconnect if it is in use by a replication session. You can delete a paused interconnect.
-interconnect -info {<name> | id=<interConnectId> | -all}
Displays information about the specified interconnect or about all interconnects known to the local system.

-interconnect -list [-destination_system <cel_name> | id=<cel_id>]
By default, lists the interconnects available on the local VNX. Specifying the name or ID of a remote VNX also lists the interconnects available on that VNX.

-interconnect -validate {<name> | id=<interconnectId>}
Verifies the interconnect, verifying that authentication is configured properly by opening the connection between the Data Mover pair. Validation is done for loopback, local, and remote configuration.

SYNCHRONOUS REPLICATION OPTIONS
Type nas_cel -syncrep to display synchronous replication options:

-syncrep
{ -enable {<cel_name> | id=<cel_id>}
  -local_fsidrange <from>,<to>
  -remote_fsidrange <from>,<to>
  [-local_storage {raid_group=<rg_id> | block_pool=<pool_id>}]  
  [-remote_storage {raid_group=<rg_id> | block_pool=<pool_id>}]  
| -disable {<cel_name> | id=<cel_id>}
| -info {<cel_name> | id=<cel_id> | -all} [-verbose]
| -list

-enable {<cel_name> | id=<cel_id>}
Enables the VDM MetroSync feature between a pair of VNX systems (from source or destination).

-local_fsidrange <from>,<to>
Sets the file system identifier range on the local VNX2 system. This range must not overlap the file system identifier range on the remote VNX2 system. Valid values are from 1 to 32767.

-remote_fsidrange <from>,<to>
Sets the file system identifier range on the remote VNX2 system. This range must not overlap the file system identifier range on the local VNX2 system. Valid values are from 1 to 32767.

[-local_storage {raid_group=<rg_id> | block_pool=<pool_id>}]  
[-remote_storage {raid_group=<rg_id> | block_pool=<pool_id>}]  
Optionally specify either a local or remote RAID group or a block storage pool to create synchronous replication mirror LUNs.
If you do not specify either "-local_storage" or "-remote_storage" options, you can manually create synchronous replication mirror LUNs. To do this, create two 4 GB LUNs and add them to the ~filestorage group with their HLUs set to 8 and 9, respectively.

```
-nas_cel -create cs110 -ip 172.24.102.240 -passphrase nasdocs
```

```
operation in progress (not interruptible)... id = 3 name = cs110 owner = 0 device = channel = net_path = 172.24.102.240 VNX_id = APM000438070430000 passphrase = nasdocs
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the remote VNX on the local VNX.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned in the local view to the remote VNX.</td>
</tr>
<tr>
<td>owner</td>
<td>ACL ID assigned automatically.</td>
</tr>
<tr>
<td>device</td>
<td>R2 device mounted by the local Control Station to read the database of the remote Control Station in the SRDF environment. This value is unique to the Symmetrix system.</td>
</tr>
<tr>
<td>channel</td>
<td>Pair of devices used in the rdf channel. One is used for writing messages to the remote (wdev), the other to read messages from them. This value is unique to the Symmetrix system.</td>
</tr>
<tr>
<td>net_path</td>
<td>IP address of the remote VNX.</td>
</tr>
<tr>
<td>VNX_id</td>
<td>Unique VNX ID number.</td>
</tr>
<tr>
<td>passphrase</td>
<td>Used for authentication with a remote VNX.</td>
</tr>
</tbody>
</table>

SEE ALSO

Using VNX Replicator, Using VDM MetroSync with VDM MetroSync Manager for Disaster Recovery, nas_copy, nas_replicate, nas_syncrep, and nas_task.
EXAMPLE #2  For the VNX for block, to list all remote VNXs, type:

```
$ nas_cel -list
```

```
id    name          owner mount_dev  channel    net_path        CMU 
0     cs100         0                           172.24.102.236  APM000420008180000
3     cs110         0                           172.24.102.240  APM000438070430000
```

For the VNX with a Symmetrix system, to list all remote VNXs, type:

```
$ nas_cel -list
```

```
id    name          owner mount_dev  channel    net_path        CMU 
0     cs30          0                           172.24.172.152 0028040001900006
1     cs40          500   /dev/sdj1  /dev/sdg   172.24.172.151 0028040002180000
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the remote VNX on the local VNX.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned in the local view to the remote VNX.</td>
</tr>
<tr>
<td>owner</td>
<td>ACL ID assigned automatically.</td>
</tr>
<tr>
<td>mount_dev</td>
<td>Mounted database from the remote VNX in the SRDF environment. This value is unique to the Symmetrix system.</td>
</tr>
<tr>
<td>channel</td>
<td>RDF channel from where information is read and written. This value is unique to the Symmetrix system.</td>
</tr>
<tr>
<td>net_path</td>
<td>IP address of the remote VNX.</td>
</tr>
<tr>
<td>CMU</td>
<td>VNX Management Unit (unique VNX ID number).</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To display information for the remote VNX, cs110, type:

```
$ nas_cel -info cs110
```

```
id         = 3
name       = cs110
owner      = 0
device     =
channel    =
net_path   = 172.24.102.240
VNX_id = APM000438070430000
passphrase = nasdocs
```

EXAMPLE #1 provides information for a description of command outputs.

EXAMPLE #4  To update the Control Station entry for cs110, type:

```
$ nas_cel -update cs110
```

```
operation in progress (not interruptible)...
id         = 3
name       = cs110
owner      = 0
```
EXAMPLE #1 provides information for a description of command outputs.

EXAMPLE #5 To modify the passphrase and name for the remote Control Station cs110, type:

$$\texttt{nas_cel -modify cs110 -passphrase nasdocs_replication -name cs110_target}$$

EXAMPLE #1 provides information for a description of command outputs.

EXAMPLE #6 To delete the Control Station entry of the remote VNX, cs110_target, type:

$$\texttt{nas_cel -delete cs110_target}$$

EXAMPLE #1 provides information for a description of command outputs.
The nas Commands

EXAMPLE #7

To create an interconnect NYs3_LAs2 between Data Mover server_3 and remote Data Mover server_2, and use a bandwidth limit of 2000 Kb/s from 7 a.m. to 6 p.m. Monday through Friday; otherwise, use a bandwidth limit of 8000 Kb/s, type:

```
$ nas_cel -interconnect -create NYs3_LAs2 -source_server server_3
  -destination_system cs110 -destination_server server_2
  -source_interfaces ip=10.6.3.190 -destination_interfaces ip=10.6.3.173
  -bandwidth MoTuWeThFr07:00-18:00/2000,/8000
```

operation in progress (not interruptible)...

id = 30003
name = NYs3_LAs2
source_server = server_3
source_interfaces = 10.6.3.190
destination_system = cs110
destination_server = server_2
destination_interfaces = 10.6.3.173
bandwidth schedule = MoTuWeThFr07:00-18:00/2000,/8000
crc enabled = yes
number of configured replications = 0
number of replications in transfer = 0
status = The interconnect is OK.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the interconnect.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the interconnect.</td>
</tr>
<tr>
<td>source_server</td>
<td>Name of an available local Data Mover to use for the local side of the interconnect.</td>
</tr>
<tr>
<td>source_interfaces</td>
<td>IP addresses available for the local side of the interconnect (at least one, or a name service interface name).</td>
</tr>
<tr>
<td>destination_system</td>
<td>Control Station names of the VNX systems available for use in a remote replication session. Local System is the default.</td>
</tr>
<tr>
<td>destination_server</td>
<td>Name of an available peer Data Mover to use for the peer side of the interconnect.</td>
</tr>
<tr>
<td>destination_interfaces</td>
<td>IP addresses available for the peer side of the interconnect (at least one, or a name service interface name). For loopback interconnects, the interface is fixed at 127.0.0.1.</td>
</tr>
<tr>
<td>bandwidth schedule</td>
<td>Bandwidth schedule with one or more comma-separated entries, most specific.</td>
</tr>
<tr>
<td>crc enabled</td>
<td>Indicates that the Cyclic Redundancy Check (CRC) method is in use for verifying the integrity of data sent over the interconnect. CRC is automatically enabled and cannot be disabled.</td>
</tr>
</tbody>
</table>
### Example #8
To modify the bandwidth schedule of the interconnect NYs3_LAs2, type:

```
$ nas_cel -interconnect -modify NYs3_LAs2 -bandwidth MoWeFr07:00-18:00/2000, TuTh07:00-18:00/4000, /8000
```

---

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of configured replications</td>
<td>Number of replication sessions currently configured.</td>
</tr>
<tr>
<td>number of replications in transfer</td>
<td>Number of replications are currently in transfer.</td>
</tr>
<tr>
<td>status</td>
<td>Status of the interconnect.</td>
</tr>
</tbody>
</table>

---

### Example #9
To list available interconnects, type:

```
$ nas_cel -interconnect -list
```

---

### Example #10
To pause the interconnect with id=30003, type:

```
$ nas_cel -interconnect -pause id=30003
```

---

### Example #11
To resume the interconnect NYs3_LAs2, type:

```
$ nas_cel -interconnect -resume NYs3_LAs2
```

---

### Example #12
To validate the interconnect NYs3_LAs2, type:

```
$ nas_cel -interconnect -validate NYs3_LAs2
```

---

### Example #7
Provides a description of the command outputs.
NYs3_LAs2: validating 9 interface pairs: please wait...ok

**EXAMPLE #13**  To display the detailed information about the interconnect NYs3_LAs2, type:

```
$ nas_cel -interconnect -info NYs3_LAs2
```

```
id = 30003
name = NYs3_LAs2
source_server = server_3
source_interfaces = 10.6.3.190
destination_system = cs110
destination_server = server_2
destination_interfaces = 10.6.3.173
bandwidth_schedule = MoWeFr07:00-18:00/2000,TuTh07:00-18:00/4000,/8000
crc_enabled = yes
number_of_configured_replications = 0
number_of_replications_in_transfer = 0
status = The interconnect is OK.
```

**EXAMPLE #7** provides a description of the command outputs.

**EXAMPLE #14**  To delete interconnect NYs3_LAs2, type:

```
$ nas_cel -interconnect -delete NYs3_LAs2
```

```
operation in progress (not interruptible)... id = 30003
name = NYs3_LAs2
source_server = server_3
source_interfaces = 10.6.3.190
destination_system = cs110
destination_server = server_2
destination_interfaces = 10.6.3.173
bandwidth_schedule = MoWeFr07:00-18:00/2000,TuTh07:00-18:00/4000,/8000
crc_enabled = no
number_of_configured_replications = 0
number_of_replications_in_transfer = 0
status = The interconnect is OK.
```

**EXAMPLE #7** provides a description of the command outputs.

**EXAMPLE #15**  To enable the synchronous replication service, type:

```
$ nas_cel -syncrep -enable id=1 -local_fsidrange 1000,10000 -remote_fsidrange 10001,20000 -local_storage block_pool=0 -remote_storage block_pool=0
```

```
Now doing precondition check... done
Now saving FSID range [10001,20000] on remote system... done
Now saving FSID range [10000,100000] on local system... done
Now adding remote storage info to local system... done
Now creating sync replication mirror LUNs on local system... done
```
Now creating sync replication mirror LUNs on remote system... done
Now creating Mirrors and Clones (may take several minutes)... done
Now waiting for Mirrors and Clones to finish initial copy... done
Now adding NBS access to local server server_2... done
Now adding NBS access to local server server_3... done
Now creating mountpoint for sync replica of NAS database... done
Now mounting sync replica of NAS database... done
Now enabling sync replication service on remote system... done

**EXAMPLE #16** To disable the synchronous replication service, type:

```
$ nas_cell -syncrep -disable id=1
```

Now unmounting sync replica of NAS database... done
Now deleting mountpoint for sync replica of NAS database... done
Now deleting remote storage info... done
Now removing NBS access to local server server_2... done
Now removing NBS access to local server server_3... done
Now deleting local Mirror and Clone... done
Now disabling service (including deleting Mirror and Clone) on remote system... done
Now removing FSID range [10001,20000] on remote system... done
Now removing FSID range [1000,10000] on local system... done
Now removing other sync replication service settings on local system... done

**EXAMPLE #17** To list the synchronous replication service, type:

```
$ nas_cell -syncrep -list
```

```
id    name          syncrep  
0     my_system1    initialized
1     my_system2    enabled
```

**EXAMPLE #18** To display synchronous replication information on a local system, type:

```
$ nas_cell -syncrep -info id=0
```

```
id = 0
name  = my_system
syncrep = initialized
fsidrange = 4096,12287
```

**Note:** `syncrep=initialized` on `id=0` means that the system has an FSID range configured. However, it does not mean that the synchronous replication service is enabled.

**EXAMPLE #19** To display synchronous replication information on a remote system that has the synchronous replication service enabled, type:

```
$ nas_cell -syncrep -info id=1 -verbose
```

```diff
```
id = 1
name = CS0_4224225
syncrep = enabled
fsidrange = 10001,20000
type = MirrorView
local_storage = APM00144311642,MirrorView=nasdb_0784_642_mv,CloneGroup=
    nasdb_0784_642_clone
remote_storage = APM00143330784,MirrorView=nasdb_642_0784_mv,CloneGroup=
    nasdb_642_0784_clone
service_status =
    local_to_remote = in_sync
    remote_to_local = sync_in_progress (47%)
nas_checkup

Provides a system health checkup for the VNX.

SYNOPSIS

nas_checkup
    [-version | -help | -rerun]

DESCRIPTION

nas_checkup runs scheduled and unscheduled health checks on the VNX, reports problems that are found and the actions needed to fix the problem, and acts as a system health monitor.

The scheduled run time for the nas_checkup command is every 2 weeks by default. If a warning or error is discovered during this time, an alert is posted on the Unisphere.

Set up email notification for warnings or errors in the Unisphere Notifications page, or modify and load the sample nas_checkup event configuration file.

If a problem is discovered that requires EMC Service Personnel assistance, nas_checkup will notify EMC.

OPTIONS

No arguments
Runs a series of system health checks on the VNX and reports the problems that are found and the actions needed to fix the problem.

Note: No email, callhome, or Unisphere alert is posted when the health check is run unscheduled.

-version
Displays the version of health check that is run on the VNX.

-help
Provides help.

-rerun
Reruns the checks that produce error messages in the previous health checkup. It does not rerun the checks that produce warning or information messages. If there are no checks that produce error messages, then the -rerun switch generates a message that there is nothing to rerun.
**CHECKS**  

`Nas_checkup` runs a subset of the available checks based on the configuration of your system. The complete list of available checks are:

**Control Station Checks:**
- Check if minimum free space exists
- Check if minimum free space exists ns
- Check if enough free space exists
- Check if enough free space exists ns
- Check if NAS Storage API is installed correctly
- Check if NAS Storage APIs match
- Check if NBS clients are started
- Check if NBS configuration exists
- Check if NBS devices are accessible
- Check if NBS service is started
- Check if standby is up
- Check if Symapi data is present
- Check if Symapi is synced with System
- Check integrity of NASDB
- Check if primary is active
- Check all callhome files delivered
- Check if NAS partitions are mounted

**Data Mover Checks:**
- Check boot files
- Check if hardware is supported
- Check if primary is active
- Check if root filesystem has enough free space
- Check if using standard DART image
- Check MAC address
- Check network connectivity
- Check status

**System Checks:**
- Check disk emulation type
- Check disk high availability access
- Check disks read cache enabled
- Check disks and storage processors write cache enabled
- Check if access logix is enabled
- Check if FLARE is committed
- Check if FLARE is supported
- Check if microcode is supported
- Check no disks or storage processors are failed over
- Check that no disks or storage processors are faulted
- Check that no hot spares are in use
- Check that no hot spares are rebuilding
- Check control lun size
- Check if storage processors are read cache enabled
The nas Commands

FILES

The files associated with system health checkups are:

/nas/log/nas_checkup-run.<timestamp>.log  Contains information about the checks that were run, problems found, and actions needed to fix the problem.

/nas/log/nas_checkup.<timestamp>.log  Produced when a scheduled nas_checkup is run and contains the same information as the nas_checkup-run.<timestamp>.log.

/nas/log/syslog  Contains the overall results of nas_checkup.

/nas/site/checkup_eventlog.cfg  Provides a sample nas_checkup event configuration file. This is the file to be modified to add email addresses and load the file.

SEE ALSO

Configuring Events and Notifications on VNX for File.

EXAMPLE #1

To run a health check on the VNX, type:

```
$ nas_checkup
```

Check Version:  5.6.23.1
Check Command:  /nas/bin/nas_checkup
Check Log      :  /nas/log/checkup-run.070611-064115.log

-------------------------------------Checks-------------------------------------
Control Station: Checking if file system usage is under limit.............. Pass
Control Station: Checking if file systems have enough space to upgrade..... Pass
Control Station: Checking if NAS Storage API is installed correctly........ Pass
Control Station: Checking if NBS clients are started........................... Pass
Control Station: Checking if NBS configuration exists...................... Pass
Control Station: Checking if NBS devices are accessible...................... Pass
Control Station: Checking if NBS service is started......................... Pass
Control Station: Checking if standby is up..................................... N/A
Control Station: Checking if Symapi data is present......................... Pass
Control Station: Checking if Symapi is synced with Storage System........ Pass
Control Station: Checking integrity of NASDB................................... Pass
Control Station: Checking all callhome files delivered....................... Pass
Control Station: Checking resolv conf......................................... Pass
Control Station: Checking if NAS partitions are mounted.................... Pass
Control Station: Checking ipmi connection------------------------------- Pass
Control Station: Checking nas site eventlog configuration.................. Pass
Control Station: Checking nas sys mcd configuration........................ Pass
Control Station: Checking nas sys eventlog configuration.................... Pass
Control Station: Checking logical volume status.............................. Pass
Control Station: Checking ups is available..................................... Fail
Data Movers   : Checking boot files........................................ Pass
Data Movers   : Checking if primary is active.................................. Pass
Data Movers   : Checking if root filesystem has enough free space........ Pass
Data Movers   : Checking if using standard DART image....................... Pass
Data Movers   : Checking network connectivity.................................. Pass
Data Movers   : Checking status.................................................. Pass
Data Movers   : Checking dart release compatibility........................ Pass
Data Movers: Checking dart version compatibility.............................. Pass
Data Movers: Checking server name.............................................. Pass
Data Movers: Checking unique id.................................................. Pass
Data Movers: Checking CIFS file server configuration....................... N/A
Data Movers: Checking domain controller connectivity and configuration. N/A
Data Movers: Checking DNS connectivity and configuration............... N/A
Data Movers: Checking connectivity to WINS servers.......................... N/A
Data Movers: Checking connectivity to NTP servers........................... N/A
Data Movers: Checking connectivity to NIS servers........................... Pass
Data Movers: Checking virus checker server configuration.................. N/A
Data Movers: Checking if workpart is OK..................................... Pass
Data Movers: Checking if free full dump is available......................... ?
Data Movers: Checking if each primary data mover has standby.......... Fail
Storage System: Checking disk emulation type................................. Pass
Storage System: Checking disk high availability access..................... Pass
Storage System: Checking disks read cache enabled.......................... Pass
Storage System: Checking disks and storage processors write cache enabled. Pass
Storage System: Checking if access logix is enabled......................... Pass
Storage System: Checking if FLARE is committed............................. Pass
Storage System: Checking if FLARE is supported.............................. Pass
Storage System: Checking if microcode is supported......................... Pass
Storage System: Checking no disks or storage processors are failed over... Pass
Storage System: Checking that no disks or storage processors are faulted.. Pass
Storage System: Checking that no hot spares are in use..................... Pass
Storage System: Checking that no hot spares are rebuilding............... Pass
Storage System: Checking minimum control lun size......................... Pass
Storage System: Checking maximum control lun size........................ Fail
Storage System: Checking system lun configuration.......................... Pass
Storage System: Checking if storage processors are read cache enabled..... Pass
Storage System: Checking if auto assign are disabled for all luns.......... Pass
Storage System: Checking if auto trespass are disabled for all luns....... Pass
Storage System: Checking backend connectivity............................... Pass

One or more warnings are shown below. It is recommended that you follow the instructions below to correct the problem then try again.

Control Station: Check ups is available
Symptom: The following UPS emcnasUPS_i0 emcnasUPS_i1 is(are) not available

Data Movers: Check if each primary data mover has standby
Symptom: The following primary Data Movers server_2, server_3 does not have a standby Data Mover configured. It is recommended that each primary Data Mover have a standby configured for it with automatic failover policy for high availability.

Storage System: Check maximum control lun size
Symptom:
The size of control LUN 5 is 32 GB. It is larger than the recommended size of 14 GB. The additional space will be reserved by the system.

---

**EXAMPLE #2**

To display help for `nas_checkup`, type:

```bash
$ nas_checkup -help
```

**EXAMPLE #3**

To display the version of `nas_checkup` utility, type:

```bash
$ nas_checkup -version
```

**DIAGNOSTICS**

- `nas_checkup` returns one of the following exit statuses:
  - 0 — No problems found
  - 1 — `nas_checkup` posted information
  - 2 — `nas_checkup` discovered a warning
  - 3 — `nas_checkup` discovered an error
  - 255 — Any other error

- `nas_checkup` is run by someone other than root or the administrator group (generally `nasadmin`)
- `nas_checkup` is run when another instance of `nas_checkup` is running
- `nas_checkup` is run on the standby Control Station

- If `nas_checkup` is run when another instance of `nas_checkup` is running, it is an error.

---

**Warnings**

- Data Movers: Check if free full dump is available
- Symptom: Cannot get workpart structure. Command failed.
  - Command: `/nas/sbin/workpart -r`
  - Command output: open: Permission denied
  - Command exit code: 2

**Action**

- Contact EMC Customer Service and refer to EMC Knowledgebase `emc146016`. Include this log with your support request.

---

**EXAMPLE #2**

To display help for `nas_checkup`, type:

```bash
$ nas_checkup -help
```

**EXAMPLE #3**

To display the version of `nas_checkup` utility, type:

```bash
$ nas_checkup -version
```

**DIAGNOSTICS**

- `nas_checkup` returns one of the following exit statuses:
  - 0 — No problems found
  - 1 — `nas_checkup` posted information
  - 2 — `nas_checkup` discovered a warning
  - 3 — `nas_checkup` discovered an error
  - 255 — Any other error

- Examples of errors that could cause a 255 exit status include, but are not limited to:
  - If `nas_checkup` is run when another instance of `nas_checkup` is running
  - If `nas_checkup` is run by someone other than root or the administrator group (generally `nasadmin`)
  - If `nas_checkup` is run on the standby Control Station

---

* The size of control LUN 5 is 32 GB. It is larger than the recommended size of 14 GB. The additional space will be reserved by the system.
nas_ckpt_schedule

Manages SnapSure checkpoint scheduling for the VNX.

SYNOPSIS

nas_ckpt_schedule
   -list
   -info {<name>|id=<id>}
   -create <name>
      -filesystem {(name)|id=<id>} [-description <description>]
      -recurrence {once [-start_on <YYYY-MM-DD>] -runtimes <HH:MM>
         [-ckpt_name <ckpt_name>]}
      | daily [-every <number_of_days>]
         [-start_on <YYYY-MM-DD>] [-end_on <YYYY-MM-DD>]
         -runtimes <HH:MM>[
            -keep <number_of_ckpts> | -ckpt_names <ckpt_name>[
               ...]]}
      | weekly [-every <number_of_weeks>]
         -days_of_week {Mon|Tue|Wed|Thu|Fri|Sat|Sun}[
            ...]
         [-start_on <YYYY-MM-DD>] [-end_on <YYYY-MM-DD>]
         -runtimes <HH:MM>[
            -keep <number_of_ckpts> | -ckpt_names <ckpt_name>[
               ...]]}
   -modify {<name>|id=<id>}
      [-name <new_name>]
      [(-cvfsname_prefix <prefix> | -time_based_cvfsname)]
      [-description <description>]
      [-recurrence {daily|weekly|monthly}]
      [-every {number_of_days|number_of_weeks|<number_of_months>}
         {number_of_weeks|<number_of_months>}]}
   -delete {<name>|id=<id>}
   -pause {<name>|id=<id>}
   -resume {<name>|id=<id>}

DESCRIPTION

nas_ckpt_schedule creates and lists the schedules for the SnapSure checkpoints. Schedules can be run once, daily, weekly, or monthly and can be modified, paused, resumed, and deleted.

OPTIONS

   -list
   Lists all checkpoint schedules on the system, the name of the schedule, the next run date, the state, and the description.
The nas Commands

- **info** {-all|<name>|id=<id>}
  Lists detailed information for all schedules or for the specified schedule.

- **create** <name> -filesystem {<name>|id=<id>}
  [-description <description>] -recurrence {  
  Creates a checkpoint schedule for the file system that is specified by <name> or <id>. The schedule name in **create** <name> must be unique. The -description option provides a label for the schedule. The -recurrence option specifies if the checkpoint operation occurs once, daily, weekly, or monthly.

  **Note**: It is recommended that a time interval of at least 15 minutes in between the creation of two checkpoints on the same production file system. *Using VNX SnapSure* provides information on checkpoint scheduling.

  **once** [-start_on <YYYY-MM-DD>] -runtime <HH:MM>  
  [-ckpt_name <ckpt_name>]
  If once is specified, the hours and minutes for the snapshot to be run must be specified. A start date and name may be optionally assigned to the checkpoint.

  For a one-time checkpoint schedule, only one runtime can be provided. For one-time schedules, the option -ckpt_name can specify a name for the single checkpoint; if omitted, the default naming is used (<schedule_name>_<fs_name>_<num>) where <num> is a four digit integer beginning with 0001.

  **daily** [-every <number_of_days>] [-start_on <YYYY-MM-DD>] [-end_on <YYYY-MM-DD>] [-runtimes <HH:MM>[,...]  
  {-keep <number_of_ckpts>|-ckpt_names  
  <ckpt_name>[,...]}
  If daily is specified, the checkpoint is taken every day unless -every is specified indicating the number of days between runs. The -start_on option indicates the day when the checkpoints will start and -end_on indicates the day when they end.

  The -runtimes option specifies one or more times to take a checkpoint on each scheduled day. The -keep option specifies the maximum number of checkpoints to be kept at any one time (using default checkpoint naming). <number_of_ckpts> should be equal to the number of checkpoint names specified for a schedule. The -ckpt_name option assigns one or more specific names to each checkpoint as it is taken.
The nas Commands

|weekly [-every <number_of_weeks>] -days_of_week
{Mon Tue Wed Thu Fri Sat Sun} [, ...] [-start_on
<YYYY-MM-DD>] [-end_on <YYYY-MM-DD>] -runtimes
<HH:MM> [, ...]
{-keep <number_of_ckpts> | -ckpt_names
<ckpt_name> [, ...]}

If weekly is specified, the checkpoint is taken every week unless the -every option is specified indicating the number of weeks between runs. The -days_of_week option specifies one or more days during the week on which to run the schedule. The -start_on option indicates the day when the checkpoints will start and -end_on indicates the day when they end.

The -runtimes option specifies one or more times to take a checkpoint on each scheduled day. The -keep option specifies the maximum number of checkpoints to be kept at any one time (using default checkpoint naming). The -ckpt_name option assigns one or more specific names to each checkpoint as it is taken.

|monthly [-every <number_of_months>] -days_of_month
<1-31> [, ...] [-start_on <YYYY-MM-DD>] [-end_on
<YYYY-MM-DD>] -runtimes <HH:MM> [, ...]
{-keep <number_of_ckpts> | -ckpt_names <ckpt_name> [, ...]}

If monthly is specified, the checkpoint is taken every month unless the -every is specified indicating the number of months between runs. The -days_of_month option specifies one or more days during the month on which to run the schedule. <days> is specified as an integer 1 through 31. The -start_on option indicates the day when the checkpoints will start and -end_on indicates the day when they end.

The -runtimes option specifies one or more times to take a checkpoint on each scheduled day. The -keep option specifies either the maximum number of checkpoints to be kept at any one time (using default checkpoint naming) or using the -ckpt_name option, one or more specific names to assign each checkpoint as it is taken.

Note: The schedule that is set takes effect immediately unless -start_on is specified. Daily, weekly, and monthly schedules run indefinitely unless -end_on is included.

The -cvfsname_prefix option specifies the customized prefix of a CVFS name. This prefix along with the cvfsname_delimiter and
the cvfs_starting_index make up the CVFS name. The 
-time_based_cvfsname option specifies the CVFS name based on 
the creation time of the CVFS. It is the default method for 
generating CVFS names and will be used if the prefix is not 
specified.

---

**Note:** The prefix must be a PFS-wide unique string and can contain up to 
20 ASCII characters. The prefix must not include intervening spaces, 
colons (:), or slashes (/).

```
-modify {<name>|id=<id>} [-name <new_name>] 
[-cvfsname_prefix <prefix>| -time_based_cvfsname]} 
[-description <description>] [-recurrence 
{daily|weekly|monthly}] [-every <number_of_days>| 
<number_of_weeks>|<number_of_months>] 
[-days_of_week {Mon|Tue|Wed|Thu|Fri|Sat|Sun}{,...}] 
[-days_of_month <1-31>][,...][ -start_on <YYYY-MM-DD>] 
[-end_on <YYYY-MM-DD>][-runtimes <HH:MM>][,...]]
```

Modifies the scheduled checkpoint entry as specified.

```
-delete {<name>|id=<id>}
```

Deletes the specified checkpoint schedule. This operation does not 
delete any checkpoints.

```
-pause {<name>|id=<id>}
```

Pauses the specified checkpoint schedule, including checkpoint 
creations.

```
-resume {<name>|id=<id>}
```

Resumes a paused checkpoint schedule.
SEE ALSO  Using VNX SnapSure.

EXAMPLE #1  To create a checkpoint schedule that creates a checkpoint of the file system ufs1 daily at 8 a.m. and 8 p.m. starting on 11/13/06 with the last run on 12/13/07, and keep 7 checkpoints, type:

$ nas_ckpt_schedule -create ufs1_ckpt_sched1 -filesystem ufs1 -description "Daily Checkpoint schedule for ufs1" -recurrence daily -every 1 -start_on 2006-11-13 -end_on 2007-12-13 -runtimes 8:00,20:00 -keep 7 -cvfsname_prefix daily

This command returns no output.

EXAMPLE #2  To create a checkpoint schedule that creates a checkpoint of the file system ufs1 weekly on Mondays at 6 p.m., starting on 11/13/06 with the last run on 12/13/07, and name new checkpoints ufs1_ckpt_mon1, ufs1_ckpt_mon2, ufs1_ckpt_mon3, ufs1_ckpt_mon4, type:

$ nas_ckpt_schedule -create ufs1_ckpt_sched2 -filesystem ufs1 -description "Weekly Checkpoint schedule for ufs1" -recurrence weekly -every 1 -days_of_week Mon -start_on 2006-11-13 -end_on 2007-12-13 -runtimes 18:00 -ckpt_names ufs1_ckpt_mon1,ufs1_ckpt_mon2,ufs1_ckpt_mon3,ufs1_ckpt_mon4 -cvfsname_prefix weekly

This command returns no output.

EXAMPLE #3  To create a checkpoint schedule that creates a checkpoint of the file system ufs1 every other 15th of the month at 7 p.m., and keep 12 checkpoints, type:

$ nas_ckpt_schedule -create ufs1_ckpt_sched3 -filesystem ufs1 -description "Monthly Checkpoint schedule for ufs1" -recurrence monthly -every 2 -days_of_month 15 -runtimes 19:00 -keep 12 -cvfsname_prefix monthly

This command returns no output.

EXAMPLE #4  To create a checkpoint schedule that creates a checkpoint of the file system ufs1 once at 3:09 p.m., type:

$ nas_ckpt_schedule -create ufs1_ckpt_sched4 -filesystem ufs1 -description
"One-time Checkpoint Schedule for ufs1" -recurrence once -runtimes 15:09

This command returns no output.

**EXAMPLE #5** To list all checkpoint schedules, type:

```
$ nas_ckpt_schedule -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>description</th>
<th>state</th>
<th>next run</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>ufs1_ckpt_sched2</td>
<td>Weekly Checkpoint schedule for ufs1</td>
<td>Pending</td>
<td>Mon Nov 13 18:00:00 EST 2006</td>
</tr>
<tr>
<td>80</td>
<td>ufs1_ckpt_sched4</td>
<td>One-time Checkpoint Schedule for ufs1</td>
<td>Pending</td>
<td>Tue Nov 14 15:09:00 EST 2006</td>
</tr>
<tr>
<td>5</td>
<td>ufs1_ckpt_sched1</td>
<td>Daily Checkpoint schedule for ufs1</td>
<td>Pending</td>
<td>Mon Nov 13 20:00:00 EST 2006</td>
</tr>
<tr>
<td>7</td>
<td>ufs1_ckpt_sched3</td>
<td>Monthly Checkpoint schedule for ufs1</td>
<td>Pending</td>
<td>Wed Nov 15 19:00:00 EST 2006</td>
</tr>
</tbody>
</table>

**EXAMPLE #6** To modify the recurrence of the checkpoint schedule `ufs1_ckpt_sched3` to run every 10th of the month, type:

```
$ nas_ckpt_schedule -modify ufs1_ckpt_sched3 -recurrence monthly -every 1 -days_of_month 10
```

This command returns no output.

**EXAMPLE #7** To get detailed information about checkpoint schedule, type:

```
$ nas_ckpt_schedule -info ufs1_ckpt_sched3
```

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>description</th>
<th>CVFS name prefix</th>
<th>tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>ufs1_ckpt_sched3</td>
<td>Monthly Checkpoint schedule for ufs1</td>
<td>monthly</td>
<td>Checkpoint ckpt_ufs1_ckpt_sched3_001 on filesystem id=25, Checkpoint ckpt_ufs1_ckpt_sched3_002 on filesystem id=25, Checkpoint ckpt_ufs1_ckpt_sched3_003 on filesystem id=25, Checkpoint</td>
</tr>
</tbody>
</table>
The nas Commands

ckpt_ufs1_ckpt_sched3_004 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_005 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_006 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_007 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_008 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_009 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_010 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_011 on filesystem id=25, Checkpoint
ckpt_ufs1_ckpt_sched3_012 on filesystem id=25
next run = Sun Dec 10 19:00:00 EST 2006
state = Pending
recurrence = every 1 months
start on = Mon Nov 13 16:47:51 EST 2006
end on =
at which times = 19:00
on which days of week =
on which days of month = 10

EXAMPLE #8  To pause a checkpoint schedule, type:

$ nas_ckpt_schedule -pause ufs1_ckpt_sched1
This command returns no output.

EXAMPLE #9  To resume a checkpoint schedule, type:

$ nas_ckpt_schedule -resume ufs1_ckpt_sched1
This command returns no output.

EXAMPLE #10  To delete a checkpoint schedule, type:

$ nas_ckpt_schedule -delete ufs1_ckpt_sched2
This command returns no output.
nas_connecthome

Configures email, FTP, modem, HTTPS and ESRS transport mechanisms for transporting Callhome event files to user-configured destinations.

SYNOPSIS

nas_connecthome
  -info
  | -test { -email_1| -email_2| -ftp_1| -ftp_2| -modem_1| -modem_2| -https| -esrs} 
  | -modify [-modem_priority { Disabled|1|2|3} ]
  | [-modem_number <phone_number>]
  | [-modem_number_2 <phone_number>]
  | [-ftp_priority { Disabled|1|2|3}]
  | [-ftp_server { <hostname>|<ip_addr> } ]
  | [-ftp_port <port> ]
  | [-ftp_user <username>]
  | [-ftp_passwd [ passwd ] ]
  | [-ftp_folder <path> ]
  | [-ftp_ipprotocol { IPv4| IPv6 } ]
  | [-ftp_mode { active| passive } ]
  | [-ftp_server_2 { <hostname>|<ip_addr> } ]
  | [-ftp_port_2 <port> ]
  | [-ftp_user_2 <username>]
  | [-ftp_passwd_2 [ passwd ] ]
  | [-ftp_folder_2 <path> ]
  | [-ftp_ipprotocol_2 { IPv4| IPv6 } ]
  | [-ftp_mode_2 { active| passive } ]
  | [-email_priority { Disabled|1|2|3} ]
  | [-email_from <email_addr>]
  | [-email_to { <email_addr>[|<email_addr>]|<email_addr> ] ]
  | [-email_subject <email_subject> ]
  | [-email_server { <hostname>|<ip_addr> } ]
  | [-email_ipprotocol { IPv4| IPv6 } ]
  | [-email_server_2 { <hostname>|<ip_addr> } ]
  | [-email_ipprotocol_2 { IPv4| IPv6 } ]
  | [-esrs_priority { Disabled|1|2|3} ]
  | [ -https_priority { Disabled|1|2|3} ]
  | [ -https_url { url } ]
  | [ -https_ipprotocol { IPv4| IPv6 } ]
  | [-dial_in_number <phone_number>]
  | [-serial_number <serial_number>]
  | [-site_id <site_id>]
  | [-encryption_enabled { yes|no} ]
  | [-dial_in_enabled { yes|no} ]
  | [-service_info]
  | -help
The nas Commands

DESCRIPTION

**nas_connecthome** pauses and resumes the ConnectHome service, displays and configures parameters for email, FTP, modem, HTTPS, and ESRS, which are mechanisms used for transmitting event files. **nas_connecthome** enables a user to configure primary and optional secondary destinations for each transport mechanism.

**nas_connecthome** also tests connectivity to the destination configured for a transport mechanism.

This command must be executed from /nas/sbin/.

OPTIONS

- **-info**
  Displays the enabled and disabled configuration parameters for all transport mechanisms:

- **-test**
  
  ```
  [-email_1 | -email_2 | -ftp_1 | -ftp_2 | -modem_1 | -modem_2 | -https | -esrs]
  ```
  Tests connectivity to the destination configured and enabled for the specified transport mechanism.

- **-modify**
  Modifies the following configuration parameters for any or all transport mechanisms:

  ```
  [-modem_priority {Disabled | 1 | 2 | 3}]
  ```
  Enables modem as a Primary, Secondary, or Tertiary transport mechanism. Specifying Disabled removes modem as a transport mechanism.

  ```
  [-modem_number <phone_number>]
  ```
  Sets or modifies the primary phone number of the modem.

  **Note:** Specifying "" (empty double quotes) disables the use of the existing phone number.

  ```
  [-modem_number_2 <phone_number>]
  ```
  Sets or modifies the secondary phone number of the modem.

  **Note:** Specifying "" (empty double quotes) disables the use of the existing phone number for this transport mechanism.

  ```
  [-ftp_priority {Disabled | 1 | 2 | 3}]
  ```
  Enables FTP as a Primary, Secondary, or Tertiary transport mechanism. Specifying Disabled removes FTP as a transport mechanism.
The nas Commands

[-ftp_server {<hostname>|<ip_addr>}]
Sets or modifies the hostname or IP address of the primary FTP server and corresponding port. The allowable input is IPv4 address, IPv6 address, or domain name.

[-ftp_port <port>]
Sets or modifies the port of the primary FTP server and corresponding port. The valid input is an integer between 1 and 65535. If an empty string "" is provided for this option, the port number is reset to the default value 21.

[-ftp_user <username>]
Sets or modifies the username of the login account on the primary FTP server.

Note: Specifying "" (empty double quotes) reverts to the default value of onalert.

[-ftp_passwd [<passwd>]]
Sets or modifies the password of the login account on the primary FTP server.

Note: Specifying "" (empty double quotes) reverts to the default value of EMCCONNECT.

[-ftp_folder <path>]
Sets or modifies the path to the folder on the primary FTP server where the event files have to be deposited.

Note: Specifying "" (empty double quotes) reverts to the default value of incoming.

[-ftp_ipprotocol {IPV4|IPV6}]
Sets or modifies the transfer mode of the primary FTP transport mechanism. If an IPv4 address is provided to FTP server, the corresponding IP protocol is changed to IPv4 automatically. If an IPv6 address is used, the IP protocol is changed to IPv6. When hostname is specified, no IP protocol change is made.

[-ftp_mode {active|passive}]
Sets or modifies the transfer mode of the primary FTP transport mechanism.
The nas Commands

---

**Note:** Specifying "" (empty double quotes) reverts to the default value of active.

```
[-ftp_server_2 <hostname>[<ip_addr>]]
```

Sets or modifies the hostname or IP address of the secondary FTP server and corresponding port. The allowable input is IPv4 address, IPv6 address, or domain name.

```
[-ftp_port_2 <port>]
```

Sets or modifies the port of the secondary FTP server and corresponding port. The valid input is an integer between 1 and 65535. If an empty string "" is provided for this option, the port number is reset to the default value of 21.

```
[-ftp_user_2 <username>]
```

Sets or modifies the username of the login account on the secondary FTP server.

**Note:** Specifying "" (empty double quotes) reverts to the default value of onalert.

```
[-ftp_passwd_2 [<passwd>]]
```

Sets or modifies the password of the login account on the secondary FTP server.

**Note:** Specifying "" (empty double quotes) reverts to the default value of EMCCONNECT.

```
[-ftp_folder_2 <path>]
```

Sets or modifies the path of the folder on the secondary FTP server where the event files have to be deposited.

**Note:** Specifying "" (empty double quotes) reverts to the default value of incoming.

```
[-ftp_ipprotocol_2 {IPv4|IPv6}]
```

Sets or modifies the transfer mode of the secondary FTP transport mechanism.

```
[-ftp_mode_2 { active|passive}]
```

Sets or modifies the transfer mode of the secondary FTP transport mechanism.
The nas Commands

Note: Specifying "" (empty double quotes) reverts to the default value of active.

[-email_priority {Disabled|1|2|3 }]
Enables email as a Primary, Secondary, or Tertiary transport mechanism. Specifying Disabled removes email as a transport mechanism.

[-email_from <email_addr>]
Sets or modifies the sender's email address. The maximum number of characters that can be specified is 63.

Note: Specifying "" (empty double quotes) reverts to the default value of connectemc@emc.com.

[-email_to <email_addr>[,<email_addr> ]]
Sets or modifies the destination email addresses that receive the event files. Multiple email addresses can be specified with a comma separating each address. The maximum number of characters that can be specified is 255.

Note: Specifying "" (empty double quotes) reverts to the default value of emailalert@emc.com.

[-email_subject <email_subject>]
Sets or modifies the subject of the email message.

Note: Specifying "" (empty double quotes) reverts to the default value of CallHome Alert.

[-email_server {<hostname>|<ip_addr>}]
Sets or modifies the primary email server that accepts and routes email messages.

Note: Specifying "" (empty double quotes) disables the use of the existing email server for this transport mechanism.

[-email_ipprotocol {IPv4|IPv6}]
Sets or modifies the secondary email server that accepts and routes email messages.
The nas Commands

[-email_server_2 {<hostname>|<ip_addr>}]  
Sets or modifies the secondary email server that accepts and routes email messages.

**Note:** Specifying "" (empty double quotes) disables the use of the existing email server for this transport mechanism.

[-email_ipprotocol_2 {IPv4|IPv6}]  
Sets or modifies the secondary email server that accepts and routes email messages.

[-esrs_priority {Disabled|1|2|3}]  
Enables ESRS as a Primary, Secondary, or Tertiary transport mechanism. Specifying Disabled removes ESRS as a transport mechanism.

[-https_priority {Disabled|1|2|3}]  
Enables HTTPS as a Primary, Secondary, or Tertiary transport mechanism. Specifying Disabled removes HTTPS as a transport mechanism.

[-https_url]  
Indicates URL of the monitoring station.

[-https_ipprotocol {IPv4|IPv6}]  
Sets or modifies the transfer mode of the secondary HTTPS transport mechanism.

[-dial_in_number <phone_number>]  
Sets or modifies the dial-in phone number of the modem.

**Note:** Specifying "" (empty double quotes) does not disable the number or restore its default value. The empty string is stored as is.

[-serial_number <serial_number>]  
Sets or modifies the VNX serial number, if it was not automatically detected.

**Note:** Specifying "" (empty double quotes) does not disable the number or restore its default value. The empty string is stored as is.

[-site_id <site_id>]  
Sets or modifies the site ID.
The nas Commands

Note: Specifying "" (empty double quotes) does not disable the number or restore its default value. The empty string is stored as is.

[-encryption_enabled {yes|no}]
Enables or disables the encryption of the CallHome payload during transmission.

Note: Specifying "" (empty double quotes) reverts to the default value of yes.

[-dial_in_enabled {yes|no}]
Enables or disables dial-in login sessions.

Note: Specifying "" (empty double quotes) reverts to the default value of yes.

SEE ALSO Configuring Events and Notifications on VNX for File.

EXAMPLE #1 To display configuration information, type:

# /nas/sbin/nas_connecthome -info

ConnectHome Configuration:
Encryption Enabled = yes
Dial In :
   Enabled = yes
   Modem phone number = 9123123123
   Site ID = MY SITE
   Serial number = APM00054703223

ESRS :
   Priority = 1

Email :
   Priority = 1
   Sender Address = admin@yourcompany.com
   Recipient Address(es) = emailalert@emc.com
   Subject = CallHome Alert
   Primary :
      Email Server = backup.mailhub.company.com
   Secondary :
      Email Server =

FTP :
   Priority = 2
   Primary :
      FTP Server = 1.2.3.4
      FTP Port = 22
FTP User Name         = onalert
FTP Password          = **********
FTP Remote Folder     = incoming
FTP Transfer Mode     = active

Secondary :
  FTP Server            = 1.2.4.4
  FTP Port              = 22
  FTP User Name         = onalert
  FTP Password          = **********
  FTP Remote Folder     = incoming
  FTP Transfer Mode     = active

Modem :
  Priority                = Disabled
Primary :
  Phone Number          =
    BT Tymnet             = no
Secondary :
  Phone Number          =
    BT Tymnet             = no

EXAMPLE #2  To test the primary email server, type:
# /nas/sbin/nas_connecthome -test -email_1

EXAMPLE #3  To modify the configuration information, type:
# /nas/sbin/nas_connecthome -modify -esrs_priority 1
nas_config

Manages a variety of configuration settings on the Control Station, some of which are security based.

SYNOPSIS

nas_config
   -IPalias { -list
     | -create [-name <device_name>] <numeric_id>
     | -delete [-name <device_name>] <numeric_id>}
   | -ssl
   | -sessiontimeout [<number_in_minutes>|off]
   | -password [-min <6..15>] [-retries <max_allowed>] [-newchars <min_num>]
     [-digits <min_num>] [-spechars <min_num>] [-lcase <min_num>] [-ucase <min_num>]
   | -password -default

DESCRIPTION

nas_config -IPalias configures different IP addresses to point to the same network device allowing use of IP aliasing to manage the Control Station. This enables communication with the primary Control Station using a single IP address regardless of whether the primary Control Station is running in slot 0 or slot 1.

nas_config -ssl generates an X.509 digital certificate on the Control Station. Unisphere uses the Secure Sockets Layer (SSL) protocol to create a secure connection between a user’s Web browser and the Control Station’s Apache Web server. When a VNX system is initially installed, a generic certificate is generated. After configuring the Control Station’s network configuration (hostname, DNS domain name, or IP address) and before using the Unisphere, a new certificate should be generated.

nas_config -sessiontimeout sets a system-wide value that automatically times out a Control Station shell session after a specified period of inactivity.

nas_config -password supports a password quality policy by requiring that passwords chosen by VNX users adhere to certain rules.

You must be root to execute this command from the /nas/sbin directory.
The nas Commands

OPTIONS

-IPalias -list
Lists IP aliases configured on the VNX.

-IPalias -create [-name <device_name>] <numeric_id>
Creates an IP alias for the Control Station.

<device_name> is the name for a specified device:
◆ If you specify a device name that device must have an IP address.
◆ If you do not specify a device name, the system uses the external network interface.

<numeric_id> is a user-defined number, and can be an integer between 0 and 255. The system allows up to 256 aliases for any device.

-delete [-name <device_name>] <numeric_id>
Deletes an IP alias for the Control Station.

-ssl
Installs a SSL certificate on the Control Station and restarts the HTTP server.

-sessiontimeout [number_in_minutes|off]
Displays the current session timeout value in minutes.
<number_in_minutes> sets the number of minutes a Control Station shell session can be inactive before it is timed out. Possible values are 5 to 240 minutes. The default value is 60 minutes. Session timeout is enabled by default. To disable session timeout, type off or 0 to indicate zero minutes.

The -sessiontimeout option enables the native timeout properties of the underlying shells on the Control Station. The relevant shell man page provides a description of how the mechanism works.

-password
Prompts for specific password policy definitions. The current value for each policy definition is shown in brackets.

[-min <6..15>] defines the minimum length of the new password. The default length is eight characters. The length has to be a value between 6 and 15 characters.

[-retries <max_allowed>] defines the number of attempts a user can make to define an acceptable new password before the command fails. The default value is three attempts.
The nas Commands

[-newchars <min_num>] defines the minimum number of characters that must be in the new password that were not included in the old password. The default value is three characters.

[-digits <min_num>] defines the minimum number of digits that must be included in the new password. The default value is one digit.

[-spechars <min_num>] defines the minimum number of special characters (such as @#$%^ and *) that must be included in the new password. The default value is 0.

[-lcase <min_num>] defines the minimum number of lowercase characters that must be included in the new password. The default value is 0.

[-ucase <min_num>] defines the minimum number of uppercase characters that must be included in the new password. The default value is 0.

-password -default
Resets the password policy definitions to their default values.


EXAMPLE #1 To create an IP alias for the Control Station, type:

# /nas/sbin/nas_config -IPalias -create 0
Do you want slot_0 IP address <1.2.3.4> as your alias [yes or no]: no
Please enter an IP address to use as an alias: 1.2.3.6
Do you want slot_0 IP address <1.2.3.4> as your alias [yes or no]: yes
Please enter a new IP address for slot_0: 1.2.3.6

EXAMPLE #2 To view the IP alias that you created, type:

# /nas/sbin/nas_config -IPalias -list
alias IPaddress state
eth2:0 1.2.3.6 UP

EXAMPLE #3 To delete an IP alias, type:

# /nas/sbin/nas_config -IPalias -delete 0
All current sessions using alias eth2:0 will terminate
Do you want to continue [yes or no]: yes
done
EXAMPLE #4  To generate and install a certificate for the Apache Web server on the Control Station, type:

```
# /nas/sbin/nas_config -ssl
```

Installing a new SSL certificate requires restarting the Apache web server. Do you want to proceed? [y/n]: y

New SSL certificate has been generated and installed successfully.

EXAMPLE #5  To change the session timeout value from the default value of 60 minutes to 100 minutes, type:

```
# /nas/sbin/nas_config -sessiontimeout 100
done
```

EXAMPLE #6  To disable session timeout, type:

```
# /nas/sbin/nas_config -sessiontimeout 0
done
```

or

```
# /nas/sbin/nas_config -sessiontimeout off
done
```

EXAMPLE #7  To set specific password policy definitions, type:

```
# /nas/sbin/nas_config -password
Minimum length for a new password (Between 6 and 15): [8]
Number of attempts to allow before failing: [3]
Number of new characters (not in the old password): [3]
Number of digits that must be in the new password: [1]
Number of special characters that must be in a new password: [0]
Number of lower case characters that must be in password: [0]
Number of upper case characters that must be in password: [0]
```

EXAMPLE #8  To set the minimum length of a new password to 10 characters, type:

```
# /nas/sbin/nas_config -password -min 10
```

EXAMPLE #9  To reset the current password policy definitions to their default values, type:

```
# /nas/sbin/nas_config -password -default
```
**nas_copy**

Creates a replication session for a one-time copy of a file system. This command is available with VNX Replicator only.

**SYNOPSIS**

```
nas_copy
  -name <sessionName>
  -source
    {-fs {<name>|id=<fsId>} | -ckpt {<ckptName>|id=<ckptId>}}
  -destination
    {<fs> {<name>|id=<dstFsId>|<existing_dstFsName>} |
    -pool {id=<dstStoragePoolId>|<dstStoragePool>} |
    -storageSystem <dstStorageSerialNumber>}}
  [-from_base {<ckpt_name>|id=<ckptId>}}
  -interconnect {<name>|id=<interConnectId>}
  [-source_interface {<nameServiceInterfaceName>|<ipaddr>}
  [-destination_interface {<nameServiceInterfaceName>|<ipaddr>}}
  [-overwrite_destination]
  [-refresh]
  [-full_copy]
  [-background]
```

**DESCRIPTION**

`nas_copy` from the Control Station on the source side performs a one-time copy of a source read-only file system or a checkpoint file system.

Note: Depending on the size of the data in the source, this command may take some time to complete. Once a copy session begins, you can monitor it or interrupt it if necessary using the `nas_task` command. You can list all replication sessions, including copy sessions, using the `nas_replicate -list` command.

**OPTIONS**

```
-name <sessionName> -source -fs {<name>|id=<fsId>} -ckpt {<ckptName>|id=<ckptId>} -destination {-fs
  {<existing_dstFsName>|id=<dstFsId>} | -pool
  {id=<dstStoragePoolId>}]} [-from_base
  {<ckpt_name>|id=<ckptId>}} [-interconnect {<name>|id=
  <interConnectId>}}
```

Creates a VNX Replicator session that performs a one-time copy of a source read-only file system or a checkpoint file system.

The session name assigned must be unique for the Data Mover pair as defined by the interconnect. The naming convention `<source_fs_or_ckpt_name>_replica<#>` is used if a read-only file system or checkpoint at the destination already has the same name as
the source. An integer between 1 and 4 is assigned according to how many replicas of that file system or checkpoint already exist.

The **-source** specifies the name or ID of an existing read-only file system or checkpoint file system as the source for this copy session. This is to be used as a common base for the initial transfer. The checkpoint is identified by checkpoint name or checkpoint file system ID. This option is intended to accommodate upgrade situations to VNX Replicator.

The **-destination** specifies either an existing destination file system or the storage needed to create the destination file system automatically, as part of the copy operation. An existing destination file system must be read-only and the same size as the source. Specifying a storage pool or ID creates the destination file system automatically, as read-only, using the same name and size as the source file system.

```bash
[-storageSystem <dstStorageSerialNumber>]
```

When the destination file system is to be created from a pool, it specifies the system for the destination file system to reside. Use the **nas_storage -list** command to obtain the serial number of the system.

```bash
[-from_base {ckpt_name>|id=<ckptId>)}
```

Specifies an existing source file system checkpoint to be used as a common base for the initial data transfer. The checkpoint is identified by the checkpoint name or ID.

The **-interconnect** specifies the local (source) side of an established Data Mover interconnect to use for this copy session. Use the **nas_cel -interconnect -list** command on the source VNX to list the interconnects available to VNX Replicator sessions.

```bash
[-source_interface {<nameServiceInterfaceName> | ip=<ipAddr>)}
```

Instructs the copy session to use a specific local interface defined for the interconnect on the source VNX instead of selecting the local interface supporting the lowest number of sessions (the default). If this local interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address. The **source_interfaces** field of the output from the **nas_cel -interconnect -info** command shows how the source interface was defined. This option does not apply to a loopback interconnect, which always uses 127.0.0.1.
[-destination_interface]
{<nameServiceInterfaceName>|ip=<ipaddr>}}
Instructs the copy session to use a specific interface defined for
the interconnect on the destination VNX instead of selecting the
peer interface supporting the lowest number of sessions (the
default). If this peer interface was defined for the interconnect
using a name service interface name, specify the name service
interface name; if it was defined using an IP address, specify the
IP address. The destination_interfaces field of the output from
the nas_cel -interconnect -info command shows how the peer
interface was defined. This option does not apply to a loopback
interconnect, which always uses 127.0.0.1.

[-overwrite_destination]
For an existing destination, discards any changes made to the
destination object and restores it from the established common
base (differential copy). If this option is not specified and an
existing destination object contains different content than the
established common base, an error is returned.

[-refresh {<name> | id=<session_id>}
Updates a destination checkpoint that has the same name as the
copied checkpoint. This option does not refresh the source object;
it refreshes only the destination for a existing checkpoint. If you
specify this option and no checkpoint exists with the same name,
the command returns an error.

[-full_copy]
For an existing destination object, if a common base checkpoint
exists, it performs a full copy of the source checkpoint to the
destination, instead of a differential copy. If this option is not
specified and an existing destination object has different content
than the established common base, an error is returned.

[-background]
Executes the command in an asynchronous mode. Use the
nas_task command to check the status of the command.

SEE ALSO
nas_cel, nas_replicate, nas_task.

EXAMPLE #1
To create a one-time copy of a checkpoint file system with session
name ufs1_replica1 with the source checkpoint ufs_ckpt1 and
destination pool clar_r5_performance on the interconnect
NYs3_LAs2, source interface 10.6.3.190, and destination interface
10.6.3.173, type:
$ nas_copy -name ufs1_replica1 -source -ckpt ufs1_ckpt1
   -destination -pool clar_r5_performance -interconnect NYs3_LAs2 -source_interface 10.6.3.190
   -destination_interface 10.6.3.173

OK

EXAMPLE #2  To create a one-time copy of a read-only file system for the session ufs1_replica1 with source file system ufs1 and overwrite an existing destination file system ufs1 on the interconnect NYs3_LAs2, source interface 10.6.3.190, and destination interface 10.6.3.173, type:

$ nas_copy -name ufs1_replica1 -source -fs ufs1
   -destination -fs ufs1 -interconnect NYs3_LAs2
   -source_interface 10.6.3.190 -destination_interface 10.6.3.173 -overwrite_destination

OK

EXAMPLE #3  To initiate a differential copy of ufs_ckpt2 to the ufs1_destination file system using ufs1_ckpt1 as the common base, using the -from_base option, type:

$ nas_copy -name ufs1_replica1 -source -ckpt -ufs1_ckpt2
   -destination -fs ufs1_destination -from_base ufs1_ckpt1
   -interconnect NYs3_LAs2

OK

CAUTION

Using the -from_base option overrides any common base that may exist. Ensure that the specified checkpoint represents the correct state of the destination file system.

EXAMPLE #4  To refresh the destination of the replication session ufs1_replica1 for the source checkpoint ufs1_ckpt1 and destination file system ufs1 on the interconnect NYs3_LAs2, type:

$ nas_copy -name ufs1_replica1 -source -ckpt ufs1_ckpt1
   -destination -fs ufs1_destination -refresh

OK

EXAMPLE #5  To perform a full copy of the source checkpoint to the destination for the replication session ufs1_replica1 with the source file system ufs1 and destination file system ufs1 on the interconnect NYs3_LAs2, type:

$ nas_copy -name ufs1_replica1 -source -fs ufs1
   -destination -fs ufs1_destination -full_copy -background
Info 26843676673: In Progress: Operation is still running. Check task id 4177 on the Task Status screen for results.
**nas_cs**

Manages the configuration properties of the Control Station.

**SYNOPSIS**

```
nas_cs
   -info [-timezones]
| -set [-hostname <hostname>]
    [-ip4address <ipv4_address>]
    [-ip4netmask <ipv4_netmask>]
    [-ip4gateway <ipv4_gateway>]]
    [-ip6address <ipv6_address[/prefix_length]>]
    [-ip6gateway <ipv6_gateway>]
    [-dns_domain <dns_domain_name>]
    [-search_domain <domain_name>[,...]]
    [-dns_servers <dns_server>[,...]]
    [-session_monitor_timeout <days>]
    [-session_idle_timeout <minutes>]
    [-time <yyyymmddhhmm [ss]>]
    [-timezone <time_zone_str>]
    [-ntp_servers <ntp_server>[,...]]
| -clear [-ip4gateway]
    [-ip6address]
    [-ip6gateway]
    [-dns]
    [-search_domain]
    [-session_monitor_timeout]
    [-session_idle_timeout]
    [-ntp_servers]
    [-dns_domain]
    [-dns_servers]
| -reboot
```

**DESCRIPTION**

`nas_cs` sets, clears, and lists the Control Station configuration. `nas_cs` can be used to reboot the Control Station.

**OPTIONS**

- **-info [-timezones]**
  Displays the Control Station configuration. The `-timezones` option displays all supported time zones on the Control Station.

- **-set [-hostname <hostname>]**
  Sets the user-configurable parameters of the Control Station configuration. Sets the hostname of the primary Control Station. To specify a hostname, the maximum number of characters is 64, excluding white spaces and dot characters.

  ```bash
  [-ip4address <ipv4_address>]
  Sets the IPv4 network address of the primary Control Station. The IPv4 address must be a valid address.
  ```
[-ip4netmask <ipv4_netmask>]
Sets the subnet mask for a valid IPv4 network address on the primary Control Station.

[-ip4gateway <ipv4_gateway>]
Sets the IPv4 network address of the gateway machine for the primary Control Station on the network. The IPv4 address must be a valid address.

[-ip6address <ipv6_addr[/prefix_length]>]
Sets the IPv6 network address of the primary Control Station. The IPv6 address must be a valid address. The /prefix_length option sets the integer value, between 8 and 128, for the prefix length of the IPv6 address of the primary Control Station.

[-ip6gateway <ipv6_gateway>]
Sets the IPv6 network address of the gateway machine for the primary Control Station on the network. The IPv6 address must be a valid address.

[-dns_domain <dns_domain_name>]
Sets the Domain Name System of which the primary Control Station is a member. It can accept valid domain names.

[-search_domain <domain_name>[,...]]
Sets the order in which DNS domains are searched to resolve a comma-separated list of valid domain names.

[-dns_servers <dns_server>[,...]]
Sets the IP addresses of the DNS servers of the domain. It is a comma-separated list of valid IPv4 or IPv6 addresses and can have multiple DNS addresses.

[-session_monitor_timeout <days>]
Sets the limit for the number of days until when a valid login is allowed to run queries on the primary Control Station. Any active management session requires a login on the primary Control Station.

[-session_idle_timeout <minutes>]
Sets the timeout period in minutes for an inactive administrator session to become invalid.

[-time <yyyyymmddhhmm [ss]>]
Sets the current system date and time in the format <yyyyymmddhhmm [ss]>.
The nas Commands

[-timezone <time_zone_str>]
Sets a valid time zone value on the primary Control Station.

[-ntp_servers <ntp_server>[,...]]
Sets the IP addresses of the NTP server used by the primary Control Station. It is a comma-separated list of valid IPv4 or IPv6 addresses, FQDN or unqualified name of NTP server. Multiple NTP servers can be specified.

-keyid <key_identifier> [,....]
Sets the NTP server authentication. It is a comma-separated list of positive integers with range of 1-65534. It is an ordered list in the same order as -ntp_servers. If authentication is not needed for a particular NTP server, the keyid field for it should be 0 to indicate that no key will be used. In that case, the corresponding keyvalue should also be left empty. If keyid is entered with leading zeroes, they are ignored.

-keyvalue <key_value> [,....]
Sets the NTP server authentication. It is a comma-separated list of keys with length of each key between 1-16 characters. This key value is obtained from the NTP server and is a message digest key used to authenticate NTP server response with symmetric key cryptography (refer RFC5905 and RFC 1321). For each keyid specified for a NTP server, there should be corresponding keyvalue. If NTP server authentication is not needed for a server, keyid should be made 0 and keyvalue should be empty. Valid keyvalues are ASCII characters with ASCII codes 0x20 to 0x7E excluding the space character(ASCII code 0x20) and the # character(ASCII code 0x23).

-clear [-ip4gateway]
Clears the user-configurable parameters of the Control Station configuration. Clears the IPv4 network address of the gateway machine for the primary Control Station on the network.

[-ip6address]
Clears the IPv6 network address of the primary Control Station.

[-ip6gateway]
Clears the IPv6 network address of the gateway machine for the primary Control Station on the network.

[-dns]
Clears the Domain Name System of which the primary Control Station is a member.
[-search_domain]  
Clears the order in which DNS domains are searched to resolve a list of valid domain names.

[-session_monitor_timeout]  
Clears the limit for the number of days until when a valid login is allowed to run queries on the primary Control Station. Any active management session requires a login on the primary Control Station.

[-session_idle_timeout]  
Clears the timeout period in minutes for an inactive administrator session to become invalid.

[-ntp_servers]  
Clears the IP addresses of the NTP server used by the primary Control Station.

[-dns_domain]  
Clears the domain name of which the Control Station is a member. This option will clear only the DNS domain name unlike option -clear -dns which clears both DNS domain and DNS servers.

[-dns_servers]  
Clears the IP addresses of the DNS servers of the domain. This option will clear only the DNS servers unlike option -clear -dns which clears both DNS domain and DNS servers.

-reboot  
Reboots the primary Control Station.
EXAMPLE #1 To display the configuration properties of the primary Control Station, type:

```bash
$ nas_cs -i
```

- Host Name = navinas21381
- Version = 7.1.9-3
- Location = system:VNX5500:FM001103001862007|controlStation::0
- Status = OK
- Standby Location =
- Standby Status =
- IPv4 Address = 10.244.213.81
- IPv4 Netmask = 255.255.255.0
- IPv4 Gateway = 10.244.213.1
- IPv6 Address =
- IPv6 Gateway =
- DNS Domain = clrcase.lab.emc.com
- DNS Domain search order =
- DNS Servers = 10.244.213.81
- Session Monitor Timeout = 0 Days
- Session Idle Timeout = 0 Minutes
- NTP Servers (Key,Value) = 2001:db8:cafe:1111::246 (5,AbCd)
  1.2.3.4 (3,xYz)
  ntp.lab.emc.com (1,s3Cr3t)
- System Time = Mon Sep 05 05:46:48 EDT 2011

EXAMPLE #2 To set the hostname, IPv4 network address, subnet mask, and IPv4 gateway for the primary Control Station, type:

```bash
$ nas_cs -set -hostname eng24416 -ip4address 172.24.244.16 -ip4netmask 255.255.255.0 -ip4gateway 128.221.252.0
```

OK

EXAMPLE #3 To set the IPv6 address and the IPv6 gateway for the primary Control Station, type:

```bash
```

OK

EXAMPLE #4 To set the DNS domain, search domains, and DNS servers for the primary Control Station, type:

```bash
```

OK
EXAMPLE # 5  To set the DNS server with IPv6 address, type:

```bash
$ nas_cs -set -dns_servers
```

OK

EXAMPLE # 6  To set NTP server without authentication, type:

```bash
$ nas_cs -set -ntp_servers
```

OK

EXAMPLE # 7  To set the session monitor timeout and session idle timeout for the primary Control Station, type:

```bash
$ nas_cs -set -session_monitor_timeout 2
-seesion_idle_timeout 30
```

OK

EXAMPLE # 8  To set the date, time, timezone, and NTP servers for the primary Control Station, type:

```bash
$ nas_cs -set -time 200811070205 -timezone
America/New_York -ntp_server 128.221.252.0
```

OK

EXAMPLE # 9  To delete the domain name of the control station, type:

```bash
$ nas_cs -clear -dns_domain
```

OK

EXAMPLE # 10 To delete DNS servers of the control station, type:

```bash
$ nas_clear -clear -dns_servers
```

OK

EXAMPLE #11 To clear the IPv4 gateway for the primary Control Station, type:

```bash
$ nas_cs -clear -ip4gateway
```

OK

EXAMPLE #12 To clear the IPv6 network address and IPv6 gateway for the primary Control Station, type:

```bash
$ nas_cs -clear -ip6address -ip6gateway
```

OK

EXAMPLE #13 To clear the DNS domain and DNS server configuration for the primary Control Station, type:

```bash
$ nas_cs -clear -dns
```
EXAMPLE #14  To clear the domain search configuration for the primary Control Station, type:

$ nas_cs -clear -search_domain

EXAMPLE #15  To clear the NTP server configuration for the primary Control Station, type:

$ nas_cs -clear -ntp_servers

EXAMPLE #16  To prevent sending settings to domain, type:

$ nas_cs -set -ntp_servers
-no_domain_push

EXAMPLE #17  To reboot the primary Control Station, type:

$ nas_cs -reboot
nas_dbtable

Displays the table records of the Control Station.

SYNOPSIS

nas_dbtable

To execute the command against a database that is on the Data Mover area:

- info -mover <movername> -db <dbname>
- query <tablename> -mover <movername> -db <dbname>
- filter { (<fieldname> <operator> <value> [{ -and | -or }<fieldname>{<|<=|>|>=|=.| CONTAIN.};<value>]... ] }
- list -mover <movername>

DESCRIPTION Displays the table records of the specified Data Mover. It also filters the records of a particular field, and lists those records by using primary or secondary key values.

To execute the command against a database that is on the Control Station area:

- info -cs_path <cs_pathname> -db <dbname>
- query <tablename> -cs_path <cs_pathname> -db <dbname>
- filter { (<fieldname> <operator> <value> [{ -and | -or }<fieldname>{<|<=|>|>=|=.| CONTAIN.};<value>]... ] }
- list -cs_path <cs_pathname>

DESCRIPTION Displays the table records of the Control Station. It also filters the records of a particular field, and lists those records by using primary or secondary key values.

The database located in the Data Mover can be read directly. The backup of the database is read on the Control Station. If the database is inconsistent, the nas_dbtable command allows you to manually verify the backup of the database before restoring it.

The Data Mover table uses the standard XML interface of the administration commands. The application can structure each table data and keys as a set of fields. Each field has a unique name, type, and size.

The table structure is stored in the db.<base name> file. It is backed up and restored with the database. The DBMS reader uses this description of the table structure to read and display the records from the backup database.
**DATA MOVER OPTIONS**

- **-info -mover <movername> -db <dbname>**
  Displays the schema of a table or the list of fields and keys. It also displays the number of records of the table so that the user can know if it is reasonable to dump the entire table.

- **-query < tablename > -mover <movername> -db <dbname>**
  Displays the records of a table. Selects the records to display on the value of some fields or secondary keys.

- **-filter \{ (<fieldname><operator><value> [{-and|-or} <fieldname>{<|<=|>|>=|=|.CONTAIN.};<value>]...]\] \}**
  Filters the records of a particular field, and lists the records using primary or secondary key values. The default with multiple filters is the `-and` option. Only the = operator is supported in the first implementation.

**Note:** The keys are used when the `-and` option is used. Multiple fields with the `-or` option parses the table, and applies a filter on each record.

The `<fieldname>` argument is the name of a secondary key or field. If the secondary key is declared as a sequence of fields, it is used by specifying either the value of its fields or value. If the secondary key is not declared in the schema, then rename the key and its value as filter.

The `<value>` argument is the value of the field encoded in character.

**CONTROL STATION OPTIONS**

- **-info -cs_path <cs_pathname> -db <dbname>**
  Displays the schema of a table or the list of fields and keys. It also displays the number of records of the table so that the user can know if it is reasonable to dump the entire table.

- **-query < tablename > -cs_path <cs_pathname> -db <dbname>**
  Displays the records of the table. Selects the records to display on the value of some fields or secondary keys.

- **-filter \{ (<fieldname><operator><value> [{-and|-or} <fieldname>{<|<=|>|>=|=|.CONTAIN.};<value>]...]\] \}**
  Filters the records of a particular field, and lists the records using primary or secondary key values. The default with multiple filters is the `-and` option. Only the = operator is supported in the first implementation.
Note: Keys are used when the -filter option contains all components of the key, and the -and option is used. With the -or option, it is necessary to parse all the records.

The <fieldname> argument is the name of a secondary key or field. If the secondary key is declared as a sequence of fields, it is used by specifying either the value of its fields or the secondary key value. If the secondary key is not declared in the schema, rename the key and its value as filter.

The <value> argument is the value of the field encoded in character.

-lst -cs_path <cs_pathname>
Displays the list of databases and tables within a particular directory of the Control Station area.

SEE ALSO

server_dbms

EXAMPLE #1
To display the Secmap schema of the Data Mover, type:

$ nas_dbtable -info -mover <movername> -db Secmap

Database identification
========================

Base Name            = Secmap
Table Name           = Mapping

Primary Key Schema
==================

sid                  = SID

Secondary Key Components
========================

xid                  = xidType, fxid

Data Schema
============

origin       = Enumeration
Unknown      : 0
Secmap       : 16
Localgroup   : 32
Etc          : 48
Nis          : 64
AD           : 80
EXAMPLE #2

To filter the records of the Secmap schema, type:

```
$ nas_dbtable -query Mapping -mover <movername> -db Secmap -filter fxid=10011
```

- **sid** = S-1-5-15-2b3be507-6bc5c62-3f32a78a-8cc
- **origin** = Nis
- **xidType** = user
- **fxid** = 10011
- **cdate** = Fri Sep 11 17:39:09 2009
- **gid** = 107
- **name** = DVT2KA\MaxUsers0000011

Record count = 1
Last key = 10500000000000515000000007e53b2b625cbc068aa7323fcc080000
**nas_devicegroup**

Manages an established MirrorView/Synchronous (MirrorView/S) consistency group, also known as a device group.

**SYNOPSIS**

```
nas_devicegroup
  -list
  -info {<name>|id=<id>|-all} [-sync [yes|no]]
  -acl <acl_value> {<name>|id=<id>}
  -suspend {<name>|id=<id>}
  -resume {<name>|id=<id>}
```

**DESCRIPTION**

`nas_devicegroup` lists the device group information for a MirrorView/S configuration, gets detailed information about a consistency group, specifies an access control level value for the group, suspends MirrorView/S operations, or resumes operations of the device group.

A MirrorView/S with a VNX configuration involves source and destination VNXs attached to old versions of systems. MirrorView/S performs synchronous mirroring of source storage logical units (LUNs) representing production images, where the mirrored LUNs are part of a MirrorView/S consistency group.

On the source VNX, you must be root to issue the `acl`, `suspend`, and `resume` options.

`nas_devicegroup` must be run from a Control Station in slot 0; it will report an error if run from a Control Station in slot 1.

**OPTIONS**

**-list**
 Displays a list of available configured MirrorView/S device groups.

```
-info {<name>|id=<id>|-all} [-sync [yes|no]]
```
 Displays detailed information about the MirrorView/S configuration for a specific device group or for all groups.

```
-suspend {<name>|id=<id>}
```

**-resume {<name>|id=<id>}**

The `sync` option first synchronizes the Control Station’s view with the VNX for block before displaying configuration information. The default is yes.
-acl <acl_value> {<name>|id=<id>}
Sets an access control level value that defines the owner of the system, and the level of access allowed for users and groups defined in the access control level table. The nas_acl command provides more information.

**CAUTION**
The access control level value for the group should not be changed from the default setting. A change in access control level value can prevent MirrorView/S from functioning properly.

-suspend {<name>|id=<id>}
Temporarily halts mirroring from the source to the destination, thereby suspending the link. Changes can still be made to the source LUNs, but are not applied to the destination LUNs until operations are resumed.

-resume {<name>|id=<id>}
Resumes device group operations and restarts mirroring, synchronizing the destination LUNs with the source LUNs.

**SEE ALSO**
Using MirrorView/Synchronous with VNX for Disaster Recovery, nas_acl, and nas_logviewer.

**SYSTEM OUTPUT**
The number associated with the storage device is dependent on the attached system of the system; for MirrorView/S, VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019. The VNX for block supports the following system-defined AVM storage pools for MirrorView/S only: cm_r1, cm_r5_performance, cm_r5_economy, cmata_archive, and cmata_r3.

**EXAMPLE #1**
To list the configured MirrorView/S device groups that are available, type:

```
$ nas_devicegroup -list
```

```
ID  name                owner   storage ID      acl type
2   mviewgroup          500     APM00053001549  0   MVIEW
```

**EXAMPLE #2**
To display detailed information for a MirrorView/S device group, type:

```
$ nas_devicegroup -info mviewgroup
```

```
Sync with CLARiiON backend ...... done
name = mviewgroup
description =
uid = 50:6:1:60:b0:60:27:20:0:0:0:0:0:0:0:0:0
```
state = Synchronized
role = Primary
condition = Active
recovery policy = Automatic
number of mirrors = 16
mode = SYNC
owner = 500
mirrored disks =
local clarid = APM00053001549
remote clarid = APM00053001552
mirror direction = local -> remote

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sync with CLARiiON system</td>
<td>Indicates that a sync with the VNX for block was performed to retrieve the most recent information. This does not appear if you specify -info -sync no.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the device group.</td>
</tr>
<tr>
<td>description</td>
<td>Brief description of device group.</td>
</tr>
<tr>
<td>uid</td>
<td>UID assigned, based on the system.</td>
</tr>
<tr>
<td>state</td>
<td>State of the device group (for example, Consistent, Synchronized, Out-of-Sync, Synchronizing, Scrambled, Empty, Incomplete, or Local Only).</td>
</tr>
<tr>
<td>role</td>
<td>Whether the current system is the Primary (source) or Secondary (destination).</td>
</tr>
<tr>
<td>condition</td>
<td>Whether the group is functioning (Active), Inactive, Admin Fractured (suspended), Waiting on Sync, System Fractured (which indicates link down), or Unknown.</td>
</tr>
<tr>
<td>recovery policy</td>
<td>Type of recovery policy (Automatic is the default and recommended value for group during system configuration; if Manual is set, use -resume after a link down failure).</td>
</tr>
<tr>
<td>number of mirrors</td>
<td>Number of mirrors in group.</td>
</tr>
<tr>
<td>mode</td>
<td>MirrorView mode (always SYNC in this release).</td>
</tr>
<tr>
<td>owner</td>
<td>User whom the object is assigned to, and is indicated by the index number in the access control level table. nas_acl provides information.</td>
</tr>
<tr>
<td>mirrored disks</td>
<td>Comma-separated list of disks that are mirrored.</td>
</tr>
<tr>
<td>local clarid</td>
<td>APM number of local VNX for block storage array.</td>
</tr>
<tr>
<td>remote clarid</td>
<td>APM number of remote VNX for block storage array.</td>
</tr>
<tr>
<td>mirror direction</td>
<td>On primary system, local to remote (on primary system); on destination system, local from remote.</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**

To display detailed information about a MirrorView/S device group without synchronizing the Control Station’s view with the VNX for block, type:

```
$ nas_devicegroup -info id=2 -sync no
```

name = mviewgroup
description = 
uid = 50:6:1:60:B0:60:27:20:0:0:0:0:0:0:0:0:0
state = Consistent
role = Primary
The nas Commands

condition = Active
recovery policy = Automatic
number of mirrors = 16
mode = SYNC
owner = 500
mirrored disks =
local clarid = APM00053001549
remote clarid = APM00053001552
mirror direction = local -> remote

EXAMPLE #4  To halt operation of the specified device group, as a root user, type:

```
# nas_devicegroup -suspend mviewgroup
```

Sync with CLARiiON backend ...... done
STARTING an MV 'SUSPEND' operation.
Device group: mviewgroup ............ done
The MV 'SUSPEND' operation SUCCEEDED.
done

EXAMPLE #5  To resume operations of the specified device group, as a root user, type:

```
# nas_devicegroup -resume mviewgroup
```

Sync with CLARiiON backend ...... done
STARTING an MV 'RESUME' operation.
Device group: mviewgroup ............ done
The MV 'RESUME' operation SUCCEEDED.
done
nas_disk

Manages the disk table.

SYNOPSIS

nas_disk
  -list
  -delete <disk_name> [[-perm] [-unbind]]
  -info {<disk_name>|id=<disk_id>}
  -rename <old_name> <new_name>

DESCRIPTION

nas_disk displays a list of known disks and renames, deletes, or displays information for the specified disk.

OPTIONS

- list
  Lists the disk table.

  Note: The ID of the object is an integer and is assigned automatically. The name of the disk might be truncated if it is too long for the display. To display the full name, use the -info option with the disk ID.

- delete <disk_name> [[-perm] [-unbind]]
  Deletes an entry from the disk table. In a VNX, restores the VNX for block LUN name to its default value.

  Unless -perm is specified, the disk is still identified as a VNX disk and can be discovered and marked again using server_devconfig. The -perm option removes the entry from the disk table and deletes the diskmark. The disk is then available to be deployed for use by another platform. The -unbind option removes the LUN from the VNX Storage group (if EMC Access Logix™ is enabled). The -unbind option permanently destroys the LUN and its contents. If this is the last LUN using a RAID group, then the RAID group will be deleted.

- info {<disk_name>|id=<disk_id>}
  Displays information for a specific <disk_name> or <disk_id> such as size, type, and Access control level (ACL).

- rename <old_name> <new_name>
  Renames a disk to <new_name>.

  Note: If a VNX for block LUN uses the default name, renames it in the format VNX_<VNX-hostname>_<lun-id>_<VNX-dvol-name>. 
The nas Commands

SEE ALSO  
VNX System Operations and server_devconfig.

SYSTEM OUTPUT
The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of alphabetic characters before a set of integers, for example, FCNTR074200038-0019. Symmetrix systems display as a set of integers, for example, 002804000190-003C.

EXAMPLE #1
To list the disk table for a VNX for block, type:

```
$ nas_disk -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>sizeMB</th>
<th>storageID-devID</th>
<th>type</th>
<th>name</th>
<th>servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>y</td>
<td>11263</td>
<td>FCNTR074200038-0000</td>
<td>CLSTD</td>
<td>root_disk</td>
<td>1,2</td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>11263</td>
<td>FCNTR074200038-0001</td>
<td>CLSTD</td>
<td>root_ldisk</td>
<td>1,2</td>
</tr>
<tr>
<td>3</td>
<td>y</td>
<td>2047</td>
<td>FCNTR074200038-0002</td>
<td>CLSTD</td>
<td>d3</td>
<td>1,2</td>
</tr>
<tr>
<td>4</td>
<td>y</td>
<td>2047</td>
<td>FCNTR074200038-0003</td>
<td>CLSTD</td>
<td>d4</td>
<td>1,2</td>
</tr>
<tr>
<td>5</td>
<td>y</td>
<td>2047</td>
<td>FCNTR074200038-0004</td>
<td>CLSTD</td>
<td>d5</td>
<td>1,2</td>
</tr>
<tr>
<td>6</td>
<td>y</td>
<td>32767</td>
<td>FCNTR074200038-0005</td>
<td>CLSTD</td>
<td>d6</td>
<td>1,2</td>
</tr>
<tr>
<td>7</td>
<td>n</td>
<td>1023</td>
<td>FCNTR074200038-0010</td>
<td>CLSTD</td>
<td>d7</td>
<td>1,2</td>
</tr>
<tr>
<td>8</td>
<td>n</td>
<td>1023</td>
<td>FCNTR074200038-0012</td>
<td>CLSTD</td>
<td>d8</td>
<td>1,2</td>
</tr>
<tr>
<td>9</td>
<td>n</td>
<td>1023</td>
<td>FCNTR074200038-0011</td>
<td>CLSTD</td>
<td>d9</td>
<td>1,2</td>
</tr>
<tr>
<td>10</td>
<td>n</td>
<td>1023</td>
<td>FCNTR074200038-0013</td>
<td>CLSTD</td>
<td>d10</td>
<td>1,2</td>
</tr>
<tr>
<td>11</td>
<td>n</td>
<td>10239</td>
<td>FCNTR074200038-0014</td>
<td>MIXED</td>
<td>d11</td>
<td>1,2</td>
</tr>
<tr>
<td>12</td>
<td>n</td>
<td>10239</td>
<td>FCNTR074200038-0015</td>
<td>MIXED</td>
<td>d12</td>
<td>1,2</td>
</tr>
<tr>
<td>13</td>
<td>n</td>
<td>10239</td>
<td>FCNTR074200038-0015</td>
<td>MIXED</td>
<td>d13</td>
<td>1,2</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the disk (assigned automatically).</td>
</tr>
<tr>
<td>inuse</td>
<td>Used by any type of volume or file system.</td>
</tr>
<tr>
<td>sizeMB</td>
<td>Total size of disk.</td>
</tr>
<tr>
<td>storageID-devID</td>
<td>ID of the system and device associated with the disk.</td>
</tr>
<tr>
<td>type</td>
<td>Type of disk contingent on the system attached; CLSTD, CLATA, CMSTD, CLEFD, CMEFD, CMATA, MIXED (indicates tiers used in the pool contain multiple disk types), Performance, Capacity, Extreme_performance, Mirrored_mixed, Mirrored_performance, Mirrored_capacity, and Mirrored_extreme_performance are VNX disk types and STD, BCV, R1BCV, R2BCV, R1STD, R2STD, ATA, R1ATA, R2ATA,BCVA, R1BCA, R2BCA, EFD, FTS, R1FTS,R2FTS, BCVF, R1BCF, R2BCF,BCVMIXED, R1MIXED, R2MIXED, R1BCVMIXED, and R2BCVMIXED are Symmetrix disk types.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the disk; 'dd' in a disk name indicates a remote disk.</td>
</tr>
<tr>
<td>servers</td>
<td>Servers that have access to this disk.</td>
</tr>
</tbody>
</table>

EXAMPLE #2
To list the disk table for the system with a Symmetrix system, type:

```
$ nas_disk -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>sizeMB</th>
<th>storageID-devID</th>
<th>type</th>
<th>name</th>
<th>servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>y</td>
<td>11507</td>
<td>000190100530-00PB</td>
<td>STD</td>
<td>root_disk</td>
<td>1,2,3,4,5,6,7,8</td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>11507</td>
<td>000190100530-00FC</td>
<td>STD</td>
<td>root_ldisk</td>
<td>1,2,3,4,5,6,7,8</td>
</tr>
</tbody>
</table>
The nas Commands

3     y      2076  00190100530-00FD  STD   d3            1,2,3,4,5,6,7,8
4     y      2076  00190100530-00FE  STD   d4            1,2,3,4,5,6,7,8
5     y      2076  00190100530-00FF  STD   d5            1,2,3,4,5,6,7,8
6     y      65536  00190100530-04D4  STD   d6            1,2,3,4,5,6,7,8
7     n      28560  00190100530-0102  STD   d7            1,2,3,4,5,6,7,8
8     n      28560  00190100530-0103  STD   d8            1,2,3,4,5,6,7,8
9     n      28560  00190100530-0104  STD   d9            1,2,3,4,5,6,7,8
10    n      28560  00190100530-0105  STD   d10           1,2,3,4,5,6,7,8
11    n      28560  00190100530-0106  STD   d11           1,2,3,4,5,6,7,8
12    n      28560  00190100530-0107  STD   d12           1,2,3,4,5,6,7,8
13    n      28560  00190100530-0108  STD   d13           1,2,3,4,5,6,7,8
14    n      28560  00190100530-0109  STD   d14           1,2,3,4,5,6,7,8
15    n      28560  00190100530-010A  STD   d15           1,2,3,4,5,6,7,8
16    n      28560  00190100530-010B  STD   d16           1,2,3,4,5,6,7,8
17    n      28560  00190100530-010C  STD   d17           1,2,3,4,5,6,7,8
18    n      28560  00190100530-010D  STD   d18           1,2,3,4,5,6,7,8
19    n      28560  00190100530-010E  STD   d19           1,2,3,4,5,6,7,8
20    n      28560  00190100530-010F  STD   d20           1,2,3,4,5,6,7,8
21    n      28560  00190100530-0110  STD   d21           1,2,3,4,5,6,7,8
22    n      28560  00190100530-0111  STD   d22           1,2,3,4,5,6,7,8
23    n      28560  00190100530-0112  STD   d23           1,2,3,4,5,6,7,8
24    n      28560  00190100530-0113  STD   d24           1,2,3,4,5,6,7,8
[....]
155   n      28560  00190100530-0196  STD   d155          1,2,3,4,5,6,7,8
156   n      28560  00190100530-0197  STD   d156          1,2,3,4,5,6,7,8
157   n      28560  00190100530-0198  BCV   rootd157      1,2,3,4,5,6,7,8
158   n      28560  00190100530-0199  BCV   rootd158      1,2,3,4,5,6,7,8
159   n      28560  00190100530-019A  BCV   rootd159      1,2,3,4,5,6,7,8
160   n      28560  00190100530-019B  BCV   rootd160      1,2,3,4,5,6,7,8
161   n      28560  00190100530-019C  BCV   rootd161      1,2,3,4,5,6,7,8
162   n      28560  00190100530-019D  BCV   rootd162      1,2,3,4,5,6,7,8
163   n      28560  00190100530-019E  BCV   rootd163      1,2,3,4,5,6,7,8
164   n      28560  00190100530-019F  BCV   rootd164      1,2,3,4,5,6,7,8
165   n      28560  00190100530-01A0  BCV   rootd165      1,2,3,4,5,6,7,8
166   n      28560  00190100530-01A1  BCV   rootd166      1,2,3,4,5,6,7,8
167   n      28560  00190100530-01A2  BCV   rootd167      1,2,3,4,5,6,7,8
168   n      28560  00190100530-01A3  BCV   rootd168      1,2,3,4,5,6,7,8
169   n      28560  00190100530-01A4  BCV   rootd169      1,2,3,4,5,6,7,8
170   n      28560  00190100530-01A5  BCV   rootd170      1,2,3,4,5,6,7,8
171   n      28560  00190100530-01A6  BCV   rootd171      1,2,3,4,5,6,7,8
172   n      28560  00190100530-01A7  BCV   rootd172      1,2,3,4,5,6,7,8
173   n      28560  00190100530-01A8  BCV   rootd173      1,2,3,4,5,6,7,8
174   n      28560  00190100530-01A9  BCV   rootd174      1,2,3,4,5,6,7,8
175   n      28560  00190100530-01AA  BCV   rootd175      1,2,3,4,5,6,7,8
176   n      28560  00190100530-01AB  BCV   rootd176      1,2,3,4,5,6,7,8
177   n      28560  00190100530-01AC  BCV   rootd177      1,2,3,4,5,6,7,8
178   n      28560  00190100530-01AD  BCV   rootd178      1,2,3,4,5,6,7,8
179   n      28560  00190100530-01AE  BCV   rootd179      1,2,3,4,5,6,7,8
180   n      28560  00190100530-01AF  BCV   rootd180      1,2,3,4,5,6,7,8
181   n      28560  00190100530-01B0  BCV   rootd181      1,2,3,4,5,6,7,8
182   n      28560  00190100530-01B1  BCV   rootd182      1,2,3,4,5,6,7,8
183   n      28560  00190100530-01B2  BCV   rootd183      1,2,3,4,5,6,7,8
The nas Commands

Note: This is a partial listing due to the length of the output.

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #3 To view information for disk d7 for a system with a VNX for block, type:

```
$ nas_disk -info d7
```

```
id        = 7
name      = d7
acl       = 0
in_use    = True
pool      = TP1
size (MB) = 273709
type      = Mixed
protection= RAID5(4+1)
stor_id   = FCNTR074200038
stor_dev  = 0012
volume_name = d7
storage_profiles = TP1
thin      = True
tiering_policy = Auto-tier
compressed= False
mirrored  = False
servers   = server_2,server_3,server_4,server_5
  server = server_2           addr=c0t1l2
  server = server_2           addr=c32t1l2
  server = server_2           addr=c16t1l2
  server = server_2           addr=c48t1l2
```
The nas Commands

server = server_3          addr=c0t1l2
server = server_3          addr=c32t1l2
server = server_3          addr=c16t1l2
server = server_3          addr=c48t1l2
server = server_4          addr=c0t1l2
server = server_4          addr=c32t1l2
server = server_4          addr=c16t1l2
server = server_4          addr=c48t1l2
server = server_5          addr=c0t1l2
server = server_5          addr=c32t1l2
server = server_5          addr=c16t1l2
server = server_5          addr=c48t1l2

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the disk (assigned automatically).</td>
</tr>
<tr>
<td>name</td>
<td>Name of the disk.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value of the disk.</td>
</tr>
<tr>
<td>in_use</td>
<td>Used by any type of volume or file system.</td>
</tr>
<tr>
<td>pool</td>
<td>Name of the storage pool in use.</td>
</tr>
<tr>
<td>size (MB)</td>
<td>Total size of the disk.</td>
</tr>
<tr>
<td>type</td>
<td>Type of disk contingent on the system attached; VNX for block disk types</td>
</tr>
<tr>
<td></td>
<td>are CLSTD, CLATA, CMSTD, CLEFD, CLSAS, CMEFD, CMATA, MIXED (indicates</td>
</tr>
<tr>
<td></td>
<td>tiers used in the pool contain multiple disk types), Performance,</td>
</tr>
<tr>
<td></td>
<td>Capacity, Extreme_performance, Mirrored_mixed, Mirrored_performance,</td>
</tr>
<tr>
<td></td>
<td>Mirrored_capacity, and Mirrored_extreme_performance.</td>
</tr>
<tr>
<td>protection</td>
<td>The type of disk protection that has been assigned.</td>
</tr>
<tr>
<td>stor_id</td>
<td>ID of the system associated with the disk.</td>
</tr>
<tr>
<td>stor_dev</td>
<td>ID of the device associated with the disk.</td>
</tr>
<tr>
<td>volume_name</td>
<td>Name of the volume residing on the disk.</td>
</tr>
<tr>
<td>storage_profiles</td>
<td>The storage profiles to which the disk belongs.</td>
</tr>
<tr>
<td>thin</td>
<td>Indicates whether the block system uses thin provisioning. Values are:</td>
</tr>
<tr>
<td></td>
<td>True, False.</td>
</tr>
<tr>
<td>tiering_policy</td>
<td>Indicates the tiering policy in effect. If the initial tier and the</td>
</tr>
<tr>
<td></td>
<td>tiering policy are the same, the values are: Auto-Tier, Highest Available</td>
</tr>
<tr>
<td></td>
<td>Tier, Lowest Available Tier. If the initial tier and the tiering policy</td>
</tr>
<tr>
<td></td>
<td>are not the same, the values are: Auto-Tier/No Data Movement, Highest</td>
</tr>
<tr>
<td></td>
<td>Available Tier/No Data Movement, Lowest Available Tier/No Data Movement.</td>
</tr>
<tr>
<td>compressed</td>
<td>For VNX for block, indicates whether data is compressed. Values are:</td>
</tr>
<tr>
<td></td>
<td>True, False, Mixed (indicates some of the LUNs, but not all, are</td>
</tr>
<tr>
<td></td>
<td>compressed).</td>
</tr>
<tr>
<td>mirrored</td>
<td>Indicates whether the disk is mirrored.</td>
</tr>
<tr>
<td>servers</td>
<td>Lists the servers that have access to this disk.</td>
</tr>
<tr>
<td>addr</td>
<td>Path to system (SCSI address).</td>
</tr>
</tbody>
</table>

EXAMPLE #4

To view information for disk d205 for the system with a Symmetrix system, type:

$ nas_disk -info d205
**The nas Commands**

id = 205
name = d205
acl = 0
in_use = True
pool = SG0
size (MB) = 28560
type = Mixed
protection = RAID1
symm_id = 000190100530
symm_dev = 0539
volume_name = d205
storage_profiles = SG0_000192601245
thin = True
tiering_enabled = True
compression = True
mirrored = False
servers =

server_2, server_3, server_4, server_5, server_6, server_7, server_8, server_9

server = server_2
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_2
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_3
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_3
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_4
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_4
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_5
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_5
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_6
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_6
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_7
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_7
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_8
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_8
   addr = c16t14l0
   FA = 04A
   FApport = 0

server = server_9
   addr = c0t14l0
   FA = 03A
   FApport = 0

server = server_9
   addr = c16t14l0
   FA = 04A
   FApport = 0

---

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the disk (assigned automatically).</td>
</tr>
<tr>
<td>name</td>
<td>Name of the disk.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value of the disk.</td>
</tr>
<tr>
<td>in_use</td>
<td>Used by any type of volume or file system.</td>
</tr>
<tr>
<td>pool</td>
<td>Name of the storage pool in use.</td>
</tr>
<tr>
<td>size (MB)</td>
<td>Total size of disk.</td>
</tr>
<tr>
<td>type</td>
<td>Type of disk contingent on the system attached; Symmetrix disk types are</td>
</tr>
<tr>
<td></td>
<td>STD, BCV, R1BCV, R2BCV, R1STD, R2STD, ATA, R1ATA, R2ATA, BCVA, R1BCA,</td>
</tr>
<tr>
<td></td>
<td>R2BCA, EFD, FTS, R1FTS, R2FTS, BCVF, R1BCF, R2BCF, BCVMIXED, R1MIXED, R2MIXED,</td>
</tr>
<tr>
<td></td>
<td>R1BCVMIXED, and R2BCVMIXED. If multiple disk volumes are used, the type is</td>
</tr>
<tr>
<td></td>
<td>Mixed.</td>
</tr>
<tr>
<td>protection</td>
<td>The type of disk protection that has been assigned.</td>
</tr>
<tr>
<td>symm_id</td>
<td>ID of the Symmetrix system associated with the disk.</td>
</tr>
</tbody>
</table>
The nas Commands

EXAMPLE #5
To view information for disk d3454 (FTS device created using eDisk configured in external provisioning mode) for the system with a Symmetrix system, type:

$ nas_disk -info id=3454

id  = 3454
name  = d3454
acl  = 0
in_use  = False
size (MB)  = 28772
type  = FTS
protection= Unprotected
symm_id  = 000196900010
symm_dev  = 0031
volume_name = d3454
storage_profiles = symm_fts
thin  = False
compression = False
mirrored  = False
servers  = server_2,server_3
server = server_2  addr=c0t1l3  FA=02E  FAport=0
server = server_2  addr=c16t1l3  FA=01E  FAport=0
server = server_2  addr=c32t1l3  FA=01E  FAport=0
server = server_2  addr=c48t1l3  FA=02E  FAport=0
server = server_3  addr=c0t1l3  FA=02E  FAport=0
server = server_3  addr=c16t1l3  FA=01E  FAport=0
server = server_3  addr=c32t1l3  FA=01E  FAport=0
server = server_3  addr=c48t1l3  FA=02E  FAport=0

EXAMPLE #4 provides a description of command outputs.

EXAMPLE #6
To rename a disk in the system with a VNX for block, type:

$ nas_disk -rename d7 disk7

id  = 7
name  = disk7
acl  = 0
in_use  = True

symm_dev  ID of the Symmetrix device associated with the disk.
volume_name  Name of the volume residing on the disk.
storage_profiles  The storage profiles to which the disk belongs.
thin  Indicates whether the system uses thin provisioning. Values are: True, False, Mixed.
tiering_enabled  Indicates whether a tiering policy is being used.
compressed  For VNX with Symmetrix backend, indicates whether data is compressed. Values are: True, False, Mixed (indicates some of the LUNs, but not all, are compressed).
mirrored  Indicates whether the disk is mirrored.
servers  Lists the servers that have access to this disk.
addr  Path to system (SCSI address).
EXAMPLE #4 provides a description of command outputs.

EXAMPLE #7
To delete a disk entry from the disk table for the system with a VNX for block, type:

```
$ nas_disk -delete d24
```

EXAMPLE #4 provides a description of command outputs.
The nas Commands

**nas_diskmark**

Queries the system, manages and lists the SCSI devices configuration.

**SYNOPSIS**

```
nas_diskmark
-mark {-all | <movername>} [-discovery {y|n}] [-monitor {y|n}]
[-Force {y|n}]
| -list {-all | <movername>}
```

**DESCRIPTION**

`nas_diskmark` queries the available system device and tape device configuration, saves the device configuration into the Data Movers database, and lists SCSI devices. This command also manages NAS database configuration related to advanced data services from back-end storage system.

**CAUTION**

It is recommended that all Data Movers have the same device configuration. When adding devices to the device table for a single Data Mover only, certain actions such as standby failover are not successful unless the standby Data Mover has the same disk device configuration as the primary Data Mover.

The -all option executes the command for all Data Movers.

**LUN migration for VNX Symmetrix systems**

When a newly created LUN having an ID same as that of some removed device is detected, the command may report a conflict error. After a LUN is removed at the backend and then a new LUN is created with the same ID, Control Station cannot be aware of its deletion at first. The error occurs because the new LUN has duplicate storage ID and device ID with stale disk volume. This case only applies in Symmetrix backend.

For example, During LUN migration, where a Symmetrix device is moved from source storage group (SG) to destination SG, the LUN ID of this device in the source SG should be maintained even in the destination SG. Else, this will reflect in a conflict error on the Control Station during running `nas_diskmark`.

**OPTIONS**

```
-mark {-all | <movername>}
```

Queries SCSI devices and saves them into the device table database on the Data Mover.
The nas Commands

Modifies VNX for block LUN names to the VNX_<VNX-hostname>_<lun-id>_<VNX-dvol-name> format, if the LUNs use the default Unisphere name.

⚠️ **CAUTION**

The time taken to complete this command may be lengthy, dependent on the number and type of attached devices.

[-discovery {y|n}]
Enables or disables the storage discovery operation.

⚠️ **CAUTION**

Disabling the -discovery option should be done only under the direction of an EMC Customer Service Engineer.

[-monitor {y|n}]
Displays the progress of the query and discovery operations.

[-Force {y|n}]
Overrides the health check failures and changes the storage configuration.

⚠️ **CAUTION**

Use the -Force option only when directed to do so, as high availability can be lost when changing storage configuration.

-list {-all | <movername>}
Lists the SCSI devices for the specified Data Mover or all Data Movers.

**EXAMPLE #1**

To query SCSI devices on server_2 and display the progress of the query operation, type:

```bash
$ nas_diskmark -mark server_2 -monitor y
```

Discovering storage (may take several minutes)

```
server_2:
chain 0 ...........
chain 16 ...........
chain 32 ...........
chain 48 ...........
chain 96 ...........
chain 112 ...........
```

Verifying disk reachability
Verifying file system reachability
Verifying local domain
Verifying disk health
Verifying gate keepers
Verifying device group
done

EXAMPLE #2  To list the SCSI devices for server_2, type:

$ nas_diskmark -list server_2

server_2 : chain 0 :
  chain= 0, scsi=0
  stor_id= HK190807090011  VNX_id= HK1908070900110032
  tid/lun= 0/0 type= disk sz= 11263 val= 1 info= DGC RAID 5 03243200000032NI
  tid/lun= 0/1 type= disk sz= 11263 val= 2 info= DGC RAID 5 03243300010033NI
  tid/lun= 0/2 type= disk sz= 2047 val= 3 info= DGC RAID 5 03243400020034NI
  tid/lun= 0/3 type= disk sz= 2047 val= 4 info= DGC RAID 5 03243500030035NI
  tid/lun= 0/4 type= disk sz= 2047 val= 5 info= DGC RAID 5 03243600040036NI
  tid/lun= 0/5 type= disk sz= 32767 val= 6 info= DGC RAID 5 03243700050037NI
  tid/lun= 1/0 type= disk sz= 274811 val= 7 info= DGC RAID 5 0324440100044NI
  tid/lun= 1/1 type= disk sz= 274811 val= -5 info= DGC RAID 5 0324450110054NI
  tid/lun= 1/2 type= disk sz= 274811 val= 8 info= DGC RAID 5 0324460120046NI
  tid/lun= 1/3 type= disk sz= 274811 val= -5 info= DGC RAID 5 0324470130047NI
  tid/lun= 1/4 type= disk sz= 274811 val= 9 info= DGC RAID 5 0324560140056NI
  tid/lun= 1/5 type= disk sz= 274811 val= -5 info= DGC RAID 5 0324570150057NI
  tid/lun= 1/6 type= disk sz= 274811 val= 10 info= DGC RAID 5 0324580160058NI
  tid/lun= 1/7 type= disk sz= 274811 val= -5 info= DGC RAID 5 0324590170059NI
  tid/lun= 1/8 type= disk sz= 274811 val= 99 info= DGC RAID 5 03245A018005ANI
  tid/lun= 1/9 type= disk sz= 274811 val= -5 info= DGC RAID 5 03245B019005JNI
  tid/lun= 1/10 type= disk sz= 274811 val= 97 info= DGC RAID 5 03245C01A005CNI
  tid/lun= 1/11 type= disk sz= 274811 val= -5 info= DGC RAID 5 03245D01B005JNI
  tid/lun= 1/12 type= disk sz= 274811 val= 13 info= DGC RAID 5 03245E01C005ENI
  tid/lun= 1/13 type= disk sz= 274811 val= -5 info= DGC RAID 5 03245F01D005JNI
  tid/lun= 1/14 type= disk sz= 274811 val= 14 info= DGC RAID 5 03246001E0060NI
  tid/lun= 1/15 type= disk sz= 274811 val= -5 info= DGC RAID 5 03246101F0061NI

server_2 : chain 1 :
  no drives on chain
server_2 : chain 2 :
  no drives on chain
server_2 : chain 3 :
  no drives on chain
server_2 : chain 4 :
  no drives on chain
server_2 : chain 5 :
  no drives on chain
server_2 : chain 6 :
  no drives on chain
server_2 : chain 7 :
  no drives on chain
server_2 : chain 8 :
  no drives on chain

nas_diskmark 209
The nas Commands

server_2 : chain 9 :
no drives on chain
server_2 : chain 10 :
no drives on chain
server_2 : chain 11 :
no drives on chain
server_2 : chain 12 :
no drives on chain
server_2 : chain 13 :
no drives on chain
server_2 : chain 14 :
no drives on chain
server_2 : chain 15 :
no drives on chain

Note: This is a partial listing due to the length of the output.
nas_emailuser

Manages email notifications for serious system events.

SYNOPSIS

nas_emailuser
   -info
   | -test
   | -modify
      [-enabled {yes|no}]
      [-to <email_addr> [,...]]
      [-cc <email_addr> [,...]]
      [-email_server <email_server>]
      [-subject_prefix <email_subject>]
      [-from <email_addr>]
   | -init

DESCRIPTION

nas_emailuser enables, configures, and tests email notifications for serious system events.

OPTIONS

-info
Displays the configuration for email notifications.

-test
Generates a test event that sends a test email notification to the email addresses configured in -to and -cc. The recipient email address must be configured prior to testing email notification.

Note: After the -test option is run, all the configured recipients must be asked to confirm whether they received the test email with the correct system identification information.

-modify
Modifies one or more of the following configuration parameters:

   [-enabled {yes|no}]
   Enables email notification if yes is specified. The recipient email address must be configured prior to enabling email notification. Disables email notification if no is specified.

   [-to <email_addr> [,...]]
   Configures one or more recipient email addresses. The email addresses are comma-separated, enclosed in single-quotes, and follow the mailbox@fully_qualified_domain_name format. For example, 'storage_admin@yourcompany.com', 'backup_admin@yourcompany.com'.
Refer the following email address format guidelines for configuring email addresses. An email address can contain:

- A maximum of 63 characters; the field can contain a maximum of 255 characters:
  - ASCII characters: a through z, A through Z, 0 through 9, ! # $ % & * + - / = ? ^ _ ` {,} ~ are allowed; a period, if it is not the first or last character in the mailbox
  - Alphanumeric strings
- Single quotes, if they are escaped in the format:
  - - your\'email@yourcompany.com
  - - first'"email@yourcompany.com,second'"email@yourcompany.com'

\[ -cc <email_addr> [, . . . ] \]
Configures a list of carbon-copy recipients. The email addresses are comma-separated, enclosed in single-quotes, and follow the mailbox@fully_qualified_domain_name format. For example, 'storage_admin@yourcompany.com'. For the email address character set and format guidelines, refer the -to option.

\[ -email_server <email_server> \]
Configures the email server that accepts and routes the email notifications. <email_server> specifies an IP address or the fully qualified domain name, which can have 1 to 63 characters. The IP addresses 0.0.0.0 and 255.255.255.255 are not allowed.

\[ -subject_prefix <email_subject> \]
Specifies the email subject prefix. The subject prefix for the email notification can be from 1 to 63 characters long, is enclosed in quotes, and should contain printable ASCII characters. You can customize the subject prefix for specific needs like email filtering. The default subject is "System Notification."

\[ -from <email_addr> \]
Configures the sender’s email address. If the sender’s email address is not specified, a default email address of the format root@<hostname> is configured. The email address follows the mailbox@fully_qualified_domain_name format. For example, 'storage_admin@yourcompany.com'. For the email address character set and format guidelines, refer the -to option.
-init
Initializes the default state; displays a status message if the feature has already been initialized. The -init option must be used only when directed.

SEE ALSO
Configuring Events and Notifications on VNX for File.

EXAMPLE #1
To configure email notifications using email server 10.6.50.122 from administrator to support, while copying engineering and documentation, type:

$ nas_emailuser -modify -to
  szg30@fire2.hosts.pvt.dns, support1@nasdocs.emc.com, documentation@nasdocs.emc.com

OK

EXAMPLE #2
To display information on email notifications, type:

$ nas_emailuser -info
Service Enabled     = Yes
Recipient Address(es) = szg30@fire2.hosts.pvt.dns, support1@nasdocs.emc.com, documentation@nasdocs.emc.com
Carbon copy Address(es) =
Email Server        = 10.241.168.23
Subject Prefix      = System Notification
Sender Address      =

EXAMPLE #3
To test email notifications, type:

$ nas_emailuser -test
OK

EXAMPLE #4
To disable email notification, type:

$ nas_emailuser -modify -enabled no
OK
The nas Commands

**nas_environment**

Reports the inlet air temperatures and input power to the user.

**SYNOPSIS**

```bash
nas_environment -info
```

- **-system** [-present|-average]
- **-dme** [enclosure_id] [-intemp [f|c]|-power] [-present] | [-average]
- **-array** [-present|-average]
- **-shelf** [<shelf_id>|<-all>] [-intemp [f|c]|-power] [-present] | [-average]
- **-battery** [a|b] [-present|-average]
- **-spe** [-intemp [f|c]|-power] [-present] | [-average]
- **-all**

**DESCRIPTION**

`nas_environment -info` displays the inlet air temperatures of the Data Mover enclosures, disk-array enclosures, the input power of the Data Mover enclosures, disk-array enclosures, and standby power supply through the CLI and Unisphere GUI.

**OPTIONS**

- **-system**
  Displays the present or average input power information of the system, which includes file and block on VNX systems, and file only on gateway systems.

  - **-present**
    Displays the current value, which is a sum of the present input power for all supported systems. The current value is computed as the 30 second average of the power consumption sampled every three seconds.

  - **-average**
    Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if there is less than one hour worth of data. The average value is computed as the 60 minute rolling average of the present power consumption values.

- **-dme**
  Displays the present or average inlet air temperature and input power information on a specified Data Mover enclosure. If a specific enclosure_id is not specified, all Data Mover enclosure information is displayed.
enclosure_id
Specifies a Data Mover enclosure_id on which to display information.

-intemp [f|c]
Displays the inlet air temperature information. The f flag indicates Fahrenheit. The default value or c flag indicates Celsius.

-power
Displays the input power information.

-present
Displays the current value.

-average
Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if there is less than one hour worth of data.

-shelf
Allows to input a value for a selected enclosure. It displays the present and average inlet air temperature and input power information on a specified disk-array enclosure. If a specific enclosure_id is not specified, all disk-array enclosure information is displayed.

<shelf_id>
Specifies a disk array enclosure_id on which to display information.

-power
Displays the input power information.

-present
Displays the current value.
-average
Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if there is less than one hour worth of data.

-battery
Displays the present and average input power information on a specified standby power supply. If no -a or -b is specified, then the information is displayed on both standby power supplies.

-a
Specifies a standby power supply A on which to display information.

-b
Specifies a standby power supply B on which to display information.

-present
Displays the current value.

-average
Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if there is not one hour worth of data.

-spe
Displays the present and average input power information on a specified standby power supply.

-intemp [f|c]
Displays the inlet air temperature information. The f flag indicates Fahrenheit. The default value or c flag indicates Celsius.

-power
Displays the input power information.

-present
Displays the current value.

-average
Displays the average value. It requires an hour to calculate the correct value. N/A is displayed if there is less than one hour worth of data.
The `nas_environment` command displays various system information including:

- System input power
- Data Mover enclosure inlet air temperatures and input power
- Array input power
- Disk-array enclosure inlet air temperatures and input power
- Storage processor enclosure inlet air temperatures and input power
- Standby power supply input power

**EXAMPLE #1**

To view the present and average input power information for file and block on systems or file only on gateway system, type:

```
$ nas_environment -info -system
```

System = Celerra ns 600 APM 000237001650000
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150

**EXAMPLE #2**

To view the average inlet air temperature on Data Mover enclosure 1 in degrees Fahrenheit, type:

```
$ nas_environment -info -dme 1 -intemp f -average
```

Component = DME 0 Data Mover 1
Temperature Status = OK
Rolling average (degrees) = 53F
Temperature Status = OK
Rolling average (degrees) = 53F

**EXAMPLE #3**

To view the average inlet air temperature on Data Mover enclosure 1 in degrees Celsius, type:

```
$ nas_environment -info -dme1 -intemp c -average
```

Data Mover Enclosure 1
Status: Valid
Inlet Air Temperature
Rolling average (degrees Celsius): 11.3

**EXAMPLE #4**

To view the present system information, type:

```
$ nas_environment -info -system -present
```

System = Celerra ns 600 APM 000237001650000
Power Status = OK
Present (watts) = 150
The nas Commands

**EXAMPLE #5** To view the information array (input power and inlet temperature), type:

```
$ nas_environment -info -array
```

Component = CLARiiON CX600 APM0023700165
Power Status = OK
Present (watts) = 230
Rolling average (watts) = 245

**EXAMPLE #6** To view the present and average inlet air temperature on all shelves, type:

```
$ nas_environment -info -shelf -all
```

Component = Shelf 0/0 Shelf 0/0
Power Status = OK
Present (watts) = 150
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 0/1 Shelf 0/1
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 1/0 Shelf 1/0
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 1/1 Shelf 1/1
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

**EXAMPLE #7** To view the present and average inlet air temperature on shelf 1, enclosure 1, type:
$ nas_environment -info -shelf 1/1 -average
Component = Shelf 1/1 Shelf 1/1
Power Status = OK
Rolling average (watts) = 150
Temperature Status = OK
Rolling average (degrees) = 11C

EXAMPLE #8  To view the present and average inlet air temperature on all spes, type:
$ nas_environment -info -spe
Component = SPE 0 SPE 0
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

EXAMPLE #9  To view the present information for all batteries, type:
$ nas_environment -info -battery
Component = Shelf 0/0 SP A
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Component = Shelf 0/0 SP B
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150

EXAMPLE #10  To view the present information for all batteries, type:
$ nas_environment -info -battery a -average
Component = Shelf 0/0 SP A
Power Status = OK
Rolling average (watts) = 150

EXAMPLE #11  To view all the components, type:
$ nas_environment -info -all
Component = Shelf 0/0 SP A
Power Status = OK
Rolling average (watts) = 150

EXAMPLE #12  To view the present and average inlet air temperature of the dme, shelf, spe components, type:
$ nas_environment -info -all
Component = Celerra ns600 APM000237001650000
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Component = DME 0 Data Mover 0
Power Status = OK
Present (watts) = 200
Rolling average (watts) = 333
Temperature Status = OK
Present (degrees) = 12C
Rolling Average (degrees) = 11C

Component = DME 0 Data Mover 1
Power Status = Error 13690667102: Not Present
Present (watts) = N/A
Rolling average (watts) = N/A
Temperature Status = Error 13690667102: Unsupported
Present (watts) = N/A
Rolling average (watts) = N/A

Component = DME 0 Data Mover 2
Power Status = Error 13690667102: Uninitialized
Present (watts) = 150
Average (watts) = N/A
Temperature Status = Error 13690667102: Uninitialized
Present (degrees) = 12C
Average (degrees) = N/A

Component = DME 0 Data Mover 3
Power Status = Error 13690667102: Failed
Present (watts) = 150
Average (watts) = N/A
Temperature Status = Error 13690667102: Failed
Present (degrees) = 12C
Average (degrees) = N/A

Component = Shelf 0/0
Power Status = OK
Present (watts): 150
Rolling average (watts): 150
Present (watts): 150
Rolling average (watts): 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 0/1
Power Status = Error 13690667102: Invalid
Present (watts) = N/A
Rolling average (watts) = N/A
Temperature Status = Error 13690667102: Invalid
Present (degrees) = N/A
Rolling average (degrees) = N/A

Component = Shelf 1/0
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 1/1
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = CLARiiON CX600 APM00023700165
Power Status = OK
Present (watts) = 230
Rolling average (watts) = 245

Component = SPE 0 SPE 0
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150
Temperature Status = OK
Present (degrees) = 12C
Rolling average (degrees) = 11C

Component = Shelf 0/0 SP A
Power Status = OK
Present (watts) = 150
Power Status = OK
Present (watts) = 150
Rolling average (watts) = 150

Component = Shelf 0/0 SP B
Power Status = Error 13690667102: Not Present
Present (watts) = N/A
Rolling average (watts) = N/A
nas_event

Provides a user interface to system-wide events.

SYNOPSIS

nas_event
  -Load {-info|<file_name>}
  | -Unload <file_name>
  | -list
    -action {-info|{trap|logfile|mail|callhome|exec|udprpc|tcprpc|terminate}
      [-component {<component>|<id>}][-facility {<facility>
       | <id>}][-severity {<severity>|<id>}][[-id]]
    | -component {-info|{<component>|<id>} [-facility {<facility>|<id>}][[-id]}]
    | -severity {-info|<severity>|<id>} [-component {<component>|<id>}
       [-facility {<facility>|<id>}][[-id]}
    | -keyword <keyword> [-component {<component>|<id>}
       [-facility{<facility>|<id>]}[-severity {<severity>|<id>}]][[-id]}

DESCRIPTION

nas_event provides a user interface to system-wide events within the
VNX. The VNX includes a default event configuration file that
contains a mapping of facilities that generate events, and the
associated actions triggered by those events.

To list the default configuration files, type:

$ nas_event -Load -info

Using a text editor, a new event configuration file can be created and
loaded into the database to add an event.

VNX facilities generate events that trigger specific actions. An event
consists of:

◆ An assigned ID for the event and the facility issuing the event
◆ The high water mark for the severity of the event
◆ A description of the event
◆ The system-defined action to take when the event occurs

CAUTION

The callhome events in the system are carefully reviewed and
configured to provide the right level of support. Do not add, delete,
or modify lines that specify the callhome action in the event
configuration files in the /nas/sys directory. User-defined event
configuration files should not use the callhome action.
The nas Commands

OPTIONS

-Load {-info|<file_name>}
Loads the event configuration file <file_name> into the system. The -info option displays the currently loaded configuration files.

-Unload <file_name>
Unloads the configuration file <file_name> from the system.

CAUTION

The /nas/sys/nas_eventlog.cfg configuration file must not be deleted, as this can lead to data loss. Unloading or modifying configuration files that are loaded by default can affect logging, alerts, notifications, and system operations.

-list
The -list option displays components and facilities that generate events, and the actions that are taken as a result. You can search for an event, facility, or action by using a keyword. Component, facility, and severity can be specified by either the text name or ID. The output is displayed with parameter names in the form $(paraname, typeIndicator, fmtStr).

-action
{-info | {trap | logfile | mail | callhome | exec | udprpc | tcprpc | terminate}}
With the -info option, lists all the possible actions associated with events. If one of the actions trap, logfile, mail, callhome, exec, udprpc, tcprpc, or terminate is specified, lists the possible events that trigger the specified action. These events are categorized by component and facility:

[-component {<component>|<id>}][-facility
{<facility> |<id>}] Lists the possible events in the specified component that trigger the given action. If facility is specified, lists the events in the specified component and facility that trigger the given action.

[-severity {<severity>|<id>}] Lists the possible events with the specified severity that trigger the given action.

[-id]
Lists the output with the MessageID number in addition to BaseID, Severity, and Brief_Description.
The nas Commands

- **-component**
  \{-info\}{<component>|<id>}\{-facility\}{<facility>|<id>}
  With the -info option, lists the ids and names of all the components. If the component is specified, lists the ids and names of all the facilities under that component. Specifying facility lists the events that can be generated by the specified facility and component.

  \{-id\}
  Lists the output with the message ID number in addition to BaseID and Brief_Description.

- **-severity** \{-info\}{<severity>|<id>}
  With the -info option, lists the severity levels. If severity is specified, lists the events with the specified severity level.

  \{-component\} {<component>|<id>} \{-facility\}{<facility>|<id>}
  Lists the events filtered by the given severity and component. If facility is specified lists the events further filtered by the given facility.

  \{-id\}
  Lists the output with the MessageID number in addition to BaseID, Severity, and Brief_Description.

---

**Note:** To receive email notifications sent to multiple recipients, specify the email addresses within the quotes and separate them with a comma.

- **-keyword** \<keyword>\n  Lists all events that match the specified keyword.

  \{-component\} {<component>|<id>}
  \{-facility\}{<facility>|<id>}
  Lists events filtered by the specified keyword and component. If facility is specified, lists the events further filtered by the given facility.

  \{-severity\} {<severity>|<id>}
  Lists events filtered by the specified severity.

  \{-id\}
  Lists the output with the MessageID number in addition to BaseID, Severity, and Brief_Description.
SEE ALSO  Configuring Events and Notifications on VNX for File.

EXAMPLE #1  After using a text editor to create an event configuration file, to load the new configuration file into the NAS database, type:

```
$ nas_event -Load /nas/site/new_eventlog.cfg
EventLog: will load /nas/site/new_eventlog.cfg...done
```

EXAMPLE #2  To verify that the configuration file was loaded, type:

```
$ nas_event -Load -info
Loaded config. files:
1:   /nas/sys/nas_eventlog.cfg
2:   /nas/http/webui/etc/web_client_eventlog.cfg
3:   /nas/site/new_eventlog.cfg
```

EXAMPLE #3  To list actions, type:

```
$ nas_event -list -action
```

```
action
  terminate
  trap
  exec
  mail
  callhome
  logfile
```

EXAMPLE #4  To list the events that trigger the mail action, type:

```
$ nas_event -list -action mail
```

```
CSPLATFORM(6)
  |--- EventLog(130)
BaseID  Severity       Brief_Description
50     EMERGENCY(0)   ${text,8,%s}
51     ALERT(1)       ${text,8,%s}
52     CRITICAL(2)    ${text,8,%s}
```

EXAMPLE #5  To list the components, type:

```
$ nas_event -list -component -info
```

```
Id     Component
1      DART
2      CS_Core
5      XML_API
6      CSPLATFORM
```

EXAMPLE #6  To list the facilities under the component DART, type:

```
$ nas_event -list -component DART -info
```

```
DART(1)
  |--- Id     Facility
      24     ADMIN
      26     CAM
```
EXAMPLE #7  To list the events generated by DART in the facility with the ID 146, type:

$ nas_event -list -component DART -facility 146

DART(1)  
|-- CEPP(146)

<table>
<thead>
<tr>
<th>BaseID</th>
<th>Severity</th>
<th>Brief_Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NOTICE(5)</td>
<td>CEPP server ${ipaddr,8,%s} of pool ${pool,8,%s} is ${status,8,%s}. Vendor ${vendor,8,%s}, ntStatus 0x${ntstatus,2,%x}.</td>
</tr>
<tr>
<td>2</td>
<td>ERROR(3)</td>
<td>Error on CEPP server ${ipaddr,8,%s} of pool ${pool,8,%s}: ${status,8,%s}. Vendor ${vendor,8,%s}, ntStatus 0x${ntstatus,2,%x}.</td>
</tr>
</tbody>
</table>
EXAMPLE #8  To list events with severity 4 generated by component CS_CORE and facility DBMS, and to display the MessageID in the output, type:

```
$ nas_event -list -severity 4 -component CS_CORE -facility DBMS -id
```

<table>
<thead>
<tr>
<th>MessageID</th>
<th>BaseID</th>
<th>Brief_Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>86444212226</td>
<td>2</td>
<td>Db: Compact${compact_option,8,%s}: ${db_name,8,%s}: Failed: ${db_status,8,%s}.</td>
</tr>
<tr>
<td>86444212227</td>
<td>3</td>
<td>Db Env: ${db_env,8,%s}: Log Remove: Failed: ${db_status,8,%s}.</td>
</tr>
</tbody>
</table>

EXAMPLE #9  To list events filtered by the keyword freeblocks, type:

```
$ nas_event -list -keyword freeblocks
```

<table>
<thead>
<tr>
<th>BaseID</th>
<th>Severity</th>
<th>Brief_Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>CRITICAL(2)</td>
<td>Only ${freeblocks,3,%llu} free blocks in the root file system (fsid ${fsid,2,%u}) of the VDM ${vdm,8,%s}.</td>
</tr>
<tr>
<td>3</td>
<td>ALERT(1)</td>
<td>The root file system (fsid ${fsid,2,%u}) of the VDM ${vdm,8,%s} is full. There are only ${freeblocks,3,%llu} free blocks.</td>
</tr>
</tbody>
</table>

EXAMPLE #10  To list events with the keyword data generated in DART with the severity level 6, type:

```
$ nas_event -list -keyword data -component DART -severity 6
```

<table>
<thead>
<tr>
<th>BaseID</th>
<th>Severity</th>
<th>Brief_Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INFO(6)</td>
<td>The Usermapper database has been created.</td>
</tr>
<tr>
<td>4</td>
<td>INFO(6)</td>
<td>The Usermapper database has been destroyed.</td>
</tr>
<tr>
<td>8</td>
<td>INFO(6)</td>
<td>The migration of the Usermapper database to the VNX version 5.6 format has started.</td>
</tr>
<tr>
<td>9</td>
<td>INFO(6)</td>
<td>The Usermapper database has been successfully migrated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BaseID</th>
<th>Severity</th>
<th>Brief_Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INFO(6)</td>
<td>The migration of the secmap database to the VNX version 5.6 format has started.</td>
</tr>
<tr>
<td>2</td>
<td>INFO(6)</td>
<td>The secmap database has been successfully migrated.</td>
</tr>
</tbody>
</table>
EXAMPLE #11  To unload the event configuration file, type:

$ nas_event -UnLoad /nas/site/new_eventlog.cfg

EventLog : will unload /nas/site/new_eventlog.cfg... done

EXAMPLE #12  To receive email notifications that are sent to multiple recipients, add the following line to your /nas/sys/eventlog.cfg file:

disposition severity=0-3, mail "nasadmin@nasdocs.emc.com, helpdesk@nasdocs.emc.com"

EXAMPLE #13  To list the events that trigger a particular trap action, type:

$ nas_event -l -a trap | more

CSPLATFORM(6)
  |--> BoxMonitor(131)
  BaseID Severity Brief_Description
  1 CRITICAL(2) EPP failed to initialize.
  3 CRITICAL(2) Failed to create ${threadname,8,%s} thread.
  4 CRITICAL(2) SIB Read failure: ${string,8,%s}
  ..
CSPLATFORM(6)
  |--> SYR(143)
  BaseID Severity Brief_Description
  5 INFO(6) The SYR file ${src_file_path,8,%s} with ${dest_extension,8,%s} extension is attached.
The nas Commands

nas_fs

Manages local file systems for the VNX.

SYNOPSIS

nas_fs
  -list [-all]
  -delete <fs_name> [-option <options>] [-Force] [-reclaim]
  -info [-size] {--all | <fs_name>| id=<fs_id>} [-option <options>]
  -rename <old_name> <new_name> [-Force]
  -size <fs_name>
  -user_files <fs_name>
  -translate <fs_name> -access_policy start
    -to {MIXED} -from {NT|NATIVE|UNIX|SECURE}
  -translate <fs_name> -access_policy status
  -xtend <fs_name> {<volume_name>|size=<integer>|T|G|M%|[pool=<pool>]
    [storage=<system_name>] [--option <options>]}
  -modify <fs_name> -auto_extend {no|yes [-thin {no|yes}]}
    [-fixed_block_dedup [n|y]]
    [-hwm <50-99>%][-max_size <integer>|T|G|M]
  -modify <fs_name> -worm [-default_retention {<integer>|{Y|M|D}|infinite}]
    [-min_retention {<integer>|{Y|M|D}|infinite}]
    [-max_retention {<integer>|{Y|M|D}|infinite}]
  -modify <fs_name> -worm -auto_lock {enable|--policy_interval
    <integer>|{M|H}|disable}
  -modify <fs_name> -auto_delete {enable|disable} [--policy_interval
    <integer>|{M|H|D}]
  -modify <fs_name> -worm -reset_epoch <year>
  -Type <type> <fs_name> -Force
  [-name <name>]|[-type <type>] -create <volume_name>
    [samesize=<fs_name>[:<cel_name>]] [-fixed_block_dedup [n|y]]
    [worm={enterprise|compliance|off} [-default_retention {<integer>|{Y|M|D}
      |infinite}][-min_retention {<integer>|{Y|M|D}|infinite}]
      [-max_retention {<integer>|{Y|M|D}|infinite}]][log_type={common|split}]
    [-fast_clone_level={1|2}][--option <options>]
  [-name <name>]|[-type <type>] -create {size=<integer>|T|G|M]
    | samesize=<fs_name>[:<cel_name>]]
    pool=<pool> [storage=<system_name>][worm={enterprise|compliance|off}]
      [-default_retention {<integer>|{Y|M|D}|infinite}]
    [-min_retention {<integer>|{Y|M|D}|infinite}]
    [-max_retention {<integer>|{Y|M|D}|infinite}]
    [log_type={common|split}][fast_clone_level={1|2}]
    [-auto_extend {no|yes} [-thin {no|yes}]]
    [-hwm <50-99>%][-max_size <integer>|T|G|M]]]
    [--option <options>]
  [-name <name>] -type nmfs -create

DESCRIPTION

nas_fs creates, deletes, extends, and lists file systems. nas_fs displays
the attributes of a file system, translates the access policy, enables,
automatic file system extension and thin provisioning capabilities, manages retention periods, enables automatic file locking and automatic file deletion, and manages access control level values.

**OPTIONS**

- **list [-all]**
  Displays a list of file systems and their attributes such as the name, ID, usage, type, access control level setting, the residing volume, and the server. The **-all** option displays all file systems including system-generated internal file systems. For example, Replicator internal checkpoints.

  **Note:** The ID is an integer and is assigned automatically, but not always sequentially, depending on ID availability. The name of a file system might be truncated if it is more than 19 characters. To display the full file system name, use the **-info** option with a file system ID.

  File system types are:
  - 1=uxfs (default)
  - 5=rawfs (unformatted file system)
  - 6=mirrorfs (mirrored file system)
  - 7=ckpt (checkpoint)
  - 8=mgfs (migration file system)
  - 100=group file system
  - 102=nmfs (nested mount file system)

  **Note:** File system types *uxfs*, *mgfs*, *nmfs*, and *rawfs* are created by using **nas_fs**. Other file system types are created either automatically or with their specific commands.

- **delete <fs_name>**
  Deletes the file system specified by file system name or ID. A file system cannot be deleted when it is mounted or part of a group.

  **[-option <options>]**
  Specifies the following comma-separated options:

  **volume**
  Deletes the file system’s underlying volume structure.
The nas Commands

Note: If a checkpoint is created with a volume that has been specified by size, the underlying volume is deleted when the checkpoint is deleted. If a file system using a storage pool is deleted, the underlying volume structure is also deleted.

[-Force]
Forces the deletion of a file system with SnapSure checkpoints known as the PFS, when a task scheduler such as an automated scheduler for SnapSure is running or is enabled.

[-reclaim]
Triggers the reclaim process for a file system during the deletion of that file system.

-info [-size] { -all | <fs_name> | id=<fs_id> }
Displays the attributes of a single file system, or all file systems, including the configuration of associated disks and replication sessions that are stopped or configured on the file system. If a file system is mounted, data is reported from the NAS database and the Data Mover. If a file system is unmounted, data is reported from the NAS database only.

The -size option also displays the total size of the file system and the block count in megabytes.

[-option <options>]
Specifies the following comma-separated options:

  mpd
  Displays the current directory type and translation status for the specified Multi-Protocol Directory (MPD) file system.

-renname <old_name> <new_name>
Changes the file system name from <old_name> to <new_name>.

  [-Force]
  Forces the rename of the file system with SnapSure checkpoints known as the PFS.

-size <fs_name>
Displays the total size of the file system and the block count in megabytes. The total size of a file system relates to the mounted or unmounted status of a file system.

-acl <acl_value> <fs_name>
Sets an access control level value that defines the owner of a file system, and the level of access allowed for users and groups defined
in the access control level table. The `nas_acl` command provides more information.

```
-translate <fs_name> -access_policy start -to {MIXED}
-from {NT | NATIVE | UNIX | SECURE}
```

Synchronizes the UNIX and Windows permissions on the specified file system. Prior to executing the `-translate` option by using `server_mount`, mount the specified file system with the MIXED access-checking policy. The `<fs_name>` must be a `uxfs` file system type mounted as read/write.

The policy specified in the `-from` option instructs the VNX about which operating system (UNIX or Windows) to derive permissions from, when migrating to the MIXED or MIXED_COMPAT access-checking policy (set with `server_mount`). For example, if you type UNIX in the `-from` option, all ACLs are regenerated from the UNIX mode bits. The policy typed in the `-from` option does not relate to the policy previously used by the file system object.

```
-translate <fs_name> -access_policy status
```

Prints the status of the access policy translation for the specified file system.

```
-xtend <fs_name> <volume_name>
```

Adds the specified volume to the mounted file system.

```
-xtend <fs_name> size=<integer>[T|G|M|%]
```

Adds the volume as specified by its desired size to the file system or checkpoint. Type an integer within the range of 1 to 1024, then specify `T` for terabytes, `G` for gigabytes (default), `M` for megabytes, or type an integer representing the percentage of a file system’s size followed by the percent sign. The extended volume added to the file system by the system will have a size equal to or greater than the total size specified.

**CAUTION**

When executing this command, extends should be performed incrementally by using like volumes to reduce time consumption.

```
[pool=<pool>]
```

Applies the specified storage pool rule set to the volume that has been added to the mounted file system.
The storage pool is a rule set that contains automatically created volumes and defines the type of disk volumes used and how they are aggregated.

```
[storage=<system_name>]
```

Specifies the system on which the checkpoint resides. If a system is not specified, the default system is the one on which the file system resides. If the file system spans multiple systems, the default is to use all the systems on which the file system resides. Use `nas_storage -list` to obtain attached system names.

```
[option <options>]
```

Specifies the following comma-separated options:

- `slice={y|n}`
  Specifies whether the disk volumes used by the file system may be shared with other file systems that use a slice. The `slice=y` option allows the file system to share disk volumes with other file systems. The `slice=n` option gives the new file system exclusive access to the disk volumes it uses, and is relevant when using TimeFinder/FS.

When `symm_std`, `symm_std_rdf_src`, `symm_ata`, `symm_ata_rdf_src`, `symm_ata_rdf_tgt`, and `symm_fts_rdf_tgt` pools are specified, the default is not to slice the volumes, which is overridden with `slice=y`. For `symm_efd`, the default is `slice=y`, because TimeFinder/FS is not supported with Flash (EFD) disk types.

When `clar_r1`, `clar_r5_performance`, `clar_r5_economy`, `clar_r6`, `clarata_r3`, `clarata_r6`, `clarata_r10`, `clarata_archive`, `cm_r1`, `cm_r5_performance`, `cm_r5_economy`, `cm_r6`, `cmata_r3`, `cmata_archive`, `cmata_r6`, `cmata_r10`, `clarsas_archive`, `clarsas_r6`, `clarsas_r10`, `clarefd_r5`, `clarefd_r10`, `cmsas_archive`, `cmsas_r6`, `cmsas_r10`, and `cmefd_r5` pools are specified, the default for standard AVM pools is to slice the volumes (`slice=y`), which is overridden by using `slice=n`. The default for mapped pools is not to slice the volumes (`slice=n`). Use `nas_pool` to change the default slice option.

```
-modify <fs_name> -auto_extend {no|yes [-thin {yes|no}]}
-fixed_block_dedup {n|y} [-hwm <50-99>]
-max_size <integer> [T|G|M]]
```
For an AVM file system, turns automatic file system extension, thin provisioning, and fixed-block deduplication on or off, and sets a high water mark and maximum size for the file system. When file system extension is turned on, the file system is automatically extended up to the maximum size specified when the high water mark is reached. The default for **-auto_extend** is **no**.

Thin provisioning reports the maximum file system size to the CIFS, NFS, and FTP users, even if the actual size of the file system is smaller. If thin provisioning is disabled, the true file system size and maximum file system sizes are reported to the system administrator. Thin provisioning requires that a maximum file system size also be set.

If a file system is created in a storage pool that contains:

- Only thick LUNs, use the **nas_fs** command's `-thin` option to enable thin provisioning on the file system.
- Only thin LUNs, using the **nas_fs** command's `-thin` option is not recommended. It is redundant, but allowed, for a thin file system to be built on thick LUNs.
- Both thick and thin LUNs, the file system may be built on either thick LUNs, thin LUNs, or both thick and thin LUNs. Using the **nas_fs** command's `-thin` option may be redundant if the file system uses thin LUNs.

Automatic File System Extension cannot be used for any file system that is part of an RDF configuration (for example, file systems on Data Movers configured with an RDF standby). Do not use the **nas_fs** command with the **-auto_extend** option for file systems associated with RDF configurations.

```
[-fixed_block_dedup {n|y}]
```

Specifies whether fixed-block deduplication is enabled on the file system. This option is only valid if the file system was created on a metavolume, the metavolume is built from local disks that belong to a mapped pool, the metavolume does not use shared disks, and the file system uses a split log type.

```
[-hwm <50-99>%]
```

Specifies the size threshold that must be reached before the file system is automatically extended. Type an integer between the range of 50 and 99 to represent the percentage of file system usage. The default is 90.
The nas Commands

[-max_size <integer> [T|G|M]]
Sets the maximum file system size to which a file system can be extended. Type an integer and specify T for terabytes, G for gigabytes (default), or M for megabytes. If the -max_size option is not specified, then it defaults to the maximum limit of the file system size which is 16 terabytes.

-modify <fs_name> -worm [-default_retention
{<integer>{Y|M|D}|infinite}]
[-min_retention '{<integer>{Y|M|D}|infinite}]
[-max_retention '{<integer>{Y|M|D}|infinite}]
For an FLR-enabled file system, manages retention periods.

[-default_retention '{<integer>{Y|M|D}|infinite}]
Sets a default retention period that is used in an FLR-enabled file system when a file is locked and a retention period is not specified. This value must be greater than or equal to the -min_retention option, and less than or equal to the -max_retention option. Type an integer and specify Y for years, M for months, or D for days. The default value is infinite. Setting infinite means that the files can never be deleted.

[-min_retention '{<integer>{Y|M|D}|infinite}]
Sets the minimum retention period that files on an FLR-enabled file system can be locked and protected from deletion. This value must be less than or equal to the -max_retention option. Type an integer and specify Y for years, M for months, or D for days. The default value is one day. Setting infinite means that the files can never be deleted.

[-max_retention '{<integer>{Y|M|D}|infinite}]
Sets the maximum retention period that files on an FLR-enabled file system can be locked and protected from deletion. Type an integer and specify Y for years, M for months, or D for days. The default value is infinite. Setting infinite means that the files can never be deleted.

-modify <fs_name> -worm [-auto_lock {enable
[-policy_interval <integer>{M|D|H}|disable}]
[-auto_delete {enable|disable}]
[-policy_interval <integer>{M|D|H}]
For an FLR-enabled file system, manages automatic file locking and automatic file deletion.
The nas Commands

[-auto_lock {enable|disable}]
Specifies whether automatic file locking for all files in an FLR-enabled file system is on or off. When enabled, auto-locked files are set with the default retention period value.

[-policy_interval <integer>{M|D|H}]
Specifies an interval for how long to wait after files are modified before the files are automatically locked in an FLR-enabled file system. Type an integer and specify M for minutes, D for days, or H for hours. The policy interval has a minimum value of 1 minute and a maximum value of 366 days. The default value is 1 hour.

[-auto_delete {enable|disable}]
Specifies whether automatically deleting locked files from an FLR-enabled file system once the retention period has expired is on or off.

-modify <fs_name> -worm -reset_epoch <year>
For an FLR-enabled file system, specifies the base year used for calculating the retention date of a file beyond 2038. Type an integer between the range of 2000 and 2037. The default value is 2003. The maximum value for the retention period is December 31, 2104 11:59:59 p.m. Trying to set a date beyond this value generates an error. Refer to Using VNX File-Level Retention for additional information.

-Type <type> <fs_name> -Force
Changes the file system type from the one of <fs_name> to the new specified <type>.

CAUTION
Converting uxfs to rawfs is prevented.

CAUTION
The conversion from rawfs to uxfs will fail with "Error 3105: invalid file system specified" because a uxfs is not available on the rawfs. However, if the user initially creates a rawfs, and restores an NDMP volume backup on the rawfs, then the conversion from the rawfs to a uxfs will be successful.

CREATING A FILE SYSTEM
File systems can be created by using:

◆ A volume specified by name
A volume specified by its size and desired storage pool
- An existing local or remote file system with the `samesize` option
- An existing local or remote file system with the `samesize` option and by using space from the available storage pool

```
[-name <name>][[-type <type>]] -create <volume_name>
```

Creates a file system on the specified volume and assigns an optional name to the file system. If a name is not specified, one is assigned automatically.

A file system name cannot:
- Begin with a dash (-)
- Be comprised entirely of integers
- Be a single integer
- Contain the word root or contain a colon (:)

The `-type` option assigns the file system type to be `uxfs` (default), `mgfs`, or `rawfs`.

```
[samesize=<fs_name>[:cel=<cel_name>]]
```

Specifies that the new file system must be created with the same size as the specified local or remote file system. When using the `samesize` option by using the options described below, the `slice=` must be set to `y`.

```
[-fixed_block_dedup {n|y}]
```

Creates a new file system on which fixed-block deduplication is enabled. `n` is the default. This option is only valid if the file system is created on a metavolume, the metavolume is built from local disks that belong to a mapped pool, the metavolume does not use shared disks, and the file system uses a split log type.

```
[worm={enterprise|compliance|off}]
```

Enables storage capability on a new file system. The option can only be specified when creating a new file system; existing file systems cannot be converted. After a file system is enabled, it is persistently marked as such until the time it is deleted.

**Note:** The compliance file system cannot be deleted if it has protected files.
CAUTION

The Enterprise version of this feature is intended for self-regulated archiving. The administrator is considered as a trusted user and the capability does not protect the archived data from the administrator’s actions. If the administrator attempts to delete the file system, the file system issues a warning message and prompts the administrator to confirm the operation. This version is not intended for high-end compliance applications such as pharmaceuticals, aerospace, or finance.

As part of enabling file-level retention (worm) on a new file system, you can also set these retention period options:

[-default_retention {<integer>{Y|M|D}|infinite}]

Sets a default retention period that is used in an FLR-enabled file system when a file is locked and a retention period is not specified. This value must be greater than or equal to the -min_retention option, and less than or equal to the -max_retention option. Type an integer and specify Y for years, M for months, D for days, or infinite. The default value is infinite which means that the files can never be deleted.

[-min_retention {<integer>{Y|M|D}|infinite}]

Sets the minimum retention period that files on an FLR-enabled file system can be locked and protected from deletion. This value must be less than or equal to the -max_retention option. Type an integer and specify Y for years, M for months, D for days, or infinite. The default value is 1 day. Setting infinite means that the files can never be deleted.

[-max_retention {<integer>{Y|M|D}|infinite}]

Sets the maximum retention period that files on an FLR-enabled file system can be locked and protected from deletion. Type an integer and specify Y for years, M for months, D for days, or infinite. The default value is infinite which means that the files can never be deleted.

log_type={common|split}

Specifies the type of log file associated with the file system. Log files can be either shared (common) or uniquely assigned to individual file systems (split, the default for all file systems created using the CLI or Unisphere). Use log_type=common when there is a requirement that the file system be compatible
with a previous release, such as that for IP Replication sessions. For VDM synchronous replication with RecoverPoint for Disaster Recovery, the split option required. For SRDF Async or STAR feature, split option is strongly recommended to avoid fsck before mounting a BCV file system on SiteB or SiteC.

\[\text{fast\_clone\_level} = \{1, 2\}\]

fast\_clone\_level=2 enables ability to create fast clone of a fast clone (also called as the second level fast clone) on the file system. fast\_clone\_level=1 enables ability to create a fast clone. File level retention and fast clone creation cannot be enabled together on a file system. Enabling split log implies fast\_clone\_level=2, if file level retention is not enabled on the file system. Replication sessions cannot be created between two different fast\_clone\_level capable file systems.

**Note:** fast\_clone\_level=1 indicates that a fast clone can be created on the file system and it is the default option if nothing is specified.

\[\text{-option <options>}\]

Specifies the following comma-separated options:

- **nbpi=<number>**
  The number of bytes per inode block. The default is 8192 bytes.

- **mover=<movername>**
  Assigns an optional Data Mover to build a file system. If no Data Mover is assigned, the system will automatically pick the first available Data Mover to build the file system.

- **slice=\{y, n\}**
  Specifies whether the disk volumes used by the new file system may be shared with other file systems by using a slice. The slice=y option allows the file system to share disk volumes with other file systems. The slice=n option ensures that the new file system has exclusive access to the disk volumes it uses, and is relevant when using TimeFinder/FS.

When **symm\_std, symm\_std\_rdf\_src, symm\_ata, symm\_ata\_rdf\_src, symm\_ata\_rdf\_tgt**, and **symm\_std\_rdf\_tgt**, **symm\_fts, symm\_fts\_rdf\_tgt**, and **symm\_fts\_rdf\_src** pools are specified, the default is not to slice the volumes. When slice=y is specified, it overrides the default. For **symm\_efd**, the default is slice=y, because TimeFinder/FS is not supported with Flash disk types.
When `clar_r1`, `clar_r5_performance`, `clar_r5_economy`, `clar_r6`, `clarata_r3`, `clarata_r6`, `clarata_r10`, `clarata_archive`, `cm_r1`, `cm_r5_performance`, `cm_r5_economy`, `cm_r6`, `cmata_r3`, `cmata_archive`, `cmata_r6`, `cmata_r10`, `clarsas_archive`, `clarsas_r6`, `clarsas_r10`, `clarefd_r5`, `clarefd_r10`, `cmsas_archive`, `cmsas_r6`, `cmsas_r10`, and `cmefd_r5` pools are specified, the default for standard AVM pools is to slice the volumes (`slice=y`), which is overridden by using `slice=n`. The default for mapped pools is not to slice the volumes (`slice=n`). Use `nas_pool` to change the default slice option.

```bash
id=<desired_id>
```

Specifies the ID to be assigned to the new file system. If a file system already exists with the specified ID, a warning is displayed indicating that the ID is not available, and the new file system is assigned the next available ID.

```bash
[-name <name>] [-type <type>] -create {size=<integer>[T|G|M]|samesize=<fs_name>[; cel=<cel_name>]} pool=<pool>
```

Creates a file system on the volume specified by its desired size and storage pool or by using the same size as a specified local or remote file system. Also assigns an optional name and file system type to a file system. If a name is not specified, one is assigned automatically. A file system name can be up to 240 characters, but cannot begin with a dash (-), be comprised entirely of integers or be a single integer, contain the word root or contain a colon (:). Available file system types are `uxfs` (default), `mgfs`, or `rawfs`.

When using the `samesize` option by using the options described below, the `slice=` should be set to `y`. The new file system is created with the same size as the specified file system.

The `pool` option specifies a rule set for the new file system that contains automatically created volumes and defines the type of disk volumes used and how they are aggregated. Storage pools are system defined (storage pool description provides more information) or user defined.

```bash
[worm={enterprise|compliance|off}]
```

Enables the storage capability on the new file system. The capability can only be specified when creating a new file system; existing file systems cannot be converted. After a file system is enabled, it is persistently marked as such until the time when it is deleted.
CAUTION

The Enterprise version of this feature is intended for self-regulated archiving. The administrator is considered as a trusted user and this feature does not protect the archived data from the administrator's actions. If the administrator attempts to delete a file system, the file system issues a warning message and prompts the administrator to confirm the operation. This version of this feature is not intended for high-end compliance applications such as pharmaceuticals, aerospace, or finance.

As part of enabling file-level retention (worm) on a new file system, you can also set these retention period options:

[-default_retention]  \(<integer>{Y|M|D|infinite}\)]
Sets a default retention period that is used in an FLR-enabled file system when a file is locked and a retention period is not specified. This value must be greater than or equal to the -min_retention option, and less than or equal to the -max_retention option. Type an integer and specify \(Y\) for years, \(M\) for months, \(D\) for days, or \(infinite\). The default value is \(infinite\) which means that the files can never be deleted.

[-min_retention]  \(<integer>{Y|M|D|infinite}\)]
Setsthe minimum retention period that files on an FLR-enabled file system can be locked and protected from deletion. This value must be less than or equal to the -max_retention option. Type an integer and specify \(Y\) for years, \(M\) for months, \(D\) for days, or \(infinite\). The default value is 1 day. Setting \(infinite\) means that the files can never be deleted.

[-max_retention]  \(<integer>{Y|M|D|infinite}\)]
Sets the maximum retention period that files on an FLR-enabled file system can be locked and protected from deletion. Type an integer and specify \(Y\) for years, \(M\) for months, \(D\) for days, or \(infinite\). The default value is \(infinite\) which means that the files can never be deleted.

(storage=<system_name>)
Specifies the system on which the file system resides. Use nas_storage -list to obtain a list of the available system names.

[-auto_extend]  \(no|yes\)  [-thin]  \(no|yes\)]
For an AVM file system, turns automatic file system extension and thin provisioning on or off, and sets a high water mark and maximum size for the file system. When automatic file system
extension is turned on, the file system is automatically extended up to the maximum size specified when the high water mark is reached. The default for \texttt{-auto\_extend} is \texttt{no}.

Thin provisioning reports the maximum file system size to the CIFS, NFS, and FTP users, even if the actual size of the file system is smaller. If disabled, the true file system size and maximum file system sizes are reported to the system administrator. Thin provisioning requires that a maximum file system size also be set.

If a file system is created in a storage pool that contains:

- Only thick LUNs, use the nas\_fs command’s \texttt{-thin} option to enable thin provisioning on the file system.
- Only thin LUNs, using the nas\_fs command’s \texttt{-thin} option is not recommended. It is redundant, but allowed, for a thin file system to be built on thin LUNs.
- Both thick and thin LUNs, the file system may be built on either thick LUNs, thin LUNs, or both thick and thin LUNs. Using the nas\_fs command’s \texttt{-thin} option may be redundant if the file system uses thin LUNs.

\textbf{Note:} SRDF pools are not supported.

\texttt{[-hwm \langle50-99\rangle\%]}  
Specifies the size threshold that must be reached before the file system is automatically extended. Type an integer between the range of 50 and 99 to represent the percentage of file system usage. The default is 90.

\texttt{[-max\_size \langleinteger\rangle \ [T|G|M]]}  
Sets the maximum file system size to which a file system can be extended. Type an integer and specify \texttt{T} for terabytes, \texttt{G} for gigabytes (default), or \texttt{M} for megabytes. If the \texttt{-max\_size} option is not specified, then it defaults to the maximum limit of the file system size which is 16 terabytes. Maximum size must be set to enable thin provisioning. The maximum size is what is presented to users as the file system size through thin provisioning.

\texttt{[-option \langleoptions\rangle]}  
Specifies the following comma-separated options:

\texttt{nbpi=\langlenumber\rangle}  
The number of bytes per inode block. The default is 8192 bytes.
mover=<movername>
Assigns an optional Data Mover on which to build a file system. If no Data Mover is assigned, the system will automatically pick the first available Data Mover to build the file system.

slice={y|n}
Specifies whether the disk volumes used by the new file system may be shared with other file systems by using a slice. The slice=y option allows the file system to share disk volumes with other file systems. The slice=n option ensures that the new file system has exclusive access to the disk volumes it uses, and is relevant when using TimeFinder/FS.

When symm_std, symm_std_rdf_src, symm_ata, symm_ata_rdf_src, symm_ata_rdf_tgt, and symm_std_rdf_tgt pools are specified, the default is not to slice the volumes, which is overridden with slice=y. For symm_efd, the default is slice=y, because TimeFinder/FS is not supported with Flash disk types.

When clar_r1, clar_r5_performance, clar_r5_economy, clar_r6, clarata_r3, clarata_r6, clarata_r10, clarata_archive, cm_r1, cm_r5_performance, cm_r5_economy, cm_r6, cmata_r3, cmata_archive, cmata_r6, cmata_r10, claras_archive, claras_r6, claras_r10, clarefd_r5, clarefd_r10, cmsas_archive, cmsas_r6, cmsas_r10, and cmefd_r5 pools are specified, the default for standard AVM pools is to slice the volumes (slice=y), which is overridden by using slice=n. The default for mapped pools is not to slice the volumes (slice=n). Use nas_pool to change the default slice option.

[-name <name>] -type nmfs -create
Creates a nested mount file system (NMFS) that can be used to combine multiple udfs file systems into a single virtual file system. The NMFS can then be mounted and exported as a single share or mount point.

SEE ALSO

SYSTEM OUTPUT
The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM before a set
of integers, for example, APM00033900124-0019. Symmetrix systems appear as 002804000190-003C. The outputs displayed in the examples use a VNX for block.

VNX for block supports the following system-defined storage pools: clar_r1, clar_r5_performance, clar_r5_economy, clar_r6, clarata_r3, clarata_r6, clarata_r10, clarata_archive, cm_r1, cm_r5_performance, cm_r5_economy, cm_r6, cmata_r3, cmata_archive, cmata_r6, cmata_r10, clarsas_archive, clarsas_r6, clarsas_r10, clarefd_r5, clarefd_r10, cmsas_archive, cmsas_r6, cmsas_r10, and cmefd_r5.

VNXs with a Symmetrix system support the following system-defined storage pools: symm_std_rdf_src, symm_std, symm_ata, symm_ata_rdf_src, symm_ata_rdf_tgt, symm_std_rdf_tgt, symm_efd, symm_fts, symm_fts_rdf_tgt, and symm_fts_rdf_src.

For user-defined storage pools, the difference in output is in the disk type. Disk types when using a Symmetrix are STD, R1STD, R2STD, BCV, R1BCV, R2BCV, ATA, R1ATA, R2ATA, BCVA, R1BCA, R2BCA, EFD, FTS, R1FTS, R2FTS, R1BCF, R2BCF, and BCVF.

Disk types when using VNX for block are: CLSTD, CLEFD, CLATA, MIXED (indicates that tiers used in the pool contain multiple disk types), Performance, Capacity, and Extreme_performance and for VNX for block involving mirrored disks are: CMEFD, CMSTD, CMATA, Mirrored_mixed, Mirrored_performance, Mirrored_capacity, and Mirrored_extreme_performance.

EXAMPLE #1

To create a file system named ufs1 on metavolume mtv1, type:

```bash
$ nas_fs -name ufs1 -create mtv1
```

```
id        = 37
name      = ufs1
acl       = 0
in_use    = False
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Clock not initialized
worm Max Retention Date= NA
worm Default Retention Period= infinite
worm Minimum Retention Period= 1 Day
worm Maximum Retention Period= infinite
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume    = mtv1
pool      =
```
The nas Commands

rw_servers=
ro_servers=
 rw_vdms   =
 ro_vdms   =
auto_ext  = no,thin=no
deduplication = off
stor_devs = APM00042000818-0012,APM00042000818-0014
disks     = d7,d9

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Automatically assigned ID of a file system.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to a file system.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control value assigned to the file system.</td>
</tr>
<tr>
<td>in_use</td>
<td>If a file system is registered into the mount table of a Data Mover.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system. -list provides information for a description of the types.</td>
</tr>
<tr>
<td>worm</td>
<td>Write Once Read Many (WORM) state of file system. It states whether the state is disabled or set to either compliance or enterprise.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which a file system resides.</td>
</tr>
<tr>
<td>pool</td>
<td>Storage pool for the file system.</td>
</tr>
<tr>
<td>rw_servers</td>
<td>Servers with read/write access to a file system.</td>
</tr>
<tr>
<td>ro_servers</td>
<td>Servers with read-only access to a file system.</td>
</tr>
<tr>
<td>rw_vdms</td>
<td>VDM servers with read/write access to a file system.</td>
</tr>
<tr>
<td>ro_vdms</td>
<td>VDM servers with read-only access to a file system.</td>
</tr>
<tr>
<td>worm_clock</td>
<td>Software clock maintained by the file system. The clock functions only when the file system is mounted read/write.</td>
</tr>
<tr>
<td>worm Max Retention Date</td>
<td>Time when the protected files expire. The file system can be deleted only after this date. The special values returned are:</td>
</tr>
<tr>
<td></td>
<td>• 3 — The file system is FLR-E with protected files.</td>
</tr>
<tr>
<td></td>
<td>• 2 — The file system is scanning for max_retention period.</td>
</tr>
<tr>
<td></td>
<td>• 1 — The default value (no protected files created).</td>
</tr>
<tr>
<td></td>
<td>• 0 — Infinite retention period (if the server is up and running).</td>
</tr>
<tr>
<td>worm Default Retention Period</td>
<td>Specifies a default retention period that files on an FLR-enabled file system will be locked and protected from deletion. If you do not set either a minimum retention period or a maximum retention period, this default value is used when file-level retention is enabled.</td>
</tr>
<tr>
<td>worm Minimum Retention Period</td>
<td>Specifies the minimum retention period that files on an FLR-enabled file system will be locked and protected from deletion.</td>
</tr>
<tr>
<td>worm Maximum Retention Period</td>
<td>Specifies the maximum retention period that files on an FLR-enabled file system will be locked and protected from deletion.</td>
</tr>
<tr>
<td>FLR Auto_lock</td>
<td>Specifies whether automatic file locking for all files in an FLR-enabled file system is on or off.</td>
</tr>
<tr>
<td>FLR Policy Interval</td>
<td>Specifies an interval for how long to wait after files are modified before the files are automatically locked and protected from deletion.</td>
</tr>
<tr>
<td>FLR Auto_delete</td>
<td>Specifies whether locked files are automatically deleted once the retention period has expired.</td>
</tr>
</tbody>
</table>
The nas Commands

- **FLR Epoch Year**: Specifies the base year used for calculating the retention date of a file beyond 2038. When a file is locked with its atime set to a value greater than the FLR Epoch Year value, the file's retention date is set to the file's atime value. When a file is locked with its atime set to a value less than the FLR Epoch Year value, the file's retention date is set to 2038 + (YEAR(atime) - 1970).

- **volume**: Volume on which a file system resides.
- **pool**: Storage pool for the file system.
- **rw_servers**: Servers with read/write access to a file system.
- **ro_servers**: Servers with read-only access to a file system.
- **rw_vdms**: VDM servers with read/write access to a file system.
- **ro_vdms**: VDM servers with read-only access to a file system.
- **auto_ext**: Indicates whether auto-extension and thin provisioning are enabled.
- **deduplication**: Deduplication state of the file system. The file data is transferred to the storage which performs the deduplication and compression on the data. The states are:
  - **On**: Deduplication on the file system is enabled.
  - **Suspended**: Deduplication on the file system is suspended. Deduplication does not perform any new space reduction but the existing files that were reduced in space remain the same.
  - **Off**: Deduplication on the file system is disabled. Deduplication does not perform any new space reduction and the data is now reduplicated.
- **stor_devs**: System devices associated with a file system.
- **disks**: Disks on which the metavolume resides.

**Note:** The deduplication state is **unavailable** when the file system is unmounted.

**EXAMPLE #2**

To display information about a file system by using the file system ID, 14, using the clar_mapped_pool VNX mapped pool, type:

```
$ nas_fs -info id=14
```

```
id  = 14
name = ufs2_flre
acl  = 0
in_use = True
type = uxfs
worm = enterprise with no protected files
worm_clock= Fri Jul 29 07:56:42 EDT 2011
worm Max Retention Date= No protected files created
worm Default Retention Period= 10 Years
worm Minimum Retention Period= 30 Days
worm Maximum Retention Period= 10 Years
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume = v117
pool = clar_mapped_pool
member_of = root_avm_fs_group_50
rw_servers= server_2
```
The nas Commands

ro_servers=
ro_vdms =
auto_ext = no,thin=no
deduplication = Off
thin_storage = True
tiering_policy = Auto-tier
compressed= False
mirrored = False
stor_devs =
BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010
disks = d16,d13,d12,d7
disk=d16   stor_dev=BB005056830430-0019 addr=c0t1l9         server=server_2
disk=d16   stor_dev=BB005056830430-0019 addr=c16t1l9        server=server_2
disk=d13   stor_dev=BB005056830430-0016 addr=c0t1l6         server=server_2
disk=d13   stor_dev=BB005056830430-0016 addr=c16t1l6        server=server_2
disk=d12   stor_dev=BB005056830430-0015 addr=c0t1l5         server=server_2
disk=d12   stor_dev=BB005056830430-0015 addr=c16t1l5        server=server_2
disk=d7    stor_dev=BB005056830430-0010 addr=c0t1l0         server=server_2
disk=d7    stor_dev=BB005056830430-0010 addr=c16t1l0        server=server_2

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>thin_storage</td>
<td>Indicates whether the VNX for block system uses thin provisioning. Values are: True, False, Mixed.</td>
</tr>
<tr>
<td>tiering_policy</td>
<td>Indicates the tiering policy in effect. If the initial tier and the tiering policy are the same, the values are: Auto-Tier, Highest Available Tier, Lowest Available Tier. If the initial tier and the tiering policy are not the same, the values are: Auto-Tier/No Data Movement, Highest Available Tier/No Data Movement, Lowest Available Tier/No Data Movement.</td>
</tr>
<tr>
<td>compressed</td>
<td>Indicates whether data is compressed. Values are True, False, Mixed (indicates some of the LUNs, but not all, are compressed).</td>
</tr>
<tr>
<td>mirrored</td>
<td>Indicates whether the disk is mirrored.</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**  To display a list of file systems, type:

```
$ nas_fs -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>type</th>
<th>acl</th>
<th>volume</th>
<th>name</th>
<th>server</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>20</td>
<td>root_fs_1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>50</td>
<td>root_fs_common</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>83</td>
<td>root_fs_ufslog</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>103</td>
<td>root_fs_d3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>104</td>
<td>root_fs_d4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>105</td>
<td>root_fs_d5</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>106</td>
<td>root_fs_d6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>22</td>
<td>root_fs_2</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>n</td>
<td>5</td>
<td>0</td>
<td>108</td>
<td>root_panic_reserve</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>112</td>
<td>ufs1</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>115</td>
<td>ufs1_flr</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>117</td>
<td>ufs2_flre</td>
<td>1</td>
</tr>
</tbody>
</table>

**nas_fs**  247
EXAMPLE #4  To list all the file systems including internal checkpoints, type:

```
$ nas_fs -list -all
```

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td></td>
<td>0</td>
<td>24</td>
<td>root_fs_1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td></td>
<td>0</td>
<td>26</td>
<td>root_fs_2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td></td>
<td>0</td>
<td>28</td>
<td>root_fs_3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td></td>
<td>0</td>
<td>30</td>
<td>root_fs_4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td></td>
<td>0</td>
<td>32</td>
<td>root_fs_5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td></td>
<td>0</td>
<td>34</td>
<td>root_fs_6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td></td>
<td>0</td>
<td>36</td>
<td>root_fs_7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td></td>
<td>0</td>
<td>38</td>
<td>root_fs_8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td></td>
<td>0</td>
<td>40</td>
<td>root_fs_9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td></td>
<td>0</td>
<td>42</td>
<td>root_fs_10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td></td>
<td>0</td>
<td>44</td>
<td>root_fs_11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td></td>
<td>0</td>
<td>46</td>
<td>root_fs_12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0</td>
<td></td>
<td>0</td>
<td>48</td>
<td>root_fs_13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0</td>
<td></td>
<td>0</td>
<td>50</td>
<td>root_fs_14</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>0</td>
<td></td>
<td>0</td>
<td>52</td>
<td>root_fs_15</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0</td>
<td></td>
<td>0</td>
<td>54</td>
<td>root_fs_common</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td></td>
<td>0</td>
<td>87</td>
<td>root_fs_ufslog</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>0</td>
<td></td>
<td>0</td>
<td>90</td>
<td>root_panic_reserve</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>0</td>
<td></td>
<td>0</td>
<td>315</td>
<td>v2src1</td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>0</td>
<td></td>
<td>0</td>
<td>318</td>
<td>v2dst1</td>
<td></td>
</tr>
<tr>
<td>230</td>
<td>0</td>
<td></td>
<td>0</td>
<td>346</td>
<td>v2srclun1</td>
<td></td>
</tr>
<tr>
<td>231</td>
<td>0</td>
<td></td>
<td>0</td>
<td>349</td>
<td>v2dstlun1</td>
<td></td>
</tr>
<tr>
<td>342</td>
<td>0</td>
<td></td>
<td>0</td>
<td>560</td>
<td>root_fs_vdm_srcvdm1</td>
<td></td>
</tr>
<tr>
<td>343</td>
<td>0</td>
<td></td>
<td>0</td>
<td>563</td>
<td>root_fs_vdm_srcvdm2</td>
<td></td>
</tr>
<tr>
<td>986</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>vpfss986</td>
<td></td>
</tr>
<tr>
<td>987</td>
<td>0</td>
<td></td>
<td>0</td>
<td>1722</td>
<td>gstest</td>
<td></td>
</tr>
<tr>
<td>988</td>
<td>0</td>
<td></td>
<td>0</td>
<td>1725</td>
<td>src1</td>
<td></td>
</tr>
<tr>
<td>989</td>
<td>0</td>
<td></td>
<td>0</td>
<td>1728</td>
<td>dst1</td>
<td></td>
</tr>
<tr>
<td>1343</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>vpfss1343</td>
<td></td>
</tr>
<tr>
<td>1344</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2351</td>
<td>root_rep_ckpt_342_2</td>
<td></td>
</tr>
<tr>
<td>1345</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2351</td>
<td>root_rep_ckpt_342_2</td>
<td></td>
</tr>
<tr>
<td>1346</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2354</td>
<td>root_fs_vdm_srcvdm1</td>
<td></td>
</tr>
<tr>
<td>1347</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>vpfss1347</td>
<td></td>
</tr>
<tr>
<td>1348</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2358</td>
<td>root_rep_ckpt_1346_1</td>
<td></td>
</tr>
<tr>
<td>1349</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2358</td>
<td>root_rep_ckpt_1346_1</td>
<td></td>
</tr>
<tr>
<td>1350</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2367</td>
<td>fs1</td>
<td></td>
</tr>
<tr>
<td>1351</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2374</td>
<td>fsl_replica1</td>
<td></td>
</tr>
<tr>
<td>1352</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2374</td>
<td>fsl_replica1</td>
<td></td>
</tr>
<tr>
<td>1353</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2383</td>
<td>root_rep_ckpt_1350_ v9</td>
<td></td>
</tr>
<tr>
<td>1354</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2383</td>
<td>root_rep_ckpt_1350_ v9</td>
<td></td>
</tr>
<tr>
<td>1355</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2385</td>
<td>fsl_replica2</td>
<td></td>
</tr>
<tr>
<td>1356</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2385</td>
<td>fsl_replica2</td>
<td></td>
</tr>
<tr>
<td>1357</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2388</td>
<td>root_rep_ckpt_1361_</td>
<td></td>
</tr>
<tr>
<td>1358</td>
<td>0</td>
<td></td>
<td>0</td>
<td>2388</td>
<td>root_rep_ckpt_1361_</td>
<td></td>
</tr>
</tbody>
</table>
The nas Commands

1365  y  1  0  2392  fs1365
1366  y  7  0  2383  root_repckpt_1350_ v9
1367  y  7  0  2383  root_repckpt_1350_ v9
1368  n  11  0  0  vpfs1368
1369  n  7  0  2395  root_repckpt_1354_
1370  n  7  0  2395  root_repckpt_1354_
1371  y  1  0  2399  root_fs_vdm_v1  1
1372  y  1  0  2401  f1  v40
1376  y  1  0  2406  root_fs_vdm_v1_rep1  2
1380  n  11  0  0  vpfs1380
1381  y  7  0  2414  root_repckpt_1372_ v40
1382  y  7  0  2414  root_repckpt_1372_ v40
1383  y  1  0  2416  f1_replica1  v41
1384  n  11  0  0  vpfs1384
1385  y  7  0  2419  root_repckpt_1383_ v41
1386  y  7  0  2419  root_repckpt_1383_ v41
1387  y  1  0  2423  cworm  1
1388  n  1  0  2425  cworm1
1389  y  1  0  2427  fs2  2
1390  y  1  0  2429  fs3  2
1391  n  11  0  0  vpfs1391
1392  y  7  0  2432  root_repckpt_1389_ 2
1393  y  7  0  2432  root_repckpt_1389_ 2
1394  n  11  0  0  vpfs1394
1395  y  7  0  2435  root_repckpt_1390_ 2
1396  y  7  0  2435  root_repckpt_1390_ 2
1397  y  7  0  2432  fs2ckpt1  2
1398  y  1  0  2439  fs4  2
1399  y  1  0  2441  fs5  2
1400  n  11  0  0  vpfs1400
1401  y  7  0  2444  root_repckpt_1398_ 2
1402  y  7  0  2444  root_repckpt_1398_ 2
1403  n  11  0  0  vpfs1403
1404  y  7  0  2447  root_repckpt_1399_ 2
1405  y  7  0  2447  root_repckpt_1399_ 2
1406  y  7  0  2444  fs4ckpt1  2

Note: NDMP and Replicator internal checkpoints can be identified by specific prefixes in the filename. Using VNX SnapSure provides more information for internal checkpoints naming formats.

EXAMPLE #5

To create a **uxfs** file system named **ufs20** on system **BB005056830430**, with a size of **1 GB**, by using the **clar_r5_performance** pool and allowing the file system to share disk volumes with other file systems, type:

```bash
$ nas_fs -name ufs20 -type uxfs -create size=1G pool=clar_r5_performance storage=BB005056830430 -option slice=y
```

id   = 15
The nas Commands

name = ufs20
acl = 0
in_use = False
type = uxf
worm = off
volume = v119
pool = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms = 
ro_vdms =
auto_ext = no,thin=no
deduplication = unavailable
stor_devs = BB005056830430-0018, BB005056830430-0017, BB005056830430-0014, BB005056830430-0011
disks = d15,d14,d11,d8

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>member_of</td>
<td>File system group to which the file system belongs.</td>
</tr>
</tbody>
</table>

EXAMPLE #1 provides a description of command output.

EXAMPLE #6 To create a rawfs file system named ufs3 with the same size as the file system ufs1 by using the clar_r5_performance pool and allowing the file system to share disk volumes with other file systems, type:

```
$ nas_fs -name ufs3 -type rawfs -create samesize=ufs1 pool=clar_r5_performance storage=APM00042000818 -option slice=y
```

id = 39
name = ufs3
acl = 0
in_use = False
type = rawfs
worm = off
volume = v173
pool = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms = 
ro_vdms =
auto_ext = no,thin=no
deduplication = unavailable
stor_devs = APM00042000818-001F, APM00042000818-001D, APM00042000818-0019, APM00042000818-0016
disks = d20,d18,d14,d11
EXAMPLE #1 and EXAMPLE #3 provide a description of command outputs.

**EXAMPLE #7** To create a *uxfs* file system named *uf4*, with a size of 100 GB, by using the *clar_r5_performance* pool, with file-level retention set to *enterprise*, 4096 bytes per inode, and *server_3* for file system building, type:

```
$ nas_fs -name ufs4 -create size=100G
    pool=clar_r5_performance worm=enterprise -option
    nbpi=4096,mover=server_3
```

```
id        = 16
name      = ufs4
acl       = 0
in_use    = False
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Clock not initialized
worm Max Retention Date= NA
worm Default Retention Period= infinite
worm Minimum Retention Period= 1 Day
worm Maximum Retention Period= infinite
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume    = v121
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
deduplication = unavailable
stor_devs  = BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010
disks     = d16,d13,d12,d7
```

To ensure retention of protected files, it can also be set to *compliance* by typing:

```
$ nas_fs -name ufs4 -create size=100G
    pool=clar_r5_performance worm=compliance -option
    nbpi=4096,mover=server_3
```

```
id        = 17
name      = ufs4
acl       = 0
in_use    = False
type      = uxfs
worm      = compliance with no protected files
```
EXAMPLE #1 provides a description of command outputs.

**EXAMPLE #8**

To create a file system named **ufs30**, with a size of **1 GB**, by using the **clar_r5_performance** pool, with file-level retention set to **enterprise**, a minimum retention period of **30 days**, and a maximum retention period of **10 years**, type:

```bash
$ nas_fs -name ufs30 -create size=1G pool=clar_r5_performance worm=enterprise -min_retention 30D -max_retention 10Y
```

```plaintext
id        = 18
name      = ufs30
acl       = 0
in_use    = False
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Clock not initialized
worm Max Retention Date= NA
worm Default Retention Period= 10 Years
worm Minimum Retention Period= 30 Days
worm Maximum Retention Period= 10 Years
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume    = v123
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms   = 
ro_vdms   = 
auto_ext  = no,thin=no
deduplication = unavailable
stor_devs = BB005056830430-0018,BB005056830430-0017,BB005056830430-0014,BB005056830430-0011
disks     = d15,d14,d11,d8
```
The nas Commands

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #9 To display information about file system ufs4, type:

```
$ nas_fs -info ufs4
```

id = 16  
name = ufs4  
acl = 0  
in_use = False  
type = uxfs  
worm = enterprise with no protected files  
worm_clock= Clock not initialized  
worm Max Retention Date= NA  
worm Default Retention Period= infinite  
worm Minimum Retention Period= 1 Day  
worm Maximum Retention Period= infinite  
FLR Auto_lock= off  
FLR Policy Interval= 3600 seconds  
FLR Auto_delete= off  
FLR Epoch Year= 2003  
volume = v121  
pool = clar_r5_performance  
member_of = root_avm_fs_group_3  
rw_servers=  
ro_servers=  
rw_vdms =  
ro_vdms =  
auto_ext = no,thin=no  
deduplication = unavailable  
stor_devs =  
BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010  
disks = d16,d13,d12,d7
```

EXAMPLE #10 To create a *uxfs* file system named *ufs40*, with a size of 10 GB, by using the *clar_r5_performance* pool, and an ID of 8000 assigned to *ufs1*, type:
EXAMPLE #11

To create a **uxfs** file system named **ufs41**, with a size of **10 GB**, by using the **clar_r5_performance** pool, and an ID of 8000 assigned to **ufs1**, type:

```bash
$ nas_fs -name ufs41 -type uxfs -create size=10G pool=clar_r5_performance -option slice=y,id=8000
```

```plaintext
id        = 8001
name      = ufs41
acl       = 0
in_use    = False
type      = uxfs
worm      = off
volume    = v129
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms   = 
ro_vdms   =
auto_ext  = no,thin=no
deduplication   = unavailable
stor_devs   = 
  BB005056830430-0019,BB005056830430-0016,BB005056830430-0015, BB005056830430-0010
disks     = d16,d13,d12,d7
```

Warning 17716815881: unavailable id : 8000.
**The nas Commands**

**Note:** The warning output is displayed if the desired ID is not available. Because id=8000 was used in Example 10, the system set the id to 8001 instead.

---

**EXAMPLE #12** To view the size of ufs1, type:

```bash
$ nas_fs -size ufs1
```

total = 945 avail = 945 used = 1 ( 0% ) (sizes in MB) ( blockcount = 2097152 )

volume: total = 1024 (sizes in MB) ( blockcount = 2097152 ) avail = 944 used = 80 ( 8% )

When a file system is mounted, the size info for the volume and a file system, as well as the number of blocks that are used are displayed.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>Total size of the file system.</td>
</tr>
<tr>
<td>blockcount</td>
<td>Total number of blocks used.</td>
</tr>
</tbody>
</table>

**EXAMPLE #13** To rename a file system from ufs1 to ufs5, type:

```bash
$ nas_fs -rename ufs1 ufs5
```

id        = 11
name      = ufs5
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = v112
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
deduplication = Off
stor_devs =
BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010
disks     = d16,d13,d12,d7
disk=d16  stor_dev=BB005056830430-0019 addr=c0t1l9 server=server_2
disk=d16  stor_dev=BB005056830430-0019 addr=c16t1l9 server=server_2
disk=d13  stor_dev=BB005056830430-0016 addr=c0t1l6 server=server_2
disk=d13  stor_dev=BB005056830430-0016 addr=c16t1l6 server=server_2
disk=d12  stor_dev=BB005056830430-0015 addr=c0t1l5 server=server_2
disk=d12  stor_dev=BB005056830430-0015 addr=c16t1l5 server=server_2
disk=d7   stor_dev=BB005056830430-0010 addr=c0t1l0 server=server_2
disk=d7   stor_dev=BB005056830430-0010 addr=c16t1l0 server=server_2
EXAMPLE #1 and EXAMPLE #3 provide a description of command outputs.

EXAMPLE #14 To extend the file system, ufs1, with the volume, emtv2b, type:

$ nas_fs -xtend ufs1 emtv2b

id        = 38
name      = ufs1
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = v171
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
deduplication = off
stor_devs = APM00042000818-001F,APM00042000818-001D,APM00042000818-0019,APM00042000818-0016,APM00042000818-001C
disks     = d20,d18,d14,d11,d17
disk=d20   stor_dev=APM00042000818-001F addr=c0t1l15        server=server_2
disk=d20   stor_dev=APM00042000818-001F addr=c32t1l15       server=server_2
disk=d18   stor_dev=APM00042000818-001D addr=c0t1l13        server=server_2
disk=d18   stor_dev=APM00042000818-001D addr=c32t1l13       server=server_2
disk=d14   stor_dev=APM00042000818-0019 addr=c0t1l9         server=server_2
disk=d14   stor_dev=APM00042000818-0019 addr=c32t1l9        server=server_2
disk=d11   stor_dev=APM00042000818-0016 addr=c0t1l6         server=server_2
disk=d11   stor_dev=APM00042000818-0016 addr=c32t1l6        server=server_2
disk=d17   stor_dev=APM00042000818-001C addr=c0t1l12        server=server_2
disk=d17   stor_dev=APM00042000818-001C addr=c32t1l12       server=server_2

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #15 To extend the file system named ufs5, with the specified size of 1 GB, by using clar_r5_performance pool, type:

$ nas_fs -xtend ufs5 size=1G pool=clar_r5_performance

id        = 11
name      = ufs5
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = v112
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
The nas Commands

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #16  To set the access control level to 1432 for the file system ufs5, type:

```
$ nas_fs -acl 1432 ufs5
```

```
id        = 11  
name      = ufs5  
accl      = 1432, owner=nasadmin, ID=201  
in_use    = True  
type      = uxfs  
worm      = off  
volume    = v112  
pool      = clar_r5_performance  
member_of = root_avm_fs_group_3  
rw_servers= server_2  
ro_servers=  
rw_vdms   =  
ro_vdms   =  
auto_ext  = no,thin=no  
deduplication = Off  
stor_devs =  
BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010  
disks     = d16,d13,d12,d7  
disk=d16 stor_dev=BB005056830430-0019 addr=c0t1l9         server=server_2  
disk=d16 stor_dev=BB005056830430-0019 addr=c16t1l9        server=server_2  
disk=d13 stor_dev=BB005056830430-0016 addr=c0t1l6         server=server_2  
disk=d13 stor_dev=BB005056830430-0016 addr=c16t1l6        server=server_2  
disk=d12 stor_dev=BB005056830430-0015 addr=c0t1l5         server=server_2  
disk=d12 stor_dev=BB005056830430-0015 addr=c16t1l5        server=server_2  
disk=d7  stor_dev=BB005056830430-0010 addr=c0t1l0         server=server_2  
disk=d7  stor_dev=BB005056830430-0010 addr=c16t1l0        server=server_2
```
The nas Commands

Note: The value 1432 specifies **nasadmin** as the owner and gives users with an access level of at least observer read access only, users with an access level of at least operator read/write access, and users with an access level of at least admin read/write/delete access.

**EXAMPLE #1** provides a description of command outputs.

**EXAMPLE #17** To set the maximum retention period for file system **ufs2_flre** to 11 years, type:

```
$ nas_fs -modify ufs2_flre -worm -max_retention 11Y
```

```
id        = 14
name      = ufs2_flre
acl       = 0
in_use    = True
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Fri Jul 29 11:14:27 EDT 2011
worm Max Retention Date= No protected files created
worm Default Retention Period= 10 Years
worm Minimum Retention Period= 30 Days
worm Maximum Retention Period= 11 Years
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume    = v117
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no, thin=no
deduplication = Off
stor_devs =
BB005056830430-0019, BB005056830430-0016, BB005056830430-0015, BB005056830430-0010
disks    = d16, d13, d12, d7
  disk=d16  stor_dev=BB005056830430-0019  addr=c0t1l19  server=server_2
  disk=d16  stor_dev=BB005056830430-0019  addr=c16t1l19 server=server_2
  disk=d13  stor_dev=BB005056830430-0016  addr=c0t1l16 server=server_2
  disk=d13  stor_dev=BB005056830430-0016  addr=c16t1l16 server=server_2
  disk=d12  stor_dev=BB005056830430-0015  addr=c0t1l15 server=server_2
  disk=d12  stor_dev=BB005056830430-0015  addr=c16t1l15 server=server_2
  disk=d7   stor_dev=BB005056830430-0010  addr=c0t1l10 server=server_2
  disk=d7   stor_dev=BB005056830430-0010  addr=c16t1l10 server=server_2
```

**EXAMPLE #1** provides a description of command outputs.
To set the maximum retention period for file system `ufs2_flre` to 11 years, type:

```
$ nas_fs -modify ufs2_flre -worm -max_retention 11Y
```

```
id        = 14
name      = ufs2_flre
acl       = 0
in_use    = True
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Fri Jul 29 11:14:27 EDT 2011
worm Max Retention Date= No protected files created
worm Default Retention Period= 10 Years
worm Minimum Retention Period= 30 Days
worm Maximum Retention Period= 11 Years
FLR Auto_lock= off
FLR Policy Interval= 3600 seconds
FLR Auto_delete= off
FLR Epoch Year= 2003
volume    = v117
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers= rw_vdms =
ro_vdms =
auto_ext = no,thin=no
deduplication = Off
stor_devs = BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010
disks     = d16,d13,d12,d7
disk=d16   stor_dev=BB005056830430-0019 addr=c0t1l9         server=server_2
disk=d16   stor_dev=BB005056830430-0019 addr=c16t1l9        server=server_2
disk=d13   stor_dev=BB005056830430-0016 addr=c0t1l6         server=server_2
disk=d13   stor_dev=BB005056830430-0016 addr=c16t1l6        server=server_2
disk=d12   stor_dev=BB005056830430-0015 addr=c0t1l5         server=server_2
disk=d12   stor_dev=BB005056830430-0015 addr=c16t1l5        server=server_2
disk=d7    stor_dev=BB005056830430-0010 addr=c0t1l0         server=server_2
disk=d7    stor_dev=BB005056830430-0010 addr=c16t1l0        server=server_2
```

**EXAMPLE #1** provides a description of command outputs.

**EXAMPLE #18** To reset the FLR epoch year for file system `ufs2_flre` to 2000, type:

```
$ nas_fs -modify ufs2_flre -worm -reset_epoch 2000
```

```
id        = 14
name      = ufs2_flre
acl       = 0
in_use    = True
type      = uxfs
worm      = enterprise with no protected files
```
EXAMPLE #19  To enable FLR automatic file locking with a policy interval of 30 minutes for file system ufs2_flre, type:

```
$ nas_fs -modify ufs2_flre -worm -auto_lock enable
   -policy_interval 30M
```
The nas Commands

EXAMPLE #20  To enable FLR automatic file deletion for file system ufs2_flre, type

}:$ nas_fs -modify ufs2_flre -worm -auto_delete enable

id        = 40
name      = ufs4
acl       = 0
in_use    = True
type      = uxfs
worm      = enterprise with no protected files
worm_clock= Wed Jul  6 11:11:13 UTC 2011
worm Max Retention Date= No protected files created
worm Default Retention Period= 1 Year
worm Minimum Retention Period= 1 Day
worm Maximum Retention Period= 1 Year
FLR Auto_lock= on
FLR Policy Interval= 1800 seconds
FLR Auto_delete= on
FLR Epoch Year= 2000
volume    = v175
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers=
ro_servers=
rw_vdms    =
ro_vdms    =
auto_ext   = no,thin=no
deduplication = Off
stor_devs  = APM00042000818-001F,APM00042000818-001D,APM00042000818-0019,APM00042
           00818-0016
disks     = d20,d18,d14,d11

EXAMPLE #21  To start the conversion of the file system, ufs2, and to conform to the MIXED access policy mode, type:

nas_fs
$ nas_fs -translate ufs2 -access_policy start -to MIXED -from NT

id        = 38
name      = ufs2
acl       = 1432, owner=nasadmin, ID=201
in_use    = True
type      = uxfs
worm      = off
volume    = v171
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
deduplication = off
stor_devs = APM00042000818-001F,APM00042000818-001D,APM00042000818-0019,APM00042
00818-0016,APM00042000818-001C
disks     = d20,d18,d14,d11,d17
disk=d20   stor_dev=APM00042000818-001F addr=c0t1l15        server=server_2
disk=d20   stor_dev=APM00042000818-001F addr=c32t1l15       server=server_2
disk=d18   stor_dev=APM00042000818-001D addr=c0t1l13        server=server_2
disk=d18   stor_dev=APM00042000818-001D addr=c32t1l13       server=server_2
disk=d14   stor_dev=APM00042000818-0019 addr=c0t1l9         server=server_2
disk=d14   stor_dev=APM00042000818-0019 addr=c32t1l9        server=server_2
disk=d11   stor_dev=APM00042000818-0016 addr=c0t1l16        server=server_2
disk=d11   stor_dev=APM00042000818-0016 addr=c32t1l16       server=server_2
disk=d17   stor_dev=APM00042000818-001C addr=c0t1l12        server=server_2
disk=d17   stor_dev=APM00042000818-001C addr=c32t1l12       server=server_2

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #22 To display the status of access policy conversion for ufs2, type:

$ nas_fs -translate ufs2 -access_policy status

status=In progress
percent_inode_scanned=90

EXAMPLE #23 To create a nested mount file system, nmfs1, type:

$id = 8002
$name = nmfs1
$acl = 0
$in_use = False
$type = nmfs
$worm = off
$volume = 0
$pool =
$rw_servers=

$ nas_fs -name nmfs1 -type nmfs -create
ro_servers=
ro_vdms =
auto_ext = no,thin=no
deduplication = unavailable
stor_devs =
disks =

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #24  To delete ufs1, type:

$ nas_fs -delete ufs1

name = ufs41
acl = 0
in_use = False
type = uxf
worm = off
volume = v129
rw_servers=
ro_servers=
ro_vdms =
auto_ext = no,thin=no
deduplication = unavailable
stor_devs =
disks = d16,d13,d12,d7

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #25  To create a file system named ufs3, with a size of 1 GB, by using the clar_r5_performance pool, a maximum size of 10 GB and with auto-extend and thin provisioning enabled, type:

$ nas_fs -name ufs3 -create size=1G pool=clar_r5_performance -auto_extend yes -max_size 10G -thin yes

id = 8003
name = ufs3
acl = 0
in_use = False
type = uxf
worm = off
volume = v133
pool = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers=
ro_servers=
ro_vdms =
auto_ext = hwm=90%,max_size=10240M,thin=yes
deduplication = unavailable
The nas Commands

stor_devs = 
BB005056830430-0018,BB005056830430-0017,BB005056830430-0014,BB005056830430-0011
disks  = d15,d14,d11,d8

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #26 To disable thin provisioning on ufs3, type:

$ nas_fs -modify ufs3 -thin no

id        = 8003
name      = ufs3
acl       = 0
in_use    = False
type      = uxfs
worm      = off
volume    = v133
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= 
ro_servers= 
rw_vdms   =
ro_vdms   =
auto_ext  = hwm=90%,max_size=10240M,thin=no
deduplication   = unavailable
stor_devs = 
BB005056830430-0018,BB005056830430-0017,BB005056830430-0014,BB005056830430-0011
disks  = d15,d14,d11,d8

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #27 To query the current directory type and translation status for MPD, type:

$ nas_fs -info ufs5 -option mpd

id        = 11
name      = ufs5
acl       = 1432, owner=nasadmin, ID=201
in_use    = True
type      = uxfs
worm      = off
volume    = v112
pool      = clar_r5_performance
member_of = root_avm_fs_group_3
rw_servers= server_2
ro_servers= 
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
deduplication   = Off
stor_devs = 
BB005056830430-0019,BB005056830430-0016,BB005056830430-0015,BB005056830430-0010
disks  = d16,d13,d12,d7
The nas Commands

Multi-Protocol Directory Information

- **Default_directory_type**: DIR3
- **Needs_translation**: False
- **Translation_state**: Never
- **Has_translation_error**: False

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default_directory_type</td>
<td>The default directory type for the file system. Available types are: DIR3 and COMPAT.</td>
</tr>
<tr>
<td>Needs_translation</td>
<td>If true, then the file system may contain more than one directory type. If false, then all directories are of the file system default directory type.</td>
</tr>
<tr>
<td>Translation_state</td>
<td>The current state of the translation thread. Available states are: never, not requested, pending, queued, running, paused, completed, and failed.</td>
</tr>
<tr>
<td>Has_translation_error</td>
<td>Indicated if the most recent translation encountered any errors.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Default_directory_type</th>
<th>Needs_translation state</th>
<th>File system</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIR3</td>
<td>False</td>
<td>Is MPD. No action required.</td>
</tr>
<tr>
<td>DIR3</td>
<td>True</td>
<td>Requires translation or file system maintenance. Contact EMC Customer Service.</td>
</tr>
<tr>
<td>COMPAT</td>
<td>False</td>
<td>Is COMPAT and requires translation. Contact EMC Customer Service.</td>
</tr>
<tr>
<td>COMPAT</td>
<td>True</td>
<td>Requires translation. Contact EMC Customer Service.</td>
</tr>
</tbody>
</table>

The state where both **Default_directory_type=DIR3** and **Needs_translation=False** assure that this file system’s directories are all in MPD format, and there are no directories of the obsolete single-protocol format.

Any other combination of states, for example, **Needs_translation=True**, indicates that there could be non-MPD directories in the file system which may not be compatible with a future release.

**EXAMPLE #28**

To display the information about the file system ufs3 and a valid fast_clone_level of 1 or 2, type::

disk=d16  stor_dev=BB005056830430-0019 addr=c0t1l9  server=server_2
disk=d16  stor_dev=BB005056830430-0019 addr=c16t1l9  server=server_2
disk=d13  stor_dev=BB005056830430-0016 addr=c0t1l6  server=server_2
disk=d13  stor_dev=BB005056830430-0016 addr=c16t1l6  server=server_2
disk=d12  stor_dev=BB005056830430-0015 addr=c0t1l5  server=server_2
disk=d12  stor_dev=BB005056830430-0015 addr=c16t1l5  server=server_2
disk=d7   stor_dev=BB005056830430-0010 addr=c0t1l0  server=server_2
disk=d7   stor_dev=BB005056830430-0010 addr=c16t1l0  server=server_2

To display the information about the file system ufs3 and a valid fast_clone_level of 1 or 2, type::
The nas Commands

$ nas_fs -info ufs3

id = 478
name = ufs2_flre
acl = 0
in_use = False
type = uxfs
worm = off
volume = v1168
pool = clarsas_archive
member_of = root_avm_fs_group_32
rw_servers=
ro_servers=
 rw_vdms =
 ro_vdms =
 auto_ext = no,thin=no
fast_clone_level= unavailable
deduplication = unavailable
stor_devs =
APM00112101832-0019,APM00112101832-0028,APM00112101832-0027,APM00112101832-0022
disks = d25,d19,d32,d16

Example #29
To display the information about a file system using the file system ufs4 using Symmetrix backend mapped pool, type:

$ nas_fs -info ufs4

id = 32
name = ufs4
acl = 0
in_use = True
type = uxfs
worm = off
volume = v644
pool = symm_mapped_pool
member_of = root_avm_fs_group_21
rw_servers= server_2
ro_servers=
 rw_vdms =
 ro_vdms =
 auto_ext = hwm=50%,max_size=1024M,thin=yes
fast_clone_level = 1
deduplication = Off
compressed= Mixed
frontend_io_quota = maxiopersec 500,maxmbpersec 500
stor_devs = 000196900016-0553
disks = d524
disk=d524 stor_dev=000196900016-0553 addr=c4t315-0-0 server=server_2
disk=d524 stor_dev=000196900016-0553 addr=c20t315-0-0 server=server_2
disk=d524 stor_dev=000196900016-0553 addr=c36t315-0-0 server=server_2
disk=d524 stor_dev=000196900016-0553 addr=c52t315-0-0 server=server_2
disk=d524 stor_dev=000196900016-0553 addr=c68t315-0-0 server=server_2
disk=d524 stor_dev=000196900016-0553 addr=c84t315-0-0 server=server_2
The nas Commands

disk=d524 stor_dev=00019690000016-0553 addr=c100t315-0-0 server=server_2
disk=d524 stor_dev=00019690000016-0553 addr=c116t315-0-0 server=server_2

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>compressed</td>
<td>For VNX with Symmetrix backend, indicates whether data is compressed. Values are: True, False, Mixed (indicates some of the LUNs, but not all, are compressed).</td>
</tr>
<tr>
<td>frontend_io_quota</td>
<td>For VNX with Symmetrix backend, indicates if Frotend IO Quota is configured on this mapped pool, could also have value as False (indicates Frontend IO Quota is not configured on mapped SG in Symmetrix backend).</td>
</tr>
</tbody>
</table>
The nas Commands

---

**nas_fsck**

Manages `fsck` and `aclchk` utilities on specified file systems.

**SYNOPSIS**

```
nas_fsck
   -list
   -info { -all | <fs_name> | id=<fs_id> }
   -start { <fs_name> | id=<fs_id> } [-aclcheckonly] [-monitor] [-mover <mover_name>] [-Force]
```

**DESCRIPTION**

`nas_fsck` uses the `fsck` and `aclchk` utilities to perform a check for consistency and errors on the specified file system. `nas_fsck` also lists and displays the status of the `fsck` and `aclchk` utilities. File systems must be mounted read-write to use these utilities.

Depending on the size of the file system, the `fsck` utility may use a significant portion of the system’s memory and may affect overall system performance. Hence, it should not be run on a server under heavy load as it is possible that the server may run out of resources. In most cases, the user will be notified if sufficient memory is not available to run a file system check. In these cases, one of the following can be done:

- Start the file system during off-peak hours.
- Reboot the server and let `nas_fsck` run on reboot.
- Run `nas_fsck` on a different server if the file system is unmounted.

**OPTIONS**

- **-list**
  Displays a list of all the file systems undergoing `fsck` or `aclchk`.

- **-info { -all | <fs_name> | id=<fs_id> }**
  Queries the Data Mover and displays information about the status of the `fsck` or `aclchk` utilities for the specified file system.

- **-start { <fs_name> | id=<fs_id> }**
  Starts the `fsck` and the `aclchk` utilities on the specified file system.
The nas Commands

CAUTION
If file system check is started on a mounted file system, the file system will be unavailable for the duration of the check. NFS clients will display the message \texttt{NFS server not responding} and CIFS clients will lose connectivity with the server and will have to remap shares.

\textbf{[-aclchonly]}
Initiates the \texttt{aclchk} utility only, which checks and corrects any errors in the ACL database and removes duplicate ACL information stored on the specified file system. The \texttt{aclchonly} option can only be used on a file system that is not exported. The default is for both \texttt{fsck} and \texttt{aclchk}.

\textbf{Note:} The NDMP backup process must be stopped on the Data Mover before using the \texttt{nas_fsck -aclchonly} command.

\textbf{[-monitor]}
Displays the status of \texttt{fsck} and \texttt{aclchk} until the command completes.

\textbf{Note:} For a mounted file system, a <movername> is not required because the \texttt{fsck} and \texttt{aclchk} utilities are run on the Data Mover where the file system is mounted.

\textbf{[-Force]}
Forces a \texttt{fsck} or \texttt{aclchk} to be run on an enabled file system.

\textbf{SEE ALSO} \textit{Managing Volumes and File Systems for VNX Manually} and \texttt{nas_fs}.

\textbf{EXAMPLE #1} To start file system check on \texttt{ufs1} and monitor the progress, type:

$ \texttt{nas_fsck -start ufs1 -monitor}

id = 27
name = ufs1
volume = mtv1
fsck_server = server_2
inode_check_percent = 10..20..30..40..60..70..80..100
directory_check_percent = 0..0..100
used_ACL_check_percent = 100
free_ACL_check_status = Done
cylinder_group_check_status = In Progress..Done
The nas Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Automatically assigned ID of a file system.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the file system.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which the file system resided.</td>
</tr>
<tr>
<td>fsck_server</td>
<td>Name of the Data Mover where the utility is being run.</td>
</tr>
<tr>
<td>inode_check_percent</td>
<td>Percentage of inodes in the file system checked and fixed.</td>
</tr>
<tr>
<td>directory_check_percent</td>
<td>Percentage of directories in the file system checked and fixed.</td>
</tr>
<tr>
<td>used_ACL_check_percent</td>
<td>Percentage of used ACLs that have been checked and fixed.</td>
</tr>
<tr>
<td>free_ACL_check_status</td>
<td>Status of the ACL check.</td>
</tr>
<tr>
<td>cylinder_group_check_status</td>
<td>Status of the cylinder group check.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2** To start ACL check on ufs1, type:

```
$ nas_fsck -start ufs1 -aclchonly
```

ACLCHK: in progress for file system ufs1

**EXAMPLE #3** To start a file system check on ufs2 using Data Mover server_5, type:

```
$ nas_fsck -start ufs2 -mover server_5
```

<table>
<thead>
<tr>
<th>name</th>
<th>ufs2</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>23</td>
</tr>
<tr>
<td>volume</td>
<td>v134</td>
</tr>
<tr>
<td>fsck_server</td>
<td>server_5</td>
</tr>
<tr>
<td>inode_check_percent</td>
<td>40</td>
</tr>
<tr>
<td>directory_check_percent</td>
<td>0</td>
</tr>
<tr>
<td>used_ACL_check_percent</td>
<td>0</td>
</tr>
<tr>
<td>free_ACL_check_status</td>
<td>Not Started</td>
</tr>
<tr>
<td>cylinder_group_check_status</td>
<td>Not Started</td>
</tr>
</tbody>
</table>

**EXAMPLE #1** provides a description of command outputs.

**EXAMPLE #4** To list all current file system checks, type:

```
$ nas_fsck -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>state</th>
<th>volume</th>
<th>name</th>
<th>server</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>1</td>
<td>FSCK</td>
<td>134</td>
<td>ufs2</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>ACLCHK</td>
<td>144</td>
<td>ufs1</td>
<td>1</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Automatically assigned ID of a file system.</td>
</tr>
<tr>
<td>type</td>
<td>Type of file system.</td>
</tr>
<tr>
<td>state</td>
<td>Utility being run.</td>
</tr>
<tr>
<td>volume</td>
<td>Volume on which the file system resided.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the file system.</td>
</tr>
<tr>
<td>server</td>
<td>Server on which fsck is being run.</td>
</tr>
</tbody>
</table>
EXAMPLE #5  To display information about file system check for ufs2 that is currently running, type:

$ nas_fsck -info ufs2

name                        = ufs2
id                          = 23
volume                      = v134
fsck_server                 = server_5
inode_check_percent         = 100
directory_check_percent     = 100
used_ACL_check_percent      = 100
free_ACL_check_status       = Done
cylinder_group_check_status = In Progress

EXAMPLE #1 provides a description of command outputs.

EXAMPLE #6  To display information about all file system checks that are currently running, type:

$ nas_fsck -info -all

name                        = ufs2
id                          = 23
volume                      = v134
fsck_server                 = server_5
inode_check_percent         = 30
directory_check_percent     = 0
used_ACL_check_percent      = 0
free_ACL_check_status       = Not Started
cylinder_group_check_status = Not Started

name                        = ufs1
id                          = 27
volume                      = mtv1
fsck_server                 = server_2
inode_check_percent         = 100
directory_check_percent     = 0
used_ACL_check_percent      = 0
free_ACL_check_status       = Not Started
cylinder_group_check_status = Not Started

EXAMPLE #1 provides a description of command outputs.
The nas Commands

---

**nas_halt**

Performs a controlled halt of all Control Stations, Data Movers, and Storage Processors on a Unified/File VNX system.

**SYNOPSIS**

```
nas_halt [-f] [-sp] now
```

**DESCRIPTION**

`nas_halt` performs an orderly shutdown of the Control Stations, Data Movers, and optionally, the Storage Processors. **nas_halt** can only be executed by root users and must be run from the `/nas/sbin` directory.

---

**Note:** For Gateway servers, only root users can use `nas_halt` to power off the Gateway.

---

**OPTIONS**

- **-f**
  Performs an immediate halt for a Unified/File VNX system.

- **-sp**
  Powers off Control Stations, Data Movers and Storage Processors on a Unified/File VNX system.

- **now**
  Performs an interactive halt for a Unified/File VNX system.

**SEE ALSO**

`VNX System Operations` and `server_cpu`.

**EXAMPLE #1**

To perform a halt of the VNX Control Stations and Data Movers, type:

```
# /nas/sbin/nas_halt now
```

---

You are about to HALT this VNX including all of its Control Stations and Data Movers. DATA will be UNAVAILABLE when the system is halted.

Note that this command does *not* halt the storage array.

---

**ARE YOU SURE YOU WANT TO CONTINUE? [yes or no] : yes**

Sending the halt signal to the Master Control Daemon...: Done

May 3 11:12:54 cs100 EMCServer: nas_mcd: Check and halt other CS...: Done

May 3 11:13:26 cs100 JSERVER: *** Java Server is exiting ***

May 3 11:13:31 cs100 ucd-snmp[11218]: Received TERM or STOP signal... shutting down...

May 3 11:13:31 cs100 snmpd: snmpd shutdown succeeded

May 3 11:13:32 cs100 setup_enclosure: Executing -dhcpd stop option

May 3 11:13:32 cs100 snmptrapd[11179]: Stopping snmptrapd
The nas Commands

May 3 11:13:32 cs100 EV_AGENT[13721]: Signal TERM received
May 3 11:13:32 cs100 EV_AGENT[13721]: Agent is going down
May 3 11:13:40 cs100 DHCPDMON: Starting DHCPD on CS 0
May 3 11:13:41 cs100 setup_enclosure: Executing -dhcpd start option
May 3 11:13:41 cs100 dhcpd: Internet Software Consortium DHCP Server V3.0pl1
May 3 11:13:41 cs100 dhcpd: All rights reserved.
May 3 11:13:41 cs100 dhcpd: For info, please visit
http://www.isc.org/products/DHCP
May 3 11:13:41 cs100 dhcpd: Wrote 0 deleted host decls to leases file.
May 3 11:13:41 cs100 dhcpd: Wrote 0 new dynamic host decls to leases file.
May 3 11:13:41 cs100 dhcpd: Listening on
LPF/eth2/00:00:f0:9d:04:13/128.221.253.0/24
May 3 11:13:41 cs100 dhcpd: Sending on
LPF/eth2/00:00:f0:9d:04:13/128.221.253.0/24
May 3 11:13:41 cs100 dhcpd: Listening on
LPF/eth0/00:00:f0:9d:01:e5/128.221.252.0/24
May 3 11:13:41 cs100 dhcpd: Sending on
LPF/eth0/00:00:f0:9d:01:e5/128.221.252.0/24
May 3 11:13:41 cs100 dhcpd: Sending on Socket/fallback/fallback-net
May 3 11:13:59 cs100 mcd_helper: : Failed to umount /nas (0)
May 3 11:13:59 cs100 EMCServer: nas_mcd: Failed to gracefully shutdown MCD and
halt servers. Forcing halt and reboot...
May 3 11:13:59 cs100 EMCServer: nas_mcd: Halting all servers...
May 3 11:15:00 cs100 get_datamover_status: Data Mover server_5: COMMAND doesn't
match.

EXAMPLE #2  To perform an immediate halt of the VNX Control Stations and Data
Movers, type:

# /nas/sbin/nas_halt -f now

Sending the halt signal to the Master Control Daemon....: Done
May 3 11:12:54 cs100 EMCServer: nas_mcd: Check and halt other CS....: Done
May 3 11:13:26 cs100 JSERVER: *** Java Server is exiting ***
May 3 11:13:31 cs100 ucd-snmp[11218]: Received TERM or STOP signal... shutting
down...
May 3 11:13:31 cs100 snmpd: snmpd shutdown succeeded
May 3 11:13:32 cs100 setup_enclosure: Executing -dhcpd stop option
May 3 11:13:32 cs100 snmptrapd[11179]: Stopping snmptrapd
May 3 11:13:32 cs100 EV_AGENT[13721]: Signal TERM received
May 3 11:13:32 cs100 EV_AGENT[13721]: Agent is going down
May 3 11:13:40 cs100 DHCPDMON: Starting DHCPD on CS 0
May 3 11:13:41 cs100 setup_enclosure: Executing -dhcpd start option
May 3 11:13:41 cs100 dhcpd: Internet Software Consortium DHCP Server V3.0pl1
May 3 11:13:41 cs100 dhcpd: All rights reserved.
May 3 11:13:41 cs100 dhcpd: For info, please visit
http://www.isc.org/products/DHCP
May 3 11:13:41 cs100 dhcpd: Wrote 0 deleted host decls to leases file.
The nas Commands

May 3 11:13:41 cs100 dhcpd: Wrote 0 new dynamic host decls to leases file.
May 3 11:13:41 cs100 dhcpd: Wrote 0 leases to leases file.
May 3 11:13:41 cs100 dhcpd: Listening on LPF/eth2/00:00:f0:9d:04:13/128.221.253.0/24
May 3 11:13:41 cs100 dhcpd: Sending on LPF/eth2/00:00:f0:9d:04:13/128.221.253.0/24
May 3 11:13:41 cs100 dhcpd: Listening on LPF/eth0/00:00:f0:9d:01:e5/128.221.252.0/24
May 3 11:13:41 cs100 dhcpd: Sending on LPF/eth0/00:00:f0:9d:01:e5/128.221.252.0/24
May 3 11:13:41 cs100 dhcpd: Sending on Socket/fallback/fallback-net
May 3 11:13:59 cs100 mcd_helper: umount /nas (0)
May 3 11:13:59 cs100 EMCServer: nas_mcd: Failed to gracefully shutdown MCD and halt servers. Forcing halt and reboot...
May 3 11:13:59 cs100 EMCServer: nas_mcd: Halting all servers...
May 3 11:15:00 cs100 get_datamover_status: Data Mover server_5: COMMAND doesn't match.

EXAMPLE #3

To perform a halt of the VNX Control Stations, Data Movers, and Storage Processors on a unified system, type:

```
# /nas/sbin/nas_halt -sp now
```

***************************************************************************
** WARNING! *****************************************************************
***************************************************************************

You are about to HALT this Celerra including all of its Control Stations and Data Movers. DATA will be UNAVAILABLE when the system is halted.
-sp switch will HALT the Storage Processors on a unified system.
ARE YOU SURE YOU WANT TO CONTINUE? [ yes or no ] : yes
Unified system detected.
Sending the halt signal to the Master Control Daemon...: Done
Feb 27 20:13:35 emcnas_i0 EMCServer: nas_mcd: Check and halt other CS...: Done
Feb 27 20:13:36 emcnas_i0 CIM: Server ***** Shutting down CIM Server *****
Feb 27 20:13:37 emcnas_i0 CIM: Server ***** Shutting down slp daemon *****
Feb 27 20:14:10 emcnas_i0 JSERVER: *** Java Server is exiting ***
Feb 27 20:14:19 emcnas_i0 mcd_helper: Cleaned up old APL share memory 71499780
Feb 27 20:14:19 emcnas_i0 mcd_helper: Cleaned up old APL semaphores 1376257
1409026 1441795
Feb 27 20:14:21 emcnas_i0 setup_enclosure: Executing -dhcpd stop option
Feb 27 20:14:34 emcnas_i0 DHCPDMON: Starting DHCPD on CS 0
Feb 27 20:14:36 emcnas_i0 setup_enclosure: Executing -dhcpd start option
Feb 27 20:14:36 emcnas_i0 dhcpd: Internet Systems Consortium DHCP Server V3.0.5-RedHat
Feb 27 20:14:36 emcnas_i0 dhcpd: All rights reserved.
Feb 27 20:14:36 emcnas_i0 dhcpd: For info, please visit http://www.isc.org/sw/dhcp/
Feb 27 20:14:36 emcnas_i0 dhcpd: Wrote 0 deleted host decls to leases file.
Feb 27 20:14:36 emcnas_i0 dhcpd: Wrote 0 new dynamic host decls to leases file.
Feb 27 20:14:36 emcnas_i0 dhcpd: Wrote 8 leases to leases file.
Feb 27 20:14:36 emcnas_i0 dhcpd: Listening on LPF/eth2/a0:36:9f:17:bb:03/128.221.253/24
Feb 27 20:14:36 emcnas_i0 dhcpd: Sending on LPF/eth2/a0:36:9f:17:bb:03/128.221.253/24
Feb 27 20:14:36 emcnas_i0 dhcpd: Listening on LPF/eth0/00:1e:67:6a:50:a9/128.221.252/24
Feb 27 20:14:36 emcnas_i0 dhcpd: Sending on LPF/eth0/00:1e:67:6a:50:a9/128.221.252/24
Feb 27 20:14:36 emcnas_i0 dhcpd: Sending on Socket/fallback/fallback-net
Feb 27 20:14:50 emcnas_i0 mcd_helper: Failed to umount /nas (0)
Feb 27 20:14:50 emcnas_i0 EMCServer: nas_mcd: Failed to gracefully shutdown MCD and halt servers. Forcing halt...
Feb 27 20:14:50 emcnas_i0 EMCServer: nas_mcd: Halting all servers...
Feb 27 20:15:03 emcnas_i0 get_backend_status: Navicli getagent aborted, possibly due to a bad network setup!
Feb 27 20:15:06 emcnas_i0 get_datamover_status: Data Mover server_3: COMMAND doesn't match.
Feb 27 20:15:06 emcnas_i0 get_datamover_status: Data Mover server_2: COMMAND doesn't match.
Feb 27 20:15:15 emcnas_i0 EMCServer: nas_mcd: Shutting down SPs...
Feb 27 20:15:17 emcnas_i0 mcd_helper: Shutting down SPB ...
Feb 27 20:15:20 emcnas_i0 mcd_helper: Navicli shutdownsp returned SUCCESS
Feb 27 20:16:04 emcnas_i0 kernel: ND id 5 rcv tmo, crnt_tm 101357, last rcv_tm 101297, que 27
Feb 27 20:16:04 emcnas_i0 kernel: ND dev nde enter nd_conn, id 5, err -32
Feb 27 20:16:07 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-115)
Feb 27 20:16:14 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-115)
Feb 27 20:16:19 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-113)
Feb 27 20:16:20 emcnas_i0 mcd_helper: SPB is inaccessible and probably down
Feb 27 20:16:25 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-113)
Feb 27 20:16:32 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-113)
Feb 27 20:16:40 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-113)
Feb 27 20:16:49 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-113)
Feb 27 20:16:59 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-113)
Feb 27 20:17:10 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-113)
Feb 27 20:17:20 emcnas_i0 mcd_helper: Shutting down SPA ...
Feb 27 20:17:21 emcnas_i0 mcd_helper: Navicli shutdownsp returned SUCCESS
Feb 27 20:17:22 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-113)
Feb 27 20:17:35 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fddd80, port 43283 err(-113)
Feb 27 20:17:49 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fddd80, port 43283 err(-113)
The nas Commands

Feb 27 20:18:04 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 3fdd80, port 43283 err(-113)
Feb 27 20:18:20 emcnas_i0 kernel: ND: id 5 can't conn socket, addr 2fdd80, port 43283 err(-113)
The nas Commands

**nas_inventory**

Provides detailed information about hardware components in the system.

**SYNOPSIS**

```
nas_inventory
  { -list [-location]
  | { -info <location> | -all}
  | -tree }
```

**DESCRIPTION**

`nas_inventory` displays detailed information about the hardware components that are configured on a system.

**OPTIONS**

- **-list**
  Displays a list of all hardware components and their associated name, type, status, and system ID.

  
  ```
  [-location]
  Displays the location string for each component in the output. The location string is a unique identifier for the component.
  
  Specifies the location string with enclosed double quotes (" ") and displays a list of detailed information for the specific component for which the string is the unique ID.
  ```

- **-info <location_string> | -all**
  Displays a list of all the properties for a component, including the component name, type, status, variant, associated system, serial number, part number, and history.

  The **-all** option lists detailed information for all components in the system.

- **-tree**
  Displays a hierarchical tree of components, including the status of each component.
EXAMPLE #1  To display a list of components on the system, type:

$ nas_inventory -list

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>Status</th>
<th>System ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery A</td>
<td>Battery</td>
<td>OK</td>
<td>CLARiiON CX4-240 FCNTR083000055001A</td>
</tr>
<tr>
<td>VNX NS40G FCNTR083000055001A</td>
<td>VNX</td>
<td>Warning</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>CLARiiON CX4-240 FCNTR083000055</td>
<td>CLARiiON</td>
<td>OK</td>
<td>CLARiiON CX4-240 FCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2</td>
<td>Data Mover</td>
<td>OK</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>Ethernet Module</td>
<td>Module</td>
<td>OK</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP BE0</td>
<td>SFP</td>
<td>OK</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP BE1</td>
<td>SFP</td>
<td>OK</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP FE0</td>
<td>SFP</td>
<td>OK</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>Description of the component.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of component. Possible types are: battery, blower, VNX, Control Station, Data Mover, and disk.</td>
</tr>
<tr>
<td>Status</td>
<td>The current status of the component. Status is component type specific. There are several possible status values, each of which is associated with a particular component type.</td>
</tr>
<tr>
<td>System ID</td>
<td>The identifier for the VNX or the storage ID of the system containing the component.</td>
</tr>
</tbody>
</table>

EXAMPLE #2  To display a list of components and component locations, type:

$ nas_inventory -list -location

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>Status</th>
<th>System ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery A</td>
<td>Battery</td>
<td>OK</td>
<td>CLARiiON CX4-240 FCNTR083000055001A</td>
</tr>
<tr>
<td>VNX NS40G FCNTR083000055001A</td>
<td>VNX</td>
<td>Warning</td>
<td>VNX NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>CLARiiON CX4-240 FCNTR083000055</td>
<td>CLARiiON</td>
<td>OK</td>
<td>CLARiiON CX4-240 FCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2</td>
<td>Data Mover</td>
<td>OK</td>
<td>Celerra NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>Ethernet Module</td>
<td>Module</td>
<td>OK</td>
<td>Celerra NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP BE0</td>
<td>SFP</td>
<td>OK</td>
<td>Celerra NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP BE1</td>
<td>SFP</td>
<td>OK</td>
<td>Celerra NS40GFCNTR083000055001A</td>
</tr>
<tr>
<td>DME 0 Data Mover 2 SFP FE0</td>
<td>SFP</td>
<td>OK</td>
<td>Celerra NS40GFCNTR083000055001A</td>
</tr>
</tbody>
</table>

Value Definition

Component: Description of the component.

Type: The type of component. Possible types are: battery, blower, VNX, Control Station, Data Mover, and disk.

Status: The current status of the component. Status is component type specific. There are several possible status values, each of which is associated with a particular component type.

System ID: The identifier for the VNX or the storage ID of the system containing the component.
EXAMPLE #3    To list information for a specific component, type:

```
$ nas_inventory -info "system:NS40G:FCNTR083000055001A\clariionSystem:CX4-240:FCNTR083000055\iomodule::B0"
```

Location = system:NS40G:FCNTR083000055001A\clariionSystem:CX4-240:
FCNTR083000055\iomodule::B0
Component Name = IO Module B0
Type = IO Module
Status = OK
Variant = 4 PORT FIBRE IO MODULE
Storage System = CLARiiON CX4-240 FCNTR083000055
Serial Number = CF2YW082800426
Part Number = 103-054-100C
History = EMC_PART_NUMBER:103-054-100C
          EMC_ARTWORK_REVISION:C01
          EMC_ASSEMBLY_REVISION:C03
          EMC_SERIAL_NUMBER:CF2YW082800426
          VENDER_PART_NUMBER:N/A
          VENDER_ARTWORK_NUMBER:N/A
          VENDER_ASSEMBLY_NUMBER:N/A
          VENDER_SERIAL_NUMBER:N/A
          VENDOR_NAME:N/A
          LOCATION_OF_MANUFACTURE:N/A
          YEAR_OF_MANUFACTURE:N/A
          MONTH_OF_MANUFACTURE:N/A
          DAY_OF_MONTH_OF_MANUFACTURE:N/A
          ASSEMBLY_NAME:4 PORT FIBRE IO MODULE

Note: The location string must be enclosed in double quotes.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>The unique identifier of the component and where the component is located in the component hierarchy.</td>
</tr>
<tr>
<td>Component</td>
<td>The description of the component.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of component. Possible types are: battery, blower, VNX for file, VNX for block, Control Station, Data Mover, and disk.</td>
</tr>
<tr>
<td>Status</td>
<td>The current condition of the component. Status is component type specific. There are several possible status values, each of which is associated with a particular component type.</td>
</tr>
<tr>
<td>Variant</td>
<td>The specific type of hardware.</td>
</tr>
<tr>
<td>Storage System</td>
<td>The model and serial number of the system.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>The serial number of the hardware component.</td>
</tr>
<tr>
<td>Part Number</td>
<td>The part number of the hardware component.</td>
</tr>
<tr>
<td>History</td>
<td>If available, the history information of the component. Possible values are: part number, serial number, vendor, date of manufacture, and CPU information.</td>
</tr>
</tbody>
</table>
### EXAMPLE #4

To display components in a tree structure, type:

$ nas_inventory -tree

<table>
<thead>
<tr>
<th>Component</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celerra NS40G FCNTR083000055001A</td>
<td>Celerra</td>
<td>Warning</td>
</tr>
<tr>
<td>CLARiiON CX4-240 FCNTR083000055</td>
<td>CLARiiON</td>
<td>OK</td>
</tr>
<tr>
<td>Battery A</td>
<td>Battery</td>
<td>OK</td>
</tr>
<tr>
<td>IO Module A0</td>
<td>IO Module</td>
<td>OK</td>
</tr>
<tr>
<td>IO Module A1</td>
<td>IO Module</td>
<td>OK</td>
</tr>
<tr>
<td>IO Module A2</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>IO Module A3</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>IO Module A4</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>IO Module B0</td>
<td>IO Module</td>
<td>OK</td>
</tr>
<tr>
<td>IO Module B1</td>
<td>IO Module</td>
<td>OK</td>
</tr>
<tr>
<td>IO Module B2</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>IO Module B3</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>IO Module B4</td>
<td>IO Module</td>
<td>Empty</td>
</tr>
<tr>
<td>Power Supply A0</td>
<td>Power Supply</td>
<td>OK</td>
</tr>
<tr>
<td>Power Supply A1</td>
<td>Power Supply</td>
<td>OK</td>
</tr>
<tr>
<td>Power Supply B0</td>
<td>Power Supply</td>
<td>OK</td>
</tr>
<tr>
<td>Power Supply B1</td>
<td>Power Supply</td>
<td>OK</td>
</tr>
</tbody>
</table>
nas_license

Enables software packages.

SYNOPSIS

nas_license
- list
- create <package_name> [ | <key_code> ]
- delete <package_name>
- init

DESCRIPTION

nas_license enables software packages that are available for use with
the system. The <key_code> is supplied by EMC.

All entries are case-sensitive.

OPTIONS

No arguments
Displays a usage message that contains all available and valid
software packages that can be installed.

-list
Displays the site_key as a string and any software packages for which
a license has been installed. The site_key is a permanent license and
cannot be deleted. The failover license is legacy and should only be
used only when instructed to do so by EMC personnel.

Note: Licenses installed on the Control Station are read by the system. The
site_key is a unique identifier which gets generated the first time nas_license
is run. The site_key is also used to decode the key_code supplied by EMC
personnel for special packages.

-create <package_name> [ = <key_code> ]
Installs the license for the indicated <package_names>. Valid
<package_names> are:

site key
nfs
cifs
failover
snapsure
advancedmanager
replicator
filelevelretention
Note: These packages do not require key_code as they can be enabled from the GUI. Special packages are supplied along with the required key_code by the EMC Customer Support Representative. The package failover requires key_code.

- **delete** <package_name>
  Deletes the license for the specified <package_name>.

- **init**
  Initializes the database and re-creates the license file by using the site_key that is already installed. The license file is located at /nas/site as nas_license. It contains license keys in an encrypted format. The **init** option should be run only if the license file containing all the license information has been lost and the following error message is received:

  license table is not initialized

  Once the license file has been re-created, the rest of the entries, if present, should be re-added by using the **create** option.

**EXAMPLE #1**
To install a license for the **snapsure** software package, type:

```
$ nas_license -create snapsure
```

**EXAMPLE #2**
To display all software packages with currently installed licenses, type:

```
$ nas_license -list
```

```
key            status     value
site_key       online     42 de 6f d1
advancedmanager online
nfs            online
cifs           online
snapsure       online
replicator     online
filelevelretention online
```

**EXAMPLE #3**
To delete a license for specified software package, type:

```
$ nas_license -delete snapsure
```

**EXAMPLE #4**
To initialize the database and re-create the license file, type:

```
$ nas_license -init
```

```
done
```
nas_logviewer

Displays the content of nas_eventlog generated log files.

SYNOPSIS

```
nas_logviewer <file_name>
[-f][-v|-t]
```

DESCRIPTION

`nas_logviewer` displays the event log and other logs created by nas_eventlog. The log files may be system generated, or created by the user. Information in the log file is read from oldest to newest.

OPTIONS

No arguments
Displays the contents of the specified logfile.

```
-f
```

Monitors the growth of the log by entering into an endless loop, pausing and reading the log as it is being generated. To exit, press Ctrl-C together.

```
[-v|-t]
```

Displays the log files in verbose or terse format.

SEE ALSO

`Configuring Events and Notifications on VNX for File` and `server_log`.

EXAMPLE #1

To view the contents of the sys_log file, type:

```
$ nas_logviewer /nas/log/sys_log|more
```

```
checkpoint in progress
Checkpoint done
May 12 18:03:00 2007:CS_PLATFORM:NASDB:ERROR:202: NAS database error
detected
checkpoint in progress
Checkpoint done
detected
checkpoint in progress
Checkpoint done
detected
```

May 12 20:03:10 2007
The nas Commands

Example #1


Note: This is a partial listing due to the length of the outputs.

Example #2

To display the contents of the log files in terse format, type:

```
$ nas_logviewer -t /nas/log/sys_log
```

Example #3

To display the contents of the log files in verbose format, type:

```
$ nas_logviewer -v /nas/log/sys_log|more
```
baseid = 305
type = EVENT
brief description = nasdb_backup: NAS_DB Checkpoint done
full description = The NAS DB backup has completed a checkpoint of the current
reparation for performing a backup of NAS system data.
recommended action = No action required.

EXAMPLE #4  To monitor the growth of the current log, type:

$ nas_logviewer -f /nas/log/sys_log|more

checkpoint in progress
Checkpoint done
May 12 18:03:00 2007:CS_PLATFORM:NASDB:ERROR:202::::::NAS database error
detected
Backup done

checkpoint in progress
Checkpoint done
detected
Backup done

checkpoint in progress
Checkpoint done
detected
Backup done

checkpoint in progress
Checkpoint done
detected
Backup done
nas_message

Displays message description.

**SYNOPSIS**

nas_message
   -info <MessageId>

**DESCRIPTION**

nas_message provides detailed descriptions to a dedicated message. A brief description, full description, and recommended user action of the message are displayed.

**OPTIONS**

- info <MessageId>

Displays detailed descriptions of the error message, including severity, component, facility, BaseID, and recommended user action. The message parameters are displayed in the form ${stateDesc,8,%s} and not as parameter values. The <MessageId> must be a positive integer.

**SEE ALSO**

Celerra Network Server Error Messages Guide.

**EXAMPLE #1**

To display detailed descriptions for error message 13421838337, type:

$ nas_message -info 13421838337

MessageID = 13421838337
BaseID = 1
Severity = ERROR
Component = CS_CORE
Facility = default
Type = STATUS
Brief_Description = Operation not permitted${arg0,8,%s}
Full_Description = The operation is not permitted due to an ACL or ownership issue on the specified object.
Recommended_Action = Check ownership or ACL of the object in question. If appropriate change the setting to resolve the conflict. Refer to the nas_acl and chmod man page.
**nas_migrate**

Plans migrations for Virtual Data Mover (VDM) level, and manages migrations for both VDM and File system (FS) level.

### SYNOPSIS

```bash
nas_migrate
-list [{-all|-mover <movername>}] [-id]
 | -info [{-all|-mover <movername>|id=<migId>|<migName>}]  
 | -plan {
   -list [{-all|-mover <movername>}] [-id]
   | -info [{-all|-mover <movername>|id=<planId>|<planName>}]  
   | -create <planName>
     -source <vdmName>
     -destination
       {<existing_dstVdmName>
         | -pool{id=<dstStoragePoolId>|<dstStoragePoolName>}
       }
     -interconnect {<interConnectName>|id=<interConnectId>}
     [-storage_pools
       {
         <srcStoragePoolName>:<dstStoragePoolName>[,...]>
         | -id <<srcStoragePoolId>:<dstStoragePoolId>[,...]>
       }
       [-take_over_ips
         [-network_devices <<srcDeviceName>:<dstDeviceName>[,...]>
         [-checkpoint_excluded]
         [-dr]
         [-enforce_fsid]
         [-background]
       ]
     | -modify {<planName>|id=<planId>}
       -name <newPlanName>
       [-filesystems
       {
         <srcFs=<name>[:<dstFs=<id>][:<dstPool=<name>][:<srcSavPool=<name>][:<dstSavPool=<name>]][,...]>
         | -id
         <srcFs=<id>[:<dstFs=<id>][:<dstPool=<id>][:<srcSavPool=<id>][:<dstSavPool=<id>]][,...]>
       }
     | -delete {<planName>|id=<planId>[]} [-background]
     }
   | -create <migName> -vdm
     -plan {<planName>|id=<planId>} [-background]
   | -create <migName> -fs
     -source {<id><fsId>|<fsName>}
   }
  }
  [-background]
```
The nas Commands

\[-sav \{id=<srcSavVolStoragePoolId>|<srcSavVolStoragePoolName>\}\]
-destination
  {<existing_dstFsName>|id=<existing_dstFsId>}
-\[pool\{id=<dstStoragePoolId>|<dstStoragePoolName>\}\]
-\[vdm <dstMountVdmName>\]
-\[-checkpoint\] [\[-checkpoint_excluded\]\]
-\[-enforce_fsid\]\n-\[-background\]\n| -\[-complete\] [\[id=<migId>\] [\[-dr\] [\[-checkpoint_mismatch_ignored\]] [\[-background\]]]
| -\[-delete\] [\[id=<migId>\] [\[-background\]]]
| -\[-stop\] [\[id=<migId>\] [\[-background\]]]
| -\[-start\] [\[id=<migId>\] [\[-background\]]]

DESCRIPTION
The nas_migrate command manages the migration of VDMs, and FS or checkpoints mounted to VDMs. It is also used for migration of FS and its mounted checkpoints.

OPTIONS
-\[-list\] [\[-all\]|\[-mover <movername>\]] [\[-id\]]
Lists summary of all the migrations for the cabinet regarded as destination cabinet, or for the specified mover regarded as destination mover. The -id option shows migration ID in the summary; by default, the system-generated migration ID isn’t shown.

-\[-info\] [\[-all\]|\[-mover <movername>\]|id=<migId>|<migName>]]
Displays detailed information of all the migrations for the cabinet regarded as destination cabinet, for the specified mover regarded as destination mover, or for one migration with a specified ID or name.

-\[-plan\]
Generates a migration plan for VDM migration.

-\[-list\] [\[-all\]|\[-mover <movername>\]] [\[-id\]]
Lists summary information for all VDM migration plans with cabinet as destination cabinet if -all option is specified or no option is specified by default, or a specific data mover as destination mover. The -id option shows migration plan ID in the summary; by default, the system-generated migration plan ID isn’t shown.

-\[-info\] [\[-all\]|\[-mover <movername>\]|id=<planId>|<planName>]]
Displays detailed information for all VDM migration plans with
cabinet as destination cabinet if -all option is specified or no option is specified by default. Also, displays detailed information for a specific data mover as destination mover, or for one migration plan with specific ID or name.

-create <planName>
Creates a VDM migration plan.

-source <vdmName>
Specifies the name of the source VDM to migrate. The source system information is implied in the DART interconnect option. See the usage of -interconnect option.

-destination {<existing_dstVdmName> | -pool {id=<dstStoragePoolId>|<dstStoragePoolName>}}
Specifies the name of an existing destination VDM, or the pool name or ID to create a new destination VDM.

-interconnect {<interConnectName>|id=<interConnectId>}
Specifies the name or ID of the local DART interconnect configured on the destination. The mutual DART interconnects are supposed to be configured between source and destination. The source system information is implied in the DART interconnect option. To configure DART interconnects, go to the “nas_cel” command and use the -interconnect option.

-storage_pools {<<srcStoragePoolName>:<dstStoragePoolName>[,...]> | -id <<srcStoragePoolId>:<dstStoragePoolId>[,...]>}
Indicates mappings of source and destination storage pools, and SavVol pools. These pools must exist on the source or the destination. This will guide the migration to create file systems in the storage pools on the destination, based on the mapping relationship of the source storage pools where their source file system lie. Either pool name or pool ID can be specified. Multiple storage pool mappings can be specified, with commas separating each mapping. If no mappings are specified, destination storage pools will be automatically selected to create each file systems.

-take_over_ips [-network_devices <<srcDeviceName>:<dstDeviceName>[,...]>]
Takes over source network interfaces if -take_over_ips option is specified. Indicates mappings of source and destination network devices. This will guide the migration to choose the
network devices, which will be used when creating destination network interfaces when option `-take_over_ips` is specified. Without `-take_over_ips`, the destination interfaces must be manually created on the destination mover by the user, with names identical to the source interfaces.

No matter whether the source network interfaces are to be taken-over or not, the interfaces attached to the source VDM will be turned down after migration is completed.

**Note:** To take over IPs, the interfaces must be in the same subnet and have the same VLAN settings at the source and the destination. Also, the interfaces must be IPv4. IPv6 interfaces cannot be taken over.

**Note:** To exclude a File System, it must be unexported or unshared and then unmounted before creating a VDM level migration plan.

[-`checkpoint_excluded`]
Excludes all the existing read-only user checkpoints from the migration.

[-`dr`]
When specified, the replication sessions created as disaster recovery solutions will be migrated from the source to the destination system. This only includes remote disaster recovery solutions. Local and loopback disaster recovery solutions are not included.

[-`enforce_fsid`]
When specified, the IDs of the source file systems are preserved on the destination system. If the IDs to be preserved have a conflict with those of the destination system (the IDs already exist on the destination system), the migration plan will report an error.

[-`background`]
Runs the task in background.

**Note:** When `background` is specified, a task ID will be returned, and the user can check `nas_task --i <taskId>` to see the result of the task: succeeded, failed or running. Otherwise, if `background` is not specified, the command will return “OK” till the task is finished or succeeded, or an error message if failed.
The nas Commands

-modify {<planName> | id=<planId>}
Modifies a VDM migration plan of specific name or ID.

[-name <newPlanName>]
Renames the migration plan.

[-filesystems]
{<srcFs=<name>[:dstFs=<id>][:dstPool=<name>][:srcSavPool=<name>][:dstSavPool=<name>],…} [-id <srcFs=<id>[:dstFs=<id>][:dstPool=<id>][:srcSavPool=<id>][:dstSavPool=<id>],…]
Updates source SavVol, recommended destination FSID, destination pool, or destination SavVol for a specified source file system. Only needs to specify the file system(s) to be reconfigured, especially srcFs=<name> or srcFs=<id>. Source file system that is not in the current migration plan can not be specified.

[-interfaces <name=<infName>:dstDevice=<devName>],…]}
Updates network devices on which to create network interfaces. Both the device name <devName> and interface name(s) <infName> should be specified, especially the interface name(s). The interface name(s) to be reconfigured are key. Interface name(s) that are not in the current migration plan can not be specified.

[-background]
Runs the task in background.

Note: When -background is specified, a task ID will be returned, and the user can check nas_task -i <taskId> to see the result of the task: succeeded, failed or running. Otherwise, if -background is not specified, the command will return “OK” till the task is finished or succeeded, or an error message if failed.

-delete {<planName> | id=<planId>}
Deletes a VDM migration plan of specific name or ID. The migration plan cannot be deleted when a migration exists that references the migration plan.

[-background]
Runs the task in background.
The nas Commands

Note: When `-background` is specified, a task ID will be returned, and the user can check `nas_task -i <taskId>` to see the result of the task: succeeded, failed or running. Otherwise, if `-background` is not specified, the command will return "OK" till the task is finished or succeeded, or an error message if failed.

`-create <migName> -vdm`
Creates a VDM level migration after creating a migration plan. The `<migName>` specifies the name of migration session, which is unique per destination cabinet.

`-plan {<planName>|id=<planId>}`
Specifies the name or ID of the VDM migration plan. The `<planName>` is created by the user and the `<planId>` is generated by the system, both of them are unique per destination cabinet.

`[-background]`
Runs the task in background.

Note: When `-background` is specified, a task ID will be returned, and the user can check `nas_task -i <taskId>` to see the result of the task: succeeded, failed or running. Otherwise, if `-background` is not specified, the command will return "OK" till the task is finished or succeeded, or an error message if failed.

`-create <migName> -fs`
Creates a file system level migration. The `<migName>` specifies the name of migration session, which is unique per destination cabinet and unchangeable.

`-source {id=<fsId>|<fsName>}`
Specifies the source file system name or ID.

`[-sav{id=<srcSavVolStoragePoolId>|<srcSavVolStoragePoolName>}]`
Specifies the SavVol pool used by all subsequent checkpoints of the source file system. If it is not specified, the VNX File Migration applies the same storage pool of the source file system as the SavVol pool.

Note: This option is only valid when the source file system has no checkpoints before the migration.

`-destination {<existing_dstFsName>|id=<existing_dstFsId>}`
Specifies the destination file system, either from a name or ID of an existing file system name as the destination. An existing destination file system must be mounted as read-only and have the same size and configuration as the source.

```
-pool {id=<dstStoragePoolId>|<dstStoragePoolName>}
```

Specifies a storage pool to create the destination file system automatically, using the same size as the source file system.

```
[-sav{id=<dstSavVolStoragePoolId>|<dstSavVolStoragePoolName>}]`
```

Specifies the SavVol pool used by all subsequent checkpoints of the destination file system. If it is not specified, the VNX File Migration applies the same storage pool of the destination file system as the SavVol pool.

**Note:** All the checkpoints for a file system share the same SavVol.

```
[-vdm <dstMountVdmName>]
```

Specifies a VDM to mount the newly created destination file system. If the destination file system is mounted to a VDM, this option is mandatory. By default, without this option, the newly-created destination file system will be mounted to the destination Data Mover specified in the DART interconnect.

```
-interconnect
{<interConnectName>|id=<interConnectId>}
```

Specifies the name or ID of the local DART interconnect configured on the destination. The mutual DART interconnects are supposed to be configured between source and destination data movers.

```
[-checkpoint_excluded]
```

Excludes all the existing read-only user checkpoints from the migration.

```
[-dr]
```

When specified, the replication sessions created as disaster recovery solutions will be migrated from the source to the destination system.

```
[-enforce_fsid]
```

When specified, the IDs of the source file systems are preserved on the destination system. If the IDs to be preserved have a
The nas Commands

conflict with those of the destination system (the IDs already exist on the destination system), the migration plan will report an error.

[background]
Runs the task in background.

Note: When -background is specified, a task ID will be returned, and the user can check nas_task –i <taskId> to see the result of the task: succeeded, failed or running. Otherwise, if -background is not specified, the command will return “OK” till the task is finished or succeeded, or an error message if failed.

-complete {<migName>|id=<migId>}
[dr]
[checkpoint_mismatch_ignored]
[background]
Completes a migration when (1)the migration state is READY_TO_COMPLETE or COMPLETE_FAILED, (2)names of the destination network interfaces must be configured the same as the source for VDM level migration, and (3)the migration has global system/mover configuration migrated with the system configuration migration script, or manually by an administrator.

Completes a migration with a specified name or ID. The -checkpoint_mismatch_ignored option forcefully completes the migration, ignoring any mismatching checkpoints. The -background option means the task can be run in the background.

Use the -dr option to cutover (or take over) existing remote disaster recovery solutions (replication sessions) after the VDM and/or PFS are cutover using the migration complete command without the -dr option.

-delete {<migName>|id=<migId>} [background]
Deletes an existing migration with a specified name or ID, when no migration commands are running. Executes the commands when the migration state is not INITIAL_COPYING, STARTING, STOPPING, or DELETING. This command does not delete the source and destination VDMs, file systems, checkpoints and interfaces. The -background option means the task can be run in the background.

-stop {<migName>|id=<migId>} [background]
Stops a migration with a specified name or ID, when the migration state is READY_TO_COMPLETE, STOP_FAILED or START_FAILED.
The `-background` option means the task can be run in the background.

```bash
-start \{<migName>|id=<migId>\} \[-background\]
```

Starts a migration with a specified name or ID, when the migration state is STOPPED, STOP_FAILED, START_FAILED or INITIAL_COPY_FAILED. The `-background` option means the task can be run in the background.

**SEE ALSO**  
`cs_standby`, `migrate_system_conf`, `nas_replicate`, `nas_fs`, and `fs_ckpt`.

**SYSTEM OUTPUT**  
The migration states that can appear in the output include CREATING, INITIAL_COPYING, INITIAL_COPY_FAILED, READY_TO_COMPLETE, COMPLETING, COMPLETE_FAILED, COMPLETED, STOPPING, STOP_FAILED, STARTING, STOPPED, START_FAILED, DELETING and DELETE_FAILED.

**EXAMPLE #1**  
To list summary information of all the migrations, type:

```bash
$ nas_migrate -list -all -id
```

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Type</th>
<th>State</th>
<th>Source Celerra/VNX</th>
<th>Source VDM/FS</th>
<th>DestVDM/FS</th>
<th>Network Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>20000010804</td>
<td>vdmMigEx1</td>
<td>VDM</td>
<td>READY_TO_COMPLETE</td>
<td>spring</td>
<td>vdmEx1</td>
<td>vdmEx1</td>
<td>OK</td>
</tr>
<tr>
<td>20000000877</td>
<td>fsMigEx1</td>
<td>FILESYSTEM</td>
<td>READY_TO_COMPLETE</td>
<td>spring</td>
<td>fs3</td>
<td>fs3</td>
<td>OK</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**  
To view detailed information of a specific migration whose destination is the current cabinet, type:

```bash
$ nas_migrate -info -sp2_vdm5_mig
```

```
sp2_vdm5_mig
Name = sp2_vdm5_mig
Type = VDM
State = READY_TO_COMPLETE
Network Status = OK
Source Celerra/VNX Network Server = eng54336
Peer Data Mover Interconnect = eng54336s3_isc21386s3
Data Mover Interconnect = isc21386s3_eng54336s3
Source VDM = sp2_vdm5
Destination VDM = sp2_vdm5
VDM Migration Plan = sp2_vdm5_plan
File Systems
  File Systems = sp2_vdm5_fs1->sp2_vdm5_fs1;
  Checkpoints:sp2_vdm5_fs1_ckpt1->
    sp2_vdm5_fs1_ckpt1
    sp2_vdm5_fs2->sp2_vdm5_fs2
    sp2_vdm5_fs3->sp2_vdm5_fs3
Source Mover = server_3
Destination Mover = server_3
```
The nas Commands

Read-Only User Checkpoints Excluded = No
Takeover IP Addresses = Yes
Interfaces to Takeover = mt-s3-cge08
Replications
  8157_FNM00123900187_2007_1357_FNM00124700250_2007 : VDM
  8160_FNM00123900187_2007_1362_FNM00124700250_2007 : Filesystem
  8167_FNM00123900187_2007_1364_FNM00124700250_2007 : Filesystem
  8170_FNM00123900187_2007_1366_FNM00124700250_2007 : Filesystem

Migrate DR Solutions = Yes
DR Solution State = MAINTAIN_SOURCE_DRS
DR Solutions = Old DR #1:
  Replication ID = 8160_FNM00123900187_2007_3962_FNM00125101578_2007:
    Replication Type = FILESYSTEM
    Replication Role = source
    Source FS = sp2_vdm5_fs1
    Common Base Checkpoint = N/A
    Peer Common Base Checkpoint = N/A
New DR #1:
  Replication ID = N/A
  Source FS = sp2_vdm5_fs1
  Common Base Checkpoint = N/A

EXAMPLE #3 To list summary information of all VDM migration plans, type:

$ nas_migrate -plan -list -id

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Source Celerra/VNX</th>
<th>Source VDM</th>
<th>Destination VDM</th>
<th>Pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>20000034500</td>
<td>PlanEx1</td>
<td>spring</td>
<td>vdmEx1</td>
<td>N/A</td>
<td>dstpool3</td>
</tr>
<tr>
<td>20000035780</td>
<td>PlanEx2</td>
<td>spring</td>
<td>vdmEx2</td>
<td>vdmEx2</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: Either Destination VDM or Pool is N/A because the user can specify a pool to create destination VDM root File system, or the existing destination VDM.

EXAMPLE #4 To display detailed information about migration plan PlanEx1 (which does not have use the -dr option), type:

$ nas_migrate -plan -info TC_SP2_VDM_3_plan

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Source Celerra/VNX Network Server</th>
<th>Peer Data Mover Interconnect</th>
<th>Data Mover Interconnect</th>
<th>Source VDM</th>
<th>Destination VDM</th>
<th>Destination Pool (for VDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>930002329011</td>
<td>TC_SP2_VDM_3_plan</td>
<td>OLDWOLF4</td>
<td>OLDWOLF4s2_isc21386s3</td>
<td>isc21386s3_OLDWOLF4s2</td>
<td>TC_SP2_VDM_3_src_vdm1</td>
<td>TC_SP2_VDM_3_dst_vdm1</td>
<td>N/A</td>
</tr>
</tbody>
</table>
The nas Commands

File Systems = srcFs = TC_SP2_VDM_3_fs1
|-- dstFs(Recommended ID)=21378,NOT PRESERVED
|-- dstPool = clarata_r6
|-- srcSavPool = clarsas_r6
|-- dstSavPool = clarata_r6
Source Mover = server_2
Destination Mover = server_3
Read-Only User Checkpoints Excluded = No
Takeover IP Addresses = Yes
Interfaces - Devices
  = name=TC_SP2_VDM_3_itfc1:dstDevice=cge-2-0
  = name=TC_SP2_VDM_3_itfc2:dstDevice=cge-2-0
Migrate DR Solutions = No
Old DR Solutions = N/A
Non-migrated DR Solutions = N/A

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOT PRESERVED</td>
<td>The source file system ID cannot be preserved, then the NFS clients have to remount this file system after VDM migration completes.</td>
</tr>
</tbody>
</table>

Note: The following additional output is representative when the -dr option has been used to create the plan.

Migrate DR Solutions = yes
Old DR Solutions:
Replication ID = 1384_BB0050562DDB4_0000_363_BB0050562C7D9C_0000
  Replication Type = vdm
  Replication Role = destination
  Destination VDM = vdm2_replica
Replication ID = 1384_BB0050562DDB4_0000_364_BB0050562C7D9C_0000
  Replication Type = filesystem
  Replication Role = source
  Source FS = vdm2_fs1
Non-migrated DR Solutions:
  fs1_rep_loopback, fs1_rep_local

EXAMPLE #5  To create a VDM migration plan with the default setting when IP-takeover applies, type:

```bash
$ nas_migrate -plan -create planEx1 -source vdmEx1
  -destination -pool dstpool3 -interconnect winter_spring
  -take_over_ips
```

nas_migrate 297
Note: Additional output, which is representative only when the -dr option is used to create the plan, is enclosed in brackets ([]).

Info 26843676673: In Progress: Operation is still running. Check task id 24416 on the Background Tasks screen for results.
Validate plan name ... succeeded
Create plan ...
Validate destination system licenses ... succeeded
Validate interconnect ... succeeded
Validate source system licenses ... succeeded
Validate system versions ... succeeded
Validate I18N and CIFS service ... succeeded
Validate source VDM ... succeeded
Make migration plan for VDM ... succeeded
Validate source file system(s) ... succeeded
Validate source checkpoint(s) ... succeeded
[Validate all related replication session(s) ... succeeded]
[Validate all interconnects related to replication session(s) ... succeeded]
Make migration plan for file system(s) ... succeeded
Make migration plan for checkpoint(s) ... succeeded
Make migration plan for interface(s) ... succeeded
[Make migration plan for replication session(s) ... succeeded]
Migration plan create or verify ... succeeded
Create plan ... succeeded
Save plan ... succeeded
OK

[Warning 17726898426: The following loopback or local DRs (fs1_rep_loopback, fs1_rep_local) will not be migrated. Re-create them manually in the destination system after migration is completed if necessary.]

EXAMPLE #6 To create a VDM migration plan with storage pool mapping and IP-takeover, type:

```
$ nas_migrate -plan -create planEx1 -source vdmEx1
   -destination -pool dstpool3 -interconnect winter_spring
   -storage_pools srcpool1:dstpool1,srcpool2:dstpool2
   -take_over_ips
```

Output omitted for brevity.

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>storage_pools</td>
<td>Specifies the storage pool mapping. When not specified, the default matching rules are: auto-select a storage pool on the destination for each file system by (in the priority order) storage pool profile, disk type, then size.</td>
</tr>
</tbody>
</table>
EXAMPLE #7 To create a VDM migration plan with network device mapping, type:

```
$ nas_migrate -plan -create planEx1 -source vdmEx1 -destination -pool dstpool3 -interconnect winter_spring -take_over_ips -network_devices cge_src1:cge_dst1, cge_src2:cge_dst2
```

Output omitted for brevity.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>network_devices</td>
<td>Specifies the network device mapping to create destination interfaces with the exact same IP addresses as source interfaces. When not specified, the default matching rule is to use the network devices with identical name as those of the source network devices. This option is a sub-option for “-take_over_ips.”</td>
</tr>
</tbody>
</table>

EXAMPLE #8 To create a VDM migration plan with storage pool mapping, IP-takeover, network device mapping, type:

```
$ nas_migrate -plan -create planEx1 -source vdmEx1 -destination -pool dstpool3 -interconnect winter_spring -storage_pools srcpool1:dstpool1,srcpool2:dstpool2 -take_over_ips -network_devices cge1:cge1,cge2:cge20
```

Output omitted for brevity.

EXAMPLE #6 and EXAMPLE #7 provide descriptions of storage pool and network device mapping.

EXAMPLE #9 To modify a VDM migration plan, type:

```
$ nas_migrate -plan -modify plan001 -name plan001_New -filesystems -id srcFs=100:dstFs=100,srcFs=300:dstPool=3 -interfaces name=eth10:dstDevice=cge10
```

Output omitted for brevity.

EXAMPLE #10 To delete a VDM migration plan, type:

```
$ nas_migrate -plan -delete plan001
```

Output omitted for brevity.

EXAMPLE #11 To create a VDM level migration, type:

```
$ nas_migrate -create vdmMigEx1 -vdm -plan planEx1
```

Output omitted for brevity.

EXAMPLE #12 To create a file system level migration, type:
The nas Commands

$ nas_migrate -create fsMigEx1 -fs -source fs3
   -destination -pool dstpool3 -interconnect summer_spring

Note: Additional output, which is representative only when the -dr option is used to create the migration, is enclosed in brackets ([ ]).

Info 26843676673: In Progress: Operation is still running. Check task id 63654 on the Background Tasks screen for results.
Validate migration name <fsmigEx1> ... succeeded
Query migration plan ... succeeded
Validate migration ... succeeded
Create migration session ... succeeded
Create FS [<fs name>] ... succeeded
Create interfaces ... succeeded
Create FS replication [<fs name>] ... succeeded
Initial Copy FS [<fs name>] ... succeeded.
Create destination file systems ...
Create destination file systems: <#created>/<#total>(updated per 2 minutes)
Create destination file systems... succeeded
Create checkpoints ...
Create checkpoints: <#created>/<#total>(updated per 2 minutes)
Create checkpoints ... succeeded
Create replications ...
Create replications: <#created>/<#total>(updated per 2 minutes)
Create replications ... succeeded
Update Migration State [INITIAL_COPYING] ... succeeded
Initial Copy ...
Initial Copy: Total=50000(M): Copied=10000(M): Transfer Rate=2000(KB/s)(updated per 10 minutes)
Initial Copy: Total=50000(M): Copied=20000(M): Transfer Rate=3000(KB/s)(updated per 10 minutes)
Initial Copy ... succeeded
Modify RPO of replications ... succeeded
Update migration state to [READY_TO_COMPLETE] ... succeeded
OK
[Warning 17726898426: The following loopback or local DRs (fs3_rep_loopback, fs3_rep_local) will not be migrated. Re-create them manually in the destination system after migration is completed if necessary.]

EXAMPLE #13 To complete a migration with the background flag, type:

$ nas_migrate -complete fsMigEx1
   -checkpoint_mismatch_ignored -background

Info 26843676432: In Progress: Operation is still running. Check task id 134227 on the Background Tasks screen for results.

EXAMPLE #14 To delete a migration with the background flag, type:

$ nas_migrate -delete fsMigEx1 -background

Info 26843676556: In Progress: Operation is still running. Check task id 142811
on the Background Tasks screen for results.

**EXAMPLE #15** To stop a migration with the background flag, type:

```
$ nas_migrate -stop fsMigEx1 -background
```

Info 26843676556: In Progress: Operation is still running. Check task id 144511 on the Background Tasks screen for results.

**EXAMPLE #16** To stop a migration, type:

```
$ nas_migrate -stop id=20002224601
```

Info 26843676673: In Progress: Operation is still running. Check task id 17919 on the Background Tasks screen for results.

Check migration state ... succeeded
Change migration state to STOPPING ... succeeded
Check local replication state ... succeeded
Check remote replication state ... succeeded
Stop replication in parallel ...
Stop replication task state: Total=10 Succeeded=0 Failed=0
Stop replication task state: Total=10 Succeeded=5 Failed=0
Stop replication task state: Total=10 Succeeded=6 Failed=0
Stop replication task state: Total=10 Succeeded=10 Failed=0
Stop replication in parallel succeeded
Change migration state to STOPPED ... succeeded

**EXAMPLE #17** To start a migration, type:

```
$ nas_migrate -start id=20002224601 -background
```

Info 26843676673: In Progress: Operation is still running. Check task id 144527 on the Background Tasks screen for results.

```
Check migration state ... passed
Change migration state to COMPLETING ... succeeded
Check mismatched user checkpoints ... passed
- Interfaces [eth32,eth33]
Check VDM and file systems status ... passed
Synchronize data to the destination ...
- - Synchronize data to the destination: Total=4 Succeeded=3 Failed=0
- - Synchronize data to the destination: Total=4 Succeeded=4 Failed=0
Synchronize data to the destination succeeded
Cut over the migration ...
----------------------------------------
- Cut-over start time:2013-04-26 06:16:50
- Turn down interfaces on the source ... succeeded
```

**EXAMPLE #18** To complete a migration without the -dr option, type:

```
$ nas_migrate -complete mig_vdm1
```

$ nas_migrate -complete mig_vdm1
Info 26843676673: In Progress: Operation is still running. Check task id 2059 on the Background Tasks screen for results.

Check migration state ... passed
Change migration state to STOPPED ... succeeded
Check interfaces available on the source mover ... succeeded
- Interfaces [eth2,eth3]
Check VDM and file systems status ... passed
Synchronize data to the destination ...
- - Synchronize data to the destination: Total=4 Succeeded=3 Failed=0
- - Synchronize data to the destination: Total=4 Succeeded=4 Failed=0
Synchronize data to the destination succeeded
Cut over the migration ...
- Cut-over start time:2013-04-26 06:16:50
- Turn down interfaces on the source ...

```
- Reverse file system replications ...
- Reverse file system replications: Total=3 Succeeded=0 Failed=0
- Reverse file system replications: Total=3 Succeeded=3 Failed=0
- Reverse replications succeeded
- Reverse VDM replications ...
- Reverse replications: Total=4 Succeeded=1 Failed=0
- Reverse VDM replications: Total=1 Succeeded=0 Failed=0
- Reverse VDM replications: Total=1 Succeeded=1 Failed=0
- Reverse VDM replication succeeded
- Restore destination FS to Read-Only ... succeeded
- Turn up interfaces on the destination ... succeeded

Cut over the migration succeeded
- Start time: 2013-04-26 06:16:50
- End time: 2013-04-26 06:18:21
- Duration: 1 mins 31 secs
 Restore checkpoint schedules on the destination ... succeeded
 Change migration state to COMPLETED ... succeeded
 OK

** EXAMPLE #19**  After the regular migration complete (without -dr option) is done, run the following command to take over (or cutover) disaster recovery replication resolutions:

```
$ nas_migrate -complete mig_vdm1 -dr
```

Info 26843676673: In Progress: Operation is still running. Check task id 2059 on the Background Tasks screen for results.

Check migration state ... passed
Change migration state to COMPLETING ... succeeded
Cut over the disaster recovery resolutions ...
- Cut-over Start time: 2013-04-26 06:16:50
- Cut over replications: Total=4 Succeeded=0 Failed=0
- Cut over replications: Total=4 Succeeded=1 Failed=0
- Cut over replications: Total=4 Succeeded=1 Failed=0
- Cut over replications: Total=4 Succeeded=4 Failed=0

Cut over the disaster recovery resolutions succeeded
- Start time: 2013-04-26 06:16:50
- End time: 2013-04-26 06:18:21
- Duration: 1 mins 31 secs
 Save replications context ... succeeded
 Change migration state to COMPLETED ... succeeded
 OK

** EXAMPLE #20**  To view detailed information of a specific migration that was created with the -dr option and whose destination is the current cabinet, type:

```
$ nas_migrate -info mig_vdm2
```

ID = 20001105556
Name                                = mig_vdm2
Type                                = VDM
State                               = COMPLETED
Network Status                      = OK
Source Celerra/VNX Network Server   = filesim9080cs0
Peer Dart Interconnect              = filesim8186cs0_dm2
Dart Interconnect                   = filesim9080cs0_dm2
Source VDM                          = vdm2_replica
Destination VDM                     = vdm2
VDM Migration Plan                  = plan_vdm2
File Systems                        = vdm2_fs1->vdm2_fs1;
                                 Checkpoints:vdm2_fs1_ckpt1->vdm2_fs1_ckpt1, vdm2_fs1_ckpt2->vdm2_fs1_ckpt2
                                 vdm2_fs2->vdm2_fs2;
                                 Checkpoints:vdm2_fs2_ckpt1->vdm2_fs2_ckpt1, vdm2_fs2_ckpt2->vdm2_fs2_ckpt2
Source Mover                        = server_2
Destination Mover                   = server_2
Read-Only User Checkpoints Excluded = No
Takeover IP Addresses               = Yes
Interfaces to Takeover              = itfc-1, itfc-2
Replications                        = 653_BB0050562DDCB4_0000_900_BB0050562C7D9C_0000
                                 : VDM
                                 : Filesystem
                                 655_BB0050562DDCB4_0000_906_BB0050562C7D9C_0000
                                 : Filesystem
                                 660_BB0050562DDCB4_0000_908_BB0050562C7D9C_0000
Migrate DR Solutions                = Yes
DR Solution State                   = COMPLETED
DR Solutions:
Old DR #1:
Replication ID                      = 660_BB0050562DDCB4_0000_909_BB0050562C7D9C_0000
Replication Type                    = vdm
Replication Role                    = destination
Destination VDM                     = vdm2_replica
Common Base Checkpoint              = root_fs_vdm_vdm1_drCkptA
Peer Common Base Checkpoint         = root_fs_vdm_vdm1_drCkptA1
New DR #1:
Replication ID                      = 660_BB0050562DDCB4_0000_910_BB0050562C7D9C_0000
Destination VDM                     = vdm2
Common Base Checkpoint              = root_fs_vdm_vdm1_drCkptA2
Old DR #2:
Replication ID                      = 660_BB0050562DDCB4_0000_911_BB0050562C7D9C_0000
Replication Type                    = filesystem
Replication Role                    = source
Source FS                           = vdm2_fs1
Common Base Checkpoint              = fs1_drCkptA
Peer Common Base Checkpoint         = fs1_drCkptA1
New DR #2:
Remote System                       = filesim8186cs0
<table>
<thead>
<tr>
<th>Replication ID</th>
<th>= 660_BB0050562DDCB4_0000_909_BB0050562C7D9C_0000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source FS</td>
<td>= vdm2_fs1</td>
</tr>
<tr>
<td>Common Base Checkpoint</td>
<td>= fs1_r1_drCkptA2</td>
</tr>
</tbody>
</table>

**Note:**

Old DR #2: The information of the old DR solutions created on the source objects of a migration.

Common Base Checkpoint: The common base checkpoint created on the source/destination VDM or FS of a migration.

Peer Common Base Checkpoint: The common base checkpoint created on the peer object (of the replication session) of the source VDM or FS of a migration.
Performs MirrorView/Synchronous (MirrorView/S) operations on a system attached to an older version of VNX for block.

**SYNOPSIS**

nas_mview
- info
- init <cel_name>
- activate
- restore

**DESCRIPTION**

nas_mview retrieves MirrorView/S cabinet-level information, initializes the source and destination systems for MirrorView/S, activates a failover to a destination VNX for file, or restores the source site after a failover.

MirrorView/S is supported on a system attached to an older version of VNX for block array serving as the boot storage, not the secondary storage. **nas_mview** must be run from a Control Station in slot 0; it will report an error if run from a Control Station in slot 1.

**OPTIONS**

- **-info**
  Displays disaster recovery information such as the MirrorView/S device group eligible, displays the MirrorView/S Data Mover configuration for the current system.

- **-init <cel_name>**
  Initializes the MirrorView/S relationship between the source and destination systems based on if the configuration is active/passive (unidirectional) or active/active’ (bidirectional).

  **Note:** The apostrophe in active/active’ indicates that both sites have source LUNs mirrored at the other site.
The passphrase-protected relationship between the source and destination systems in the MirrorView/S configuration must be built prior to initialization using the `nas_cel -create` command:

- On the destination Control Station in a MirrorView/S active/passive configuration, use the `-init` option to specify the name of the source system.

- On the Control Station of each system in a MirrorView/S active/active configuration, use the `-init` option to specify the name of the remote system. The active/active configuration is a bidirectional configuration in which a VNX for file can serve both as source and destination for another system.

### -activate
Executed from the destination system using the remote administration account, initiates a failover from the source to the destination system. The activation works as follows:

- If the source is available, the `-activate` option swaps the primary-secondary role for all mirrors in the MirrorView/S device group and makes the destination LUNs read/write. The standby Data Movers acquire the IP and MAC addresses, file systems, and export tables of their source counterparts.

- If the original source site is unavailable, the destination LUNs are promoted to the primary role, making them visible to the destination VNX for file. The original source LUNs cannot be converted to backup images; they stay visible to the source VNX for file, and the original destination site is activated with new source (primary) LUNs only. If the source cannot be shut down in a disaster scenario, any writes occurring after the forced activation will be lost during a restore.

### -restore
Issued from the destination system using the remote administration account, restores a source system after a MirrorView/S failover, and fails back the device group to the source system.

The restore process begins by checking the state of the device group. If the device group state is Local Only (where each mirror has only the source LUN), the device group will be fully synchronized and rebuilt before the failback can occur. If the device group condition is fractured, an incremental synchronization is performed before the failback occurs. Source devices are then synchronized with the data on the original destination devices. I/O access is shut down, the original destination Data Movers are rebooted as remote standbys,
and the mirrored devices are failed back. When the source side is restored, the source Data Movers and their services are restarted.

If the restore fails, the source Control Station is not reachable on the data network. To complete the restore, access the source, log in as root, and type /nasmd/sbin/nas_mview -restore.

SEE ALSO

Using MirrorView/Synchronous with VNX for Disaster Recovery, nas_cel, and nas_checkup.

SYSTEM OUTPUT

The number associated with the storage device reflects the attached system; for MirrorView/S, VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019.

The VNX for block supports the following system-defined AVM storage pools for MirrorView/S only: cm_r1, cm_r5_performance, cm_r5_economy, cmata_archive, cmata_r3, cm_r6, and cmata_r6.

EXAMPLE #1

To initialize a destination VNX for file in an active/passive configuration to communicate with source site source_cs, from the destination Control Station, type:

```
# /nas/sbin/nas_mview -init source_cs
```

Celerra with MirrorView/Synchronous Disaster Recovery

Initializing source_cs  -->  target_cs

Contacting source_cs for remote storage info

Local  storage system: APM00053001549
Remote storage system: APM00053001552

Enter the Global CLARiiON account information
Username: emc
Password: *** Retype your response to validate
Password: ***

Discovering storage on source_cs (may take several minutes)
Setting security information for APM00053001549
Discovering storage APM00053001552 (may take several minutes)

Discovering storage (may take several minutes)

Contacting source_cs for remote storage info
Gathering server information...
Contacting source_cs for server capabilities...
Analyzing server information...

Source servers available to be configured for remote DR

-------------------------------------------------------
The nas Commands

1. server_2:source_cs
2. server_3:source_cs [ local standby ]
v. Verify standby server configuration
q. Quit initialization process
c. Continue initialization
Select a source_cs server: 1

Destination servers available to act as remote standby
------------------------------------------------------
1. server_2:target_cs [ unconfigured standby ]
2. server_3:target_cs [ unconfigured standby ]
b. Back
Select a target_cs server: 1

Source servers available to be configured for remote DR
-------------------------------------------------------
1. server_2:source_cs [ remote standby is server_2:target_cs ]
2. server_3:source_cs [ local standby ]
v. Verify standby server configuration
q. Quit initialization process
c. Continue initialization
Select a source_cs server: 2

Destination servers available to act as remote standby
------------------------------------------------------
server_2:target_cs [ is remote standby for server_2:source_cs ]
2. server_3:target_cs [ unconfigured standby ]
b. Back
Select a target_cs server: 2

Source servers available to be configured for remote DR
-------------------------------------------------------
1. server_2:source_cs [ remote standby is server_2:target_cs ]
2. server_3:source_cs [ remote standby is server_3:target_cs ]
v. Verify standby server configuration
q. Quit initialization process
c. Continue initialization
Select a source_cs server: c

Standby configuration validated OK

Enter user information for managing remote site source_cs
Username: dradmin
Password: *******               Retype your response to validate
Password: ******

Active/Active configuration
Initializing (source_cs-->target_cs)

Do you wish to continue? [yes or no] yes

Updating MirrorView configuration cache
Setting up server_3 on source_cs
Setting up server_2 on source_cs
Creating user account dradmin
Setting acl for server_3 on target_cs
Setting acl for server_2 on target_cs
Updating the Celerra domain information
Creating device group mviewgroup on source_cs
done

EXAMPLE #2  To get information about a source MirrorView configuration (for example, on new_york configured as active/passive), type:

```
# /nas/sbin/nas_mview -info
```

***** Device Group Configuration *****

```
name                  = mviewgroup
description           =
uid                   = 50:6:1:60:B0:60:26:BC:0:0:0:0:0:0:0:0:0
state                 = Consistent
role                  = Primary
condition             = Active
recovery policy       = Automatic
number of mirrors     = 16
mode                  = SYNC
owner                 = 0
mirrored disks        =
root_disk,root_ldisk,d5,d8,d10,d11,d24,d25,d26,d27,d29,d30,d31,d32,d33,d39,
local clarid          = APM00053001552
remote clarid         = APM00053001549
mirror direction      = local -> remote
```

***** Servers configured with RDFstandby *****

```
id        = 1
name      = server_2
acl       = 1000, owner=nasadmin, ID=201
type      = nas
slot      = 2
member_of =
standby   = server_3, policy=auto
RDFstandby= slot=2
status    :
  defined = enabled
  actual  = online, active
```

```
id        = 2
name      = server_3
acl       = 1000, owner=nasadmin, ID=201
type      = standby
slot      = 3
member_of =
```
standbyfor= server_2
RDFstandby= slot=3
status :
  defined = enabled
  actual = online, ready

***** Servers configured as standby *****

No servers configured as standby

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device group configuration:</strong></td>
<td></td>
</tr>
<tr>
<td>name</td>
<td>Name of the consistency (device) group.</td>
</tr>
<tr>
<td>description</td>
<td>Brief description of device group.</td>
</tr>
<tr>
<td>uid</td>
<td>UID assigned, based on the system.</td>
</tr>
<tr>
<td>state</td>
<td>State of the device group (for example, Consistent, Synchronized, Out-of-Sync, Synchronizing, Scrambled, Empty, Incomplete, or Local Only).</td>
</tr>
<tr>
<td>role</td>
<td>Whether the current system is the Primary (source) or Secondary (destination) for this group.</td>
</tr>
<tr>
<td>condition</td>
<td>Whether the group is functioning (Active), Inactive, Admin Fractured (suspended), Waiting on Sync, System Fractured (which indicates link down), or Unknown.</td>
</tr>
<tr>
<td>recovery policy</td>
<td>Type of recovery policy (Automatic is the default and recommended value for group during system configuration; if Manual is set, you must use -resume after a link down failure).</td>
</tr>
<tr>
<td>number of mirrors</td>
<td>Number of mirrors in group.</td>
</tr>
<tr>
<td>mode</td>
<td>MirrorView mode (always SYNC in this release).</td>
</tr>
<tr>
<td>owner</td>
<td>ACL ID assigned (0 indicates no control). nas_acl provides information.</td>
</tr>
<tr>
<td>mirrored disks</td>
<td>Comma-separated list of disks that are mirrored.</td>
</tr>
<tr>
<td>local clarid</td>
<td>APM number of local VNX for block storage array.</td>
</tr>
<tr>
<td>remote clarid</td>
<td>APM number of remote VNX for block storage array.</td>
</tr>
<tr>
<td>mirror direction</td>
<td>On primary system, local to remote (on primary system); on destination system, local from remote.</td>
</tr>
</tbody>
</table>
The nas Commands

EXAMPLE #3
To activate a failover, log in to destination Control Station using `dradmin` account, `su` to `root`, and type:

```
# /nas/sbin/nas_mview -activate
```
Sync with CLARiiON backend ...... done
Validating mirror group configuration ...... done
Is source site source_cs ready for complete shut down (power OFF)? [yes or no] yes
Contacting source site source_cs, please wait... done
Shutting down remote site source_cs ...................................... done
Sync with CLARiiON backend ...... done
STARTING an MV 'FAILOVER' operation.
Device group: mviewgroup ............ done
The MV 'FAILOVER' operation SUCCEEDED.
Failing over Devices ... done
Adding NBS access for server_2 ........ done
Adding NBS access for server_3 ........ done
Activating the target environment ... done

server_2 : going offline
  rdf : going active
  replace in progress ...done
  failover activity complete

server_3 : going offline
  rdf : going active
  replace in progress ...done
  failover activity complete
  commit in progress (not interruptible)...done

### Value Definition

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers configured with RDFstandby/ Servers configured as standby:</td>
<td></td>
</tr>
<tr>
<td>id</td>
<td>Server ID</td>
</tr>
<tr>
<td>name</td>
<td>Server name</td>
</tr>
<tr>
<td>acl</td>
<td>ACL value and owner</td>
</tr>
<tr>
<td>type</td>
<td>Server type (for example, nas or standby)</td>
</tr>
<tr>
<td>slot</td>
<td>Slot number for this Data Mover</td>
</tr>
<tr>
<td>member_of</td>
<td>If applicable, shows membership information.</td>
</tr>
<tr>
<td>standby</td>
<td>If this Data Mover is configured with local standbys, the server that is</td>
</tr>
<tr>
<td>RDFstandby</td>
<td>the local standby and any policy information.</td>
</tr>
<tr>
<td>standbyfor</td>
<td>If this Data Mover is also configured as a local standby, the server</td>
</tr>
<tr>
<td>status</td>
<td>Indicates whether the Data Mover is defined and online/ready.</td>
</tr>
</tbody>
</table>

Value Definition

Servers configured with RDFstandby/ Servers configured as standby:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Server ID</td>
</tr>
<tr>
<td>name</td>
<td>Server name</td>
</tr>
<tr>
<td>acl</td>
<td>ACL value and owner</td>
</tr>
<tr>
<td>type</td>
<td>Server type (for example, nas or standby)</td>
</tr>
<tr>
<td>slot</td>
<td>Slot number for this Data Mover</td>
</tr>
<tr>
<td>member_of</td>
<td>If applicable, shows membership information.</td>
</tr>
<tr>
<td>standby</td>
<td>If this Data Mover is configured with local standbys, the server that is the local standby and any policy information.</td>
</tr>
<tr>
<td>RDFstandby</td>
<td>If this Data Mover is configured with a remote RDF standby, the slot number of the destination Data Mover that serves as the RDF standby.</td>
</tr>
<tr>
<td>standbyfor</td>
<td>If this Data Mover is also configured as a local standby, the server numbers for which it is a local standby.</td>
</tr>
<tr>
<td>status</td>
<td>Indicates whether the Data Mover is defined and online/ready.</td>
</tr>
</tbody>
</table>
EXAMPLE #4 To restore, log in to the destination Control Station using `dradmin` account, as a `root` user, and type:

```
# /nas/sbin/nas_mview -restore
```

Sync with CLARiiON backend ...... done
Validating mirror group configuration ...... done
Contacting source site source_cs, please wait... done
Running restore requires shutting down source site source_cs.
Do you wish to continue? [yes or no] yes
Shutting down remote site source_cs ...... done
Is source site source_cs ready for storage restoration? [yes or no] yes
Sync with CLARiiON backend ...... done
STARTING an MV 'RESUME' operation.
Device group: mviewgroup ............. done
The MV 'RESUME' operation SUCCEEDED.
Percent synchronized: 100
Updating device group ... done
Is source site ready for network restoration? [yes or no] yes
Restoring servers ...... done
Waiting for servers to reboot ...... done
Removing NBS access for server_2 .. done
Removing NBS access for server_3 .. done
Waiting for device group ready to failback .... done
Sync with CLARiiON backend ...... done
STARTING an MV 'FAILBACK' operation.
Device group: mviewgroup ............. done
The MV 'FAILBACK' operation SUCCEEDED.
Restoring remote site source_cs ...... failed
Error 5008: -1:Cannot restore source_cs. Please run restore on site source_cs.

Then on the Source Control Station, as a `root` user, type:

```
# /nasmcd/sbin/nas_mview -restore
```

Stopping NAS services. Please wait...

Powering on servers (please wait) ...... done
Sync with CLARiiON backend ...... done
STARTING an MV 'SUSPEND' operation.
Device group: mviewgroup ............. done
The MV 'SUSPEND' operation SUCCEEDED.
server_2 : going standby
rdf : going active
replace in progress ...done
failover activity complete
server_3 : going standby
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
commit in progress (not interruptible)...done
Sync with CLARiiON backend ...... done
STARTING an MV 'RESUME' operation.
Device group: mviewgroup ............ done
The MV 'RESUME' operation SUCCEEDED.
Restarting NAS services ...... done
commit in progress (not interruptible)...done
commit in progress (not interruptible)...done
done
The nas Commands

nas_pool

Manages the user-defined and system-defined storage pools for the system.

SYNOPSIS

nas_pool
  -list
  | -info {<name>|id=<id>|-all}[-storage <system_name>]
  | -size {<name>|id=<id>|-all} [-mover <mover>][-slice {y|n}]
    [-storage <system_name>]
  | -create [-name <name>][-acl <acl>][-description <desc>]
    [-default_slice_flag {y|n}] [-is_greedy {y|n}]
    [-fixed_block_dedup {n|y}]
  | -delete {<name>|id=<id>} [-deep] [-storage <system_name>]
  | -modify {<name>|id=<id>} [-acl <acl>] [-description <desc>]
    [-default_slice_flag {y|n}] [-is_greedy {y|n}]
    [-is_dynamic {y|n}][-fixed_block_dedup {n|y}]
  | -xtend {<name>|id=<id>} [-size <integer> [M|G|T] [-storage <system_name>]
  | -shrink {<name>|id=<id>} [-volumes <volume_name>[-deep]
    [-storage <system_name>]
    [-deep]

DESCRIPTION

nas_pool creates, deletes, extends, shrinks, lists, displays, manages the access control level, and modifies a user-defined storage pool.

nas_pool extends, shrinks, lists, displays, and modifies system-defined storage pools.

OPTIONS

- list
  Lists all storage pools on the system.

  - info {<name>|id=<id>|-all} [-storage <system_name>]
  Displays detailed information for the specified storage pool, or all storage pools. The -storage option can be used to differentiate pools when the same pool name is used in multiple systems.

  - size {<name>|id=<id>|-all}
  Displays the size for the specified storage pool, or all storage pools.
The nas Commands

[-mover <mover>]
Displays size information that is visible to the physical Data Mover or the virtual Data Mover (VDM).

[-slice {y|n}]
If y is typed, displays size information when volumes in the storage pool are sliced. If n is typed, displays size information when volumes in the storage pool are not sliced. The -slice option defaults to the value of default_slice_flag for the storage pool.

[-storage <system_name>]
Displays size information for members that reside on a specified system.

-create
Creates a user-defined storage pool.

[-name <name>]
Assigns a name to the new storage pool. If no name is specified, assigns one by default.

[-acl <acl>]
Sets an access control level value that defines the owner of the storage pool, and the level of access allowed for users and groups defined in the access control level table. The nas_acl command provides more information.

[-description <desc>]
Assigns a comment to the storage pool.

[-volumes <volume_name>[,<volume_name>,...]]
Designates the members to be added to the storage pool. The members can be any meta, slice, stripe, or disk volumes.

[-default_slice_flag {y|n}]
If set to y (default), then members of the storage pool might be sliced when space is allocated from the storage pool. If set to n, members of the storage pool will not be sliced when space is dispensed from the storage pool and the volumes specified cannot be built on a slice.

[-is_greedy {y|n}]
If set to n (default), the system uses space from the user-defined storage pool's existing member volumes in the order that the volumes were added to the pool to create a new file system or extend an existing file system.
If set to \( y \), the user-defined storage pool uses space from the least-used member volume to create a new file system. When there is more than one least-used member volume available, AVM selects the member volume that contains the most disk volumes. For example, if one member volume contains four disk volumes and another member volume contains eight disk volumes, AVM selects the one with eight disk volumes. If there are two or more member volumes that have the same number of disk volumes, AVM selects the one with the lowest ID.

\[\text{fixed_block_dedup} \{n|y\}\]

Enables fixed-block deduplication on the specified file storage pool. \( n \) is the default. This option is only valid if the file storage pool does not use shared disks and contains only file systems that use a split log type.

\[\text{size} <\text{integer}> \{M|G|T\}\]

Creates a storage pool with the size specified. \( M \) specifies megabytes, \( G \) specifies gigabytes (default), and \( T \) specifies terabytes. The maximum size that you can specify for a storage pool is the maximum supported storage capacity for the system.

\[\text{storage} <\text{system_name}>\]

Specifies the system on which one or more volumes will be created, to be added to the storage pool.

\[\text{template} <\text{system_pool_name}>\]

Specifies a system pool name, required when the \text{size} option is specified. The user pool will be created using the profile attributes of the specified system pool template.

\[\text{num_stripe_members} <\text{num}>\]

Specifies the number of stripe members for user pool creation by size. The \text{num_stripe_members} option works only when both \text{size} and \text{template} options are specified. It overrides the number of stripe members attribute of the specified system pool template.

\[\text{stripe_size} <\text{num}>\]

Specifies the stripe size for user pool creation by size. The \text{stripe_size} option works only when both \text{size} and \text{template} options are specified. It overrides the stripe size attribute of the specified system pool template.

\text{-modify} \{<\text{name}|\text{id}=<id>} \text{storage} <\text{system_name}>\]

Modifies the attributes of the specified user-defined or system-defined storage pool. The \text{storage} option can be used to
differentiate pools when the same pool name is used in multiple systems.

Managing Volumes and File Systems with VNX Automatic Volume Management lists the available system-defined storage pools.

[-name <name>]
Changes the name of the storage pool to the new name.

[-acl <acl>]
Sets an access control level value that defines the owner of the storage pool, and the level of access allowed for users and groups defined in the access control level table. The nas_acl command provides more information.

[-description <desc>]
Changes the comment for the storage pool.

[-default_slice_flag {y|n}]
If set to y (default), then members of the storage pool might be sliced when space is dispensed from the storage pool. If set to n, members of the storage pool will not be sliced when space is dispensed from the storage pool and the volumes specified cannot be built on a slice.

[-is_dynamic {y|n}]
Allows a system-defined storage pool to automatically extend or shrink member volumes.

**Note:** The -is_dynamic option is for system-defined storage pools only.

[-is_greedy {y|n}]
For system-defined storage pools, if set to y, then the storage pool attempts to create new member volumes before using space from existing member volumes. A system-defined storage pool that is not greedy (set to n), consumes all the space existing in the storage pool before trying to add additional member volumes. A y or n value must be specified when modifying a system-defined storage pool.

For user-defined storage pools, if set to n (default), the system uses space from the user-defined storage pool’s existing member volumes in the order that the volumes were added to the pool to create a new file system.
For user-defined storage pools, if set to y, the system uses space from the least-used member volume in the user-defined storage pool to create a new file system. When there is more than one least-used member volume available, AVM selects the member volume that contains the most disk volumes. For example, if one member volume contains four disk volumes and another member volume contains eight disk volumes, AVM selects the one with eight disk volumes. If there are two or more member volumes that have the same number of disk volumes, AVM selects the one with the lowest ID.

For both system-defined and user-defined pools when extending a file system, the is_greedy attribute is ignored unless there is not enough free space on the existing volumes that the file system is using to meet the requested extension size.

\[-\text{fixed_block_dedup}\ \{n|y\}\]

 Specifies whether fixed-block deduplication is enabled on the file storage pool. This option is only valid if the file storage pool does not use shared disks and contains only file systems that use a split log type.

\[-\text{delete}\ \{<\text{name}|\text{id}=<\text{id}>\} \[-\text{storage}\ <\text{system\_name}>\]

 Deletes a storage pool. Storage pools cannot be deleted if any members are in use. After deletion, the storage pool no longer exists on the system; however, members of the storage pool are not deleted. The -storage option can be used to differentiate pools when the same pool name is used in multiple systems.

\[-\text{deep}\]

 Deletes the storage pool and also recursively deletes each member of the storage pool. Each storage pool member is deleted unless it is in use or is a disk volume.

\[-\text{xtend}\ \{<\text{name}|\text{id}=<\text{id}>\} \[-\text{storage}\ <\text{system\_name}>\]
 \[-\text{volumes}\ <\text{volume\_name}>,\ <\text{volume\_name}>,...\]

 Adds one or more unused volumes to a storage pool. The -storage option can be used to differentiate pools when the same pool name is used in multiple systems. If the default_slice_value is set to n, member volumes cannot contain slice volumes (for compatibility with TimeFinder/FS).

**Note:** Extending a storage pool by volume is for user-defined storage pools only.
The nas Commands

-xtend {<name>|id=<id>} -size <integer> [M|G|T]
Extends the specified storage pool with one or more volumes of the size equal to or greater than the size specified. When specifying the volume by size, type an integer between 1 and 1024, then specify T for terabytes, G for gigabytes (default), or M for megabytes.

[-storage <system_name>]
Specifies the system on which one or more volumes will be created, to be added to the storage pool.

**Note:** To successfully extend a system-defined storage pool by size, the `is_dynamic` attribute must be set to n, and there must be enough available disk volumes to satisfy the request.

-shrink {<name>|id=<id>} [-storage <system_name>]
-volumes <volume_name>[, <volume_name>, ...][-deep]
Shrinks the storage pool by the specified unused volumes. The `-storage` option can be used to differentiate pools when the same pool name is used in multiple systems. When the `-deep` option is used to shrink a user-defined storage pool, it removes the specified member volumes from the pool, and recursively deletes any unused volumes unless it is a disk volume. If the `-deep` option is not used to shrink a user-defined storage pool, the member volumes are left intact so that they can be reused. The `is_dynamic` option must be set to n before shrinking system-defined storage pools.

**Note:** Shrinking of a system-defined storage pool by default deletes member volumes automatically. Specifying the `-deep` option on the system-defined storage pool shrink does not make any difference.

SEE ALSO

SYSTEM OUTPUT
VNX for block supports the following traditional system-defined storage pools: clar_r1, clar_r5_performance, clar_r5_economy, clar_r6, clarata_r3, clarata_r6, clarata_r10, clarata_archive, cm_r1, cm_r5_performance, cm_r5_economy, cm_r6, cmata_r3, cmata_archive, cmata_r6, cmata_r10, clarsas_archive, clarsas_r6, clarsas_r10, clarefd_r5, clarefd_r10, cmsas_archive, cmsas_r6, cmsas_r10, and cmefd_r5.
A mapped pool was formerly called a thin or virtual pool.

Disk types when using VNX for block are CLSTD, CLEFD, CLATA, MIXED (indicates that tiers used in the pool contain multiple disk types), Performance, Capacity, and Extreme_performance and for VNX for block involving mirrored disks are: CMEFD, CMSTD, CMATA, Mirrored_mixed, Mirrored_performance, Mirrored_capacity, and Mirrored_extreme_performance.

Disk types when using VNX for block are CLSTD, CLEFD, and CLATA, and for VNX for block involving mirrored disks are CMEFD, CMSTD, and CMATA.

VNX with a Symmetrix system supports the following system-defined storage pools: symm_std, symm_std_rdf_src, symm_ata, symm_ata_rdf_src, symm_ata_rdf_tgt, symm_std_rdf_tgt, symm_efd, symm_fts, symm_fts_rdf_tgt and symm_fts_rdf_src.

For user-defined storage pools, the difference in output is in the disk type. Disk types when using a Symmetrix are STD, R1STD, R2STD, BCV, R1BCV, R2BCV, ATA, R1ATA, R2ATA, BCVA, R1BCA, R2BCA, EFD, FTS, R1FTS, R2FTS, R1BCF, R2BCF, BCVF, BCVMIXED, R1MIXED, R2MIXED, R1BCVMIXED, and R2BCVMIXED.

**EXAMPLE #1**

To create a storage pool with the name, marketing, with a description, with the following disk members, d12, d13, and with the default slice flag set to y, type:

```bash
$ nas_pool -create -name marketing -description 'Storage Pool' -volumes d12,d13 -default_slice_flag y
```

```plaintext
id                   = 20
name                 = marketing
description          = Storage Pool
acl                  = 0
in_use               = False
clients              =
members              = d12,d13
storage_system(s)    = FNM00105000212
default_slice_flag   = True
is_user_defined      = True
thin                 = False
disk_type            = CLSTD
server_visibility    = server_2,server_3,server_4,server_5
is_greedy            = False
template_pool        = N/A
numStripeMembers     = N/A
stripeSize           = N/A
```
Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the storage pool.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the storage pool.</td>
</tr>
<tr>
<td>description</td>
<td>Comment assigned to the storage pool.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the storage pool.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether the storage pool is being used by a file system.</td>
</tr>
<tr>
<td>clients</td>
<td>File systems using the storage pool.</td>
</tr>
<tr>
<td>members</td>
<td>Volumes used by the storage pool.</td>
</tr>
<tr>
<td>storage_system(s)</td>
<td>Storage systems used by the storage pool.</td>
</tr>
<tr>
<td>default_slice_flag</td>
<td>Allows slices from the storage pool.</td>
</tr>
<tr>
<td>is_user_defined</td>
<td>User-defined as opposed to system-defined.</td>
</tr>
<tr>
<td>thin</td>
<td>Indicates whether thin provisioning is enabled or disabled.</td>
</tr>
<tr>
<td>disk_type</td>
<td>Type of disk contingent on the system attached. Performance, Capacity,</td>
</tr>
<tr>
<td></td>
<td>Extreme_performance, Mirrored_mixed, Mirrored_performance, Mirrored_capacity,</td>
</tr>
<tr>
<td></td>
<td>and Mirrored_extreme_performance are for VNX for block, and STD, BCV,</td>
</tr>
<tr>
<td></td>
<td>R1BCV, R2BCV, R1STD, R2STD, ATA, R1ATA, R2ATA, BCVA, R1BCA, R2BCA, EFD,</td>
</tr>
<tr>
<td></td>
<td>BCVMIXED, R1MIXED, R2MIXED, R1BCVMIXED, and R2BCVMIXED are for Symmetrix.</td>
</tr>
<tr>
<td>server_visibility</td>
<td>Storage pool is visible to the physical Data Movers specified.</td>
</tr>
<tr>
<td>is_greedy</td>
<td>Indicates whether the system-defined storage pool will use new member</td>
</tr>
<tr>
<td></td>
<td>volumes as needed.</td>
</tr>
<tr>
<td>template_pool</td>
<td>System pool template used to create the user pool. Only applicable to user</td>
</tr>
<tr>
<td></td>
<td>pools created by size or if the last member volume is a stripe or both.</td>
</tr>
<tr>
<td>num_stripe_members</td>
<td>Number of stripe members used to create the user pool. Applicable to</td>
</tr>
<tr>
<td></td>
<td>system pools and user pools created by size or if the last member volume</td>
</tr>
<tr>
<td></td>
<td>is a stripe or both.</td>
</tr>
<tr>
<td>stripe_size</td>
<td>Stripe size used to create the user pool. Applicable to system pools and</td>
</tr>
<tr>
<td></td>
<td>user pools created by size or if the last member volume is a stripe or both.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2** To change the description for the **marketing** storage pool to include a descriptive comment, type:

```
$ nas_pool -modify marketing -description 'Marketing Storage Pool'
```

| id      | = 20 |
| name    | = marketing |
| description | = Marketing Storage Pool |
| acl     | = 0 |
| in_use  | = False |
| clients | = |
| members | = d12,d13 |
| storage_system(s) | = FNM001050000212 |
| default_slice_flag | = True |
| is_user_defined | = True |
| thin    | = False |
EXAMPLE #1 provides a description of command output.

EXAMPLE #3 To view the size information for the FP1 mapped pool, type:

```bash
$ nas_pool -size FP1
id           = 40
name         = FP1
used_mb      = 0
avail_mb     = 0
total_mb     = 0
potential_mb = 2047
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>used_mb</td>
<td>Space in use by the storage pool specified.</td>
</tr>
<tr>
<td>avail_mb</td>
<td>Unused space still available in the storage pool.</td>
</tr>
<tr>
<td>total_mb</td>
<td>Total space in the storage pool (total of used and unused).</td>
</tr>
<tr>
<td>potential_mb</td>
<td>Available space that can be added to the storage pool.</td>
</tr>
</tbody>
</table>

Note: Each of the options used with the command `nas_pool -size` filters for the output of the command. For example, if you specify a Data Mover, the output will reflect only the space to which the specified Data Mover has visibility. Physical `used_mb`, Physical `avail_mb`, and Physical `total_mb` are applicable for system-defined virtual AVM pools only.

EXAMPLE #4 To view the size information for the TP1 mapped pool that contains only virtual LUNs, type:

```bash
$ nas_pool -size TP1
id           = 40
name         = TP1
used_mb      = 0
avail_mb     = 0
total_mb     = 0
potential_mb = 2047
```

Physical storage usage in tp1 on FCNTR074200038:

- `used_mb` = 0
- `avail_mb` = 20470
Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical used_mb</td>
<td>Used physical size of a system mapped pool in MB (some may be used by non-VNX hosts).</td>
</tr>
<tr>
<td>Physical avail_mb</td>
<td>Available physical size of a system mapped pool in MB.</td>
</tr>
</tbody>
</table>

**Note:** Physical used_mb and Physical avail_mb are applicable for system-defined AVM pools that contain virtual LUNs only.

**EXAMPLE #5**
For a VNX system, to change the -is_greedy and -is_dynamic options for the system defined, clar_r5_performance storage pool, type:

```bash
$ nas_pool -modify clar_r5_performance -is_dynamic n -is_greedy y
```

```bash
id       = 3
name      = clar_r5_performance
description = CLARiiON RAID5 4plus1
 acl      = 421
 in_use   = False
 clients  =
 members  = v120
 storage_system(s) =
default_slice_flag = True
 is_user_defined = False
thin = False
disk_type = CLSTD
 server_visibility = server_2,server_3,server_4,server_5
 volume_profile = clar_r5_performance_vp
 is_dynamic = False
 is_greedy = True
 numStripe_members = 4
 stripe_size = 32768
```

**EXAMPLE #1** provides a description of command output.

**EXAMPLE #6**
For a VNX for file with a Symmetrix system, to change the -is_greedy and -is_dynamic options for the system-defined, symm_std storage pool, type:

```bash
$ nas_pool -modify symm_std -is_dynamic y -is_greedy y
```

```bash
id       = 1
name      = symm_std
description = Symmetrix STD
 acl      = 1421, owner=nasadmin, ID=201
 in_use   = True
 clients  = ufs3
 members  = v169,v171
default_slice_flag = False
 is_user_defined = False
```
The nas Commands

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the storage pool.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the storage pool.</td>
</tr>
<tr>
<td>description</td>
<td>Comment assigned to the storage pool.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the storage pool.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether the storage pool is being used by a file system.</td>
</tr>
<tr>
<td>clients</td>
<td>File systems using the storage pool.</td>
</tr>
<tr>
<td>members</td>
<td>Disks used by the storage pool.</td>
</tr>
<tr>
<td>default_slice_flag</td>
<td>Allows slices from the storage pool.</td>
</tr>
<tr>
<td>is_user_defined</td>
<td>User-defined as opposed to system-defined.</td>
</tr>
<tr>
<td>thin</td>
<td>Indicates whether thin provisioning is enabled or disabled.</td>
</tr>
<tr>
<td>disk_type</td>
<td>Contingent on the system attached.</td>
</tr>
<tr>
<td>compressed</td>
<td>For VNX with Symmetrix backend, indicates whether data is compressed.</td>
</tr>
<tr>
<td>server_visibility</td>
<td>Storage pool is visible to the physical Data Movers specified.</td>
</tr>
<tr>
<td>volume_profile</td>
<td>Volume profile used.</td>
</tr>
<tr>
<td>is_dynamic</td>
<td>Whether the system-defined storage pool can add or remove volumes.</td>
</tr>
<tr>
<td>is_greedy</td>
<td>Indicates whether the system-defined storage pool will use new member volumes as needed.</td>
</tr>
<tr>
<td>template_pool</td>
<td>System pool template used to create the user pool.</td>
</tr>
<tr>
<td>numStripe_members</td>
<td>Number of stripe members used to create the user pool.</td>
</tr>
<tr>
<td>stripe_size</td>
<td>Stripe size used to create the user pool.</td>
</tr>
</tbody>
</table>

Where:

EXAMPLE #7

To change the -is_greedy option for the user-defined, user_pool storage pool, type:

```
$ nas_pool -modify user_pool -is_greedy y
```

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>58</td>
</tr>
<tr>
<td>name</td>
<td>user_pool</td>
</tr>
<tr>
<td>description</td>
<td>= 0</td>
</tr>
<tr>
<td>acl</td>
<td>False</td>
</tr>
</tbody>
</table>

Thin                 = False
disk_type            = STD
compressed           = True
server_visibility    = server_2,server_3,server_4,server_5
volume_profile       = symm_std_vp
is_dynamic           = True
is_greedy            = True
numStripe_members    = 8
stripe_size          = 32768
EXAMPLE #8

To add the volumes, d7 and d8, to the marketing storage pool, type:

```bash
$ nas_pool -xtend marketing -volumes d7,d8
```

```
id                   = 20
name                 = marketing
description          = Marketing Storage Pool
acl                  = 0
in_use               = False
clients              =
members              = d12,d13,d7,d8
default_slice_flag   = True
is_user_defined      = True
thin                 = True
disk_type            = CLSTD
server_visibility    = server_2,server_3,server_4,server_5
template_pool        = N/A
num Stripe_members   = N/A
stripe_size          = N/A
```

EXAMPLE #1 provides a description of command output.

EXAMPLE #9

For a VNX system, to extend the system-defined storage pool by a specified size with a specified system, type:

```bash
$ nas_pool -xtend clar_r5_performance -size 128M -storage APM00042000818
```

```
id                   = 3
name                 = clar_r5_performance
description          = CLARiiON RAID5 4plus1
acl                  = 1421, owner=nasadmin, ID=201
in_use               = False
clients              =
members              = v120
default_slice_flag   = True
is_user_defined      = False
thin                 = False
disk_type            = CLSTD
```
The nas Commands

server_visibility = server_2,server_3,server_4,server_5
volume_profile = clar_r5_performance_vp
is_dynamic = False
is_greedy = True
num_stripe_members = 4
stripe_size = 32768

EXAMPLE #1 provides a description of command output.

EXAMPLE #10 For VNX system, to remove d7 and d8 from the marketing storage pool, type:

```bash
$ nas_pool -shrink marketing -volumes d7,d8
```

id = 20
name = marketing
description = Marketing Storage Pool
acl = 0
in_use = False
clients =
members = d12,d13
default_slice_flag = True
is_user_defined = True
thin = True
disk_type = CLSTD
server_visibility = server_2,server_3,server_4,server_5
template_pool = N/A
num_stripe_members = N/A
stripe_size = N/A

EXAMPLE #1 provides a description of command output.

EXAMPLE #11 To list the storage pools, type:

```
$ nas_pool -list
```

id  inuse acl  name                     storage_system
2   n    421 clar_r1                     N/A
3   n    421 clar_r5_performance       FCNTR074200038
4   n    421 clar_r5_economy           N/A
10  n    421 clarata_archive           FCNTR074200038
11  n    421 clarata_r3                N/A
20  n    0    marketing                FCNTR074200038
40  y    0    TP1                      FCNTR074200038
41  y    0    FP1                      FCNTR074200038

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the storage pool.</td>
</tr>
<tr>
<td>inuse</td>
<td>Whether the storage pool is being used by a file system.</td>
</tr>
</tbody>
</table>
EXAMPLE #12 To display information about the user-defined storage pool called **marketing**, type:

```
$ nas_pool -info marketing
```

```plaintext
id                   = 20
name                 = marketing
description          = Marketing Storage Pool
acl                  = 0
in_use               = False
members              = d12,d13
storage_system(s)    =
default_slice_flag   = True
is_user_defined      = True
thin                 = True
disk_type            = CLSTD
server_visibility    = server_2,server_3,server_4,server_5
is_greedy            = False
num_stripe_members   = N/A
stripe_size          = N/A
```

**EXAMPLE #1** provides a description of command output.

EXAMPLE #13 To display information about the system-defined **clar_r5_performance** storage pool, type:

```
$ nas_pool -info clar_r5_performance
```

```plaintext
id                   = 3
name                 = clar_r5_performance
description          = CLARiiON RAID5 4plus1
acl                  = 1421, owner=nasadmin, ID=201
in_use               = False
members              = v120
default_slice_flag   = True
is_user_defined      = False
thin                 = False
disk_type            = CLSTD
server_visibility    = server_2,server_3,server_4,server_5
volume_profile       = clar_r5_performance_vp
is_dynamic           = False
is_greedy            = True
num_stripe_members   = 4
stripe_size          = 32768
```

**EXAMPLE #1** provides a description of command output.

---

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>acl</td>
<td>Access control level value assigned to the storage pool.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the storage pool.</td>
</tr>
<tr>
<td>storage_system</td>
<td>Name of the system where the storage pool resides.</td>
</tr>
</tbody>
</table>
EXAMPLE #14  To display information about the system-defined engineer virtual pool, type:

$ nas_pool -info engineer

id = 40
name = engineer
description = Mapped Pool engineer on APM00084401666
acl = 0
in_use = True
clients = DA_BE_VIRT_FS, vp_test, vp_test1, vp_test12, cvpfs1, cvpfs3
members = v363
default_slice_flag = True
is_user_defined = False
thin = True
disk_type = CLSTD
server_visibility = server_2, server_3
volume_profile = engineer_APM00084401666_vp
is_dynamic = True
is_greedy = True
num_stripe_members = N/A
stripe_size = N/A

EXAMPLE #1 provides a description of command output.

EXAMPLE #15  To display information about the mapped storage pool called FP1 from a VNX for block, type:

$ nas_pool -info FP1

id = 40
name = FP1
description = Mapped Pool on FCNTR074200038
acl = 0
in_use = False
clients =
members =
default_slice_flag = True
is_user_defined = False
thin = True
tiering_policy = Auto-tier
compressed = False
mirrored = False
disk_type = Mixed
volume_profile = FP1
is_dynamic = True
is_greedy = True
The nas Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>tiering_policy</td>
<td>Indicates the tiering policy in effect. If the initial tier and the tiering policy are the same, the values are: Auto-Tier, Highest Available Tier, Lowest Available Tier. If the initial tier and the tiering policy are not the same, the values are: Auto-Tier/No Data Movement, Highest Available Tier/No Data Movement, Lowest Available Tier/No Data Movement.</td>
</tr>
<tr>
<td>compressed</td>
<td>For VNX for block, indicates whether data is compressed. Values are: True, False, Mixed (indicates that some of the LUNs, but not all, are compressed).</td>
</tr>
<tr>
<td>mirrored</td>
<td>Indicates whether the disk is mirrored.</td>
</tr>
</tbody>
</table>

**EXAMPLE #16**  
To display information about the mapped storage pool called SG0 from a Symmtrix system, type:

```
$ nas_pool -info SG0
```

```
id                  = 40
name                 = SG0
description          = Symmtrix Mapped Pool on 000192601245
acl                  = 0
in_use               = False
clients              =
members              =
default_slice_flag   = True
is_user_defined      = False
thin                 = True
tiering_policy       = symm_policy_1
compressed           = True
frontend_io_quota    = maxiopersec 500,maxmbpersec 500
disk_type            = Mixed
volume_profile       = True
is_dynamic           = True
is_greedy            = N/A
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the storage pool.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the storage pool.</td>
</tr>
<tr>
<td>description</td>
<td>Comment assigned to the storage pool.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the storage pool.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether the storage pool is being used by a file system.</td>
</tr>
<tr>
<td>clients</td>
<td>File systems using the storage pool.</td>
</tr>
<tr>
<td>members</td>
<td>Volumes used by the storage pool.</td>
</tr>
<tr>
<td>default_slice_flag</td>
<td>Allows slices from the storage pool.</td>
</tr>
<tr>
<td>is_user_defined</td>
<td>User-defined as opposed to system-defined.</td>
</tr>
<tr>
<td>thin</td>
<td>Indicates whether thin provisioning is enabled or disabled.</td>
</tr>
</tbody>
</table>
**EXAMPLE #17**

To delete the storage pool, **marketing**, and each of the storage pool member volumes recursively, type:

```
$ nas_pool -delete marketing -deep
```

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>20</td>
</tr>
<tr>
<td>name</td>
<td>marketing</td>
</tr>
<tr>
<td>description</td>
<td>Marketing Storage Pool</td>
</tr>
<tr>
<td>acl</td>
<td>0</td>
</tr>
<tr>
<td>in_use</td>
<td>False</td>
</tr>
<tr>
<td>clients</td>
<td></td>
</tr>
<tr>
<td>members</td>
<td></td>
</tr>
<tr>
<td>storage_system(s)</td>
<td></td>
</tr>
<tr>
<td>default_slice_flag</td>
<td>True</td>
</tr>
<tr>
<td>is_user_defined</td>
<td>True</td>
</tr>
<tr>
<td>is_greedy</td>
<td>True</td>
</tr>
<tr>
<td>thin</td>
<td>True</td>
</tr>
<tr>
<td>template_pool</td>
<td>N/A</td>
</tr>
<tr>
<td>num_stripe_members</td>
<td>N/A</td>
</tr>
<tr>
<td>stripe_size</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**EXAMPLE #1** provides a description of command output.
nas_quotas

Manages quotas for mounted file systems.

SYNOPSIS

nas_quotas
   -edit [-user|-group] {-mover <movername>|-fs <fs_name>} [-path 
   <pathname>] [[-proto <proto_id>]|[-block <hard_limit>[:<soft_limit>]] 
   [-inode <hard_limit>[:<soft_limit>]] <id> [<id>...] 
   -edit -config {-mover <movername>|-fs <fs_name>} [-path <pathname>] 
      [-option <options>] 
   -edit -tree -fs <fs_name> 
      [[-proto <proto_id>]|[-block <hard_limit>[:<soft_limit>]] 
      [-inode <hard_limit>[:<soft_limit>]] 
      [-comment <comment>] <id> [<id>...] 
   -report [-user|-group] {-mover <movername>|-fs <fs_name>} 
      [-path <pathname>] [<id> <id>...] 
   -report -config {-mover <movername>|-fs <fs_name>} [-path <pathname>] 
   -report -tree -fs <fs_name> [<-user|-group|-both] 
      {-mover <movername>|-fs <fs_name}> [-path <pathname>] -all) 
   -on -tree -fs <fs_name> -path <pathname> [-comment <comment>] 
   -off -tree -fs <fs_name> -path <pathname> 
   {-list|-clear} -tree -fs <fs_name> 
   -check -start [-mode online|offline] [-tree] -fs <fs_name> [-path 
   <pathname>] 
   -check {<stop|-status} -fs <fs_name> [-path <pathname>] 
   -quotadb {<info|-upgrade [-Force]} {-mover <movername>|-fs <fs_name>}

DESCRIPTION

nas_quotas edits quotas for mounted file systems, and displays a 
listing of quotas and disk usage at the file system level (by the user, 
group, or tree), or at the quota-tree level (by the user or group).

nas_quotas also turns quotas on and off, and clears quotas records 
for a file system, quota tree, or a Data Mover. When a Data Mover is 
specified, the action applies to all mounted file systems on the Data 
Mover.

nas_quotas also starts and stops quota database checks either online 
or offline for quota trees and file systems, and allows you to upgrade 
the quota database limits to the maximum limit value for a file 
system. When a Data Mover is specified, the action applies to all 
mounted file systems on the Data Mover.
CAUTION

Quotas should be turned on (enabled) before file systems go into a production environment. Enabling (or disabling, or clearing) quotas in a production environment is time consuming and the process may disrupt file system operation. CIFS clients are disconnected during these events and NFS clients receive a message that the server is not responding. However, once enabled, quotas can be changed at any time without impact.

OPTIONS

`-edit [-user | -group] { -mover <movername> | -fs <fs_name> [-path <pathname>] } [id] [id...]`

Sets the quota limits for users or groups on a specified Data Mover, mounted file system, or directory tree.

For a user, the ID can be a user ID or UID, however, if NIS or the local password file on the Data Mover is available, a user name can also be used.

For a group, the ID can be a group ID or GID, however, if NIS or the local password file is available, a group name can also be used.

Upon execution, a vi session (unless the EDITOR environment variable specifies otherwise) is opened to edit the quota configuration file. Changes to the file are applied when the vi session is saved and exited.

`[-proto <proto_id>] [-block <hard_limit> [[:<soft_limit>]]]`

Applies the quota configuration defined for the prototype user for each specified ID, and sets a hard and soft limit for storage (block) usage in kilobytes.

`[-inode <hard_limit> [[:<soft_limit>]] [id] [id...] [-block <hard_limit> [[:<soft_limit>]]]`

Edits the inode (file count) limits and the block (storage in KBs) limits directly into the quota configuration file without opening an editing session.

`-edit -config { -mover <movername> | -fs <fs_name> } [-path <pathname>]`

Edits the default quota configuration for all users/groups currently without quotas or subsequently added to the specified Data Mover or file system or quota tree. Also edits the grace periods for soft quotas, and the conditions upon which to generate a quotas-event message to the system log.
The nas Commands

[-option <options>]
Specifies the following comma-separated options:

BGP=<integer>
Sets the block grace period in seconds.

IGP=<integer>
Sets the inode grace period in seconds.

DUBSL=<integer>
Sets the default user block soft limit in KB.

DUBHL=<integer>
Sets the default user block hard limit in KB.

DUISL=<integer>
Sets the default user inode soft limit.

DUIHL=<integer>
Sets the default user inode hard limit.

DGBSL=<integer>
Sets the default group block soft limit in KB.

DGBHL=<integer>
Sets the default group block hard limit in KB.

DGISL=<integer>
Sets the default group inode soft limit.

DGIHL=<integer>
Sets the default group inode hard limit.

HLE={True|False}
Specifies whether the hard limit is enforced.

ESFCS={True|False}
Specifies the event for check start has been sent.

ESFCE={True|False}
Specifies the event for check end has been sent.

ESFBSL={True|False}
Specifies that the event for block soft limits has been sent.

ESFBHL={True|False}
Specifies that the event for block hard limits has been sent.
The nas Commands

-`edit -tree -fs <fs_name> [([-proto <proto_id>]| [-block <hard_limit> [:<soft_limit>]| [-inode <hard_limit>[:<soft_limit>]]| [-comment <comment>]] <id> [<id> ...])
Edits the quota limits for trees (inodes or blocks used by a tree directory) where the <id> is the tree ID. This option can only be applied on each file system basis. The `list` option to display the tree IDs.

The `-proto` option applies the quota configuration of the prototype tree for each specified tree ID, or sets a hard and soft limit for blocks. The `<proto_id>` must be a tree ID.

The `-inode` and `-block` options edit the inode/block limits for the tree directly in the quota configuration file without opening an editing session.

The `-comment` option associates a comment with the quota tree. The comment is delimited by single quotes. Comment length is limited to 256 bytes (represented as 256 ASCII characters or a variable number of Unicode multibyte characters) and cannot include single quotes (`'`), double quotes ("""), semicolons (;), NL (New Line), or FF (Form Feed).

-`report [-user |-group] [-mover <movername>|-fs <fs_name>] [-path <pathname>] [<id> <id> ...]
Displays a summary of disk usage and quotas for the user or group, including the number of files and space in kilobytes for the specified `fs_name`, or all file systems mounted on the specified `movername`, or for the specified quota tree. The `edit` option provides more information for the usage of UIDs and GIDs.

Note: The nas_quotas can show report for maximum 1024 IDs at a time.

-`report -config [-mover <movername>|-fs <fs_name>] [-path <pathname>]`
Displays quota configuration information as viewed from the specified Data Mover, file system, or quota-tree level, including:

- Active quota policy
- Quota status (user/group quotas enabled or disabled)
- Grace period
- Default limits currently set for users/groups
- Hard-quota enforcement option setting (deny disk space enabled or disabled)
- Quota conditions that trigger event-logging
The nas Commands

**-report -tree -fs <fs_name>[<id> <id>...]**
Displays the quota limits for a specified quota tree in a file system. The <id> is a tree ID.

**Note:** The <id> is either a user ID, a group ID, or a tree ID. If the quota type is not specified, the default is set to the `-user' ID.

{ -on | -off | -clear } [ -user | -group | -both ] { -mover <movername> | -fs <fs_name> | [-path <pathname>] | -all }
Turns quotas on, off, and clears quotas for the user, group, or both (users and groups at once) on the <movername>, <fs_name>, <pathname>, for all users, or groups on all file systems on all Data Movers in the cabinet.

The -clear option permanently removes all quota records, deletes the quota configuration file, and turns quotas off.

**CAUTION**
While quotas are being turned on, off, or cleared, other operations to a file system may be disrupted. CIFS clients are disconnected during this execution.

**-on -tree -fs <fs_name> -path <pathname>**
Turns on (enables) tree quotas so that quota tracking and hard-limit enforcement (if enabled) can occur. When enabling tree quotas, the directory must not exist; it is created in this tree-quota-enabling process.

**Note:** The quota path length (which VNX for file calculates as including the file system mountpoint) must be less than 1024 bytes. If Unicode is enabled on the selected Data Mover, -path accepts any characters defined by the Unicode 3.0 standard. Otherwise, it accepts only ASCII characters.

{ -comment <comment> }
The -comment option associates a comment with the quota tree. The comment is delimited by single quotes. Comment length is limited to 256 bytes (represented as 256 ASCII characters or a variable number of Unicode multibyte characters) and cannot include single quotes (""), double quotes (""), semicolons (;), NL (New Line), or FF (Form Feed).
-off -tree -fs <fs_name> -path <pathname>

Turns tree quotas off. When turning tree quotas off, the tree directory must be empty.

{-list|-clear} -tree -fs <fs_name>

The -list option displays all active quota trees and their respective tree IDs used by -edit and -report with the specified file system.

Use the -tree -clear option to clear all the information from the database after you disable (turn off) quotas for all trees within a file system. Once cleared, the database information is not recoverable.

CAUTION

The -clear option deletes the usage and the limit information for tree quotas. The limits cannot be recovered.

-check -start [-mode online|offline] [-tree] -fs <fs_name> [-path <pathname>]

Starts a check of a quota database in online or offline mode for a tree quota or a file system quota. The default mode is online if the -mode option is not specified, and a quota check is run while the file system remains online.

-check {-stop|-status} -fs <fs_name> [-path <pathname>]

Stops or provides status of a file system quota database check that is in progress.

-quotadb {-info|-upgrade [-Force]} {-mover <movername>|-fs <fs_name>}

Either displays status related to the quota database upgrade or starts an upgrade of the quota database for a specific file system or all file systems on a Data Mover.

The -info option displays the status related to the quota database limits upgrade.

Use the -upgrade option to perform an upgrade of the quota database. If the -Force option is not specified, you are in interactive mode while upgrading the quota database. If the -Force option is specified, you are in non-interactive mode while upgrading the quota database.

Use -mover <movername> to upgrade all mounted file systems’ quota databases on a Data Mover.

Use -fs <fs_name> to upgrade a specific file system’s quota database.
Note: Before the upgrade process runs, the Control Station displays the estimated upgrade time on the file system whose quota database will be upgraded, and also displays a warning message to notify users that the file system will be unavailable during the upgrade process. If users are in interactive mode, a dialog box displays letting users choose whether they want to continue. If users are in non-interactive mode, after displaying the estimated upgrade time message and warning message, the upgrade process starts immediately.

SEE ALSO
Using Quotas on VNX.

EXAMPLE #1
To enable quotas on for users and groups of a file system, type:

```
$ nas_quotas -on -both -fs ufs1
```

done

EXAMPLE #2
To open a vi session to edit file system quotas on ufs1 for the specified user, 1000, type:

```
$ nas_quotas -edit -user -fs ufs1 1000
```

Userid : 1000
fs ufs1 blocks (soft = 2000, hard = 3000) inodes (soft = 0, hard = 0)
~
~
~
"/tmp/EdP.agGQuIz" 2L, 84C written
done

EXAMPLE #3
To change the block limit and inode limit for a file system without opening up a vi session, type:

```
$ nas_quotas -edit -user -fs ufs1 -block 7000:6000 -inode 700:600 2000
```

done

EXAMPLE #4
To view a report of user quotas for ufs1, type:

```
$ nas_quotas -report -user -fs ufs1
```

Report for user quotas on filesystem ufs1 mounted on /ufs1

```
+-----------+--------------------------------+------------------------------+
<table>
<thead>
<tr>
<th>User</th>
<th>Bytes Used (1K)</th>
<th>Files</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Used</td>
<td>Soft</td>
<td>Hard</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>#1000</td>
<td>1328</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>#2000</td>
<td>6992</td>
<td>6000</td>
<td>7000</td>
</tr>
<tr>
<td>#5000</td>
<td>141592</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
```

done
EXAMPLE #5 To select user 300 as prototype user for ufs1, and assign other users the same limits, type:

```bash
$ nas_quotas -group -edit -fs ufs1 -proto 300 301 302 303
done
```

EXAMPLE #6 To display the group quotas information for ufs1, type:

```bash
$ nas_quotas -report -group -fs ufs1
```

Report for group quotas on filesystem ufs1 mounted on /ufs1

| Group | Bytes Used (1K) | Files |
|-------|-----------------+-------|
|       | Used            | Soft  | Hard | Timeleft | Used | Soft | Hard | Timeleft |
| #1    | 296             | 0     | 0    |          | 12   | 0    | 0    |          |
| #300  | 6992            | 6000  | 7000 | 7.0days  | 67   | 600  | 700  |          |
| #301  | 0               | 6000  | 7000 |          | 0    | 600  | 700  |          |
| #302  | 0               | 6000  | 7000 |          | 0    | 600  | 700  |          |
| #303  | 0               | 6000  | 7000 |          | 0    | 600  | 700  |          |
| #32772| 22296           | 0     | 0    |          | 228  | 0    | 0    |          |

done

EXAMPLE #7 To edit the default quota configuration for server_2, type:

```bash
$ nas_quotas -edit -config -mover server_2
```

File System Quota Parameters:

fs "ufs1"

Block Grace: (1.0 weeks)
Inode Grace: (1.0 weeks)
* Default Quota Limits:
  User: block (soft = 5000, hard = 8000) inodes (soft = 100, hard= 200)
  Group: block (soft = 6000, hard = 9000) inodes (soft = 200, hard= 400)
Deny disk space to users exceeding quotas: (yes)
* Generate Events when:
  Quota check starts: (no)
  Quota check ends: (no)
  soft quota crossed: (no)
  hard quota crossed: (no)

fs "ufs2"

Block Grace: (1.0 weeks)
Inode Grace: (1.0 weeks)
* Default Quota Limits:
  User: block (soft = 0, hard = 0) inodes (soft = 0, hard= 0)
  Group: block (soft = 0, hard = 0) inodes (soft = 0, hard= 0)
Deny disk space to users exceeding quotas: (yes)
* Generate Events when:
  Quota check starts: (no)
  Quota check ends: (no)
  soft quota crossed: (no)
  hard quota crossed: (no)
EXAMPLE #8  To open a vi session and edit the quotas for a file system, type:

$ nas_quotas -edit -config -fs ufs1

File System Quota Parameters:
fs "ufs1"
    Block Grace: (1.0 weeks)
    Inode Grace: (1.0 weeks)
* Default Quota Limits:
    User: block (soft = 5000, hard = 8000) inodes (soft = 100, hard= 200)
    Group: block (soft = 6000, hard = 9000) inodes (soft = 200, hard= 400)
Deny disk space to users exceeding quotas: (yes)
* Generate Events when:
    Quota check starts:          (no)
    Quota check ends:            (no)
    soft quota crossed:          (yes)
    hard quota crossed:          (yes)

EXAMPLE #9  To view the quota configuration for the file system, ufs1, type:

$ nas_quotas -report -config -fs ufs1

+------------------------------------------------------------------------------+
| Quota parameters for filesystem ufs1 mounted on /ufs1:                      |
+------------------------------------------------------------------------------+
| Quota Policy: blocks                                                       |
| User Quota: ON                                                            |
| Group Quota: ON                                                           |
| Block grace period: (1.0 weeks)                                           |
| Inode grace period: (1.0 weeks)                                           |
| Default USER quota limits:                                               |
|     Block Soft: (    5000), Block Hard: (     8000)                      |
|     Inode Soft: (      100), Inode Hard: (      200)                     |
| Default GROUP quota limits:                                              |
|     Block Soft: (    6000), Block Hard: (     9000)                      |
|     Inode Soft: (      200), Inode Hard: (      400)                     |
| Deny Disk Space to users exceeding quotas: YES                            |
| Log an event when ...                                                     |
|     Block hard limit reached/exceeded: YES                               |
|     Block soft limit (warning level) crossed: YES                         |
|     Quota check starts: NO                                               |
|     Quota Check ends: NO                                                 |
+------------------------------------------------------------------------------+
done
**EXAMPLE #10**  To enable tree quotas on for *ufs1*, type:

```
$ nas_quotas -on -tree -fs ufs1 -path /tree1 -comment 'Tree #1'
done
```

**EXAMPLE #11**  To create a tree quota in a language that uses multibyte characters (such as Japanese), type:

```
$ nas_quotas -on -tree -fs fs_22 -path /<path_in_local_language_text> -comment <comment_in_local_language_text>
done
```

**EXAMPLE #12**  To list the tree quotas for *ufs1*, type:

```
$ nas_quotas -list -tree -fs ufs1
```

```
+----------------------------------------------------------------------------+
| Quota trees for filesystem ufs1 mounted on /ufs1:                        |
+----------------------------------------------------------------------------|
| TreeId | Quota tree path (Comment)                                               |
+----------------------------------------------------------------------------|
| 1      | /tree1 (Tree #1)                                                        |
| 2      | /tree2 (Tree #2)                                                        |
| 3      | /<tree_path_in_local_language_text> (Tree #3)                            |
+----------------------------------------------------------------------------|
```

**EXAMPLE #13**  To edit or add a comment for a tree quota for *ufs1*, type:

```
$ nas_quotas -edit -tree -fs ufs1 -comment 'Quota for Tree1' 1

done
```

**EXAMPLE #14**  To edit tree quotas for *ufs1*, type:

```
$ nas_quotas -edit -tree -fs ufs1 1
treeid : 1
fs ufs1 blocks (soft = 6000, hard = 8000) inodes (soft = 200, hard = 300)
~
~
"/tmp/EdP.aiHKgh5" 2L, 85C written
done
```

**EXAMPLE #15**  To edit tree quotas for *ufs1* and change the block and inodes, type:

```
$ nas_quotas -edit -tree -fs ufs1 -block 8000:6000 -inode 900:800 1

done
```

**EXAMPLE #16**  To edit tree quotas for *ufs1* and apply the quota configuration of the prototype tree, type:
EXAMPLE #17  To display any currently active trees on a file system, type:

$ nas_quotas -edit -tree -fs ufs1 -proto 1 2

EXAMPLE #18  To enable tree quotas off, type:

$ nas_quotas -tree -off -fs ufs1 -path /tree1

EXAMPLE #19  To enable quotas on for users and groups on tree quota, /tree3, of a file system, ufs1, type:

$ nas_quotas -on -both -fs ufs1 -path /tree3

EXAMPLE #20  To open a vi session to edit file system quotas on quota tree, /tree3, on ufs1 for the specified user, 1000, type:

$ nas_quotas -edit -user -fs ufs1 -path /tree3 1000

EXAMPLE #21  To change the block limit and inode limit on quota tree, /tree3, on ufs1 for the specified user, 1000, without opening up a vi session, type:

$ nas_quotas -edit -user -fs ufs1 -path /tree3 -block 6000:4000 -inode 300:200 1000
EXAMPLE #22  To view a report of user quotas on tree quota, /tree3, for ufs1, type:

$ nas_quotas -report -user -fs ufs1 -path /tree3

Report for user quotas on quota tree /tree3 on filesystem ufs1 mounted on /ufs1

+-----------+--------------------------------+------------------------------+
|User       |        Bytes Used (1K)        |           Files              |
+-----------+-------+-------+-------+--------+-------+------+------+--------+
|           |  Used |  Soft |  Hard |Timeleft|  Used | Soft | Hard |Timeleft|
+-----------+-------+-------+-------+--------+-------+------+------+--------+
|#1000      |   2992|   4000|   6000|        |     34|   200|   300|        |
|#32768     |   9824|      0|      0|        |     28|     0|     0|        |
+-----------+-------+-------+-------+--------+-------+------+------+--------+

done

EXAMPLE #23  To open a vi session and edit the quota configuration for tree quota, /tree3, on a file system, ufs1, type:

$ nas_quotas -edit -config -fs ufs1 -path /tree3

Tree Quota Parameters:
fs "ufs1"
tree "/tree3"
Block Grace: (1.0 weeks)
Inode Grace: (1.0 weeks)
* Default Quota Limits:
  User: block (soft = 8000, hard = 9000) inodes (soft = 200, hard= 300)
  Group: block (soft = 8000, hard = 9000) inodes (soft = 300, hard= 400)
Deny disk space to users exceeding quotas: (yes)
* Generate Events when:
  Quota check starts: (no)
  Quota check ends: (no)
  soft quota crossed: (yes)
  hard quota crossed: (yes)

```
~/
```

"/tmp/EdP.aDTOKeU" 14L, 508C written
done

EXAMPLE #24  To view the quota configuration for tree quota, /tree3, on file system, ufs1, type:

$ nas_quotas -report -config -fs ufs1 -path /tree3

<table>
<thead>
<tr>
<th>Quota parameters for tree quota /tree3 on filesystem ufs1 mounted on /ufs1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quota Policy: blocks</td>
</tr>
<tr>
<td>User Quota: ON</td>
</tr>
<tr>
<td>Group Quota: ON</td>
</tr>
<tr>
<td>Block grace period: (1.0 weeks)</td>
</tr>
<tr>
<td>Inode grace period: (1.0 weeks)</td>
</tr>
<tr>
<td>Default USER quota limits:</td>
</tr>
</tbody>
</table>
The nas Commands

| Block Soft: (8000), Block Hard: (9000) |
| Inode Soft: (200), Inode Hard: (300) |
Default GROUP quota limits:
| Block Soft: (8000), Block Hard: (9000) |
| Inode Soft: (300), Inode Hard: (400) |
Deny Disk Space to users exceeding quotas: YES
Log an event when ...
| Block hard limit reached/exceeded: YES |
| Block soft limit (warning level) crossed: YES |
| Quota check starts: NO |
| Quota Check ends: NO |

EXAMPLE #25
To disable user quota and group quota on tree quota, /tree3, type:

```
$ nas_quotas -off -both -fs ufs1 -path /tree3
```

EXAMPLE #26
To disable group quotas for ufs1, type:

```
$ nas_quotas -off -group -fs ufs1
```

EXAMPLE #27
To clear all tree quotas for ufs1, type:

```
$ nas_quotas -clear -tree -fs ufs1
```

EXAMPLE #28
To clear quotas for users and groups of a Data Mover, type:

```
$ nas_quotas -clear -both -mover server_2
```

EXAMPLE #29
To start a tree quota check in quota tree /mktg-a/dir1 in file system ufs1 with the file system online, type:

```
$ nas_quotas -check -start -mode online -tree -fs ufs1 /mktg-a/dir1
```

EXAMPLE #30
To stop a tree quota check in file system ufs1, type:

```
$ nas_quotas -check -stop -fs ufs1
```

EXAMPLE #31
To view the status of a tree quota check in quota tree /mktg-a/dir1 in file system ufs1, type:

```
$ nas_quotas -check -status -tree -fs ufs1 -path /mktg-a/dir1
```
Tree quota check on filesystem ufs1 and path /mktg-a/dir is running and is 60% complete.
Done

**EXAMPLE #32**

To list quota database limits for all file systems on a Data Mover, type:

```
$ nas_quotas -quotadb -info -mover server_2
```

Info 13421850365 : The quota limit on ufs0 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365 : The quota limit on ufs1 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365 : The quota limit on ufs2 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365 : The quota limit on ufs3 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850366 : The quota limit on ufs4 is at 256 TB

**EXAMPLE #33**

To list quota database limits for file system ufs4, type:

```
$ nas_quotas -quotadb -info -fs ufs4
```

Info 13421850366 : The quota limit on ufs4 is at 256 TB

**EXAMPLE #34**

To upgrade all file systems on a Data Mover, in interactive mode, type:

```
$ nas_quotas -quotadb -upgrade -mover server_2
```

Info 13421850365 : The quota limit on ufs0 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365 : The quota limit on ufs1 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.
Info 13421850365: The quota limit on ufs2 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365: The quota limit on ufs3 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850366: The quota limit on ufs4 is at 256 TB

Warning 17716861297: The file systems specified in the list above will not be accessible during the quota database upgrade, and a file system's CIFS share and NFS export also will not be accessible during the upgrade. The file systems shown above are listed in the order that the quota database conversion is performed, one by one sequentially. The estimated time (shown above) needed to upgrade the quota database may change based on the file system's quota configuration and I/O performance when the conversion is running.

Do you really want to upgrade the file system quota database now? [Y/N]: Y

Info 13421850367: quota db upgraded on ufs0
Info 13421850367: quota db upgraded on ufs1
Info 13421850367: quota db upgraded on ufs2

Error 13421850368: Timeout occurred when upgrading quota db on ufs3. The Quota db upgrade may still be in progress. Use the "-info" option to check status.
Info 13421850369: quota db already upgraded on ufs4

**EXAMPLE #35**
To list quota database limits for file system ufs3 after an upgrade has timed out, type:

```
$ nas_quotas -quotadb -info -fs ufs3
```

Info 13421850370: The quota limit on ufs3 is at 4TB. Upgrade is 48% complete.

**EXAMPLE #36**
To upgrade all file systems on a Data Mover, in non-interactive mode, type:

```
$ nas_quotas -quotadb -upgrade -Force -mover server_2
```

Info 13421850365: The quota limit on ufs0 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365: The quota limit on ufs1 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Info 13421850365: The quota limit on ufs2 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.
Info 13421850365: The quota limit on ufs3 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.
Info 13421850366: The quota limit on ufs4 is at 256 TB

Warning 17716861297: The file systems specified in the list above will not be accessible during the quota database upgrade, and a file system's CIFS share and NFS export also will not be accessible during the upgrade. The file systems shown above are listed in the order that the quota database conversion is performed, one by one sequentially. The estimated time (shown above) needed to upgrade the quota database may change based on the file system's quota configuration and I/O performance when the conversion is running.
Info 13421850367: quota db upgraded on ufs0
Info 13421850367: quota db upgraded on ufs1
Info 13421850367: quota db upgraded on ufs2
Error 13421850368: Timeout occurred when upgrading quota db on ufs3. The Quota db upgrade may still be in progress. Use the "-info" option to check status.
Info 13421850369: quota db already upgraded on ufs4

**EXAMPLE #37**
To upgrade file system *ufs3*, in interactive mode, type:

```
$ nas_quotas -quotadb -upgrade -fs ufs3
```

Info 13421850365: The quota limit on ufs3 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.

Warning 17716861297: The file systems specified in the list above will not be accessible during the quota database upgrade, and a file system's CIFS share and NFS export also will not be accessible during the upgrade. The file systems shown above are listed in the order that the quota database conversion is performed, one by one sequentially. The estimated time (shown above) needed to upgrade the quota database may change based on the file system's quota configuration and I/O performance when the conversion is running.
Do you really want to upgrade the file system quota database now? [Y/N]: Y
Info 13421850367: quota db upgraded on ufs3
done

**EXAMPLE #38**
To upgrade file system *ufs3*, in non-interactive mode, type:

```
$ nas_quotas -quotadb -upgrade -Force -fs ufs3
```

Info 13421850365: The quota limit on ufs3 is at 4TB. The upgrade to 256 TB is estimated to take 5 seconds.
A total number of 1500 data blocks in the quota database will be converted at a speed of 300 blocks per second.
Warning 17716861297: The file systems specified in the list above will not be accessible during the quota database upgrade, and a file system's CIFS share and NFS export also will not be accessible during the upgrade. The file systems shown above are listed in the order that the quota database conversion is performed, one by one sequentially. The estimated time (shown above) needed to upgrade the quota database may change based on the file system's quota configuration and I/O performance when the conversion is running.
Info 13421850367: quota db upgraded on ufs3
done
nas_rdf

Facilitates communication between two VNX systems. Its primary use is to manage VNX for file systems and define the relationships needed for disaster recovery in a SRDF environment.

SYNOPSIS

nas_rdf
  -init
  | -activate [-reverse] [-skip_rdf_operations] [-skip_SiteA_shutdown] [-nocheck]
  | -restore [-skip_rdf_operations] [-skip_SiteA_shutdown] [-nocheck]
  -check {-all | <test>, ...}

DESCRIPTION

nas_rdf establishes and manages relationships for Control Stations and Data Movers that physically reside in separate VNX for file cabinets.

For SRDF, nas_rdf initializes the VNX, activates a failover to a destination VNX for file, or restores a source VNX. For Dynamic SRDF, nas_rdf activates a failover and reverses the system from a destination volume (R2) to a source volume (R1). Configuration details depend on the type of SRDF: active/passive or active/active'. SRDF/S for synchronous replication with disaster recovery, or active/passive SRDF/A for extended-distance, or asynchronous replication with a point-in-time replica.

Note: The apostrophe in active/active' indicates that both sites have a source volume mirrored at the other site.

SRDF is supported only on a VNX attached to a Symmetrix system. Also, this command must be run from a primary Control Station in slot 0; it will report an error if run from a Control Station in slot 1.

Note: This command must be executed from the /nas/sbin directory, unless otherwise directed. Log in with your administrative username and password, and execute this functionality from root.

OPTIONS

-init
Initializes a source or destination (target) VNX for SRDF/S or SRDF/A.

-activate [-reverse]
Initiates an SRDF failover from the source VNX for file to the destination. The -activate option is executed on the destination VNX.
at the discretion of the user. The **-activate** option sets each SRDF-protected volume on the source VNX as read-only, and each mirrored volume on the destination VNX is set as read-write. The SRDF standby Data Movers acquire the IP and MAC addresses, file systems, and export tables of their source counterparts. The **-reverse** option reverses SRDF direction by converting R2 volumes at destination site to R1 and synchronizing the destination and source sites. The **-reverse** option adds SYMCLI swap and establishes operations on the system after the normal activate operation is performed. When the **-activate** option is executed, an automatic, internal SRDF health check is performed before activating a failover. The **-nocheck** option allows you to skip this health check.

**-activate -skip_rdf_operations**

Skips RDF backend operations like symrdf failover. The backend operations must be done using Solution Enablers or Mainframe host component prior to this command. SiteA shutdown (Data Mover shutdown and reboot Control Station) will be skipped all the time when this option is specified. However Control Station reboot is sent to SiteA at the end of the activate operation when the backend RDF status is not “Split” to clean up old processes. (The “Split” status means SiteA is read write, and the production site is up and running). For failover from SiteB to SiteC or SiteC to SiteB, the Control Station reboot is sent to SiteB or SiteC. SiteB/SiteC must be read write before starting this operation. The **-activate -skip_rdf_operations -skip_SiteA_shutdown** will do the same operation.

**-activate -skip_SiteA_shutdown**

Skips SiteA shutdown (Data Mover shutdown and reboot Control Station) operation. However the SiteA shutdown is sent to SiteA at the end of the activate operation. This option is mainly used to minimize the failover time.

**-restore -skip_rdf_operations**

Skips RDF backend operations like symrdf failback. This option also completes only SiteB/SiteC restore operations and skip SiteA restore operation. The SiteA restore operation must be done separately at SiteA after the SiteB/SiteC restore operation completes. SiteB/SiteC must be read write before starting this operation.

**-restore -skip_rdf_operations -skip_SiteA_shutdown**

Skips RDF backend operations like symrdf failback and also skip SiteA shutdown operation. This is mainly used to failover from SiteB to SiteC or from SiteC to SiteB.
The nas Commands

-restore
Restores a source VNX after a failover. The -restore option is initially executed on the destination VNX. The data on each destination volume is copied to the corresponding volume on the source VNX. On the destination VNX, services on each SRDF standby Data Mover are stopped. (NFS clients connected to these Data Movers see a “server unavailable” message; CIFS client connections time out.) Each volume on the source VNX is set as read-write, and each mirrored volume on the destination VNX is set as read-only.

Finally, nas_rdf -restore can be remotely executed on the source VNX to restore the original configuration. Each primary Data Mover reacquires its IP and MAC addresses, file systems, and export tables. When the -restore option is executed, an automatic, internal SRDF health check is performed before restoring source and destination VNX systems. The -nocheck option allows you to skip this health check.

-check { -all | <test>, ... } Runs SRDF health checks on the VNX. The -check option can be executed either by using the -all option or by specifying one or more of the following individual checks: SRDF standby Data Mover configuration check (r1_dm_config, r2_dm_config), SRDF session state check (r1_session, r2_session), Device group configuration check (r1_dev_group, r2_dev_group), Data Mover mirrored device accessibility check (r1_dev_avail, r2_dev_avail), Symmetrix device state check (dev_not_normal), and SRDF restored state check (restored). In these checks, r1 represents the source side and r2 represents the destination side.

When the -all option is used, all the checks are performed automatically. If the -check option detects invalid configurations or state issues, it prints relevant warning messages with recommended actions so that the issues can be resolved before running the activate or restore options. You can use the -check option to perform health checks at any time.

Note: To run the -check option, you must log in to the VNX either as nasadmin and then switch (su) to root, or as rdfadmin and then switch (su) to root.

SEE ALSO Using SRDF/S with VNX for Disaster Recovery, Using SRDF/S with VNX, and nas_cel.

EXAMPLE #1 To start the initialization process on a destination VNX in an
The nas Commands

For an active/passive SRDF/S configuration, as a nasadmin su to root user, type:

```
# /nas/sbin/nas_rdf -init
```

Discover local storage devices ...

Discovering storage on eng564168 (may take several minutes)
done

Start R2 dos client ...
done
Start R2 nas client ...
done

Contact CS_A ... is alive

Create a new login account to manage the RDF site CELERRA
Caution: For an active-active configuration, avoid using the same UID that was used for the rdfadmin account on the other side.

New login username and UID (example: rdfadmin:500): rdfadmin:600
done

New UNIX password:
BAD PASSWORD: it is based on a dictionary word
Reype new UNIX password:
Changing password for user rdfadmin.
passwd: all authentication tokens updated successfully.
done

operation in progress (not interruptible)...

id = 1
name = CS_A
owner = 600
device = /dev/ndj1
channel = rdev=/dev/ndg, off_MB=391; wdev=/dev/nda, off_MB=391
net_path = 10.245.64.169
celerra_id = 0001949004310028
passphrase = nasadmin

Discover remote storage devices ... done

The following servers have been detected on the system (CS_B):

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
</tbody>
</table>

Please enter the id(s) of the server(s) you wish to reserve (separated by spaces) or "none" for no servers.
Select server(s) to use as standby: 1

operation in progress (not interruptible)...

id = 1
name = CS_A
owner = 600
device = /dev/ndj1
channel = rdev=/dev/ndg, off_MB=391; wdev=/dev/nda, off_MB=391
net_path = 10.245.64.169
celerra_id = 0001949004310028
passphrase = nasadmin
EXAMPLE #2 To initiate an SRDF failover from the source VNX to the destination, as a rdfadmin su to root, type:

```
# /nas/sbin/nas_rdf -activate
```

Is remote site CELERRA completely shut down (power OFF)?
Do you wish to continue? [yes or no]: yes
Successfully pinged (Remotely) Symmetrix ID: 000187430809
Successfully pinged (Remotely) Symmetrix ID: 000190100559
Successfully pinged (Remotely) Symmetrix ID: 000190100582
  Write Disable devices on SA at source (R1)..............Done.
  Suspend RDF links.......................................Done.
  Read/Write Enable devices on RA at target (R2).........Done.
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
fsck 1.35 (28-Feb-2004)
/dev/ndj1: recovering journal
/dev/ndj1: clean, 13780/231360 files, 233674/461860 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1000</td>
<td>2</td>
<td>0</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>1000</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1000</td>
<td>4</td>
<td>0</td>
<td>server_4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1000</td>
<td>5</td>
<td>0</td>
<td>server_5</td>
<td></td>
</tr>
</tbody>
</table>

server_2:
server_2: going offline
rdf: going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done

server_3:
server_3: going offline
rdf: going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done

server_4:
Error 4003: server_4: standby is not configured

server_5:
Error 4003: server_5: standby is not configured
Suspend RDF links.................................Done.
Merge device track tables between source and target.......Started.
Device: 045A in (0557,005).......................... Merged.
Merge device track tables between source and target.......Done.
Resume RDF links..................................Started.
Resume RDF links..................................Done.
EXAMPLE #3  To initiate an SRDF failover from the source VNX to the destination, without the SRDF health check, as rdfadmin su to root user, type:

```
# /nas/sbin/nas_rdf -activate -nocheck
```

Skipping SRDF health check ....

Is remote site CELERRA completely shut down (power OFF)?
Do you wish to continue? [yes or no]: yes
Successfully pinged (Remotely) Symmetrix ID: 000187430809
Successfully pinged (Remotely) Symmetrix ID: 000190100559
Successfully pinged (Remotely) Symmetrix ID: 000190100582
Write Disable devices on SA at source (R1)..............Done.
Suspend RDF links........................................Done.
Read/Write Enable devices on RA at target (R2).........Done.
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
fsck 1.35 (28-Feb-2004)
/dev/ndj1: recovering journal
/dev/ndj1: clean, 13780/231360 files, 233674/461860 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
id type acl slot groupID state name
1 1 1000 2 0 server_2
2 4 1000 3 0 server_3
3 1 1000 4 0 server_4
4 4 1000 5 0 server_5
server_2 :
server_2 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done
server_3 :
server_3 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done
server_4 :
Error 4003: server_4 : standby is not configured
server_5 :
Error 4003: server_5 : standby is not configured
Suspend RDF links...........................................Done.
Merge device track tables between source and target.......Started.
Device: 045A in (0557,005)...............................Merged.
Merge device track tables between source and target.......Started.
Resume RDF links........................................Done.
Resume RDF links........................................Done.
EXAMPLE #4  To initiate a Dynamic SRDF failover from the source VNX to the destination, as rdfadmin su to root user, type:

```
# /nas/sbin/nas_rdf -activate -reverse
```

Is remote site CELERRA completely shut down (power OFF)?
Do you wish to continue? [yes or no]: yes
Successfully pinged (Remotely) Symmetrix ID: 000280600118
Write Disable devices on SA at source (R1)..............Done.
Suspend RDF links......................Done.
Read/Write Enable devices on RA at target (R2).........Done.
fsck 1.35 (28-Feb-2004)
/dev/sdj1: recovering journal
Clearing orphaned inode 37188 (uid=0, gid=0, mode=0100644, size=0)
/dev/sdj1: clean, 12860/219968 files, 194793/439797 blocks

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1000</td>
<td>2</td>
<td>0</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>1000</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2000</td>
<td>4</td>
<td>0</td>
<td>server_4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>2000</td>
<td>5</td>
<td>0</td>
<td>server_5</td>
<td></td>
</tr>
</tbody>
</table>

server_2 :
server_2 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done
server_3 :
server_3 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done
An RDF 'Swap Personality' operation execution is
in progress for device group '1R2_500_1'. Please wait...

Swap RDF Personality......................................Started.
Swap RDF Personality......................................Done.

The RDF 'Swap Personality' operation successfully executed for
device group '1R2_500_1'.

An RDF 'Incremental Establish' operation execution is
in progress for device group '1R2_500_1'. Please wait...

Suspend RDF links......................................Done.
Resume RDF links........................................Started.
Merge device track tables between source and target.......Started.
Devices: 0009-000B ...................................... Merged.
Devices: 0032-0034 ...................................... Merged.
The RDF 'Incremental Establish' operation successfully initiated for device group '1R2_500_1'.
### EXAMPLE #5

To restore a source VNX after failover, as rdfadmin su to root user, type:

```
# /nas/sbin/nasrdf -restore
```

Is remote site CELERRA ready for Storage restoration?
Do you wish to continue? [yes or no]: yes
Contact Joker_R1_CS0 ... is alive

Restore will now reboot the source site control station.
Do you wish to continue? [yes or no]: yes

Device Group (DG) Name : 1R2_500_5
DG's Type : RDF2
DG's Symmetrix ID : 000190100557

<table>
<thead>
<tr>
<th>Device Group (DG) Name</th>
<th>Device Group ID</th>
<th>Device Group Type</th>
<th>Device Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG</td>
<td>1R2_500_5</td>
<td>RDF2</td>
<td>000190100557</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target (R2) View</th>
<th>Source (R1) View</th>
<th>modes</th>
<th>Device Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>LI</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Standard ST</td>
<td>LI</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Logical ST</td>
<td>LI</td>
<td>ST</td>
<td>RDF Pair</td>
</tr>
<tr>
<td>Device Group Name</td>
<td>Device Group ID</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Dev</th>
<th>E</th>
<th>Tracks</th>
<th>Tracks</th>
<th>S</th>
<th>Dev</th>
<th>E</th>
<th>Tracks</th>
<th>Tracks</th>
<th>MDA</th>
<th>STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEV001</td>
<td>045A</td>
<td>RW</td>
<td>10</td>
<td>0</td>
<td>RW</td>
<td>045A</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>R1 Updated</td>
</tr>
<tr>
<td>DEV002</td>
<td>045B</td>
<td>RW</td>
<td>2054</td>
<td>0</td>
<td>NR</td>
<td>045B</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV003</td>
<td>045C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>045C</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV004</td>
<td>045D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>045D</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV005</td>
<td>045E</td>
<td>RW</td>
<td>1284</td>
<td>0</td>
<td>NR</td>
<td>045E</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV006</td>
<td>045F</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>045F</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV007</td>
<td>0467</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0467</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV008</td>
<td>0468</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>0468</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV009</td>
<td>0469</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0469</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV010</td>
<td>046A</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>046A</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV011</td>
<td>046B</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>046B</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV012</td>
<td>046C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>046C</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV013</td>
<td>046D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>046D</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV014</td>
<td>046E</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>046E</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV015</td>
<td>046F</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>046F</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV016</td>
<td>0470</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0470</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV017</td>
<td>0471</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>0471</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV018</td>
<td>0472</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0472</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV019</td>
<td>0473</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0473</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV020</td>
<td>0474</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0474</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV021</td>
<td>0475</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0475</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV022</td>
<td>0476</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0476</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV023</td>
<td>0477</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>0477</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV024</td>
<td>0478</td>
<td>RW</td>
<td>2</td>
<td>0</td>
<td>NR</td>
<td>0478</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV025</td>
<td>0479</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>0479</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV026</td>
<td>047A</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>047A</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV027</td>
<td>047B</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>047B</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV028</td>
<td>047C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>047C</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
<tr>
<td>DEV029</td>
<td>047D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>NR</td>
<td>047D</td>
<td>WD</td>
<td>0</td>
<td>0</td>
<td>S..</td>
<td>Failed Over</td>
</tr>
</tbody>
</table>
The nas Commands

DEV030 047E RW 0 0 NR 047E WD 0 0 S.. Failed Over
DEV031 047F RW 0 0 NR 047F WD 0 0 S.. Failed Over
DEV032 0480 RW 0 0 NR 0480 WD 0 0 S.. Failed Over
DEV033 0481 RW 0 0 NR 0481 WD 0 0 S.. Failed Over
DEV034 0482 RW 0 0 NR 0482 WD 0 0 S.. Failed Over
DEV035 0483 RW 0 0 NR 0483 WD 0 0 S.. Failed Over
DEV036 0484 RW 0 0 NR 0484 WD 0 0 S.. Failed Over
DEV037 0485 RW 0 0 NR 0485 WD 0 0 S.. Failed Over
DEV038 0486 RW 0 0 NR 0486 WD 0 0 S.. Failed Over
DEV039 0487 RW 0 0 NR 0487 WD 0 0 S.. Failed Over
DEV040 0488 RW 0 0 NR 0488 WD 0 0 S.. Failed Over
DEV041 0489 RW 0 0 NR 0489 WD 0 0 S.. Failed Over
DEV042 048A RW 0 0 NR 048A WD 0 0 S.. Failed Over
DEV043 048B RW 0 0 NR 048B WD 0 0 S.. Failed Over
DEV044 048C RW 0 0 NR 048C WD 0 0 S.. Failed Over
DEV045 048D RW 0 0 NR 048D WD 0 0 S.. Failed Over
DEV046 048E RW 0 0 NR 048E WD 0 0 S.. Failed Over
DEV047 048F RW 2 0 NR 048F WD 0 0 S.. Failed Over
DEV048 0490 RW 0 0 NR 0490 WD 0 0 S.. Failed Over
DEV049 0491 RW 0 0 NR 0491 WD 0 0 S.. Failed Over
DEV050 0492 RW 0 0 NR 0492 WD 0 0 S.. Failed Over
DEV051 0493 RW 0 0 NR 0493 WD 0 0 S.. Failed Over
DEV052 0494 RW 0 0 NR 0494 WD 0 0 S.. Failed Over
DEV053 0495 RW 0 0 NR 0495 WD 0 0 S.. Failed Over
DEV054 0496 RW 0 0 NR 0496 WD 0 0 S.. Failed Over
DEV055 0497 RW 2 0 NR 0497 WD 0 0 S.. Failed Over
DEV056 0498 RW 2 0 NR 0498 WD 0 0 S.. Failed Over
DEV057 0499 RW 0 0 NR 0499 WD 0 0 S.. Failed Over
DEV058 049A RW 0 0 NR 049A WD 0 0 S.. Failed Over
DEV059 049B RW 0 0 NR 049B WD 0 0 S.. Failed Over
DEV060 049C RW 0 0 NR 049C WD 0 0 S.. Failed Over
DEV061 049D RW 0 0 NR 049D WD 0 0 S.. Failed Over
DEV062 049E RW 0 0 NR 049E WD 0 0 S.. Failed Over
DEV063 049F RW 0 0 NR 049F WD 0 0 S.. Failed Over
DEV064 04A0 RW 0 0 NR 04A0 WD 0 0 S.. Failed Over
DEV065 04A1 RW 0 0 NR 04A1 WD 0 0 S.. Failed Over
DEV066 04A2 RW 0 0 NR 04A2 WD 0 0 S.. Failed Over
DEV067 04A3 RW 0 0 NR 04A3 WD 0 0 S.. Failed Over
DEV068 04A4 RW 0 0 NR 04A4 WD 0 0 S.. Failed Over
DEV069 04A5 RW 0 0 NR 04A5 WD 0 0 S.. Failed Over
DEV070 04A6 RW 0 0 NR 04A6 WD 0 0 S.. Failed Over

Total

<table>
<thead>
<tr>
<th>Tracks</th>
<th>MBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3366</td>
<td>105.2</td>
</tr>
</tbody>
</table>

Legend for MODES:
M(ode of Operation): A = Async, S = Sync, E = Semi-sync, C = Adaptive Copy
D(omino)           : X = Enabled, . = Disabled
A(daptive Copy)    : D = Disk Mode, W = WP Mode, . = ACp off

Suspend RDF link(s).......................................Done.
Merge device track tables between source and target.......Started.
Devices: 045A-045F, 0467-0477 in (0557,005).............. Merged.
Devices: 0478-0489 in (0557,005)......................... Merged.

nas_rdf 357
The nas Commands

Devices: 048A-049B in (0557,005)......................... Merged.
Devices: 049C-04A6 in (0557,005)......................... Merged.
Merge device track tables between source and target........Done.
Resume RDF link(s)........................................Started.
Resume RDF link(s)........................................Done.

Is remote site CELERRA ready for Network restoration?
Do you wish to continue? [yes or no]: yes
server_2 : done
server_3 : done
server_4 :
Error 4003: server_4 : standby is not configured
server_5 :
Error 4003: server_5 : standby is not configured
fsck 1.35 (28-Feb-2004)
/dev/ndj1: clean, 13836/231360 files, 233729/461860 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for 1R2_500_5 access ... done
Write Disable device(s) on RA at target (R2).............Done.
Suspend RDF link(s)........................................Done.
Merge device track tables between source and target.......Started.
Devices: 045A-045F, 0467-0477 in (0557,005)............ Merged.
Devices: 0478-0489 in (0557,005)......................... Merged.
Devices: 048A-049B in (0557,005)......................... Merged.
Devices: 049C-04A6 in (0557,005)......................... Merged.
Merge device track tables between source and target.......Done.
Resume RDF link(s)........................................Started.
Resume RDF link(s)........................................Done.
Read/Write Enable device(s) on SA at source (R1).........Done.
Waiting for 1R2_500_5 sync .... done
Starting restore on remote site CELERRA ... 
Waiting for nbs clients to start ... done
Waiting for nbs clients to start ... done
  Suspend RDF link(s)....................................Done.
server_2 :
  server_2 : going standby
  rdf : going active
  replace in progress ... done
  failover activity complete
  commit in progress (not interruptible)... done
server_3 :
  server_3 : going standby
  rdf : going active
  replace in progress ... done
  failover activity complete
  commit in progress (not interruptible)... done
server_4 :
Error 4003: server_4 : standby is not configured
The nas Commands

server_5:
Error 4003: server_5 : standby is not configured
   Resume RDF link(s)........................................Started.
   Resume RDF link(s)........................................Done.
If the RDF device groups were setup to operate in ASYNCHRONOUS (SRDF/A) mode,
now would be a good time to set it back to that mode.
Would you like to set device group 1R2_500_5 to ASYNC Mode? [yes or no]: no
done

EXAMPLE #6 To restore a source VNX after failover, without the SRDF health
check, as rdfadmin su to root user, type:
   # /nas/sbin/nas_rdf -restore -nocheck
Skipping SRDF health check ....

Is remote site CELERRA ready for Storage restoration?
Do you wish to continue? [yes or no]: yes
Contact Joker_R1_CS0 ... is alive
Restore will now reboot the source site control station.
Do you wish to continue? [yes or no]: yes
Device Group (DG) Name : 1R2_500_5
DG's Type : RDF2
DG's Symmetrix ID : 000190100557
Target (R2) View Source (R1) View MODES
-------------------------------- ------------------------ ----- ------------
ST          LI      ST
Standard      A                   N       A
Logical       T  R1 Inv   R2 Inv  K       T  R1 Inv   R2 Inv       RDF Pair
Device  Dev   E  Tracks   Tracks  S Dev   E  Tracks   Tracks MDA   STATE
-------------------------------- -- ------------------------ ----- ------------
DEV001  045A RW   10    0 RW 045A WD      0    0 S..  R1 Updated
DEV002  045B RW  2054    0 NR 045B WD      0    0 S..  Failed Over
DEV003  045C RW  0       0 NR 045C WD      0    0 S..  Failed Over
DEV004  045D RW  0       0 NR 045D WD      0    0 S..  Failed Over
DEV005  045E RW  1284    0 NR 045E WD      0    0 S..  Failed Over
DEV006  045F RW  0       0 NR 045F WD      0    0 S..  Failed Over
DEV007  0467 RW  0       0 NR 0467 WD      0    0 S..  Failed Over
DEV008  0468 RW  2       0 NR 0468 WD      0    0 S..  Failed Over
DEV009  0469 RW  0       0 NR 0469 WD      0    0 S..  Failed Over
DEV010  046A RW  0       0 NR 046A WD      0    0 S..  Failed Over
DEV011  046B RW  2       0 NR 046B WD      0    0 S..  Failed Over
DEV012  046C RW  0       0 NR 046C WD      0    0 S..  Failed Over
DEV013  046D RW  0       0 NR 046D WD      0    0 S..  Failed Over
DEV014  046E RW  0       0 NR 046E WD      0    0 S..  Failed Over
DEV015  046F RW  2       0 NR 046F WD      0    0 S..  Failed Over
DEV016  0470 RW  0       0 NR 0470 WD      0    0 S..  Failed Over
DEV017  0471 RW  2       0 NR 0471 WD      0    0 S..  Failed Over
DEV018  0472 RW  0       0 NR 0472 WD      0    0 S..  Failed Over
DEV019  0473 RW  0       0 NR 0473 WD      0    0 S..  Failed Over
DEV020  0474 RW  0       0 NR 0474 WD      0    0 S..  Failed Over
DEV021  0475 RW  0       0 NR 0475 WD      0    0 S..  Failed Over
DEV022  0476 RW  0       0 NR 0476 WD      0    0 S..  Failed Over
### The nas Commands

<table>
<thead>
<tr>
<th>Device</th>
<th>Block Size</th>
<th>Mode</th>
<th>Blocks Used</th>
<th>Blocks Free</th>
<th>Blocks Used</th>
<th>Blocks Free</th>
<th>Status</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEV022</td>
<td>0476</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV023</td>
<td>0477</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV024</td>
<td>0478</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV025</td>
<td>0479</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV026</td>
<td>047A</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV027</td>
<td>047B</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV028</td>
<td>047C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV029</td>
<td>047D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV030</td>
<td>047E</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV031</td>
<td>047F</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV032</td>
<td>0480</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV033</td>
<td>0481</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV034</td>
<td>0482</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV035</td>
<td>0483</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV036</td>
<td>0484</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV037</td>
<td>0485</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV038</td>
<td>0486</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV039</td>
<td>0487</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV040</td>
<td>0488</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV041</td>
<td>0489</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV042</td>
<td>048A</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV043</td>
<td>048B</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV044</td>
<td>048C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV045</td>
<td>048D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV046</td>
<td>048E</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV047</td>
<td>048F</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV048</td>
<td>0490</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV049</td>
<td>0491</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV050</td>
<td>0492</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV051</td>
<td>0493</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV052</td>
<td>0494</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV053</td>
<td>0495</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV054</td>
<td>0496</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV055</td>
<td>0497</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV056</td>
<td>0498</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV057</td>
<td>0499</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV058</td>
<td>049A</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV059</td>
<td>049B</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV060</td>
<td>049C</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV061</td>
<td>049D</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV062</td>
<td>049E</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV063</td>
<td>049F</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV064</td>
<td>04A0</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV065</td>
<td>04A1</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV066</td>
<td>04A2</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV067</td>
<td>04A3</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV068</td>
<td>04A4</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV069</td>
<td>04A5</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
<tr>
<td>DEV070</td>
<td>04A6</td>
<td>RW</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Failed Over</td>
<td></td>
</tr>
</tbody>
</table>

Total: 3366 tracks, 0.00 MB(s) used for the nas Commands

Track(s): 3366
MB(s): 0.00
The nas Commands

Legend for MODES:
M(ode of Operation): A = Async, S = Sync, E = Semi-sync, C = Adaptive Copy
D(omino): X = Enabled, . = Disabled
A(daptive Copy): D = Disk Mode, W = WP Mode, . = ACp off
Suspend RDF link(s).......................................Done.
Merge device track tables between source and target.......Started.
Devices: 045A-045F, 0467-0477 in (0557,005)............... Merged.
Devices: 0478-0489 in (0557,005)............................ Merged.
Devices: 048A-049B in (0557,005)............................ Merged.
Devices: 049C-04A6 in (0557,005)............................ Merged.
Merge device track tables between source and target.......Done.
Resume RDF link(s)........................................Started.
Resume RDF link(s)........................................Done.
Is remote site CELERRA ready for Network restoration?
Do you wish to continue? [yes or no]: yes
server_2 : done
server_3 : done
server_4 :
Error 4003: server_4 : standby is not configured
server_5 :
Error 4003: server_5 : standby is not configured
fsck 1.35 (28-Feb-2004)
/dev/ndj1: clean, 13836/231360 files, 233729/461860 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for 1R2_500_5 access ... done
Write Disable device(s) on RA at target (R2)..............Done.
Suspend RDF link(s).......................................Done.
Merge device track tables between source and target.......Started.
Devices: 045A-045F, 0467-0477 in (0557,005)............... Merged.
Devices: 0478-0489 in (0557,005)............................ Merged.
Devices: 048A-049B in (0557,005)............................ Merged.
Devices: 049C-04A6 in (0557,005)............................ Merged.
Merge device track tables between source and target.......Done.
Resume RDF link(s)........................................Started.
Resume RDF link(s)........................................Done.
Read/Write Enable device(s) on SA at source (R1).........Done.
Waiting for 1R2_500_5 sync ... done
Starting restore on remote site CELERRA ...
Waiting for nbs clients to start ... done
Waiting for nbs clients to start ... done
Suspend RDF link(s).......................................Done.
server_2 :
server_2 : going standby
rdf : going active
replace in progress ... done
failover activity complete
commit in progress (not interruptible) ... done
doneThe nas Commands
server_3 :
server_3 : going standby
dfd : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done
server_4 :
Error 4003: server_4 : standby is not configured
server_5 :
Error 4003: server_5 : standby is not configured
Resume RDF link(s)..............................Started.
Resume RDF link(s)..............................Done.
If the RDF device groups were setup to operate in ASYNCHRONOUS ( SRDF/A ) mode, now would be a good time to set it back to that mode.
Would you like to set device group 1R2_500_5 to ASYNC Mode ? [yes or no]: no
done

**EXAMPLE #7**  To restore a source VNX after failover, when using Dynamic SRDF, as rdfadmin su to root user, type:

```
# /nas/sbin/nas_rdf -restore
```

Is remote site CELERRA ready for Storage restoration?
Do you wish to continue? [yes or no]: yes
Contact eng17335 ... is alive

Restore will now reboot the source site control station.
Do you wish to continue? [yes or no]: yes

Device Group (DG) Name : 1R2_500_1
DG's Type : RDF1
DG's Symmetrix ID : 000280600187  (Microcode Version: 5568)
Remote Symmetrix ID : 000280600118  (Microcode Version: 5568)
RDF (RA) Group Number : 1 (00)

<table>
<thead>
<tr>
<th>Source (R1) View</th>
<th>Target (R2) View</th>
<th>MODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>LI ST</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>A N A</td>
<td></td>
</tr>
<tr>
<td>Logical</td>
<td>T R1 Inv R2 Inv K</td>
<td>T R1 Inv R2 Inv</td>
</tr>
<tr>
<td>Device Dev</td>
<td>E Tracks Tracks S Dev</td>
<td>E Tracks Tracks MDA STATE</td>
</tr>
</tbody>
</table>

| DEV001 0056 RW 0 RW 0030 WD | 0 0 S.. Synchronized |
| DEV002 0057 RW 0 RW 0031 WD | 0 0 S.. Synchronized |
| DEV003 0032 RW 0 RW 000C WD | 0 0 S.. Synchronized |
| BCV008 0069 RW 0 RW 005F WD | 0 0 S.. Synchronized |
| BCV009 006A RW 0 RW 0060 WD | 0 0 S.. Synchronized |
| BCV010 006B RW 0 RW 0061 WD | 0 0 S.. Synchronized |

<table>
<thead>
<tr>
<th>Total</th>
<th>Track(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>------</td>
<td>----------</td>
</tr>
<tr>
<td>0 0</td>
<td>0 0</td>
</tr>
</tbody>
</table>
The nas Commands

MB(s)            0.0    0.0               0.0    0.0
Legend for MODES: M(ode of Operation): A = Async, S = Sync, E = Semi-sync, C = Adaptive Copy
D(omino)           : X = Enabled, . = Disabled
A(daptive Copy)    : D = Disk Mode, W = WP Mode, . = ACp off

Is remote site CELERRA ready for Network restoration?
Do you wish to continue? [yes or no]: yes
server_2 : done
server_3 : done
server_4 :
Error 4003: server_4 : standby is not configured
server_5 :
Error 4003: server_5 : standby is not configured

fsck 1.35 (28-Feb-2004)
/dev/sdj1: clean, 12956/219968 files, 188765/439797 blocks

An RDF 'Failover' operation execution is
in progress for device group '1R2_500_1'. Please wait...

Write Disable device(s) on SA at source (R1)...............Done.
Suspend RDF link(s)...........................................Done.
Swap RDF Personality...........................................Started.
Swap RDF Personality...........................................Done.
Suspend RDF link(s)...........................................Done.
Read/Write Enable device(s) on SA at source (R1)..........Done.
Resume RDF link(s)...........................................Started.
Resume RDF link(s)...........................................Done.
Read/Write Enable device(s) on SA at target (R2)..........Done.

The RDF 'Failover' operation successfully executed for
device group '1R2_500_1'.

Waiting for 1R2_500_1 sync ...done

Starting restore on remote site CELERRA ...
Suspend RDF link(s)...........................................Done.
server_2 :
server_2 : going standby
  rdf : going active
  replace in progress ...done
  failover activity complete
  commit in progress (not interruptible)...done
  done
server_3 :
server_3 : going standby
  rdf : going active
  replace in progress ...done
  failover activity complete
  commit in progress (not interruptible)...done
  done
server_4:
Error 4003: server_4: standby is not configured

server_5:
Error 4003: server_5: standby is not configured

done

**EXAMPLE #8**  To run all available checks on a source VNX, as a nasadmin su to root user, type:

```
# /nas/sbin/nas_rdf -check -all
```

SRDF: Checking device is normal.......................... Pass
SRDF: Checking system is restored........................ Pass
SRDF: Checking R1 SRDF session is Synch or Consistent.... Pass
SRDF: Checking R1 Data Mover configuration is valid...... Pass
SRDF: Checking R1 devices are available................... Pass
SRDF: Checking R1 device group has all devices......... Pass
SRDF: Checking R2 SRDF session is Synch or Consistent.... Pass
SRDF: Checking R2 Data Mover configuration is valid...... Pass
SRDF: Checking R2 devices are available................... Pass
SRDF: Checking R2 device group has all devices......... Pass

**EXAMPLE #9**  To run one or more specific available checks on a source VNX, as a nasadmin su to root user, type:

```
# /nas/sbin/nas_rdf -check r1_dev_group,r2_dev_group
```

SRDF: Checking R1 device group has all devices........ Pass
SRDF: Checking R2 device group has all devices........ Pass

**EXAMPLE #10**  To initiate an SRDF failover from the source VNX to the destination, without the SRDF health check for the following use cases, a rdfadmin su to root user, type:

```
# /nas/sbin/nas_rdf -activate -skip_rdf_operations
```

- SRDF STAR concurrent or cascaded
- SRDF concurrent or cascaded
- SRDF R2 enable (Split)

**SiteA to SiteB/SiteC failover case**
Skipping SRDF health check ....
Skipping Site A shutdown process for the skip_rdf_operations option ....

Successfully pinged (Remotely) Symmetrix ID: 000194900462

Successfully pinged (Remotely) Symmetrix ID: 000194900546
Skipping symrdf failover process ....
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
fsck 1.39 (29-May-2006)
/dev/ndj1: recovering journal
/dev/ndj1: clean, 15012/252928 files, 271838/516080 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
</tbody>
</table>

server_2 :
server_2 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done

Skipping symrdf update process ....
A reboot Control Station request was sent to Site A to clean up old processes ....

SiteB to SiteC failover case
[root@CS_C rdfadmin]# /nas/sbin/nas_rdf -activate
              -skip_rdf_operations -nocheck

Skipping Site A shutdown process ....
For Site B to Site C failover or Site C to Site B failover, nas_rdf -restore
              -skip_rdf_operations -skip_SiteA_shutdown and reboot -f -n operations must be
done on the source side Control Station (with read write backend) to clean up
old processes before continue this activate operation unless the source side
is not reachable or destroyed.
Do you wish to continue? [yes or no]: yes

Successfully pinged (Remotely) Symmetrix ID: 000194900431
Successfully pinged (Remotely) Symmetrix ID: 000194900546
Successfully pinged (Remotely) Symmetrix ID: 000194900673

Skipping symrdf failover process ....
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
fsck 1.39 (29-May-2006)
/dev/ndj1: clean, 14717/252928 files, 279439/516080 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
server_2 :
server_2 : going standby
rdf : going active
replace in progress ...done
The nas Commands

failover activity complete
commit in progress (not interruptible)...done

Skipping symrdf update process ....
A reboot Control Station request was sent to 10.245.64.168 to clean up old processes ....

EXAMPLE #11  To initiate an SRDF failover from the source VNX to the destination, without the SRDF health check for the case SiteA Data Movers are already shutdown and the Control Station is already rebooted, type:

```
# /nas/sbin/nas_rdf -activate -skip.SiteA_shutdown -nocheck
```

Skipping SRDF health check ....
Skipping Site A shutdown process ....

This skip SiteA_shutdown option is only for the case the Site A Data Movers have been already shutdown and the Site A Control Station has been already rebooted to clean up old processes.
Do you wish to continue? [yes or no]: yes

Successfully pinged (Remotely) Symmetrix ID: 000194900431
Successfully pinged (Remotely) Symmetrix ID: 000194900462
Successfully pinged (Remotely) Symmetrix ID: 000194900673

Write Disable device(s) on SA at source (R1)..............Done.
Suspend RDF link(s).......................................Done.
Read/Write Enable device(s) on RA at target (R2)..........Done.
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
fsck 1.39 (29-May-2006)
/dev/ndj1: recovering journal
/dev/ndj1: clean, 14237/252928 files, 297432/516080 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
id      type  acl  slot groupID  state  name
1        4    2000  2              0    server_2
2        1    1000  3              0    server_3

server_3:
server_3: going offline
rdf: going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
done

Suspend RDF link(s).......................................Done.
Merge device track tables between source and target.......Started.
The nas Commands

EXAMPLE #12 To restore a source VNX after failover for the following use cases, as a nasadmin su to root user, type:

```
# /nas/sbin/nas_rdf -restore -skip_rdf_operations
```

- SRDF STAR concurrent or cascaded
- SRDF concurrent or cascaded
- SRDF R2 enable (Split)

**Restore on SiteB/SiteC**

Is remote site CELERRA ready for Storage restoration?
Do you wish to continue? [yes or no]: yes
Contact eng564169 ... is alive

Restore will now reboot the source site control station. This process may take several minutes.
Do you wish to continue? [yes or no]: yes
Halting SiteA Data Movers and rebooting SiteA Control Station ....
Checking SiteA Data Mover halt status ....
Skipping symrdf update operation ....

Is remote site CELERRA ready for Network restoration?
Do you wish to continue? [yes or no]: yes
server_2 : done
server_3 :
Error 4003: server_3 : standby is not configured
fsck 1.39 (29-May-2006)
/dev/ndj1: clean, 14716/252928 files, 279441/516080 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Skipping symrdf failback operation & Site A restore ....

**Restore on SiteA**

To restore on siteA as a nasadmin su to root user, type:

```
[root@CS_A nasadmin]# /nasmcd/sbin/nas_rdf -restore -skip_rdf_operations
```

Waiting for NAS services to finish starting......................... Done

Ensure that SiteA is currently write-enabled to continue this restore operation.
Do you wish to continue? [yes or no]: yes
Waiting for nbs clients to start ... done
Waiting for nbs clients to start ... done
server_2:
server_2: going standby
rdf: going active
replace in progress ... done
failover activity complete
commit in progress (not interruptible)... done
done

server_3:
Error 4003: server_3: standby is not configured
Skipping symrdf set async operation ....
Run 'nas_diskmark -mark -all' on all Control Stations in the SRDF configuration
to make sure the SRDF configuration and nasdb are restored completely.
Starting Services ... done

**Example # 13** To disable SiteB for failover from SiteB to SiteC, as a rdfadmin su to root user, type:

```
# /nas/sbin/nas_rdf -restore -skip_rdf_operations -skip_SiteA_shutdown
```

Skipping session check ....
Skipping Site A shutdown process ....
Skipping symrdf update operation ....

Is remote site CELERRA ready for Network restoration?
Do you wish to continue? [yes or no]: yes
server_2: done

server_3:
Error 4003: server_3: standby is not configured
fsck 1.39 (29-May-2006)
/dev/ndj1: clean, 14717/252928 files, 279439/516080 blocks
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Waiting for nbs clients to die ... done
Waiting for nbs clients to start ... done
Skipping symrdf failback operation & Site A restore ....
nas_reclaim_schedule

Manages the schedule of space reclaim operations within a production file system or checkpoint SavVol.

SYNOPSIS

```bash
nas_reclaim_schedule
 -list
   | -info {-all <name> | id=<id>}
   | -delete {<name> | id=<id>}
   | -create <name>
     -filesystem {<name> | id=<id>}
     -type {PFS | CKPT}
     -recurrence {
       daily -start_time <HH:MM> -stop_time <HH:MM> -HWM <value> -HWM_UNIT <GB | Percent>
       weekly -start_time <HH:MM> -stop_time <HH:MM> -HWM <value> -HWM_UNIT <GB | Percent>
       -days_of_week {Mon | Tue | Wed | Thu | Fri | Sat | Sun} [, ...]
       monthly -start_time <HH:MM> -stop_time <HH:MM> -HWM <value> -HWM_UNIT <GB | Percent>
       -days_of_month <1-31>
     }
   | -modify {<name> | id=<id>}
     [-recurrence {daily | weekly | monthly}]
     [-start_time <HH:MM> -stop_time <HH:MM> -HWM <value> -HWM_UNIT <GB | Percent>]
     [-days_of_week {Mon | Tue | Wed | Thu | Fri | Sat | Sun} [, ...]]
     [-days_of_month <1-31>]
```

DESCRIPTION

nas_reclaim_schedule creates, modifies, deletes, lists, and stops and starts the space reclaim schedule task within a production file system or checkpoint SavVol. Schedules can be run daily, weekly, or monthly and can be modified and deleted.

OPTIONS

- **-list**
  Lists space reclaim schedules and their attributes such as the ID, name and PFS name.

  ```bash
  -info {-all <name> | id=<id>}
  ```
  Lists detailed information for all space reclaim schedules or for the specified schedule.

  ```bash
  -delete {<name> | id=<id>}
  ```
  Deletes the specified space reclaim schedule.

  ```bash
  -create <name> -filesystem {<name> | id=<id>}
  -type {PFS | CKPT} -recurrence {
  ```
  Creates a space reclaim schedule for the file system that is specified
The nas Commands

by <name> or <id> and by type, PFS (production file system) or CKPT (checkpoint). The reclaim schedule name in -create <name> must be unique. The -recurrence option specifies if the space reclaim operation occurs daily, weekly, or monthly.

\[ \text{daily} \ -\text{start\_time} \ <\text{HH}:\text{MM}> \ -\text{stop\_time} \ <\text{HH}:\text{MM}> \ -\text{HWM} \ <\text{value}> \ -\text{HWM\_UNIT} \ <\text{GB}|\text{Percent}> \]

If daily is specified, the space reclaim operation is run every day. The -start\_time option indicates the time of day when the space reclaim operation will start and -stop\_on indicates the time of day when the operation stops. The HWM (high water mark) value specifies the minimum threshold value reclaimable space must reach before a scheduled reclaim operation is run. The HWM\_UNIT <GB|Percent> value specifies whether the minimum threshold value is measured in GB or as a percentage.

\[ \text{weekly} \ -\text{start\_time} \ <\text{HH}:\text{MM}> \ -\text{stop\_time} \ <\text{HH}:\text{MM}> \ -\text{HWM} \ <\text{value}> \ -\text{HWM\_UNIT} \ <\text{GB}|\text{Percent}> \ -\text{days\_of\_week} \ {\text{Mon}|\text{Tue}|\text{Wed}|\text{Thu}|\text{Fri}|\text{Sat}|\text{Sun}} \]

If weekly is specified, the space reclaim operation is run every week. The -start\_time option indicates the time of day when the space reclaim operation will start and -stop\_on indicates the time of day when the operation stops. The HWM (high water mark) value specifies the minimum threshold value reclaimable space must reach before a scheduled reclaim operation is run. The HWM\_UNIT <GB|Percent> value specifies whether the minimum threshold value is measured in GB or as a percentage. The -days\_of\_week option specifies one or more days during the week on which to run the space reclaim operation.

\[ \text{monthly} \ -\text{start\_time} \ <\text{HH}:\text{MM}> \ -\text{stop\_time} \ <\text{HH}:\text{MM}> \ -\text{HWM} \ <\text{value}> \ -\text{HWM\_UNIT} \ <\text{GB}|\text{Percent}> \ -\text{days\_of\_month} \ <1-31> \]

If monthly is specified, the space reclaim operation is run every month. The -start\_time and -stop\_on options indicate the time of day when the space reclaim operation will start and stop, respectively. The HWM (high water mark) value specifies the minimum threshold value reclaimable space must reach before a scheduled reclaim operation is run. The HWM\_UNIT <GB|Percent> value specifies whether the minimum threshold value is measured in GB or as a percentage. The -days\_of\_month option specifies the day during the month on which to run the space reclaim operation. The day is specified as an integer 1 through 31 and must be a valid date for that month.
-modify {<name>|id=<id>} [-recurrence {daily|weekly|monthly}] [-start_time <HH:MM> -stop_time <HH:MM> -HWM <value> -HWM_UNIT <GB|Percent>] [-days_of_week {Mon|Tue|Wed|Thu|Fri|Sat|Sun}] [-days_of_month <1-31>]

Modifies the scheduled space reclaim operation entry as specified.

**EXAMPLE #1**

To display the attributes of a specific reclaim schedule named ckpt_2262_space_reclaim, type:

```
$ nas_reclaim_schedule -info ckpt_2262_space_reclaim
ID = 46
Name = ckpt_2262_space_reclaim
Description =
Tasks =
Start Reclaim for CKPT
PFS ID:2262
HWM:0GB
Next Run = Sat May 16 04:31:00 EDT 2015
State = Pending
Recurrence = every 1 months
Start reclaim at = 04:31
Stop reclaim at =
On Which Days of Week =
On Which Days of Month = 16
```
nas_replicate

Manages loopback, local, and remote VNX Replicator sessions.

SYNOPSIS

nas_replicate
   -list [-id]
   -info [-all |id=<sessionId>|<name>]
   -create <name>
       -source -fs {<fsName>|id=<fsId>}
           [-sav {<srcSavVolStoragePool>|id=<srcSavVolStoragePoolId>|
           <storageSystem><srcSavStorageSerialNumber>]]
           -destination {-fs {id=<dstFsId>|<existing_dstFsName>}
           | -pool {id=<dstStoragePoolId>|<dstStoragePool>|
           <storageSystem><dstStorageSerialNumber> }}
           [-vdm <dstVdmName>]
           [-sav {id=<dstSavVolStoragePoolId>|<dstSavVolStoragePool>|
           <storageSystem><dstSavStorageSerialNumber> } ]
           -interconnect {<name>|id=<interConnectId>}
           [-source_interface {<ipAddr>|<nameServiceInterfaceName>}}
           [-destination_interface
           {<ipAddr>|<nameServiceInterfaceName>}]}
       [{-max_time_out_of_sync <maxTimeOutOfSync>|-manual_refresh}]
       [-overwrite_destination][-tape_copy][-background]
   -create <name>
       -source -vdm <vdmName>
       -destination {<vdm <existing_dstVdmName>|-pool
           {id=<dstStoragePoolId>|<dstStoragePool>}{-storageSystem
           <dstStorageSerialNumber>}}
       -interconnect {<name>|id=<interConnectId>}
       [-source_interface {<ipAddr>|<nameServiceInterfaceName>}}
       [-destination_interface
       {<ipAddr>|<nameServiceInterfaceName>}]}
       [{-max_time_out_of_sync <maxTimeOutOfSync>|-manual_refresh}]
       [-overwrite_destination][-background]
   -start {<name>|id=<sessionId>}
       [-interconnect {<name>|id=<interConnectId>}}
       [-source_interface {<ipAddr>|<nameServiceInterfaceName>}}
       [-destination_interface
       {<ipAddr>|<nameServiceInterfaceName>}]}
       [{-max_time_out_of_sync <maxTimeOutOfSync>|-manual_refresh}]
       [-overwrite_destination][-background]
   -modify {<name>|id=<sessionId>}{-name <new name>}
       [-source_interface {<ipAddr>|<nameServiceInterfaceName>}}
       [-destination_interface
       {<ipAddr>|<nameServiceInterfaceName>}]}
       [{-max_time_out_of_sync <maxTimeOutOfSync>|-manual_refresh}]
       [-overwrite_destination][-reverse][-full_copy][-background]
   -stop {<name>|id=<sessionId>}{-mode {source|destination|both}}
       [-background]
   -delete {<name>|id=<sessionId>}{-mode {source|destination|both}}
       [-background]
   -failover {<name>|id=<sessionId>}{-background}
   -switchover {<name>|id=<sessionId>}
   -reverse {<name>|id=<sessionId}}[-background]
   -refresh {<name>|id=<sessionId>}{-source {<ckptName>|id=<ckptId>}}
The nas Commands

The nas Commands

-destination {<ckptName>|id=<ckptId>} [ -background ]

Note: This command manages replication sessions using VNX Replicator. For a one-time file system copy using VNX Replicator, use the nas_copy command. For ongoing file system copy, use the nas_replicate command.

DESCRIPTION

nas_replicate creates, manages, or displays session information for ongoing VNX Replicator replication of a file system, Virtual Data Mover (VDM) at a destination using an existing Data Mover interconnect. Each session handles a single source object and destination, and is assigned a globally unique ID, fixed for the life of the session.

In response to a potential disaster scenario, use nas_replicate to perform a failover of a specified replication session with possible data loss. The -switchover option switches over a replication relationship and performs synchronization of the source and destination without data loss. Use nas_replicate to also reverse the direction of a replication session or refresh the destination side with updates to the source based on a time-out of synchronization value or on demand.

OPTIONS

-list  [-id]

Displays all configured (or stopped) replication sessions on each Data Mover in the VNX for file cabinet. Each session is represented by either a name or a session ID that is generated automatically whenever a session is configured and is globally unique.

Use this option to obtain the session ID needed for another command. Since session IDs are lengthy, the session ID obtained from this command can be copied and pasted into the command.

-info {-all |id=<sessionId>|<name>}

Displays the status of a specific configured (or stopped) replication session or copy session, or the status of all replication sessions.

CREATING FILE SYSTEM Replication

-create <name>

Assigns a name to the file system replication session. The name must be unique for each Data Mover pair, which is defined by the interconnect.

-source -fs {<fsName>|id=<fsId>}

-sav<srcSavVolStoragePool>|id=<srcSavVolStoragePoolId>[-storageSystem<srcSavSto rageSerialNumber>]]
Specifies the name or ID of the existing source file system to replicate. The source file system must be mounted as read-only or read and write.

---

**Note:** If the source file system is mounted to a VDM and the goal is to replicate a CIFS environment for disaster recovery (that is, replicate a VDM and the file systems mounted to the VDM), create a session to replicate the VDM first, before replicating a file system mounted to the VDM.

---

The **-sav** option allocates a storage pool for all subsequent checkpoints for the file system. By default, if checkpoint storage (the checkpoint SavVol) needs to be allocated for checkpoints of the file system, the command uses the same storage pool used to create the source file system.

The **-storageSystem** option identifies the system on which all subsequent checkpoints for the source file system reside. For RAID group-based pools, specifies the system when there are multiple systems attached. For mapped pools, specify the pool ID or the pool ID and system serial number to uniquely identify a pool.

```
-destination {-fs {<existing_dstFsName> | id=<dstFsId>} | -pool {<dstStoragePool> | id=<dstStoragePoolId>} [-storageSystem <dstStorageSerialNumber>]}
```

Specifies an existing destination file system or the storage needed to create the destination file system. An existing destination file system must be mounted as read-only and the same size as the source. Specifying a storage pool or ID creates the destination file system automatically, as read-only, using the same name and size as the source file system.

The **-storageSystem** option identifies the system on which the destination file system will reside. This is necessary when there are multiple back-end systems attached. Use `nas_storage -list` to obtain attached system serial numbers.

```
-vdm <dstVdmName>] [-sav {id=<dstSavVolStoragePoolId> | <dstSavVolStoragePool>][-storageSystem <dstStorageSerialNumber>]
```

Specifying a pool with the **-vdm** option mounts the destination file system to an existing VDM as part of replication in a CIFS environment.
The `-sav` option allocates a storage pool for all subsequent checkpoints of the destination file system. By default, if destination checkpoint storage needs to be allocated for checkpoints, the command uses the same storage pool used to create the destination file system. The `-storageSystem` option identifies the system on which the destination checkpoint will reside. This is necessary when there are multiple back-end systems attached. Use `nas_storage -list` to obtain attached system serial numbers.

By default, the destination file system name will be the same as the source file system name. If a file system with the same name as the source file system already exists on the destination, the naming convention `<source_fs_name>_replica<#>` will be used. A number 1–4 is assigned according to how many replicas of that file system already exist.

`-interconnect {<name>|id=<interConnectId>}`

Specifies the local (source) side of an established Data Mover interconnect to use for this replication session.

Use the `nas_cel -interconnect -list` command on the source VNX for file to list the interconnects available to the replication sessions.

`[-source_interface {<nameServiceInterfaceName>|ip=<ipAddr>}]`

Instructs the replication session to use a specific local interface defined for the interconnect on the source VNX instead of selecting the local interface supporting the lowest number of sessions (the default). If this local interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address. If you define an interface using an IP address, ensure that the destination interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

The source_interfaces field of the output from the `nas_cel -interconnect -info` command shows how the source interface was defined. This option does not apply to a loopback interconnect, which always uses 127.0.0.1.
If no source interface is specified, the system will select an interface. This ensures that the interface selected can communicate with the destination interface.

```
[-destination_interface{<nameServiceInterfaceName>|ip
=<ipaddr>}]`
```

Instructs the replication session to use a specific peer interface defined for the interconnect on the destination VNX instead of selecting the peer interface supporting the lowest number of sessions (the default). If this peer interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address. If you define an interface using an IP address, ensure that the source interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

The destination_interfaces field of the output from the `nas_cel -interconnect -info` command shows how the peer interface was defined. This option does not apply to a loopback interconnect, which always uses 127.0.0.1.

If no destination interface is specified, the system will select an interface. This ensures that the interface selected can communicate with the source interface.

```
[{-max_time_out_of_sync <maxTimeOutOfSync> | -manual_refresh}]`
```

Specifies the time, in 1.1440 minutes (up to 24 hours), that the source and destination can be out of synchronization before an update occurs. If you do not specify a `max_time_out_of_sync` value, use the `-manual_refresh` option to indicate that the destination will be updated on demand using the `nas_replicate -refresh` command. If no option is selected, the refresh default time for a file system replication is 10 minutes.

```
[-overwrite_destination]
```

For an existing destination object, discards any changes made to the destination object and restores it from the established common base, thereby starting the replication session from a differential copy. If this option is not specified and the destination object contains different content than the established common base, an error is returned.
The nas Commands

[-tape_copy]
For file system replication only, creates and stops the replication session to enable an initial copy using the physical tape backup and process instead of an initial copy over the network. Using VNX Replicator describes the procedures for performing a tape copy, which involves a manually issued backup to tape from the source file system, a restore from tape to the destination file system, and a start of the replication session.

[-background]
Executes the command in an asynchronous mode. Use the nas_task command to check the status of the command.

CREATING VDM REPLICATION

-create <name>
Assigns a name to the VDM replication session. The name must be unique for each Data Mover pair, which is defined by the interconnect.

-source -vdm <vdmName> | [id=<VdmId>]
Specifies the name or ID of an existing VDM to replicate. This replicates the CIFS working environment information contained in the root file system of the VDM. The source VDM must be in a loaded read/write or mounted read-only state. The source VDM can be the source or destination VDM of another replication session.

Note: Any file system mounted to a VDM must be replicated using file system replication. VDM replication affects the VDM only.

-destination { -vdm {<existing_dstVdmName> | id=<dstVdmId> | -pool {id=<dstStoragePoolId> | <dstStoragePool>]} | -storageSystem <dstStorageSerialNumber>}
Specifies either an existing destination VDM or the storage needed to create the destination VDM. An existing destination VDM must be mounted as read-only, the same size as the source, and not loaded. The destination VDM can be the source of another replication but cannot be the destination of another replication. Specifying a storage pool creates the destination VDM automatically, as read-only, using the same name and size as the source VDM.
The \texttt{-storageSystem} option identifies the system on which the destination VDM will reside. This is necessary when there are multiple back-end systems attached. Use \texttt{nas\_storage\ -list} to obtain attached system serial numbers.

\texttt{-interconnect \{<name>|id=<interConnectId>\}}

Specifies the local (source) side of an established Data Mover interconnect to use for this replication session.

Use the \texttt{nas\_cel\ -interconnect\ -list} command on the source VNX to list the interconnects available to replication sessions. The \texttt{nas\_cel\ -interconnect\ -create} command is executed twice, one from each side, to create an interconnect between a pair of Data Movers (two local Data Movers for local replication, or one local and one remote, for remote replication). Loopback interconnects are created for each Data Mover and are named automatically.

\texttt{[-source\_interface \{<nameServiceInterfaceName>|ip=<ipAddr>\}]}  
Instructs the replication session to use a specific local interface defined for the interconnect on the source VNX instead of selecting the local interface supporting the lowest number of sessions (the default). If this local interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address. If you define an interface using an IP address, ensure that the destination interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

The source\_interfaces field of the output from the \texttt{nas\_cel\ -interconnect\ -info} command shows how the source interface was defined. This option does not apply to a loopback interconnect, which always uses 127.0.0.1.

If no source interface is specified, the system will select an interface. This ensures that the interface selected can communicate with the destination interface.

\texttt{[-destination\_interface\{<nameServiceInterfaceName>|ip=<ipAddr>\}]}  
Instructs the replication session to use a specific peer interface defined for the interconnect on the destination VNX instead of selecting the peer interface supporting the lowest number of sessions (the default). If this peer interface was defined for the
interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address. If you define an interface using an IP address, ensure that the source interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

The destination Interfaces field of the output from the `nas_cel -interconnect -info` command shows how the peer interface was defined. This option does not apply to a loopback interconnect, which always uses 127.0.0.1.

If no destination interface is specified, the system will select an interface. This ensures that the interface selected can communicate with the source interface.

```
[{-max_time_out_of_sync <maxTimeOutOfSync>
 | -manual_refresh}]
```

Specifies the time, in 1.1440 minutes (up to 24 hours), that the source and destination can be out of synchronization before an update occurs. If you do not specify a `max_time_out_of_sync` value, use the `-manual_refresh` option to indicate that the destination will be updated on demand using the `nas_replicate -refresh` command. If no option is selected, the refresh default time for a VDM replication is 5 minutes.

```
[-overwrite_destination]
```

For an existing destination object, discards any changes made to the destination object and restores it from the established common base, thereby starting the replication session from a differential copy. If this option is not specified, and the destination object contains different content than the established common base, an error is returned.

```
[-background]
```

Executes the command in an asynchronous mode. Use the `nas_task` command to check the status of the command.

```
-start {<name>|id=<sessionId>}
```

From the source side only, specifies the name or session ID needed to start the replication session. A replication name is unique for each Data Mover pair; if a duplicate name is detected on the system, the session ID is required. To get the session ID, use `nas_replicate -list`. 

START OPTIONS
Specifies an established source-side (local) Data Mover interconnect to use for the replication session. Use the `nas_cel -interconnect -list` command to list the interconnects available to replication sessions. The `nas_cel -interconnect -create` command creates an interconnect between a pair of Data Movers (two local Data Movers for local replication, or one local and one remote, for remote replication). Loopback interconnects are created and named automatically, and always use IP address 127.0.0.1.

As the source interface for the replication session, uses a specific local interface defined for the interconnect instead of any local interface defined for the interconnect (the default, which enables the software to select the interface supporting the lowest number of sessions). If this interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address (IPv4 or IPv6). If you define an interface using an IP address, ensure that the destination interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

As the destination interface for the replication session, uses a specific peer interface defined for the interconnect instead of any peer interface defined for the interconnect (the default, which enables the software to select the interface supporting the lowest number of sessions). If this interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address (IPv4 or IPv6). If you define an interface using an IP address, ensure that the source interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

Specifies the time, in 1.1440 minutes (up to 24 hours), that the source and destination can be out of synchronization before an update occurs. If you do not specify a `max_time_out_of_sync`
value, use the `-manual_refresh` option to indicate that the destination will be updated on demand using the `nas_replicate-refresh` command. If no option is selected, the refresh default time for file system replication is 10 minutes, and 5 minutes for VDM replication sessions.

`[-overwrite_destination]`
For an existing destination object, discards any changes made to the destination object and restores the destination object from the established, internal common base checkpoint, thereby starting the replication session from a differential copy. If this option is not specified and the destination object has different content than the established common base, an error is returned.

`[-reverse]`
Reverses the direction of the replication session when invoked from the new source side (the original destination). A reverse operation continues to use the established replication name or replication session ID. Use this option to restart replication after a failover or switchover.

`[-full_copy]`
For an existing destination object that contains content changes, performs a full copy of the source object to the destination object. If replication cannot be started from a differential copy using the `-overwrite_destination` option, omitting this option causes the command to return an error.

`[-background]`
Executes the command in an asynchronous mode. Use the `nas_task` command to check the status of the command.

**MODIFY OPTIONS**

`-modify {<name>|id=<sessionId>}`
From the source side only, specifies the name or session ID of the replication session to be modified. If a duplicate name is detected on the system, the session ID (fixed for the life of the session) is required. To get the session ID, use `nas_replicate-list`.

**Note:** A session cannot be modified if a `stop`, `-delete`, `-reverse`, `-failover`, `-switchover`, `-create`, or `-start` operation is running. However, once a `-modify` operation is running, any other operation is permitted.
The nas Commands

[-name <newName>]
Renames the replication session to the new name specified. When renaming a session, note that the name must be unique for each Data Mover pair.

[-source_interface {<nameServiceInterfaceName> | ip=<ipaddr>}]  
Changes the source interface used for the session to another local interface from the list defined for the interconnect. If this interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address (IPv4 or IPv6). If you change an IP address, ensure that the destination interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

[-destination_interface {<nameServiceInterfaceName> | ip=<ipaddr>}]  
Changes the destination interface used for the session to another peer interface from the list defined for the interconnect. If this interface was defined for the interconnect using a name service interface name, specify the name service interface name; if it was defined using an IP address, specify the IP address (IPv4 or IPv6).

If you change an IP address, ensure that the source interface uses the same IPv4/IPv6 protocol. An IPv4 interface cannot connect to an IPv6 interface and vice versa. Both sides of the connection must use the same protocol.

[-max_time_out_of_sync <maxTimeOutOfSync> | -manual_refresh]
Specifies the time, from 1.1440 minutes (up to 24 hours), that the source and destination can be out of synchronization before an update occurs. If you do not specify a max_time_out_of_sync value, use the -manual_refresh option to indicate that the destination will be updated on demand using the nas_replicate -refresh command. If no option is selected, the refresh default time for file system replication is 10 minutes, and 5 minutes for VDM replication sessions.

STOP OPTIONS

- stop {<name> | id=<session_id>}
Executed from the Control Station on the source VNX, stops the specified replication session but retains the session’s configuration.
information. Any data transfer in progress is terminated immediately and the destination object is restored to a consistent state.

**Note:** A session cannot be stopped if the **-delete option** is already running for the session. Once a stop operation is in progress, only the options **-list**, **-info**, and the **nas_task** command are permitted.

```
[-mode {source|destination|both}]
```

When stopping a session handling a local or remote replication from the source side, the **-mode both** option immediately stops both sides of the replication session. The **-mode source** option stops only the replication session on the source and ignores the other side of the replication relationship. If the destination side is not operational, the **-mode source** option is required to stop the session. From the destination side, only the **-mode destination** option can be issued. When stopping a session handling a loopback replication, you can specify any **-mode** option to stop the session.

```
[-background]
```

Executes the command in an asynchronous mode. Use the **nas_task** command to check progress.

**DELETE OPTIONS**

```
-delete {<name>|id=<session_id>}
```

Executed from the Control Station on the source VNX, cancels replication data transfer if it is in progress, performs an internal checkpoint restore of the latest destination checkpoint to bring the file system back to a consistent state and then deletes the replication session specified by the **-mode** options.

```
[-mode {source|destination|both}]
```

When deleting a local or remote replication session from the source side, the **-mode both** option deletes both sides of the replication session. The **-mode source** option immediately aborts only the replication session on the source and ignores the other side of the replication relationship. If the destination side is not operational, the **-mode source** option is required to delete the session. From the destination side, only the **-mode destination** option can be issued. When deleting a loopback replication, you can specify any **-mode** option to stop the session.

```
[-background]
```

Executes the command in an asynchronous mode. Use the **nas_task** command to check progress.
The execution of the **-delete** option is asynchronous and can be delayed if there is a network problem. During the delete process, other operations on the replication session are not allowed.

**FAILOVER OPTIONS**

```
-failover {<name>|id=<session_id>}
```

In response to a potential disaster scenario, performs a failover of the specified replication session with possible data loss. Execute this command from the Control Station on the destination VNX only. This command cancels any data transfer that is in process and marks the destination object as read-write so that it can serve as the new source object. When the original source Data Mover becomes reachable, the source object is changed to read-only.

**CAUTION**

The execution of the failover operation is asynchronous and results in data loss if all the data was not transferred to the destination site prior to issuing the failover.

If there are multiple sessions using the same source object, only one replication session can be failed over. After the selected session is failed over, the other sessions become inactive until the session is restarted or failed back.

```
[ -background ]
```

Executes the command in an asynchronous mode. Use the `nas_task` command to check progress.

**SWITCHOVER OPTIONS**

```
-switchover {<name>|id=<session_id>}
```

For test or migration purposes, switches over the specified replication relationship and performs synchronization of the source and destination without data loss. Execute this command from the Control Station on the source VNX only. This command stops replication, mounts the source object as read-only, and marks the destination object as read-write so that it can act as the new source object.

Unlike a reverse operation, a switchover operation does not restart replication.

```
[ -background ]
```

Executes the command in an asynchronous mode. Use the `nas_task` command to check progress.

**REVERSE OPTIONS**

```
-reverse {<name>|id=<session_id>}
```

If executed from the source side of a replication session, reverses the
direction of the specified replication session without data loss. A reverse synchronizes the destination with the source, mounts the source object as read-only, stops replication, marks the destination object as read-write so that it can act as the new source object, then restarts replication in the reverse direction from a differential copy (using the same configuration parameters established originally for the session).

[-background]
Executes the command in an asynchronous mode. Use the nas_task command to check progress.

REFRESH OPTIONS

-refresh{<name>|id=<session_id>}
Updates the destination side of the specified replication session based on changes to the source side. Execute this command from the Control Station on the source side only. A refresh operation handles updates on demand; as an alternative, the -max_time_out_of_sync option performs an update automatically after a specified number of minutes.

If the data changes on the source are large, this command can take a long time to complete. Consider running this command in background mode.

[source]{<ckptName>|id=<ckptId>}
-destination{<ckptName>|id=<ckptId>}

Instructs the replication -refresh option to use a specific checkpoint on the source side and a specific checkpoint on the destination side.

Specifying source and destination checkpoints for the -refresh option is optional. However, if you specify a source checkpoint, you must also specify a destination checkpoint. Replication transfers the contents of the user-specified source checkpoint to the destination file system. This transfer can be either a full copy or a differential copy depending on the existing replication semantics. After the transfer, the replication internally refreshes the user-specified destination checkpoint and marks the two checkpoints as common bases.

After the replication refresh operation completes successfully, both the source and destination checkpoints have the same view of their file systems. The replication continues to use these checkpoints as common bases until the next transfer is completed. After a user checkpoint is marked with a common base property, the property is retained until the checkpoint is refreshed or deleted. A checkpoint that is already paired as a common base with another checkpoint propagates its common base property when it is specified as the
source in a replication refresh operation. This propagation makes it possible for file systems without a direct replication relationship to have common base checkpoints.

```bash
[-background]
```

Executes the command in an asynchronous mode. Use the `nas_task` command to check progress.

**SYSTEM OUTPUT**

The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019. For example, Symmetrix systems appear as 002804000190-003C. The outputs displayed in the examples use a VNX system.

**EXAMPLE #1**

To list all the VNX Replicator sessions, type:

```bash
$ nas_replicate -list
```

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Local Mover</th>
<th>Interconnect</th>
<th>Celerra</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs1_rep1</td>
<td>filesystem</td>
<td>server_3 --&gt;NYs3_LAs2</td>
<td>cs110</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>vdm1_rep1</td>
<td>vdm</td>
<td>server_3 --&gt;NYs3_LAs2</td>
<td>cs110</td>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Either the name of the session or the globally unique session ID for the session, if there are duplicate names on the system.</td>
</tr>
<tr>
<td>Type</td>
<td>The type of replication session (ongoing file system (fs), copy, or VDM).</td>
</tr>
<tr>
<td>Source Mover</td>
<td>The source Data Mover for the session.</td>
</tr>
<tr>
<td>Interconnect</td>
<td>The name of the source-side interconnect used for the session.</td>
</tr>
<tr>
<td>Celerra</td>
<td>The name of the VNX system.</td>
</tr>
<tr>
<td>Status</td>
<td>The status of the session (OK, Active, Idle, Stopped, Error, Waiting) Info, Critical.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**

To create a file system replication session `ufs1_rep1` on the source file system `ufs1` and destination pool `clar_r5_performance` on the interconnect `NYs3_LAs2` using the specified source and destination IP addresses to be updated automatically every 5 minutes, type:

```bash
$ nas_replicate -create ufs1_rep1 -source -fs ufs1 -destination -pool clar_r5_performance -interconnect NYs3_LAs2 -source_interface ip=10.6.3.190 -destination_interface ip=10.6.3.173 -max_time_out_of_sync 5
```

OK

**EXAMPLE #3**

To display information for a replication session `ufs1_rep1`, type:

```bash
$ nas_replicate -info ufs1_rep1
```

```
ID = 184_APM00064600086_0000_173_APM00072901601_0000
```
The nas Commands

EXAMPLE #4

To create a VDM replication session vdm_rep1 on source VDM vdm1 and destination pool clar_r5_performance on the interconnect NYs3_LAs2 with the given source and destination IP addresses to be updated automatically every 5 minutes, type:

$ nas_replicate -create vdm1_rep1 -source -vdm vdm1 -destination -pool clar_r5_performance -interconnect NYs3_LAs2 -source_interface ip=10.6.3.190 -destination_interface ip=10.6.3.173 -max_time_out_of_sync 5

OK

EXAMPLE #5

To list existing replication sessions, type:
The nas Commands

$ nas_replicate -list

Name    Type     Local Mover Interconnect      Celerra Status
ufsl_rep1 filesystem server_3 -->NYs3_LAs2        cs110     OK
vdm1_rep1             vdm     server_3 -->NYs3_LAs2        cs110     OK

EXAMPLE #6 To manually synchronize source and destination for the replication session ufs1_rep1, type:

$ nas_replicate -refresh ufs1_rep1

OK

EXAMPLE #7 To manually synchronize source and destination for the replication session ufs1_rep1 by using user checkpoints on the source and the destination, type:

$ nas_replicate -refresh ufs1_rep1 -source id=101 -destination id=102

OK

EXAMPLE #8 To stop replication on both source and destination for the replication session ufs1_rep1, type:

$ nas_replicate -stop ufs1_rep1 -mode both

OK

EXAMPLE #9 To start stopped replication session ufs1_rep1 on interconnect NYs3_LAs2, specify manual refresh and to overwrite the destination LUN performing a full copy, type:

$ nas_replicate -start ufs1_rep1 -interconnect NYs3_LAs2 -manual_refresh -overwrite_destination -full_copy

OK

EXAMPLE #10 To display information for the VDM replication session vdm_rep1, type:

$ nas_replicate -info vdm1_rep1

ID                             = 278_APB00064600086_0000_180_APB0072901601_0000
Name                           = vdm1_rep1
Source Status                  = OK
Network Status                 = OK
Destination Status             = OK
Last Sync Time                 = Fri Dec 14 16:49:54 EST 2007
Type                           = vdm
Celerra Network Server         = cs110
Dart Interconnect              = NYs3_LAs2
Peer Dart Interconnect         = 20004
Replication Role               = source
Source VDM                     = vdm1
Source Data Mover              = server_3
Source Interface               = 10.6.3.190
Source Control Port            = 0
The nas Commands

Source Current Data Port = 0
Destination VDM = vdm1
Destination Data Mover = server_2
Destination Interface = 10.6.3.173
Destination Control Port = 5081
Destination Data Port = 8888
Max Out of Sync Time (minutes) = 5
Next Transfer Size (Kb) = 0
Latest Snap on Source =
Latest Snap on Destination =
Current Transfer Size (KB) = 0
Current Transfer Remain (KB) = 0
Estimated Completion Time =
Current Transfer is Full Copy = No
Current Transfer Rate (KB/s) = 313
Current Read Rate (KB/s) = 19297
Current Write Rate (KB/s) = 469
Previous Transfer Rate (KB/s) = 0
Previous Read Rate (KB/s) = 0
Previous Write Rate (KB/s) = 0
Average Transfer Rate (KB/s) = 155
Average Read Rate (KB/s) = 0
Average Write Rate (KB/s) = 0

EXAMPLE #11  To change the session name vdm1_rep1 to vdm1_rep2, and to change max time out of sync value to 90, type:

```
$ nas_replicate -modify vdm1_rep1 -name vdm1_rep2 -max_time_out_of_sync 90
```

OK

EXAMPLE #12  To failover the replication session ufs1_rep1, type on destination:

```
$ nas_replicate -failover ufs1_rep1
```

OK

EXAMPLE #13  To start failed over replication in the reverse direction, type:

```
$ nas_replicate -start ufs1_rep1 -interconnect LAs2_NYs3 -reverse -overwrite_destination
```

OK

EXAMPLE #14  To reverse direction of the replication session ufs1_rep1, type:

```
$ nas_replicate -reverse ufs1_rep1
```

OK

EXAMPLE #15  To switch over the replication session ufs1_rep1 using the -background option, type:

```
$ nas_replicate -switchover ufs1_rep1 -background
```
Info 26843676673: In Progress: Operation is still running. Check task id 4058 on the Task Status screen for results.

*** Comment: Use nas_task -info command to find out the status of background task.

**EXAMPLE #16** To delete the replication session `fs1_rep1` on both source and destination, type:

```
$ nas_replicate -delete fs1_rep1 -mode both
```

OK
nas_rp

Manages VNX systems that use RecoverPoint and defines the relationships needed for cabinet level disaster recovery.

SYNOPSIS

nas_rp
 -cabinetdr { -info -init <cel_name> -failover -failback }
 -cg { -list -info {<cg_name>|id=<cg_id>} -suspend {<cg_name>|id=<cg_id>} -resume {<cg_name>|id=<cg_id>} -modify {<cg_name>|id=<cg_id>} -rpo <time in seconds> }
 -rpa { -add <rpa_name> -local_ip <local_ip> -remote_ip <remote_ip> -admin <rpa_adminname> [-password <password>] -delete {<rpa_name>|id=<rpa_Id>} -update {<rpa_name>|id=<rpa_Id>} -update {<rpa_name>|id=<rpa_Id>}-local_ip <local_ip> -remote_ip <remote_ip> -admin <rpa_adminname> [-password <password>] -info {<rpa_name>|id=<rpa_Id>} [-version] [-verbose] -list }

DESCRIPTION

nas_rp manages VNX systems and cabinet level disaster recovery using RecoverPoint.

OPTIONS

-cabinetdr
Manages the activities needed for cabinet level disaster recovery.

-info
Displays the CG to be failed over, the state and transfer information of the CG, servers that have been configured as standby, and the state of these servers.

-init <cel_name>
Initializes a source or destination (target) Culham system.

-failover
Initiates a RecoverPoint cabinet failover from the source VNX to the destination VNX. The -failover option is executed on the destination Control Station at the discretion of the user. The
The nas Commands

- **failover** option fails over the RecoverPoint NAS CGs. It sets each RecoverPoint-protected volume on the source VNX as read-only and each mirrored volume on the destination VNX as read-write.

- **failback**
  Restores a source VNX after a failover. The **failback** option is initially executed on the destination Control Station. The data on each destination volume is copied to the corresponding volume on the source VNX. On the destination VNX, services on each standby Data Mover are stopped. (NFS clients connected to these Data Movers see a “server unavailable” message; CIFS client connections time out.) Each volume on the source VNX is set as read-write, and each mirrored volume on the destination VNX is set as read-only.

- **cg**
  Manages the NAS Consistency Groups or CG.

  - **list**
    Lists all the NAS CGs discovered on the RPA.

  - **info** {<cg_name>|id=<cg_id>}
    Displays the properties of a specified NAS CG, including the devices or LUNs that are being replicated.

  - **suspend** {<cg_name>|id=<cg_id>}
    Suspends the data transfer for a specified NAS CG.

  - **resume** {<cg_name>|id=<cg_id>}
    Resumes the suspended data transfer for a specified NAS CG.

  - **modify** {<cg_name>|id=<cg_id>} **-rpo** <time in seconds>
    Modifies the RPO settings on a specified NAS CG to a user-specified value. The RPO value must be greater than or equal to 1 minute.

- **rpa**
  Manages the configurations of RecoverPoint Appliances or RPA.

  - **add** <rpa_name> **-local_ip** <local_ip> **-remote_ip** <remote_ip> **-admin** <rpa_adminname> [ **-password** <password>]
    Adds an RPA entry to the NAS database with the RPA’s local IP address, remote IP address and administrator login credentials. The **add** option can be run in the non-interactive mode with the **password** option specified.
-delete \{<rpa_name>|id=<rpa_Id>\}
Deletes the RPA entry from the NAS database.

-update \{<rpa_name>|id=<rpa_Id>\}
Repairs all SSH RSA key issues to make the CS-RPA communication go through based on SSH Key authentication.

-update \{<rpa_name>|id=<rpa_Id>\} -local_ip <local_ip> -remote_ip <remote_ip> -admin <rpa_adminname> [-password <password>]
Updates the local IP and remote IP of RPA entry.

-info \{<rpa_name>|id=<rpa_id>\} [-version] [-verbose]
Displays the properties of a specified RPA and the license settings.

-list
Lists all the RPAs configured in the system.

EXAMPLE #1 To add an RPA to the NAS database, type:

```
$ /nas/sbin/nas_rp -rpa -add rpa1 -ip 10.245.64.16 -admin admin -password admin
done
```

EXAMPLE #2 To fix all the SSH key related problems for an RPA, type:

```
$ /nas/sbin/nas_rp -rpa -update rpa1
done
```

EXAMPLE #3 To get detailed information about an RPA, type:

```
$ /nas/sbin/nas_rp -rpa -info rpa1
```

Name = rpa1
ID = 1
IP = 172.24.173.9
Administrator = admin
Installation ID = f442ea06c265ac910b153fcf855d98a8b86fe1f0
License =
Rts6q8aDCHx1175rYkKxuQs/NqZtosXmSWwxodZIojIVaXw6Ot9TLuMXkTD7/rAnVnvEUL2wfqF+5eBMw0RS0wAA
Activation Code = 13dfacBpSohMgUIzHwgRJpYhboBvK1L56RnfU6CELkJDoWXNa/PJB7whLptoixFsASdTgtaqTHs57UFP7M7wECwAA
Version = 3.2.SP2.P2(h.26)

EXAMPLE #4 To list all the RPAs configured in the system, type:

```
$ nas_rp -rpa -list
```

<table>
<thead>
<tr>
<th>Id</th>
<th>name</th>
<th>ipaddress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>rpa1</td>
<td>172.24.173.9</td>
</tr>
</tbody>
</table>
EXAMPLE #5  To list all the NAS CGs discovered on the RPA, type:

```
$ nas_rp -cg -list
```

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>RPA ID</th>
<th>Prod Copy</th>
<th>Remote Copy</th>
<th>Control LUN</th>
<th>CG</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>NASCG_dev10_dev13</td>
<td>4</td>
<td>Src_dev10</td>
<td>DR_dev13</td>
<td>True</td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE #6  To display the properties of a specified NAS CG, including the devices or LUNs that are being replicated, type:

```
$ nas_rp -cg -info id=13
```

```
id                    = 13
name                  = NASCG_dev10_dev13
rpa                   = rpal
source copy           = Src_dev10
remote copy           = DR_dev13
source clar id        = APM00102102333
remote clar id        = APM00102400657
contains control luns = True
transfer state        = ACTIVE
replication direction = remote -> local
role                  = Secondary
transfer mode         = Async
rpo                   = SYSTEM
```

Replication sets

<table>
<thead>
<tr>
<th>Id</th>
<th>Name</th>
<th>Src LUN</th>
<th>Dst LUN</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>277</td>
<td>RSet 1</td>
<td>4</td>
<td>25</td>
<td>2147483648</td>
</tr>
<tr>
<td>278</td>
<td>RSet 10</td>
<td>119</td>
<td>119</td>
<td>214748364800</td>
</tr>
<tr>
<td>279</td>
<td>RSet 11</td>
<td>120</td>
<td>120</td>
<td>214748364800</td>
</tr>
<tr>
<td>280</td>
<td>RSet 12</td>
<td>101</td>
<td>101</td>
<td>214748364800</td>
</tr>
<tr>
<td>281</td>
<td>RSet 13</td>
<td>102</td>
<td>102</td>
<td>214748364800</td>
</tr>
<tr>
<td>282</td>
<td>RSet 14</td>
<td>103</td>
<td>103</td>
<td>214748364800</td>
</tr>
<tr>
<td>283</td>
<td>RSet 15</td>
<td>104</td>
<td>104</td>
<td>214748364800</td>
</tr>
<tr>
<td>284</td>
<td>RSet 16</td>
<td>105</td>
<td>105</td>
<td>214748364800</td>
</tr>
<tr>
<td>285</td>
<td>RSet 17</td>
<td>106</td>
<td>106</td>
<td>214748364800</td>
</tr>
<tr>
<td>286</td>
<td>RSet 18</td>
<td>107</td>
<td>107</td>
<td>214748364800</td>
</tr>
<tr>
<td>287</td>
<td>RSet 19</td>
<td>108</td>
<td>108</td>
<td>214748364800</td>
</tr>
<tr>
<td>288</td>
<td>RSet 2</td>
<td>0</td>
<td>18</td>
<td>11811160064</td>
</tr>
<tr>
<td>289</td>
<td>RSet 20</td>
<td>109</td>
<td>109</td>
<td>214748364800</td>
</tr>
<tr>
<td>290</td>
<td>RSet 21</td>
<td>110</td>
<td>110</td>
<td>214748364800</td>
</tr>
<tr>
<td>291</td>
<td>RSet 22</td>
<td>111</td>
<td>111</td>
<td>214748364800</td>
</tr>
<tr>
<td>292</td>
<td>RSet 23</td>
<td>112</td>
<td>112</td>
<td>214748364800</td>
</tr>
<tr>
<td>293</td>
<td>RSet 3</td>
<td>1</td>
<td>19</td>
<td>11811160064</td>
</tr>
<tr>
<td>294</td>
<td>RSet 4</td>
<td>113</td>
<td>113</td>
<td>214748364800</td>
</tr>
<tr>
<td>295</td>
<td>RSet 5</td>
<td>114</td>
<td>114</td>
<td>214748364800</td>
</tr>
<tr>
<td>296</td>
<td>RSet 6</td>
<td>115</td>
<td>115</td>
<td>214748364800</td>
</tr>
<tr>
<td>297</td>
<td>RSet 7</td>
<td>116</td>
<td>116</td>
<td>214748364800</td>
</tr>
<tr>
<td>298</td>
<td>RSet 8</td>
<td>117</td>
<td>117</td>
<td>214748364800</td>
</tr>
<tr>
<td>299</td>
<td>RSet 9</td>
<td>118</td>
<td>118</td>
<td>214748364800</td>
</tr>
</tbody>
</table>

EXAMPLE #7  To suspend data transfer for a specified NAS CG, type:

```
$ nas_rp -cg -suspend id=13
```
EXAMPLE #8  To resume the suspended data transfer for a specified NAS CG, type:

$ nas_rp -cg -resume id=13

done

EXAMPLE #9  To modify the RPO settings on a specified NAS CG to a user-specified value, type:

$ nas_rp -cg -modify id=13 -rpo 300

done

EXAMPLE #10  To display the CG to be failed over, the state and transfer information of the CG, servers that have been configured as standby, and the state of these servers, type:

# nas_rp -cabinetdr -info

***** Consistency Group Configuration *****

name                  = NASCG_dev10_dev13
description           =
uid                   = 50:6:1:60:B0:60:26:BC:0:0:0:0:0:0:0:0
state                 = Consistent
role                  = Primary
condition             = Active
recovery policy       = Automatic
number of mirrors     = 16
mode                  = SYNC
owner                 = 0
mirrored disks        =
root_disk,root_ldisk,d5,d8,d10,d11,d24,d25,d26,d27,d29,d30,d31,d32,d33,d39,
local clarid          = APM00053001552
remote clarid         = APM00053001549
mirror direction      = local -> remote

***** Servers configured with RPstandby *****

id        = 1
name      = server_2
acl       = 2000, owner=rpadmin, ID=500
type      = nas
slot      = 2
member_of =
standby   = server_3, policy=auto
RDFstandby= slot=2
status :
 defined = enabled
 actual = online, active
The nas Commands

id        = 2
name      = server_3
acl       = 1000, owner=nasadmin, ID=201
type      = standby
slot      = 3
member_of =
standbyfor= server_2
RDFstandby= slot=3
status    :
  defined = enabled
  actual = online, ready

***** Servers configured as standby *****

id        = 1
name      = server_2
acl       = 2000, owner=rpadmin, ID=500
type      = standby
slot      = 2
member_of =
standbyfor=
status    :
  defined = enabled
  actual = online, ready

id        = 2
name      = server_3
acl       = 2000, owner=rpadmin, ID=500
type      = standby
slot      = 3
member_of =
standbyfor=
status    :
  defined = enabled
  actual = online, ready

EXAMPLE #11 To initialize a source or destination (target) VNX, type:

    # /nas/sbin/nas_rp -cabinetdr -init new_york

Culham with RecoverPoint Disaster Recovery
Initializing new_york --> new_jersey
Contacting new_york for remote storage info
Local storage system: FNM00093600019
Remote storage system: FNM00094700042
Discovering storage on new_york (may take several minutes)
Setting security information for FNM00093600019
Discovering storage at 172.24.173.26 (may take several minutes)
Contacting new_york for remote storage info
Contacting new_york for server capabilities...
Analyzing server information...
Source servers available to be configured for remote DR
The nas Commands

1. server_2:new_york
2. server_3:new_york [ local standby ]
v. Verify standby server configuration
q. Quit initialization process
c. Continue initialization
Select a new_york server: 1
Destination servers available to act as remote standby

1. server_2:new_jersey
server_3:new_jersey [ local standby ]
b. Back
Select a new_jersey server: 1
Source servers available to be configured for remote DR

1. server_2:new_york [ remote standby is server_2:new_jersey ]
2. server_3:new_york [ local standby ]
v. Verify standby server configuration
q. Quit initialization process
c. Continue initialization
Select a new_york server: c
Standby configuration validated OK
Enter user information for managing remote site new_york
Username: dradmin
Password: ********* Retype your response to validate
Password: *********
Setting up server_2 on new_york
Rebooting server_2 on new_jersey as standby ... done
Setting acl for server_2 on new_jersey
Updating the Culham domain information
done

EXAMPLE #12  To activate a failover, log in to destination Control Station by using the dradmin account, su to root, and type:

```
# /nas/sbin/nas_rp -cabinetdr -failover
```
Sync with CLARiiON backend ...... done
Validating consistency group configuration ...... done
Is source site new_york ready for complete shut down (power OFF)?  [yes or no] yes
Contacting source site source_cs, please wait... done
Shutting down remote site source_cs ...................................... done
Sync with CLARiiON backend ...... done
STARTING an RP 'FAILOVER' operation.
Device group: cg_new_york ............ done
The RP 'FAILOVER' operation SUCCEEDED.
Failing over Devices ... done
Adding NBS access for server_2 ....... done
Adding NBS access for server_3 ....... done
Activating the target environment ... done

server_2 : going offline
The nas Commands

rdf : going active
replace in progress ...done
failover activity complete

server_3 : going offline
rdf : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done
commit in progress (not interruptible)...done
commit in progress (not interruptible)...done
commit in progress (not interruptible)...done
done

EXAMPLE #13 To restore, log in to the destination Control Station by using the
`dradmin` account, `su` to `root`, and type:

```
# /nas/sbin/nas_rp -cabinetdr -failback
```

Sync with CLARiiON backend ...... done
Validating consistency group configuration ...... done
Contacting source site new_york, please wait... done
Running restore requires shutting down source site new_york.
Do you wish to continue? [yes or no] yes
Shutting down remote site new_york ....... done
Is source site new_york ready for storage restoration? [yes or no] yes
Sync with CLARiiON backend ...... done
STARTING an RP 'RESUME' operation.
Consistency group: cg_new_york ............ done
The RP 'RESUME' operation SUCCEEDED.
Percent synchronized: 100
Updating consistency group ... done
Is source site ready for network restoration? [yes or no] yes
Restoring servers ...... done
Waiting for servers to reboot ...... done
Removing NBS access for server_2 .. done
Removing NBS access for server_3 .. done
Waiting for consistency group ready to failback .... done
Sync with CLARiiON backend ...... done
STARTING an RP 'FAILBACK' operation.
Consistency group: cg_new_york ............ done
The RP 'FAILBACK' operation SUCCEEDED.
Restoring remote site cg_new_york, please wait... done
done
nas_server

Manages the Data Mover (server) table.

SYNOPSIS

nas_server
   -list [-all | -vdm]
   -delete <movername>
   -info { -all | <movername> | <slot_number> | id=<mover_id>
   | -vdm { -all | <vdm_name> | id=<vdm_id> }}
   -rename <old_movername> <new_movername>
   -acl <acl_value> <movername>
   [-name <name>] [-type <type>] -create <movername> [-setstate <state>]
   [-fs <fs_name> | pool=<pool>] [storage=<system_name>] [-option <options>]
   -vdm <vdm_name> -setstate <state> [ <movername>] [-ConvertI18N]
   -vdm <vdm_name> -attach <interface>[,<interface2>,...]
   -vdm <vdm_name> -detach <interface>[,<interface2>,...]
   -vdm <vdm_name> -move <movername> [-ConvertI18N]
   -vdm <vdm_name> -option syncreplicable={yes|no}

DESCRIPTION

nas_server manages the server tables for both physical and virtual Data Movers (VDMs), creates a VDM, sets an access control value for a physical Data Mover or VDM, renames a Data Mover and displays attributes for a specified Data Mover or all Data Movers, deletes a physical Data Mover entry from the server table, and deletes the VDM configuration for a Data Mover, and attaches or detaches the network interface to a VDM.

OPTIONS

-list
Lists the Data Mover server table. The server table displays the ID, type, access control level value, slot number, group ID, state, and name of a Data Mover. VDMs have their own server table and do not have a numeric reference in the general server table.

Note: The ID of the object is an integer and is assigned automatically. The name of the Data Mover might be truncated if it is too long for the display. To display the full name, use the -info option with the Data Mover ID.

Valid Data Mover types are:

- 1=nas
- 2=not used
- 3=not used
- 4=standby
The nas Commands

- 5=not used
- 6=rdf

Note: The nas type is set automatically, vdm is set using nas_rp, rdf and standby are set up using server_ssh.

[-all | -vdm]
The -all option displays the physical Data Mover and VDMs. The -vdm option lists the VDMs only.

-delete <movername>
Deletes the specified physical Data Mover entry from the server table or deletes the VDM configuration. A Data Mover that is being deleted cannot contain mounted file systems.

Deleting a physical Data Mover requires the root command. Use /nas/sbin/rootnas_server to execute a delete.

-info {-all | <movername> | <slot_number> | id =<mover_id>}
Displays attributes for all physical Data Movers, or a Data Mover specified by its <movername>, <slot_number>, or <mover_id>.

-info -vdm {-all | <vdm_name> | id=<vdm_id>}
Displays attributes for all VDMs, or a specified VDM, including the network interfaces that are being used by the CIFS servers.

-rename <old_movername> <new_movername>
Changes the name of the physical Data Mover or the VDM to the specified name. The -create option provides more information for rules applicable to naming a Data Mover.

-acl <acl_value> <movername>
Sets an access control level value that defines the owner of the physical Data Mover or the Virtual Data Mover, and the level of access allowed for users and groups defined in the access control level table. The nas_acl command provides more information.

[-name <name>][-type vdm] -create <movername>
Creates a VDM with an optional name for the specified physical or VDM. The movername is case-sensitive and supports the following characters: a through z, A through Z, 0 through 9, _(underscore), - (hyphen) though names may not start with a hyphen. The default type is nas.

[-setstate <state>]
Sets the Data Mover to loaded or mounted.
The **loaded** option installs the image of the VDM onto the physical Data Mover, but does not mount the non-root file systems. The **mounted** option mounts the **root_fs** as read-only, but the VDM image is not installed. The **-setstate** option is for use with replication.

**Note:** Before a VDM image is loaded, the image must be unloaded from the previous Data Mover, and the CIFS server must be joined using **server_cifs**. The network interfaces used by the CIFS servers on the VDM must be available on the destination Data Mover.

```
[ -fs <fs_name> | pool=<pool> ]
```

Specifies a file system or assigns a rule set known as a storage **pool** for the VDM root file system.

For the -fs option, the file system must be unmounted, clean (**nas_fsck** provides more information), and be either of type **uxfs** or **rawfs**. For a loaded state VDM, only an uXfs file system type can be used, but for mounted state VDM, both uXfs and rawfs can be used. The file system to be provided as the VDM root file system is renamed to **root_fs_vdm_<vdm_name>**. This is deleted when the VDM is deleted.

```
[ storage=<system_name> ]
```

The storage **pool** option assigns a rule set for the root file system of the VDM that contains automatically created volumes and defines the type of disk volumes used and how they are aggregated. Storage pools are system defined (storage pool description provides more information) or user defined. **nas_pool** provides a description of pool types.

```
[ -option <options> ]
```

Specifies the following comma-separated list of options:

- **fstype={rawfs|uxfs}**
  Specifies the file system type of the root file system for the server. It can be either rawfs or uXfs type.

- **log_type={common|split}**
  Specifies the type of log file associated with the file system. Log files can be either shared (common) or uniquely assigned to individual file systems(split). For SRDF Async or STAR feature, split option is strongly recommended to avoid fsck before mounting a BCV file system on SiteB or SiteC.
The nas Commands

**syncreplicable={yes|no}**
Specifies whether to enable (yes) or disable (no) the sync-replicable option.

```
-vdm <vdm_name> -attach <interface> [,<interface2>...]  
```
Allows the user to manage the network interface(s) for a VDM. The interfaces are attached to a VDM when the VDM state is loaded. When an interface is attached to a VDM, the NFS clients connecting the Data Mover through this interface have access to the file system exported by the VDM configuration.

```
-vdm <vdm_name> -detach <interface> [,<interface2>...]  
```
An attempt to delete an interface attached to the VDM with the server_ifconfig command fails with an error message. It indicates that the interface is currently used by the VDM <vdm_name>. The user must detach the interface from the VDM before deleting it.

---

**Note:** If the user wants to share a VDM interface for both CIFS and NFSv3 or NFSv4 clients, the administrator must create a CIFS server and assign it to the interface by using the server_cifs command.

```
-vdm <vdm_name> -setstate <state>  
```
Sets the state of the VDM to **loaded**, **mounted**, **tempunloaded**, or **permunloaded**.

The **loaded** option installs the image of the VDM onto the physical Data Mover, but does not mount the non-root file systems. The **mounted** option mounts the root_fs read-only, but the VDM image is not installed.

The **tempunloaded** option temporarily unloads the VDM image, while the **permunloaded** option permanently unloads the image.

```
[movername]  
```
Specifies a physical Data Mover for the VDM.

```
[-ConvertI18N]  
```
When loading the VDM image, forces the conversion of the I18N mode of the VDM’s root file system from ASCII to UNICODE. The I18N mode of the Data Mover can be either ASCII or UNICODE. The mode of the VDM must be the same as the physical Data Mover, for example, when performing the -move option, or when replicating.

This mode is used when the mode of the VDM root file system is different from that of the physical Data Mover.
The nas Commands

-vdm <vdm_name> -move <movername>
Moves the image of the VDM onto the physical Data Mover, and mounts the non-root file systems.

Note: Before a VDM image is loaded, the image must be unloaded from the previous Data Mover, and the CIFS server must be joined using server_cifs. The network interfaces used by the CIFS servers on the VDM must be available on the destination Data Mover.

[-ConvertI18N]
When loading the VDM image, forces the conversion of the I18N mode of the VDM’s root file system from ASCII to UNICODE. The I18N mode of the Data Mover can be either ASCII or UNICODE. The mode of the VDM must be the same as the physical Data Mover, for example, when performing the -move option, or when replicating.

This mode is used when the mode of the VDM root file system is different from that of the physical Data Mover.

-vdm <vdm_name> -option syncreplicable={yes|no}
Set syncreplicable=yes to modify the specified VDM to sync-replicable. Set syncreplicable=no to modify the specified VDM to non-sync-replicable.

SEE ALSO Configuring Virtual Data Mover on VNX, Using International Character Sets for File, nas_cel, nas_fs, nas_volume, server_cifs.
VNX systems support the following system-defined storage pools: clar_r1, clar_r5_performance, clar_r5_economy, clar_r6, clarata_r3, clarata_r6, clarata_r10, clarata_archive, cm_r1, cm_r5_performance, cm_r5_economy, cm_r6, cmata_r3, cmata_archive, cmata_r6, cmata_r10, clarsas_archive, clarsas_r6, clarsas_r10, clarefd_r5, clarefd_r10, cmsas_archive, cmsas_r6, cmsas_r10, and cmefd_r5.

Disk types when using VNX for block are CLSTD, CLEFD, and CLATA, and for VNX for block involving mirrored disks are CMEFD, CMSTD, and CMATA.

VNX with a Symmetrix system supports the following system-defined storage pools: symm_std, symm_std_rdf_src, symm_ata, symm_ata_rdf_src, symm_ata_rdf_tgt, symm_std_rdf_tgt, symm_ata_rdf_tgt, symm_std_rdf_tgt, and symm_efd.

For user-defined storage pools, the difference in output is in the disk type. Disk types when using a Symmetrix are STD, R1STD, R2STD, BCV, R1BCV, R2BCV, ATA, R1ATA, R2ATA, BCVA, R1BCA, R2BCA, and EFD.

**EXAMPLE #1**

To list the physical Data Mover table, type:

```bash
$ nas_server -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1000</td>
<td>2</td>
<td>0</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1000</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1000</td>
<td>4</td>
<td>0</td>
<td>server_4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1000</td>
<td>5</td>
<td>0</td>
<td>server_5</td>
<td></td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the Data Mover.</td>
</tr>
<tr>
<td>type</td>
<td>Type assigned to Data Mover.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the Data Mover or VDM.</td>
</tr>
<tr>
<td>slot</td>
<td>Physical slot in the cabinet where the Data Mover resides.</td>
</tr>
<tr>
<td>groupID</td>
<td>ID of the Data Mover group.</td>
</tr>
<tr>
<td>state</td>
<td>Whether the Data Mover is enabled=0, disabled=1, failed over=2.</td>
</tr>
<tr>
<td>name</td>
<td>Name given to the Data Mover.</td>
</tr>
</tbody>
</table>
**EXAMPLE #2**  To list the physical Data Mover and VDM table, type:

```
$ nas_server -list -all
```

<table>
<thead>
<tr>
<th>id</th>
<th>type</th>
<th>acl</th>
<th>slot</th>
<th>groupID</th>
<th>state</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1000</td>
<td>2</td>
<td>0</td>
<td>server_2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1000</td>
<td>3</td>
<td>0</td>
<td>server_3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1000</td>
<td>4</td>
<td>0</td>
<td>server_4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1000</td>
<td>5</td>
<td>0</td>
<td>server_5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>id</th>
<th>acl</th>
<th>server</th>
<th>mountedfs</th>
<th>rootfs</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td>31</td>
<td>vdm_1</td>
</tr>
</tbody>
</table>

**EXAMPLE #1** provides a description of outputs for the physical Data Movers. The following table provides a description of the command output for the VDM table.

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the Data Mover.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the Data Mover or VDM.</td>
</tr>
<tr>
<td>server</td>
<td>Server on which the VDM is loaded on.</td>
</tr>
<tr>
<td>mountedfs</td>
<td>File systems that are mounted on this VDM.</td>
</tr>
<tr>
<td>rootfs</td>
<td>ID number of the root file system.</td>
</tr>
<tr>
<td>name</td>
<td>Name given to the Data Mover or VDM.</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**  To list the VDM server table, type:

```
$ nas_server -list -vdm
```

<table>
<thead>
<tr>
<th>id</th>
<th>acl</th>
<th>server</th>
<th>mountedfs</th>
<th>rootfs</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td>31</td>
<td>vdm_1</td>
</tr>
</tbody>
</table>

**EXAMPLE #4**  To list information for a Data Mover, type:

```
$ nas_server -info server_2
```

| id   | = 1                     |
| name | = server_2              |
| acl  | = 1000, owner=nasadmin, ID=201 |
| type | = nas                   |
| slot | = 2                     |
| member_of |                          |
| standby | = server_5, policy=auto |
| status | :                      |
|       |  defined = enabled     |
|       | actual = online, ready |

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the Data Mover.</td>
</tr>
<tr>
<td>name</td>
<td>Name given to the Data Mover.</td>
</tr>
</tbody>
</table>
The nas Commands

<table>
<thead>
<tr>
<th>acl</th>
<th>Access control level value assigned to the Data Mover or VDM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>Type assigned to Data Mover.</td>
</tr>
<tr>
<td>slot</td>
<td>Physical slot in the cabinet where the Data Mover resides.</td>
</tr>
<tr>
<td>member_of</td>
<td>Group to which the Data Mover is a member.</td>
</tr>
<tr>
<td>standby</td>
<td>If the Data Mover has a local standby associated with it.</td>
</tr>
<tr>
<td>status</td>
<td>Whether the Data Mover is enabled or disabled, and whether it is active.</td>
</tr>
</tbody>
</table>

EXAMPLE #5 To display detailed information for all servers, type:

```
$ nas_server -info -all
```

```bash
id = 1
name = server_2
acl = 1000, owner=nasadmin, ID=201
type = nas
slot = 2
member_of =
standby = server_5, policy=auto
status :
  defined = enabled
  actual = online, active

id = 2
name = server_3
acl = 1000, owner=nasadmin, ID=201
type = nas
slot = 3
member_of =
standby = server_5, policy=auto
status :
  defined = enabled
  actual = online, ready

id = 3
name = server_4
acl = 1000, owner=nasadmin, ID=201
slot = 4
member_of =
standby = server_5, policy=auto
status :
  defined = enabled
  actual = online, ready

id = 4
name = server_5
acl = 1000, owner=nasadmin, ID=201
type = standby
slot = 5
member_of =
standbyfor = server_4, server_2, server_3
```
status:
  defined = enabled
  actual = online, ready

EXAMPLE #4 provides a description of command outputs.

EXAMPLE #6 To display information for all VDMs, type:

```bash
$ nas_server -info -vdm -all
```

id    = 3
name  = vdm_1
acl   = 0
type  = vdm
server = server_2
rootfs = root_fs_vdm_1
I18N mode = UNICODE
mountedfs =
member_of =
status :
  defined = enabled
  actual = mounted

Interfaces to services mapping:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the Data Mover.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the Data Mover.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the VDM.</td>
</tr>
<tr>
<td>type</td>
<td>For VDM server, the type is always VDM.</td>
</tr>
<tr>
<td>server</td>
<td>Server on which the VDM loaded.</td>
</tr>
<tr>
<td>rootfs</td>
<td>Root file system of the VDM.</td>
</tr>
<tr>
<td>I18N mode</td>
<td>L18N mode of the VDM. I18N mode is either ASCII or UNICODE.</td>
</tr>
<tr>
<td>mountedfs</td>
<td>File systems that are mounted on this VDM.</td>
</tr>
<tr>
<td>member_of</td>
<td>If it is a member of a cluster, then this field will show the cluster name.</td>
</tr>
<tr>
<td>status</td>
<td>Whether the VDM is enabled or disabled, and whether it can be loaded ready, loaded active, mounted, temporarily unloaded and permanently unloaded.</td>
</tr>
<tr>
<td>Interfaces to services mapping</td>
<td>List of interfaces that are used for the services configured on this VDM. Currently, only CIFS service is provided, so this field lists all the interfaces used in the CIFS servers configured on this VDM.</td>
</tr>
</tbody>
</table>
EXAMPLE #7  To create a mounted VDM named vdm_1 on server_2 using the storage pool, clar_r5_performance with a rawfs, type:

```
$ nas_server -name vdm_1 -type vdm -create server_2
-setstate mounted pool=clar_r5_performance -option
fstype=uxfs
```

```
id        = 3
name      = vdm_1
acl       = 0
type      = vdm
server    = server_2
rootfs    = root_fs_vdm_1
I18N mode = UNICODE
mountedfs =
member_of =
status    :
    defined = enabled
    actual = mounted
```

Interfaces to services mapping:

EXAMPLE #6 provides a description of command outputs.

EXAMPLE #8  To set the state of a vdm_1 to mounted, type:

```
$ nas_server -vdm vdm_1 -setstate mounted
```

```
id        = 3
name      = vdm_1
acl       = 0
type      = vdm
server    = server_2
rootfs    = root_fs_vdm_1
I18N mode = UNICODE
mountedfs =
member_of =
status    :
    defined = enabled
    actual = mounted
```

Interfaces to services mapping:

EXAMPLE #6 provides a description of command outputs.

EXAMPLE #9  To move the image of vdm_1 onto server_4, type:

```
$ nas_server -vdm vdm_1 -move server_4
```

```
id        = 3
name      = vdm_1
acl       = 0
type      = vdm
server    = server_4
rootfs    = root_fs_vdm_1
I18N mode = UNICODE
mountedfs =
```
member_of = 
status :  
  defined = enabled  
  actual = loaded, ready  
Interfaces to services mapping:

**EXAMPLE #6** provides a description of command outputs.

**EXAMPLE #10** To rename a Data Mover entry from **server_2** to **dm2**, type:

```bash
$ nas_server -rename server_2 dm2
```

id = 1  
name = dm2  
ac1 = 1000, owner=nasadmin, ID=201  
type = nas  
slot = 2  
member_of =  
standby = server_5, policy=auto  
status :  
  defined = enabled  
  actual = online, active

**EXAMPLE #4** provides a description of command outputs.

**EXAMPLE #11** To set the access control level for **server_2**, type:

```bash
$ nas_server -acl 1432 server_2
```

id = 1  
name = server_2  
ac1 = 1432, owner=nasadmin, ID=201  
type = nas  
slot = 2  
member_of =  
standby = server_5, policy=auto  
status :  
  defined = enabled  
  actual = online, ready

---

**Note:** The value 1432 specifies **nasadmin** as the owner, gives users with an access level of at least observer read-only access, users with an access level of at least operator read/write access, and users with an access level of at least admin read/write/delete access.

**EXAMPLE #4** provides a description of command outputs.
**EXAMPLE #12** To delete vdm_1, type:

```
$ nas_server -delete vdm_1
```

```
id        = 3
name      = vdm_1
acl       = 0
type      = vdm
server    =
rootfs    = root_fs_vdm_1
I18N mode = UNICODE
mountedfs =
member_of =
status    :
    defined = enabled
    actual = permanently unloaded
Interfaces to services mapping:
```

**EXAMPLE #6** provides a description of command outputs.

**EXAMPLE #13** To delete a physical Data Mover using root command, type:

```
$ /nas/sbin/rootnas_server -delete server_3
```

```
id        = 2
name      = server_3
acl       = 0
type      = nas
slot      = 3
member_of =
standby   = server_5, policy=auto
status    :
    defined = disabled
    actual = boot_level=0
```

**EXAMPLE #6** provides a description of command outputs.

**EXAMPLE #14** To create a VDM named vdm1 on the server 3, type:

```
$ nas_server -name vdm1 -type vdm -create server_3
```

```
id        = 43
name   = vdm1
acl       = 0
type   = vdm
server    = server_3
rootfs    = root_fs_vdm_vdm1
I18N mode = UNICODE
mountedfs =
member_of =
status    :
    defined = enabled
    actual = loaded, ready
```
The nas Commands

Interfaces to services mapping:

EXAMPLE #15  To assign the network interface to vdm1, assuming vdm1if1 and vdm1if2 exist and are not attached to another vdm, type:

$ nas_server -vdm vdm1 -attach vdm1if1,vdm1if2

```
id        = 43
name      = vdm1
acl       = 0
type      = vdm
server    = server_2
rootfs    = root_fs_vdm_vdm1
I18N mode = UNICODE
mountedfs =
member_of =
status    :
  defined = enabled
  actual = loaded, ready
Interfaces to services mapping:
  interface=vdm1if1 :vdm
  interface=vdm1if2 :vdm
```

EXAMPLE #16  To query the state of sync-replicable vdm1, type:

$ nas_server -info -vdm vdm1

```
id        = 43
name      = vdm1
acl       = 0
type      = vdm
server    = server_2
rootfs    = root_fs_vdm_vdm1
I18N mode = UNICODE
mountedfs =
syncreplicable = True
member_of =
status    :
  defined = enabled
    actual = loaded, ready
Interfaces to services mapping:
  interface=vdm1if2 :cifs vdm
  interface=vdm1if1 :vdm
```

EXAMPLE #17  To create a VDM named vdm2 on the server_3 using split ufs log type, type:

$ nas_server -name vdm2 -type vdm -create server_3
  -setstate loaded pool=symm_std_rdf_src -o log_type=split

nas_server
The nas Commands

```
d        = 2
name      = vdm2
acl       = 0
type      = vdm
server    = server_3
rootfs    = root_fs_vdm_vdm2
I18N mode = ASCII
mountedfs =
member_of =
status    :
  defined = enabled
  actual = loaded, ready
Interfaces to services mapping:

To confirm a VDM ufs log type, type:
```
/nas/sbin/rootnas_fs -i root_fs_vdm_vdm2
```

```
id        = 49
name      = root_fs_vdm_vdm2
acl       = 0
in_use    = True
type      = uxfs
worm      = off
volume    = v1260
pool      = symm_std_rdf_src
member_of = root_avm_fs_group_8
rw_servers= server_3
ro_servers=
rw_vdms   =
ro_vdms   =
auto_ext  = no,thin=no
log_type  = split
fast_clone_level = 2
deduplication = Off
stor_devs =
  000194900462-10C6,000194900462-10CE,000194900462-10D6,000194900462-10DE,00019
    4900462-10E6,000194900462-10EE,000194900462-10F6,000194900462-10FE
disks    = d1102,d1103,d1104,d1105,d1106,d1107,d1108,d1109
disk=d1102 stor_dev=000194900462-10C6   addr=c4t3l4-72-0   server=server_3
disk=d1102 stor_dev=000194900462-10C6   addr=c20t3l4-71-0   server=server_3
disk=d1102 stor_dev=000194900462-10C6   addr=c36t3l4-71-0   server=server_3
disk=d1102 stor_dev=000194900462-10C6   addr=c52t3l4-72-0   server=server_3
disk=d1103 stor_dev=000194900462-10CE  addr=c4t3l5-72-0    server=server_3
disk=d1103 stor_dev=000194900462-10CE  addr=c20t3l5-71-0    server=server_3
disk=d1103 stor_dev=000194900462-10CE  addr=c36t3l5-71-0    server=server_3
disk=d1103 stor_dev=000194900462-10CE  addr=c52t3l5-72-0    server=server_3
disk=d1104 stor_dev=000194900462-10D6  addr=c4t3l6-72-0    server=server_3
disk=d1104 stor_dev=000194900462-10D6  addr=c20t3l6-71-0    server=server_3
disk=d1104 stor_dev=000194900462-10D6  addr=c36t3l6-71-0    server=server_3
disk=d1104 stor_dev=000194900462-10D6  addr=c52t3l6-72-0    server=server_3
disk=d1105 stor_dev=000194900462-10DE  addr=c4t3l7-72-0    server=server_3
disk=d1105 stor_dev=000194900462-10DE  addr=c20t3l7-71-0    server=server_3
```
EXAMPLE #18  To modify a VDM from non-sync-replicable to sync-replicable, type:

```bash
$ nas_server -vdm test_vdm -option syncreplicable=yes
```

id    = 80
name  = test_vdm
acl   = 0
type  = vdm
server = server_2
rootfs = root_fs_vdm_test_vdm
I18N mode = ASCII
mountedfs =
syncreplicable = True
member_of =
status :    defined = enabled
           actual = loaded, ready
Interfaces to services mapping:
nas_slice

Manages the slice table.

SYNOPSIS

nas_slice
   -list
   -delete <slice_name>
   -info {<slice_name>|id=<slice_id>}
   -rename <old_name> <new_name>
   [-name <name>] -create <volume_name> <size>[<offset>]

DESCRIPTION  

nas_slice creates, deletes, and renames a slice. nas_slice also displays the slice table and displays the attributes of a specified slice.

OPTIONS

-list
Lists the slice table.

Note: The ID of the slice is an integer and is assigned automatically. The name of the slice may be truncated if it is too long for the display. To display the full name, use the -info option with the slice ID.

-delete <slice_name>
Deletes an unused slice. Slices cannot be used by a storage pool.

-info {<slice_name>|id=<slice_id>}
Displays attributes for the slice as specified by the <slice_name> or <slice_id>.

-rename <old_name> <new_name>
Changes the current name of a slice to the new name.

[-name <name>] -create <volume_name> <size>
Creates a slice with the specified size in megabytes. Also assigns an optional name for the slice. Names are case-sensitive.

[<offset>]
Specifies the offset which is the distance in megabytes from the beginning of the volume to the start of a slice. If an offset is not specified, the system defaults to the next best-fit size.

SEE ALSO

Managing Volumes and File Systems with VNX Automatic Volume Management, Managing Volumes and File Systems for VNX Manually, nas_volume to manage metavolumes, stripe volumes, and disk volumes and nas_cel.
EXAMPLE #1

To display the slice table, type:

```
$ nas_slice -list
```

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>slice_of</th>
<th>offsetMB</th>
<th>sizeMB</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>134</td>
<td>root_dos</td>
</tr>
<tr>
<td>2</td>
<td>n</td>
<td>1</td>
<td>134</td>
<td>1</td>
<td>root_layout</td>
</tr>
<tr>
<td>3</td>
<td>y</td>
<td>1</td>
<td>135</td>
<td>16</td>
<td>root_slice_1</td>
</tr>
<tr>
<td>4</td>
<td>y</td>
<td>1</td>
<td>151</td>
<td>16</td>
<td>root_slice_2</td>
</tr>
<tr>
<td>5</td>
<td>y</td>
<td>1</td>
<td>167</td>
<td>16</td>
<td>root_slice_3</td>
</tr>
<tr>
<td>6</td>
<td>y</td>
<td>1</td>
<td>183</td>
<td>16</td>
<td>root_slice_4</td>
</tr>
<tr>
<td>7</td>
<td>y</td>
<td>1</td>
<td>199</td>
<td>16</td>
<td>root_slice_5</td>
</tr>
<tr>
<td>8</td>
<td>y</td>
<td>1</td>
<td>215</td>
<td>16</td>
<td>root_slice_6</td>
</tr>
<tr>
<td>9</td>
<td>y</td>
<td>1</td>
<td>231</td>
<td>16</td>
<td>root_slice_7</td>
</tr>
<tr>
<td>10</td>
<td>y</td>
<td>1</td>
<td>247</td>
<td>16</td>
<td>root_slice_8</td>
</tr>
<tr>
<td>11</td>
<td>y</td>
<td>1</td>
<td>263</td>
<td>16</td>
<td>root_slice_9</td>
</tr>
<tr>
<td>12</td>
<td>y</td>
<td>1</td>
<td>279</td>
<td>16</td>
<td>root_slice_10</td>
</tr>
<tr>
<td>13</td>
<td>y</td>
<td>1</td>
<td>295</td>
<td>16</td>
<td>root_slice_11</td>
</tr>
<tr>
<td>14</td>
<td>y</td>
<td>1</td>
<td>311</td>
<td>16</td>
<td>root_slice_12</td>
</tr>
<tr>
<td>15</td>
<td>y</td>
<td>1</td>
<td>327</td>
<td>16</td>
<td>root_slice_13</td>
</tr>
<tr>
<td>16</td>
<td>y</td>
<td>1</td>
<td>343</td>
<td>16</td>
<td>root_slice_14</td>
</tr>
<tr>
<td>17</td>
<td>y</td>
<td>1</td>
<td>359</td>
<td>16</td>
<td>root_slice_15</td>
</tr>
<tr>
<td>18</td>
<td>y</td>
<td>1</td>
<td>375</td>
<td>16</td>
<td>root_slice_16</td>
</tr>
<tr>
<td>19</td>
<td>n</td>
<td>1</td>
<td>391</td>
<td>1</td>
<td>root_log_1</td>
</tr>
<tr>
<td>20</td>
<td>n</td>
<td>1</td>
<td>392</td>
<td>1</td>
<td>root_log_2</td>
</tr>
<tr>
<td>21</td>
<td>n</td>
<td>1</td>
<td>393</td>
<td>1</td>
<td>root_log_3</td>
</tr>
<tr>
<td>22</td>
<td>n</td>
<td>1</td>
<td>394</td>
<td>1</td>
<td>root_log_4</td>
</tr>
<tr>
<td>23</td>
<td>n</td>
<td>1</td>
<td>395</td>
<td>1</td>
<td>root_log_5</td>
</tr>
<tr>
<td>24</td>
<td>n</td>
<td>1</td>
<td>396</td>
<td>1</td>
<td>root_log_6</td>
</tr>
<tr>
<td>25</td>
<td>n</td>
<td>1</td>
<td>397</td>
<td>1</td>
<td>root_log_7</td>
</tr>
<tr>
<td>26</td>
<td>n</td>
<td>1</td>
<td>398</td>
<td>1</td>
<td>root_log_8</td>
</tr>
<tr>
<td>27</td>
<td>n</td>
<td>1</td>
<td>399</td>
<td>1</td>
<td>root_log_9</td>
</tr>
<tr>
<td>28</td>
<td>n</td>
<td>1</td>
<td>400</td>
<td>1</td>
<td>root_log_10</td>
</tr>
<tr>
<td>29</td>
<td>n</td>
<td>1</td>
<td>401</td>
<td>1</td>
<td>root_log_11</td>
</tr>
<tr>
<td>30</td>
<td>n</td>
<td>1</td>
<td>402</td>
<td>1</td>
<td>root_log_12</td>
</tr>
<tr>
<td>31</td>
<td>n</td>
<td>1</td>
<td>403</td>
<td>1</td>
<td>root_log_13</td>
</tr>
<tr>
<td>32</td>
<td>n</td>
<td>1</td>
<td>404</td>
<td>1</td>
<td>root_log_14</td>
</tr>
</tbody>
</table>

Note: This is a partial listing of the slice table.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the slice.</td>
</tr>
<tr>
<td>inuse</td>
<td>Whether the slice is used.</td>
</tr>
<tr>
<td>slice_of</td>
<td>Volume the slice is sliced from.</td>
</tr>
<tr>
<td>offsetMB</td>
<td>Distance in megabytes from the beginning of the disk to the start of the slice.</td>
</tr>
<tr>
<td>sizeMB</td>
<td>Slice size in megabytes.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the slice.</td>
</tr>
</tbody>
</table>
EXAMPLE #2  To create a slice named slv1 on volume d8 of 1024 MB in size, type:

```
$ nas_slice -name slv1 -create d8 1024
```

id        = 76  
name      = slv1  
acl       = 0  
in_use    = False  
slice_of  = d8  
offset(MB)= 0  
size  (MB)= 1024  
volume_name = slv1

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the slice.</td>
</tr>
<tr>
<td>name</td>
<td>Name of the slice.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the slice.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether the slice is used.</td>
</tr>
<tr>
<td>slice_of</td>
<td>Volume the slice is sliced from.</td>
</tr>
<tr>
<td>offset(MB)</td>
<td>Distance in Megabytes from the beginning of the disk to the start of the slice.</td>
</tr>
<tr>
<td>size  (MB)</td>
<td>Slice size in Megabytes.</td>
</tr>
<tr>
<td>volume_name</td>
<td>Volume used to create the slice.</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To create a slice volume of 1 GB (1024 MB) with an offset of 1 GB called slv2 from volume d8, type:

```
$ nas_slice -name slv2 -create d8 1024 1024
```

id        = 77  
name      = slv2  
acl       = 0  
in_use    = False  
slice_of  = d8  
offset(MB)= 1024  
size  (MB)= 1024  
volume_name = slv2

EXAMPLE #2 provides a description of command outputs.

EXAMPLE #4  To display attributes of slv1, type:

```
$ nas_slice -info slv1
```

id        = 76  
name      = slv1  
acl       = 0  
in_use    = False  
slice_of  = d8  
offset(MB)= 0  
size  (MB)= 1024  
volume_name = slv1
EXAMPLE #5

To rename a slice from slv to slv1, type:

$ nas_slice -rename slv slv1

id        = 76
name      = slv1
acl       = 0
in_use    = False
slice_of  = d8
offset(MB)= 0
size (MB)= 1024
volume_name = slv1

EXAMPLE #6

To delete slv1, type:

$ nas_slice -delete slv1

id        = 76
name      = slv1
acl       = 0
in_use    = False
slice_of  = d8
offset(MB)= 0
size (MB)= 1024

EXAMPLE #2 provides a description of command outputs.
The nas Commands

**nas_stats**

Manages Statistics Groups.

**SYNOPSIS**

```
nas_stats
  -groups
    { -list
        | -info [-all]<statgroup_name>[,...]
        | -create <statgroup_name>
            [-description "<description_line>"]
            {<statpath_name>|<statgroup_name>}[,...]
        | -modify <statgroup_name>
            {[ -rename <new_statgroup_name>
                [-description "<description_line>"]
                {[<statpath_name>|<statgroup_name>][,...]}
            ]
            | -add <statgroup_name>
                {<statpath_name>|<statgroup_name>}[,...]
            | -remove <statgroup_name>
                {<statpath_name>|<statgroup_name>}[,...]
            | -delete <statgroup_name> [-Force]
        | -database
            { -recover [-Force]
                | -verify }
    }
```

**DESCRIPTION**

`nas_stats` allows the user to manage Statistics Groups. There are two types of Statistics Groups: system-defined and user-defined groups.

System-defined statistics groups are created as part of the installation (or upgrade) process and include the following statistics, which correspond to the summary and table collections used by server_stats:

<table>
<thead>
<tr>
<th>System-defined statistics group name</th>
<th>server_stats collection name</th>
</tr>
</thead>
<tbody>
<tr>
<td>basic-std</td>
<td>-summary basic</td>
</tr>
<tr>
<td>caches-std</td>
<td>-summary caches</td>
</tr>
<tr>
<td>cifs-std</td>
<td>-summary cifs</td>
</tr>
<tr>
<td>nfs-std</td>
<td>-summary nfs</td>
</tr>
<tr>
<td>cifsOps-std</td>
<td>-table cifs</td>
</tr>
<tr>
<td>diskVolumes-std</td>
<td>-table dvol</td>
</tr>
<tr>
<td>metaVolumes-std</td>
<td>-table fsvol</td>
</tr>
<tr>
<td>netDevices-std</td>
<td>-table net</td>
</tr>
<tr>
<td>nfsOps-std</td>
<td>-table nfs</td>
</tr>
</tbody>
</table>
Note: server_stats collection names are deprecated and will not be supported in future releases.

Statistics Groups can be created to include any combination of statpath names, displayed through the server_stats command, as well as other existing statgroup names.

Any Statistics Group name can be used with server_stats -monitor to collect statistics as defined in its member_stats list.

**OPTIONS**

- **-list**
  Lists system and user-defined Statistics Groups.

- **-info**
  Provides detailed information on all (or specified) Statistics Groups.

- **-create**
  Creates a statistics group and specifies what statpath names it includes. It also allows the nesting of statgroups by adding existing statgroups to new statgroups.

  Statgroup names can be used with the -info request. A statgroup name is limited to 255 characters. Space, slash, back slash, quote, double quote, and comma are the illegal characters in it.

  [-description]

  The -description option is optional and defaults to the statgroup name. If the -description option is used, its argument must be enclosed in quotation marks.

- **-modify**
  Allows you to modify a statgroup’s member_stats list by specifying the new member statistics of the group, overriding the previous contents.

- **-add**
  Allows you to add statpath and existing statgroup names to a statgroup by specifying additional items to be appended to the statgroup’s list member_stats list.

- **-remove**
  Allows you to remove member statpath and statgroup names from a statgroup by specifying the items to remove from the statgroup’s member_stats list.
-delete
Allows you to delete a statgroup. However, this option does not delete any statsgroups that are members of the statgroup.

-recover
Attempts to recover the latest uncorrupted copy of the Statistics Groups database from the NAS database backups. `nas_stats` searches through the available backups and restores the latest copy. In this event, NAS database backups do not contain a healthy version of the Statistics Groups; a new Statistics Groups database is installed. In the case of a new Statistics Groups database, all user-defined information is lost. NAS database backups run hourly and VNX maintains the last 12 backups.

  [-Force]

  Use the -Force option with the -recover option to skip the warning prompt.

-verify
Checks the health status of the Statistics Groups database.

SEE ALSO  `server_stats`

EXAMPLE #1  To list the system-defined and user-defined Statistics Groups, type:

```
$ nas_stats -groups -list
```

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>basic-std</td>
</tr>
<tr>
<td>System</td>
<td>basicCifs-std</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>User</td>
<td>basic</td>
</tr>
<tr>
<td>User</td>
<td>nfsNet</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

EXAMPLE #2  To provide detailed information on all (or specified) Statistics Groups, type:

```
$ nas_stats -groups -info
```

```
name = basic-std
description = The basic system-defined group.
type = System-defined
member_stats =
  kernel.cpu.utilization.cpuUtil,net.basic.inBytes,net.basic.outBytes,store.readBytes,store.writeBytes
member_elements =
member_of =
```
name            = basic3
description     = CPU and Memory
type            = User-defined
member_stats    = kernel.cpu.utilization.cpuUtil,kernel.memory.freeBytes
member_elements =
member_of       =

name            = caches-std
description     = The caches system-defined group.
type            = System-defined
member_stats    = fs.dnlc.hitRatio,fs.ofCache.hitRatio,kernel.memory.bufferCache.hitRatio
member_elements =
member_of       =

name            = cifs-std
description     = The cifs system-defined group.
type            = System-defined
member_stats    = cifs.global.basic.totalCalls,cifs.global.basic.reads,cifs.global.basic.readBytes
                 ,cifs.global.basic.readAvgSize,cifs.global.basic.writes,cifs.global.basic.writeBytes,cifs.global.basic.writeAvgSize,cifs.global.usage.currentConnections,cifs.global.usage.currentOpenFiles
member_elements =
member_of       = newSG

name            = cifsOps-std
description     = The cifs table system-defined group.
type            = System-defined
member_stats    = cifs.smb1.op,cifs.smb2.op
member_elements =
member_of       =

name            = diskVolumes-std
description     = The disk volume table system-defined group.
type            = System-defined
member_stats    = store.diskVolume
member_elements =

name            = metaVolumes-std
description     = The meta volume table system-defined group.
type            = System-defined
member_stats    = store.logicalVolume.metaVolume
member_elements =
member_of       =

name            = netDevices-std
description     = The net table system-defined group.
type            = System-defined
member_stats    = net.device
member_elements =
member_of       =
EXAMPLE #3

To provide detailed information on all (or specified) Statistics Groups, type:

```bash
$ nas_stats -groups -info statsA
```

name = statsA
description = My group # 2
type = user-defined
member_stats = statpath1, statpath2, statpath3, statsC
member_elements =
member_of = statsB
EXAMPLE #4  To create a statistics group called basic3, type:

$ nas_stats -groups -create basic3 -description "CPU and Memory" kernel.cpu.utilization.cpuUtil, kernel.memory.freeBytes

'basic3' created successfully.

EXAMPLE #5  To create a statistics group called statgroup2, type:

$ nas_stats -groups -create statgroup2 statgroup1,nfs,net

'statgroup2' created successfully.

EXAMPLE #6  To use an existing statgroup, type:

$ nas_stats -groups -create statgroup1 -description "My first group" kernel.cpu.utilization.cpuUtil, net.basic.inBytes, net.basic.outBytes, store.readBytes, store.writeBytes

ERROR (13421969439): 'statgroup1' already exists.

EXAMPLE #7  To modify a statgroup by specifying the new contents of the group, overriding the previous contents, type:

$ nas_stats -groups -modify statgroup2 cifs,nfs-std

'statgroup2' modified successfully.

EXAMPLE #8  To modify the description of a statgroup, type:

$ nas_stats -groups -modify basic1 -description "My basic group"

'basic1' modified successfully.

EXAMPLE #9  To rename a user-defined statgroup, type:

$ nas_stats -groups -modify statgroup2 -rename basic2

'statgroup2' modified successfully.

EXAMPLE #10  To add to the member_stats list of a statgroup, type:

$ nas_stats -groups -add statgroup2 kernel.cpu.utilization.cpuUtil, statgroup1

Adding the following statistics:
... kernel.cpu.utilization.cpuUtil
... statgroup1
Statistics added to 'statgroup2' successfully.

EXAMPLE #11  To remove from the member_stats list of a statgroup, type:

$ nas_stats -groups -remove statgroup1 kernel.cpu.utilization.cpuUtil

Removing the following statistics:
... kernel.cpu.utilization.cpuUtil
Statistics removed from 'statgroup1' successfully.
EXAMPLE #12  To delete a statgroup, type:

```
$ nas_stats -groups -delete statgroup1
```

‘statgroup1’ deleted successfully.

EXAMPLE #13  To delete reference from other groups using statgroupA, type:

```
$ nas_stats -groups -delete statgroupA
```

‘statgroupA’ is used in group (s): mystats1, mystats2.
Clear ‘statgroupA’ from other groups? [Y/N] Y
‘statgroupA’ deleted successfully.

EXAMPLE #14  To delete reference from other groups using statgroupA and the -Force option to skip the warning prompt, type:

```
$ nas_stats -groups -delete statgroupA -F
```

‘statgroupA’ is used in group (s): mystats1, mystats2.
‘statgroupA’ deleted successfully.

EXAMPLE #15  To recover the latest healthy (uncorrupted) copy of a statgroup database from the NAS database backups, type:

```
$ nas_stats -groups -database -recover
```

Latest healthy database modified last on Tue Apr 7 17:29:06 EDT 2009.
Any updates performed after the latest backup will be lost. Continue? [Y/N] Y
The nas_stats command recover operation is completed successfully.

EXAMPLE #16  To recover the latest healthy (uncorrupted) copy of the statgroup database from the NAS database backups using the -Force option to skip the warning prompt, type:

```
$ nas_stats -groups -database -recover -Force
```

Latest healthy database modified last on Tue Apr 7 17:29:06 EDT 2009.
The nas_stats command recover operation is completed successfully.

EXAMPLE #17  To check the health status of the Statistics Groups database, type:

```
$ nas_stats -groups -database -verify
```

Database is healthy.
nas_storage

Controls system access and performs some management tasks.

SYNOPSIS

```
nas_storage

-list
-info {-all|<name>|id=<storage_id>} [-option <options>]
-rename <old_name> <new_name>
-acl <acl_value> <name>
-delete {<name>|id=<storage_id>} [-spare <spindle-id>|-group <diskgroup-id>]
-failback {<name>|id=<storage_id>}
-sync {-all|<name>|id=<storage_id>}
-check {-all|<name>|id=<storage_id>}
-modify {<name>|id=<storage_id>} -network {-spa|-spb} <IP>
-modify {<name>|id=<storage_id>}
-security [-username <username>][-password <password>][-newpassword <new_password>]```

Note: Output from this command is determined by the type of system attached to the VNX.

DESCRIPTION

`nas_storage` sets the name for a system, assigns an access control value, displays attributes, performs a health check, synchronizes the system with the Control Station, and performs a failback for VNX for block systems.

OPTIONS

-list
Displays a list of all attached systems available for the VNX.

Note: The ID of the object is an integer and is assigned automatically. The name of the system may be truncated if it is too long for the display. To display the full name, use the -info option with the system ID.

-info {-all|<name>|id=<storage_id>}
Displays the configuration of the attached system.

[-option <options>]
Specifies a comma-separated list of options.

sync={yes|no}
Synchronizes the Control Station’s view with that of the system before displaying configuration information. Default=yes.
The nas Commands

- **rename** `<old_name> <new_name>`
  Renames the current system name to a new name. By default, the system name is its serial number.

- **acl** `<acl_value> <name>`
  Sets an access control level value that defines the owner of the system, and the level of access allowed for users and groups defined in the access control level table (nas_acl provides information).

- **delete** `{<name>|id=<storage_id> [-spare <spindle-id> | -group <diskgroup-id>]}
  Deletes an entry from the system table. The system can only be deleted after all disks on the system have been deleted using nas_disk. The system and disks can be rediscovered using the server_devconfig command. The -spare option deletes the hot spare disk from the hot spare pool on the VNX for block storage used by NAS. The -group option deletes the disk group specified. This deletes and unbinds the LUNs in the RAID groups used by VNX for file. If there are other LUNs in the RAID group not allocated to the VNX, the RAID group is not unbound. After removing the VNX LUNs, the RAID group is empty and it will be destroyed.

- **sync** `{all|<name>|id=<storage_id>}`
  Synchronizes the Control Station’s view with that of the system.

- **check** `{all|<name>|id=<storage_id>}`
  Performs a health check on the system to verify if it is configured for, and in a state to provide the level of high availability that is required.

  Use this option after making any management changes to your system (for example, changes to VNX for block array properties, such as enabling/disabling statistics polling).

  **Note:** This option does not support remote storage. For example, for recoverpoint configurations where remote storage is listed, the check will only run on first listed system.

For VNX for Block only

- **failback** `{<name>|id=<storage_id>}`
  Returns the system’s normal operating state by returning ownership of all disk volumes to their default storage processor.

  To verify that the system failed over, type the -info option. If the value appears as failed_over=True, then the system has failed over.
The nas Commands

-modify {<name>|id=<storage_id>} -modify {<name>|id=<storage_id>}

Modifies the IP address of the VNX for block in the VNX database.

-modify {<name>|id=<storage_id>} -security [-username <username>
-modify {<name>|id=<storage_id>} -security [-username <username>][ -password <password>]

Updates the login information the VNX for file uses to authenticate with the VNX and changes the VNX username, or password if the VNX account is changed or the following error is reported:

Error 5010: APM00055105668: Storage API code=4651:
SYMAPI_C_CLAR_NOT_PRIVILEGED

Operation denied by Clarion array - you are not privileged to perform the requested operation

- [newpassword <new_password>]

Assigns a new password to the username on the VNX for block.

Note: This operation is not supported for Symmetrix systems.

SEE ALSO VNX System Operations, nas_rdf, nas_disk, and server_devconfig.

SYSTEM OUTPUT The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019. For example, Symmetrix systems appear as 002804000190-003C.

EXAMPLE #1 For the VNX system, to list all attached systems, type:

$ nas_storage -list

id    acl        name       serial_number
1      0         APM00042000818  APM00042000818

For the VNX with a Symmetrix system, to list all attached systems, type:

$ nas_storage -list

id    acl        name       serial_number
1      0         000187940260  000187940260

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID number of the attached system.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the attached system.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the attached system.</td>
</tr>
<tr>
<td>serial_number</td>
<td>Serial number of the attached system.</td>
</tr>
</tbody>
</table>
EXAMPLE #2 For the VNX system, to display information for the attached system, type:

```
$ nas_storage -info APM00042000818
```

id                    = 1
arrayname             = APM00042000818
name                  = APM00042000818
type                  = Clarion
model_type            = RACKMOUNT
model_num             = 700
db_sync_time          = 1131986667 == Mon Nov 14 11:44:27 EST 2005
API_version           = V6.0-629
num_disks             = 60
num_devs              = 34
num_pdevs             = 8
num_storage_grps      = 1
num_raid_grps         = 16
cache_page_size       = 8
wr_cache_mirror       = True
low_watermark         = 60
high_watermark        = 80
unassigned_cache      = 0
is_local              = True
failed_over           = False
captive_storage       = False

Active Software

-AccessLogix          = -
FLARE-Operating-Environment= 02.16.700.5.004
-NavisphereManager    = -

Storage Processors

SP Identifier         = A
signature             = 1057303
microcode_version     = 2.16.700.5.004
serial_num            = LKE00040201171
prom_rev              = 3.30.00
agent_rev             = 6.16.0 (4.80)
phys_memory           = 3967
sys_buffer            = 773
read_cache            = 122
write_cache           = 3072
free_memory           = 0
raid3_mem_size        = 0
failed_over           = False
hidden                = False
network_name          = spa
ip_address            = 172.24.102.5
subnet_mask           = 255.255.255.0
gateway_address = 172.24.102.254
num_disk_volumes = 20 - root_disk root_ldisk d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16 d17 d18 d19 d20

Port Information

Port 1

link_status = UP
port_status = ONLINE
switch_present = True
sp_source_id = 6373907

<...removed...>

Port 2

link_status = UP
port_status = ONLINE
switch_present = True
sp_source_id = 6373651

SP Identifier = B
signature = 1118484
microcode_version = 2.16.700.5.004
serial_num = LKE00041700812
prom_rev = 3.30.00
agent_rev = 6.16.0 (4.80)
phys_memory = 3967
sys_buffer = 773
read_cache = 122
write_cache = 3072
free_memory = 0
raid3_mem_size = 0
failed_over = False
hidden = False
network_name =spb
ip_address = 172.24.102.6
subnet_mask = 255.255.255.0
gateway_address = 172.24.102.254
num_disk_volumes = 0

Port Information

Port 1

link_status = UP
The nas Commands

```
port_status       = ONLINE
switch_present    = True
switch_uid        = 10:0:8:0:88:A0:36:F3:20:3E:8:0:88:A0:36:F3
sp_source_id      = 6372883

...removed...

Port 2

link_status       = UP
port_status       = ONLINE
switch_present    = True
switch_uid        = 10:0:8:0:88:A0:36:F3:20:3D:8:0:88:A0:36:F3
sp_source_id      = 6372627

Storage Groups

name                  = ns704g-cs100
num_hbas              = 18
num_devices           = 24
shareable             = True
hidden                = False

Hosts

storage_processor = B
port              = 1
server            = server_4

storage_processor = A
port              = 0
server            = server_4

storage_processor = B
port              = 0
server            = server_2

...removed...

storage_processor = B
port              = 1
server            = server_3

uid               = 20:0:0:0:C9:2B:98:77:10:0:0:0:C9:2B:98:77
storage_processor = B
port              = 0
```
uid = 20:0:0:0:C9:2B:98:77:10:0:0:0:C9:2B:98:77
storage_processor = A
port = 0

ALU HLU
--------
0000 -> 0000
0001 -> 0001
0002 -> 0002
0003 -> 0003
0004 -> 0004
0005 -> 0005
0018 -> 0018
0019 -> 0019
0020 -> 0020
0021 -> 0021
0022 -> 0022
0023 -> 0023
0024 -> 0024
0025 -> 0025
0026 -> 0026
0027 -> 0027
0028 -> 0028
0029 -> 0029
0030 -> 0030
0031 -> 0031
0032 -> 0032
0033 -> 0033
0034 -> 0034
0035 -> 0035

Disk Groups

id = 0000
storage_profiles = 2 - clar_r5_performance, cm_r5_performance
raid_type = RAID5
logical_capacity = 1068997528
num_spindles = 5 - 0_0_0 0_0_1 0_0_2 0_0_3 0_0_4
num_luns = 6 - 0000 0001 0002 0003 0004 0005
num_disk_volumes = 6 - root_disk root_ldisk d3 d4 d5 d6
spindle_type = FC
bus = 0
raw_capacity = 1336246910
used_capacity = 62914560
free_capacity = 1006082968
hidden = False

<...removed...>

id = 2_0_14
For the VNX with a Symmetrix system, to display information for the attached system, type:

```
$ nas_storage -info 000187940260
```

id                   = 1
serial_number         = 000187940260
name                  = 000187940260
type                  = Symmetrix
ident                 = Symm6
model                 = 800-M2
microcode_version     = 5670
microcode_version_num = 16260000
microcode_date        = 03012004
microcode_patch_level = 69
microcode_patch_date  = 03012004
symmetrix_pwron_time  = 1130260200 == Tue Oct 25 13:10:00 EDT 2005
db_sync_time          = 1133215405 == Mon Nov 28 17:03:25 EST 2005
db_sync_bcv_time      = 1133215405 == Mon Nov 28 17:03:25 EST 2005
db_sync_rdf_time      = 1133215405 == Mon Nov 28 17:03:25 EST 2005
last_ipl_time         = 1128707062 == Fri Oct  7 13:44:22 EDT 2005
last_fast_ipl_time    = 1130260200 == Tue Oct 25 13:10:00 EDT 2005
API_version           = V6.0-629
cache_size            = 32768
cache_slot_count      = 860268
max_wr_pend_slots     = 180000
max_da_wr_pend_slots  = 90000
max_dev_wr_pend_slots = 6513
permacache_slot_count = 0
num_disks             = 60
num_symdevs           = 378
num_pdevs             = 10
sddf_configuration    = ENABLED
config_checksum       = 0x01ca544
num_powerpath_devs    = 0
config_crc            = 0x07e0ba6e
is_local              = True
Physical Devices
/nas/dev/c0t0115s2
/nas/dev/c0t0115s3
/nas/dev/c0t0115s4
/nas/dev/c0t0115s6
/nas/dev/c0t0115s7
/nas/dev/c0t0115s8
/nas/dev/c16t0115s2
/nas/dev/c16t0115s3
/nas/dev/c16t0115s4
/nas/dev/c16t0115s8

Director Table

<table>
<thead>
<tr>
<th>type</th>
<th>num</th>
<th>slot</th>
<th>ident</th>
<th>stat</th>
<th>scsi</th>
<th>vols</th>
<th>ports</th>
<th>p0_stat</th>
<th>p1_stat</th>
<th>p2_stat</th>
<th>p3_stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA</td>
<td>1</td>
<td>1</td>
<td>DF-1A</td>
<td>On</td>
<td>NA</td>
<td>21</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>2</td>
<td>2</td>
<td>DF-2A</td>
<td>On</td>
<td>NA</td>
<td>8</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>15</td>
<td>15</td>
<td>DF-15A</td>
<td>On</td>
<td>NA</td>
<td>8</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>16</td>
<td>16</td>
<td>DF-16A</td>
<td>On</td>
<td>NA</td>
<td>8</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>17</td>
<td>1</td>
<td>DF-1B</td>
<td>On</td>
<td>NA</td>
<td>8</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>18</td>
<td>2</td>
<td>DF-2B</td>
<td>On</td>
<td>NA</td>
<td>21</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>31</td>
<td>15</td>
<td>DF-15B</td>
<td>On</td>
<td>NA</td>
<td>152</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>DA</td>
<td>32</td>
<td>16</td>
<td>DF-16B</td>
<td>On</td>
<td>NA</td>
<td>165</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>FA</td>
<td>33</td>
<td>1</td>
<td>FA-1C</td>
<td>On</td>
<td>NA</td>
<td>0</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>FA</td>
<td>34</td>
<td>2</td>
<td>FA-2C</td>
<td>On</td>
<td>NA</td>
<td>0</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>FA</td>
<td>47</td>
<td>15</td>
<td>FA-15C</td>
<td>On</td>
<td>NA</td>
<td>0</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>FA</td>
<td>48</td>
<td>16</td>
<td>FA-16C</td>
<td>On</td>
<td>NA</td>
<td>0</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>FA</td>
<td>49</td>
<td>1</td>
<td>FA-1D</td>
<td>On</td>
<td>NA</td>
<td>0</td>
<td>2</td>
<td>On</td>
<td>On</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Note: This is a partial listing due to the length of the outputs.

**EXAMPLE #3** To rename a system, type:

```
$ nas_storage -rename APM00042000818 cx700_1
```

id    = 1
serial_number = APM00042000818
name  = cx700_1
acl   = 0

**EXAMPLE #4** To set the access control level for the system cx700_1, type:

```
$ nas_storage -acl 1000 cx700_1
```

id    = 1
serial_number = APM00042000818
name  = cx700_1
acl   = 1000, owner=nasadmin, ID=201

Note: The value 1000 specifies nasadmin as the owner and gives read, write, and delete access only to nasadmin.
EXAMPLE #5   To change the existing password on the VNX for block, type:

$ nas_storage -modify APM00070204288 -security -username nasadmin -password nasadmin -newpassword abc

Changing password on APM00070204288

EXAMPLE #6   To avoid specifying passwords in clear text on the command line, type:

$ nas_storage -modify APM00070204288 -security -newpassword

Enter the Global CLARiiON account information
Username: nasadmin
Password: *** Retype your response to validate
Password: ***
New Password
Password: ******** Retype your response to validate
Password: ********
Changing password on APM00070204288
Done

EXAMPLE #7   To failback a VNX for block, type:

$ nas_storage -failback cx700_1

id       = 1
serial_number = APM00042000818
name     = cx700_1
acl      = 1000, owner=nasadmin, ID=201

EXAMPLE #8   To display information for a VNX for block and turn synchronization off, type:

$ nas_storage -info cx700_1 -option sync=no

id                    = 1
arrayname             = APM00042000818
name                  = cx700_1
type                  = Clariion
model_type            = RACKMOUNT
model_num             = 700
db_sync_time          = 1131986667 == Mon Nov 14 11:44:27 EST 2005
API_version           = V6.0-629
num_disks             = 60
num_devs              = 34
num_pdevs             = 8
num_storage_grps      = 1
num RAID_grps         = 16
cache_page_size       = 8
wr_cache_mirror       = True
low_watermark         = 60
high_watermark        = 80
unassigned_cache      = 0
is_local              = True
Failed_over = False
Captive_storage = False

Active Software

AccessLogix = -
FLARE-Operating-Environment = 02.16.700.5.004
NavisphereManager = -

Storage Processors

SP Identifier = A
Signature = 1057303
Microcode_version = 2.16.700.5.004
Serial_num = LKE0004020171
Prom_rev = 3.30.00
Agent_rev = 6.16.0 (4.80)
Phys_memory = 3967
Sys_buffer = 773
Read_cache = 122
Write_cache = 3072
Free_memory = 0
Raid3_mem_size = 0
Failed_over = False
Hidden = False
Network_name = espa
Ip_address = 172.24.102.5
Subnet_mask = 255.255.255.0
Gateway_address = 172.24.102.254
Num_disk_volumes = 20 - root_disk root_ldisk d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16 d17 d18 d19 d20

Port Information

Port 1

Link_status = UP
Port_status = ONLINE
Switch_present = True
Sp_source_id = 6373907

<...removed...>

Port 2

Link_status = UP
Port_status = ONLINE
Switch_present = True
The nas Commands

```
sp_source_id = 6373651

SP Identifier = B
signature = 1118484
microcode_version = 2.16.700.5.004
serial_num = LKE00041700812
prom_rev = 3.30.00
agent_rev = 6.16.0 (4.80)
phys_memory = 3967
sys_buffer = 773
read_cache = 122
write_cache = 3072
free_memory = 0
raid3_mem_size = 0
failed_over = False
hidden = False
network_name = spb
ip_address = 172.24.102.6
subnet_mask = 255.255.255.0
gateway_address = 172.24.102.254
num_disk_volumes = 0

Port Information

Port 1
link_status = UP
port_status = ONLINE
switch_present = True
switch_uid = 10:0:8:0:88:A0:36:F3:20:3E:8:0:88:A0:36:F3
sp_source_id = 6372883

...removed...

Port 2
link_status = UP
port_status = ONLINE
switch_present = True
switch_uid = 10:0:8:0:88:A0:36:F3:20:3D:8:0:88:A0:36:F3
sp_source_id = 6372627

Storage Groups

name = ns704g-cs100
num_hbas = 18
num_devices = 24
shareable = True
```
hidden = False

Hosts
storage_processor = B
port = 1
server = server_4

storage_processor = A
port = 0
server = server_4

storage_processor = B
port = 0
server = server_2

<...removed...>

storage_processor = B
port = 1
server = server_3

uid = 20:0:0:0:C9:2B:98:77:10:0:0:0:C9:2B:98:77
storage_processor = B
port = 0

uid = 20:0:0:0:C9:2B:98:77:10:0:0:0:C9:2B:98:77
storage_processor = A
port = 0

ALU   HLU
-------
0000 -> 0000
0001 -> 0001
0002 -> 0002
0003 -> 0003
0004 -> 0004
0005 -> 0005
0018 -> 0018
0019 -> 0019
0020 -> 0020
0021 -> 0021
0022 -> 0022
0023 -> 0023
0024 -> 0024
0025 -> 0025
0026 -> 0026
0027 -> 0027
Disk Groups

id = 0000
storage_profiles = 2 - clar_r5_performance,cm_r5_performance
raid_type = RAID5
logical_capacity = 1068997528
num_spindles = 5 - 0_0_0 0_0_1 0_0_2 0_0_3 0_0_4
num_luns = 6 - 0000 0001 0002 0003 0004 0005
num_disk_volumes = 6 - root_disk root_ldisk d3 d4 d5 d6
spindle_type = FC
bus = 0
raw_capacity = 1336246910
used_capacity = 62914560
free_capacity = 1006082968
hidden = False

<...removed...>

id = 0205
storage_profiles = 0
raid_type = SPARE
logical_capacity = 622868992
num_spindles = 1 - 0_1_0
num_luns = 1 - 0205
num_disk_volumes = 0
spindle_type = ATA
bus = 0
raw_capacity = 622868992
used_capacity = 622868992
free_capacity = 0
hidden = False

Spindles

id = 0_0_0
product = ST314670 CLAR146
revision = 6A06
serial = 3KS088SQ
capacity = 280346624
used_capacity = 12582912
disk_group = 0000
hidden = False
The nas Commands

```
type                  = FC
bus                   = 0
enclosure             = 0
slot                  = 0
vendor                = SEAGATE
remapped_blocks       = -1
state                 = ENABLED

<...removed...>

id                    = 2_0_14
product               = ST314670 CLAR146
revision              = 6A06
serial                = 3KS02RHM
capacity              = 280346624
used_capacity         = 224222822
disk_group            = 0014
hidden                = False
type                  = FC
bus                   = 2
enclosure             = 0
slot                  = 14
vendor                = SEAGATE
remapped_blocks       = -1
state                 = ENABLED
```

Note: This is a partial display due to the length of the outputs.

**EXAMPLE #9** To delete a system with no attached disks, type:
```
$ nas_storage -delete APM00035101740
```
```
id = 0
serial_number = APM00035101740
name = APM00035101740
acl = 0
```

**EXAMPLE #10** To turn synchronization on for all systems, type:
```
$ nas_storage -sync -all
```
done
EXAMPLE #11 To perform a health check on the system, type:

```
$ nas_storage -check -all
```

Discovering storage (may take several minutes)

done

EXAMPLE #12 To set the access control level for the system APM00042000818, type:

```
$ nas_storage -acl 1432 APM00042000818
```

id = 1
serial_number = APM00042000818
name = APM00042000818
acl = 1432, owner=nasadmin, ID=201

Note: The value 1432 specifies nasadmin as the owner and gives users with
an access level of at least observer read access only, users with an access level
of at least operator read/write access, and users with an access level of at
least admin read/write/delete access.

EXAMPLE #13 To modify the IP address of the VNX for block, type:

```
$ nas_storage -modify APM00072303347 -network -spa 10.6.4.225
```

Changing IP address for APM00072303347
Discovering storage (may take several minutes)
done
**nas_syncrep**

Manages Virtual Data Mover (VDM) synchronous replication sessions. The list, info, and create switches of this command can be executed on both the active and standby systems. Execute the delete switch of this command on the active system. Execute the reverse, failover, and Clean switches of this command on the standby system.

**SYNOPSIS**

```
nas_syncrep
   -list
   -info {-all|<name>|id=<id>} [-verbose]
   -create <name>
       -vdm <vdm_name>
       -remote_system <cel_name>
       -remote_pool <pool_name>
       -remote_mover <mover_name>
       [-network_devices <local_device_name>:<remote_device_name>[,...]]
   -start {-all|<name>|id=<id>}
   -delete {<name>|id=<id>}
   -reverse {<name>|id=<id>}
   -failover {<name>|id=<id>}
   -Clean {-all|<name>|id=<id>}
```

**DESCRIPTION**

`nas_syncrep` creates, manages, or displays session information for ongoing VDM synchronous replication sessions. Each session handles a single object between the active and standby systems.

**OPTIONS**

- `-list`
  Displays all configured synchronous replication sessions on the local system's NAS database and those having the local system as the standby system in the remote system's replicated NAS database.

- `-info {-all|<name>|id=<id>} [-verbose]`
  Displays the status of a specific configured synchronous replication session, or the status of all synchronous replication sessions.

- `-create <name>`
  Assigns a name to the synchronous replication session. The session name is case-sensitive and supports the following characters: a through z, A through Z, 0 through 9, _(underscore), -(hyphen) though names may not start with a hyphen. The maximum length of the name is 128 characters.
The following items will need to be manually migrated using the migrate_system_conf command after the creation of a synchronous replication session and any time this data changes:

- DNS
- NIS
- NTP
- Local passwd and group
- Usermapper client
- FTP/SFTP, LDAP, HTTP, CEPP, CAVA, Server Parameters
- Netgroup
- Nsswitch
- Hosts

-vdm <vdm_name>
Specifies the name of an existing source sync-replicable VDM to replicate.

-remote_system <cel_name>
Specifies the name of an existing remote VNX system.

-remote_pool <pool_name>
Specifies the name of an existing remote user-defined pool.

-remote_mover <mover_name>
Specifies the name of the existing remote Data Mover.

[-network_devices
  <local_device_name>:<remote_device_name>[,...]]
Specifies the mappings of the local and remote network devices.

-start { -all | <name> | id=<id> }
Starts the specified VDM synchronous replication session or all VDM synchronous replication sessions.

-delete { <name> | id=<id> }
Deletes a synchronous replication session of a specific name or ID with the local system as active. Execute this switch on the active system.

-reverse { <name> | id=<id> }
Switches the active and standby roles of the two VNX systems in a VDM synchronous replication session when both are available. Execute this switch on the standby system.
-failover {<name>|id=<id>}
Fails over the specified VDM to the standby system to make it active.
Execute this switch on the standby system.

-clean {-all|<name>|id=<id>}
After a successful failover, cleans all synchronous replication sessions or a specified synchronous replication session. Execute this switch on the standby system.

Note: After failover, the LUNs on the standby system under synchronous replication are Read Only and the original VDMs, file systems, and checkpoints remain on them. If any write operation occurs on those objects, such as mounting a file system or writing I/O to a file system, the Data Mover will run into a panic.

The Clean operation removes those obsoleted objects from the failed system for the specified synchronous session or all synchronous replication sessions on the standby system so that the Data Mover can be returned to use.

SEE ALSO
Using VNX Replicator and Using VDM MetroSync with VDM MetroSync Manager for Disaster Recovery

EXAMPLE #1
To list VDM synchronous replication sessions, type:

$ nas_syncrep -list

<table>
<thead>
<tr>
<th>id</th>
<th>name</th>
<th>vdm_name</th>
<th>remote_system</th>
<th>session_status</th>
</tr>
</thead>
<tbody>
<tr>
<td>5020</td>
<td>my_syncrep1</td>
<td>my_vdm</td>
<td>--&gt;my_system1</td>
<td>sync_in_progress</td>
</tr>
<tr>
<td>10030</td>
<td>my_syncrep2</td>
<td>my_vdm</td>
<td>&lt;--my_system1</td>
<td>in_sync</td>
</tr>
</tbody>
</table>

EXAMPLE #2
To create a VDM synchronous replication session, type:

$ nas_syncrep -create my_syncrep1 -vdm my_vdm -remote_system my_system1 -remote_pool my_pool1 -remote_mover server_2

Now validating params... done
Now marking remote pool as standby pool... done
Now creating CG... done
Now updating local disk type... done
Now updating remote disk type... done
Now generating session entry... done
EXAMPLE #3 To display information for a VDM synchronous replication session, type:

$ nas_syncrep -info my_syncrep1 -verbose

id = 5020
name = my_syncrep1
vdm_name = my_vdm
syncrep_role = active
local_system = my_system
local_pool = my_pool1
local_mover = server_2
remote_system = my_system1
remote_pool = my_pool1
remote_mover = server_2
consistency_group = syncrep_72_0784_72_642
session_status = sync_in_progress (8%)
local_cg_state = Synchronizing
local_cg_condition = Active
remote_cg_state = Synchronizing
remote_cg_condition = Active

EXAMPLE #4 To delete a VDM synchronous replication session, type:

$ nas_syncrep -delete my_syncrep1

Deleting...
WARNING: Please do not perform any operation on my_syncrep1 on standby system until delete is done.
done

EXAMPLE #5 To reverse a VDM synchronous replication session, type:

$ nas_syncrep -reverse id=4315

WARNING: You have just issued the nas_syncrep -reverse command. There will be a period of Data Unavailability during the reverse operation. After the reverse operation, the VDM/FS(s)/checkpoint(s) protected by the sync replication session will be reversed to the local site. Are you sure you want to proceed? [yes or no]
yes
Now doing precondition check... done: 19 s
Now doing health check... done: 11 s
Now cleaning local... done: 1 s

Service outage start......
Now turning down remote network interface(s)... done: 8 s
Now switching the session (may take several minutes)... done: 7 s
Now importing sync replica of NAS database... done: 16 s
Now creating VDM... done: 5 s
Now importing VDM settings... done: 0 s
Now mounting exported FS(s)/checkpoint(s)... done: 13 s
Now loading VDM... done: 3 s
Now turning up local network interface(s)... done: 0 s
The nas Commands

EXAMPLE #6  To failover a VDM synchronous replication session, type:

$ nas_syncrep -failover id=4560

WARNING: You have just issued the nas_syncrep -failover command. Verify whether the peer system or any of its file storage resources are accessible. If they are, you should issue the nas_syncrep -reverse command instead. Running the nas_syncrep -failover command while the peer system is still accessible could result in Data Loss if the session is not in sync. Are you sure you want to proceed? [yes or no] yes

Now doing precondition check... done: 30 s
Now doing health check... done: 7 s
Now cleaning local... done: 1 s
Now switching the session (may take several minutes)... done: 4 s
Now importing sync replica of NAS database... done: 15 s
Now creating VDM... done: 5 s
Now importing VDM settings... done: 0 s
Now mounting exported FS(s)/checkpoint(s)... done: 3 s
Now loading VDM... done: 4 s
Now turning up local network interface(s)... done: 0 s

Service outage end: 69 s

Now mounting unexported FS(s)/checkpoint(s)... done: 0 s
Now importing schedule(s)... done: 0 s

Elapsed time: 69 s

done

EXAMPLE #7  To clean all VDM synchronous replication sessions, type:

$ nas_syncrep -Clean -all

WARNING: You have just issued the nas_syncrep -Clean command. This will result in a reboot of the original source Data Mover that the VDM was failed over from. Verify whether or not you have working VDM(s)/FS(s)/checkpoint(s) on this Data Mover and plan for this reboot accordingly. Running the nas_syncrep -Clean command while you have working VDM(s)/FS(s)/checkpoint(s) on this Data Mover will result in Data Unavailability during the reboot. Are you sure you want to proceed? [yes or no] y

Now cleaning session my_session1 (may take several minutes)...already cleaned, skipped
Now cleaning session my_session2 (may take several minutes)...done
Now cleaning session my_session3 (may take several minutes)...done
Now rebooting Data Mover server_2 ... done
Now deleting obsolete mountpoints... done
Now starting session my_session1... done
Now starting session my_session2... done
Now starting session my_session3... done

Note: If a Data Mover reboot is not needed, the Warning prompt message does not display.

EXAMPLE #8 To clean a specific VDM synchronous replication session, type:

$ nas_syncrep -Clean id=8002
Now cleaning session my_session1 (may take several minutes)... done
Now starting session my_session1... done

Note: The Data Mover may reboot during a clean operation. If a Data Mover reboot is needed, a warning prompt message is displayed. (See EXAMPLE #7.) Otherwise, the warning prompt message does not display.
**nas_syncrep_rr**

Manages ReplicatorV2 sessions for sync-replicable VDMs.

**SYNOPSIS**

```bash
nas_syncrep_rr
 -list
 -config { -enable | -disable | -info }
 -restore { -all | -vdm {<vdm_name>|id=<vdm_id>} }
 -free_intermediate_data
 -Clean -server <server_name>
```

**DESCRIPTION**

`nas_syncrep_rr` restores corrupted ReplicatorV2 sessions for the storage resources on failed-over sync-replicable VDMs; cleans the intermediate internal checkpoints after restoring the ReplicatorV2 sessions; and cleans all broken ReplicatorV2 sessions.

`nas_syncrep_rr` also manages the configuration of the Preserve RepV2 sessions for VDM MetroSync feature.

**OPTIONS**

- **-list**
  Displays the ReplicatorV2 sessions and their properties, including related VDM and current status (ToBeRestored, Restoring, N/A).

- **-restore { -all | -vdm {<vdm_name>|id=<vdm_id>} }**
  Restores all ReplicatorV2 sessions on all VDMs, or restores Replicator V2 sessions on the specified VDMs. The VDMs specified must be sync-replicable VDMs.

  Using the **-all** option may take some time for the operation to complete. Check the operation's status by running the `nas_task -info <task_id>` command.

- **-free_intermediate_data**
  Cleans all intermediate internal checkpoints after restoring ReplicatorV2 sessions.

- **-clean -server <server_name>**
  Cleans all broken ReplicatorV2 sessions and finishes the synchronous replication clean process.

**SEE ALSO**

*Using VNX Replicator, Using VDM MetroSync with VDM MetroSync Manager for Disaster Recovery, nas_cel, nas_fs, nas_replicate, nas_server, nas_syncrep, and nas_task.*
EXAMPLE #1  To list ReplicatorV2 sessions and their properties, type:

$ nas_syncrep_rr -list

```
Session Name  VDM Name Local FS/VDM Remote FS/VDM  CMU         Restore State   Session Type
repfs1          vrep1      5069            16166         FNM001249009462007   ToBeRestored   Remote
```

EXAMPLE #2  To enable the Preserve RepV2 sessions for VDM MetroSync feature, type:

$ nas_syncrep_rr -config -enable

```
Info 26316963879: Command result:
Note:'Preserve RepV2 sessions for VDM Sync MV Replication' only supports Mirror View environment. If you're in VDM Sync RP/SRDF environment, please disable this feature immediately.

Enabling "Preserve RepV2 for SyncRep" on local array
Enable Successfully

Enabling "Preserve RepV2 for SyncRep" on remote array
Enable Successfully

OK
```

EXAMPLE #3  To disable the Preserve RepV2 sessions for VDM MetroSync feature, type:

$ nas_syncrep_rr -config -disable

```
Info 26316963879: Command result:
Disabling "Preserve RepV2 for SyncRep" on local array
Disable Successfully

Disabling "Preserve RepV2 for SyncRep" on remote array
Disable Successfully

OK
```

EXAMPLE #4  To show the Preserve RepV2 sessions for VDM MetroSync status, type:

$ nas_syncrep_rr -config -info

```
Info 26316963879: Command result:
Configuration for "Preserve RepV2 for SyncRep" on remote array:
    Preserve Repv2 is Enabled

Configuration for "Preserve RepV2 for SyncRep" on local array:
    Preserve Repv2 is Enabled

OK
```
**EXAMPLE #5**  To restore all ReplicatorV2 sessions on all VDMs, type:

```
$ nas_syncrep_rr -restore -all
```

Info 26316963879: Command result: The `nas_syncrep_rr` command may take a long time to complete, please avoid performing any syncrep operations for related vdm(s) during restore, use `nas_task` to check task {id = 34630} status. Follow up by running

```
"/nas/sbin/syncrep/RestoreRepv2/nas_syncrep_rr -free_intermediate_data"
```

command to clean all the intermediate data after restore finish.

OK

**EXAMPLE #6**  To restore ReplicatorV2 sessions on VDM vdm1, type:

```
$ nas_syncrep_rr -restore -vdm vdm1
```

Info 26316963879: Command result: The `nas_syncrep_rr` command may take a long time to complete, please avoid performing any syncrep operations for related vdm(s) during restore, use `nas_task` to check task {id = 380092} status. Follow up by running

```
"/nas/sbin/syncrep/RestoreRepv2/nas_syncrep_rr -free_intermediate_data"
```

command to clean all the intermediate data after restore finish.

OK

**EXAMPLE #7**  To clean all intermediate internal checkpoints after restoring ReplicatorV2 sessions, type:

```
$ nas_syncrep_rr -free_intermediate_data
```

Clean renamed internal ckpts for successfully restored RepV2 sessions:

```
Clean Count: 4      Success: 4      Fail: 0
```

Free_intermediate_data Done

**EXAMPLE #8**  To clean ReplicatorV2 sessions on Data Mover server_2, type:

```
$ nas_syncrep_rr -Clean -server server_2
```

Now start cleaning up DART BDBs as well as all broken repV2 sessions.

Deleting server_2 repV2 session info.

done
The nas Commands

---

### nas_task

Manages in-progress or completed tasks.

**SYNOPSIS**

```bash
nas_task
  -list [-remote_system {<remoteSystemName>|id=<id>}] | -info {-all|<taskId>}
    [-remote_system {<remoteSystemName>|id=<id>}] | -abort <taskId>
      [-mover <moverName>] [-remote_system {<remoteSystemName>|id=<id>}] | -delete <taskId>
        [-remote_system {<remoteSystemName>|id=<id>}]```

**DESCRIPTION**

`nas_task` lists the tasks associated with commands currently in progress or completed, reports information about a particular task, aborts a task, or deletes a task. Each task can be uniquely identified by its task ID and the remote VNX system name or ID.

Use the `nas_task` command to monitor, abort, and delete long running tasks and tasks started in asynchronous mode.

**OPTIONS**

- **-list**
  Lists all local tasks that are in progress, or completed tasks that have not been deleted. For each task, lists the task ID, remote system name, a description of the task, and the task state (running, recovering, succeeded, or failed).

  ```bash
  -remote_system {<remoteSystemName>|id=<id>}
  Lists local tasks initiated by the specified remote VNX system.
  Specify the remote system name or ID.
  ```

- **-info {-all|<taskId>**
  Provides more detailed status information for all tasks or for a particular task. Displays the run time status, estimated completion time, and percent complete for running tasks. Displays the completion status and actual end time for completed tasks.

  The taskID is the ID returned from a command run in the background mode or from the `nas_task -list` command.

  **Note:** The ID of the task is an integer and is assigned automatically. The task ID is unique to the VNX.
The nas Commands

[-remote_system {<remoteSystemName>|id=<id>}]  
Provides more detailed status information of local tasks initiated by the specified remote VNX system. Specify the remote system name or remote system ID. The remote system name is returned from the nas_task -list command.

-abort <taskId>  
Aborts the specified task leaving the system in a consistent state. For example, it aborts a one-time copy in progress. This might take a long time to complete because a remote system may be unavailable or the network may be down. You should check the status of the task to verify that the task was aborted. This command can be executed from the source only.

CAUTION  
This option might leave the system in an inconsistent state. Use caution when using this option.

[-mover <moverName>]  
Aborts a task running locally on the specified Data Mover. This command can be executed from the source or destination side. Use this command when the source and destination VNX systems cannot communicate. You should run this command on both sides.

[-remote_system {<remoteSystemName>|id=<id>}]  
Aborts a task that was initiated on a remote VNX leaving the source side intact. Specify the Data Mover to abort a task from the destination side. Specify the Data Mover and remote system name or remote system id along with the task id.

-delete id <taskId>  
Based on the task ID, deletes a completed task from the database on the Control Station.

[-remote_system {<remoteSystemName>|id=<id>}]  
Deletes a task that was initiated on a remote VNX. Specify the remote system name or remote system id along with the task id.

SEE ALSO  Using VNX Replicator, nas_copy, nas_replicate, and nas_cel.
EXAMPLE #1  To display detailed information about the task with task ID 4241, type:

```bash
$ nas_task -info 4241
```

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task Id</td>
<td>Globally unique character string used as the identifier of the task.</td>
</tr>
<tr>
<td>VNX</td>
<td>When set, local.</td>
</tr>
<tr>
<td>Remote Task Id</td>
<td>When set, identifies a remote task.</td>
</tr>
<tr>
<td>State</td>
<td>Running, Recovering, Completed, or Failed. Running could be a combination of completed and failed.</td>
</tr>
<tr>
<td>Current Activity</td>
<td>Displays state property when available.</td>
</tr>
<tr>
<td>Percent Complete</td>
<td>Appears only when set and not complete.</td>
</tr>
<tr>
<td>Description</td>
<td>Appears if details are set.</td>
</tr>
<tr>
<td>Originator</td>
<td>User or host that initiated the task.</td>
</tr>
<tr>
<td>Start Time/End Time</td>
<td>The starting time and ending time (or status) for the task.</td>
</tr>
<tr>
<td>Estimated End Time</td>
<td>Appears instead of previous line when available and task is incomplete.</td>
</tr>
<tr>
<td>Schedule</td>
<td>The schedule in effect, or n/a for a task that is not a scheduled checkpoint refresh.</td>
</tr>
<tr>
<td>Response Statuses</td>
<td>Displayed list of messages, if any. A completed task should always have one.</td>
</tr>
</tbody>
</table>

EXAMPLE #2  To display the list of all tasks, type:

```bash
$ nas_task -list
```

<table>
<thead>
<tr>
<th>ID</th>
<th>Task State</th>
<th>Originator</th>
<th>Start Time</th>
<th>Description</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>4241</td>
<td>Running</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 14:21:35 EST 2007</td>
<td>Create Replication ufs1_replica1.</td>
<td></td>
</tr>
<tr>
<td>4228</td>
<td>Succeeded</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 14:04:02 EST 2007</td>
<td>Delete task NONE: 4214.</td>
<td></td>
</tr>
<tr>
<td>4177</td>
<td>Failed</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 13:59:26 EST 2007</td>
<td>Create Replication ufs1_replica1.</td>
<td></td>
</tr>
<tr>
<td>4150</td>
<td>Succeeded</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 13:55:39 EST 2007</td>
<td>Delete task NONE: 4136.</td>
<td></td>
</tr>
<tr>
<td>4127</td>
<td>Succeeded</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 11:38:32 EST 2007</td>
<td>Delete task NONE: 4113.</td>
<td></td>
</tr>
<tr>
<td>4103</td>
<td>Succeeded</td>
<td>nasadmin@cli+</td>
<td>Mon Dec 17 11:21:00 EST 2007</td>
<td>Delete task NONE: 4098.</td>
<td></td>
</tr>
</tbody>
</table>
EXAMPLE #1 provides a description of the outputs.

**EXAMPLE #3**  To abort task 4267 running locally on server_3, type:

```
$ nas_task -abort 4267 -mover server_3
```

OK

**EXAMPLE #4**  To delete the existing task 4267, type:

```
$ nas_task -delete 4267
```

OK
The nas Commands

nas_tls

Manages the TLS settings.

SYNOPSIS

nas_tls
  -info
  -set {tls1Enabled | tls1Disabled} [-Force]
  -help

DESCRIPTION

nas_tls configures and displays TLS settings on a Gateway VNX2 or a Unified VNX2. It can configure and display TLS versions supported by Apache, ECOM, Data Movers, CS LDAP client on the File side, and the ManagementServer and SP LDAP client on the Block side.

Note: root privileges are required to set or get the TLS protocols supported by different components.

OPTIONS

-info
List TLS versions supported by Apache, ECOM, Data Movers, CS LDAP client on the File side, and the ManagementServer and SP LDAP client on the Block side.

-set {tls1Enabled | tls1Disabled} [-Force]
Enable (tls1Enabled) or disable (tls1Disabled) TLS 1.0 for Apache, ECOM, Data Movers, CS LDAP client on the File side, and the ManagementServer and SP LDAP client on the Block side.

Note: CS LDAP client will only use TLS 1.2 in tls1Disabled mode, and use TLS 1.0 in tls1Enabled mode. For other components listed above: TLS 1.1 and TLS 1.2 are both supported in tls1Disabled mode. TLS 1.0, TLS 1.1, and TLS 1.2 are all supported in tls1Enabled mode.

[-Force]
No warning message promote to user when setting TLS protocol.

-help
Help message of nas_tls command. This displays two extra options:

-setCSLDAP: Set TLS version for Control Station LDAP client. Only the selected TLS version will be used to communicate with LDAP servers.

-setSPLDAP: Enable or disable TLS 1.0 for Storage Processor LDAP client.
EXAMPLE #1    To check TLS settings, su to root and type:

# nas_tls -info

TLS versions supported on Block side
ManagementServer        : TLSv1.0    TLSv1.1    TLSv1.2
SP LDAP                  : TLSv1.0    TLSv1.1    TLSv1.2

TLS versions supported on File side
CS LDAP                  : TLSv1.0
Apache                   : TLSv1.0    TLSv1.1    TLSv1.2
ECOM                     : TLSv1.0    TLSv1.1    TLSv1.2
server_2                 : TLSv1.0    TLSv1.1    TLSv1.2
server_3                 : TLSv1.0    TLSv1.1    TLSv1.2

EXAMPLE #2    To disable TLS v1.0 globally, su to root and type:

# nas_tls -set tls1Disabled

WARNING: This operation will restart the following services and temporarily terminate its interactive sessions!
ManagementServer service
Apache service
CS ECOM service
Data Mover service (IO will be affected and may result in Data Unavailability during the reboot!)

NOTE: Only TLSv1.2 will be applied for Control Station LDAP client, you can change it by running 'nas_tls -setCSLDAP { TLSv1 | TLSv11 | TLSv12 }' command.
See more help information by running 'nas_tls -help' command.

Do you wish to continue? [y/n]: y

EXAMPLE #3    To enable TLS v1.0 globally, su to root and type:

# nas_tls -set tls1Enabled

WARNING: This operation will restart the following services and temporarily terminate its interactive sessions!
ManagementServer service
Apache service
CS ECOM service
Data Mover service (IO will be affected and may result in Data Unavailability during the reboot!)

NOTE: Only TLSv1.0 will be applied for Control Station LDAP client, you can change it by running 'nas_tls -setCSLDAP { TLSv1 | TLSv11 | TLSv12 }' command.
See more help information by running 'nas_tls -help' command.

Do you wish to continue? [y/n]: y
**EXAMPLE #4**  To disable TLS v1.0 globally without displaying a warning message, su to root and type:

```
# nas_tls -set tls1Disabled -Force
```
Configure on Block side
Reboot server_2
Reboot server_3

**EXAMPLE #5**  To show more TLS setting options, su to root and type:

```
# nas_tls -help
```

Usage: nas_tls

  -info
  | -set { tls1Enabled | tls1Disabled } [-Force]
  | -setCSLDAP { TLSv1 | TLSv11 | TLSv12 }
  | -setSPLDAP { tls1Enabled | tls1Disabled }

-**info:** List TLS versions supported by Apache, ECOM, Data Movers, CS LDAP client on File side, and ManagementServer, SP LDAP client on Block side.
-**set:** Enable or disable TLS 1.0 for Apache, ECOM, Data Movers, CS LDAP client on File side, and ManagementServer, SP LDAP client on Block side.
-**setCSLDAP:** Set TLS version for Control Station LDAP client. Only the selected TLS version will be used to communicate with LDAP servers.
-**setSPLDAP:** Enable or disable TLS 1.0 for Storage Processor LDAP client.
nas_version

Displays the software version running on the Control Station.

SYNOPSIS

nas_version [-h|-l]

DESCRIPTION

nas_version displays the Control Station version in long form or short form. When used during a software upgrade, informs the user about the upgrade in progress.

OPTIONS

No arguments
Displays the software version running on the Control Station.

-h
Displays command usage.

-l
Displays detailed software version information for the Control Station.

EXAMPLE #1

To display the software version running on the Control Station during a software upgrade, type:

$ nas_version

5.6.25-0

EXAMPLE #2

To display the system output during a software upgrade, type:

$ nas_version

5.6.19-0
Warning!!Upgrade is in progress from 5.6.19-0 to 5.6.20-0
Warning!!Please log off IMMEDIATELY if you are not upgrading the Celerra

EXAMPLE #3

To display the usage for nas_version, type:

$ nas_version -h

usage: /nas/bin/nas_version [-h|-l]
-h help
-l long_format

EXAMPLE #4

To display detailed software version information for the Control Station, type:

$ nas_version -l

Name : emcnas
Version : 5.6.19
Release : 0
Size : 454239545
Relocations: /nas
Vendor: EMC
Build Date: Tue 19 Dec 2006 08:53:31 PM EST
License: EMC Copyright
EXAMPLE #5  To display detailed software version information for the Control Station during a software upgrade, type:

$ nas_version -l

Name        : emcnas  Relocations: /nas
Version     : 5.6.19  Vendor: EMC
Release     : 0  Build Date: Wed 14 Mar 2007 12:36:55 PM EDT
Size        : 500815102  License: EMC Copyright
Signature   : (none)
Packager    : EMC Corporation
URL         : http://www.emc.com
Summary     : EMC nfs base install
Description : EMC nfs base install
Warning!!Upgrade is in progress from 5.6.19-0 to 5.6.20-0
Warning!!Please log off IMMEDIATELY if you are not upgrading the Celerra
**nas_volume**

Manages the volume table.

**SYNOPSIS**

```bash
nas_volume
  -list
  -delete <volume_name>
  -info [-size] {-all|<volume_name>} [-tree]
  -rename <old_name> <new_name>
  -size <volume_name>
  -acl <acl_value> <volume_name>
  -xtend <volume_name> {<volume_name>,...}
  [ -name <name> ] -create [-Stripe [<stripe_size>]|-Meta]
    [-Force] {<volume_name>,...}
  | -Clone <volume_name> [{<svol>:<dvol>,...}] [-option <options>]
```

**DESCRIPTION**

`nas_volume` creates metavolumes and stripe volumes and lists, renames, extends, clones, and deletes metavolumes, stripe, and slice volumes. `nas_volume` sets an access control value for a volume, and displays detailed volume attributes, including the total size of the volume configuration.

**OPTIONS**

- `-list`
  Displays the volume table.

  *Note:* The ID of the object is an integer and is assigned automatically. The name of the volume may be truncated if it is more than 17 characters. To display the full name, use the `-info` option with the volume ID.

- `-delete <volume_name>`
  Deletes the specified volume.

- `-info [-size] {-all|<volume_name>} [-tree]`
  Displays attributes and the size for all volumes, or the specified `<volume_name>`. The `-tree` option recursively displays the volume set, that is, the list of component volumes for the specified volume or all volumes.

- `-rename <old_name> <new_name>`
  Changes the current name of a volume to a new name.

- `-size <volume_name>`
  Displays the total size in MB of the `<volume_name>`, including used and available space.
-acl <acl_value> <volume_name>
Sets an access control level value that defines the owner of the volume, and the level of access allowed for users and groups defined in the access control level table. The nas_acl command provides information.

-xtend <volume_name> {<volume_name>,...}
Extends the specified metavolume by adding volumes to the configuration. The total size of the metavolume increases by the sum of all the volumes added.

Note: Only metavolumes can be extended. The volume that was added remains in use until the original metavolume is deleted. Volumes containing mounted file systems cannot be extended using this option. The nas_fs command provides information to extend a volume that is hosting a mounted file system.

-create {<volume_name>,...}
Creates a volume configuration from the specified volumes. Unless otherwise specified, volumes are automatically created as metavolumes.

[-name <name>]
Assigns a <name> to volume. If a name is not specified, one is assigned automatically. The name of a volume is case-sensitive.

[-Stripe <stripe_size>|-Meta]
Sets the type for the volume to be either a stripe volume or metavolume (default). If -Stripe is specified, type a stripe size in multiples of 8192 bytes with a recommended size of 262,144 bytes (256 KB) for all environments and drive types. If a stripe size is not specified, the system creates a 256 KB stripe by default.

nas_slice provides information to create a slice volume.

[-Force] {<volume_name>,...}
Forces the creation of a volume on a mixed system.

-Clone <volume_name>
Creates an exact clone of the specified <volume_name>. Volumes can be cloned from slice, stripe, or metavolumes. The name automatically assigned to the clone is derived from the ID of the volume.

[{{<svol>:<dvol>,...}}]
Sets a specific disk volume set for the source volume and the destination volume. The size of the destination volume must be the same as the source volume.
The nas Commands

-option disktype=<type>
Specifies the type of disk to be created.

Disk types when using VNX for block are CLSTD, CLEFD, and
CLATA, and for VNX for block involving mirrored disks are
CMEFD, CMSTD, and CMATA.

Disk types when using a Symmetrix are STD, R1STD, R2STD,
BCV, R1BCV, R2BCV, ATA, R1ATA, R2ATA, BCVA, R1BCA,
R2BCA, and EFD.

SEE ALSO Managing Volumes and File Systems with VNX Automatic Volume
Management, Managing Volumes and File Systems for VNX Manually,
Using TimeFinder/FS, NearCopy, and FarCopy on VNX for File,
Controlling Access to System Objects on VNX, nas_slice, nas_disk,
nas_acl, and nas_fs.

EXAMPLE #1 To list all volumes, type:
$ nas_volume -list

<table>
<thead>
<tr>
<th>id</th>
<th>inuse</th>
<th>type</th>
<th>acl</th>
<th>name</th>
<th>cltype</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>root_disk</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,2,3,4,5,6,7,8,9,10,11,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12,13,14,15,16,17,18,19,20,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21,22,23,24,25,26,27,28,29,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30,31,32,33,34,35,36,37,38,39,40,41,42,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43,44,45,46,47,48,49,50,51</td>
</tr>
<tr>
<td>2</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>root_ldisk</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>d3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>d4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>d5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>y</td>
<td>4</td>
<td>0</td>
<td>d6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>root_dos</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>n</td>
<td>1</td>
<td>0</td>
<td>root_layout</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>root_slice_1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>y</td>
<td>3</td>
<td>0</td>
<td>root_volume_1</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>root_slice_2</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>y</td>
<td>3</td>
<td>0</td>
<td>root_volume_2</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>y</td>
<td>1</td>
<td>0</td>
<td>root_slice_3</td>
<td>1</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: This is a partial listing due to the length of the outputs.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the volume.</td>
</tr>
<tr>
<td>inuse</td>
<td>Whether the volume is used.</td>
</tr>
<tr>
<td>type</td>
<td>Type assigned to the volume. Available types are: 1=slice, 2=stripe, 3=meta, 4=disk, and 100=pool.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level assigned to the volume.</td>
</tr>
</tbody>
</table>
The nas Commands

**EXAMPLE #2** To create a metavolume named, *mtv1*, on disk volume, *d7*, type:

```
$ nas_volume -name mtv1 -create d7
```

<table>
<thead>
<tr>
<th>id</th>
<th>146</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>mtv1</td>
</tr>
<tr>
<td>acl</td>
<td>0</td>
</tr>
<tr>
<td>in_use</td>
<td>False</td>
</tr>
<tr>
<td>type</td>
<td>meta</td>
</tr>
<tr>
<td>volume_set</td>
<td>d7</td>
</tr>
<tr>
<td>disks</td>
<td>d7</td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>ID of the volume.</td>
</tr>
<tr>
<td>name</td>
<td>Name assigned to the volume.</td>
</tr>
<tr>
<td>acl</td>
<td>Access control level value assigned to the volume.</td>
</tr>
<tr>
<td>in_use</td>
<td>Whether the volume is used.</td>
</tr>
<tr>
<td>type</td>
<td>Type assigned to the volume. Types are meta, stripe, slice, disk, and pool.</td>
</tr>
<tr>
<td>volume_set</td>
<td>Name assigned to the volume.</td>
</tr>
<tr>
<td>disks</td>
<td>Disks used to build a file system.</td>
</tr>
</tbody>
</table>

**EXAMPLE #3** To display configuration information for *mtv1*, type:

```
$ nas_volume -info mtv1
```

<table>
<thead>
<tr>
<th>id</th>
<th>146</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>mtv1</td>
</tr>
<tr>
<td>acl</td>
<td>0</td>
</tr>
<tr>
<td>in_use</td>
<td>False</td>
</tr>
<tr>
<td>type</td>
<td>meta</td>
</tr>
<tr>
<td>volume_set</td>
<td>d7</td>
</tr>
<tr>
<td>disks</td>
<td>d7</td>
</tr>
</tbody>
</table>
EXAMPLE #4  To rename a mtv1 to mtv2, type:

```
$ nas_volume -rename mtv1 mtv2
```

id          = 146
name        = mtv2
acl         = 0
in_use      = False
type        = meta
volume_set  = d7
disks       = d7

EXAMPLE #5  To create a stripe volume named, stv1, with a size of 32768 bytes on
disk volumes d10, d12, d13, and d15, type:

```
$ nas_volume -name stv1 -create -Stripe 32768
d10,d12,d13,d15
```

id          = 147
name        = stv1
acl         = 0
in_use      = False
type        = stripe
stripe_size = 32768
volume_set  = d10,d12,d13,d15
disks       = d10,d12,d13,d15

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>stripe_size</td>
<td>Specified size of the stripe volume.</td>
</tr>
</tbody>
</table>

EXAMPLE #6  To clone mtv1, type:

```
$ nas_volume -Clone mtv1
```

id          = 146
name        = mtv1
acl         = 0
in_use      = False
type        = meta
volume_set  = d7
disks       = d7

id          = 148
name        = v148
acl         = 0
in_use      = False
type        = meta
volume_set  = d8
disks       = d8
EXAMPLE #7  To clone the volume mtv1 and set the disk type to BCV, type:

```
$ /nas/sbin/rootnas_volume -Clone mtv1 -option disktype=BCV
```

```
id          = 322
name        = mtv1
acl         = 0
in_use      = False
type        = meta
volume_set  = d87
disks       = d87
```

```
id          = 323
name        = v323
acl         = 0
in_use      = False
type        = meta
volume_set  = rootd99
disks       = rootd99
```

EXAMPLE #8  To extend mtv1 with mtv2, type:

```
$ nas_volume -xtend mtv1 mtv2
```

```
id          = 146
name        = mtv1
acl         = 0
in_use      = False
type        = meta
volume_set  = d7,mtv2
disks       = d7,d8
```

EXAMPLE #9  To display the size of mtv1, type:

```
$ nas_volume -size mtv1
```

```
total = 547418 avail = 547418 used = 0 ( 0% ) (sizes in MB)
```

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>Total size of the volume.</td>
</tr>
<tr>
<td>avail</td>
<td>Amount of unused space on the volume.</td>
</tr>
<tr>
<td>used</td>
<td>Amount of space used on the volume.</td>
</tr>
</tbody>
</table>
EXAMPLE #10  To set the access control level for the metavolume mtv1, type:

$ nas_volume -acl 1432 mtv1

id          = 125
name        = mtv1
acl         = 1432, owner=nasadmin, ID=201
in_use      = False
type        = meta
volume_set  = d7,mtv2
disks       = d7,d8

Note: The value 1432 specifies nasadmin as the owner and gives users with an access level of at least observer read access only, users with an access level of at least operator read/write access, and users with an access level of at least admin read/write/delete access.

EXAMPLE #11  To delete mtv2, type:

$ nas_volume -delete mtv1

id          = 146
name        = mtv1
acl         = 1432, owner=nasadmin, ID=201
in_use      = False
type        = meta
volume_set  = d7,mtv2
disks       = d7,d8
This chapter lists the VNX Command Set provided for managing, configuring, and monitoring Data Movers. The commands are prefixed with server and appear alphabetically. The command line syntax (Synopsis), a description of the options, and an example of usage are provided for each command. Commands included are:

- server_archive................................................................. 469
- server_arp........................................................................... 483
- server_certificate ............................................................ 485
- server_cdms ........................................................................ 491
- server_cepp ........................................................................ 497
- server_checkup ................................................................. 500
- server_cifs ......................................................................... 517
- server_cifssupport ............................................................ 545
- server_cpu .......................................................................... 559
- server_date ......................................................................... 561
- server_dbms ....................................................................... 566
- server_devconfig .............................................................. 573
- server_df ............................................................................. 581
- server_dns ........................................................................... 583
- server_export ................................................................. 585
- server_file ......................................................................... 599
- server_fileresolve ............................................................ 600
- server_http ......................................................................... 620
- server_ifconfig ............................................................... 626
- server_ip ............................................................................. 633
- server_kerberos ............................................................... 638
- server_kerberos ............................................................... 638
- server_ldap......................................................................... 645
The server Commands

- server_log............................................................... 657
- server_mount........................................................ 664
- server_mountpoint.................................................. 673
- server_mpfs ............................................................ 675
- server_mt................................................................. 678
- server_name............................................................ 680
- server_netstat ......................................................... 681
- server_nfs............................................................... 685
- server_nis ................................................................. 694
- server_nsdomains ..................................................... 698
- server_param.......................................................... 701
- server_pax............................................................... 709
- server_ping .............................................................. 713
- server_ping6 ........................................................... 715
- server_rip ................................................................. 719
- server_reclaim .......................................................... 717
- server_route ............................................................. 720
- server_security .......................................................... 723
- server_setup............................................................ 726
- server_snmpd ............................................................ 729
- server_ssh............................................................... 733
- server_standby .......................................................... 745
- server_stats ............................................................. 748
- server_sysconfig ........................................................ 795
- server_sysstat ........................................................... 804
- server_tftp ............................................................... 806
- server_umount .......................................................... 809
- server_uptime ........................................................... 811
- server_user .............................................................. 812
- server_usermapper ...................................................... 815
- server_version .......................................................... 819
- server_viruschk .......................................................... 820
- server_vtlu .............................................................. 824
server_archive

Reads and writes file archives, and copies directory hierarchies.

SYNOPSIS

server_archive <movername> [-cdnvN] -f <archive_file> [-J [p][w|d|u]]
[-I <client_dialect>]
[-e <archive_name>] [-s <replstr>] ... [-T [from_date]][,<to_date>][<pattern>] ...

server_archive <movername> -r [-cdiknuvDNYZ][-E <limit>]
[-J [w|d|u]][-C d|i|m][-I <client_dialect>]
[-f <file_name>] [-e <archive_name>] [-p <string>] ...
[-s <replstr>] ...
[-T [from_date]][,<to_date>][<pattern>] ...

server_archive <movername> -w [-dituvLNPF]
[-J [w|d|u]][-I <client_dialect>]
[-b <block_size>] [-f <file_name>] [-e <archive_name>]
[-x <format>][-B bytes][-s <replstr>] ...
[-T [from_date]][,<to_date>][<pattern>]

server_archive -r -w [-dikntuvDLNPXY]
[-J [w|d|u]][-C d|i|m]
[-p <string>] ...
[-s <replstr>] ...
[-T [from_date]][,<to_date>][<pattern>]

DESCRIPTION

server_archive reads, writes, and lists the members of an archive file, and copies directory hierarchies. The server_archive operation is independent of the specific archive format, and supports a variety of different archive formats.

Note: A list of supported archive formats can be found under the description of the -x option.

The presence of the -r and the -w options specifies the following functional modes: list, read, write, and copy.

-List (no arguments) server_archive writes to standard output a table of contents of the members of the archive file read from archive, whose pathnames match the specified patterns.

Note: If no options are specified, server_archive lists the contents of the archive.
Read (-r)

`server_archive` extracts the members of the archive file read from the archive, with pathnames matching the specified patterns. The archive format and blocking are automatically determined on input. When an extracted file is a directory, the entire file hierarchy rooted at that directory is extracted.

**Note:** Ownership, access, and modification times, and file mode of the extracted files are discussed in more detail under the `-p` option.

Write (-w)

`server_archive` writes an archive containing the file operands to archive using the specified archive format. When a file operand is also a directory, the entire file hierarchy rooted at that directory is included.

Copy (-r -w)

`server_archive` copies the file operands to the destination directory. When a file operand is also a directory, the entire file hierarchy rooted at that directory is included. The effect of the copy is as if the copied files were written to an archive file and then subsequently extracted, except that there may be hard links between the original and the copied files. The `-l` option provides more information.

**CAUTION**

The destination directory must exist and must not be one of the file operands or a member of a file hierarchy rooted at one of the file operands. The result of a copy under these conditions is unpredictable.

While processing a damaged archive during a read or list operation, `server_archive` attempts to recover from media defects and searches through the archive to locate and process the largest number of archive members possible (the `-E` option provides more details on error handling).

**OPERANDS**

The directory operand specifies a destination directory pathname. If the directory operand does not exist, or it is not writable by the user, or it is not a directory name, `server_archive` exits with a non-zero exit status.

The pattern operand is used to select one or more pathnames of archive members. Archive members are selected using the pattern matching notation described by `fnmatch 3`. When the pattern
operand is not supplied, all members of the archive are selected. When a pattern matches a directory, the entire file hierarchy rooted at that directory is selected. When a pattern operand does not select at least one archive member, server_archive writes these pattern operands in a diagnostic message to standard error and then exits with a non-zero exit status.

The file operand specifies the pathname of a file to be copied or archived. When a file operand does not select at least one archive member, server_archive writes these file operand pathnames in a diagnostic message to standard error and then exits with a non-zero exit status.

The archive_file operand is the name of a file where the data is stored (write) or read (read/list). The archive_name is the name of the streamer on which the data will be stored (write) or read (read/list).

Note: To obtain the device name, you can use server_devconfig -scsi.

OPTIONS

The following options are supported:

- \texttt{-r}
  Reads an archive file from archive and extracts the specified files. If any intermediate directories are needed to extract an archive member, these directories will be created as if \texttt{mkdir 2} was called with the bit-wise inclusive OR of S_IRWXU, S_IRWXG, and S_IRWXO, as the mode argument. When the selected archive format supports the specification of linked files and these files cannot be linked while the archive is being extracted, server_archive writes a diagnostic message to standard error and exits with a non-zero exit status at the completion of operation.

- \texttt{-w}
  Writes files to the archive in the specified archive format.

- \texttt{-0} (zero)
  With this option, a full referenced backup is performed with the time and date of launching put in a reference file. This reference file is an ASCII file and is located in /etc/BackupDates. The backup is referenced by the pathname of the files to back up and the time and date when the backup was created. This file is updated only if the backup is successful.

Backup files can be copied using the server_file command.
The server Commands

- `<x>`
  Level x (x=1–9) indicates a backup of all files in a file system that have been modified since the last backup of a level smaller than the previous backup.

  For example, a backup is performed for:
  
  - Monday: level 0 = full backup
  - Tuesday: level 3 = files modified since Monday
  - Friday: level 5 = files modified since Tuesday
  - Saturday: level 4 = files modified since Tuesday
  - Sunday: level 4 = files modified since Tuesday

  **Note:** If the backup type is not indicated, a full backup is performed automatically.

- `-b <block_size>`
  When writing an archive, blocks the output at a positive decimal integer number of bytes per write to the archive file. The `<block_size>` must be a multiple of 512 bytes with a maximum size of 40 kilobytes.

  **Note:** To remain POSIX-compatible, do not exceed 32256 Bytes.

  A `<block_size>` can end with k or b to specify multiplication by 1024 (1K) or 512, respectively. A pair of `<block_size>` can be separated by x to indicate a product. A specific archive device may impose additional restrictions on the size of blocking it will support. When blocking is not specified, the default for `<block_size>` is dependent on the specific archive format being used. The `-x` option provides more information.

- `-c`
  Matches all file or archive members except those specified by the pattern and file operands.

- `-d`
  Causes files of type directory being copied or archived, or archive members of type directory being extracted, to match only the directory file or archive member, and not the file hierarchy rooted at the directory.

- `-e <archive_name>`
  Specifies the archive name when it is streamed.
Note: To prevent the tape from rewinding at the end of command execution, use the -N option with the -e <archive_name> option.

-f <archive_file>
Specifies the archive name when it is a file.

Note: A single archive may span multiple files and different archive devices. When required, server_archive prompts for the pathname of the file or device of the next volume in the archive.

-i
Interactively renames files or archive members. For each archive member matching a pattern operand, or each file matching a file operand, server_archive prompts to /dev/tty giving the name of the file, its file mode, and its modification time. Then server_archive reads a line from /dev/tty. If this line is blank, the file or archive member is skipped. If this line consists of a single period, the file or archive member is processed with no modification to its name. Otherwise, its name is replaced with the contents of the line. Then server_archive immediately exits with a non-zero exit status if <EOF> is encountered when reading a response, or if /dev/tty cannot be opened for reading and writing.

-k
Does not allow overwriting existing files.

-l
Links files. In the copy mode (-r, -w), hard links are made between the source and destination file hierarchies whenever possible.

-l <client_dialect>
Allows filename information recovered from an archive to be translated into UTF-8.

-n
Selects the first archive member that matches each pattern operand. No more than one archive member is matched for each pattern. When members of type directory are matched, the file hierarchy rooted at that directory is also matched (unless -d is also specified).

-p <string>
Specifies one or more file characteristic options (privileges). The <string> option-argument is a string specifying file characteristics to be retained or discarded on extraction. The string consists of the specification characters a, e, m, o, and p. Multiple characteristics can
be concatenated within the same string and multiple \texttt{-p} options can be specified. The meaning of the specification characters is as follows:

\textbf{a}

Do not preserve file access times. By default, file access times are preserved whenever possible.

\textbf{e}

Preserve everything (default mode), the user ID, group ID, file mode bits, file access time, and file modification time.

\textbf{m}

Do not preserve file modification times. By default, file modification times are preserved whenever possible.

\textbf{o}

Preserve the user ID and group ID.

\textbf{p}

Preserve the file mode bits. This specification character is intended for a user with regular privileges who wants to preserve all aspects of the file other than the ownership. The file times are preserved by default, but two other flags are offered to disable this and use the time of extraction instead.

In the preceding list, preserve indicates that an attribute stored in the archive is given to the extracted file, subject to the permissions of the invoking process. Otherwise, the attribute of the extracted file is determined as part of the normal file creation action. If neither the \texttt{e} nor the \texttt{o} specification character is specified, or the user ID and group ID are not preserved for any reason, \texttt{server_archive} will not set the S_ISUID (setuid) and S_ISGID (setgid) bits of the file mode. If the preservation of any of these items fails for any reason, \texttt{server_archive} writes a diagnostic message to standard error.

\textbf{Note:} Failure to preserve these items will affect the final exit status, but will not cause the extracted file to be deleted.

If the file characteristic letters in any of the string option-arguments are duplicated, or in conflict with one another, the ones given last will take precedence. For example, if you specify \texttt{-p eme}, file modification times are still preserved.
-s <replstr>
Modifies the file or archive member names specified by the pattern or <file> operand according to the substitution expression <replstr> using the syntax of the ed utility regular expressions.

Note: The ed 1 manual page provides information.

Multiple -s expressions can be specified. The expressions are applied in the order they are specified on the command line, terminating with the first successful substitution. The optional trailing g continues to apply the substitution expression to the pathname substring, which starts with the first character following the end of the last successful substitution.

The optional trailing p causes the final result of a successful substitution to be written to standard error in the following format:

<original pathname> >> <new pathname>

File or archive member names that substitute the empty string are not selected and are skipped.

-t
Resets the access times of any file or directory read or accessed by server_archive to be the same as they were before being read or accessed by server_archive.

-u
Ignores files that are older (having a less recent file modification time) than a pre-existing file, or archive member with the same name. During read, an archive member with the same name as a file in a file system is extracted if the archive member is newer than the file. During copy, the file in the destination hierarchy is replaced by the file in the source hierarchy, or by a link to the file in the source hierarchy if the file in the source hierarchy is newer.
The server Commands

-**v**

During a list operation, produces a verbose table of contents using the format of the *ls 1* utility with the -l option. For pathnames representing a hard link to a previous member of the archive, the output has the format:

```bash
<ls -l listing> == <link name>
```

For pathnames representing a symbolic link, the output has the format:

```bash
<ls -l listing> => <link name>
```

where `<ls -l listing>` is the output format specified by the *ls 1* utility when used with the -l option. Otherwise, for all the other operational modes (read, write, and copy), pathnames are written and flushed a standard error without a trailing <newline> as soon as processing begins on that file or archive member. The trailing <newline> is not buffered, and is written only after the file has been read or written.

-**x** format

Specifies the output archive format, with the default format being *ustar*. The server_archive command currently supports the following formats:

- **cpio**
  The extended cpio interchange format specified in the *-p1003.2* standard. The default blocksize for this format is 5120 bytes.
  Inode and device information about a file (used for detecting file hard links by this format) which may be truncated by this format is detected by server_archive and is repaired.

  **Note:** To be readable by server_archive, the archive must be built on another machine with the option -c (write header information in ASCII).

- **bcpio**
  The old binary cpio format. The default blocksize for this format is 5120 bytes.

  **Note:** This format is not very portable and should not be used when other formats are available.

  Inode and device information about a file (used for detecting file hard links by this format) which may be truncated by this format is detected by server_archive and is repaired.
sv4cpio
The System V release 4 cpio. The default blocksize for this format is 5120 bytes. Inode and device information about a file (used for detecting file hard links by this format) which may be truncated by this format is detected by server_archive and is repaired.

sv4crc
The System V release 4 cpio with file crc checksums. The default blocksize for this format is 5120 bytes. Inode and device information about a file (used for detecting file hard links by this format) which may be truncated by this format is detected by server_archive and is repaired.

tar
The old BSD tar format as found in BSD4.3. The default blocksize for this format is 10240 bytes. Pathnames stored by this format must be 100 characters or less in length. Only regular files, hard links, soft links, and directories will be archived (other file system types are not supported).

ustar
The extended tar interchange format specified in the -p1003.2 standard. The default blocksize for this format is 10240 bytes.

Note: Pathnames stored by this format must be 250 characters or less in length (150 for basename and 100 for <file_name>).

emctar
This format is not compatible with -p1003.2 standard. It allows archiving to a file greater than 8 GB. Pathnames stored by this format are limited to 3070 characters. The other features of this format are the same as ustar.

server_archive detects and reports any file that it is unable to store or extract as the result of any specific archive format restrictions. The individual archive formats may impose additional restrictions on use.

Note: Typical archive format restrictions include (but are not limited to) file pathname length, file size, link pathname length, and the type of the file.

-B bytes
Limits the number of bytes written to a single archive volume to bytes. The bytes limit can end with m, k, or b to specify multiplication by 1048576 (1M), 1024 (1K) or 512, respectively. A pair of bytes limits can be separated by x to indicate a product.
The server Commands

Note: The limit size will be rounded up to the nearest block size.

-C [d| i|m]
When performing a restore, this allows you to choose PAX behaviors on CIFS collision names.

  d: delete
  i: ignore
  m: mangle

-D
Ignores files that have a less recent file inode change time than a pre-existing file, or archive member with the same name. The -u option provides information.

Note: This option is the same as the -u option, except that the file inode change time is checked instead of the file modification time. The file inode change time can be used to select files whose inode information (such as uid, gid, and so on) is newer than a copy of the file in the destination directory.

-E limit
Has the following two goals:

  • In case of medium error, to limit the number of consecutive read faults while trying to read a flawed archive to limit. With a positive limit, server_archive attempts to recover from an archive read error and will continue processing starting with the next file stored in the archive. A limit of 0 (zero) will cause server_archive to stop operation after the first read error is detected on an archive volume. A limit of "NONE" will cause server_archive to attempt to recover from read errors forever.

  • In case of no medium error, to limit the number of consecutive valid header searches when an invalid format detection occurs. With a positive value, server_archive will attempt to recover from an invalid format detection and will continue processing starting with the next file stored in the archive. A limit of 0 (zero) will cause server_archive to stop operation after the first invalid header is detected on an archive volume. A limit of "NONE" will cause server_archive to attempt to recover from invalid format errors forever. The default limit is 10 retries.
CAUTION

Using this option with NONE requires extreme caution as server_archive may get stuck in an infinite loop on a badly flawed archive.

-J
Backs up, restores, or displays CIFS extended attributes.

  p: Displays the full pathname for alternate names (for listing and archive only)
  u: Specifies UNIX name for pattern search
  w: Specifies M256 name for pattern search
  d: Specifies M83 name for pattern search

-L
Follows all symbolic links to perform a logical file system traversal.

-N
Used with the -e archive_name option, prevents the tape from rewinding at the end of command execution.

-P
Does not follow symbolic links.

Note: Performs a physical file system traversal. This is the default mode.

-T [from_date] [, to_date] [/c|m]
Allows files to be selected based on a file modification or inode change time falling within a specified time range of from_date to to_date (the dates are inclusive). If only a from_date is supplied, all files with a modification or inode change time equal to or less than are selected. If only a to_date is supplied, all files with a modification or inode change time equal to or greater than will be selected. When the from_date is equal to the to_date, only files with a modification or inode change time of exactly that time will be selected.

When server_archive is in the write or copy mode, the optional trailing field [c][m] can be used to determine which file time (inode change, file modification or both) is used in the comparison. If neither is specified, the default is to use file modification time only. The m specifies the comparison of file modification time (the time when the file was last written). The c specifies the comparison of inode change time (the time when the file inode was last changed; for example, a change of owner, group, mode, and so on). When c and m are both
specified, then the modification and inode change times are both compared. The inode change time comparison is useful in selecting files whose attributes were recently changed, or selecting files which were recently created and had their modification time reset to an older time (as what happens when a file is extracted from an archive and the modification time is preserved). Time comparisons using both file times are useful when `server_archive` is used to create a time-based incremental archive (only files that were changed during a specified time range will be archived).

A time range is made up of six different fields and each field must contain two digits. The format is:

```
[yy [mm [dd [hh]]] ] mm [ss]
```

where `yy` is the last two digits of the year, the first `mm` is the month (from 01 to 12), `dd` is the day of the month (from 01 to 31), `hh` is the hour of the day (from 00 to 23), the second `mm` is the minute (from 00 to 59), and `ss` is seconds (from 00 to 59). The minute field `mm` is required, while the other fields are optional, and must be added in the following order: `hh`, `dd`, `mm`, `yy`. The `ss` field may be added independently of the other fields. Time ranges are relative to the current time, so `-T 1234/cm` selects all files with a modification or inode change time of 12:34 p.m. today or later. Multiple `-T` time range can be supplied, and checking stops with the first match.

- `x`  
  When traversing the file hierarchy specified by a pathname does not allow descending into directories that have a different device ID. The `st_dev` field as described in `stat 2` provides more information about device IDs.

- `y`  
  Ignores files that have a less recent file inode change time than a pre-existing file, or archive member with the same name.

---

**Note:** This option is the same as the `-D` option, except that the inode change time is checked using the pathname created after all the filename modifications have completed.

- `z`  
  Ignores files that are older (having a less recent file modification time) than a pre-existing file, or archive member with the same name.
Note: This option is the same as the -u option, except that the modification time is checked using the pathname created after all the filename modifications have completed.

The options that operate on the names of files or archive members (-c, -i, -n, -s, -u, -v, -D, -T, -Y, and -Z) interact as follows.

When extracting files during a read operation, archive members are selected, based only on the user-specified pattern operands as modified by the -c, -n, -u, -D, and -T options. Then any -s and -i options will modify, in that order, the names of those selected files. Then the -Y and -Z options will be applied based on the final pathname. Finally, the -v option will write the names resulting from these modifications.

When archiving files during a write operation, or copying files during a copy operation, archive members are selected, based only on the user-specified pathnames as modified by the -n, -u, -D, and -T options (the -D option applies only during a copy operation). Then any -s and -i options will modify, in that order, the names of these selected files. Then during a copy operation, the -Y and -Z options will be applied based on the final pathname. Finally, the -v option will write the names resulting from these modifications.

When one or both of the -u or -D options are specified along with the -n option, a file is not considered selected unless it is newer than the file to which it is compared.

SEE ALSO

Using the server_archive Utility on VNX.

EXAMPLE #1
To archive the contents of the root directory to the device rst0, type:

$ server_archive <movername> -w -e rst0

EXAMPLE #2
To display the verbose table of contents for an archive stored in <file_name>, type:

$ server_archive <movername> -v -f <file_name>

EXAMPLE #3
To copy the entire olddir directory hierarchy to newdir, type:

$ server_archive <movername> -rw <olddir newdir>

EXAMPLE #4
To interactively select the files to copy from the current directory to dest_dir, type:

$ server_archive <movername> -rw -i <olddir dest_dir>
EXAMPLE #5  To extract all files from the archive stored in <file_name>, type:

\$ server_archive <movername> -r -f <file_name>

EXAMPLE #6  To update (and list) only those files in the destination directory /backup that are older (less recent inode change or file modification times) than files with the same name found in the source file tree home, type:

\$ server_archive <movername> -r -w -v -Y -Z home /backup

STANDARDS  The server_archive utility is a superset of the -p1003.2 standard.

Note: The archive formats bcpio, sv4cpio, sv4crc, and tar, and the flawed archive handling during list and read operations are extensions to the POSIX standard.

ERRORS  The server_archive command exits with one of the following system messages:

All files were processed successfully.
or
An error occurred.

Whenever server_archive cannot create a file or a link when reading an archive, or cannot find a file when writing an archive, or cannot preserve the user ID, group ID, or file mode when the -p option is specified, a diagnostic message is written to standard error, and a non-zero exit status is returned. However, processing continues.

In the case where server_archive cannot create a link to a file, this command will not create a second copy of the file.

If the extraction of a file from an archive is prematurely terminated by a signal or error, server_archive may have only partially extracted a file the user wanted. Additionally, the file modes of extracted files and directories may have incorrect file bits, and the modification and access times may be wrong.

If the creation of an archive is prematurely terminated by a signal or error, server_archive may have only partially created the archive which may violate the specific archive format specification.

If while doing a copy, server_archive detects a file is about to overwrite itself, the file is not copied, a diagnostic message is written to standard error and when server_archive completes, it exits with a non-zero exit status.
**server_arp**

Manages the Address Resolution Protocol (ARP) table for Data Movers.

**SYNOPSIS**

```
server_arp {<movername>|ALL} <ip_addr> | -all | -delete <ip_addr> | -set <ip_addr> <physaddr>
```

**DESCRIPTION**

`server_arp` displays and modifies the IP-to-MAC address translation tables used by the ARP for the specified Data Mover.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- `<ip_addr>`
  Displays the ARP entry for the specified IP address.

- `-all`
  Displays the first 64 of the current ARP entries.

- `-delete <ip_addr>`
  Deletes an ARP entry.

- `-set <ip_addr> <physaddr>`
  Creates an ARP entry with an IP address and physical address.

**EXAMPLE #1**

To create an ARP entry, type:

```
$ server_arp server_2 -set 172.24.102.20 00:D0:B7:82:98:E0
server_2 : added: 172.24.102.20 at 0:d0:b7:82:98:e0
```

**EXAMPLE #2**

To display all ARP entries for a specified Data Mover, type:

```
$ server_arp server_2 -all
server_2 :
172.24.102.254 at 0:d0:3:f9:37:fc
172.24.102.20 at 0:d0:b7:82:98:e0
172.24.102.24 at 0:50:56:8e:1d:5
128.221.253.100 at 0:4:23:a7:b1:35
```

**EXAMPLE #3**

To display an ARP entry specified by IP address, type:

```
$ server_arp server_2 172.24.102.20
server_2 : 172.24.102.20 at 0:d0:b7:82:98:e0
```
**EXAMPLE #4**  To delete an ARP entry, type:

```
$ server_arp server_2 -delete 172.24.102.24
server_2 : deleted: 172.24.102.24 at 0:50:56:8e:1d:5
```
server_certificate

Manages VNX for file system’s Public Key Infrastructure (PKI) for the specified Data Movers.

SYNOPSIS

server_certificate {<movername>|ALL}
   -ca_certificate
      [-list]
      | -info {-all|<certificate_id>}
      | -import [-filename <path>]
      | -delete {-all|<certificate_id>}
   -persona
      [-list]
      | -info {-all|<persona_name>|id=<persona_id>}
      | -generate {<persona_name>|id=<persona_id>} -key_size {2048|4096}
         [-cs_sign_duration <# of months>]
         [-cn|--common_name] <common_name>[;<common_name>]
         [-ou <org_unit>[:<org_unit>]]
         [-organization <organization>]
         [-location <location>]
         [-state <state>]
         [-country <country>]
         [-filename <output_path>]
      | -clear {<persona_name>|id=<persona_id>} {-next|-current|-both}
      | -import {<persona_name>|id=<persona_id>} [-filename <path>]

DESCRIPTION

server_certificate manages the use of public key certificates between Data Movers acting as either clients or servers. server_certificate -ca_certificate manages the Certificate Authority (CA) certificates the VNX uses to confirm a server’s identity when the Data Mover is acting as a client. server_certificate -persona manages the certificates presented by the Data Mover to a client application when the Data Mover is acting as a server as well as the certificates presented by the Data Mover to a server configured to require client authentication.

OPTIONS

-ca_certificate
Lists the CA certificates currently available on the VNX. The output from this command is identical to the output from the -list option.

-ca_certificate -list
Lists the CA certificates currently available on the VNX.

-ca_certificate -info {-all|<certificate_id>}
Displays the properties of a specified CA certificate or all CA certificates.
The server Commands

-ca_certificate -import [-filename <path>]
Imports a CA certificate. You can only paste text in PEM format at the command prompt. Specify -filename and provide a path to import a CA certificate in either DER or PEM format.

-ca_certificate -delete { -all | <certificate_id> }
Deletes a specified CA certificate or all CA certificates.

-persona
Lists the key sets and associated certificates currently available on the VNX. The output from this command is identical to the output from the -list option.

-persona -list
Lists the key sets and associated certificates currently available on the VNX.

-persona -info { -all | <persona_name> | id= <persona_id> }
Displays the properties of the key sets and associated certificates, including the text of a pending certificate request, of a specified persona or all personas.

-persona -generate { <persona_name> | id= <persona_id> }
-key_size <bits> { -cn | -common_name } <common_name> [ ; <common_name> ]
Generates a public/private key set along with a request to sign the certificate. Specify either the persona name or ID. The ID is automatically generated when the persona is created. You can determine the ID using the -list or -info options. The key size can be either 2048 or 4096 bits. Use either -cn or -common_name to specify the commonly used name. The common name is typically a hostname that describes the Data Mover with which the persona is associated. Multiple common names are allowed but must be separated by semicolon.

[-cs_sign_duration <# of months>]
Specifies the number of months the certificate is valid. A month is defined as 30 days. This option is valid only if the certificate will be signed by the Control Station. If this option is specified, you cannot save the request to a file using the -filename option.

[-ou <org_unit> [ ; <org_unit> ]]
Identifies the organizational unit. Multiple organizational units are allowed but must be separated by semicolon.

[-organization <organization>]
Identifies the organization.
[-location <location>]
Identifies the physical location of the organizational unit.

[-state <state>]
Identifies the state where the organizational unit is located.

[-country <country>]
Identifies the country where the organization unit is located. This value is limited to two characters.

[-filename <output_path>]
Provides a path to where the request should be saved to a file. This option is valid only if the certificate will be signed by an external CA. If this option is specified, you cannot specify the number of months the certificate is valid using the -cs_sign_duration option.

-persona -clear {<persona_name>|id=<persona_id>} {-next | -current | -both}
Deletes a key set and the associated certificate. You can delete the current key set and certificate, the next key set and certificate, or both.

-persona -import {<persona_name>|id=<persona_id>} [-filename <path>]
Imports a CA-signed certificate. You can only paste text in PEM format at the command prompt. Specify -filename and provide a path to import a CA-signed certificate in either DER or PEM format.

SEE ALSO
nas_ca_certificate.

EXAMPLE #1
To import a CA certificate, specifying a filename and path, type:

$ server_certificate server_2 -ca_certificate -import
-filename "/tmp/ca_cert.pem"

done
EXAMPLE #2  To list all the CA certificates currently available on the VNX, type:

$ server_certificate ALL -ca_certificate -list

server_2 :
  id=1
  subject=O=VNX Certificate Authority;CN=sorento
  issuer=O=VNX Certificate Authority;CN=sorento
  expire=20120318032639Z
  id=2
  subject=C=US;O=VeriSign, Inc.;OU=Class 3 Public Primary Certification Authority
  issuer=C=US;O=VeriSign, Inc.;OU=Class 3 Public Primary Certification Authority
  expire=20280801235959Z

EXAMPLE #3  To list the properties of the CA certificate identified by certificate ID 2, type:

$ server_certificate server_2 -ca_certificate -info 2

server_2 :
  id=2
  subject = C=US;O=VeriSign, Inc.;OU=Class 3 Public Primary Certification Authority
  issuer = C=US;O=VeriSign, Inc.;OU=Class 3 Public Primary Certification Authority
  start = 19960129000000Z
  expire = 20280801235959Z
  signature alg. = md2WithRSAEncryption
  public key alg. = rsaEncryption
  public key size = 1024 bits
  serial number = 70ba e41d 10d9 2934 b638 ca7b 03cc babf
  version = 1

EXAMPLE #4  To generate a key set and certificate request to be sent to an external CA for the persona identified by the persona name default, type:

$ server_certificate server_2 -persona -generate default
  -key_size 2048 -common_name division.xyz.com

server_2 :
Starting key generation. This could take a long time ...
done

EXAMPLE #5  To list all the key sets and associated certificates currently available on the VNX, type:

$ server_certificate ALL -persona -list

server_2 :
  id=1
  name=default
  next state=Request Pending
  request subject=CN=name;CN=1.2.3.4
EXAMPLE #6   To list the properties of the key set and certificate identified by
persona ID 1, type:

$ server_certificate server_2 -persona -info id=1

server_2 :
id=1
name=default
next state=Request Pending
request subject=CN=name;CN=1.2.3.4
Request:
-----BEGIN CERTIFICATE REQUEST-----
MIIEZjCCAk4CAQAwITENMAsGA1UEAxMEbmFtZTEQMA4GA1UdEwEB/nA8 TERMS
AiTwDQYJ9JoZIhvcNAQEBBQADgggBADADCAgoCggIBANKW3Q/F6emMqIxrC051eXLET
bWkm5Rzrb151HxLmUhorR5S9G2o+k47X0QZFKgGzq/2F7kR06vVIH7CPhX92GAzV
7GmZaFO0wPcktPfYJzqE8quNhcLlqZpPlI4ZrbnSGEAWeAEOnvNwlq9aN0WSC+N
TDJZY4A9yTURiUc+B98p1hQf16wLL0zjUKIVKjaqiTEF3RApVJEE/9y6N+Idsb
VwF/vrzzP6/z0wZw5H184HXINJaHTBDK59G+e/Y2JgvyU1UNB25SODunOakHabex
k6COFYjdU7vd+yHpvvyTalHN2RCiavpOMU02o+VVpxgUy7M1+VXJXTJm0y4j4g
tZIT0SV2FqEpoKipZqoAL7a9B69WfPbbbIX8danhReafDh4oj4yWocvSwMKYv1
3nLak3+wpmQNrnwJZl9FIHP2FClrvThQupm7uqHF3TFNbbBPTVY3qkNP278wx
/njUrZKbfvd81Cc+ngU133bhuBR3FFsQNASYUzgl5+JexALH5jhBahd2aRXBag
iqLhvxdYK0dEqIEwfdDedi7i+yro2gbNhxLDdtkubklMrn0t5g2WXNKNzaNa/H7
KWv8JSWcVlvmW1n/w79aEbdizBBfer+ZoMPkGLbyb/EVYZhHABeWH3iK6/ecnRd
4Kn7k09f9xXH1zzTevYAVMBAAgGADANBkgbexiG9wOBAQUDAAQAcgEAzSS4ffYf
2WN0vmZQlgsSbcVHPVEYg+p/Au9iNM9KD4P4OK41UD8tOgy09Kc8EvlkBUM59
fyjt2T/3RqSgv vkCEHJsvW3MnSsyjDo6Ruc0HmuY4q+tuLL+diLSQnZXGUt8asw
dhEpdEzXa6o9cfvVZMST5qicfAmNBR4BaO96+VALg59fu/chU1pvKWWMGXz4I2s
7z+UdmBYO4pEyGli134Qof/z4K0SVNiCn3CEkW5TisSt8qA/E2JXX1LhbMYWKyuY
9ur/gspHuWzk1XZFX4sMTK/RsElV7fBztIO8NmyFNOma84D9pqqrls/yhvZ/Z
iDP6Tgk4RbNzuanRBSyIjF4uT/rnJ1K8uv3ZyFJ+3DKc8oz1BLuQdadxHcJgl4t
m/T4FsHa3JS+D8cd4aEPfIvVNCwP4+RKB+Dk6EyQe8uKrVL7ShbacQCUxn0AAd
01+DQyFQ7Mczcm84L98srhoV3JnIEKjcaPseiB7S9KtHvv3s4q1lQ5M2jQppkyz
qSPFhCyOGjQoccQoRsNehV9f4h9fTszEdUY1UgLvtrJf+FTT2k7nMK641wFvTSO
Lc16kuYsZg16FxcncH5gKHTQMx9nv+UyJ5Wx3aN12N0ZQbaIDcQP75Em2E
aKj28cZ6FEavimn69sz0B8PHVQ+6dPwywM=

-----BEGIN CERTIFICATE REQUEST-----
EXAMPLE #7  To generate a key set and certificate request that is automatically received by the Control Station for the persona identified by the persona name default, type:

```
$ server_certificate server_2 -persona -generate default -key_size 2048 -cs_sign_duration 12 -common_name division.xyz.com
```

```
server_2 :
Starting key generation. This could take a long time ...
done
```

EXAMPLE #8  To generate a key set and certificate request to be sent to an external CA specifying subject information, type:

```
$ server_certificate server_2 -persona -generate default -key_size 2048 -common_name division.xyz.com -ou QA -organization XYZ -location Bethesda -state Maryland -country US -filename /tmp/server_2.1.request.pem
```

```
server_2 :
Starting key generation. This could take a long time ...
done
```

EXAMPLE #9  To import a signed certificate and paste the certificate text, type:

```
$ server_certificate server_2 -persona -import default
```

```
server_2 : Please paste certificate data. Enter a carriage return and on the new line type 'end of file' or 'eof' followed by another carriage return.
```
server_cdms

Provides File Migration Service for VNX functionality for the specified Data Movers.

SYNOPSIS

server_cdms {<movername>|ALL}
   -connect <mgfs> -type {nfsv2|nfsv3} -path <localpath>
   -source <srcName>:<srcPath>[-option <options>]
|   -connect <mgfs> -type cifs -path <localpath> -netbios <netbios> -source
     \\<srcServer>[.<domain>]<srcShare>[<srcPath>] -admin
     [<domain>]<admin_name> [<wins> <wins>]
|   -disconnect <mgfs> {-path <localpath>|-path <cid>|-all}
|   -verify <mgfs> [-path {<localpath>|<cid>}]| -admin
|   -Convert <mgfs>
|   -start <mgfs> -path <localpath> [-Force] -log <logpath>
|     [-include <include_path>][-exclude <exclude_path>]
|   -halt <mgfs> -path <localpath>
|   -info [<mgfs>][-state {START|STOP|ON_GOING|ERROR|SUCCEED|FAIL}]

DESCRIPTION

server_cdms establishes and removes connections to remote systems, and allows users to start on-access migration.

server_cdms creates an auto-migration process on the Data Mover to ensure that all data has been migrated from the remote system. server_cdms also checks the state of the migrated file system (MGFS), all auto-migration processes, and the connection, and reports if all data has been migrated successfully.

CDMS supports NFSv2 and NFSv3 only.

The ALL option executes the command for all Data Movers.

OPTIONS

-connect <mgfs> -type {nfsv2|nfsv3} -path <localpath>
   -source <srcName>:<srcPath> Provides a connection for the VNX with the remote NFS server. The -type option specifies the protocol type to be used for communication with the remote NFS server. The directory <localpath> in the file system must be unique for that file system.

The -source option specifies the source file server name or IP address of the remote server as the <srcName> and the export path for migration. For example, nfs_server:/export/path

Note: After the -connect command completes, the file system must be exported.
[-option <options>]
Specifies the following comma-separated options:

[useRootCred={true|false}]
When the file system is mounted, true ensures that the MGFS reads from the source file server using root access UID=0, GID=0. This assumes that the source file server path is exported to allow root access from the specified Data Mover. When false (default), the MGFS uses the owner’s UID and GID to access data.

[proto={TCP|UDP}]
Sets the connection protocol type. The default is TCP.

[nfsPort=<port>]
Sets a remote NFS port number in case the Portmapper or RPC bind is not running, and the port is not the default of 2049.

[mntPort=<port>]
Sets a remote mount port number in case Portmapper or RPC bind is not running.

[mntVer={1|2|3}]}
Sets the version used for mount protocol. By default, NFSv2 uses mount version 2, unless user specified version 1; NFSv3 uses mount version 3.

[localPort=<port>]
Sets the port number used for NFS services, if it needs to be different from the default. The default port number is always greater than 1024.

-connect <mgfs> -type cifs -path <localpath> -netbios <netbios> -source \\<srcServer>.[<domain>] \\
<srcShare>[\<srcPath>] -admin [\<admin_name>] -wins [\<wins>]
Provides a connection for the VNX with the remote CIFS server as specified by its NetBIOS name. The directory <localpath> in the file system must be unique for that file system. The -source option specifies the source file server name of the remote server as the <srcName> and the share path for migration that is not at the root of the share. For example, \\share\dir1...

The -source and -admin option strings must be enclosed by quotes when issued in a Linux shell.

The -admin option specifies an administrator for the file system. A password is asked interactively when the command is issued. The -wins option specifies an IP address for the WINS server.
Note: This is required only for Windows NT 4.0.

-disconnect <mgfs> [-path <localpath> | -path <cid> | -all]
Removes a connection without migrating the data. The <localpath> is not removed nor is any partially migrated data.

The administrator should manually remove this data before attempting a -verify or -Convert command. It may require the administrator to handle a partial migration of old data as well as potentially new data created by users.

It is recommended not to use the -disconnect option if the administrator has exported this directory for user access.

-verify <mgfs>
Checks that all data has completed the migration for the <mgfs>.

[-path {<localpath>|<cid>}]
If the -path option is provided, it can check on a communication basis. If no path is provided, the system defaults to checking all connections on the file system.

-Convert <mgfs>
Performs a verify check on the entire file system, then changes the file system type from MGFS to UxFS. After the -Convert option succeeds, no data migration can be done on that file system.

-start <mgfs> -path <localpath> [-Force] -log <logpath>
Directs the Data Mover to migrate all files from the source file server to the VNX. The -log option provides detailed information on the state of the migration, and any failures that might occur. The <localpath> is the path where the migration thread is started. The -Force option is used if you need to start a migration thread a second time on the same <localpath> where a previous migration thread had already finished. For example, -Force would be needed to start a thread which had no include file (that is, to migrate all remaining files) on <localpath> where a thread with an include file had already been run.

[-include <include_path>]
Starts the thread in the <include_path> which is the path of the file containing the specified directories.

[-exclude <exclude_path>]
Excludes files or directories from migration. The <include_path> is the path of the file containing the specified directories.
The server Commands

-halt <mgfs> -path <localpath>
Stops a running thread, and halts its execution on the Data Mover. The <mgfs> is the name of the migration file system and the <localpath> is the full path where the migration thread was started.

The -start option resumes thread execution.

-info
Displays a status on the migration file system and the threads.

   [<mgfs>]
   Specifies the migration file system.

   [-state {START|STOP|ON_GOING|ERROR|SUCCEED|FAIL}]
   Displays only the threads that are in the state that is specified.

SEE ALSO
VNX CDMS Version 2.0 for NFS and CIFS, server_export, server_mount, and server_setup.

EXAMPLE #1
To provide a connection for the migration file system to communicate with the remote NFS server, type:

$ server_cdms server_2 -connect ufs1 -type nfsv3 -path /nfsdir -source 172.24.102.144:/srcdir -option proto=TCP

server_2 : done

EXAMPLE #2
To provide a connection for the migration file system to communicate with the remote CIFS server, type:

$ server_cdms server_2 -connect ufs1 -type cifs -path /dstdir -netbios dm112-cge0 -source "\\\winserver1.nasdocs.emc.com\srcdir" -admin "nasdocs.emc.com\administrator" -wins 172.24.102.25

server_2 : Enter Password:******
done

EXAMPLE #3
To display a status on the migration file system, type:

$ server_cdms server_2

server_2 :
CDMS enabled with 32 threads.

ufs1:
path = /nfsdir
cid = 0
type = NFSV3
source = 172.24.102.144:/srcdir
options = proto=TCP
path = /dstdir
cid = 1
When migration is started:

$ server_cdms server_2

server_2 :
CDMS enabled with 32 threads.

ufs1:
path = /nfsdir
cid = 0
type = NFSV3
source = 172.24.102.144:/srcdir
options= proto=TCP
path = /dstdir
cid = 1
type = CIFS
source = 172.24.102.144:/srcdir
netbios= DM112-CGE0.NASDOCS.EMC.COM
admin = nasdocs.emc.com\administrator

threads:
path = /dstdir
state = ON_GOING
log = /
cid = NONE

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs1</td>
<td>Migration file system.</td>
</tr>
<tr>
<td>path</td>
<td>Directory in the local file system.</td>
</tr>
<tr>
<td>cid</td>
<td>Connection ID (0 through 1023).</td>
</tr>
<tr>
<td>type</td>
<td>Protocol type to be used to communicate with the remote server.</td>
</tr>
<tr>
<td>source</td>
<td>Source file server name or IP address of the remote server and the export path for migration.</td>
</tr>
<tr>
<td>options</td>
<td>Connection protocol type.</td>
</tr>
<tr>
<td>netbios</td>
<td>NetBIOS name of the remote CIFS server.</td>
</tr>
<tr>
<td>admin</td>
<td>Administrator for the file system.</td>
</tr>
<tr>
<td>threads</td>
<td>Currently existing migration threads.</td>
</tr>
<tr>
<td>state</td>
<td>Current status of migration threads.</td>
</tr>
<tr>
<td>log</td>
<td>Location of the log file that provides detailed information.</td>
</tr>
</tbody>
</table>

**EXAMPLE #4**

To direct server_2 to migrate all files from the source file server to the VNX, type:

$ server_cdms server_2 -start ufs1 -path /dstdir -log /

server_2 : done
EXAMPLE #5  To display information about migration with the specified status, type:

\$ server_cdms server_2 -info ufs1 -state ON_GOING

server_2 :

ufs1:
  path    = /nfsdir
  cid     = 0
  type    = NFSV3
  source  = 172.24.102.144:/srcdir
  options = proto=TCP
  path    = /dstdir
  cid     = 1
  type    = CIFS
  source  = \winserver1.nasdocs.emc.com\srcdir\netbios= DM112-CGE0.NASDOCS.EMC.COM
  admin   = nasdocs.emc.com\administrator
  threads:
    path      = /dstdir
    state     = ON_GOING
    log       = /none

EXAMPLE #6  To stop data migration on server_2 for ufs1, type:

\$ server_cdms server_2 -halt ufs1 -path /dstdir

server_2 : done

EXAMPLE #7  To check that all data has completed the migration, type:

\$ server_cdms server_2 -verify ufs1 -path /dstdir

server_2 : done

EXAMPLE #8  To disconnect the path on server_2 for data migration, type:

\$ server_cdms server_2 -disconnect ufs1 -path /nfsdir

server_2 : done

EXAMPLE #9  To disconnect all paths for data migration, type:

\$ server_cdms server_2 -disconnect ufs1 -all

server_2 : done

EXAMPLE #10  To perform a verify check on ufs1, and then convert it to a uxs, type:

\$ server_cdms server_2 -Convert ufs1

server_2 : done
server_cepp

Manages the Common Event Publishing Agent (CEPA) service on the specified Data Mover.

SYNOPSIS

server_cepp {<movername>|ALL}
           -service { -start | -stop | -status | -info }
           | -pool { -info | -stats }

DESCRIPTION

server_cepp starts or stops the CEPA service on the specified Data Mover or all Data Movers and displays information on the status, configuration, and statistics for the service and the pool. The CEPA service is set up in the cepp.conf configuration file. The CEPA configuration is displayed using -service -status, but changes can only be made by directly editing the file with a text editor.

ALL executes the command for all Data Movers.

OPTIONS

-service { -start | -stop | -status | -info }
The -start option starts the CEPA service on the specified Data Mover.
-stop stops the CEPA service, -status returns a message indicating whether the CEPA service has started or been stopped, and -info displays information about the CEPA service including key properties of the configured pool.

-pool { -info | -stats }
Displays properties or statistics for the CEPA pool on the specified Data Mover.

SEE ALSO

Using VNX Event Enabler

EXAMPLE #1
To start the CEPA service on a Data Mover, type:

$ server_cepp server_2 -service -start
server_2 : done

EXAMPLE #2
To display the status of the CEPA service, type:

$ server_cepp server_2 -service -status
server_2 : CEPP Stopped
EXAMPLE #3  To display the configuration of the CEPA service, type:

\$ server_cepp server_2 -service -info

server_2 :
CIFS share name = \DVBL\CHECK$
cifs_server = DVBL
heartbeat_interval = 15 seconds
ft level = 1
ft size = 1048576
ft location = /.etc/cepp
msrpc user = OMEGA13$
msrpc client name = OMEGA13.CEE.LAB.COM

<table>
<thead>
<tr>
<th>pool_name</th>
<th>server_required</th>
<th>access_checks_ignored</th>
<th>req_timeout</th>
<th>retry_timeout</th>
</tr>
</thead>
<tbody>
<tr>
<td>pool_1</td>
<td>no</td>
<td>0</td>
<td>5000</td>
<td>25000</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIFS share name</td>
<td>The name of the shared directory and CIFS server used to access files in the Data Movers.</td>
</tr>
<tr>
<td>cifs_server</td>
<td>CIFS server to access files.</td>
</tr>
<tr>
<td>heartbeat_interval</td>
<td>The time taken to scan each CEPA server.</td>
</tr>
<tr>
<td>ft level</td>
<td>Fault tolerance level assigned. This option is required. 0 (continue and tolerate lost events; default setting), 1 (continue and use a persistence file as a circular event buffer for lost events), 2 (continue and use a persistence file as a circular event buffer for lost events until the buffer is filled and then stop CIFS), or 3 (upon heartbeat loss of connectivity, stop CIFS).</td>
</tr>
<tr>
<td>ft location</td>
<td>Directory where the persistence buffer file resides relative to the root of a file system. If a location is not specified, the default location is the root of the file system.</td>
</tr>
<tr>
<td>ft size</td>
<td>Maximum size in MB of the persistence buffer file. The default is 1 MB and the range is 1 MB to 100 MB.</td>
</tr>
<tr>
<td>msrpc user</td>
<td>Name assigned to the user account that the CEPA service is running under on the CEE machine. For example, ceeuser.</td>
</tr>
<tr>
<td>msrpc client name</td>
<td>Domain name assigned if the msrpc user is a member of a domain. For example, domain.ceeuser.</td>
</tr>
<tr>
<td>pool_name</td>
<td>Name assigned to the pool that will use the specified CEPA options.</td>
</tr>
<tr>
<td>server_required</td>
<td>Displays availability of the CEPA server. If a CEPA server is not available and this option is yes, an error is returned to the requestor that access is denied. If a CEPA server is not available and this option is no, an error is not returned to the requestor and access is allowed.</td>
</tr>
<tr>
<td>access_checks_ignored</td>
<td>The number of CIFS requests processed when a CEPA server is not available and the server_required option is set to “no.” This option is reset when the CEPA server becomes available.</td>
</tr>
<tr>
<td>req_timeout</td>
<td>Time out in ms to send a request that allows access to the CEPA server.</td>
</tr>
<tr>
<td>retry_timeout</td>
<td>Time out in ms to retry the access request sent to the CEPA server.</td>
</tr>
</tbody>
</table>
EXAMPLE #4   To display information about the CEPA pool, type:

$ server_cepp server_2 -pool -info

server_2 :
pool_name = pool1
server_required = yes
access_checks_ignored = 0
req_timeout = 5000 ms
retry_timeout = 25000 ms
pre_events = OpenFileNoAccess, OpenFileRead
post_events = CreateFile, DeleteFile
post_err_events = CreateFile, DeleteFile
CEPP Servers:
IP = 10.171.10.115, state = ONLINE, vendor = Unknown
...

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre_events</td>
<td>Sends notification before selected event occurs. An empty list indicates that no pre-event messages are generated.</td>
</tr>
<tr>
<td>post_events</td>
<td>Sends notification after selected event occurs. An empty list indicates that no post-event messages are generated.</td>
</tr>
<tr>
<td>post_err_events</td>
<td>Sends notification if selected event generates an error. An empty list indicates that no post-error-event messages are generated.</td>
</tr>
<tr>
<td>CEPP Servers</td>
<td>IP addresses of the CEPA servers; state of the CEPA servers; vendor software installed on CEPA servers.</td>
</tr>
</tbody>
</table>

EXAMPLE #5   To display statistics for the CEPA pool, type:

$ server_cepp server_2 -pool -stats

server_2 :
pool_name = pool1
Event Name                      Requests  Min(us)  Max(us)  Average(us)
OpenFileWrite                   2         659      758       709
CloseModified                   2         604      635       620
Total Requests = 4
Min(us) = 604
Max(us) = 758
Average(us) = 664
server_checkup

Checks the configuration parameters, and state of a Data Mover and its dependencies.

SYNOPSIS

server_checkup {<movername>|ALL}
\{-test <component> [-subtest <dependency>]|-quiet|-full\}
| -list
| -info {<component>|all}

DESCRIPTION

server_checkup performs a sanity check of a specific Data Mover component and its dependencies by checking configuration parameters, and the current state of the component and dependencies.

A component is any basic feature that is available on the Data Mover, for example, CIFS. A dependency is a configuration component of a Data Mover that the proper operation of a Data Mover functionality (like CIFS) is depending upon. This configuration component can be owned by multiple Data Mover components. For example, proper operation of a CIFS service depends on correctly specified DNS, WINS, Antivirus, and so on.

server_checkup displays a report of errors and warnings detected in the specified Data Mover component and its dependencies.

OPTIONS

No arguments
Performs a sanity check of all the components and all their dependencies on the specified Data Mover or all Data Movers.

-test <component>
Performs a sanity check of a specific component and all of its dependencies.

[ -subtest <dependency> ]
Performs a sanity check of a specific component and its specified dependency only. If the dependency is not defined, executes the command for all the dependencies of the component.

-quiet
Displays only the number of errors and warnings for the sanity check.

-full
Provides a full sanity check of the specified Data Movers.
-list
Lists all available components that can be checked on a Data Mover.

-info <component>
Lists all dependencies of the specified component, with details of checks that can be performed on each dependency.

**EXAMPLE #1**
To list the available component in the Data Mover, type:

```bash
$ server_checkup server_2 -list
```

```
server_2 : done
REPV2
HTTPS
CIFS
FTPDS
```

**EXAMPLE #2**
To execute the check of the CIFS component, type:

```bash
$ server_checkup server_2 -test CIFS
```

```
Component CIFS :
ACL       : Checking the number of ACL per file system.........................*Pass
Connection: Checking the load of TCP connections of CIFS......................... Pass
Credential: Checking the validity of credentials.............................. Pass
DC        : Checking the connectivity and configuration of the DCs.............. Fail
DFS       : Checking the DFS configuration files and DFS registry.............. Pass
DNS       : Checking the DNS configuration and connectivity to DNS servers. Pass
EventLog  : Checking the configuration of Windows Event Logs.................. Pass
FS_Type   : Checking if all file systems are all DIR3 type........................ Pass
GPO       : Checking the GPO configuration........................................ Pass
HomeDir   : Checking the configuration of home directory share............... Pass
I18N      : Checking the I18N mode and the Unicode/UTF8 translation tables. Pass
Kerberos  : Checking machine password update for Kerberos...................... Fail
LocalGrp  : Checking the local groups database configuration................... Fail
NIS       : Checking the connectivity to the NIS servers, if defined......... Pass
NTP       : Checking the connectivity to the NTP servers, if defined........ Pass
Ntxmap    : Checking the ntxmap configuration file.............................. Pass
Security  : Checking the CIFS security settings.................................. Pass
Server    : Checking the CIFS files servers configuration........................ Pass
Share     : Checking the network shares database.................................. Pass
SmbList   : Checking the range availability of SMB ID............................*Pass
Threads   : Checking for CIFS blocked threads.................................... Pass
UM_Client : Checking for the connectivity to usermapper servers, if any.... Pass
UM_Server : Checking the consistency of usermapper database, if primary....*Pass
UnsupOS   : Checking for unsupported client network OS.......................... Pass
UnsupProto: Checking for unsupported client network protocols................ Pass
VC        : Checking the configuration to Virus Checker servers................. Pass
```
The server Commands

WINS : Checking for the connectivity to WINS servers, if defined...... Pass

NB: a result with a '*' means that some tests were not executed. use -full to run them

---------------------------------------------CIFS : Kerberos Warnings---------------------------------------------

Warning 17451974742: server_2 : No update of the machine password of server 'DM102-CGE1'. hold.
--> Check the log events to find out the reason of this issue.

Warning 17451974742: server_2 : No update of the machine password of server 'DM102-CGE0'. hold.
--> Check the log events to find out the reason of this issue.

---------------------------------------------CIFS : LocalGrp Warnings---------------------------------------------

Warning 17451974726: server_2 : The local group 'Guests' of server 'DM102-CGE1' contains an unmapped member: S-1-5-15-60415a8a-335a7a0d-6b635f23-202. The access to some network resources may be refused.
--> According the configured resolver of your system (NIS, etc config files, usermapper, LDAP...),add the missing members.

---------------------------------------------CIFS : DC Errors---------------------------------------------

Error 13160939577: server_2 : pingdc failed due to NT error ACCESS_DENIED at step SAMR lookups
--> check server configuration and/or DC policies according to reported error.

Error 13160939577: server_2 : pingdc failed due to NT error ACCESS_DENIED at step SAMR lookups
--> check server configuration and/or DC policies according to reported error.

EXAMPLE #3

To execute only the check of the DNS dependency of the CIFS component, type:

$ server_checkup server_2 -test CIFS -subtest DNS

server_2 :

Component CIFS :

DNS : Checking the DNS configuration and connectivity to DNS servers. Pass
EXAMPLE #4  To list the available dependencies of the CIFS component, type:

```
$ server_checkup server_2 -info CIFS
```

```
server_2 :
done

COMPONENT    : CIFS
DEPENDENCY   : ACL
DESCRIPTION   : Number of ACL per file system.
TESTS        :
In full mode, check if the number of ACL per file system doesn't exceed 90% of the
maximum limit.

COMPONENT    : CIFS
DEPENDENCY   : Connection
DESCRIPTION   : TCP connection number
TESTS        :
Check if the number of CIFS TCP connections doesn't exceed 80% of the maximum
number.

COMPONENT    : CIFS
DEPENDENCY   : Credential
DESCRIPTION   : Users and groups not mapped
TESTS        :
Check if all credentials in memory are mapped to a valid SID.

COMPONENT    : CIFS
DEPENDENCY   : DC
DESCRIPTION   : Connectivity to the domain controllers
TESTS        :
Check the connectivity to the favorite DC (DCPing),
In full mode, check the connectivity to all DC of the domain,
Check if DNS site information are defined for each computer name,
Check if the site of each computer name has an available DC,
Check if trusted domain of each computer name can be reached,
Check the ds.useDCLdapPing parameter is enabled,
Check the ds.useADSite parameter is enabled.

COMPONENT    : CIFS
DEPENDENCY   : DFS
DESCRIPTION   : DFS service configuration on computer names
TESTS        :
Check the DFS service is enabled in registry if DFS metadata exists,
Check the DFS metadata of each share with DFS flag are correct,
Check if share names in DFS metadata are valid and have the DFS flag,
Check if each DFS link is valid and loaded,
Check in the registry if the WideLink key is enabled and corresponds to a valid
share name.

COMPONENT    : CIFS
DEPENDENCY   : DNS
DESCRIPTION   : DNS domain configuration
The server Commands

TESTS :
Check if each DNS domain has at least 2 defined servers,
Check the connectivity to each DNS server of each DNS domain,
Check if each DNS server of each DNS domain supports really the DNS service,
Check the ds.useDSFile parameter (automatic discovery of DC),
Check the ds.useDSFile parameter is enabled if the directoryservice file exists.

COMPONENT : CIFS
DEPENDENCY : EventLog
DESCRIPTION : Event Logs parameters on servers
TESTS :
Check if the pathnames of each event logs files are valid (application, system and security),
Check if the maximum file size of each event logs file doesn't exceed 1GB,
Check if the retention time of each event logs file doesn't exceed 1 month.

COMPONENT : CIFS
DEPENDENCY : FS_Type
DESCRIPTION : DIR3 mode of filesystems
TESTS :
Check if each file system is configured in the DIR3 mode.

COMPONENT : CIFS
DEPENDENCY : GPO
DESCRIPTION : GPO configuration on Win2K servers
TESTS :
Check if the size of the GPO cache file doesn't exceed 10% of the total size of the root file system,
Check the last modification date of the GPO cache file is up-to-date,
Check the cifs.gpo and cifs.gpoCache parameters have not been changed,

COMPONENT : CIFS
DEPENDENCY : HomeDir
DESCRIPTION : Home directory shares configuration
TESTS :
Check if the home directory shares configuration file exists, the feature is enabled,
Check if the home directory shares configuration file is optimized (40 lines maximum),
Check the syntax of the home directory shares configuration file.

COMPONENT : CIFS
DEPENDENCY : I18N
DESCRIPTION : Internationalization and translation tables
TESTS :
Check if computer name exists, the I18N mode is enabled,
Check the .etc_common file system is correctly mounted,
Check the syntax of the definition file of the Unicode characters,
Check the uppercase/lowercase conversion table of Unicode character is valid.

COMPONENT : CIFS
DEPENDENCY : Kerberos
DESCRIPTION : Kerberos configuration
TESTS : Check the machine password update is enabled and up-to-date.

COMPONENT : CIFS
DEPENDENCY : LocalGrp
DESCRIPTION : Local groups and local users
TESTS : Check the local group database doesn't contain more than 80% of the maximum number of servers,
Check if the servers in the local group database are all valid servers,
Check the state of the local group database (initialized and writable),
Check if the members of built-in local groups are all resolved in the domain,
Check the number of built-in local groups and built-in local users,
Check if the number of defined local users doesn't exceed 90% of the maximum number.

COMPONENT : CIFS
DEPENDENCY : NIS
DESCRIPTION : Network Information System (NIS) configuration
TESTS : If NIS is configured, check at least 2 NIS servers are defined (redundancy check),
Check if each NIS server can be contacted on the network,
Check if each NIS server really supports the NIS service.

COMPONENT : CIFS
DEPENDENCY : NTP
DESCRIPTION : Network Time Protocol (NTP) configuration
TESTS : If NTP is configured, check at least 2 NTP servers are defined (redundancy check),
Check if each NIS server can be contacted on the network,
If computer names exist, check if NTP is configured and is running.

COMPONENT : CIFS
DEPENDENCY : Ntxmap
DESCRIPTION : Checking the ntxmap.conf file.
TESTS : Check the data consistency of the ntxmap configuration file.

COMPONENT : CIFS
DEPENDENCY : Security
DESCRIPTION : Security settings
TESTS : If the I18N mode is enabled, check the share/unix security setting is not in use,
Discourage to use the share/unix security setting,
Check the cifs.checkAcl parameter is enabled if the security setting is set to NT.

COMPONENT : CIFS
DEPENDENCY : Server
DESCRIPTION : Files servers
TESTS : Check if each CIFS server is configured with a valid IP interface,
The server Commands

Check if each computer name has joined its domain,
Check if each computer name is correctly registered in their DNS servers,
Check if the DNS servers have the valid IP addresses of each computer name,
Check if a DNS domain exists if at least one computer name exists,

COMPONENT : CIFS
DEPENDENCY : Share
DESCRIPTION : Network shares
TESTS :
Check the available size and i-nodes on the root file system are at least 10% of the total size,
Check the size of the share database doesn't exceed 30% of the total size of the root file system,
Check if the pathname of each share is valid and is available,
Check if each server in the share database really exists,
Check if the I18N mode is enabled, all the share names are UTF-8 compatible,
Check the list of ACL of each share contains some ACE,
Check the length of each share name doesn't exceed 80 Unicode characters.

COMPONENT : CIFS
DEPENDENCY : SmbList
DESCRIPTION : 64k UID, TID and FID limits
TESTS :
In full mode, check the 3 SMB ID lists (UID, FID and TID) don't exceed 90% of the maximum ID number.

COMPONENT : CIFS
DEPENDENCY : Threads
DESCRIPTION : Blocked threads and overload
TESTS :
Check CIFS threads blocked more than 5 and 30 seconds,
Check the maximum number of CIFS threads in use in the later 5 minutes doesn't exceed 90% of the total number,
Check the number of threads reserved for Virus Checker doesn't exceed 20% of the total number of CIFS threads.

COMPONENT : CIFS
DEPENDENCY : UM_Client
DESCRIPTION : Connectivity to the usermapper server
TESTS :
If usermapper servers are defined, check each server can be contacted,
Check if usermapper servers are defined, NIS is not simultaneously activated.

COMPONENT : CIFS
DEPENDENCY : UM_Server
DESCRIPTION : Primary usermapper server
TESTS :
If a primary usermapper is defined locally, check its database size doesn't exceed 30% of the total size,
Check if configuration file is in use, the filling rate of the ranges doesn't exceed 90%,
Check if configuration file is in use, 2 ranges do not overlap,
Check if secmap is enabled,
In full mode, check the SID/UID and SID/GID mappings and reverses are correct and coherent.

**COMPONENT** : CIFS
**DEPENDENCY** : UnsupOS
**DESCRIPTION** : Client OS not supported
**TESTS** :
Check for unsupported client network OS.

**COMPONENT** : CIFS
**DEPENDENCY** : UnsupProto
**DESCRIPTION** : Unsupported protocol commands detected
**TESTS** :
Check for unsupported client network protocol commands.

**COMPONENT** : CIFS
**DEPENDENCY** : VC
**DESCRIPTION** : Virus checker configuration
**TESTS** :
If VC is enabled, check the syntax of the VC configuration file,
Check if the VC 'enable' file and the VC configuration are compatible,
Check the number of VC servers. Make sure at least 2 servers are defined, for redundancy,
Check if there are offline VC servers,
Check if the VC high watermark has not been reached,
Check the connection of VC servers to the Data Mover.

**COMPONENT** : CIFS
**DEPENDENCY** : WINS
**DESCRIPTION** : WINS servers.
**TESTS** :
If NetBIOS names are defined, check if at least one WINS server is defined,
Check the number of WINS servers. check if two servers are defined for redundancy,
Check if each WINS server can be contacted on the network,
Check these servers are really WINS servers,
Check if the NetBIOS are correctly registered on the servers.

**EXAMPLE #5**
To execute additional tests, type:

\$ server_checkup server_2 -full

server_2 :

--------------------------------------------------------------------------------------Checks--------------------------------------------------------------------------------------

Component REPV2 :

F_RDE_CHEC: Checking the F-RDE compatibility of Repv2 sessions................. Fail

Component HTTPS :

HTTP : Checking the configuration of HTTP applications.................... Pass
The server Commands

SSL : Checking the configuration of SSL applications................. Fail

Component CIFS :

ACL : Checking the number of ACLs per file system..................... Pass
Connection: Checking the load of CIFS TCP connections.................. Pass
Credential: Checking the validity of credentials......................... Fail
DC : Checking the connectivity and configuration of Domain Controller Fail
DFS : Checking the DFS configuration files and DFS registry......... Fail
DNS : Checking the DNS configuration and connectivity to DNS servers. Fail
EventLog : Checking the configuration of Windows Event Logs........ Fail
FS_Type : Checking if all file systems are in the DIR3 format......... Pass
GPO : Checking the GPO configuration.................................. Pass
HomeDir : Checking the configuration of home directory shares........ Fail
I18N : Checking the I18N mode and the Unicode/UTF8 translation tables. Fail
Kerberos : Checking password updates for Kerberos.................... Fail
LDAP : Checking the LDAP configuration................................ Pass
LocalGrp : Checking the database configuration of local groups........ Fail
NIS : Checking the connectivity to the NIS servers.................... Pass
NS : Checking the naming services configuration....................... Fail
NTP : Checking the connectivity to the NTP servers..................... Fail
Ntxmap : Checking the ntxmap configuration file........................ Pass
Secmap : Checking the SECMAP database................................ Fail
Security : Checking the CIFS security settings............................ Fail
Server : Checking the CIFS file servers configuration.................. Fail
Share : Checking the network shares database........................... Fail
SmbList : Checking the range availability of SMB IDs.................. Fail
Threads : Checking for CIFS blocked threads............................ Pass
UM_Client : Checking the connectivity to usermapper servers.......... Pass
UM_Server : Checking the usermapper server database.................. Pass
UnsupOS : Checking for unsupported client network operating systems Pass
UnsupProto: Checking for unsupported client network protocols........ Pass
VC : Checking the configuration of Virus Checker servers............ Pass
WINS : Checking the connectivity to WINS servers...................... Fail

Component FTPDS :

FS_Type : Checking if all file systems are in the DIR3 format......... Pass
FTPD : Checking the configuration of FTPD............................... Fail
NIS : Checking the connectivity to the NIS servers.................... Pass
NS : Checking the naming services configuration....................... Fail
NTP : Checking the connectivity to the NTP servers..................... Fail
SSL : Checking the configuration of SSL applications.................. Fail

-----------------------------HTTPS : SSL Warnings-----------------------------

Warning 17456169084: server_2 : The SSL feature 'DHSM' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
--> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DIC' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
-->
--> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DIC_S' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
-->
--> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DIC_L' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
-->
--> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DBMS_FILE_TRANSFER' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
-->
--> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

--------------------------CIFS : Credential Warnings----------------------------

Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
-->
Start the CIFS server by executing the 'server_setup' command, and try again.

--------------------------CIFS : DC Warnings--------------------------------

Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
-->
Start the CIFS server by executing the 'server_setup' command, and try again.

--------------------------CIFS : DFS Warnings--------------------------------

Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
-->
Start the CIFS server by executing the 'server_setup' command, and try again.
The server Commands

---------------------------CIFS : EventLog Warnings---------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

---------------------------CIFS : HomeDir Warnings---------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

-----------------------------CIFS : I18N Warnings-----------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

---------------------------CIFS : Kerberos Warnings---------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

---------------------------CIFS : LocalGrp Warnings---------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

---------------------------CIFS : NTP Warnings---------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

Warning 17456168968: server_2: The Network Time Protocol subsystem (NTP) has been stopped or is not connected to its server. It may cause potential errors during Kerberos authentication (timeskew).
--> If the NTP service is not running, start it using the server_date command. If it is not connected, check the IP address of the NTP server and make sure the NTP service is up and running on the server. If needed, add another NTP server in the configuration of the Data Mover. Use the server_date command to manage the NTP service and the parameters on the Data Mover.

-----------------------------CIFS : Secmap Warnings-----------------------------

Warning 17456168968: server_2: The CIFS service is currently stopped. Many CIFS sanity check tests cannot be done as all CIFS servers are currently disabled on this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

----------------------------CIFS : Server Warnings-------------------------------
Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS
sanity check tests cannot be done as all CIFS servers are currently disabled on
this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

----------------------------CIFS : Share Warnings-------------------------------
Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS
sanity check tests cannot be done as all CIFS servers are currently disabled on
this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

----------------------------CIFS : SmbList Warnings-----------------------------
Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS
sanity check tests cannot be done as all CIFS servers are currently disabled on
this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

-----------------------------CIFS : WINS Warnings-----------------------------
Warning 17456168968: server_2 : The CIFS service is currently stopped. Many CIFS
sanity check tests cannot be done as all CIFS servers are currently disabled on
this Data Mover.
--> Start the CIFS server by executing the 'server_setup' command, and try again.

-----------------------------FTPDS : NTP Warnings-----------------------------
Warning 17456168968: server_2 : The Network Time Protocol subsystem (NTP) has
been stopped or is not connected to its server. It may cause potential errors
during Kerberos authentication (timeskew).
--> If the NTP service is not running, start it using the server_date command. If
it is not connected, check the IP address of the NTP server and make sure the NTP
service is up and running on the server. If needed, add another NTP server in the
configuration of the Data Mover. Use the server_date command to manage the NTP
service and the parameters on the Data Mover.

-----------------------------FTPDS : SSL Warnings-----------------------------
Warning 17456169044: server_2 : The Network Time Protocol subsystem (NTP) has
been stopped or is not connected to its server. It may cause potential errors
during Kerberos authentication (timeskew).
--> If the NTP service is not running, start it using the server_date command. If
it is not connected, check the IP address of the NTP server and make sure the NTP
service is up and running on the server. If needed, add another NTP server in the
configuration of the Data Mover. Use the server_date command to manage the NTP
service and the parameters on the Data Mover.

Warning 17456169084: server_2 : The SSL feature 'DHSM' can not get certificate
from the persona default. Because this feature needs a certificate and a private
key, it can not start,
--> Run the server_certificate command to generate a new key set and certificate
for this persona. Or run the appropriate command (like server_http for instance)
to set a correct persona for this SSL feature.
Warning 17456169084: server_2 : The SSL feature 'DIC' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
---> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DIC_S' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
---> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DIC_L' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
---> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

Warning 17456169084: server_2 : The SSL feature 'DBMS_FILE_TRANSFER' can not get certificate from the persona default. Because this feature needs a certificate and a private key, it can not start,
---> Run the server_certificate command to generate a new key set and certificate for this persona. Or run the appropriate command (like server_http for instance) to set a correct persona for this SSL feature.

-------------------------------------------------------------------------------------------------

--------------------------REPV2 : F_RDE_CHECK Errors----------------------------

Error 13160415855: server_2 : For the Replication session: rep1,
Data Mover version on the source fs: 5.6.47
Data Mover version on the destination fs: 5.5.5
Minimum required Data Mover version on the destination fs: 5.6.46

The Data Mover version on the destination file system is incompatible with the Data Mover version on the source file system. After data transfer, the data in the destination file system may appear to be corrupt, even though the data is in fact intact.

Upgrade the Data Mover where the destination file system resides to at least 5.6.46.

Error 13160415855: server_2 : For the Replication session:rsd1,
F-RDE version on the source fs: 5.6.46
F-RDE version on the destination fs: 5.5.5
Minimum required F-RDE version on the destination fs: 5.6.46
The F-RDE versions are incompatible.
After data transfer, the data in the dst FS may appear to be corrupt.
The server Commands

--> Upgrade the DataMover where the dst fs resides to at least the version on the source.

Error 13160415855: server_2: For the Replication session: rsd2, F-RDE version on the source fs: 5.6.46
F-RDE version on the destination fs: 5.5.5
Minimum required F-RDE version on the destination fs: 5.6.46
The F-RDE versions are incompatible.
After data transfer, the data in the dst FS may appear to be corrupt.
--> Upgrade the DataMover where the dst fs resides to at least the version on the source.

Error 13160415855: server_2: For the Replication session: rsd3, F-RDE version on the source fs: 5.6.46
F-RDE version on the destination fs: 5.5.5
Minimum required F-RDE version on the destination fs: 5.6.46
The F-RDE versions are incompatible.
After data transfer, the data in the dst FS may appear to be corrupt.
--> Upgrade the DataMover where the dst fs resides to at least the version on the source.

-----------------------------HTTPS : SSL Errors-------------------------------------

Error 13156876314: server_2: The persona 'default' contains neither certificate nor private keys sets. So, this persona can not be used by a SSL feature on the Data Mover.
--> Run the server_certificate command to generate a new key set and certificate for this persona.

-----------------------------CIFS : DNS Errors-------------------------------------

Error 13161070637: server_2: The DNS service is currently stopped and does not contact any DNS server. The CIFS clients may not be able to access the Data Mover on the network.
--> Start the DNS service on the Data Mover, using the 'server_dns' command.

-----------------------------CIFS : NS Errors-------------------------------------

Error 13156352011: server_2: None of the naming services defined for the entity 'host' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.

Error 13156352011: server_2: None of the naming services defined for the entity 'group' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.
The server Commands

Error 13156352011: server_2 : None of the naming services defined for the entity 'netgroup' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.

-----------------------------FTPDS : FTPD Errors--------------------------------

Error 13156876314: server_2 : The persona 'default' contains nor certificate neither private keys sets. So, this persona can not be used by a SSL feature on the Data Mover.
--> Run the server_certificate command to generate a new key set and certificate for this persona.

------------------------------FTPDS : NS Errors---------------------------------

Error 13156352011: server_2 : None of the naming services defined for the entity 'host' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.

Error 13156352011: server_2 : None of the naming services defined for the entity 'group' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.

Error 13156352011: server_2 : None of the naming services defined for the entity 'netgroup' in nsswitch.conf is configured.
--> Make sure each entity (e.g. host, passwd..) in the nsswitch.conf file contains naming services, (e.g. local files, NIS or usermapper), and make sure these services are configured. Use the corresponding commands like server_nis, server_dns or server_ldap to make sure they are configured.

------------------------------FTPDS : SSL Errors--------------------------------

Error 13156876314: server_2 : The persona 'default' contains nor certificate neither private keys sets. So, this persona can not be used by a SSL feature on the Data Mover.
--> Run the server_certificate command to generate a new key set and certificate for this persona.

--------------------------------------------------------------------------------

Total : 14 errors, 25 warnings
EXAMPLE #6  To display only the number of errors and warnings for a Data Mover and dependency, type:

```bash
$ server_checkup server_2 -quiet
```

server_2:

```
------------------------------------Checks--------------------------------------
Component REPV2:
F_RDE_CHEC: Checking the F-RDE compatibility of Repv2 sessions........... Fail

Component HTTPS:
HTTP: Checking the configuration of HTTP applications................. Pass
SSL: Checking the configuration of SSL applications.................... Pass

Component CIFS:
ACL: Checking the number of ACLs per file system...................... Pass
Connection: Checking the load of CIFS TCP connections....................... Pass
Credential: Checking the validity of credentials......................... Fail
DC: Checking the connectivity and configuration of Domain Controller..... Fail
DFS: Checking the DFS configuration files and DFS registry.............. Fail
DNS: Checking the DNS configuration and connectivity to DNS servers... Fail
EventLog: Checking the configuration of Windows Event Logs........... Fail
FS_Type: Checking if all file systems are in the DIR3 format........... Pass
GPO: Checking the GPO configuration..................................... Pass
HomeDir: Checking the configuration of home directory shares........ Fail
I18N: Checking the I18N mode and the Unicode/UTF8 translation tables... Fail
Kerberos: Checking password updates for Kerberos...................... Fail
LDAP: Checking the LDAP configuration.................................. Pass
LocalGrp: Checking the database configuration of local groups.......... Fail
NIS: Checking the connectivity to the NIS servers...................... Pass
NS: Checking the naming services configuration.......................... Fail
NTP: Checking the connectivity to the NTP servers...................... Fail
Ntxmap: Checking the ntxmap configuration file.......................... Pass
Secmap: Checking the SECMAP database.................................. Fail
Security: Checking the CIFS security settings.......................... Fail
Server: Checking the CIFS file servers configuration................... Fail
Share: Checking the network shares database............................ Fail
SmbList: Checking the range availability of SMB IDs.................. Pass
Threads: Checking for CIFS blocked threads............................. Pass
UM_Client: Checking the connectivity to usermapper servers........ Pass
UM_Server: Checking the usermapper server database................... Pass
UnsupOS: Checking for unsupported client network operating systems... Pass
UnsupProto: Checking for unsupported client network protocols........ Pass
VC: Checking the configuration of Virus Checker servers.............. Pass
WINS: Checking the connectivity to WINS servers........................ Fail

Component FTPDS:
```
FS_Type   : Checking if all file systems are in the DIR3 format............ Pass
FTPD      : Checking the configuration of FTPD............................. Fail
NIS       : Checking the connectivity to the NIS servers................... Pass
NS        : Checking the naming services configuration..................... Fail
NTP       : Checking the connectivity to the NTP servers................... Fail
SSL       : Checking the configuration of SSL applications................. Pass

NB: a result with a '*' means that some tests were not executed. use -full to run them

--------------------------------------------------------------------------------

Total :   12 errors, 14 warnings

------------------------------------Checks--------------------------------------
server_cifs

Manages the CIFS configuration for the specified Data Movers or Virtual Data Movers (VDMs).

SYNOPSIS

server_cifs {<movername>|ALL} [options]
'options' can be one of the following:
  - option {{audit [,user=<user_name>][,client=<client_name>] [,full]}
        | homedir [=NO]}
  - add netbios=<netbios_name>,domain=<domain_name>[,alias=<alias_name>...]
    [,hidden={y|n}] [[,interface=<if_name>[,wins=<ip>[:<ip>]]]...]
    [,local_users] [-comment <comment>]
  - add
    compname=<comp_name>,domain=<full_domain_name>[,alias=<alias_name>...]
    [,hidden={y|n}][,authentication={kerberos|all}]
    [,netbios=<netbios_name>][[,interface=<if_name>[,wins=<ip>[:<ip>]]]
    [,dns=<if_suffix>]]...[,local_users][-comment <comment>]
  - add standalone=<netbios_name>,workgroup=<workgroup_name>
    [,alias=<alias_name>...][,hidden={y|n}]
    [[,interface=<if_name>[,wins=<ip>[:<ip>]]]...][,local_users]
    [-comment <comment>]
  - rename -netbios <old_name> <new_name>
  - Join compname=<comp_name>,domain=<full_domain_name>,admin=<admin_name>
    [,ou=<organizational_unit>]
  - option {reuse|resetserverpasswd|addservice=nfs}
  - Unjoin compname=<comp_name>,domain=<full_domain_name>,admin=<admin_name>
  - add security={NT|UNIX|SHARE} [,dialect=<dialect_name>]
  - add wins=<ip_addr>[,wins=<ip_addr>...]
  - add usrmapper=<ip_addr>[,usrmapper=<ip_addr>...]
  - Disable <interface>[,<interface>...]
  - Enable <interface>[,<interface>...]
  - delete netbios=<netbios_name> [-remove_localgroup]
    [,alias=<alias_name>...][,interface=<if_name>]
  - delete compname=<comp_name> [-remove_localgroup]
    [,alias=<alias_name>...][,interface=<if_name>]
  - delete wins=<ip_addr>[,wins=<ip_addr>...]
  - delete usrmapper=<ip_addr>[,usrmapper=<ip_addr>...]
  - delete standalone=<netbios_name> [-remove_localgroup]
    [,alias=<alias_name>...][,interface=<if_name>]
  - update {<share_name>|<path>} [mindirsizex=<size>][force]
  - Migrate {<fs_name>-acl|<netbios_servername> -localgroup}
    <src_domain>{:nb=<netbios>|:if=<interface>}
    <dst_domain>{:nb=<netbios>|:if=<interface>}
  - Replace {<fs_name>-acl|<netbios_servername> -localgroup}
    {:nb=<netbios>|:if=<interface>}
  - smbhash
    {-hashgen <path> [-recursive] [-minsize <size>]
    | -hashdel <path> [-recursive]
The server Commands

-abort <id>
-info
-fsusage <fs_name>
-exclusionfilter <filter>
-audit {enable|disable} [-task] [-service] [-access]
-service {enable|disable}
-cleanup <fs_name> [-all | -unusedfor <days> | -unusedsince <date>}

-setspn {-list [server=<full_comp_name>]
| -add <SPN> compname=<comp_name>, domain=<full_domain_name>,
  admin=<admin_name>
| -delete <SPN> compname=<comp_name>, domain=<full_domain_name>,
  admin=<admin_name>}

DESCRIPTION

server_cifs manages the CIFS configuration for the specified <movername> which can be the physical Data Mover or VDMs.

Most command options are used with both VDMs and physical Data Movers, whereas others are only used with physical Data Movers. Options available for physical Data Movers only are:

- add security/dialect...
- add/delete usrmapper
- enable/disable interface

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments

Displays the CIFS protocol configuration. Certain inputs are not case-sensitive; however, variables may be automatically converted to uppercase.

<options>

CIFS options include:

-option audit

Audits the CIFS configuration by testing for live connections to a Data Mover.

[ ,user=<user_name>][,client=<client_name>][,full]

Audits the live connections created when the session is initiated by the specified <client_name> or audits the live connections for those owned by the specified <user_name>. The full option can be used to identify open files. The <client_name> can be a string or an IPV4 address and the <user_name> can be a string of maximum 20 characters.
-option homedir [=NO]
Enables and disables (default) the home directory feature. The Data Mover reads information from the homedir map file.

-add netbios=<netbios_name>, domain=<domain_name>
Configures a Windows NT 4.0-like CIFS server on a Data Mover, assigning the specified <netbios_name> and <domain_name> to the server. The domain name is limited to 15 bytes.

CAUTION
Each NetBIOS name must be unique to the domain and the Data Mover.

[,alias=<alias_name>...]
Assigns a NetBIOS alias to the <netbios_name> associated with the NetBIOS name. The <alias_name> must:

- Be unique on a Data Mover
- Be limited to 15 bytes
- Not begin with an @ (at sign) or - (dash) character
- Not include spaces, tab characters, or the following symbols: / \ : ; , = * + | [ ] ? < >"

[,hidden={y|n}]
By default, the <netbios_name> is displayed in the Network Neighborhood. If hidden=y is specified, the <netbios_name> does not appear.

[,interface=<if_name>[,wins=<ip>[:<ip>]]][...]
Specifies a logical IP interface for the CIFS server in the Windows NT 4.0 domain and associates up to two WINS IP addresses with each interface. The interface name is case-sensitive.

Note: When configuring a CIFS server without any interfaces for a Data Mover, it becomes the default CIFS server and is available on all interfaces not used by other CIFS servers. The default CIFS server can be deleted at any time. It is recommended that IP interfaces should always be specified. VDMs do not have default CIFS servers.

[,local_users]
Enables local user support that allows the creation of a limited number of local user accounts on the CIFS server. When this command executes, type and confirm a password that is assigned to the local Administrator account on the CIFS server. In addition
to the Administrator account, a Guest account is also created. The Guest account is disabled by default. The Administrator account password must be changed before the Administrator can log in to the CIFS server.

After initial creation of the stand-alone server, the `local_users` option resets the local Administrator account password. The password can only be reset if it has not been changed through a Windows client. If the password has already been changed through Windows, the reset will be refused.

```
[-comment <comment>]
```

Assigns a comment to the configuration. The comment is delimited by quotes. Comment length is limited to 48 bytes (represented as 48 ASCII characters or a variable number of Unicode multibyte characters) and cannot include colons since they are recognized as delimiters.

```
-add compname=<comp_name>,domain= <full_domain_name>
```

Configures a CIFS server as the `<comp_name>` in the specified Windows Active Directory workgroup. A default NetBIOS name is automatically assigned to the `<comp_name>`. Since the default for `<netbios_name>` is derived from the `<comp_name>`, the `<comp_name>` must not contain any characters that are invalid for a `<netbios_name>`.

In the case of disjointed namespaces, you must use the fully qualified domain name for the `<comp_name>`. For example, for a disjointed namespace, you must always specify the fully qualified domain name (FQDN) with the computer name when joining a CIFS server to a domain, that is, dm112-cge0.emc.com, not just dm112-cge0.

The `<comp_name>` is limited to 63 bytes. The fully qualified domain name is limited to 155 bytes. The `<full_domain_name>` must contain a dot (.). There cannot be a @ (at sign) or - (dash) character. The name also cannot include spaces, tab characters, or the symbols: / \ : ; , = * + | [ ] ? < > "

**CAUTION**

Each computer name must be unique to the domain and the Data Mover.

---

**Note:** Using International Character Sets for File provides details. Only Windows NT security mode can be configured when UTF-8 is enabled.
The server Commands

[,alias=<alias_name>...] Assigns an alias to the NetBIOS name. The <alias_name> must:

- Be unique on a Data Mover
- Be limited to 15 bytes
- Not begin with an @ (at sign) or - (dash) character
- Not include spaces, tab characters, or the following symbols: / : ; , = * + |

[,hidden={y|n}] By default, the computer name appears in the Network Neighborhood. If hidden=y is specified, then the computer name does not appear.

[,authentication={kerberos|all}] Specifies the type of user authentication. The kerberos option limits the server usage to Kerberos authentication; the all option (default) allows both Kerberos and NTLM authentication.

[,netbios=<netbios_name>] Specifies a <netbios_name> for the <comp_name> in place of the default. The default for <netbios_name> is assigned automatically and is derived from the first 15 bytes of the <comp_name>. The <netbios_name> cannot begin with an @ (at sign) or - (dash) character. The name also cannot include spaces, tab characters, or the symbols: / : ; , = * + |

[,interface=<if_name>[,wins=<ip>[:<ip>]]]... Specifies a logical IP interface for the CIFS server in the Active Directory domain and associates up to two WINS IP addresses with each interface. The interface name is case-sensitive.

Note: When configuring a CIFS server without any interfaces for a Data Mover, it becomes the default CIFS server and is available on all interfaces not used by other CIFS servers. The default CIFS server can be deleted at any time. It is recommended that IP interfaces should always be specified. VDMs do not have default CIFS servers.

[,dns=<if_suffix>] Specifies a different DNS suffix for the interface for DNS updates. By default, the DNS suffix is derived from the domain. This DNS option does not have any impact on the DNS settings of the Data Mover.
The server Commands

[,\texttt{local_users}]

Enables local user support that allows the creation of a limited number of local user accounts on the CIFS server. When this command executes, type and confirm a password that is assigned to the local Administrator account on the CIFS server. In addition to the Administrator account, a Guest account is also created. The Guest account is disabled by default. The Administrator account password must be changed before the Administrator account can log in to the CIFS server.

After initial creation of the stand-alone server, the \texttt{local_users} option resets the local Administrator account password. The password can only be reset if it has not been changed through a Windows client. If the password has already been changed through Windows, the reset will be refused.

[\texttt{-comment <comment>}]  
Assigns a comment to the configuration. The comment is delimited by quotes. Comment length is limited to 48 bytes (represented as 48 ASCII characters or a variable number of Unicode multibyte characters) and cannot include colons since they are recognized as delimiters.

\texttt{-add standalone=<netbios_name>, workgroup=<workgroup_name>}

Creates or modifies a stand-alone CIFS server on a Data Mover, assigning the specified \texttt{<netbios_name>} and \texttt{<workgroup_name>} to the server. The NetBIOS and workgroup names are limited to 15 bytes. When creating a stand-alone CIFS server for the first time, the \texttt{local_users} option must be typed, or the command will fail. It is not required when modifying the CIFS server. A stand-alone CIFS server does not require any Windows domain infrastructure. A stand-alone server has local user accounts on the Data Mover and NTLM is used to authenticate users against the local accounts database.

\textbf{CAUTION}

Each NetBIOS name must be unique to the workgroup and the Data Mover.

[,\texttt{alias=<alias_name>...}]

Assigns an alias to the NetBIOS name. The \texttt{<alias_name>} must:

- Be unique on a Data Mover
- Be limited to 15 bytes
• Not begin with an @ (at sign) or - (dash) character
• Not include spaces, tab characters, or the following symbols: / \\
  ;; = * + [ ] ? < > "

[ , hidden = ( y | n ) ]
By default, the <netbios_name> is displayed in the Network Neighborhood. If hidden = y is specified, the <netbios_name> does not appear.

[[ , interface = <if_name> , wins = <ip> [: <ip>] ] ... ]
Specifies a logical IP interface for the CIFS server and associates up to two WINS IP addresses with each interface. The interface name is case-sensitive.

Note: When configuring a CIFS server without any interfaces for a Data Mover, it becomes the default CIFS server and is available on all interfaces not used by other CIFS servers. The default CIFS server can be deleted at any time. It is recommended that IP interfaces should always be specified. VDMs do not have default CIFS servers.

[ , local_users ]
Enables local user support that allows the creation of a limited number of local user accounts on the CIFS server. When this command executes, type and confirm a password that is assigned to the local Administrator account on the CIFS server. In addition to the Administrator account, a Guest account is also created. The Guest account is disabled by default. The Administrator account password must be changed before the Administrator can log in to the CIFS server.

After initial creation of the stand-alone server, the local_users option resets the local Administrator account password. The password can only be reset if it has not been changed through a Windows client. If the password has already been changed through Windows, the reset will be refused.

[-comment <comment> ]
Assigns a comment to the configuration. The comment is delimited by quotes. Comment length is limited to 48 bytes (represented as 48 ASCII characters or a variable number of Unicode multibyte characters) and cannot include colons since they are recognized as delimiters.
The server Commands

- **rename** -netbios `<old_name>` `<new_name>`
Renames a NetBIOS name. For Windows Server, renames a Compname after the CIFS server is unjoined from the domain.

---

**Note:** Before performing a rename, the new NetBIOS name must be added to the domain using the Windows Server Users and Computers MMC snap-in.

---

- **Join** `compname=<comp_name>, domain=<full_domain_name>, admin=<admin_name>`
Creates an account for the CIFS server in the Active Directory. By default, the account is created under the domain root as `ou=Computers, ou=EMC VNX`.

**CAUTION**

Before performing a -Join, CIFS service must be started using `server_setup`.

The `<comp_name>` is limited to 63 bytes and represents the name of the server to be registered in DNS. The `<full_domain_name>` is the full domain name to which the server belongs. This means the name must contain at least one period (.). The `<admin_name>` is the logon name of the user with the right to create and manage computer accounts in the Organizational Unit that the CIFS server is being joined to. If a domain is given as part of the admin username it should be of the form: admin@FQDN. If no domain is given the admin user account is assumed to be part of the domain the CIFS Server is being joined to. The user is prompted to type a password for the admin account.

An Active Directory and a DNS can have the same domain name, or a different domain name (disjoint namespace). For each type of Active Directory and DNS domain relationship, specific VNX parameters and command values must be used. For example, for a disjoint namespace, you must always specify the fully qualified domain name (FQDN) with the computer name when joining a CIFS server to a domain, that is, `dm112-cge0.emc.com`, not just `dm112-cge0`.

**CAUTION**

Time services must be synchronized using `server_date`.

```
[, `ou=<organizational_unit>`,]
```
Specifies the organizational unit or container where computer accounts are created in the Active Directory. By default, computer
accounts are created in an organizational unit called Computers. The name must be in a valid distinguished name format, for example, ou="cn=My_mover". The name may contain multiple nested elements, such as ou="cn=comp:ou=mach". The colon (:) must be used as a separator for multiple elements. By default, ou=Computers,ou=EMC VNX is used. The organizational unit name is limited to 256 bytes.

[-option {reuse|resetserverpasswd|addservice= nfs}] The **reuse** option reuses the existing computer account with the original principal or joins a CIFS server to the domain where the computer account has been created manually.

The **resetserverpasswd** option resets the CIFS server password and encryption keys on a domain controller. This option could be used for security reasons, such as changing the server password in the Kerberos Domain Controller.

The **addservice** option adds the NFS service to the CIFS server, making it possible for NFS users to access the Windows Kerberos Domain Controller. Before adding NFS service, the <comp_name> must already be joined to the domain, otherwise the command will fail.

**-Unjoin compname=<comp_name>,domain=<full_domain_name>,admin=<admin_name>** Deletes the account for the CIFS server as specified by its <comp_name> from the Active Directory database. The user is prompted to type a password for the admin account.

**-add security={NT|UNIX|SHARE}** Defines the user authentication mechanism used by the Data Mover for CIFS services. NT (default) security mode uses standard Windows domain based user authentication. The local password and group files, NIS, EMC Active Directory UNIX users and groups extension, or UserMapper are required to translate Windows user and group names into UNIX UIDs and GIDs. NT security mode is required for the Data Mover to run Windows 2000 or later native environments. Unicode should be enabled for NT security mode.

**CAUTION**

EMC does not recommend the use of UNIX or SHARE security modes.
For UNIX security mode, the client supplies a username and a plain-text password to the server. The server uses the local (password or group) file or NIS to authenticate the user. To use UNIX security mode, CIFS client machines must be configured to send user passwords to the Data Mover unencrypted in plain text. This requires a registry or security policy change on every CIFS client machine.

For VDM, UNIX and SHARE security modes are global to the Data Mover and cannot be set for each VDM. Unicode must not be enabled.

For SHARE security mode, clients supply a read-only or read-write password for the share. No user authentication is performed using SHARE security. Since this password is sent through the network in clear text, you must modify the Client Registry to allow for clear text passwords.

CAUTION

Before adding or changing a security mode, CIFS service must be stopped using server_setup, then restarted once options have been set.

```
[, dialect=<dialect_name>]
```

Specifies a dialect. Optimum dialects are assigned by default. Options include CORE, COREPLUS, LANMAN1 (default for UNIX and SHARE security modes), LANMAN2, and NT1 (which represents SMB1 and is the default for NT security mode), SMB2 and SMB3.

- SMB1 dialect is NT1 dialect.
- SMB2 dialect means max dialect in SMB2 which is SMB2.1. SMB2.0 or SMB2.1 can be specified explicitly to refine the dialect revision.
- SMB3 dialect means max dialect in SMB3 which is SMB3.0. SMB3.0 can be specified explicitly.

Note: SMB3 is enabled by default.

```
-add wins=<ip_addr>[, wins=<ip_addr>...]
```

Adds the WINS servers to the CIFS configuration. The list of WINS servers is processed in the order in which they are added. The first one is the preferred WINS server. If after 1500 milliseconds, the first WINS server times out, the next WINS server on the list is used.
-add usrmapper=<ip_addr>[,usrmapper=<ip_addr>...]  
Adds the IP address(es) of a secondary Usermapper hosts to the CIFS configuration. A single IP address can point to a primary or secondary Usermapper host. If you are using distributed Usermappers, up to eight subsequent IP addresses can point to secondary Usermapper hosts.

-Disable <interface> [<interface>,...]  
Disables the specified IP interfaces for CIFS service. Interface names are case-sensitive. All unused interfaces should be disabled.

-Enable <interface> [<interface>,...]  
Enables the specified IP interfaces for CIFS service. Interface names are case-sensitive.

-delete standalone=<netbios_name>  
[,-remove_localgroup][,alias=<alias_name>...][,interface= <if_name>]  
Deletes the stand-alone CIFS server as identified by its NetBIOS name from the CIFS configuration of the Data Mover.

-delete netbios=<netbios_name>  
[,-remove_localgroup][,alias=<alias_name>...][,interface= <if_name>]  
Deletes the CIFS server as identified by its NetBIOS name from the CIFS configuration of the Data Mover.

-delete compname=<comp_name> [,-remove_localgroup]  
[,-alias=<alias_name>...][,interface= <if_name>]  
Deletes the CIFS server as identified by its compname from the CIFS configuration of the Data Mover. This does not remove the account from the Active Directory. It is recommended that an -Unjoin be executed prior to deleting the computer name.

CAUTION  
The -remove_localgroup option permanently deletes the local group information of the CIFS server from the permanent storage of the Data Mover. The alias and interface options delete the alias and the interface only, however, the CIFS server exists. The alias and interface options can be combined in the same delete command.

-delete wins=<ip_addr>[,wins=<ip_addr>...]  
Deletes the WINS servers from the CIFS configuration.
The server Commands

\[\text{delete usrmapper}=<\text{ip_addr}>,\text{usrmapper}=<\text{ip_addr}>\ldots\]

Deletes the IP addresses of a secondary Usermapper hosts from the CIFS configuration.

\[\text{update} \{<\text{share\_name}|<\text{path}>\}

Updates the attributes and their CIFS names for COMPAT file systems. For every file system, CIFS maintains certain attributes for which there are no NFS equivalents. Updating CIFS attributes updates file attributes and CIFS names by searching the subdirectories of the defined share or path, generating a listing of Microsoft clients filenames (M8.3 and M256), and converting them to a format that CIFS supports. It is not necessary to use this command for DIR3 file systems. Options include:

\[\text{mindirsize}=<\text{size}>\]

Updates the directories with the minimum size specified. Size must be typed in multiples of 512 bytes. A value of 0 ensures that all directories are rebuilt.

\[\text{force}\]

Forces a previous update to be overwritten.

\[\text{CAUTION}\]

The initial conversion of a directory can take considerable time when the directory contains a large number of files. Although the process is designed to take place in the background, an update should be run only during periods of light system usage.

\[\text{Migrate} \{<\text{fs\_name}> -acl <\text{netbios\_servername}> -localgroup \}<\text{src\_domain}>({\text{:nb}=<\text{netbios}|:if=<\text{interface}>})<\text{dst\_domain}>({\text{:nb}=<\text{netbios}|:if=<\text{interface}>})\]

Updates all security IDs (SIDs) from a \(<\text{src\_domain}>\) to the SIDs of a \(<\text{dst\_domain}>\) by matching the user and group account names in the source domain to the user and group account names in the destination domain. The interface that is specified in this option queries the local server, then its corresponding source and target Domain Controllers to look up each object’s SID.

If -acl is specified, all secure IDs in the ACL database are migrated for the specified file system.

The -localgroup option must be used to migrate the SID members of local group defined for the specified NetBIOS name.

On the source domain, an interface specified to issue a lookup of the SID is defined by either the NetBIOS name or the interface name. On
the destination domain, an interface specified to issue a lookup of the SID is defined by either the NetBIOS name or the interface name.

-Replace {<fs_name> -acl|<netbios_servername> -localgroup}{:nb=<netbios>|:if=<interface>}

Replaces the history SIDs from the old domain with the new SIDS in the new domain. An interface that can be specified to issue a lookup of the SIDs is defined by the interface name or the NetBIOS name.

The -localgroup option must be used to migrate the SID members of the local group defined for the specified NetBIOS name. When the -Replace option is used, the user or group migrated in the new domain keeps their old SID in addition to the new SID created in the new domain.

The -localgroup option does the same kind of migration for a specified NetBIOS name in the local groups (instead of the ACL in a file system for the history argument).

-smbhash -hashgen <path> [-recursive][-minsize <size>]

Triggers the generation of all SMB Hash Files for this path. Both BranchCache V1 and BranchCache V2 hash files are generated. This path is an absolute path from the root of the VDM.

If the path is a file, only the SMB Hash File for this file will be generated.

If the path is a directory, then SMB Hash File for all files will be generated in this directory. Additionally, if the -recursive option is specified, then the SMB Hash File for all files will be generated recursively inside the sub-directories.

By default, only files greater than 64KB are considered. If -minsize option is specified, then all files greater or equal to the specified size in KB will be considered. Any size specified smaller than 64 KB will be ignored. SMB Hash Files are generated only if they are missing or obsolete.

The hash file generation is asynchronous, so the command will reply immediately. Use -info or check the system event log to monitor if the request has been completed.
The server Commands

**-smbhash -hashdel** `<path> [-recursive]`
Triggers the deletion of all SMB Hash Files for this path. Both BranchCache V1 and BranchCache V2 hash files are deleted. This path is an absolute path from the root of the VDM.

If the path is a file, only the SMB Hash File for this file will be deleted.

If the path is a directory, then SMB Hash File will be deleted for all files in this directory. Additionally, if the `-recursive` option is specified, then the SMB Hash File will be deleted recursively for all files inside the sub-directories.

The hash file deletion is asynchronous, so the command will reply immediately. Use `-info` or check the system event log to monitor if the request has been completed.

**-smbhash -abort** `<id>`
Cancels the pending or ongoing request (generation or deletion) provided its ID is given. Request ID is received from the output of the command `-info`.

**-smbhash -info**
Get all kinds of information relative to the hash generation service:

- The list of pending requests with their ID.
- The list of under processing requests with their ID.
- Values of the parameters which are actually in use.
- Value of the GPO setting taken into account for each server.
- Statistics

**-smbhash -fsusage** `<fs_name>`
Displays the SMB Hash File disk usage of the specified file system. The return values are:

- Total size in bytes of the file system
- Usage in bytes of the SMB Hash Files of the file system
- Usage in percentage of the file system of the SMB Hash Files

**-smbhash -exclusionfilter** `<filter>`
Files which match the exclusion filter will not have a SMB Hash File generated. This is to avoid waste of resources spent on files that frequently change like temporary files.

---

---
This command directly modifies the parameter *ExclusionFilter* as defined with the specified format:

**Type:** REG_STRING

**Meaning:** Hash files are not generated for files which match one of the specified filters. The comparison between this parameter and the filename is done case less. Any change is taken into account immediately.

**Values:** Default is no filter. A filter is a list of items separated by a character “:”. Each item is made of:

- Any valid character for a filename
- *: means any string
- ?: means any character

```
-smbhash -audit { enable | disable } [-service] [-task] [-access]
```

Enables the generation of audits in the smbhash event log. By default, it is not validated. The parameters are one of the following:

- **enable:** Enables generation of specified event. If no event is specified in the optional list, all events are enabled.
- **disable:** Disable generation of specified event. If no event is specified in the optional list, all events are disabled.

Optional list of event’s category is:

- **-service:** Generate service events
- **-task:** Generate task events
- **-access:** Generate SMB Hash access events.

```
-smbhash -service { enable | disable }
```

Enables or disables the SMB hash generation service (default is started). If CIFS service is started, this command is taken into account immediately. If CIFS is not running, this command is executed at the next “cifs start”.

```
-smbhash -cleanup <fs_name> [-all | -unusedfor <days> | -unusedsince <date>]
```

Cleans up the SMB Hash Files of the specified file system.

- If no option is specified, only obsolete SMB Hash Files are removed.
The server Commands

- If `-all` option is specified, the entire “smbhash” directory is removed.

- If `-unusedfor <days>` option is specified, obsolete SMB Hash Files plus SMB Hash Files not accessed since the specified number of days are removed.

- If `-unusedsince <date>` option is specified, SMB Hash Files not accessed since the specified date are removed. The format of the date is `<YYMMDDHHMM>`.

```
-setspn {-list [server=<full_comp_name>] 
  | -add <SPN> compname=<comp_name>,
     domain=<full_domain_name>,admin=<admin_name>
  | -delete <SPN> compname=<comp_name>,
     domain=<full_domain_name>,admin=<admin_name>
```

Displays all SPNs for the specified FQDN server, both for the Data Mover and for the KDC Windows Active Directory entry. If no server is specified, then the SPNs for all joined CIFS Servers for the specified movername is displayed. The command fails if an error occurs. For example, unable to connect to the Active Directory, the specified server is not joined to the domain.

When the `-add` and `-delete` sub-options are used, the user is prompted for the password associated with the admin name. The SPN must be the full value to use, including the realm.

The `-add` sub-option attempts to add the specified SPN to both the Data Mover and Active Directory. The operation succeeds if the SPN is added to both the Data Mover and Active Directory. In an entry already exists in one of these places, it is not duplicated. Otherwise, the operation fails if an error occurs. For example, unable to connect to the Active Directory, the specified server is not joined to the domain, or incorrect admin password.

The `-delete` sub-option attempts to remove the specified SPN from both the Data Mover and Active Directory. The operation succeeds if the SPN is removed from both the Data Mover and Active Directory. If the entry has already been deleted, it is not considered an error. Otherwise, the operation fails if an error occurs. For example, unable to connect to the Active Directory, the specified server is not joined to the domain, or incorrect admin password.

SEE ALSO

Using EMC Utilities for the CIFS Environment, Managing a Multiprotocol Environment on VNX, Using VNX Replicator, Using
The server Commands

International Character Sets on VNX for File, server_date, server_export, server_mount, and server_setup.

OUTPUT NOTE

The network interface that appears in the output is dependent on the type of network interface cards that are installed. Dates appearing in the output are in UTC format.

EXAMPLE #1

To display the number and names of open files on server_2, type:

```
$ server_cifs server_2 -o audit,full
```

```
AUDIT Ctx=0xdffcc404, ref=2, Client(fm-main07B60004) Port=36654/139
  NS40_1[BRCSLAB] on if=cge0_new
  CurrentDC 0xceeab604=W2K3PHYAD
  Proto=NT1, Arch=UNKNOWN, RemBufsz=0xfefb, LocBufsz=0xffffffff, popupMsg=1
  0 FNN in FNNlist NbUsr=1 NbCnx=0
  Uid=0x3f NTcred(0xcf156a04 RC=1 NTLM Capa=0x401) 'BRCSLAB\gustavo' CHECKER

AUDIT Ctx=0xde05cc04, ref=2, XP Client(BRCSBARREGL1C) Port=1329/445
  NS40_1[BRCSLAB] on if=cge0_new
  CurrentDC 0xceeab604=W2K3PHYAD
  Proto=NT1, Arch=Win2K, RemBufsz=0xffffffff, LocBufsz=0xffffffff, popupMsg=1
  0 FNN in FNNlist NbUsr=1 NbCnx=2
  Uid=0x3f NTcred(0xceeabc04 RC=3 NTLMSSP Capa=0x11001) 'BRCSLAB\gustavo' CHECKER
  Cnxp(0xceeaae04), Name=IPC$, cUid=0x3f Tid=0x3f, Ref=1, Aborted=0
  readOnly=0, umask=22, opened files/dirs=0
  Cnxp(0xde4e3204), Name=gustavo, cUid=0x3f Tid=0x41, Ref=1, Aborted=0
  readOnly=0, umask=22, opened files/dirs=2
  Fid=64, FNN=0x1b0648f0(FREE,0x0,0), FOF=0x0  DIR=
  Notify commands received:
    Event=0x17, wt=0, curSize=0x0, maxSize=0x20, buffer=0x0
    Tid=0x41, Fid=0xb84, Mid=0xec0, Uid=0x3f, size=0x20
    Fid=73, FNN=0x1b019ed0(FREE,0x0,0), FOF=0xdf2ae504 (CHECK) FILE=\New Wordpad Document.doc
```

EXAMPLE #2

To configure CIFS service on server_2 with a NetBIOS name of `dm110-cge0`, in the NT4 domain `NASDOCS`, with a NetBIOS alias of `dm110-cge0a1`, hiding the NetBIOS name in the Network Neighborhood, with the interface for CIFS service as `cge0`, the WINS server as `172.24.102.25`, and with the comment string `EMC VNX`, type:

```
$ server_cifs server_2 -add netbios=dm110-cge0,domain=NASDOCS,alias=dm110-cge0a1,hide=y,interface=cge0,wins=172.24.102.25 -comment "EMC Celerra"
```

server_2 : done
EXAMPLE #3  To enable the home directory on server_2, type:

```bash
$ server_cifs server_2 -option homedir
```

server_2 : done

EXAMPLE #4  To add the WINS servers, 172.24.103.25 and 172.24.102.25, type:

```bash
$ server_cifs server_2 -add
wins=172.24.103.25,wins=172.24.102.25
```

server_2 : done

EXAMPLE #5  To rename the NetBIOS name from dm110-cge0 to dm112-cge0, type:

```bash
$ server_cifs server_2 -rename -netbios dm110-cge0
dm112-cge0
```

server_2 : done

EXAMPLE #6  To display the CIFS configuration for NT4 with Internal Usermapper, type:

```bash
$ server_cifs server_2
```

server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = NT1
I18N mode = UNICODE
Home Directory Shares ENABLED, map=./etc/homedir
Usermapper auto broadcast enabled

Usermapper[0] = [127.0.0.1] state:active port:14640 (auto discovered)

Default WINS servers = 172.24.103.25:172.24.102.25
Enabled interfaces: (All interfaces are enabled)

Disabled interfaces: (No interface disabled)

DOMAIN NASDOCS RC=3
SID=S-1-5-15-99589f8d-9aa3a5f-338728a8-fffffffff
>DC=WINSERVER1(172.24.102.66) ref=2 time=0 ms

CIFS Server DM112-CGE0[NASDOCS] RC=2 (Hidden)
Alias(es): DM110-CGE0A1
Comment='EMC Celerra'
if=cge0 l=172.24.102.242 b=172.24.102.255 mac=0:60:16:4:35:4f
  wins=172.24.102.25
Password change interval: 0 minutes
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cifs threads started</td>
<td>Number of CIFS threads used when the CIFS service was started.</td>
</tr>
<tr>
<td>Security mode</td>
<td>User authorization mechanism used by the Data Mover.</td>
</tr>
<tr>
<td>Max protocol</td>
<td>Maximum dialect supported by the security mode.</td>
</tr>
<tr>
<td>I18N mode</td>
<td>L18N mode (unicode or ASCII).</td>
</tr>
<tr>
<td>Home Directory Shares</td>
<td>Whether Home Directory shares are enabled.</td>
</tr>
<tr>
<td>map</td>
<td>Home directory used by the Data Mover.</td>
</tr>
<tr>
<td>Usermapper auto broadcast enabled</td>
<td>Usermapper is using its broadcast mechanism to discover its servers. This only displays when the mechanism is active. It is disabled when you manually set the Usermapper server addresses.</td>
</tr>
<tr>
<td>Usermapper</td>
<td>IP address of the servers running the Usermapper service.</td>
</tr>
<tr>
<td>state</td>
<td>Current state of Usermapper.</td>
</tr>
<tr>
<td>Default WINS servers</td>
<td>Addresses of the default WINS servers.</td>
</tr>
<tr>
<td>Enabled interfaces</td>
<td>Data Mover’s enabled interfaces.</td>
</tr>
<tr>
<td>Disabled interfaces</td>
<td>Data Mover’s disabled interfaces.</td>
</tr>
<tr>
<td>Unused Interface(s)</td>
<td>Interfaces not currently used by the Data Mover.</td>
</tr>
<tr>
<td>RC</td>
<td>Reference count indicating the number of internal objects (such as client contexts) using the CIFS server.</td>
</tr>
<tr>
<td>SID</td>
<td>Security ID of the domain.</td>
</tr>
<tr>
<td>DC</td>
<td>Domain controllers used by the Data Mover. Depending on the number of DCs in the domain, this list may be large.</td>
</tr>
<tr>
<td>ref</td>
<td>Number of internal objects using the Domain Controller.</td>
</tr>
<tr>
<td>time</td>
<td>Domain Controller response time.</td>
</tr>
<tr>
<td>Alias(es)</td>
<td>Alternate NetBIOS names assigned to the CIFS server configuration.</td>
</tr>
<tr>
<td>if</td>
<td>Interfaces used by the CIFS server.</td>
</tr>
<tr>
<td>Password change interval:</td>
<td>The amount of time between password changes.</td>
</tr>
</tbody>
</table>

**EXAMPLE #7**

To display the CIFS configuration for NT4, type:

```
$ server_cifs server_2
```

server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = NT1
I18N mode = UNICODE
Home Directory Shares ENABLED, map=/.etc/homedir
Usermapper auto broadcast suspended

Usermapper[0] = [172.24.102.20] state:available

Default WINS servers = 172.24.103.25:172.24.102.25
Enabled interfaces: (All interfaces are enabled)
The server Commands

Disabled interfaces: (No interface disabled)

DOMAIN NASDOCS RC=3  
SID=S-1-5-15-99589f8d-9aa3a5f-338728a8-ffffffff  
>DC=WINSERVER1(172.24.102.66) ref=2 time=0 ms

CIFS Server DM112-CGE0 [NASDOCS] RC=2 (Hidden)  
Alias(es): DM110-CGE0A1  
Comment='EMC Celerra'  
if=cge0 l=172.24.102.242 b=172.24.102.255 mac=0:60:16:4:35:4f  
wins=172.24.102.25
  
Password change interval: 0 minutes

EXAMPLE #8 To add a Windows server using the compname dm112-cge0, in the  
Active Directory domain nasdocs.emc.com, with a NetBIOS alias of dm112-cge0a1, hiding the NetBIOS name in the Network  
Neighborhood, with the interface for CIFS service as cge0, the WINS  
servers as 172.24.102.25 and 172.24.103.25, in the DNS domain nasdocs.emc.com, and with the comment string EMC VNX, type:

$ server_cifs server_2 -add  
  compname=dm112-cge0,domain=nasdocs.emc.com,alias=dm112-cge0a1,hidden=y,interface=cge0,wins=172.24.102.25:172.24.103.25,dns=nasdocs.emc.com -comment "EMC Celerra"

server_2 : done

EXAMPLE #9 To join dm112-cge0 into the Active Directory domain  
nasdocs.emc.com, using the Administrator account, and to add this  
server to Engineering\Computers organizational unit, type:

$ server_cifs server_2 -Join  
  compname=dm112-cge0,domain=nasdocs.emc.com,admin=administrator,ou="ou=Computers:ou=Engineering"

server_2 : Enter Password:********

done

EXAMPLE #10 To add the NFS service to the CIFS server to make it possible for NFS  
users to access the Windows KDC, type:

$ server_cifs server_2 -Join  
  compname=dm112-cge0,domain=nasdocs.emc.com,admin=administrator -option addservice=nfs

server_2 : Enter Password:********

done

EXAMPLE #11 To enable the cge1 interface, type:

$ server_cifs server_2 -Enable cge1

server_2 : done
EXAMPLE #12  To display CIFS information for a Data Mover in a Windows domain with internal usermapper, type:

```bash
$ server_cifs server_2
```

```
server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = NT1
I18N mode = UNICODE
Home Directory Shares ENABLED, map=/etc/homedir
Usermapper auto broadcast enabled

Usermapper[0] = [127.0.0.1] state:active (auto discovered)

Default WINS servers = 172.24.103.25:172.24.102.25
Enabled interfaces: (All interfaces are enabled)

Disabled interfaces: (No interface disabled)

Unused Interface(s):
  if=cge1 l=172.24.102.243 b=172.24.102.255 mac=0:60:16:4:35:4e

DOMAIN NASDOCS FQDN=nasdocs.emc.com SITE=Default-First-Site-Name RC=3
  SID=S-1-5-15-99589f8d-9aa3a5f-338728a8-ffffffff
  >DC=WINSERVER1(172.24.102.66) ref=3 time=1 ms (Closest Site)

CIFS Server DM112-CGE0[NASDOCS] RC=2 (Hidden)
  Alias(es): DM112-CGEA1
  Full computer name=dm112-cge0.nasdocs.emc.com realm=NASDOCS.EMC.COM
  Comment='EMC Celerra'
  if=cge0 l=172.24.102.242 b=172.24.102.255 mac=0:60:16:4:35:4f
    wins=172.24.102.25:172.24.102.25
  FQDN=dm112-cge0.nasdocs.emc.com (Updated to DNS)
Password change interval: 30 minutes
Last password change: Thu Oct 27 15:59:17 2005
Password versions: 2
```

EXAMPLE #13  To display CIFS information for a Data Mover in a Windows domain, type:

```bash
$ server_cifs server_2
```

```
server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = NT1
I18N mode = UNICODE
Home Directory Shares ENABLED, map=/etc/homedir
Usermapper auto broadcast suspended

Usermapper[0] = [172.24.102.20] state:available

Default WINS servers = 172.24.103.25:172.24.102.25
```
Enabled interfaces: (All interfaces are enabled)

Disabled interfaces: (No interface disabled)

Unused Interface(s):
  if=cge1 l=172.24.102.243 b=172.24.102.255 mac=0:60:16:4:35:4e

DOMAIN NASDOCS FQDN=nasdocs.emc.com SITE=Default-First-Site-Name RC=3
  SID=S-1-5-15-99589f8d-9aa3a5f-338728a8-ffffffff
  >DC=WINSERVER1(172.24.102.66) ref=3 time=1 ms (Closest Site)

CIFS Server DM112-CGE0[NASDOCS] RC=2 (Hidden)
  Alias(es): DM112-CGEA1
  Full computer name=dm112-cge0.nasdocs.emc.com realm=NASDOCS.EMC.COM
  Comment='EMC Celerra'
  if=cge0 l=172.24.102.242 b=172.24.102.255 mac=0:60:16:4:35:4f
  wins=172.24.102.25:172.24.103.25
  FQDN=dm112-cge0.nasdocs.emc.com (Updated to DNS)
  Password change interval: 30 minutes
  Last password change: Thu Oct 27 16:29:21 2005
  Password versions: 3, 2

EXAMPLE #14  To display CIFS information for a Data Mover when CIFS service is
not started, type:

$ server_cifs server_2

server_2 :
  Cifs NOT started
  Security mode = NT
  Max protocol = NT1
  I18N mode = UNICODE
  Home Directory Shares ENABLED, map=/.etc/homedir
  Usermapper auto broadcast suspended

Usermapper[0] = [172.24.102.20] state:available

Default WINS servers = 172.24.103.25:172.24.102.25
Enabled interfaces: (All interfaces are enabled)

Disabled interfaces: (No interface disabled)

Unused Interface(s):
  if=cge1 l=172.24.102.243 b=172.24.102.255 mac=0:60:16:4:35:4e

CIFS Server DM112-CGE0[NASDOCS] RC=2 (Hidden)
  Alias(es): DM112-CGEA1
  Full computer name=dm112-cge0.nasdocs.emc.com realm=NASDOCS.EMC.COM
  Comment='EMC Celerra'
  if=cge0 l=172.24.102.242 b=172.24.102.255 mac=0:60:16:4:35:4f
  wins=172.24.102.25:172.24.103.25
  FQDN=dm112-cge0.nasdocs.emc.com (Updated to DNS)
  Password change interval: 30 minutes
The server Commands

Last password change: Thu Oct 27 16:29:21 2005
Password versions: 3, 2

**EXAMPLE #15**  To add a Windows server named, dm112-cge0, in the Active Directory domain nasdocs.emc.com, with the interface for CIFS service as cge0, and enable local users support, type:

```bash
$ server_cifs server_2 -add  
compname=dm112-cge0,domain=nasdocs.emc.com,interface=cge0,local_users
```

Enter Password:********
Enter Password Again:********
done

**EXAMPLE #16**  To set a security mode to NT for a Data Mover, type:

```bash
$ server_cifs server_2 -add security=NT
```

server_2 : done

**EXAMPLE #17**  To disable a CIFS interface, type:

```bash
$ server_cifs server_2 -Disable cge1
```

server_2 : done

**EXAMPLE #18**  To display CIFS audit information for a Data Mover, type:

```bash
$ server_cifs server_2 -option audit
```

```

||| AUDIT Ctx=0xad3d4820, ref=1, W2K3 Client(WINSERVER1) Port=1638/139
||| DM112-CGE0[NASDOCS] on if=cge0
||| CurrentDC 0xad407620=WINSERVER1
||| Proto=NT1, Arch=Win2K, RemBufsz=0xffff, LocBufsz=0xffff
||| 0 FNN in FNNlist NbUsr=1 NbCnx=1
||| Uid=0x3f NTcred(0xad406a20 RC=2 KERBEROS Capa=0x2) 'NASDOCS\administrator'
||| Cnxp(0xad3d5420), Name=IPC$, cUid=0x3f Tid=0x3f, Ref=1, Aborted=0
||| readOnly=0, umask=22, opened files/dirs=1

||| AUDIT Ctx=0xad43c020, ref=1, W2K3 Client(172.24.102.67) Port=1099/445
||| DM112-CGE0[NASDOCS] on if=cge0
||| CurrentDC 0xad407620=WINSERVER1
||| Proto=NT1, Arch=Win2K, RemBufsz=0xffff, LocBufsz=0xffff
||| 0 FNN in FNNlist NbUsr=1 NbCnx=1
||| Uid=0x3f NTcred(0xad362c20 RC=2 KERBEROS Capa=0x2) 'NASDOCS\user1'
||| Cnxp(0xaec21020), Name=IPC$, cUid=0x3f Tid=0x3f, Ref=1, Aborted=0
||| readOnly=0, umask=22, opened files/dirs=2
```
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ctx</td>
<td>Address in memory of the Stream Context.</td>
</tr>
<tr>
<td>ref</td>
<td>Reference counter of components using this context at this time.</td>
</tr>
<tr>
<td>Port</td>
<td>The client port and the Data Mover port used in the current TCP connection.</td>
</tr>
<tr>
<td>CurrentDC</td>
<td>Specifies the address of the Domain Controller that is currently used.</td>
</tr>
<tr>
<td>Proto</td>
<td>Dialect level that is currently used.</td>
</tr>
<tr>
<td>Arch</td>
<td>Type of the client OS.</td>
</tr>
<tr>
<td>RemBufsz</td>
<td>Max buffer size negotiated by the client.</td>
</tr>
<tr>
<td>LocBufsz</td>
<td>Max buffer size we have negotiated.</td>
</tr>
<tr>
<td>FNN/FNNlist</td>
<td>Number of blocked files that has not yet been checked by Virus Checker.</td>
</tr>
<tr>
<td>NbUsr</td>
<td>Number of sessions connected to the stream context (TCP connection).</td>
</tr>
<tr>
<td>NbCnx</td>
<td>Number of connections to shares for this TCP connection.</td>
</tr>
<tr>
<td>Uid/NTcred</td>
<td>User Id (this number is not related to the UNIX UID used to create a file), the credential address, and the type of authentication.</td>
</tr>
<tr>
<td>Cnxp/Name</td>
<td>Share connection address’ and the name of the share the user is connecting to.</td>
</tr>
<tr>
<td>cUid</td>
<td>User Id who has opened the connection first.</td>
</tr>
<tr>
<td>Tid</td>
<td>Tree Id (number which represents the share connection in any protocol request).</td>
</tr>
<tr>
<td>Aborted</td>
<td>Status of the connection.</td>
</tr>
<tr>
<td>readOnly</td>
<td>If the share connection is read only.</td>
</tr>
<tr>
<td>umask</td>
<td>A user file-creation mask.</td>
</tr>
<tr>
<td>opened files/dirs</td>
<td>Number of files or directories opened on this share connection.</td>
</tr>
</tbody>
</table>

**EXAMPLE #19**  To unjoin the computer **dm112-cge0** from the **nasdocs.emc.com** domain, type:

```
$ server_cifs server_2 -Unjoin
  compname=dm112-cge0,domain=nasdocs.emc.com,admin=adminis
  trader
```

`server_2 : Enter Password:********
done`

**EXAMPLE #20**  To delete WINS servers, **172.24.102.25**, and **172.24.103.25**, type:

```
$ server_cifs server_2 -delete
  wins=172.24.102.25,wins=172.24.103.25
```

`server_2 : done`

**EXAMPLE #21**  To delete a NetBIOS name, **dm112-cge0**, type:

```
$ server_cifs server_2 -delete netbios=dm112-cge0
```

`server_2 : done`
EXAMPLE #22  To delete the compname, *dm112-cge0*, type:

$ server_cifs server_2 -delete compname=dm112-cge0

server_2 : done

EXAMPLE #23  To delete the usrmapper, *172.24.102.20*, type:

$ server_cifs server_2 -delete usrmapper=172.24.102.20

server_2 : done

EXAMPLE #24  To add and join a Windows server in disjoint DNS and Windows domains, type:

$ server_cifs server_2 -add
compname=dm112-cge0,domain=nasdocs.emc.com,interface=cge0,dns=eng.emc.com -comment "EMC Celerra"

$ server_cifs server_2 -Join
compname=dm112-cge0.eng.emc.com,domain=nasdocs.emc.com,admin=Administrator

EXAMPLE #25  To add a Windows server using a delegated account from a trusted domain, type:

$ server_cifs server_2 -Join
compname=dm112-cge0,domain=nasdocs.emc.com,admin=delegateduser@it.emc.com

done

EXAMPLE #26  To add a Windows server in the Active Directory domain using a pre-created computer account, type:

$ server_cifs server_2 -Join
compname=dm112-cge0,domain=nasdocs.emc.com,admin=administor -option reuse

done

EXAMPLE #27  To update the directory */ufs1/users* with a new minimum directory size of *8192*, type:

$ server_cifs server_2 -update /ufs1/users
mindirsize=8192

server_2 : done

EXAMPLE #28  To migrate all SIDs in the ACL database for file system, *ufs1*, from the <src_domain>, *eng.emc.com:nb=dm112-cge1:if=cge1* to the <dst_domain>, *nasdocs.emc.com:nb=dm112-cge0:if=cge0*, type:
EXAMPLE #29  To migrate SIDs of members of the local group defined for the specified NetBIOS name, from the <src_domain>, eng.emc.com:nb=dm112-cge1:if=cge1 to the <dst_domain>, nasdocs.emc.com:nb=dm112-cge0:if=cge0, type:

```
$ server_cifs server_2 -Migrate dm112-cge1 -localgroup
eng.emc.com:nb=dm112-cge1:if=cge1
nasdocs.emc.com:nb=dm112-cge0:if=cge0
```

server_2 : done

EXAMPLE #30 To replace the SIDs for ufs1, type:

```
$ server_cifs server_2 -Replace ufs1 -acl
:nb=dm112-cge0:if=cge0
```

server_2 : done

EXAMPLE #31 To configure a stand-alone CIFS server on server_2 with a NetBIOS name of dm112-cge0, in the workgroup NASDOCS, with a NetBIOS alias of dm112-cge0a1, hiding the NetBIOS name in the Network Neighborhood, with the interface for CIFS service as cge0, the WINS servers as 172.24.102.25 and 172.24.103.25, and with enabled local users support, type:

```
$ server_cifs server_2 -add
standalone=dm112-cge0,workgroup=NASDOCS,alias=dm112-cge0
a1,hidden=y,interface=cge0,wins=172.24.102.25:172.24.103
 .25,local_users
```

server_2 : Enter Password:********
Enter Password Again:********
done

EXAMPLE #32 To delete the stand-alone CIFS server, dm112-cge0, type:

```
$ server_cifs server_2 -delete standalone=dm112-cge0
```

server_2 : done

EXAMPLE #33 To display a summary of SMB statistics, type:

```
$ server_cifs server_2 -stats -summary
```

server_2 :
State info:
Open connection Open files
2            2

SMB total requests:
totalAllSmb totalSmb totalTrans2Smb totalTransNTSmb
The server Commands

EXAMPLE #34  To display all non-zero CIFS statistics, type:

```
$ server_cifs server_2 -stats
```

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>1305</td>
<td>7.96</td>
<td>46.21</td>
<td>2.16</td>
</tr>
<tr>
<td>Rename</td>
<td>2</td>
<td>0.01</td>
<td>0.81</td>
<td>0.50</td>
</tr>
<tr>
<td>Trans</td>
<td>314</td>
<td>1.91</td>
<td>0.77</td>
<td>0.08</td>
</tr>
<tr>
<td>Echo</td>
<td>21</td>
<td>0.13</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>ReadX</td>
<td>231</td>
<td>1.41</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>WriteX</td>
<td>3697</td>
<td>22.54</td>
<td>39.96</td>
<td>0.98</td>
</tr>
<tr>
<td>Trans2Prim</td>
<td>9375</td>
<td>57.16</td>
<td>34.27</td>
<td>0.46</td>
</tr>
<tr>
<td>TreeDisco</td>
<td>10</td>
<td>0.06</td>
<td>0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>NegProt</td>
<td>29</td>
<td>0.18</td>
<td>0.42</td>
<td>0.24</td>
</tr>
<tr>
<td>SessSetupX</td>
<td>47</td>
<td>0.29</td>
<td>60.55</td>
<td>5.81</td>
</tr>
<tr>
<td>UserLogoffX</td>
<td>9</td>
<td>0.05</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>TreeConnectX</td>
<td>13</td>
<td>0.08</td>
<td>0.39</td>
<td>0.23</td>
</tr>
<tr>
<td>TransNT</td>
<td>8</td>
<td>0.05</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>CreateNTX</td>
<td>1338</td>
<td>8.16</td>
<td>47.11</td>
<td>0.81</td>
</tr>
<tr>
<td>CancelNT</td>
<td>1</td>
<td>0.01</td>
<td>0.03</td>
<td>0.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
<tbody>
<tr>
<td>FindFirst</td>
<td>22</td>
<td>0.23</td>
<td>0.22</td>
<td>0.09</td>
</tr>
<tr>
<td>QFsInfo</td>
<td>3154</td>
<td>33.65</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>QPathInfo</td>
<td>1113</td>
<td>11.87</td>
<td>6.73</td>
<td>0.15</td>
</tr>
<tr>
<td>QFileInfo</td>
<td>2077</td>
<td>22.16</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>SetFileInfo</td>
<td>3007</td>
<td>32.08</td>
<td>34.26</td>
<td>1.28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotifyChange</td>
<td>8</td>
<td>100.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Performance info:

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
</table>

State info:

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
</table>

Shadow info:

<table>
<thead>
<tr>
<th>proc</th>
<th>n calls</th>
<th>% tot calls</th>
<th>maxTime</th>
<th>ms/call</th>
</tr>
</thead>
</table>

SMB total requests:

```
totalAllSmb   totalSmb   totalTrans2Smb   totalTransNTSmb (unsupported)
totalAllSmb   totalSmb   totalTrans2Smb   totalTransNTSmb (unsupported)
```
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>proc</td>
<td>Name of CIFS requests received.</td>
</tr>
<tr>
<td>ncalls</td>
<td>Number of requests received.</td>
</tr>
<tr>
<td>%totcalls</td>
<td>Percentage of this type of request compared to all requests.</td>
</tr>
<tr>
<td>maxTime</td>
<td>Maximum amount of time used.</td>
</tr>
<tr>
<td>ms/call</td>
<td>Average time in milliseconds taken to service calls.</td>
</tr>
<tr>
<td>failures</td>
<td>Number of times the call has failed.</td>
</tr>
<tr>
<td>Read</td>
<td>Total number of read operations.</td>
</tr>
<tr>
<td>Re/s</td>
<td>Number of read operations per second.</td>
</tr>
<tr>
<td>Write</td>
<td>Total number of write operations.</td>
</tr>
<tr>
<td>Wr/s</td>
<td>Number of write operations per second.</td>
</tr>
</tbody>
</table>

**EXAMPLE #35**

To reset to zero the values for all SMB statistics, type:

```
$ server_cifs server_2 -stats -zero
```

server_2 : done

**EXAMPLE #36**

To configure CIFS service in a language that uses multibyte characters (such as Japanese), type:

```
$ server_cifs server_2 -add
compname=<computer_name_in_local_language_text>
domain=nasdocs.emc.com, -comment
<comment_in_local_language_text>
```

server_2 : done

**EXAMPLE #37**

To enable the SMB3 protocol, type:

```
$ server_cifs server_2 -add security=NT,dialect=SMB3
```

server_2 :
256 Cifs threads started
Security mode = NT
Max protocol = SMB3.0
I18N mode = UNICODE

**EXAMPLE #38**

To disable both SMB2 and SMB3, type:

```
$ server_cifs server_2 -add security=NT,dialect=NT1
```

server_2 : done
server_cifssupport

Provides support services for CIFS users.

SYNOPSIS

server_cifssupport {<movername>|ALL}

-accessright
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>| -uname <unix_name>| -uid <user_id>}
  {-path <pathname>| -share <sharename>}
  [-policy {mixed|native|secure|nt|unix}]
  [-build [-admin <admin_name>]]
  [-netbios <netbios_servername>| -compname <comp_name>
   | -standalone <netbios_name>]

  -acl (-path <pathname>| -share <sharename>) [-verbose]

  -cred
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>| -uname <unix_name>| -uid <user_id>}
  [-build [-ldap][-admin <admin_name>]]
  [-netbios <netbios_servername>| -compname <comp_name>
   | -standalone <netbios_name>]

  -pingdc
  
  {-netbios <netbios_servername>| -compname <comp_name>}
  [-dc <netbios_Dcname>]
  [-verbose]}

  -secmap

  -list
  
  [-name <name> [-domain <domain_name>]
   | -domain <domain_name>
   | -sid <SID>
   | -uid <user_id>
   | -gid <group_id>]

  -create
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>}

  -verify
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>}

  -update
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>}

  -delete
  
  {-name <name> [-domain <domain_name>]
   | -sid <SID>}

  -export [-file <filename>]

  -import -file <filename>

  -report

  -migration
DESCRIPTION

server_cifssupport checks network connectivity between a CIFS server and domain controller, manages access rights, generates credentials, and manages secure mapping cache.

The **-accessright** option:

- Displays user access rights to a file, directory, or share in a Windows permission mask.
- Rebuilds and displays a credential for users of a file, directory, or share, who do not have a session opened in one of the CIFS servers.
- Without impact on the actual access-checking policy of a file system object, shows how user permissions are reset if you were to change the policy on that object.

The **-acl** option displays the access control list (ACL) of files, directories, or shares in plain text form.

The **-cred** option generates a credential containing all groups to which a user belongs, including local groups, without the user being connected to a CIFS server. This allows you to verify if user’s SIDs are being correctly mapped to UNIX UIDs and GIDs and to troubleshoot any user access control issues.

The **-pingdc** option checks the network connectivity between a CIFS server and a domain controller then verifies that a CIFS server can access and use the following domain controller services:

- IPC$ share logon
- Secure Channel when verifying domain users during NT LAN Manager (NTLM) authentication
- Local Security Authority (LSA) pipe information when mapping Windows SIDs to UNIX UIDs and GIDs
- SAMR (Remote Security Account Manager) pipe when merging a user’s UNIX and Windows groups together to create a credential
- Trusted domain information
- Privilege names for internationalization: pingdc

The **-secmap** option manages the secure mapping (secmap) cache. Secmap contains all mapping between SIDs and UID/GIDs used by a Data Mover or Virtual Data Mover (VDM). The Data Mover permanently caches all mappings it receives from any mapping mechanism (local files, NIS, iPlanet, Active Directory, and Usermapper) in the secmap database, making the response to
The server Commands

subsequent mapping requests faster and less susceptible to network problems. Reverse mapping provides better quota support.

**ACCESS RIGHT OPTIONS**

- **-accessright**
  - **-name** <name> [--domain <domain_name>] or
  - **-sid** <SID> | **-uname** <unix_name> | **-uid** <user_id>
  - **-path** <pathname> | **-share** <sharename>

Displays user access rights to a file, directory, or share in a Windows permission mask for the specified:

- Windows username and the optional domain to which the user belongs
  or
- <SID> which is the user’s Windows security identifier
  or
- <unix_name>
  or
- <user_id> which is the user’s UNIX identifier

The **-path** option specifies the path of the file or directory to check for user permissions, or the absolute path of the share to check for user permissions.

- **-policy** {mixed | native | secure | nt | unix}
  Specifies an access-checking policy for the specified file, directory, or share. This does not change the current access-checking policy, instead it helps you anticipate any access problems before actually resetting the policy on a file system object. See server_cifs for more information.

- **-build** [-admin <admin_name>]
  Rebuilds a credential for a user of a file, directory, or share, who does not have a session opened in one of the CIFS servers. If **-build** is not specified, the system searches the known user credentials in cache. If none are found, an error message is generated. The **-admin** option specifies the name of an administrative user to use for creating the access right list. The password of the admin_name user is prompted when executing the command.

- **-netbios** <netbios_servername> | **-compname** <comp_name> | **-standalone** <netbios_name>
  Indicates the CIFS server, as specified by its NetBIOS name or computer name to use when rebuilding the user credential.
The **-standalone** option specifies the stand-alone CIFS server, as specified by its name, to use when rebuilding a user credential.

**Note:** If no CIFS server is specified, the system uses the default CIFS server, which uses all interfaces not assigned to other CIFS servers on the Data Mover.

### ACL OPTIONS

- `acl { -path <pathname> | -share <sharename> } [-verbose]`

Displays the ACL of a file, directory, or a share in plain text form. Windows or UNIX access control data are both displayed in their native forms. The `*-verbose` option displays the ACE access rights mask in plain text form in addition to their native forms.

### CREDENTIAL OPTIONS

- `cred { -name <name> [-domain <domain_name>] | -sid <SID> | -uname <unix_name> | -uid <user_id> }

Generates a credential containing all of the groups to which a user belongs without being connected to a CIFS server. The credential is specified by the user’s:

- Windows username and the domain to which the user belongs or
- Windows security identifier or
- UNIX name or
- UNIX identifier

  [-build [-ldap][-admin <admin_name>]]

Rebuilds a user credential. If **-build** is not specified, the system searches the known user credentials in cache. If none are found, an error message is generated. The **-ldap** option retrieves the user’s universal groups to be included in the credential. If none are found, no universal groups are incorporated into the credential. The **-admin** option indicates the name of an administrative user for creating the credential. The password of the **<admin_name>** is prompted when executing the command.

  [-netbios <netbios_servername> | -compname <comp_name> | -standalone <netbios_ name>]}

Indicates the CIFS server, as specified by its NetBIOS name or computer name to use when rebuilding the user credential.
The -standalone option specifies the stand-alone CIFS server to use when rebuilding a user credential.

Note: If no CIFS server is specified, the system uses the default CIFS server, which uses all interfaces not assigned to other CIFS servers on the Data Mover.

PINGDC OPTIONS

-pingdc {-netbios <netbios_servername> | -compname <comp_name>}
Checks the network connectivity for the CIFS server as specified by its NetBIOS name or by its computer name with a domain controller. Once connectivity is established, it verifies that a CIFS server can access and use the domain controller services.

Note: An IP address can be used for the <netbios_servername> and the <comp_name>.

[-dc <netbios_Dcname>]
Indicates the domain controller to ping for network and resource connectivity with the CIFS server. If not specified, the command checks the domain controllers currently in use by the CIFS server.

Note: An IP address can be used for the <netbios_Dcname>.

[-verbose]
Adds troubleshooting information to the command output.

SECMAP OPTIONS

-secmap -list
Lists the secmap mapping entries.

-secmap -list -name <name> -domain <domain_name>
Lists the secmap mapping entries with the specified name and domain name.

-secmap -list -domain <domain_name>
Lists the secmap mapping entries with the specified domain name.

-secmap -list -sid <SID>
Lists the secmap mapping entries with the specified SID.

-secmap -list -uid <user_id>
Lists the secmap mapping entries with the specified UID (reverse mapping).
-secmap -list -gid <group_id>
Lists the secmap mapping entries with the specified GID (reverse mapping).

-secmap -create { -name <name> [-domain <domain_name>]} 
Creates the secmap mapping entry with the specified name and domain name.

-secmap -create -sid <SID>
Creates the secmap mapping entry with the specified SID.

-secmap -verify { -name <name> [-domain <domain_name>]} 
Checks the mapping entry stored in secmap with the specified name and optional domain name with what is currently available in the mapping sources. If a mapping has changed, it is marked.

-secmap -verify -sid <SID>
Checks the secmap mapping entry with the specified SID.

-secmap -update { -name <name> [-domain <domain_name>]} 
Updates the specified mapping entry stored in secmap with the mappings currently available in the mapping sources. Once this option is performed, force an update of the Data Mover’s file systems ACLs so that the new mappings are recognized.

-secmap -update -sid <SID>
Updates the secmap mapping entry with the specified SID.

-secmap -delete -name <name> [-domain <domain_name>]
Deletes the secmap mapping entry with the specified name and domain name.

-secmap -delete -sid <SID>
Deletes the secmap mapping entry with the specified SID.

-secmap -export [-file <filename>]
Exports the secmap mapping entry to the specified file.

Note: If no filename is specified, the secmap database is displayed on the screen.

-secmap -import -file <filename>
Imports secmap mapping entries from the specified file.

-secmap -report
Displays current secmap status, including database state, domains handled by secmap, and resource usage.
The server Commands

-secmap -migration
Displays secmap database migration information like start date and end date of the operation, and migration status.

EXAMPLE #1
To display user access rights to a file for user1, type:

```
$ server_cifssupport server_2 -accessright -name user1 -domain NASDOCS -path /ufs1/test/test.txt
```

ACCOUNT GENERAL INFORMATIONS

Name : user1
Domain : NASDOCS
Path : /ufs1/test/test.txt
Allowed mask : 0x200a9
Action : List Folder / Read data
Action : Read Extended Attributes
Action : Traverse Folder / Execute File
Action : Read Attributes
Action : Read Permissions

EXAMPLE #2
To rebuild a credential for a user to a file using the SID, type:

```
$ server_cifssupport server_2 -accessright -sid S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4 -path /ufs1/test/test.txt -build -compname dm102-cge0
```

ACCOUNT GENERAL INFORMATIONS

Path : /ufs1/test/test.txt
Allowed mask : 0x301ff
Action : List Folder / Read data
Action : Create Files / Write data
Action : Create Folders / Append Data
Action : Read Extended Attributes
Action : Write Extended Attributes
Action : Traverse Folder / Execute File
Action : Delete Subfolders and Files
Action : Read Attributes
Action : Write Attributes
Action : Delete
Action : Read Permissions

EXAMPLE #3
To display user access rights to a file for user1 with access-checking policy UNIX, type:

```
$ server_cifssupport server_2 -accessright -name user1 -domain NASDOCS -path /ufs1/test/test.txt -policy unix
```

server_2 : done
ACCOUNT GENERAL INFORMATIONS

Name : user1
Domain : NASDOCS
Path : /ufs1/test/test.txt
Allowed mask : 0x20089
Action : List Folder / Read data
Action : Read Extended Attributes
Action : Read Attributes
Action : Read Permissions

EXAMPLE #4 To rebuild a credential for **user1** to a file using an administrative account, type:

```
$ server_cifssupport server_2 -accessright -name user1 -domain NASDOCS -path /ufs1/test/test.txt -build -admin administrator
```

done

EXAMPLE #5 To display the verbose ACL information of a file, type:

```
$ server_cifssupport server_2 -acl -path /ufs1/test/test.txt -verbose
```

```
server_2 : done

ACL DUMP REPORT

Path : /ufs1/test/test.txt
UID : 32770
GID : 32797
Rights : rw-r--r--
acl ID : 0x4
acl size : 174
owner SID : S-1-5-20-220
group SID : S-1-5-15-b8e641e2-33f0942d-8f03a08f-201

DACL

Owner : USER 32770 S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4
```
The server Commands

Access       : ALLOWED 0x0 0x1f01ff RWXPDO
Rights       : List Folder / Read data
Create Files / Write data
Create Folders / Append Data
Read Extended Attributes
Write Extended Attributes
Traverse Folder / Execute File
Delete Subfolders and Files
Read Attributes
Write Attributes
Delete
Read Permissions
Change Permissions
Take Ownership
Synchronize

Owner       : USER 32771 S-1-5-15-b8e641e2-33f0942d-8f03a08f-a59
Access       : ALLOWED 0x0 0x1200a9 R-X---
Rights       : List Folder / Read data
Read Extended Attributes
Traverse Folder / Execute File
Read Attributes
Read Permissions
Synchronize

EXAMPLE #6  To display the access control level of a share, type:

```
$ server_cifssupport server_2 -acl -share ufs1
```

server_2 : done

ACL DUMP REPORT

Share        : ufs1
UID          : 0
GID          : 1
Rights       : rwxr-xr-x

EXAMPLE #7  To generate a credential for user1, type:

```
$ server_cifssupport server_2 -cred -name user1 -domain NASDOCS
```

server_2 : done

ACCOUNT GENERAL INFORMATIONS

Name                     : user1
Domain                   : NASDOCS
Primary SID              : S-1-5-15-b8e641e2-33f0942d-8f03a08f-a59
UID                      : 32771
GID                      : 32768
Authentification         : KERBEROS
Credential capability    : 0x2
The server Commands

Privileges : 0x8
System privileges : 0x2
Default Options : 0x2
NT administrator : False
Backup administrator : False
Backup : False
NT credential capability : 0x2

ACCOUNT GROUPS INFORMATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>UNIX ID</th>
<th>Name</th>
<th>Domain</th>
<th>SID</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>32797</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>32798</td>
<td></td>
<td></td>
<td>S-1-1-0</td>
</tr>
<tr>
<td>NT</td>
<td>4294967294</td>
<td>S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>4294967294</td>
<td>S-1-5-15-b8e641e2-33f0942d-8f03a08f-e45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>2151678497</td>
<td>S-1-5-20-221</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE #8

To rebuild a user credential including the user’s universal groups for a user using SID, type:

```
$ server_cifssupport server_2 -cred -sid
S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4 -build -ldap
-compname dm102-cge0
```

server_2 : done

ACCOUNT GENERAL INFORMATIONS

<table>
<thead>
<tr>
<th>Name</th>
<th>Domain</th>
<th>Server</th>
<th>Primary SID</th>
<th>UID</th>
<th>GID</th>
<th>Authentication</th>
<th>Credential capability</th>
<th>Privileges</th>
<th>System privileges</th>
<th>Default Options</th>
<th>NT administrator</th>
<th>Backup administrator</th>
<th>Backup</th>
<th>NT credential capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4</td>
<td>32770</td>
<td>32768</td>
<td>NTLM</td>
<td>0x0</td>
<td>0x7f</td>
<td>0x1</td>
<td>0xe</td>
<td>True</td>
<td>False</td>
<td>True</td>
<td>0x0</td>
</tr>
</tbody>
</table>

ACCOUNT GROUPS INFORMATIONS
<table>
<thead>
<tr>
<th>Type</th>
<th>UNIX ID</th>
<th>Name</th>
<th>Domain</th>
<th>SID</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>32794</td>
<td>Group Policy Cre</td>
<td>NASDOCS S-1-5-15-b8e641e2-33f0942d-8f03a08f-208</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>32795</td>
<td>Schema Admins</td>
<td>NASDOCS S-1-5-15-b8e641e2-33f0942d-8f03a08f-206</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>32796</td>
<td>Enterprise Admin</td>
<td>NASDOCS S-1-5-15-b8e641e2-33f0942d-8f03a08f-207</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>32797</td>
<td>Domain Users</td>
<td>NASDOCS S-1-5-15-b8e641e2-33f0942d-8f03a08f-201</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>32793</td>
<td>Domain Admins</td>
<td>NASDOCS S-1-5-15-b8e641e2-33f0942d-8f03a08f-200</td>
<td></td>
</tr>
<tr>
<td>NT</td>
<td>4294967294</td>
<td>Everyone</td>
<td></td>
<td>S-1-1-0</td>
</tr>
<tr>
<td>NT</td>
<td>4294967294</td>
<td>NETWORK</td>
<td>NT AUTHORITY</td>
<td>S-1-5-2</td>
</tr>
<tr>
<td>NT</td>
<td>4294967294</td>
<td>ANONYMOUS LOGON</td>
<td>NT AUTHORITY</td>
<td>S-1-5-7</td>
</tr>
<tr>
<td>NT</td>
<td>2151678496</td>
<td>Administrators</td>
<td>BUILTIN</td>
<td>S-1-5-20-220</td>
</tr>
<tr>
<td>NT</td>
<td>2151678497</td>
<td>Users</td>
<td>BUILTIN</td>
<td>S-1-5-20-221</td>
</tr>
<tr>
<td>NT</td>
<td>1</td>
<td>UNIX GID=0x1 &amp;ap</td>
<td></td>
<td>S-1-5-12-2-1</td>
</tr>
</tbody>
</table>

**EXAMPLE #9**

To check the network connectivity for the CIFS server with netbios `dm102-cge0`, type:

```bash
$ server_cifssupport server_2 -pingdc -netbios dm102-cge0
```

Server_2 : done

PINGDC GENERAL INFORMATIONS

DC SERVER:
Netbios name : NASDOCSDC

CIFS SERVER:
Compname : dm102-cge0
Domain : nasdocs.emc.com

**EXAMPLE #10**

To check the network connectivity between the domain controller and the CIFS server with compname `dm102-cge0`, type:

```bash
$ server_cifssupport server_2 -pingdc -compname dm102-cge0 -dc NASDOCSDC -verbose
```

Server_2 : done

PINGDC GENERAL INFORMATIONS

DC SERVER:
Netbios name : NASDOCSDC

CIFS SERVER:
Compname : dm102-cge0
Domain : nasdocs.emc.com

**EXAMPLE #11**

To display the secmap mapping entries, type:

```bash
$ server_cifssupport server_2 -secmap -list
```
The server Commands

EXAMPLE #12  To display the secmap mapping entry for a user user1 in a domain NASDOCS, type:

```
$ server_cifssupport server_2 -secmap -list -name user1 -domain NASDOCS
```

EXAMPLE #13  To display the secmap mapping entry for a user with UID 32771, type:

```
$ server_cifssupport server_2 -secmap -list -uid 32771
```
SECMAP USER MAPPING TABLE

<table>
<thead>
<tr>
<th>UID</th>
<th>Origin</th>
<th>Date</th>
<th>Name</th>
<th>SID</th>
</tr>
</thead>
<tbody>
<tr>
<td>32771</td>
<td>usermapper</td>
<td>Tue Sep 18 17:56:53 2007</td>
<td>NASDOCS\user1</td>
<td>S-1-5-15-b8e641e2-33f0942d-8f03a08f-a59</td>
</tr>
</tbody>
</table>

**EXAMPLE #14**  To create the secmap mapping entry for user3 in a domain NASDOCS, type:

```bash
$ server_cifssupport server_2 -secmap -create -name user3 -domain NASDOCS
```

server_2 : done

SECMAP USER MAPPING TABLE

<table>
<thead>
<tr>
<th>UID</th>
<th>Origin</th>
<th>Date</th>
<th>Name</th>
<th>SID</th>
</tr>
</thead>
<tbody>
<tr>
<td>32773</td>
<td>usermapper</td>
<td>Tue Sep 18 19:21:59 2007</td>
<td>NASDOCS\user3</td>
<td>S-1-5-15-b8e641e2-33f0942d-8f03a08f-a3d</td>
</tr>
</tbody>
</table>

**EXAMPLE #15**  To check the secmap mapping for user1 in a domain NASDOCS, type:

```bash
$ server_cifssupport server_2 -secmap -verify -name user1 -domain NASDOCS
```

server_2 : done

**EXAMPLE #16**  To update the secmap mapping entry for a user using SID, type:

```bash
$ server_cifssupport server_2 -secmap -update -sid S-1-5-15-b8e641e2-33f0942d-8f03a08f-a3d
```

server_2 : done

**EXAMPLE #17**  To delete the secmap mapping entry for user3, type:

```bash
$ server_cifssupport server_2 -secmap -delete -name user3 -domain NASDOCS
```

server_2 : done

**EXAMPLE #18**  To display current secmap status, type:

```bash
$ server_cifssupport server_2 -secmap -report
```

server_2 : done

SECMAP GENERAL INFORMATIONS

- **Name**: server_2
- **State**: Enabled
- **Fs**: /
- **Used nodes**: 12
- **Used blocks**: 8192
EXAMPE #19

To export the secmap mapping entries to the display, type:

```
$ server_cifssupport server_2 -secmap -export
```

server_2: done

**SECMAP MAPPING RECORDS**

- S-1-5-15-b8e641e2-33f0942d-8f03a08f-200:2:96:8019:8019:NASDOCS\Domain Admins
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-201:2:96:801d:801d:NASDOCS\Domain Users
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-202:2:96:801f:801f:NASDOCS\Domain Guests
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-203:2:96:8020:8020:NASDOCS\Domain Computers
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-206:2:96:801b:801b:NASDOCS\Schema Admins
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-207:2:96:801c:801c:NASDOCS\Enterprise Admins
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-208:2:96:801a:801a:NASDOCS\Group Policy Creator Owners
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-e45:2:96:801e:801e:NASDOCS\CERTSV.C_DCOM_ACCESS
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-452:1:96:8004:8000:NASDOCS\user2
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-a59:1:96:8003:8000:NASDOCS\user1
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-45b:2:96:8021:8021:NASDOCS\NASDOCS Group
- S-1-5-15-b8e641e2-33f0942d-8f03a08f-1f4:1:96:8002:8000:NASDOCS\Administrator

EXAMPE #20

To export the secmap mapping entries to a file, type:

```
$ server_cifssupport server_2 -secmap -export -file exportfile.txt
```

server_2: done

EXAMPE #21

To import the secmap mapping entries from a file, type:

```
$ server_cifssupport server_2 -secmap -import -file exportfile.txt
```

server_2:
Secmap import in progress: #
done
server_cpu

Performs an orderly, timed, or immediate halt or reboot of a Data Mover.

SYNOPSIS

server_cpu {<movername> | ALL} 
{-halt | -reboot [cold | warm]} [-monitor] <time>

DESCRIPTION

server_cpu performs an orderly halt or reboot of the specified Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

-halt
Performs an orderly shutdown of a Data Mover for the VNX. To restart a Data Mover, perform a -reboot. For the NS series, a -halt causes a system reboot.

-reboot
Performs an orderly shutdown, and restarts a Data Mover. The default parameter of the -reboot option will be the warm parameter. In case the warm rebooting fails, the -reboot option will use the cold parameter to reboot the Data Mover.

[cold]
A cold reboot or a hardware reset shuts down the Data Mover completely before restarting, including a Power on Self Test (POST).

[warm]
A warm reboot or a software reset performs a partial shutdown of the Data Mover, and skips the POST after restarting. A software reset is faster than the hardware reset.

CAUTION

Performing a reboot for ALL Data Movers can be time consuming relative to the size of the mounted file system configuration.

-monitor
Polls and displays the boot status until completion of the halt or reboot.
<time>
Specifies the time when the Data Mover is to be halted or rebooted. Time is specified as `{now | +<min> | <hour>:<min>}`. The `now` option is used for an immediate shutdown or reboot.

After a power fail and crash recovery, the system reboots itself at power-up unless previously halted.

**SEE ALSO** VNX System Operations.

**EXAMPLE #1** To monitor an immediate reboot of `server_2`, type:

```bash
$ server_cpu server_2 -reboot -monitor now
```

server_2 : reboot in progress 0.0.0.0.0.0.0.0.0.0.3.3.3.3.3.3.4.done

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Reset</td>
</tr>
<tr>
<td>1</td>
<td>DOS booted</td>
</tr>
<tr>
<td>2</td>
<td>SIB failed</td>
</tr>
<tr>
<td>3</td>
<td>Loaded</td>
</tr>
<tr>
<td>4</td>
<td>Configured</td>
</tr>
<tr>
<td>5</td>
<td>Contacted</td>
</tr>
<tr>
<td>7</td>
<td>Panicked</td>
</tr>
<tr>
<td>9</td>
<td>Reboot pending</td>
</tr>
</tbody>
</table>

**EXAMPLE #2** To immediately halt `server_2`, type:

```bash
$ server_cpu server_2 -halt now
```

server_2 : done

**EXAMPLE #3** To immediately reboot `server_2`, type:

```bash
$ server_cpu server_2 -reboot now
```

server_2 : done

**EXAMPLE #4** To monitor a reboot of `server_2`, that is set to take place in one minute, type:

```bash
$ server_cpu server_2 -reboot -monitor +1
```

server_2 : reboot in progress ..........3.3.3.3.3.done
**server_date**

Displays or sets the date and time for a Data Mover, and synchronizes time between a Data Mover and an external time source.

**SYNOPSIS**

```
server_date {<movername>|ALL} [+<format>] [<yymmddhhmm>[<ss>]]
timesvc start ntp [-sync_delay][-interval <hh>[:<mm>]] [<host>[<host>...]]
timesvc update ntp
timesvc stop ntp
timesvc delete ntp
timesvc set ntp
timesvc stats ntp
timesvc timezone [<timezonestr>]
timezone -name <timezone_name>
```

**DESCRIPTION**

The `server_date` command sets and displays the current date and time for the specified Data Movers.

The `server_date` and `timesvc` commands control the synchronization of the Data Mover with external timing sources and gets and sets the time zone.

The `ALL` option executes the command for all Data Movers.

**OPTIONS**

**No arguments**

Displays the current date and time for the specified Data Mover.

```
+[<format>]
```

Displays the date information in the format specified by each field descriptor. Each field descriptor is preceded by percent and is replaced in the output by its corresponding value. A single percent is encoded by double percent (%%).

If the argument contains embedded blanks, it must be quoted.

The complete listing of all field descriptors can be viewed using the Linux strftime (3C) man page.

```
<yymmddhhmm>[<ss>]
```

Sets a two-digit number for the year, month, day, hour, minutes, and seconds in this order where `<yy>` is the year; the first `<mm>` is the month; `<dd>` is the day; `<hh>` is the hour (in 24-hour system); and the second `<mm>` is the minute, and `<ss>` is the second.
timesvc start ntp  <host> [<host>...]
Starts time synchronization immediately between a Data Mover and a host, which is the IP address of the time server hosts, and adds an entry to the database. The host must be running the NTP protocol. Only four host entries are allowed.

Other options include:

- **-sync_delay**
  Indicates that the clock should not be synchronized when the time server is activated. Instead, when the first poll is taken, latency adjustments are handled slowly. This option is generally used if time service is started after the Data Mover has already started, or if synchronization is starting after other services have already started.

  **Note:** If `-sync_delay` is not typed, by default, the clock is set at Data Mover startup. The clock is synchronized after the first poll.

- **-interval**  <hh>[:<mm>]
  Sets the delay in hours (or hours and minutes) between polls (default=1 hour which is entered 01 or 00:60). Interval is displayed in minutes.

timesvc update ntp
Immediately polls the external source and synchronizes the time on the Data Mover.

timesvc stop ntp
Stops timing synchronization between the Data Mover and an external timing host for the NTP protocol, and does not remove the entry from the database.

  **Note:** A stop of time services takes about 12 seconds. If time service is restarted within this time, a "busy" status message is returned.

timesvc delete ntp
Stops time synchronization and deletes the NTP protocol from the database.

timesvc set ntp
Immediately polls the external source and synchronizes the time on the Data Mover without slewing the clock.

timesvc stats ntp
Displays the statistical information of time synchronization for the
Network Time Protocol such as time differences between the Data Mover and the time server. Also provides information about the current state of NTP service on the Data Mover.

**timesvc**
Displays the current time service configuration.

**timezone**
Displays the current time zone on the specified Data Mover.

```[<timezonestr>]
Sets the current time zone on the specified Data Mover. The <timezonestr> is a POSIX style time zone specification with the following formats:

<std><offset> (no daylight savings time)
<std><offset><dst>[offset],start[/time],end[/time] (adjusts for daylight savings time)
```

**Note:** The Linux man page for tzset provides information about the format.

**timezone -name** *<timezonename>*
Sets the time zone on the Data Mover to the specified <timezonename>. The <timezonename> is in Linux style time zone specification. A list of valid Linux timezones is located in the /usr/share/zoneinfo directory. The third column in the table in this file lists the valid timezones.

**Note:** The timezone -name option does not reset time on the Data Mover to the specified <timezonename> time.

**SEE ALSO** Configuring Time Services on VNX, server_dns, and server_nis.

**EXAMPLE #1**
To display the current date and time on a Data Mover, type:

```
$ server_date server_2
server_2 : Thu Jan  6 16:55:09 EST 2005
```

**EXAMPLE #2**
To customize the display of the date and time on a Data Mover, type:

```
$ server_date server_2 "+%Y-%m-%d %H:%M:%S"
```
The server Commands

**EXAMPLE #3** To start time synchronization between a Data Mover and an external source, type:

```
$ server_date server_2 timesvc start ntp -interval 06:00
172.24.102.20
```

timeout

server_2 : done

**EXAMPLE #4** To set the time service without slewing the clock, type:

```
$ server_date server_2 timesvc set ntp
```

server_2 : done

**EXAMPLE #5** To display statistical information, type:

```
$ server_date server_2 timesvc stats ntp
```

server_2 :
Time synchronization statistics since start:
hits= 2, misses= 0, first poll hit= 2, miss= 0
Last offset: 0 secs, 0 usecs
Current State: Running, connected, interval=360
Time sync hosts:
   0 1 172.24.102.20

**EXAMPLE #6** To update time synchronization between a Data Mover and an external source, type:

```
$ server_date server_2 timesvc update ntp
```

server_2 : done

**EXAMPLE #7** To get the time zone on the specified Data Mover, type:

```
$ server_date server_2 timezone
```

server_2 : Local timezone:  GMT

**EXAMPLE #8** To set the time zone to Central Time for a Data Mover when you do not have to adjust for daylight savings time, type:

```
$ server_date server_2 timezone CST6
```

server_2 : done

---

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>hits</td>
<td>When a client sends a request to the server requesting the current time, if there is a reply, that is a hit.</td>
</tr>
<tr>
<td>misses</td>
<td>No reply from any of the time servers.</td>
</tr>
<tr>
<td>first poll hit</td>
<td>First poll hit which sets the first official time for the Data Mover.</td>
</tr>
<tr>
<td>miss</td>
<td>First poll miss.</td>
</tr>
<tr>
<td>Last offset</td>
<td>Time difference between the time server and the Data Mover.</td>
</tr>
<tr>
<td>Current State</td>
<td>State of the time server.</td>
</tr>
<tr>
<td>Time sync hosts</td>
<td>IP address of the time server.</td>
</tr>
</tbody>
</table>
EXAMPLE #9  To set the time zone to Central Time and adjust for daylight savings time for a Data Mover, type:

```
$ server_date server_2 timezone CST6CDT5,M4.1.0,M10.5.0
```

server_2 : done

EXAMPLE #10  To set the time zone to Central Time and adjust the daylight savings time for a Data Mover using the Linux method, type:

```
$ server_date server_2 timezone -name America/Chicago
```

server_2 : done

EXAMPLE #11  To display the time service configuration for a Data Mover, type:

```
$ server_date server_2 timesvc
```

server_2 :

Timeservice State

time: Thu Jan  6 17:04:28 EST 2005
type: ntp
sync delay: off
interval: 360
hosts: 172.24.102.20,

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>time</td>
<td>Date and time known to the Data Mover.</td>
</tr>
<tr>
<td>type</td>
<td>Time service protocol configured on the Data Mover.</td>
</tr>
<tr>
<td>sync delay</td>
<td>Whether sync delay is on or off.</td>
</tr>
<tr>
<td>interval</td>
<td>Time interval between polls.</td>
</tr>
<tr>
<td>hosts</td>
<td>Specifies the IP address of the time server.</td>
</tr>
</tbody>
</table>

EXAMPLE #12  To stop time services for a Data Mover, type:

```
$ server_date server_2 timesvc stop ntp
```

server_2 : done

EXAMPLE #13  To delete the time service configuration for a Data Mover, type:

```
$ server_date server_2 timesvc delete ntp
```

server_2 : done

EXAMPLE #14  To set the time zone on a Data Mover to Los Angeles, type:

```
$ server_date server_2 timezone -n America/Los_Angeles
```

server_2 : done
server_dbms

Enables backup and restore of databases, displays database environment statistics.

**SYNOPSIS**

```
server_dbms {<movername>}|ALL}
{-db
  {-list [<db_name>]}
  {-delete <db_name>}
  {-check [<db_name>]}
  {-repair [<db_name>]}
  {-compact [<db name>]}
  {-fullbackup -target <pathname>}
  {-incbckup -previous <pathname> -target <pathname>}
  {-restore [<db_name>] -source <pathname>}
  {-stats [<db_name> [-table <name>]] [-reset]}
  {-service -stats [transaction|memory|log|lock|mutex] [-reset]}
}
```

**DESCRIPTION**

`server_dbms` provides recovery of media failure or application corruption, displays database information, checks application database consistency, and fixes inconsistencies.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- **-db -list [<db_name>]**
  Gets the list of all application databases and their status. If `<db_name>` is specified, displays the list of all tables belonging to that database.

- **-db -delete <db_name>**
  Deletes the target application database.

  **Note:** This command will fail if the target database is not closed.

- **-db -check [<db_name>]**
  Checks the consistency of the target database at application level.

- **-db -repair [<db_name>]**
  Fixes the application level inconsistencies in the database.

- **-db -compact [<db_name> [-table <name>]]**
  Frees up disc space by compacting the target environment or database.
-db -fullbackup -target <pathname>
Performs an online full backup of the VDM database environment.
The target parameter specifies the location to copy the database files.
The <pathname> specifies the local path of the database environment
on the Control Station.

-db -incrbackup -previous <pathname> -target <pathname>
Downloads the transactional logs from the VDM and replays them on
a copy of the previous VDM backup specified by previous
<pathname>.
The -target option specifies the location to which the database files
are copied.

-db -restore [<db_name>] -source <pathname>
Restores the environment or database specified by <db_name>.
source <pathname> specifies the location for the backup of the
environment/database to be restored.

Note: The database must be closed before the command is executed.

-db -stats [<db_name>] [-table <name>] [-reset]
Displays statistics related to the specified databases and tables. If
-reset is specified, resets the statistics.

-service -stats [transaction|memory|log|lock|mutex] [-reset]
Displays transaction, memory, logging, locking or mutex statistics of
the VDM database environment. If -reset is specified, resets all or
specified statistics.

Note: For this command to be executed, the VDM on which the target
environment resides must be up.

EXAMPLE #1
To get the list of all application databases and their status, type:
$ server_dbms server_3 -db -list

server_3 : done
BASE NAME : Secmap
Version : 1
Comment : CIFS Secure mapping database.
This is a cache of the sid to uid/gid mapping of the VDM.
This database is part of the CIFS application.
It can closed with the command server_setup
Size : 16384
Modification time : Fri May 25 09:58:21 2007
Creation time : Fri May 25 09:58:21 2007
TABLE NAME : Mapping
Version : 1
Comment : Sid to uid/gid mapping table with one secondary key on xid ((1,uid) &amp;
(2,gid))
Size : 16384
Modification time : Fri May 25 09:58:21 2007
Creation time : Fri May 25 09:58:21 2007
BASE NAME : V4NameSpace
Version : 1
Comment : NFSv4 namespace database, this represents the pseudofs and referrals.
Size : 8192
Modification time : Tue Jun 5 08:57:12 2007
Creation time : Tue Jun 5 08:57:12 2007
TABLE NAME : pseudofs
Version : 1
Comment : Pseudofs-table, this holds the export tree heirarchy
Size : 8192
Modification time : Mon Jun 11 11:06:23 2007
Creation time : Mon Jun 11 11:06:23 2007
BASE NAME : Usermapper
Version : 1
Comment : Usermapper database. It allows to assign a new uid or gid to a given SID.
Size : 57344
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : aliases
Version : 1
Comment : This table allows to retrieve a domain name from one of his aliases
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : usrmapc
Version : 1
Comment : Store the uid &amp; gid ranges allocations for domains.
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : idxname
Version : 1
Comment : Store the reverse mapping uid/gid to sid.
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : usrmapusrp
Version : 1
Comment : Store the mapping SID -&gt; (uid, name).
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : usrgroupmapname
Version : 1
Comment : Store the mapping user.domain -&gt; SID.
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : usrmapgrpc
Version : 1
Comment : Store the mapping SID -&gt; (gid, name).
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007
TABLE NAME : groupmapnamesid
Version : 1
Comment : Store the mapping group.domain -&gt; SID.
Size : 8192
Modification time : Tue Jun 12 09:14:31 2007
Creation time : Tue Jun 12 09:14:31 2007

EXAMPLE #2 To display Secmap statistics, type:

$ server_dbms server_3 -db -stats Secmap

server_3 : done
STATISTICS FOR DATABASE : Secmap
TABLE : Mapping
NAME VALUE COMMENT
magic 340322 Magic number.
version 9 Table version number.
metaflags 0 Metadata flags.
nkeys 14 Number of unique keys.
ndata 14 Number of data items.
pagesize 4096 Page size.
minkey 2 Minkey value.
re_len 0 Fixed-length record length.
re_pad 32 Fixed-length record pad.
levels 1 Tree levels.
int_pg 0 Internal pages.
leaf_pg 1 Leaf pages.
dup_pg 0 Duplicate pages.
over_pg 0 Overflow pages.
empty_pg 0 Empty pages.
free 0 Pages on the free list.
int_pgfree 0 Bytes free in internal pages.
leaf_pgfree 2982 Bytes free in leaf pages.
dup_pgfree 0 Bytes free in duplicate pages.
over_pgfree 0 Bytes free in overflow pages.

EXAMPLE #3 To display statistics of the VDM database environment, type:

$ server_dbms server_3 -service -stats

STATISTICS FOR MODULE : LOG
NAME VALUE COMMENT
magic 264584 Log file magic number.
version 12 Log file version number.
### The server Commands

- **mode**: 0
- **lg_bsize**: 32768
- **lg_size**: 5242880
- **record**: 96
- **w_bytes**: 16001
- **w_mbytes**: 0
- **wc_bytes**: 0
- **wc_mbytes**: 0
- **wcount**: 31
- **wcount_fill**: 0
- **rcount**: 137
- **scount**: 31
- **region_wait**: 0
- **region_nowait**: 0
- **cur_file**: 3
- **cur_offset**: 16001
- **disk_file**: 3
- **disk_offset**: 16001
- **regsize**: 98304
- **maxcommitperflush**: 1
- **mincommitperflush**: 1

### STATISTICS FOR MODULE : LOCK

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>last_id</td>
<td>91</td>
<td>Last allocated locker ID.</td>
</tr>
<tr>
<td>cur_maxid</td>
<td>2147483647</td>
<td>Current maximum unused ID.</td>
</tr>
<tr>
<td>maxlocks</td>
<td>1000</td>
<td>Maximum number of locks in table.</td>
</tr>
<tr>
<td>maxlockers</td>
<td>1000</td>
<td>Maximum num of lockers in table.</td>
</tr>
<tr>
<td>maxobjects</td>
<td>1000</td>
<td>Maximum num of objects in table.</td>
</tr>
<tr>
<td>rmodes</td>
<td>9</td>
<td>Number of lock modes.</td>
</tr>
<tr>
<td>nlocks</td>
<td>20</td>
<td>Current number of locks.</td>
</tr>
<tr>
<td>maxnlocks</td>
<td>21</td>
<td>Maximum number of locks so far.</td>
</tr>
<tr>
<td>nlockers</td>
<td>49</td>
<td>Current number of lockers.</td>
</tr>
<tr>
<td>maxnlockers</td>
<td>49</td>
<td>Maximum number of lockers so far.</td>
</tr>
<tr>
<td>nobjects</td>
<td>20</td>
<td>Current number of objects.</td>
</tr>
<tr>
<td>maxnobjects</td>
<td>21</td>
<td>Maximum number of objects so far.</td>
</tr>
<tr>
<td>nrequests</td>
<td>65711</td>
<td>Number of lock gets.</td>
</tr>
<tr>
<td>nreleases</td>
<td>65691</td>
<td>Number of lock puts.</td>
</tr>
<tr>
<td>upgrade</td>
<td>0</td>
<td>Number of lock upgrades.</td>
</tr>
<tr>
<td>ndowngrade</td>
<td>20</td>
<td>Number of lock downgrades.</td>
</tr>
<tr>
<td>lock_wait</td>
<td>0</td>
<td>Lock conflicts w/ subsequent wait.</td>
</tr>
<tr>
<td>lock_nowait</td>
<td>0</td>
<td>Lock conflicts w/o subsequent wait.</td>
</tr>
<tr>
<td>ndeadlocks</td>
<td>0</td>
<td>Number of lock deadlocks.</td>
</tr>
<tr>
<td>locktimeouts</td>
<td>0</td>
<td>Lock timeout.</td>
</tr>
<tr>
<td>nlocktimeouts</td>
<td>0</td>
<td>Number of lock timeouts.</td>
</tr>
<tr>
<td>txntimeout</td>
<td>0</td>
<td>Transaction timeout.</td>
</tr>
<tr>
<td>ntxntimeouts</td>
<td>0</td>
<td>Number of transaction timeouts.</td>
</tr>
<tr>
<td>region_wait</td>
<td>0</td>
<td>Region lock granted after wait.</td>
</tr>
<tr>
<td>region_nowait</td>
<td>0</td>
<td>Region lock granted without wait.</td>
</tr>
<tr>
<td>regsize</td>
<td>352256</td>
<td>Region size.</td>
</tr>
</tbody>
</table>

---

570 Command Line Interface Reference for File 8.1
### STATISTICS FOR MODULE : TXN

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>last_ckp</td>
<td>3/15945</td>
<td>lsn of the last checkpoint.</td>
</tr>
<tr>
<td>time_ckp</td>
<td>Fri Aug 3 09:38:36 2007</td>
<td>time of last checkpoint.</td>
</tr>
<tr>
<td>last_txnid</td>
<td>0x8000001a</td>
<td>last transaction id given out.</td>
</tr>
<tr>
<td>maxtxns</td>
<td>20</td>
<td>maximum txns possible.</td>
</tr>
<tr>
<td>naborts</td>
<td>0</td>
<td>number of aborted transactions.</td>
</tr>
<tr>
<td>nbegins</td>
<td>26</td>
<td>number of begun transactions.</td>
</tr>
<tr>
<td>ncommits</td>
<td>26</td>
<td>number of committed transactions.</td>
</tr>
<tr>
<td>nactive</td>
<td>0</td>
<td>number of active transactions.</td>
</tr>
<tr>
<td>nsnapshot</td>
<td>0</td>
<td>number of snapshot transactions.</td>
</tr>
<tr>
<td>nrestores</td>
<td>0</td>
<td>number of restored transactions after recovery.</td>
</tr>
<tr>
<td>maxnactive</td>
<td>2</td>
<td>maximum active transactions.</td>
</tr>
<tr>
<td>maxnsnapshot</td>
<td>0</td>
<td>maximum snapshot transactions.</td>
</tr>
<tr>
<td>region_wait</td>
<td>0</td>
<td>Region lock granted after wait.</td>
</tr>
<tr>
<td>region_nowait</td>
<td>0</td>
<td>Region lock granted without wait.</td>
</tr>
<tr>
<td>regsize</td>
<td>16384</td>
<td>Region size.</td>
</tr>
</tbody>
</table>

### STATISTICS FOR MODULE : MPOOL

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>gbytes</td>
<td>0</td>
<td>Total cache size: GB.</td>
</tr>
<tr>
<td>bytes</td>
<td>10487684</td>
<td>Total cache size: B.</td>
</tr>
<tr>
<td>ncache</td>
<td>1</td>
<td>Number of caches.</td>
</tr>
<tr>
<td>regsize</td>
<td>10493952</td>
<td>Region size.</td>
</tr>
<tr>
<td>mmapsize</td>
<td>0</td>
<td>Maximum file size for mmap.</td>
</tr>
<tr>
<td>maxopenfd</td>
<td>0</td>
<td>Maximum number of open fd's.</td>
</tr>
<tr>
<td>maxwrite</td>
<td>0</td>
<td>Maximum buffers to write.</td>
</tr>
<tr>
<td>maxwrite_sleep</td>
<td>0</td>
<td>Sleep after writing max buffers.</td>
</tr>
<tr>
<td>map</td>
<td>0</td>
<td>Pages from mapped files.</td>
</tr>
<tr>
<td>cache_hit</td>
<td>65672</td>
<td>Pages found in the cache.</td>
</tr>
<tr>
<td>cache_miss</td>
<td>36</td>
<td>Pages not found in the cache.</td>
</tr>
<tr>
<td>page_create</td>
<td>0</td>
<td>Pages created in the cache.</td>
</tr>
<tr>
<td>page_in</td>
<td>36</td>
<td>Pages read in.</td>
</tr>
<tr>
<td>page_out</td>
<td>2</td>
<td>Pages written out.</td>
</tr>
<tr>
<td>ro_evict</td>
<td>0</td>
<td>Clean pages forced from the cache.</td>
</tr>
<tr>
<td>rw_evict</td>
<td>0</td>
<td>Dirty pages forced from the cache.</td>
</tr>
<tr>
<td>page_trickle</td>
<td>0</td>
<td>Pages written by memp_trickle.</td>
</tr>
<tr>
<td>pages</td>
<td>36</td>
<td>Total number of pages.</td>
</tr>
<tr>
<td>page_clean</td>
<td>36</td>
<td>Clean pages.</td>
</tr>
<tr>
<td>page_dirty</td>
<td>0</td>
<td>Dirty pages.</td>
</tr>
<tr>
<td>hash_buckets</td>
<td>1031</td>
<td>Number of hash buckets.</td>
</tr>
<tr>
<td>hash Searches</td>
<td>65744</td>
<td>Total hash chain searches.</td>
</tr>
<tr>
<td>hash_longest</td>
<td>1</td>
<td>Longest hash chain searched.</td>
</tr>
<tr>
<td>hash_examined</td>
<td>65672</td>
<td>Total hash entries searched.</td>
</tr>
<tr>
<td>hash_nowait</td>
<td>0</td>
<td>Hash lock granted with nowait.</td>
</tr>
<tr>
<td>hash_wait</td>
<td>0</td>
<td>Hash lock granted after wait.</td>
</tr>
<tr>
<td>hash_max_nowait</td>
<td>0</td>
<td>Max hash lock granted with nowait.</td>
</tr>
<tr>
<td>hash_max_wait</td>
<td>0</td>
<td>Max hash lock granted after wait.</td>
</tr>
<tr>
<td>region_nowait</td>
<td>0</td>
<td>Region lock granted with nowait.</td>
</tr>
</tbody>
</table>
The server Commands

region_wait 0 Region lock granted after wait.
mvcc_frozen 0 Buffers frozen.
mvcc_thawed 0 Buffers thawed.
mvcc_freed 0 Frozen buffers freed.
alloc 123 Number of page allocations.
alloc_buckets 0 Buckets checked during allocation.
alloc_max_buckets 0 Max checked during allocation.
alloc_pages 0 Pages checked during allocation.
alloc_max_pages 0 Max checked during allocation.
io_wait 0 Thread waited on buffer I/O.

STATISTICS FOR MODULE : MUTEX

<table>
<thead>
<tr>
<th>NAME</th>
<th>VALUE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>mutex_align</td>
<td>4</td>
<td>Mutex alignment.</td>
</tr>
<tr>
<td>mutex_tas_spins</td>
<td>1</td>
<td>Mutex test-and-set spins.</td>
</tr>
<tr>
<td>mutex_cnt</td>
<td>3254</td>
<td>Mutex count.</td>
</tr>
<tr>
<td>mutex_free</td>
<td>1078</td>
<td>Available mutexes.</td>
</tr>
<tr>
<td>mutex_inuse</td>
<td>2176</td>
<td>Mutexes in use.</td>
</tr>
<tr>
<td>mutex_inuse_max</td>
<td>2176</td>
<td>Maximum mutexes ever in use.</td>
</tr>
<tr>
<td>region_wait</td>
<td>0</td>
<td>Region lock granted after wait.</td>
</tr>
<tr>
<td>region_nowait</td>
<td>0</td>
<td>Region lock granted without wait.</td>
</tr>
<tr>
<td>regsize</td>
<td>278528</td>
<td>Region size.</td>
</tr>
</tbody>
</table>
server_devconfig

Queries, saves, and displays the SCSI over Fibre Channel device configuration connected to the specified Data Movers.

SYNOPSIS

server_devconfig {<movername> | ALL}
| -create -scsi {<disks> | <nondisks> | <all>}
  [-discovery {y | n}] [-monitor {y | n}] [-Force {y | n}]
| -list -scsi [<chain_number>] {<disks> | <nondisks> | <all>}
| -probe -scsi [<chain_number>] {<disks> | <nondisks> | <all>}
| -rename <old_name> <new_name>

DESCRIPTION

server_devconfig queries the available system device and tape device configuration, and saves the device configuration into the Data Mover’s database. server_devconfig renames the device name, and lists SCSI devices.

CAUTION

It is recommended that all Data Movers have the same device configuration. When adding devices to the device table for a single Data Mover only, certain actions such as standby failover will not be successful unless the standby Data Mover has the same disk device configuration as the primary Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

- create - scsi [<chain_number>] {<disks> | <nondisks> | <all>}
Queries SCSI devices and saves them into the device table database on the Data Mover. The <chain_number> specifies a SCSI chain number.

The -disks option limits operations to disks. The -nondisks option limits operations to non-disks such as tapes, juke boxes, and gatekeeper devices. The -all option permits all SCSI devices (disks and non-disks).

Note: The -create option modifies VNX for lock LUN names to the VNX_<vnx-hostname>_<lun-id>_vnx-dvol-name format, if the LUNs use the default Unisphere name.
The server Commands

CAUTION
The time taken to complete this command might be lengthy, dependent on the number and type of attached devices.

[-discovery {y|n}]
Enables or disables the storage discovery operation.

CAUTION
Disabling the -discovery option should only be done under the direction of an EMC Customer Service Engineer.

[-monitor {y|n}]
Displays the progress of the query and discovery operations.

[-Force {y|n}]
Overrides the health check failures and changes the storage configuration.

CAUTION
High availability can be lost when changing the storage configuration. Changing the storage configuration should only be done under the direction of an EMC Customer Service Engineer.

-list -scsi [<chain_number>] {-disks | -nondisks | -all}
Lists the SCSI device table database that has been saved on the Data Mover. The <chain_number> specifies a SCSI chain number.

Note: Fibre Channel devices appear as SCSI devices. Therefore, chain numbers might be different for Fibre Channel.

The -disks option limits operations to disks. The -nondisks option limits operations to non-disks such as tapes, juke boxes, and gatekeeper devices. The -all option permits all SCSI devices (disks and non-disks).

-probe -scsi [<chain_number>] {-disks | -nondisks | -all}
Queries and displays the SCSI devices without saving them into the database. The <chain_number> specifies a SCSI chain number.

Note: Fibre Channel devices appear as SCSI devices, therefore, chain numbers may be different for Fibre Channel.
The **-disks** option limits operations to disks. The **-nondisks** option limits operations to non-disks such as tapes, juke boxes, and gatekeeper devices. The **-all** option permits all SCSI devices (disks and non-disks).

```
-renname <old_name> <new_name>
```

Renames the specified non-disk from the `<old_name>` to `<new_name>`. The **-rename** option is available for non-disks only.

**SEE ALSO**

*VNX System Operations*, *nas_disk*, and *nas_storage*.

**SYSTEM OUTPUT**

The number associated with the storage device is dependent on the attached system. VNX for block displays a prefix of APM before a set of integers, for example, APM00033900124-0019. For example, Symmetrix systems appear as 002804000190-003C.

**EXAMPLE #1**

For the VNX system, to list all devices, type:

```
$ server_devconfig server_2 -list -scsi -all
```

server_2:

```
Scsi Disk Table

<table>
<thead>
<tr>
<th>name</th>
<th>addr</th>
<th>Director</th>
<th>Port</th>
<th>num</th>
<th>type</th>
<th>info</th>
</tr>
</thead>
<tbody>
<tr>
<td>root_disk</td>
<td>c0t0l0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>root_disk</td>
<td>c16t0l0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>root_ldisk</td>
<td>c0t0l1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>root_ldisk</td>
<td>c16t0l1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d3</td>
<td>c0t0l2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d3</td>
<td>c16t0l2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d4</td>
<td>c0t0l3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d4</td>
<td>c16t0l3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d5</td>
<td>c0t0l4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d5</td>
<td>c16t0l4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d6</td>
<td>c0t0l5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d6</td>
<td>c16t0l5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d7</td>
<td>c0t1l0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d7</td>
<td>c16t1l0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d8</td>
<td>c16t1l1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d8</td>
<td>c0t1l1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scsi Device Table

<table>
<thead>
<tr>
<th>name</th>
<th>addr</th>
<th>type</th>
<th>info</th>
</tr>
</thead>
<tbody>
<tr>
<td>gk01</td>
<td>c0t0l0</td>
<td>disk</td>
<td>5 020700000000APM00043807043</td>
</tr>
<tr>
<td>ggk01</td>
<td>c0t1l0</td>
<td>disk</td>
<td>5 020710001000APM00043807043</td>
</tr>
<tr>
<td>gk161</td>
<td>c16t1l1</td>
<td>disk</td>
<td>5 02071101100APM00043807043</td>
</tr>
</tbody>
</table>
```

For the VNX with a Symmetrix system, to list all the devices in the SCSI table, type:

```
$ server_devconfig server_2 -list -scsi -all
```
The server Commands

server_2:

### Scsi Disk Table

<table>
<thead>
<tr>
<th>name</th>
<th>addr</th>
<th>type</th>
<th>info</th>
<th>stor_id</th>
<th>stor_dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>root_disk</td>
<td>c0t0l0</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>root_disk</td>
<td>c16t0l0</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>root_ldisk</td>
<td>c0t0l1</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>root_ldisk</td>
<td>c16t0l1</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d3</td>
<td>c0t1l0</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d3</td>
<td>c16t1l0</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d4</td>
<td>c0t1l1</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d4</td>
<td>c16t1l1</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d5</td>
<td>c0t1l2</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d5</td>
<td>c16t1l2</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d6</td>
<td>c0t1l3</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d6</td>
<td>c16t1l3</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d7</td>
<td>c0t1l4</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d7</td>
<td>c16t1l4</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>&lt;... removed ...&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d377</td>
<td>c1t8l6</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>d377</td>
<td>c17t8l6</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd378</td>
<td>c1t8l7</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd378</td>
<td>c17t8l7</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd379</td>
<td>c1t8l8</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd379</td>
<td>c17t8l8</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd380</td>
<td>c1t8l9</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd380</td>
<td>c17t8l9</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd381</td>
<td>c1t8l10</td>
<td>16C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
<tr>
<td>rootd381</td>
<td>c17t8l10</td>
<td>01C</td>
<td>FA</td>
<td>0 On</td>
<td>000187940268</td>
</tr>
</tbody>
</table>

### Scsi Device Table

<table>
<thead>
<tr>
<th>name</th>
<th>addr</th>
<th>type</th>
<th>info</th>
<th>stor_id</th>
<th>stor_dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>gk01</td>
<td>c0t0l15</td>
<td>disk</td>
<td>56706817D480</td>
<td>000187940268</td>
<td></td>
</tr>
<tr>
<td>gk161</td>
<td>c16t0l15</td>
<td>disk</td>
<td>56706817D330</td>
<td>000187940268</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This is a partial display due to the length of the output.
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>A unique name for each device in the chain.</td>
</tr>
<tr>
<td>addr</td>
<td>SCSI chain, target, and LUN information.</td>
</tr>
<tr>
<td>Director num</td>
<td>Director number. This output is applicable for Symmetrix systems only.</td>
</tr>
<tr>
<td>type</td>
<td>Device type, as specified in the SCSI spec. for peripherals. This output is applicable for Symmetrix systems only.</td>
</tr>
<tr>
<td>Port num</td>
<td>Port number. This output is applicable for Symmetrix systems only.</td>
</tr>
<tr>
<td>sts</td>
<td>Indicates the port status. Possible values are: On, Off, WD (write disabled), and NA. This output is applicable for Symmetrix systems only.</td>
</tr>
<tr>
<td>stor_id</td>
<td>System ID.</td>
</tr>
<tr>
<td>stor_dev</td>
<td>System device ID.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**  For the VNX, to list all SCSI-attached non-disk devices, type:

```
$ server_devconfig server_2 -list -scsi -nondisks
```

```
server_2 : Scsi Device Table
name       addr         type  info
gk01       c0t0l0       disk  5 020700000000APM00043807043
ggk01      c0t1l0       disk  5 020710001000APM00043807043
gk161      c16t1l1      disk  5 020710001100APM00043807043

For the VNX with a Symmetrix system, to list all SCSI-attached non-disk devices, type:

```
$ server_devconfig server_2 -list -scsi -nondisks
```

```
server_2 : Scsi Device Table
name       addr         type  info
gk01       c0t0l15      disk  56706817D480 000187940268
gk161      c16t0l15     disk  56706817D330 000187940268

For info=56706817D480, the following breakdown applies:

<table>
<thead>
<tr>
<th>5670</th>
<th>68</th>
<th>17D</th>
<th>48</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symm code</td>
<td>Last 2 digits in the Symm S/N</td>
<td>Symm Device ID#</td>
<td>Symm SA #</td>
<td>SA Port # (0=a, 1=b)</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**  To rename a device, type:

```
$ server_devconfig server_2 -rename gk161 gk201
```

```
server_2 : done
```
**EXAMPLE #4**

For the VNX, to discover SCSI disk devices, without saving them to the database table, type:

```
$ server_devconfig server_2 -probe -scsi -disks
```

```
server_2:
SCSI disk devices:
chain= 0, scsi-0
stor_id= APM000438070433  celerra_id= APM0004380704330000
  tid/lun= 0/0 type= disk sz= 11263 val= 1 info= DGC RAID 5 02070000000000NI
  tid/lun= 0/1 type= disk sz= 11263 val= 2 info= DGC RAID 5 02070100010001NI
  tid/lun= 0/2 type= disk sz= 2047 val= 3 info= DGC RAID 5 02070200020002NI
  tid/lun= 0/3 type= disk sz= 2047 val= 4 info= DGC RAID 5 02070300030003NI
  tid/lun= 0/4 type= disk sz= 2047 val= 5 info= DGC RAID 5 02070400040004NI
  tid/lun= 0/5 type= disk sz= 2047 val= 6 info= DGC RAID 5 02070500050005NI
  tid/lun= 0/6 type= disk sz= 2047 val= 7 info= DGC RAID 5 02070600060006NI
  tid/lun= 1/0 type= disk sz= 245625 val= 8 info= DGC RAID 5 02071000100010NI
  tid/lun= 1/1 type= disk sz= 0 val= -5 info= DGC RAID 5 02071100110011NI
  tid/lun= 1/2 type= disk sz= 273709 val= 9 info= DGC RAID 5 02071200120012NI
  tid/lun= 1/3 type= disk sz= 0 val= -5 info= DGC RAID 5 02071300130013NI
  tid/lun= 1/4 type= disk sz= 273709 val= 10 info= DGC RAID 5 02071400140014NI
  tid/lun= 1/5 type= disk sz= 0 val= -5 info= DGC RAID 5 02071500150015NI
  tid/lun= 1/6 type= disk sz= 273709 val= 11 info= DGC RAID 5 02071600160016NI
  tid/lun= 1/7 type= disk sz= 0 val= -5 info= DGC RAID 5 02071700170017NI
  tid/lun= 1/8 type= disk sz= 273709 val= 12 info= DGC RAID 5 02071800180018NI
  tid/lun= 1/9 type= disk sz= 0 val= -5 info= DGC RAID 5 02071900190019NI
chain= 1, scsi-1 : no devices on chain
chain= 2, scsi-2 : no devices on chain
chain= 3, scsi-3 : no devices on chain
chain= 4, scsi-4 : no devices on chain
chain= 5, scsi-5 : no devices on chain
chain= 6, scsi-6 : no devices on chain
chain= 7, scsi-7 : no devices on chain
chain= 8, scsi-8 : no devices on chain
chain= 9, scsi-9 : no devices on chain
chain= 10, scsi-10 : no devices on chain
chain= 11, scsi-11 : no devices on chain
chain= 12, scsi-12 : no devices on chain
chain= 13, scsi-13 : no devices on chain
chain= 14, scsi-14 : no devices on chain
chain= 15, scsi-15 : no devices on chain
```

For the VNX with a Symmetrix system, to discover SCSI disk devices, without saving them to the database table, type:

```
$ server_devconfig server_2 -probe -scsi -disks
```

```
server_2:
SCSI disk devices:
chain= 0, scsi-0
stor_id= 000190102173  celerra_id= 0001901021730041
  tid/lun= 0/0 type= disk sz= 11507 val= 1 info= 577273041291SI00041
  tid/lun= 0/1 type= disk sz= 11507 val= 2 info= 577273042291SI00042
```
The server Commands

Note: This is a partial listing due to the length of the output.
**EXAMPLE #5**
To discover and save all SCSI devices, type:

```
$ server_devconfig server_2 -create -scsi -all
```

Discovering storage (may take several minutes)

server_2 : done

**EXAMPLE #6**
To discover and save all non-disk devices, type:

```
$ server_devconfig server_2 -create -scsi -nondisks
```

Discovering storage (may take several minutes)

server_2 : done

**EXAMPLE #7**
To save all SCSI devices with the discovery operation disabled, and display information regarding the progress, type:

```
$ server_devconfig ALL -create -scsi -all -discovery n -monitor y
```

server_2 :
server_2:
chain 0 ..........
chain 16 ..... done
server_3 :
server_3:
chain 0 ..........
chain 16 ..... done
server_4 :
server_4:
chain 0 ..........
chain 16 ..... done
server_5 :
server_5:
chain 0 ..........
chain 16 ..... done
**server_df**

Reports free and used disk space and inodes for mounted file systems on the specified Data Movers.

**SYNOPSIS**

```
server_df {<movername>|ALL} [-inode] [<pathname>|<fs_name>]
```

**DESCRIPTION**

*server_df* reports the amount of used and available disk space for a Data Mover or file system, how much of a file system’s total capacity has been used, and the number of used and free inodes.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

No arguments

Displays the amount of disk space in kilobytes used by file systems.

*-inode*

Reports used and free inodes.

```
[<pathname>|<fs_name>]
```

Gets file system information. If *<fs_name>* specified, gets information for file system only.

**SEE ALSO**

*Managing Volumes and File Systems for VNX Manually, nas_disk, and nas_fs.*

**EXAMPLE #1**

To display the amount of used and available disk space on a Data Mover, type:

```
$ server_df server_2
```

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>kbytes</th>
<th>used</th>
<th>avail</th>
<th>capacity</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs1</td>
<td>1075686032</td>
<td>477816</td>
<td>1075208216</td>
<td>0%</td>
<td>/ufs1</td>
</tr>
<tr>
<td>ufs4</td>
<td>101683184</td>
<td>584</td>
<td>101682600</td>
<td>0%</td>
<td>/nmfs1/ufs4</td>
</tr>
<tr>
<td>ufs2</td>
<td>206515184</td>
<td>600</td>
<td>206514584</td>
<td>0%</td>
<td>/nmfs1/ufs2</td>
</tr>
<tr>
<td>nmfs1</td>
<td>308198368</td>
<td>1184</td>
<td>308197184</td>
<td>0%</td>
<td>/nmfs1</td>
</tr>
<tr>
<td>root_fs_common</td>
<td>13624</td>
<td>5264</td>
<td>8360</td>
<td>39%</td>
<td>/.etc_common</td>
</tr>
<tr>
<td>root_fs_2</td>
<td>114592</td>
<td>760</td>
<td>113832</td>
<td>1%</td>
<td>/</td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filesystem</td>
<td>Name of the file system.</td>
</tr>
<tr>
<td>kbytes</td>
<td>Total amount of space in kilobytes for the file system.</td>
</tr>
<tr>
<td>used</td>
<td>Amount of kilobytes used by the file system.</td>
</tr>
</tbody>
</table>
The server Commands

EXAMPLE #2  To display the amount of disk space and the amount of free and unused inodes on a Data Mover, type:

```
$ server_df server_2 -inode
```

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>inodes</th>
<th>used</th>
<th>avail</th>
<th>capacity</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs1</td>
<td>131210494</td>
<td>140</td>
<td>131210354</td>
<td>0%</td>
<td>/ufs1</td>
</tr>
<tr>
<td>ufs4</td>
<td>25190398</td>
<td>10</td>
<td>25190388</td>
<td>0%</td>
<td>/nmfs1/ufs4</td>
</tr>
<tr>
<td>ufs2</td>
<td>25190398</td>
<td>11</td>
<td>25190387</td>
<td>0%</td>
<td>/nmfs1/ufs2</td>
</tr>
<tr>
<td>nmfs1</td>
<td>50380796</td>
<td>21</td>
<td>50380775</td>
<td>0%</td>
<td>/nmfs1</td>
</tr>
<tr>
<td>root_fs_common</td>
<td>21822</td>
<td>26</td>
<td>21796</td>
<td>0%</td>
<td>/.etc_common</td>
</tr>
<tr>
<td>root_fs_2</td>
<td>130942</td>
<td>66</td>
<td>130876</td>
<td>0%</td>
<td>/</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To display the amount of disk space and the amount of free and unused inodes on a file system, type:

```
$ server_df server_2 -inode ufs1
```

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>inodes</th>
<th>used</th>
<th>avail</th>
<th>capacity</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs1</td>
<td>131210494</td>
<td>140</td>
<td>131210354</td>
<td>0%</td>
<td>/ufs1</td>
</tr>
</tbody>
</table>
server_dns

Manages the Domain Name System (DNS) lookup server configuration for the specified Data Movers.

**SYNOPSIS**

```
server_dns {<movername>|ALL}

[-protocol {tcp|udp}] <domainname> {<ip_addr>,...}
[-delete <domainname>]
[-option {start|stop|flush|dump}]
```

**DESCRIPTION**

server_dns provides connectivity to the DNS lookup servers for the specified Data Movers to convert hostnames and IP addresses. Up to three DNS lookup servers are supported for each domain on the Data Mover.

server_dns also provides the ability to clear the cache that has been saved on the Data Mover as a result of the DNS lookup servers.

The ALL option executes the command for all Data Movers.

**OPTIONS**

No arguments
Displays the DNS configuration.

```
-protocol {tcp|udp} <domainname> {<ip_addr>,...}
```

Sets the protocol for the DNS lookup servers (udp is the default).

```
<domainname> {<ip_addr>,...}
```

Creates list of up to three IP addresses to be used as the DNS lookup servers for the specified <domainname>.

```
-delete <domainname>
```

Deletes the DNS lookup servers in the DNS domain name.

```
-option {start|stop|flush|dump}
```

The start option activates the link for the DNS lookup servers. The stop option halts access to the DNS lookup servers. After DNS service has been halted, the flush option can be used to clear the cache that has been saved on the Data Mover, and the dump option displays the DNS cache.

**SEE ALSO**

Configuring VNX Naming Services and server_nis.

**EXAMPLE #1**

To connect to a DNS lookup server, type:

```
$ server_dns server_2 prod.emc.com 172.10.20.10
server_2 : done
```
The server Commands

**EXAMPLE #2** To display the DNS configuration, type:

```
$ server_dns server_2
```

server_2 :
DNS is running.
prod.emc.com
proto:udp server(s):172.10.20.10

**EXAMPLE #3** To change the protocol to TCP from UDP, type:

```
$ server_dns server_2 -protocol tcp prod.emc.com
```

server_2 : done

**EXAMPLE #4** To halt access to the DNS lookup servers, type:

```
$ server_dns server_2 -option stop
```

server_2 : done

**EXAMPLE #5** To flush the cache on a Data Mover, type:

```
$ server_dns server_2 -option flush
```

server_2 : done

**EXAMPLE #6** To dump the DNS cache, type:

```
$ server_dns server_2 -option dump
```

server_2 :
DNS cache size for one record type: 64
DNS cache includes 6 item(s):

```
dm102-cge0.nasdocs.emc.com
  Type:A    TTL=184 s  dataCount:1
  172.24.102.202 (local subnet)
---
winserver1.nasdocs.emc.com
  Type:A    TTL=3258 s  dataCount:1
  172.24.103.60
---
ldap._tcp.Default-First-Site-Name._sites.dc._msdcs.nasdocs.emc.com
  Type:SRV   TTL=258 s  dataCount:1
  priority:0  weight:100  port:389  server:winserver1.nasdocs.emc.com
---
kerberos._tcp.Default-First-Site-Name._sites.dc._msdcs.nasdocs.emc.com
  Type:SRV   TTL=258 s  dataCount:1
  priority:0  weight:100  port:88  server:winserver1.nasdocs.emc.com
---
```
Expired item(s): 2

**EXAMPLE #7** To delete the DNS lookup servers, type:

```
$ server_dns server_2 -delete prod.emc.com
```

server_2 : done
server_export

Exports file systems, and manages access on the specified Data Movers for NFS and CIFS clients.

SYNOPSIS

server_export {<movername>|ALL}

operations on all cifs and/or nfs entries:
| [-Protocol {cifs|nfs}] -list -all
| [-Protocol {cifs|nfs}] -all
| [-Protocol {cifs|nfs}] -unexport [-perm] -all

nfs operations per entry:
| -list <pathname>
| [-Protocol nfs [-name <name>]][-ignore][-option <options>]
  [-comment <comment>] <pathname>
| -unexport [-perm] <pathname>

cifs operations per entry:
| -list -name <sharename> [-option <options>]
| -name <sharename> [-ignore][-option <options>][-comment <comment>]
  <pathname>
| -unexport -name <sharename> [-option <options>]

-option type = {

DESCRIPTION

server_export provides user access by exporting an NFS pathname, or creating a CIFS share. Allows specification of multiple clients identified by hostnames or network and subnet addresses separated by a colon.

server_export removes access by unexporting an NFS pathname, deleting a CIFS share, and displaying the exported entries and available shares for the specified Data Mover.

The ALL option executes the command for all Data Movers.

Note: NFSv4 does not support the -name option.

GENERAL OPTIONS FOR CIFS AND NFS OPERATIONS

No arguments
Displays all exported NFS entries and CIFS shares.

[-Protocol {cifs|nfs}] -list -all
Lists all exported entries as defined by the protocol. The default is NFS.
The server Commands

[-Protocol {cifs|nfs}] -all
Exports all entries on a Data Mover as defined by the protocol. The default is NFS.

[-Protocol {cifs|nfs}] -unexport [-perm] -all
Unexports all entries as defined by the protocol. By default, unexports are permanent for CIFS, and temporary for NFS, unless -perm is specified. If -perm is specified, removes all entries from the export table. When the entry is temporarily unexported, clients are denied access to the entry until it is re-exported or the system is rebooted, but the entries are not removed from the export table. The default is NFS.

FOR NFS OPERATIONS

-list <pathname>
Lists a specific NFS entry. If there are extra spaces in the <pathname>, the entire pathname must be enclosed by quotes. By using the server_export command, IPv6 addresses can be specified and the hosts configured with these addresses can mount and access file systems over NFS.

Note: If you are configuring an IPv6 address for ro, rw, access, and root, it must be enclosed in [ ] or square brackets. This is to properly handle the colon used to separate entries. Link local addresses are not supported.

-Protocol nfs [-name <name>] <pathname>
Exports an NFS <pathname> by default as read-write for everyone. If specified, assigns an optional file system name for the <name>. Pathname length is limited to 1024 bytes (represented as 1024 ASCII characters or a variable number of Unicode multibyte characters), and must be enclosed by quotes, if spaces are used. Name length is limited to 255 bytes.

Note: In a nested mount file system hierarchy, users can export the mount point path of the component file system. Subdirectories of the component file system cannot be exported. In a multilevel file system hierarchy, users can export any part of a file system independent of existing exports.

-ignore <pathname>
Overwrites previous options and comments in the export table for the entry.

-comment <comment>] <pathname>
Adds a comment for the specified NFS export entry. The comment is displayed when listing the exported entries.
The server Commands

[-option <options>] <pathname>

Specifies the following comma-separated options:

```
sec=[sys|krb5|krb5i|krb5p]:<mode> [...]
```

Specifies a user authentication or security method with an access mode setting. The `sys` (default) security option specifies AUTH_SYS security. The access mode can be one, or a combination of the following: ro, rw=, ro=, root=, access=, anon=, webroot, public.

If the `sec` option is specified, it must always be the first option specified in the string.

`krb5` security specifies Kerberos user and data authentication.

`krb5i` checks for the integrity of the data by adding a signature to each NFS packet and `krb5p` encrypts the data before sending it over the network.

For `krb5`, `krb5i`, and `krb5p` security, the access mode can be one, or a combination of the following: ro, rw=, ro=, root=, access=.

`ro`

Exports the `<pathname>` for all NFS clients as read-only.

```
ro=<client>[:<client>]...
```

Exports the `<pathname>` for the specified NFS clients as read-only.

**Note:** If `<client>` is an IPv6 address, it must be enclosed in square brackets or [ ].

```
ro=<-client>[:<-client>]...
```

Excludes the specified NFS clients from ro privileges. Clients must be preceded with dash (-) to specify exclusion.

**Note:** If `<client>` is an IPv6 address, it must be enclosed in square brackets or [ ].

```
rw=<client>[:<client>]...
```

Exports the `<pathname>` as read-mostly for the specified NFS clients. Read-mostly means exported read-only to most machines, but read-write to those specified. The default is read-write to all.

**Note:** If `<client>` is an IPv6 address, it must be enclosed in square brackets or [ ].
The server Commands

\textbf{rw}=\langle-client\rangle[\colon\langle-client\rangle]...
Excludes the specified NFS clients from rw privileges. The description of read-mostly provides information. Clients must be preceded with - (dash) to specify exclusion.

\textbf{Note:} If \langle-client\rangle is an IPv6 address, it must be enclosed in square brackets or [ ].

\textbf{root}=\langle-client\rangle[\colon\langle-client\rangle]...
Provides root privileges for the specified NFS clients. By default, no host is granted root privilege.

\textbf{Note:} If \langle-client\rangle is an IPv6 address, it must be enclosed in square brackets or [ ].

\textbf{root}=<\langle-client\rangle[\colon\langle-client\rangle]...
Excludes the specified NFS clients from root privileges. Clients must be preceded with - (dash) to specify exclusion.

\textbf{Note:} If \langle-client\rangle is an IPv6 address, it must be enclosed in square brackets or [ ].

\textbf{anon}=\langle uid\rangle
If a request comes from an unknown user, the UID should be used as the effective user ID. Root users (UID =0) are considered “unknown” by the NFS server unless they are included in the root option. The default value for anon=\langle uid\rangle is the user “nobody.” If the user “nobody” does not exist, then the value 65534 is used.

\textbf{CAUTION}
Using anon=0 is not recommended for security concerns.

\textbf{access}=\langle-client\rangle[\colon\langle-client\rangle]...
Provides mount access for the specified NFS clients.

\textbf{Note:} If \langle-client\rangle is an IPv6 address, it must be enclosed in square brackets or [ ].
access=<client>[:<client>]...
Excludes the specified NFS clients from access even if they are part of a subnet or netgroup that is allowed access. Clients must be preceded with - (dash) to specify exclusion.

---

**Note:** If `<client>` is an IPv6 address, it must be enclosed in square brackets or [ ].

---

**nfsv4only**
Specifies that the NFS export can be accessed only when a client is using NFSv4.

**vlan=<vlanid>[,<vlanid>,...]**
Specifies that all hosts belonging to the VLAN ID will have access to the exported file system. Hosts on other VLANs will be denied.

The VLANs are separated by : or colon, just as any other `server_export` option values.

Clients can be a hostname, netgroup, subnet, or IP address and must be colon-separated, without spaces. A subnet is an IP address/netmask (for example, 168.159.50.0/255.255.255.0). A hostname is first checked for in the Data Mover’s local hosts database, then on the NIS (host database) or DNS server (if enabled). A netgroup is searched in the local netgroup database and then on the NIS server’s netgroup database. If the client name does not exist in any case, then access is denied.

---

**Note:** Netgroups are supported. The hosts and netgroup files can be created on the Control Station using your preferred method (for example, with an editor, or by copying from another node), then copied to the Data Mover.

---

**nosuid=<client>[:<client>]... OR**
**nosuid=<-client>[:<-client>]...**
When the nosuid NFS export option is used with a list of client names, the setuid and setgid bits are cleared from the permissions before setting the permissions on any file on the exported pathname for those clients.

When the nosuid NFS export option is used with a dash (-) before each client name, the setuid and setgid bits are cleared from the permissions before setting the permissions on any file on the exported pathname for all clients except for the clients listed.
The server Commands

-unexport [-perm] <pathname>
Temporarily unexports a <pathname> unless -perm is specified. If -perm is specified, removes the entry from the export table.

FOR CIFS OPERATIONS

-list -name <sharename>
Displays the specified CIFS share.

[-option <options>]
Specifies the following comma-separated list of options:

[netbios=<netbios_name>]
When the share has an associated NetBIOS name that name is required to locate the entry. Multiple CIFS entries can have same <sharename> when belonging to a different NetBIOS name.

-name <sharename> [-ignore][-option <options>]
[-comment <comment>] <pathname>
Creates a CIFS share. Share name length is limited to 12 ASCII characters unless Unicode is enabled, in which case the limit is 80 multibyte characters. Share names cannot include the following characters: /, \, %, ", NUL (Null character), STX (start of header), SOT (start of text), and LF (line feed). Share names can contain spaces and other nonalphanumeric characters, but must be enclosed by quotes if spaces are used. Share names cannot begin with a - (hyphen). Share names are case-sensitive.

Comment length is limited to 256 bytes (represented as 256 ASCII characters or a variable number of Unicode multibyte characters). A comment cannot include the following characters: NUL (Null character), STX (start of header), and SOT (start of text). Comments can contain spaces and other nonalphanumeric characters, but must be enclosed by quotes if spaces are used. Pathname length is limited to 1024 bytes.

The -ignore option overwrites the previous options and comment in the export table.

[-option <options>]
Specifies the following comma-separated options:

ro
Exports the <pathname> for CIFS clients as read-only.

rw=<client>[;<client>]
Creates the share for CIFS clients as read-mostly. Read-mostly means shared read-only to most clients, but read-write to those specified. By default, the <pathname> is shared read-write to all. A client may be either a <user_name> or <group_name>.
Note: If `<client>` is an IPv6 address, it must be enclosed in [ ] or square brackets.

`umask=<mask>`
Specifies a user file-creation mask for the umask allowing NFS permissions to be determined for the share.

Note: The value of the umask is specified in octal and is XORed with the permissions of 666 for files and 777 for directories. Common values include 002, which gives complete access to the group, and read (and directory search) access to others or 022 (default) which gives read (and directory search), but not write permission to the group and others.

`user=<default_user>`
When using share level access (server_checkup provides information), specifies a `<default_user>` which must be entered as a character string. The user must be defined in the Data Mover’s password file. There is a 20 character limit for the username.

`group=<default_group>`
When using share level access (server_checkup provides information), indicates a `<default_group>` which must be entered as a character string. There is a 256 character limit for group names.

`ropasswd=<share_passwd>`
When using share level access (server_checkup provides information), creates a read-only password to allow clients access to the share. Passwords can be viewed in the list of shared entries.

`rwpasswd=<share_rw_passwd>`
When using share level access (server_checkup provides information), creates a read-write password to allow clients access to the share. Passwords are displayed in the list of shared entries.

Note: Users from any client machine who know the value of the ropasswd or rwpasswd can access the share for read-only and read-write operations.

`maxusr=<maxusr>`
Sets the maximum number of simultaneous users permitted for a share.
The server Commands

\textbf{netbios}=\texttt{<netbiosName>},\texttt{<netbiosName>}...
Associates a share on a single domain with one or more NetBIOS names created with \texttt{server_checkup}. By default, if a NetBIOS name is not specified for a share, the share is visible to all NetBIOS names.

\texttt{-comment}
Adds a comment for the specified CIFS share. The comment is displayed when listing the shared entries.

\texttt{-unexport -name <sharename>}
Permanently removes access to a share by removing the entry from the export table.

\begin{verbatim}
[-option <options>]
\end{verbatim}
Specifies the following comma-separated options:

\texttt{netbios}=\texttt{<netbios_name>}
When the share has an associated NetBIOS name the NetBIOS name is required to locate the entry. This is required because multiple CIFS entries can have same \texttt{<sharename>} when belonging to different NetBIOS name.

\begin{verbatim}
-option
type={\texttt{CA[:]}\texttt{Encrypted[:]}\texttt{ABE[:]}\texttt{HASH[:]}\texttt{OCAutoI|OCVDO|OCNO NE]}|\texttt{NONE}}
\end{verbatim}
Specifies the following colon-separated list of options:

\begin{itemize}
  \item Continuous Availability (\texttt{CA}): Indicates continuous availability of data on the specific share.
  \item Encrypted: The server requires encrypted messages to access the share.
  \item Access Based Enumeration (\texttt{ABE}): Only files and directories to which the user has read access are visible (Access Based Enumeration).
  \item HASH: Indicates that the share supports hash generation for BranchCache retrieval.
  \item Offline Caching Attributes (\texttt{OC}): User MUST allow only manual caching for the files open from this share by default.
    \begin{itemize}
      \item \texttt{OCAutoI}: The user MAY cache every file that it opens from this share.
    \end{itemize}
\end{itemize}
• OCVDO: The user MAY cache every file that it opens from this share. Also, the user MAY satisfy the file requests from its local cache.

• OCNone: Indicates no files or programs from the shared folder are available offline.

• HASH: The share supports hash generation for BranchCache retrieval.

**SEE ALSO** Configuring NFS on VNX, Managing Volumes and File Systems for VNX Manually, server_checkup, and server_mount.

**EXAMPLE #1** To export a specific NFS entry, type:

```bash
$ server_export server_2 -Protocol nfs /ufs1
```

server_2 : done

**EXAMPLE #2** To export an NFS entry and overwrite existing settings, type:

```bash
$ server_export server_2 -Protocol nfs -ignore -option access=172.24.102.0/255.255.255.0,root=172.24.102.240 -comment 'NFS Export for ufs1' /ufs1
```

server_2 : done

**EXAMPLE #3** To export an NFS entry dir1, a subdirectory of the exported entry /ufs1 in a multilevel file system hierarchy, type:

```bash
$ server_export server_2 -Protocol nfs /ufs1/dir1
```

server_2 : done

**EXAMPLE #4** To assign a name to an NFS export, type:

```bash
$ server_export server_2 -Protocol nfs -name nasdocsfs /ufs1
```

server_2 : done

**EXAMPLE #5** To export an NFS entry using Kerberos authentication, type:

```bash
$ server_export server_2 -Protocol nfs -option sec=krb5:ro,root=172.24.102.240,access=172.24.102.0/255.255.0 /ufs2
```

server_2 : done

**EXAMPLE #6** To export an NFS entry for NFSv4 only, type:

```bash
$ server_export server_2 -Protocol nfs -option nfsv4only /ufs1
```

server_2 : done

**EXAMPLE #7** To list all NFS entries, type:

```bash
$ server_export server_2 -Protocol nfs -list -all
```
server_2:
export "/ufs2" sec=krb5 ro root=172.24.102.240 access=172.24.102.0/255.255.255.0
export "/ufs1" name="/nasdocsfs" access=172.24.102.0/255.255.255.0
root=172.24.102.240 nfsv4only comment="NFS Export for ufs1"
export "/" anon=0

EXAMPLE #8 To list NFS entries for the specified path, type:
$ server_export server_2 -list /ufs1

EXAMPLE #9 To temporarily unexport an NFS entry, type:
$ server_export server_2 -Protocol nfs -unexport /ufs2
server_2 : done

EXAMPLE #10 To export all NFS entries, type:
$ server_export server_2 -Protocol nfs -all
server_2 : done

EXAMPLE #11 To export a specific NFS entry in a language that uses multibyte characters (such as Japanese), type:
$ server_export server_2 -Protocol nfs
/nfs_entry_in_local_language_text>
server_2 : done

EXAMPLE #12 To permanently unexport an NFS entry, type:
$ server_export server_2 -unexport -perm /ufs1
server_2 : done

EXAMPLE #13 To permanently unexport all NFS entries, type:
$ server_export server_2 -Protocol nfs -unexport -perm -all
server_2 : done

EXAMPLE #14 To provide access to a CIFS share, type:
$ server_export server_2 -name ufs1 /ufs1
server_2 : done

EXAMPLE #15 To create a CIFS share and overwrite existing settings, type:
$ server_export server_2 -name ufs1 -ignore -option ro,umask=027,maxusr=200,netbios=dm112-cge0 -comment 'CIFS share' /ufs1
server_2 : done
EXAMPLE #16  To create a CIFS share in a language that uses multibyte characters (such as Japanese), type:

```
$ server_export server_2 -P cifs -name <name_in_local_language_text> -comment <comment_in_local_language_text>
```

```
server_2 : done
```

EXAMPLE #17  To list all CIFS entries, type:

```
$ server_export server_2 -Protocol cifs -list
```

```
server_2 :
share "ufs1" "/ufs1" ro umask=027 maxusr=200 netbios=DM112-CGE0 comment="CIFS share"
share "ufs2" "/ufs2" umask=022 maxusr=4294967295
```

EXAMPLE #18  To display a specific CIFS share, type:

```
$ server_export server_2 -list -name ufs1 -option netbios=dm112-cge0
```

```
server_2 :
share "ufs1" "/ufs1" ro umask=027 maxusr=200 netbios=DM112-CGE0 comment="CIFS share"
```

EXAMPLE #19  To export all CIFS entries, type:

```
$ server_export server_2 -Protocol cifs -all
```

```
server_2 : done
```

EXAMPLE #20  To list all NFS and CIFS entries, type:

```
$ server_export server_2
```

```
server_2 :
export "/ufs2" sec=krb5 ro root=172.24.102.240 access=172.24.102.0/255.255.255.0
export "/ufs1" nfsv4only
export "/" anon=0 access=128.221.252.100:128.221.253.100:128.221.252.101:128.221.253.101
share "ufs2" "/ufs2" umask=022 maxusr=4294967295
share "ufs1" "/ufs1" ro umask=027 maxusr=200 netbios=DM112-CGE0 comment="CIFS share"
```
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>export</td>
<td>A file system entry to be exported.</td>
</tr>
<tr>
<td>sec</td>
<td>Security mode for the file system.</td>
</tr>
<tr>
<td>ro</td>
<td>File system is to be exported as read-only.</td>
</tr>
<tr>
<td>root</td>
<td>IP address with root access.</td>
</tr>
<tr>
<td>access</td>
<td>Access is permitted for those IP addresses.</td>
</tr>
<tr>
<td>share</td>
<td>Entry to be shared.</td>
</tr>
<tr>
<td>ro</td>
<td>File system is to be shared as read-only.</td>
</tr>
<tr>
<td>umask</td>
<td>User creation mask.</td>
</tr>
<tr>
<td>maxuser</td>
<td>Maximum number of simultaneous users.</td>
</tr>
<tr>
<td>netbios</td>
<td>NetBIOS name for the share.</td>
</tr>
<tr>
<td>comment</td>
<td>Comment specified for the share.</td>
</tr>
</tbody>
</table>

**EXAMPLE #21**  To permanently unexport all CIFS and NFS entries, type:

```
$ server_export server_2 -unexport -perm -all
```

server_2 : done

**EXAMPLE #22**  To delete a CIFS share, type:

```
$ server_export server_2 -unexport -name ufs1 -option netbios=dm112-cge0
```

server_2 : done

**EXAMPLE #23**  To delete all CIFS shares, type:

```
$ server_export server_2 -Protocol cifs -unexport -all
```

server_2 : done

**EXAMPLE #24**  To export a file system for NFS that specifies an IPv4 and IPv6 address, type:

```
$ server_export server_2 -Protocol nfs -option access=172.24.108.10:[1080:0:0:8:800:200C:417A] /fs1
```

server_2 : done

**EXAMPLE #25**  To export a file system for NFS that specifies two IPv6 addresses, type:

```
```

server_2 : done
EXAMPLE #26 To verify that the file system was exported, type:

```bash
$ server_export server_2 -list /fs1
```

server_2:
export "/fs1" rw=[1080:0:0:0:8:80:200C:417A]:[1080:0:0:0:8:800:200C:417B]

done

EXAMPLE #27 To export the fs42 file system of the VDM vdm1, type:

```bash
$ server_export vdm1 -P nfs /fs42
done
```

EXAMPLE #28 To create a share foo on the server PALIC with HASH and ABE enabled, type:

```bash
$ server_export server_3 -name foo -option netbios=PALIC,
type=ABE:HASH /fs3/foo
```

server_3: done

EXAMPLE #29 To change attributes to this share to ABE only, type:

```bash
$ server_export server_3 -name foo -option netbios=PALIC,
type=ABE /fs3/foo
```

server_3: done

EXAMPLE #30 To remove all the attributes, type:

```bash
server_export server_3 -name foo -ignore -option netbios=PALIC,
type=None /fs3/fro
```

server_3: done

EXAMPLE #31 To view the attributes, type:

```bash
server_export server_3 share "foo" "/fs3/fro"
type=ABE:HASH umask=022 maxusr=4294967295 netbios=PALIC
```

server_3: done

EXAMPLE #32 To create a share foo on the server palic with CA and ABE enabled, type:

```bash
$ server_export server_3 -name foo -option netbios=PALIC,
type=CA:ABE /fs3/foo
```

server_3: done
The server Commands

**EXAMPLE #33**  To change attributes of the share foo to CA only, type:

```
$ server_export server_3 -name foo -option netbios=PALIC,
type=CA /fs3/foo
```

server_3 : done

**EXAMPLE #34**  To view the attributes, type:

```
$ server_export server_3 share "foo" "/fs3/fro" type=CA
umask=022 maxusr=4294967295 netbios=PALIC
```

server_3 : done

**EXAMPLE #35**  To create a share share10 accessible only through encrypted SMB messages, type:

```
$ server_export vdm1 -P cifs -name share10 -o

type=Encrypted /fs42/protected_dir1
```

server_3 : done

**EXAMPLE #36**  To export the NFS pathname "/users/gary" on Data Mover server_2 restricting setuid and setgid bit access for clients host10 and host11, type:

```
$ server_export server_2 -Protocol nfs -option
nosuid=host10:host11 /users/gary
```

server_2 : done

**EXAMPLE #37**  To export the NFS pathname "/production1" on all Data Movers restricting setuid and setgid bit access for client host123, type:

```
$ server_export ALL -option nosuid=host123 /production1
```

server_2 : done

**EXAMPLE #38**  To export the NFS pathname "/fs1" on all Data Movers restricting setuid and setgid bit access for all clients except for 10.241.216.239, which is allowed root privileges in addition to setuid and setgid bit access, type:

```
$ server_export server_2 -Protocol nfs -option
root=10.241.216.239,nosuid=-10.241.216.239 /fs1
```

server_2 : done
server_file

Copies files between the Control Station and the specified Data Movers.

SYNOPSIS

server_file {<movername>|ALL} {-get|-put} <src_file> <dst_file>

DESCRIPTION

server_file copies the source file from the specified Data Mover (or Control Station) to the destination file on the Control Station (or specified Data Mover). The <src_file> indicates the source file, and the name <dst_file> indicates destination file. By default, if a directory is not specified on the Data Mover, the /etc directory is used.

The ALL option executes the command for all Data Movers.

OPTIONS

-get <src_file> <dst_file>
Copies the source file on Data Mover to destination file on Control Station. Both the <src_file> and <dst_file> may be full pathnames.

-put <src_file> <dst_file>
Copies source file on the Control Station to the destination file on the Data Mover. Both the <src_file> and <dst_file> must be full pathnames.

CAUTION

This command overwrites existing files of the same name without notification. Use care when copying files.

EXAMPLE #1
To copy a file from the Control Station to a Data Mover, type:

```
$ server_file server_2 -put passwd passwd
```

EXAMPLE #2
To copy a file from the Data Mover to the Control Station, type:

```
$ server_file server_2 -get passwd /home/nasadmin/passwd
```
server_fileresolve

Starts, deletes, stops, checks, and displays the fileresolve service for the specified Data Mover. Fileresolve service facilitates inode-to-filename translation. This translation is required when administrator monitors the "fs.qtreeFile" and "fs.filesystem" statistics.

SYNOPSIS

server_fileresolve <movername>
   -service { -start [-maxlimit <1M>] |
                -stop |
                -delete |
                -status }
   -list
   -add <path_name> [, ...]
   -drop <path_name> [, ...]
   -lookup { -filesystem <fs_name> -inode <inode>[,...] |
                -qtree <qt_name> -inode <inode>[,...] } [ ...]

DESCRIPTION

Controls and manages the fileresolve service, which crawls through file systems specified by the user. To have the fileresolve service started at boot time, it is recommended that this command be added to the eof config file for the Data Mover.

OPTIONS

-service { -start [-maxlimit <1M>] }

Starts the fileresolve service on the specified Data Mover. By default, the fileresolve service caches up to 1 million files (this takes about 32MB of memory on the Data Mover). By increasing the maximum limit of the inode-to-filename translation cache, from 1M to 2M, it would increase memory consumed by the service to 64M.

To change the maxlimit, use the following command:

server_fileresolve <movername> -service -start -maxlimit <new_value>

This new limit will be preserved across Data Mover reboots. However, when a new limit is applied, the entire inode-to-filename cache will be flushed and rebuilt. The File system crawler adds files to its cache in the order they are traversed. Hence, the first 1 million files traversed (by default) go in the cache.

-stop

Flushes the inode-to-filename cache and stops the service. Deleting the service also would free up the memory consumed by the
fileresolve service and deletes the configuration files created by the service.

**-delete**
Deletes the fileresolve service on the specified Data Mover.

**-status**
Checks the status of the files that are added to the cache on the specified Data Mover.

**-list**
Displays the file systems/directories that are in the configuration and used for crawling.

**-add <path_name> [,...]**
Adds specified path to the server_fileresolver configuration. Crawls the specified path and builds the inode-to-filename cache.

To add a specific file that should be included in the inode-to-filename map, the following command should be used:

```
server_fileresolve server_X -add <path for file>
```

**-drop <path_name>[,...]**
Drops specified path to the server_fileresolver configuration. Inode-to-filename cache for the specified path is not cleared until the service is restarted.

**-lookup {-filesystem <fs_name> -inode <inode> [,...]}**
Performs an on demand crawl of the specified file system to translate the inode to a pathname. If the pathname is not found for the inode, the inode value is returned. For example, server_stats displays this inode value instead of a path name in its output.

The user can do a 'deep, non-cached' lookup of the inode to discover the pathname (if it still exists). However, this could take time (in the order of minutes). Hence, server_stats only attempts to lookup in the cache and does not attempt a full file system crawl.

**Note:** If the file name is successfully resolved, full pathname is returned. Even if the file name is the same as the inode path is appended.

**-lookup -qtree <qt_name> -inode <inode> [,...] } [...]**
The server Commands

Performs an on demand crawl of the specified quota tree to translate the inode to a pathname.

**EXAMPLE #1**
To display the new paths added, type:

```
$ server_fileresolve server_2 -add /server_2/ufs_0
```

```
server_2 :
New paths are added
```

**EXAMPLE #2**
To list the specified file paths that are included in the inode-to-filename map, type:

```
$ server_fileresolve server_2 -list
```

```
PATH
/server_2/ufs_5
/server_2/ufs_4
/server_2/ufs_3
/server_2/ufs_2
/server_2/ufs_1
/server_2/ufs_0
```

**EXAMPLE #3**
To check the status of the fileresolve services, type:

```
$ server_fileresolve server_2 -service -status
```

```
server_2 :
FileResolve service is running :Max Limit of the cache:1000000 Entries used:10 Dropped entries:0
```

**EXAMPLE #4**
To drop the specified path to the server_fileresolver configuration, type

```
$ server_fileresolve server_2 -drop /server_2/ufs_0
```

```
server_2 :
Paths are dropped
Warning: Restart service to remove the cached entries of dropped paths.
```

**EXAMPLE #5**
To lookup multiple inodes within the same file system, type:

```
$ server_fileresolve server_2 -lookup -filesystem ufs_0 -inode 61697,61670,61660
```

```
server_2 :
Filesystem/QTree Inode Path
.ufs_0 61660 /server_2/ufs_0/dir00000/testdir/yYY_0000039425.tmp
.ufs_0 61670 /server_2/ufs_0/dir00000/testdir/kNt_0000028175.tmp
.ufs_0 61697 /server_2/ufs_0/dir00000/testdir/gwR_0000058176.tmp
```

**EXAMPLE #6**
To lookup multiple inodes within a Quota Tree, type:
$ server_fileresolve server_2 -lookup -qtree dir00000
   -inode 61697

server_2 :
Filesystem/QTree       Inode                   Path
dir00000                                61697         /server_2/ufs_0/dir00000/
                                              testdir/gwR_0000058176.tmp
server_ftp

Configures the FTP server configuration for the specified Data Movers.

SYNOPSIS

server_ftp {<movername>|ALL}
-service {-status|-start|-stop|{-stats [-all|-reset]}}
| -info
| -modify
  [-controlport <controlport>]
  [-dataport <dataport>]
  [-defauldir <path>]
  [-homedir {enable|disable}]
  [-keepalive <keepalive>]
  [-highwatermark <highwatermark>]
  [-lowwatermark <lowwatermark>]
  [-deniedusers [<path>]]
  [-welcome [<path>]]
  [-motd [<path>]]
  [-timeout <timeout>]
  [-maxtimeout <maxtimeout>]
  [-readsize <readsize>]
  [-writesize <writesize>]
  [-maxcnx <maxcnx>]
  [-umask <umask>]
  [-sslcontrol {no|allow|require|requireforauth}]
  [-ssldata {allow require|deny}]
  [-sslpersona {anonymous|default|<persona_name>}]}
  [-sslprotocol {default|ssl3|tls1|all}]
  [-sslcipher {default|<cipherlist>}]
  [-sslcontrolport <sslcontrolport>]
  [-ssldataport <ssldataport>]

DESCRIPTION

server_ftp configures the ftp daemon. Optional SSL security support is available. The modifications are performed when the ftp daemon is stopped and are reflected after restart of the ftp daemon. There is no need to reboot the Data Mover for the changes to be reflected.

OPTIONS

server_ftp {<movername>|ALL}
Sends a request to the Data Mover to get all the parameters of the ftp daemon.

ALL option executes the command for all Data Movers.

-service {-status|-start|-stop|{-stats [-all|-reset]}}


The server Commands

- **status**
  Retrieves the current status of the ftp daemon.

- **start**
  Starts the ftp daemon. The start option persists after the daemon is rebooted.

- **stop**
  Stops the ftp daemon.

- **stats [all | reset]**
  Displays the statistics of the ftp daemon. The reset option resets all the ftp server statistics. The all option displays detailed statistics.

- **info**
  Retrieves all the parameters for the ftp daemon along with its current status.

- **modify**
  Modifies the ftp daemon configuration. The ftp daemon has to be stopped to carry out the changes. The modifications are taken into account when the service is restarted.

  - **controlport <controlport>**
    Sets the local tcp port for control connections. By default, the port is 21. When control port is set to 0, it disables unsecure ftp usage and validates port for implicit secure connection on SSL port (default 990).

  Note: This default port can be changed using the **sslcontrolport** option.

  - **dataport <dataport>**
    Sets the local tcp port for active data connections. By default, the port is 20. When <dataport> is set to 0, the port is allocated dynamically by the server in active mode.

  - **defaultdir <path>**
    Sets the default user directory when the user home directory is not accessible. This option replaces "ftpd.defaultdir." By default, "/" is used.

  - **homedir {enable | disable}**
    Restricts or allows user access to their home directory tree. When enabled the user is allowed access to their home directory only. If
the user home directory is not accesible, access is denied. During connection the user is denied access to data outside of their home directory space. By default, this feature is disabled.

**Note:** Using FTP on VNX provides more information about how the home directory of a user is managed.

- **-umask <umask>**
  Defines the mask to set the mode bits on file or directory creation. By default the mask is 027, which means that `xrw-r----` mode bits are assigned.

- **-keepalive <keepalive>**
  Sets TCP keepalive value for the ftp daemon. This value is given in seconds. By default, the value is 60. The value 0 disables the TCP keepalive option. The maximum value is 15300 (255 minutes).

- **-highwatermark <highwatermark>**
  Sets TCP high watermark value (amount of data stored without knowledge of the client) for the ftp daemon. By default, the value is 65536. The minimum value is 8192, and the maximum value is 1048576 (1 MB).

**CAUTION**
Do not modify this parameter without a thorough knowledge of the impact on FTP client behavior.

- **-lowwatermark <lowwatermark>**
  Sets TCP low watermark value (amount of the data to be added, after the highwatermark has been reached and new data can be accepted from the client) for the ftp daemon. The minimum value is 8192, maximum value is 1048576 (1 MB), and default value is 32768.

**CAUTION**
Do not modify this parameter without a thorough knowledge of the impact on FTP client behavior.
The server Commands

-deniedusers <deniedusers_file>
Denies FTP access to specific users on a Data Mover. Specifies the path and text file containing the list of usernames to be denied access. Places each username on a separate line. By default, all users are allowed.

-welcome <welcome_file>
Specifies path of the file to be displayed on the welcome screen. For example, this file can display a login banner before the user is requested for authentication data. By default, no welcome message is displayed.

-motd <motd_file>
Specifies path of the file to be displayed on the welcome screen. Users see a welcome screen ("message of the day") after they successfully log in. By default, no message of the day is displayed.

-timeout <timeout>
Specifies the default inactivity time-out period (when not set by the client). The value is given in seconds. After the specified time if there is no activity, the client is disconnected from the server and will have to re-open a connection. By default, the <timeout> value is 900 seconds. The minimum value is 10 seconds, and the maximum value is 7200.

-maxtimeout <maxtimeout>
Sets the maximum time-out period allowed by the client. The value is given in seconds and any value larger than maximum time-out period is not allowed. By default, the <maxtimeout> value is 7200 seconds. The minimum value is 10 seconds, and the maximum value is 7200.

-readsize <readsize>
Sets the size for reading files from the disk. The value must be greater than 8192, and a multiple of 8K. By default, the <readsize> is 8192 bytes. The minimum value is 8192, and the maximum value is 1048576 (1 MB).

-writesize <writesize>
Sets the size for writing files from the disk. The value must be greater than 8192, and a multiple of 8K. By default, the <writesize> is 49152 (48 KB). The minimum value is 8192, and the maximum value is 1048576 (1 MB).
**-maxcnx** `<maxcnx>`  
Sets the maximum number of control connections the ftp daemon will support. By default, the `<maxcnx>` value is set to 65535 (64K-1). The minimum value is 1, and the maximum value is 65535 (64K-1).

**-sslcontrol** `{no|allow|require|requireforauth}`  
Uses SSL for the ftp control connection depending on the attributes specified. By default, SSL is disabled. The `no` option disables SSL control. The `allow` option specifies that SSL is enabled, but the user can still connect without SSL. The `require` option specifies that SSL is required for the connection. The `requireforauth` option specifies that SSL is required for authentication. The control path goes back to unsecure after this authentication. When the client is behind a firewall, this helps the firewall to filter the ftp commands requiring new port access.

**Note:** Before the server can be configured with SSL, the Data Mover must be set up with a private key and a public certificate. This key and certificate are identified using a `persona`. In addition, the necessary Certificate Authority (CA) certificates used to identify trusted servers must be imported into the Data Mover. Use the system’s PKI feature to manage the use of certificates prior to configuring SSL operation.

**-ssldata** `{no|allow|require}`  
Uses SSL for the data connection depending on the attributes specified. The `no` option disables SSL. The `allow` option specifies that SSL is enabled, but the user can also transfer data without SSL. The `require` option specifies that SSL is required for data connection. The `ssldata` value cannot be set to `allow` or `require` if `sslcontrol` is set to `no`. By default, SSL is disabled.

**Note:** These options are set on the server but are dependent on ftp client capabilities. Some client capabilities may be incompatible with server settings. Using FTP on VNX provides information on validating compatibility.

**-sslpersona** `{anonymous|default|<persona_name>}`  
Specifies the persona associated with the Data Mover. Personas are used to identify the private key and public certificate used by SSL. The default value specified is `default` (each Data Mover is configured with a persona named default). The `anonymous` value specifies that SSL can operate without using a certificate. This implies that the communication between client and server is encrypted and data integrity is guaranteed.
Note: Use `server_certificate` to configure the persona before using `server_ftp`.

- **-sslprotocol** `{default | ssl3 | tls1 | all}`
  Specifies the SSL protocol version that the ftp daemon on the server accepts:
  - `ssl3` — Only SSLv3 connections
  - `tls1` — Only TLSv1 connections
  - `all` — Both SSLv3 and TLSv1 connections
  - `default` — Uses the value set in the ssl.protocol parameter which, by default, is 0 (SSLv3 and TLSv1)

- **-sslcipher** `{default | <cipherlist>}
  Specifies the SSL cipher suite. The value of default is the value set in the ssl.cipher parameter. This value means that all ciphers are supported by VNX except the Anonymous Diffie-Hellman, NULL, and SSLv2 ciphers and that the supported ciphers are sorted by the size of the encryption key.

- **-sslcontrolport** `<sslcontrolport>`
  Sets the implicit control port for FTP connections over SSL. By default, the port is 990. To disable implicit FTP connections over SSL, the `<sslcontrolport>` must be set to 0.

- **-ssldataport** `<ssldataport>`
  Sets the local tcp port for active data connections using implicit FTP connections over SSL. By default, the port is 899. If the `ssldataport` is set to 0, the Data Mover will use a port allocated by the system.

**SEE ALSO**

“server_certificate”.

**EXAMPLE #1**

To retrieve all the parameters for the ftp daemon and its status, type:

```
$ server_ftp server_2 -info
```

```bash
FTP started
=======
controlport       21
dataport          20
defaultdir /     .etc/ftpd/pub
homendir         disable
umask            027

tcp keepalive     1 minute
tcp high watermark 65536 bytes
tcp low watermark 32768 bytes
```
The server Commands

readsize 8192 bytes
writesize 49152 bytes
denied users file path /.etc/ftpd/conf/ftpusers
welcome file path /.etc/ftpd/conf/welcome
motd file path /.etc/ftpd/conf/motd
session timeout 900 seconds
max session timeoutQ 7200 seconds

Security Options

sslpersona default
sslprotocol default
sslcipher default

FTP over TLS explicit Options

sslcontrol SSL require for authentication
ssldata allow SSL

FTP over SSL implicit Options

sslcontrolport 990
ssidataport 989

EXAMPLE #2 To display the statistics of the ftp daemon, type:

$ server_ftp server_2 -service -stats

<table>
<thead>
<tr>
<th>Login Type</th>
<th>Successful</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anonymous</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Unix</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CIFS</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data transfers</th>
<th>Count</th>
<th>min</th>
<th>average</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write Bin</td>
<td>10</td>
<td>10.00</td>
<td>19.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Read Bin</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Write ASCII</td>
<td>2</td>
<td>1.00</td>
<td>1.50</td>
<td>2.00</td>
</tr>
<tr>
<td>Read ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>SSL Write Bin</td>
<td>5</td>
<td>5.00</td>
<td>17.00</td>
<td>18.00</td>
</tr>
<tr>
<td>SSL Read Bin</td>
<td>15</td>
<td>7.00</td>
<td>25.00</td>
<td>35.00</td>
</tr>
<tr>
<td>SSL Write ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>SSL Read ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput (MBytes/sec)</td>
<td>Throughput is calculated using the size of the file (Mbytes) divided by the duration of the transfer (in seconds).</td>
</tr>
<tr>
<td>average</td>
<td>Average is the average of the throughputs (sum of the throughputs divided by the number of transfers).</td>
</tr>
<tr>
<td>Data transfers</td>
<td>Defines the type of transfer.</td>
</tr>
<tr>
<td>Count</td>
<td>Number of operations for a transfer type.</td>
</tr>
<tr>
<td>min</td>
<td>Minimum time in milliseconds required to execute the operation (with regards to Data Mover).</td>
</tr>
<tr>
<td>max</td>
<td>Maximum time in milliseconds required to execute the operation (with regards to Data Mover).</td>
</tr>
</tbody>
</table>

**EXAMPLE #3**  To display the statistics of the ftp daemon with details, type:

```
$ server_ftp server_2 -service -stats -all
```

<table>
<thead>
<tr>
<th>Commands</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>USER</td>
<td>23</td>
</tr>
<tr>
<td>PASS</td>
<td>23</td>
</tr>
<tr>
<td>QUIT</td>
<td>23</td>
</tr>
<tr>
<td>PORT</td>
<td>45</td>
</tr>
<tr>
<td>EPRT</td>
<td>10</td>
</tr>
<tr>
<td>...</td>
<td>....</td>
</tr>
<tr>
<td>FEAT</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SITE Commands</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMASK</td>
<td>0</td>
</tr>
<tr>
<td>IDLE</td>
<td>10</td>
</tr>
<tr>
<td>CHMOD</td>
<td>0</td>
</tr>
<tr>
<td>HELP</td>
<td>0</td>
</tr>
<tr>
<td>BANDWIDTH</td>
<td>0</td>
</tr>
<tr>
<td>KEEPALIVE</td>
<td>10</td>
</tr>
<tr>
<td>PASV</td>
<td>56</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPTS Commands</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTF8</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Login Type</th>
<th>Successful</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anonymous</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Unix</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>CIFS</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connections</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non secure</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>10</td>
</tr>
</tbody>
</table>
The server Commands

Data 44

Explicit SSL
Control Auth 3
Control 8
Data 20

Implicit SSL
Control 0
Data 0

Throughput (MBytes/sec)

<table>
<thead>
<tr>
<th>Data transfers</th>
<th>Count</th>
<th>min</th>
<th>average</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write Bin</td>
<td>10</td>
<td>10.00</td>
<td>19.00</td>
<td>20.00</td>
</tr>
<tr>
<td>Read Bin</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>Write ASCII</td>
<td>2</td>
<td>1.00</td>
<td>1.50</td>
<td>2.00</td>
</tr>
<tr>
<td>Read ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>SSL Write Bin</td>
<td>5</td>
<td>5.00</td>
<td>17.00</td>
<td>18.00</td>
</tr>
<tr>
<td>SSL Read Bin</td>
<td>15</td>
<td>7.00</td>
<td>25.00</td>
<td>35.00</td>
</tr>
<tr>
<td>SSL Write ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>SSL Read ASCII</td>
<td>0</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commands</td>
<td>FTP protocol command name.</td>
</tr>
<tr>
<td>Count</td>
<td>Number of commands received by Data Mover.</td>
</tr>
<tr>
<td>SITE Commands</td>
<td>Class of command in FTP protocol.</td>
</tr>
<tr>
<td>POTS Commands</td>
<td>Class of command in FTP protocol.</td>
</tr>
</tbody>
</table>

EXAMPLE #4
To retrieve the status of the ftp daemon, type:

```
$ server_ftp server_3 -service -status
```

server_3 : done
State : running

EXAMPLE #5
To start the ftp daemon, type:

```
$ server_ftp server_2 -service -start
```

server_2 : done

EXAMPLE #6
To stop the ftp daemon, type:

```
$ server_ftp server_2 -service -stop
```

server_2 : done
EXAMPLE #7  To set the local tcp port for the control connections, type:

$ server_ftp server_2 -modify -controlport 256

server_2 : done

FTPD CONFIGURATION
==================
State : stopped
Control Port : 256
Data Port : 20
Default dir : /
Home dir : disable
Keepalive : 1
High watermark : 65536
Low watermark : 32768
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 27
Max connection : 65535

SSL CONFIGURATION
================
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #8  To set the local tcp port for active data connections, type:

$ server_ftp server_2 -modify -dataport 257

server_2 : done

FTPD CONFIGURATION
==================
State : stopped
Control Port : 256
Data Port : 257
Default dir : /
Home dir : disable
Keepalive : 1
High watermark : 65536
Low watermark : 32768
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 27
The server Commands

Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #9
To change the default directory of a user when the home directory is not accessible, type:

$ server_ftp server_2 -modify -defaultdir /big

server_2 : done

FTPD CONFIGURATION
==================
State : stopped
Control Port : 256
Data Port : 257
Default dir : /big
Home dir : disable
Keepalive : 1
High watermark : 65536
Low watermark : 32768
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 27
Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #10
To allow users access to their home directory tree, type:

$ server_ftp server_2 -modify -homedir enable

server_2 : done

FTPD CONFIGURATION
==================
State : stopped  
Control Port : 256  
Data Port : 257  
Default dir : /big  
Home dir : enable  
Keepalive : 1  
High watermark : 65536  
Low watermark : 32768  
Timeout : 900  
Max timeout : 7200  
Read size : 8192  
Write size : 49152  
Umask : 27  
Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable  
Data channel mode : disable  
Persona : default  
Protocol : default  
Cipher : default  
Control port : 990  
Data port : 989

EXAMPLE #11
To restrict users access to their home directory tree, type:

$$server_ftp server_2 -modify -homedir disable$$

server_2 : done

FTPD CONFIGURATION
==================
State : stopped  
Control Port : 256  
Data Port : 257  
Default dir : /big  
Home dir : disable  
Keepalive : 1  
High watermark : 65536  
Low watermark : 32768  
Timeout : 900  
Max timeout : 7200  
Read size : 8192  
Write size : 49152  
Umask : 27  
Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable  
Data channel mode : disable  
Persona : default
The server Commands

Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #12
To set the default umask for creating a file or a directory by means of the ftp daemon, type:

$ server_ftp server_2 -modify -umask 077

EXAMPLE #13
To set the TCP keepalive for the ftp daemon, type:

$ server_ftp server_2 -modify -keepalive 120
Low watermark : 32768
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 77
Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #14 To set the TCP high water mark for the ftp daemon, type:

$ server_ftp server_2 -modify -highwatermark 90112

server_2 : done

FTPD CONFIGURATION
==================
State : stopped
Control Port : 256
Data Port : 257
Default dir : /big
Home dir : disable
Keepalive : 120
High watermark : 90112
Low watermark : 32768
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 77
Max connection : 65535

SSL CONFIGURATION
=================
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989
**EXAMPLE #15**
To set the TCP low water mark for the ftp daemon, type:

```
$ server_ftp server_2 -modify -lowwatermark 32768
```

```
server_2 : done
```

**FTP CONFIGURATION**

```
State                      : stopped
Control Port               : 256
Data Port                  : 257
Default dir                : /big
Home dir                   : disable
Keepalive                  : 120
High watermark             : 90112
Low watermark              : 32768
Timeout                    : 900
Max timeout                : 7200
Read size                  : 8192
Write size                 : 49152
Umask                      : 77
Max connection             : 65535
```

**SSL CONFIGURATION**

```
Control channel mode       : disable
Data channel mode          : disable
Persona                    : default
Protocol                   : default
Cipher                     : default
Control port               : 990
Data port                  : 989
```

**EXAMPLE #16**
To restrict FTP server access to specific users, type:

```
$ server_ftp server_2 -modify -deniedusers
  /etc/mydeniedlist
```

```
server_2 : done
```

**FTP CONFIGURATION**

```
State                      : stopped
Control Port               : 256
Data Port                  : 257
Default dir                : /big
Home dir                   : disable
Keepalive                  : 120
High watermark             : 90112
Low watermark              : 32768
Denied users conf file     : /etc/mydeniedlist
Timeout                    : 900
Max timeout                : 7200
Read size                  : 8192
```
The server Commands

Write size : 49152
Umask : 77
Max connection : 65535

SSL CONFIGURATION
==============
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989

EXAMPLE #17  To set the path of the file displayed before the user logs in, type:

```
$ server_ftp server_2 -modify -welcome
/.etc/mywelcomefile
```

server_2 : done

FTPD CONFIGURATION
==============
State : stopped
Control Port : 256
Data Port : 257
Default dir : /big
Home dir : disable
Keepalive : 120
High watermark : 90112
Low watermark : 32768
Welcome file : /.etc/mywelcomefile
Timeout : 900
Max timeout : 7200
Read size : 8192
Write size : 49152
Umask : 77
Max connection : 65535

SSL CONFIGURATION
==============
Control channel mode : disable
Data channel mode : disable
Persona : default
Protocol : default
Cipher : default
Control port : 990
Data port : 989
server_http

Configures the HTTP configuration file for independent services, such as VNX FileMover, for the specified Data Movers.

SYNOPSIS

```
server_http {<movername>|ALL}
   -info [<feature>]
   -service <feature> {-start|-stop}
   -service [<feature>] -stats [-reset]
   -modify <feature>
      [-threads <threads>]
      [-users {valid|<user>[,<user>,<user>...]})
      [-hosts <ip>[,<ip>,<ip>...]]
      [-port <port_number>]
      [-timeout <max_idle_time>]
      [-maxrequests <maxrequests>]
      [-authentication {none|basic|digest}]
      [-realm <realm_name>]
      [-ssl {required|off}]
      [-sslpersona {anonymous|default|<persona_name>})
      [-sslprotocol {default|ssl3|tls1|all}]
      [-sslcipher {default|<cipherlist>})
   | -append <feature>
      [-users {valid|<user>[,<user>,<user>...]})
      [-hosts <ip>[,<ip>,<ip>...]]
   | -remove <feature>
      [-users {valid|<user>[,<user>,<user>...]})
      [-hosts <ip>[,<ip>,<ip>...]]
```

DESCRIPTION

server_http manages user and host access to HTTP servers for independent services such as FileMover.

ALL option executes the command for all Data Movers.

OPTIONS

- **-info [<feature>]**
  
  Displays information about the specified feature or all features including server status, port, threads, requests allowed, timeout, access control, and SSL configuration.

- **-service <feature> {-start|-stop}**
  
  Stops or starts the HTTP server for the specified feature.

- **-service [<feature>] -stats [-reset]**
  
  Lists the usage statistics of the HTTP server for the specified feature or all features. If -reset is specified, statistics are reset to zero.
**The server Commands**

**-modify <feature>**
Displays the current HTTP protocol connection for the specified feature. When issued with options, **-modify** sets the HTTP protocol connection for the specified option. Any options previously set will be overwritten.

[[-threads <threads>]]
Sets the number of threads (default=20) for incoming service requests. The minimum value is 4, the maximum 99. The HTTP threads are started on the Data Mover at boot time.

[[-users [valid|<user>,<user>,<user>...]]]
Allows the users who correctly authenticate as defined in the Data Mover passwd file ([server_user provides more information](https://example.com)) to execute commands for the specified <feature>.

If **valid** is entered, all users in the passwd file are allowed to use digest authentication. A comma-separated list of users can also be given. If no users are given, digest authentication is turned off.

[[-hosts <ip>,<ip>,<ip>...]]
Specifies hosts by their IP addresses that are allowed to execute commands for the specified <feature>.

[[-port <port_number>]]
Specifies the port on which the HTTP server listens for incoming service requests. By default, the HTTP server instance for FileMover listens on port 5080.

[[-timeout <max_idle_time>]]
Specifies the maximum time the HTTP server waits for a request before disconnecting from the client. The default value is 60 seconds.

[[-maxrequests <max_requests>]]
Specifies the maximum number of requests allowed. The default value is 300 requests.

[[-authentication {none|basic|digest}]]
Specifies the authentication method. **none** disables user authentication, allowing for anonymous access (that is, no authentication). **basic** authentication uses a clear text password. **digest** authentication uses a scripted password. The default value is **digest** authentication.
The server Commands

[-realm <realm_name>]
Specifies the realm name. This information is required when authentication is enabled (that is, the -authentication option is set to basic or digest). The default realm name for FileMover is DHSM_authorization.

[-ssl {required|off}]
Specifies whether the HTTP server runs in secure mode, that is, only accepts data receive on encrypted SSL sessions. The default value is off.

Note: Before the HTTP server can be configured with SSL, the Data Mover must be set up with a private key and public certificate. This key and certificate are identified using a persona. In addition, the necessary Certificate Authority (CA) certificates to identify trusted servers must be imported into the Data Mover. Use the system’s PKI feature to manage the use of certificates prior to configuring SSL operation.

[-sslpersona {default|anonymous|<persona_name>}] specifies the persona associated with the Data Mover. Personas are used to identify the private key and public certificate used by SSL. The default value is default (each Data Mover is currently configured with a single persona named default). anonymous specifies that SSL can operate without using a certificate.

[-sslprotocol {default|ssl3|tls1|all}] specifies the SSL protocol version the HTTPS server accepts:

- ssl3 — Only SSLv3 connections
- tls1 — Only TLSv1 connections
- all — Both SSLv3 and TLSv1 connections
- default — Uses the value set in the ssl.protocol parameter which, by default, is 0 (SSLv3 and TLSv1)

[-sslcipher {default|<cipherlist>}]
Specifies the SSL cipher suite. The value of default is the value set in the ssl.cipher parameter which, by default, is ALL:!ADH:!SSLv2:@STRENGTH. This value means that all ciphers are supported by VNX except the Anonymous Diffie-Hellman, NULL, and SSLv2 ciphers and that the supported ciphers are sorted by the size of the encryption key.

-append <feature> [-users {valid|<user>[,<user>,<user>...]}][-hosts <ip>[,<ip>,<ip>...]]
Adds the specified users or hosts to the list of those who can execute commands for the specified <feature> without having to re-enter the
existing list. The users and hosts descriptions provide information. If users or hosts are not specified, displays the current HTTP configuration.

```
-remove <feature> [-users {valid|<user>[,<user>,<user>...]}][-hosts <ip>[,<ip>,<ip>...]]
```

Removes the specified users and hosts from the list of those who can execute commands for the specified <feature> without impacting others in the list. The users and hosts descriptions provide information. If users or hosts are not specified, displays the current HTTP configuration.

**SEE ALSO**  

**EXAMPLE #1**  
To display information about the HTTP protocol connection for the FileMover service, type:

```
$ server_http server_2 -info dhsm
```

```
server_2 : done
DHSM FACILITY CONFIGURATION
  Service name    : EMC File Mover service
  Comment         : Service facility for getting DHSM attributes
  Active          : False
  Port            : 5080
  Threads         : 16
  Max requests    : 300
  Timeout         : 60 seconds
ACCESS CONTROL
  Allowed IPs     : any
  Authentication  : digest ,Realm : DHSM_Authorization
  Allowed user    : nobody
SSL CONFIGURATION
  Mode            : OFF
  Persona         : default
  Protocol        : default
  Cipher          : default
```

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service name</td>
<td>Name of the FileMover service.</td>
</tr>
<tr>
<td>active</td>
<td>Whether VNX FileMover is enabled or disabled on the file system.</td>
</tr>
<tr>
<td>port</td>
<td>TCP port of the FileMover service.</td>
</tr>
<tr>
<td>threads</td>
<td>Number of threads reserved for the FileMover service.</td>
</tr>
<tr>
<td>max requests</td>
<td>Maximum number of HTTP requests the service allows to keep the connection alive.</td>
</tr>
<tr>
<td>timeout</td>
<td>The time in seconds until which the service is kept alive after a period of no activity.</td>
</tr>
<tr>
<td>allowed IPs</td>
<td>List of client IP addresses that are allowed to connect to the service.</td>
</tr>
</tbody>
</table>
EXAMPLE #2  To display statistical information about the HTTP protocol connection for the FileMover service, type:

```bash
$ server_http server_2 -service dhsm -stats
```

Statistics report for HTTPD facility DHSM:

- **Thread activity**
  - Maximum in use count: 0

- **Connection**
  - IP filtering rejection count: 0

- **Request**
  - Authentication failure count: 0

- **SSL**
  - Handshake failure count: 0

EXAMPLE #3  To configure an HTTP protocol connection for FileMover using SSL, type:

```bash
$ server_http server_2 -modify dhsm -ssl
```

EXAMPLE #4  To modify the threads option of the HTTP protocol connection for FileMover, type:

```bash
$ server_http server_2 -modify dhsm -threads 40
```

**DHSM FACILITY CONFIGURATION**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service name</td>
<td>EMC File Mover service</td>
</tr>
<tr>
<td>Comment</td>
<td>Service facility for getting DHSM attributes</td>
</tr>
<tr>
<td>Active</td>
<td>False</td>
</tr>
<tr>
<td>Port</td>
<td>5080</td>
</tr>
<tr>
<td>Threads</td>
<td>40</td>
</tr>
<tr>
<td>Max requests</td>
<td>300</td>
</tr>
<tr>
<td>Timeout</td>
<td>60 seconds</td>
</tr>
</tbody>
</table>

**ACCESS CONTROL**

- Allowed IPs: any
- Authentication: digest, Realm: DHSM_Authorization
- Allowed user: nobody

**SSL CONFIGURATION**

- Mode: OFF
- Persona: default
- Protocol: default
Cipher : default

**EXAMPLE #5** To allow specific users to manage the HTTP protocol connection for FileMover, type:

```
$ server_http server_2 -modify dhsm -users valid -hosts 10.240.12.146
```

```
server_2 : done
```

**EXAMPLE #6** To add specific users who can manage the existing HTTP protocol connection for FileMover, type:

```
$ server_http server_2 -append dhsm -users user1,user2,user3
```

```
server_2 : done
```

**EXAMPLE #7** To add a specific user who can manage the existing HTTP protocol connection for FileMover, type:

```
$ server_http server_2 -append dhsm -users user4 -hosts 172.24.102.20,172.24.102.21
```

```
server_2 : done
```

**EXAMPLE #8** To remove the specified users and hosts so they can no longer manage the HTTP connection for FileMover, type:

```
$ server_http server_2 -remove dhsm -users user1,user2 -hosts 10.240.12.146
```

```
server_2 : done
```
**server_ifconfig**

Manages the network interface configuration for the specified Data Movers.

**SYNOPSIS**

```bash
server_ifconfig {<movername>|ALL}
   -all [ -ip4|-ip6 ]
   | -delete <if_name>
   | -create -Device <device_name> -name <if_name>
      -protocol { IP <ipv4_addr> <ipmask> <ipbroadcast>
          | IP6 <ipv6_addr> [/PrefixLength]
          [mtu=<MTUbytes>] [vlan=<vlanID>]
          [down]
      | <if_name>  [up|down]
          | [mtu=<MTUbytes>] [vlan=<vlanID>]]
```

**DESCRIPTION**

`server_ifconfig` creates a network interface, assigns an IP address to a network interface, enables and disables an interface, sets the MTU size and the VLAN ID, and displays network interface parameters for the specified Data Mover.

`server_ifconfig` is used to define the network address of each interface existing on a machine, to delete and recreate an interface’s address and operating parameters.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- **-all [ip4|ip6]**
  Displays parameters for all configured interfaces. The **-ip4** option displays all ipv4 only interfaces, and the **-ip6** option displays all ipv6 only interfaces.

- **-delete <if_name>**
  Deletes a network interface configuration. However, the autogenerated link-local interfaces cannot be deleted.

- **-create -Device <device_name> -name <if_name> -protocol IP <ipv4_addr> <ipmask> <ipbroadcast> | IP6 <ipv6_addr> [/PrefixLength] [mtu=<MTUbytes>] [vlan=<vlanID>] [down]
  Creates a network interface configuration on the specified device with the specified name and assigns a protocol to the interface. The `<if_name>` must not contain a colon (:).
Available protocols are:

**IP** `<ipv4_addr> <ipmask> <ipbroadcast>`

**IP6** `<ipv6_addr> [/PrefixLength]`

IPv4 assigns the IP protocol with the specified IP address, mask, and broadcast address. The **IP address** is the address of a particular interface. Multiple interfaces are allowed for each device, each identified by a different IP address. The **IP mask** includes the network part of the local address and the subnet, which is taken from the host field of the address. For example, 255.255.255.0 would be a mask for a Class C network. The **IP broadcast** is a special destination address that specifies a broadcast message to a network. For example, x.x.x.255 is the broadcast address for a Class C network.

IP6 assigns the IPv6 address and prefix length. When prefix length is not specified, the default value of 64 is used. It also assigns the maximum transmission unit (MTU) size in bytes, the ID for the virtual LAN (VLAN) (valid inputs are 0 (default) to 4094).

When creating the first IPv6 interface with a global unicast address on a broadcast domain, the system automatically creates an associated IPv6 link-local interface. Similarly, when deleting the last remaining IPv6 interface on a broadcast domain, the system automatically deletes the associated IPv6 link-local interface.

The **down** option can be specified for both IPv4 and IPv6. If specified, the network interface will be set to the down state; otherwise, the network interface is up by default.

For CIFS users, when an interface is created, deleted, or marked up or down, use the **server_setup** command to stop and then restart the CIFS service in order to update the CIFS interface list.

```
<if_name> up
```

Allows the interface to receive and transmit data, but does not enable the physical port. Interfaces are marked up automatically when initially setting up the IP address.

```
<if_name> down
```

Stops data from being transmitted through that interface. If possible, the interface is reset to disable reception as well. This does not automatically disable routes using the interface.

```
<if_name> mtu=<MTUbytes>
```

Resets the maximum transmission unit (MTU) size in bytes for the specified interface. By default, the MTU is automatically set depending on the type of network interface card installed.
Regardless of whether you have Ethernet or Gigabit Ethernet, the initial default MTU size is 1500 bytes. To take advantage of the capacity of Gigabit Ethernet, the MTU size can be increased up to 9000 bytes if your switch supports jumbo frames. Jumbo frames should be used only when the entire infrastructure, including client NICs, supports them.

For UDP, it is important that both the client and server use the same MTU size. TCP negotiates the MTU size when the connection is initialized. The switch’s MTU must be greater than or equal to the host’s MTU.

**Note:** The MTU size specified here is for the interface. The MTU size specified in `server_netstat` applies to the device and is automatically set.

```bash
@if_name> vlan=<vlanID>
```

Sets the ID for the virtual LAN (VLAN). Valid inputs are 0 (default) to 4094. When a VLAN ID other than 0 is set, the interface only accepts packets tagged with that specified ID. Outbound packets are also tagged with the specified ID.

**Note:** IEEE 802.1Q VLAN tagging is supported. VLAN tagging is not supported on ana interfaces.

### SEE ALSO
- Configuring and Managing Networking on VNX and Configuring and Managing Network High Availability on VNX
- `server_netstat`
- `server_setup`
- `server_sysconfig`

### FRONT-END OUTPUT

The network device name is dependent on the front end of the system (for example, NS series Data Mover, 514 Data Movers, 510 Data Movers, and so on) and the network device type. NS series and 514 Data Movers network device name display a prefix of `cge`, for example, `cge0`. 510 or earlier Data Movers display a prefix of `ana` or `ace`, for example, `ana0`, `ace0`. Internal network devices on a Data Mover are displayed as `el30`, `el31`.

### EXAMPLE #1

To display parameters of all interfaces on a Data Mover, type:

```
$ server_ifconfig server_2 -all
```

```plaintext
server_2 :
loop protocol=IP device=loop
    inet=127.0.0.1 netmask=255.0.0.0 broadcast=127.255.255.255
    UP, loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
cge0 protocol=IP device=cge0
    inet=172.24.102.238 netmask=255.255.255.0 broadcast=172.24.102.255
```
The server Commands

UP, ethernet, mtu=1500, vlan=0, macaddr=0:60:16:4:29:87
el31 protocol=IP device=cge6
  inet=128.221.253.2 netmask=255.255.255.0 broadcast=128.221.253.255
UP, ethernet, mtu=1500, vlan=0, macaddr=0:60:16:4:11:a6 netname=localhost
el30 protocol=IP device=fxp0
  inet=128.221.252.2 netmask=255.255.255.0 broadcast=128.221.252.255
UP, ethernet, mtu=1500, vlan=0, macaddr=8:0:1b:43:7e:b8 netname=localhost

EXAMPLE #2
To create an IP interface for Gigabit Ethernet, type:

$ server_ifconfig server_2 -create -Device cge1 -name
cge1 -protocol IP 172.24.102.239 255.255.255.0
  172.24.102.255
server_2 : done

EXAMPLE #3
To create an interface for network device cge0 with an IPv6 address
with a nondefault prefix length on server_2, type:

$ server_ifconfig server_2 -create -Device cge0 -name
cge0_int1 -protocol IP6
server_2 : done

EXAMPLE #4
To create an interface for network device cge0 with an IPv6 address
on server_2, type:

$ server_ifconfig server_2 -create -Device cge0 -name
cge0_int1 -protocol IP6
  3ffe:0000:3c4d:0015:0435:0200:0300:ED20
server_2 : done

EXAMPLE #5
To verify that the settings for the cge0_int1 interface for server_2 are
correct, type:

$ server_ifconfig server_2 cge0_int1
server_2 :
cge0_int1 protocol=IP6 device=cge0
  inet=3ffe:0:3c4d:15:435:200:300:ed20 prefix=48
UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:5:5

Note: The bold item in the output highlights the nondefault 48-bit prefix.

EXAMPLE #6
To verify that the interface settings for server_2 are correct, type:

$ server_ifconfig server_2 -all
server_2 :
el30 protocol=IP device=mge0
  inet=128.221.252.2 netmask=255.255.255.0 broadcast=128.221.252.255
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b1 netname=localhost
e131 protocol=IP device=mge1
The server Commands

```
inet=128.221.253.2 netmask=255.255.255.0 broadcast=128.221.253.255
UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b2 netname=localhost
loop6 protocol=IP6 device=loop
  inet=::1 prefix=128
  UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
loop protocol=IP device=loop
  inet=127.0.0.1 netmask=255.0.0.0 broadcast=127.255.255.255
  UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
cge0_int1 protocol=IP6 device=cge0
  inet=3ffe:0:3c4d:15:435:200:300:ed20 prefix=64
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:2:5
cge0_0000_11 protocol=IP6 device=cge0
  inet=fe80::260:16ff:fe0c:205 prefix=64
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:2:5
```

**Note:** The first bold item in the output highlights the default 64-bit prefix. The second and third bold items highlight the link-local name and address that are automatically generated when you configure a global address for cge0. The automatically created link-local interface name is made by concatenating the device name with the four digit VLAN ID between 0 and 4094. Note that the interface you configured with the IPv6 address 3ffe:0:3c4d:15:435:200:300:ed20 and the address with the link-local address fe80::260:16ff:fe0c:205 share the same MAC address. The link-local address is derived from the MAC address.

**EXAMPLE #7**

To verify that the interface settings for server_2 are correct, type:

```
$ server_ifconfig server_2 -all
```

```
server_2 :
cge0_int2 protocol=IP device=cge0
  inet=172.24.108.10 netmask=255.255.255.0 broadcast=172.24.108.255
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:2:5
cge0_int1 protocol=IP6 device=cge0
  inet=3ffe:0:3c4d:15:435:200:300:ed20 prefix=64
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:2:5
cge0_0000_11 protocol=IP6 device=cge0
  inet=fe80::260:16ff:fe0c:205 prefix=64
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:c:2:5
e130 protocol=IP device=mge0
  inet=128.221.252.2 netmask=255.255.255.0 broadcast=128.221.252.255
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b1 netname=localhost
e131 protocol=IP device=mge1
  inet=128.221.253.2 netmask=255.255.255.0 broadcast=128.221.253.255
  UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b2 netname=localhost
loop6 protocol=IP6 device=loop
  inet=::1 prefix=128
  UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
loop protocol=IP device=loop
  inet=127.0.0.1 netmask=255.0.0.0 broadcast=127.255.255.255
  UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
```
Note: The bold items in the output highlight the IPv4 interface, cge0_int2, and the IPv6 interface, cge0_int1.

EXAMPLE #8  To disable an interface, type:
$ server_ifconfig server_2 cge0_int2 down

EXAMPLE #9  To enable an interface, type:
$ server_ifconfig server_2 cge0_int2 up

EXAMPLE #10 To reset the MTU for Gigabit Ethernet, type:
$ server_ifconfig server_2 cge0_int2 mtu=9000

EXAMPLE #11 To set the ID for the Virtual LAN, type:
$ server_ifconfig server_2 cge0_int1 vlan=40

EXAMPLE #12 To verify that the VLAN ID in the interface settings for server_2 are correct, type:
$ server_ifconfig server_2 -all

server_2 :
cge0_int1 protocol=IP6 device=cge0
    inet=3ffe:0:3c4d:15:435:200:300:ed20 prefix=64
    UP, Ethernet, mtu=1500, vlan=40, macaddr=0:60:16:c:2:5

cge0_0040_11 protocol=IP6 device=cge0
    inet=fe80::260:16ff:fe0c:205 prefix=64
    UP, Ethernet, mtu=1500, vlan=40, macaddr=0:60:16:c:2:5

cge0_int2 protocol=IP device=cge0
    inet=172.24.108.10 netmask=255.255.255.0 broadcast=172.24.108.255
    UP, Ethernet, mtu=1500, vlan=20, macaddr=0:60:16:c:2:5

el30 protocol=IP device=mge0
    inet=128.221.252.2 netmask=255.255.255.0 broadcast=128.221.252.255
    UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b1 netname=localhost

el31 protocol=IP device=mge1
    inet=128.221.253.2 netmask=255.255.255.0 broadcast=128.221.253.255
    UP, Ethernet, mtu=1500, vlan=0, macaddr=0:60:16:d:30:b2 netname=localhost

loop6 protocol=IP6 device=loop
    inet=::1 prefix=128
    UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost

loop protocol=IP device=loop
    inet=127.0.0.1 netmask=255.0.0.0 broadcast=127.255.255.255
    UP, Loopback, mtu=32768, vlan=0, macaddr=0:0:0:0:0:0 netname=localhost
The server Commands

**Note**: The bold items in the output highlight the VLAN tag. Note that the link-local address uses the VLAN tag as part of its name.

**EXAMPLE #13**

To delete an IP interface, type:

```sh
$ server_ifconfig server_2 -delete cge1_int2
```

server_2 : done

**Note**: The autogenerated link local interfaces cannot be deleted.
server_ip

Manages the IPv6 neighbor cache and route table for the VNX.

SYNOPSIS
server_ip {ALL | <mover>}
-neighbor {
  -list [<v6addr> [-interface <ifname>]]
  -create <v6addr> -lladdress <macaddr> [-interface <ifname>]
  -delete {-all | <v6addr> [-interface <ifname>]} }
| -route {
  -list
  -create {
    -destination <destination> -interface <ifname>
    | -default -gateway <v6gw> [-interface <ifname>]
  }
  -delete {
    -destination <destination>
    | -default -gateway <v6gw> [-interface <ifname>]
    | -all
  }
}

DESCRIPTION
server_ip creates, deletes, and lists the neighbor cache and route tables.

OPTIONS
server_ip {<movername> | ALL}
Sends a request to the Data Mover to get IPv6 parameters related to the IPv6 routing table and neighbor cache.

ALL option executes the command for all Data Movers.

-neighb or {-list | -create | -delete}
Lists, creates, or deletes the neighbor cache entries from the neighbor cache table.

-list
Displays the neighbor cache entries.

-create
Creates a neighbor cache table entry with the specified details.

-delete
Deletes the specified neighbor cache table entries or all entries.

-route {-list | -create | -delete}
Lists, creates, or deletes entries in the IPv6 route table.
The server Commands

- **list**
  Displays the IPv6 route table.

- **create**
  Creates a route table entry with the specified details.

- **delete**
  Deletes the specified route table entries.

**EXAMPLE #1**
To view a list of neighbor cache entries on Data Mover server_2, type:

```bash
$ server_ip server_2 -neighbor -list
```

<table>
<thead>
<tr>
<th>Address</th>
<th>Link layer address</th>
<th>Interface</th>
<th>Type</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe80::204:23ff:fead:4fd4</td>
<td>0:4:23:ad:4f:d4</td>
<td>cge1_0000_ll</td>
<td>host</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge1_0000_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge4_0000_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge3_2998_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>3ffe::1</td>
<td>0:16:9c:15:c:10</td>
<td>cge3_0000_ll</td>
<td>router</td>
<td>REACHABLE</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**
To view a list of neighbor cache entries for a specific IP address on Data Mover server_2, type:

```bash
$ server_ip server_2 -neighbor -list fe80::216:9cff:fe15:c00
```

<table>
<thead>
<tr>
<th>Address</th>
<th>Link layer address</th>
<th>Interface</th>
<th>Type</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge1_0000_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge4_0000_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge3_2998_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c:0</td>
<td>cge2_2442_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>The neighbor IPv6 address.</td>
</tr>
<tr>
<td>Link layer address</td>
<td>The link layer address of the neighbor.</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface name of the interface connecting to the neighbor.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of neighbor. The neighbor can be either host or router.</td>
</tr>
<tr>
<td>State</td>
<td>The state of the neighbor such as REACHABLE, INCOMPLETE, STALE, DELAY, or PROBE.</td>
</tr>
</tbody>
</table>
EXAMPLE #3  To view a list of neighbor cache entries for a specific IP address and interface type on Data Mover server_2, type:

```
$ server_ip server_2 -neighbor -list
fe80::216:9cff:fe15:c00 -interface cge1_0000_ll
```

server_2:

<table>
<thead>
<tr>
<th>Address</th>
<th>Link layer address</th>
<th>Interface</th>
<th>Type</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe80::216:9cff:fe15:c00</td>
<td>0:16:9c:15:c0</td>
<td>cge1_0000_ll</td>
<td>router</td>
<td>STALE</td>
</tr>
</tbody>
</table>

EXAMPLE #4  To add an entry to the neighbor cache for a global unicast IPv6 address on Data Mover server_2, type:

```
$ server_ip server_2 -neighbor -create 2002:8c8:0:2310::2 -lladdress 0:16:9c:15:c:15
```

OK

EXAMPLE #5  To add an entry to the neighbor cache for a link-local IPv6 address on Data Mover server_2, type:

```
$ server_ip server_2 -neighbor -create fe80::2 -lladdress 0:16:9c:15:c:12 -interface cge1v6
```

OK

EXAMPLE #6  To delete an entry from the neighbor cache for a global unicast IPv6 address on Data Mover server_2, type:

```
$ server_ip server_2 -neighbor -delete 2002:8c8:0:2310::2:ac18:f401
```

OK

EXAMPLE #7  To delete an entry from the neighbor cache for a link-local IPv6 address on all Data Movers, type:

```
$ server_ip ALL -neighbor -delete fe80::1 -interface cge1v6
```

OK

EXAMPLE #8  To delete entries from the neighbor cache on Data Mover server_2, type:

```
$ server_ip server_2 -neighbor -delete -all
```

OK

EXAMPLE #9  To view a list of route table entries on Data Mover server_2, type:

```
$ server_ip server_2 -route -list
```
The server Commands

server_2:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Gateway</th>
<th>Interface</th>
<th>Expires (secs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002:8c8:0:2310::/64</td>
<td>cge1v6</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2002:8c8:0:2311::/64</td>
<td>cge1v6</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2002:8c8:0:2312::/64</td>
<td>cge1v6</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2002:8c8:0:2313::/64</td>
<td>cge1v6</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>default</td>
<td>fe80::260:16ff:fe05:1bdc</td>
<td>cge1_0000_ll</td>
<td>1785</td>
</tr>
<tr>
<td>default</td>
<td>fe80::260:16ff:fe05:1bdc</td>
<td>cge1_0000_ll</td>
<td>1785</td>
</tr>
<tr>
<td>default</td>
<td>2002:8c8:0:2314::1</td>
<td>cge4v6</td>
<td>0</td>
</tr>
<tr>
<td>selected default</td>
<td>fe80::260:16ff:fe05:1bdc</td>
<td>cge1_0000_ll</td>
<td>1785</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destination</td>
<td>The prefix of the destination or the default route entry. There can be multiple default routes, but only one is active and shown as “selected default”. The default sorting of the destination column displays the default routes at the bottom of the list and the selected default at the end of the list.</td>
</tr>
<tr>
<td>Gateway</td>
<td>The default gateway for default route entries. This value is blank for prefix destination entries.</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface name of the interface used for the route.</td>
</tr>
<tr>
<td>Expires</td>
<td>The time until the route entry is valid. Zero denotes route is permanent and does not have an expiry.</td>
</tr>
</tbody>
</table>

**EXAMPLE #10** To add a default route table entry on the Data Mover `server_2` to the destination network with the specified prefix, type:

```
$ server_ip server_2 -route -create -destination 2002:8c8:0:2314::/64 -interface cge4v6
```

OK

**EXAMPLE #11** To add a default route table entry on the Data Mover `server_2` through the specified gateway, type:

```
$ server_ip server_2 -route -create -default -gateway 2002:8c8:0:2314::1
```

OK

**EXAMPLE #12** To add a default route table entry on the Data Mover `server_2` through the specified gateway using the link-local interface, type:

```
$ server_ip server_2 -route -create -default -gateway fe80::1 -interface cge1v6
```

OK
EXAMPLE #13  To delete an entry from the route table with an IPv6 prefix route destination for all Data Movers, type:

$ server_ip ALL -route -delete -destination 2002:8c8:0:2314::/64

OK

EXAMPLE #14  To delete an entry from the route table for a global unicast IPv6 address on Data Mover server_2, type:

$ server_ip server_2 -route -delete -default -gateway 2002:8c8:0:2314::1

OK

EXAMPLE #15  To delete an entry from the route table for a link-local IPv6 address on Data Mover server_2, type:

$ server_ip server_2 -route -delete -default -gateway fe80::1 -interface cge1v6

OK

EXAMPLE #16  To delete all entries from the IPv6 route table on Data Mover server_2, type:

$ server_ip server_2 -route -delete -all

OK
server_kerberos

Manages the Kerberos configuration within the specified Data Movers.

SYNOPSIS

server_kerberos {<movername>|ALL}
   -add realm=<realm_name>, kdc=<fqdn_kdc_name>[[:<port>]]
   [, kdc=<fqdn_kdc_name>[[:<port>]]...
   [, kpasswd=<fqdn_kpasswd_server_name>]
   [, kadmin=<kadmin_server>]
   [, domain=<domain_name>][, defaultrealm]
   -add -Disjoint realm=<realm_name>, domain=<domain_name>
   -delete realm=<realm_name>
   -delete -Disjoint realm=<realm_name>, domain=<domain_name>
   -keytab
   -ccache [-flush]
   -list
   -kadmin [kadmin_options]

DESCRIPTION

server_kerberos adds, deletes, lists the realms within the Kerberos configuration of a Data Mover, and manages the Data Movers service principals and keys.

server_kerberos displays the key table content, and specifies a kadmin server.

OPTIONS

-add realm=<realm_name>, kdc=<fqdn_kdc_name>
Adds the specified realm to the Kerberos configuration on the specified Data Mover. The <realm_name> is the fully qualified domain name of the Kerberos realm to be added to the key distribution center (KDC) configuration. The <fqdn_kdc_name> is the fully qualified domain name of the KDC for the specified realm.

Note: The -add option is relevant only if you are using a UNIX/Linux Kerberos KDC.

[[:<port>]
Specifies a port that the KDC listens on.

[, kdc=<fqdn_kdc_name[[:<port>]]...]
Specifies additional KDCs with ports that KDCs listen on.
The server Commands

[.kpasswd=<fqdn_kpasswd_server_name>]
Specifies a password server for the KDC. The <fqdn_kpasswd_server_name> must be a fully qualified domain name for the server.

[.kadmin=<kadmin_server>]
Specifies the kadmin server.

[.domain=<domain_name>]
The <domain_name> is the full name of the DNS domain for the realm.

[.defaultrealm]
Indicates that the default realm is to be used.

-delete realm=<realm_name>
Deletes the specified realm from the Kerberos configuration for the specified Data Mover.

Note: The -delete option is relevant only if you are using a UNIX/Linux Kerberos KDC.

-keytab
Displays the principal names for the keys stored in the keytab file.

-ccache
Displays the entries in the Data Movers Kerberos credential cache.

Note: The -ccache option can also be used to provide EMC Customer Support with information for troubleshooting user access problems.

-flush
Flushes the Kerberos credential cache removing all entries. Credential cache entries are automatically flushed when they expire or during a Data Mover reboot.

Once the cache is flushed, Kerberos obtains new credentials when needed. The repopulation of credentials may take place immediately, over several hours, or be put off indefinitely if no Kerberos activity occurs.

-list
Displays a listing of all configured realms on a specified Data Mover or on all Data Movers.

-kadmin [kadmin_options]
Invokes the kadmin tool with the following specified options:
The server Commands

[-r <realm>]
Specifies a realm as the default database realm.

[-p <principal>]
Specifies the principal for authentication. Otherwise, kadmin will append "/admin" to the primary principal name of the default cache, the value of the USER environment variable, or the username as obtained with getpwuid, in order of preference.

[-q <query>]
Runs kadmin in non-interactive mode. This passes the query directly to kadmin, which performs the query, then exits.

[-w <password>]
Uses a specified password instead of prompting for a password.

[-s <admin_server> [:<port>]]
Specifies the kadmin server with its associated port.

Note: The kadmin tool is relevant only if you are using a UNIX/Linux Kerberos KDC. You must be root to execute the -kadmin option.

SEE ALSO Configuring NFS on VNX, server_checkup, and server_nfs.

OUTPUT Dates appearing in output are in UTC format.

EXAMPLE #1 To add a realm to the Kerberos configuration of a Data Mover, type:

```
$ server_kerberos server_2 -add
realm=nasdocs.emc.com,kdc=winserver1.nasdocs.emc.com,domain=nasdocs.emc.com
```

server_2 : done

EXAMPLE #2 To list the keytabs, type:

```
$ server_kerberos server_2 -keytab
```

server_2 :
Dumping keytab file

keytab file major version = 0, minor version 0

-- Entry number 1 --
principal: DM102-CGE0$@NASDOCS.EMC.COM
realm: NASDOCS.EMC.COM
encryption type: rc4-hmac-md5
principal type 1, key version: 332
    key length: 16, key: b1c199a6ac11cd529df172e270326d5e
    key flags:(0x0), Dynamic Key, Not Cached
    key cache hits: 0
-- Entry number 2 --
principal: DM102-CGE0$@NASDOCS.EMC.COM
realm: NASDOCS.EMC.COM
encryption type: des-cbc-md5
principal type 1, key version: 332
  key length: 8, key: ced9a23183619267
  key flags: (0x0), Dynamic Key, Not Cached
  key cache hits: 0

-- Entry number 3 --
principal: DM102-CGE0$@NASDOCS.EMC.COM
realm: NASDOCS.EMC.COM
encryption type: des-cbc-crc
principal type 1, key version: 332
  key length: 8, key: ced9a23183619267
  key flags: (0x0), Dynamic Key, Not Cached
  key cache hits: 0

-- Entry number 4 --
principal: host/dm102-cge0@NASDOCS.EMC.COM
realm: NASDOCS.EMC.COM
encryption type: rc4-hmac-md5
principal type 1, key version: 332
  key length: 16, key: b1c199a6ac11cd529df172e270326d5e
  key flags: (0x0), Dynamic Key, Not Cached
  key cache hits: 0

<... removed ...>

-- Entry number 30 --
principal: cifs/dm102-cge0@NASDOCS.EMC.COM
realm: NASDOCS.EMC.COM
encryption type: des-cbc-crc
principal type 1, key version: 333
  key length: 8, key: d95e1940b910ec61
  key flags: (0x0), Dynamic Key, Not Cached
  key cache hits: 0

End of keytab entries. 30 entries found.

Note: This is a partial listing due to the length of the output.

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>principal type</td>
<td>Type of the principal as defined in the GSS-API. Reference to RFC 2743.</td>
</tr>
<tr>
<td>key version</td>
<td>Every time a key is regenerated its version changes.</td>
</tr>
</tbody>
</table>
EXAMPLE #3  To list all the realms on a Data Mover, type:

```
$ server_kerberos server_2 -list
```

```
server_2 :
Kerberos common attributes section:
  Supported TGS encryption types: rc4-hmac-md5 des-cbc-md5 des-cbc-crc
  Supported TKT encryption types: rc4-hmac-md5 des-cbc-md5 des-cbc-crc
  Use DNS locator: yes

End of Kerberos common attributes.

Kerberos realm configuration:

realm name:      NASDOCS.EMC.COM
  kdc:            winserver1.nasdocs.emc.com
  admin server:   winserver1.nasdocs.emc.com
  kpasswd server: winserver1.nasdocs.emc.com
  default domain: nasdocs.emc.com

End of Kerberos realm configuration.

Kerberos domain_realm section:
  DNS domain = Kerberos realm
    .nasdocs.emc.com = NASDOCS.EMC.COM

End of Krb5.conf domain_realm section.

EXAMPLE #4  To specify a kadmin server, type:

```
$ server_kerberos server_2 -add
  realm=eng.nasdocs.emc.com,kdc=winserver1.nasdocs.emc.com
    ,kadmin=172.24.102.67
```

```
server_2 : done
```

Note: You must be root to execute the -kadmin option. Replace $ with # as the root login is a requirement.

EXAMPLE #5  To delete a realm on a Data Mover, type:

```
$ server_kerberos server_2 -delete
  realm=eng.nasdocs.emc.com
```

```
server_2 : done
```

EXAMPLE #6  To display the credential cache on a Data Mover, type:

```
$ server_kerberos server_2 -ccache
```

```
server_2 :
Dumping credential cache

Names:
  Client: DM102-CGE0$@NASDOCS.EMC.COM
```
Service: WINSERVER1.NASDOCS.EMC.COM
Target: HOST/WINSERVER1.NASDOCS.EMC.COM@NASDOCS.EMC.COM

Times:
  Auth:  09/12/2005 07:15:04 GMT
  Start: 09/12/2005 07:15:04 GMT
  End:   09/12/2005 17:15:04 GMT

Flags: PRE_AUTH,OK_AS_DELEGATE

Encryption Types:
  Key:    rc4-hmac-md5
  Ticket: rc4-hmac-md5

Names:
  Client: DM102-CGE0$@NASDOCS.EMC.COM
  Service: winserver1.nasdocs.emc.com
  Target: ldap/winserver1.nasdocs.emc.com@NASDOCS.EMC.COM

Times:
  Auth:  09/12/2005 07:15:04 GMT
  Start: 09/12/2005 07:15:04 GMT
  End:   09/12/2005 17:15:04 GMT

Flags: PRE_AUTH,OK_AS_DELEGATE

Encryption Types:
  Key:    rc4-hmac-md5
  Ticket: rc4-hmac-md5

Names:
  Client: DM102-CGE0$@NASDOCS.EMC.COM
  Service: NASDOCS.EMC.COM
  Target: krbtgt/NASDOCS.EMC.COM@NASDOCS.EMC.COM

Times:
  Auth:  09/12/2005 07:15:04 GMT
  Start: 09/12/2005 07:15:04 GMT
  End:   09/12/2005 17:15:04 GMT

Flags: INITIAL,PRE_AUTH

Encryption Types:
  Key:    rc4-hmac-md5
  Ticket: rc4-hmac-md5

End of credential cache entries.

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>client</td>
<td>Client name and its realm.</td>
</tr>
<tr>
<td>service</td>
<td>Domain controller and its realm.</td>
</tr>
<tr>
<td>target</td>
<td>Target name and its realm.</td>
</tr>
<tr>
<td>auth</td>
<td>Time of the initial authentication for the named principal.</td>
</tr>
<tr>
<td>start</td>
<td>Time after which the ticket is valid.</td>
</tr>
<tr>
<td>end</td>
<td>Time after which the ticket will not be honored (its expiration time).</td>
</tr>
</tbody>
</table>
The server Commands

### Value | Definition
--- | ---
flags | Options used or requested when the ticket was issued.
key | Key encryption type.
ticket | Ticket encryption type.

**EXAMPLE #7** To flush the credential cache on a Data Mover, type:

```
$ server_kerberos server_2 -ccache flush
```

server_2:
Purging credential cache.
Credential cache flushed.
server_ldap

Manages the LDAP-based directory client configuration and LDAP over SSL for the specified Data Movers.

SYNOPSIS

server_ldap {<movername>|ALL}
{-set|-add} [-p] {-domain <FQDN>| -basedn
 <attribute_name>=<attribute_value>[,...]}
[-servers {<IPv4_addr>[:<port>]|[<IPv6_addr>[:<IPv6_addr>]:<port>]}[,...]]
[-profile <profile_name>] |{-file <file_name>}
[-nisdomain <NIS_domain>]
[-binddn <bind_DN>] |{-kerberos -kaccount <account_name> [-realm
 <realm_name>]]}
[-sslenabled {y|n}]
[-sslpersona {none|<persona_name>}] 
[-sslcipher {default|<cipher_list>}] 
| -clear [-all|-domain <FQDN>| -basedn
 <attribute_name>=<attribute_value>[,...]]
| -info [-all | -domain <FQDN> | -basedn
 <attribute_name>=<attribute_value>[,...]][-verbose]
| -service {-start|-stop|-status}
| -lookup [-domain <FQDN> | -basedn
 <attribute_name>=<attribute_value>[,...]}{-user <username>
 | -group <groupname>
 | -uid <uid>
 | -gid <gid>
 | -hostbyname <hostname>
 | -netgroup <groupname>}

DESCRIPTION server_ldap configures, starts, stops, deletes, and displays the status of the LDAP-based directory client configuration, and queries the LDAP-based directory server.

OPTIONS

{-set|-add} [-p] {-domain <FQDN>| -basedn
 <attribute_name>=<attribute_value>[,...]}
Specifies the LDAP-based directory client domain for the specified Data Mover and starts the service. The -add and -set options can be used to configure one initial LDAP-based directory client domain for the specified Data Mover and start the service. The -add option supersedes the -set option as the preferred method to configure one initial LDAP-based directory client domain for the specified Data Mover. The -add option must be used to add domains and extend the configuration if multiple domains are required. Domains must be configured or added one at a time. The -p option requests a prompt for the password. A password is required in conjunction with a bind
distinguished name in order to specify the use of simple authentication. The -basedn option specifies the Distinguished Name (DN) of the directory base, an x509 formatted name that uniquely identifies the directory base. For example: ou=abc,o=def,c=ghi. If a base distinguished name contains space characters, enclose the entire string within double quotation marks and enclose the name with a backslash and double quotation mark. For example, "\"cn=abc,cn=def ghi,dc=com\"".

It is recommended configuring an LDAP-based directory client by using the -basedn option instead of the -domain option. The DN provides the root position for:

- Searching for iPlanet profiles
- Defining default search containers for users, groups, hosts, and netgroups according to RFC 2307. An iPlanet profile and OpenLDAP or Active Directory with SFU or IdMU ldap.conf file are only required for customized setups.

Note: In the case in which the DN of the directory base contains dots and the client is configured using the domain name, the default containers may not be set up correctly. For example, if the name is dc=my.company,dc=com and it is specified as domain name my.company.com, VNX incorrectly defines the default containers as dc=my,dc=company,dc=com.

```[-servers {<IPv4_addr>[::<port>] | <IPv6_addr> | <\[IPv6_addr\]:<port>>}[,...]]```

Specifies the IP addresses of the LDAP-based directory client servers. <IPv4_addr> or <IPv6_addr> indicates the IP address of the LDAP-based directory servers. IPv6 addresses need to be enclosed in square brackets if a port is specified; the brackets do not signify optional content. The <port> option specifies the LDAP-based directory server TCP port number. If the port is not specified, the default port is 389 for LDAP and 636 for SSL-based LDAP. It is recommended that at least two LDAP servers are defined, so that VNX Operating Environment (OE) for File can switch to the second server in case the first cannot be reached.

Note: IP addresses of the LDAP-based directory servers do not have to be included every time with the server_ldap command once you have indicated the configuration server, and if configuring the same LDAP-based directory service.
**The server Commands**

**[-profile <profile>]**
Specifies the profile name or the profile distinguished name which provides the iPlanet client with configuration information about the directory service. For example, both the following values are allowed: **-profile vnx_profile** and **-profile cn=vnx_profile,ou=admin,dc=mycompany,dc=com**.

**Note:** It is recommended that unique profile names be used in the Directory Information Tree (DIT). The specified profile is searched for by scanning the entire tree and if it is present in multiple locations, the first available profile is used unless the profile distinguished name is specified.

**{-file <file_name>}**
Allows to specify a LDAP configuration file per domain:

- The various LDAP domains may have different schemas (OpenLDAP, IdMU, and so on) or different customizations (non-standard containers).
- All LDAP domains can share the same /.etc/ldap.conf setup file or even no file if all the domains comply with the RFC2307.
- The configuration files must be put in /.etc using server_file. In order to prevent collisions with other system files, it is required that the LDAP configuration is prefixed by "ldap" and suffixed by ".conf", i.e. "ldap<anything>.conf".
- The default value of the -file option is "ldap.conf".
- server_ldap -service -status lists all the configured domains, and their configuration source (default, file or profile). Several LDAP domains can be configured using the same LDAP configuration file.

**[nisdomain <NIS_domain>]**
Specifies the NIS domain of which the Data Mover is a member since an LDAP-based directory domain can host more than one NIS domain.

**[binddn <bind_DN>|{-kerberos -kaccount</account_name> [-realm <realm_name>]}]}**
Specifies the distinguished name (DN) or Kerberos account of the identity used to bind to the service. Active Directory with SFU or IdMU requires an authentication method that uses simple authentication, SSL, or Kerberos.
Simple authentication requires that a DN be specified along with a password. For SSL-based client authentication to succeed, the Data Mover certificate Subject must match the distinguished name for an existing user (account) at the directory server.

**Note:** To configure a LDAP-based directory service for authentication, **-binddn** is not required if the **-sslpersona** option is specified. In this case, SSL-based client authentication will be used.

The Kerberos account name must be the CIFS server computer name known by the KDC. The account name must terminate with a $ symbol.

By default, the Data Mover assumes that the realm is the same as the LDAP domain provided in the **-domain** or **-basedn** options. But a different realm name can be specified if necessary.

```
[-sslenabled {y|n}]
```

Enables (y) or disables (n) SSL. SSL is disabled by default.

```
[-sslpersona {none|<persona_name>}]n
```

Specifies the key and certificate of the directory server. If a persona has been previously configured, none disables the user of a client key and certificate. The **-sslpersona** option without the **-binddn** option indicates that the user wants to authenticate using the client (persona) certificate. To authenticate using the client certificate, the LDAP server must be configured to **always request** (or require) the persona certificate during the SSL transaction, or the authentication will fail. If authentication using the client certificate is not desired, then the **-binddn** option must be used. The configuration rules are explained in Table 1 on page 649.
Note: The -sslpersona option does not automatically enable SSL, but configures the specified value. The value remains persistent and is used whenever SSL is enabled.

Table 1  
Configuration rules

<table>
<thead>
<tr>
<th>Description</th>
<th>Data Mover configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSL enabled on Data Mover, LDAP server should accept SSL, anonymous authentication is used.</td>
<td>server_ldap -sslenabled y</td>
</tr>
<tr>
<td>SSL enabled, password-based authentication is used.</td>
<td>server_ldap -p -binddn cn=foo -sslenabled y</td>
</tr>
<tr>
<td>SSL enabled, SSL certificate authentication is used, LDAP server should be configured to request client certificate.</td>
<td>server_ldap -sslenabled y -sslpersona default (use server_certificate to verify that the certificate for the Data Mover’s default persona exists)</td>
</tr>
</tbody>
</table>

Note: The user should refer to the LDAP server documentation for information about configuring the server to request the client certificate.

[-sslcipher {default|<cipher_list>}]  
Specifies default or the cipher list.

Note: The -sslcipher option does not automatically enable SSL, but configures the specified value. The value remains persistent and is used whenever SSL is enabled.

-clear  
Deletes the LDAP-based directory client configuration for the specified Data Mover and stops the service.

-info  
Displays the service status and the static and dynamic configuration.

[-verbose]  
Adds troubleshooting information to the output.

-service (-start | -stop | -status)  
The -start option enables the LDAP-based directory client service. The LDAP-based directory client service is also restarted when the VNX is rebooted. The -stop option disables the LDAP-based directory client service, and the -status option displays the status of the LDAP-based directory service.
-lookup
(user=<username> | group=<groupname> | uid=<uid> | gid=<gid> | hostname=<hostname> | netgroup=<groupname>)
Provides lookup information about the specified resource for troubleshooting purposes.

Note: The server_ldap requires the user to specify the domain name when more than one domain is configured for the -clear, -info, and -lookup options. Other options are unchanged and they are applicable for each different domain.

SEE ALSO Configuring VNX Naming Services.

EXAMPLE #1 To configure the use of an LDAP-based directory by a Data Mover, type:

$ server_ldap server_4 -set -domain nasdocs.emc.com
    -servers 172.24.102.62
server_4 : done

EXAMPLE #2 To configure the use of an LDAP-based directory by a Data Mover using the Distinguished Name of the server at IPv4 address 172.24.102.62 with the default port, type:

$ server_ldap server_2 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 172.24.102.62
server_2 : done

EXAMPLE #3 To configure the use of an LDAP-based directory by a Data Mover using the Distinguished Name of the server at IPv6 address 2002:c8c::24:172:63 with the default port, type:

$ server_ldap server_2 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 2002:c8c::24:172:63
server_2 : done

EXAMPLE #4 To configure the use of an LDAP-based directory by a Data Mover and specify the use of the client profile, type:

$ server_ldap server_4 -set -domain nasdocs.emc.com
    -servers 172.24.102.62 -profile celerra_profile
    -nisdomain nasdocs -sslenabled y
server_4 : done

EXAMPLE #5 To configure the use of an LDAP-based directory by a Data Mover and specify the use of the client profile using its distinguished name, type:
EXAMPLE #6
To specify the NIS domain to which the Data Mover is a member, type:

$ server_ldap server_2 -set -domain nasdocs.emc.com
-servers 172.24.102.62 -nisdomain nasdocs

server_2 : done

EXAMPLE #7
To configure the use of simple authentication by specifying a bind Distinguished Name (DN) and password, type:

$ server_ldap server_2 -set -p -domain nasdocs.emc.com
-servers 172.24.102.10 -binddn
"cn=admin,cn=users,dc=nasdocs,dc=emc"

server_2 : Enter Password:********
done

EXAMPLE #8
To configure the use of an LDAP-based directory by a Data Mover using SSL, type:

$ server_ldap server_4 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 172.24.102.62
-sslenabled y

server_4 : done

EXAMPLE #9
To configure the use of an LDAP-based directory by a Data Mover using SSL and user key and certificate, type:

$ server_ldap server_4 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 172.24.102.62
-sslenabled y -sslpersona default

server_4 : done

EXAMPLE #10
To configure the use of an LDAP-based directory by a Data Mover using SSL and using specified ciphers, type:

$ server_ldap server_4 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 172.24.102.62
-sslenabled y -sslcipher "RC4-MD5,RC4-SHA"

server_4 : done

EXAMPLE #11
To display information about the LDAP-based directory configuration on a Data Mover, type:

$ server_ldap server_4 -info

LDAP domain: nasdocs.emc.com
The server Commands

```
base DN: dc=nasdocs,dc=emc,dc=com
State: Configured - Connected
NIS domain: nasdocs.emc.com
No client profile nor config. file provided (using default setup)
Connected to LDAP server address: 172.24.102.62 - port 636
SSL enabled/disabled by Command line, cipher suites configured by Command line
```

**EXAMPLE #12**  To configure the use of Kerberos authentication by specifying a Kerberos account, type:

```
$ server_ldap server_2 -set -basedn
dc=nasdocs,dc=emc,dc=com -servers 172.24.102.62 -kerberos
-kaccount cifs_comname$
```

server_2 : done

**EXAMPLE #13**  To display detailed information about the LDAP-based directory configuration on a Data Mover, type:

```
$ server_ldap server_2 -info -verbose
```

```
server_2 :
LDAP domain:      devldapdom1.lcsc
State:            Configured - Connected
Schema:           OpenLDAP
Base dn:          dc=devldapdom1,dc=lcsc
Bind dn:          <anonymous>
Configuration:    RFC-2307 defaults
Global warnings & errors
{ The LDAP cache is disabled.
}
LDAP server: 192.168.67.11 - Port: 389 - Active
SSL:            Not enabled
Naming ctx:      (baseDn is ticked)
[ ] dc=devldapdom1,dc=lcsc
Containers:      (no [scope] means ignored, unless parent container with sub scope is valid)
Passwd:          Class: posixAccount - Attributes: uid, uidNumber, gidNumber,
userPassword, homeDirectory
[one] ou=People,dc=devldapdom1,dc=lcsc - prefix=uid
Group:           Class: posixGroup - Attributes: gidNumber, memberUid
memberUid syntax is DN (Windows)
[one] ou=posixGroup,dc=devldapdom1,dc=lcsc - prefix=cn
Hosts:           Class: ipHost - Attributes: ipHostName
[one] ou=Group,dc=devldapdom1,dc=lcsc - prefix=cn
Netgroup:        Class: nisNetgroup - Attributes: nisNetgroupTriple,
memberNisNetgroup
[one] ou=netgroup,dc=devldapdom1,dc=lcsc - prefix=cn
LDAP server:     10.64.220.148 - Port: 389 - Spare
SSL:             Not enabled
```

**EXAMPLE #14**  To display lookup information about the user *nasadmin*, type:

```
```
$ server_ldap server_4 -lookup -user nasadmin

server_4 :
user: nasadmin, uid: 1, gid: 201, gecos: nasadmin, home dir: /home/nasadmin,
shell: /bin/csh
### EXAMPLE #15
To display the status of the LDAP-based directory service, type:

```
$ server_ldap server_2 -service -status
```

server_2:
LDAP domain "devldapdom1.lcsc" is active - Configured with RFC-2307 defaults

### EXAMPLE #16
To stop the LDAP-based directory service, type:

```
$ server_ldap server_4 -service -stop
```

server_4: done

### EXAMPLE #17
To delete the LDAP configuration for the specified Data Mover and stop the service, type:

```
$ server_ldap server_4 -clear
```

server_4: done

### EXAMPLE #18
To check if any ldap domain is configured, type:

```
server_ldap server_3 -service -status
```

server_3:
LDAP domain is not configured yet.

### EXAMPLE #19
To configure a domain for openLdap with standard schema, type:

```
server_ldap server_3 -set -domain devldapdom1.lcsc -servers 192.168.67.114, 192.168.67.148
```

server_3: done

Note: Since this is the first domain, you can use `-set` or `-add` option.

### EXAMPLE #20
To configure a domain for Fedora Directory Service (same as openLdap), type:

```
server_ldap server_3 -add -p -basedn dc=389-ds,dc=lcsc -servers 192.168.67.10.64.223.182 -binddn "\"cn=Directory Manager\""
```

server_3: Enter Password:********
done

Note: Since a domain is already set up, you must use `-add` option.

### EXAMPLE #21
To configure a domain for iPlanet using specific configuration profile, type:

```
server_ldap server_3 -add -domain dvt.emc -servers 192.168.67.140 -profile profilecad3
```

server_3: done
EXAMPLE #22  To configure a domain for IDMU using specific configuration file, type:

```
server_ldap server_3 -add -p -basedn dc=eng,dc=lcsc
   -servers 192.168.67.82 -binddn
cn=administrator,cn=Users,dc=eng,dc=lcsc -file
   ldap.conf
```

server_3 : Enter Password:******
done

EXAMPLE #23  To check if the domains are ok, type:

```
server_ldap server_3 -service -status
```

server_3 :
LDAP domain "dev.lcsc" is active - Configured with RFC-2307 defaults
LDAP domain "ds.lcsc" is inactive - Configured with RFC-2307 defaults
LDAP domain "dvt.emc" is active - Configured with profile "profilecad3"
LDAP domain "eng.lcsc" is active - Configured with file "ldap.conf"

EXAMPLE #24  To get the details about the domain ds.lcsc, type:

```
server_ldap server_3 -info -verbose -domain ds.lcsc
```

server_3 :
LDAP domain:      ds.lcsc
State:            Uninitialized - Disconnected
Schema:           Unknown yet (must succeed to connect)
Base dn:          dc=ds,dc=lcsc
Bind dn:          cn=Directory Manager
Configuration:    RFC-2307 defaults
Global warnings & errors
{ Only one LDAP server is configured for LDAP domain ds.lcsc. }
LDAP server:      192.168.67.182 - Port: 389 - Spare
SSL:             Not enabled
Last error:       91 / Connect error
Server warnings & errors
{ LDAP server 192.168.67.182: LDAP protocol error: LDAP is unable to connect to the specified port. }
LDAP server 192.168.67.182: LDAP protocol error: Connect error.

EXAMPLE #25  To delete the domain ds.lcsc, type:

```
server_ldap server_3 -clear -domain ds.lcsc
```

server_3 : done

```
server_ldap server_3 -service -status
```

server_3 :
LDAP domain "dev.lcsc" is active - Configured with RFC-2307 defaults
LDAP domain "dvt.emc" is active - Configured with profile "profilecad3"
LDAP domain "eng.lcsc" is active - Configured with file "ldap.conf"
The server Commands

EXAMPLE #26  To lookup a user in a given domain, type:

```
server_ldap server_3 -lookup -user cad -domain eng.lcsc
```

server_3 :
user: cad, uid: 33021, gid: 32769, homeDir: /emc/cad

EXAMPLE #27  To get info on all domains, type:

```
server_ldap server_3 -info -all
```

server_3 :
LDAP domain:  dev.lcsc
State:       Configured - Connected
Schema:      OpenLDAP
Base dn:     dc=devldapdom1,dc=lcsc
Bind dn:     <anonymous>
Configuration: RFC-2307 defaults
LDAP server: 192.168.67.114 - Port: 389 - Active
  SSL:          Not enabled
LDAP server: 192.168.67.148 - Port: 389 - Spare
  SSL:          Not enabled

LDAP domain:  dvt.emc
State:       Configured - Connected
Schema:      Sun Directory Server (iPlanet) (Sun-ONE-Directory/5.2)
Base dn:     dc=dvt,dc=emc
Bind dn:     <anonymous>
Configuration: Profile name: profilecad3 - TTL: 11 s
LDAP conf server: 192.168.67.140 - Port: 389
  SSL:          Not enabled
LDAP default servers:
LDAP server: 192.168.67.140 - Port: 389 - Active
  SSL:          Not enabled

LDAP domain:  eng.lcsc
State:       Configured - Connected
Schema:      Active Directory
Base dn:     dc=eng,dc=lcsc
Bind dn:     cn=administrator,cn=Users,dc=eng,dc=lcsc
Configuration: File: ldap.conf - TTL: 1200 s
LDAP server: 192.168.67.82 - Port: 389 - Active
  SSL:          Not enabled

EXAMPLE #28  To clear all the domains, type:

```
server_ldap server_3 -clear -all
```

server_3 : done

```
server_ldap server_3 -service -status
```

server_3 :
LDAP domain is not configured yet.
server_log

Displays the log generated by the specified Data Mover.

SYNOPSIS

server_log <movername>

[-a][-f][-n][-s][-v|-t]

DESCRIPTION

server_log reads and displays the log generated by the Data Mover. Information in the log file is read from oldest to newest. To view that most recent log activity, add `tail` to the end of your command line.

OPTIONS

No arguments

Displays the contents of the log added since the last reboot.

-a

Displays the complete log.

-f

Displays the contents of the log added since the last reboot. Additionally monitors the growth of the log by entering into an endless loop, pausing, reading the log being generated. The output is updated every second. To exit, press Ctrl-C together.

-n

Displays the log without the time stamp.

-s

Displays the time in `yyyy-mm-dd` format when each command in the log was executed.

-v|-t

Displays the log files in verbose form or terse form.

EXAMPLE #1

To monitor the growth of the current log, type:

```
$ server_log server_2 -f
```

NAS LOG for slot 2:

```
0 keys=0  h=0  nc=0
1200229390:  SVFS:  6: Merge Start FsVol:118 event:0x0
1200229390:  CFS:  6: Resuming fs 24
1200229390:  SVFS:  6: D113118_736:Merge hdr=82944 prev=99328 id=113 chunk=0 s tableEntry=7
1200229390:  UFS:  6: Volume name:Sh122113
```
The server Commands

1200229390: UFS: 6: starting gid map file processing.
1200229390: UFS: 6: gid map file processing is completed.
1200229390: DPSVC: 6: DpRequest::done() BEGIN reqType:DpRequest_VersionInt_SchSr
cRefresh reqCaller:DpRequest Caller_Scheduler status:0
1200229390: DPSVC: 6: SchedulerSrc=118_APM00062400708_0000_253_APM00062400708_00
00, curState=active, input=refreshDone
1200229390: DPSVC: 6: DpVersion::getTotalBlocksVolume enter
1200229390: DPSVC: 6: DpVersion::getTotalBlocksVolume found newV 118.ckpt003, bl
ocks 17534
1200229390: DPSVC: 6: DpVersion::getTotalBlocksVolume enter
1200229390: DPSVC: 6: DpVersion::getTotalBlocksVolume found newV 118.ckpt003, bl
ocks 17534
1200229390: DPSVC: 6: DpVersion::getTotalBlocksVolume exit
1200229390: DPSVC: 6: SchedulerSrc=118_APM00062400708_0000_253_APM00062400708_00
00, newState=active

--More--

Note: This is a partial listing due to the length of the output.

EXAMPLE #2
To display the current log, type:

$ server_log server_2

NAS LOG for slot 2:
---------------------
0 keys=0 h=0 nc=0
2008-01-13 08:03:10: SVFS: 6: Merge Start FsVol:118 event:0x0
_503
2008-01-13 08:03:10: CFS: 6: Resuming fs 24
_503
2008-01-13 08:03:10: CFS: 6: Resuming fs 24
_503
2008-01-13 08:03:10: UFS: 6: Volume name:Sh122113
The server Commands

2008-01-13 08:03:10: UFS: 6: gid map file processing is completed.
2008-01-13 08:03:10: DPSVC: 6: DpRequest::done() BEGIN reqType:DpRequest_Version
   Int_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler status:0
   400708_0000, curState=active, input=refreshDone
2008-01-13 08:03:10: DPSVC: 6: DpVersion::getTotalBlocksVolume enter
2008-01-13 08:03:10: DPSVC: 6: DpVersion::getTotalBlocksVolume found newV 118.ckpt003, blocks 17534
2008-01-13 08:03:10: DPSVC: 6: DpVersion::getTotalBlocksVolume 0 blocks for vnum ber 1038 totalB 0
2008-01-13 08:03:10: DPSVC: 6: DpVersion::getTotalBlocksVolume found oldV 118.ckpt004
2008-01-13 08:03:10: DPSVC: 6: DpVersion::getTotalBlocksVolume exit
   400708_0000, newState=active
2008-01-13 08:03:10: SVFS: 6: Merge Start FsVol:118 event:0x0
2008-01-13 08:03:10: CFS: 6: Resuming fs 24
2008-01-13 08:03:10: SVFS: 6: 118:D113118_736:Merge hdr=82944 prev=99328 id=113 chunk=0 stableEntry=7
2008-01-13 08:03:10: UFS: 6: Volume name:Sh122113
2008-01-13 08:05:10: DPSVC: 6: refreshSnap: cur=1200229510, dl=1200229520, kbyte s=0, setup=0, rate=1000
   400708_0000, curState=active, input=refresh
2008-01-13 08:05:10: DPSVC: 6: DpRequest::execute() BEGIN reqType:DpRequest_Vers
   ionInt_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler reqMode:0

Note: This is a partial listing due to the length of the output.

EXAMPLE #3  To display the log file without the time stamp, type:
$ server_log server_2 -n

NAS LOG for slot 2:
-------------------------------
0 keys=0 h=0 nc=0

SVFS: 6: Merge Start FsVol:118 event:0x0
SVFS: 6: D113118_736: hdr=82944 currInd:6, Destpmdv:D114118_503
CFS: 6: Resuming fs 24
SVFS: 6: 118:D113118_736:Merge hdr=82944 prev=99328 id=113 chunk=0 stableEntry=7
UFS: 6: Volume name:Sh122113
UFS: 6: starting gid map file processing.
UFS: 6: gid map file processing is completed.
DPSVC: 6: DpRequest::done() BEGIN reqType:DpRequest_VersionInt_SchSrcRefresh req
   Caller:DpRequest_Caller_Scheduler status:0
DPSVC: 6: SchedulerSrc=118_APM00062400708_0000_253_APM00062400708_0000, curState
The server Commands

```
=active, input=refreshDone
DPSVC: 6: DpVersion::getTotalBlocksVolume enter
DPSVC: 6: DpVersion::getTotalBlocksVolume found newV 118.ckpt003, blocks 17534
DPSVC: 6: DpVersion::getTotalBlocksVolume 0 blocks for vnumber 1038 totalB 0
DPSVC: 6: DpVersion::getTotalBlocksVolume found oldV 118.ckpt004
DPSVC: 6: DpVersion::getTotalBlocksVolume exit
DPSVC: 6: DpVersion::getTotalBytes 0 blocks 0 bytes
DPSVC: 6: SchedulerSrc=118_APM00062400708_0000_253_APM00062400708_0000, newState =active
SVFS: 6: D113118_736: After Merge err:4 full:0 mD:0
SVFS: 6: D113118_737: Chunk:0 hdrAdd:50176 ==> prevChunk:82944 before changePrev Chunk
SVFS: 6: D113118_737: Ch:0 hdr:50176 : prevCh:99328 after changePrev
DPSVC: 6: refreshSnap: cur=1200229510, dl=1200229520, kbytes=0, setup=0, rate=10 00
DPSVC: 6: SchedulerSrc=199_APM00062400708_0000_258_APM00062400708_0000, curState =active, input=refresh
DPSVC: 6: DpRequest::execute() BEGIN reqType:DpRequest_VersionInt_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler reqMode:0
DPSVC: 6: DpRequest::execute() END reqType:DpRequest_VersionInt_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler status:0 reqMode:0
DPSVC: 6: SchedulerSrc=199_APM00062400708_0000_258_APM00062400708_0000, newState =active
VBB: 6: VBB session list empty
CFS: 6: fs 0x78 type = dhfs being unmounted. Waiting for quiesce ...
CFS: 6: fs 0x78 type = dhfs unmounted
```

Note: This is a partial listing due to the length of the output.

**EXAMPLE #4**

To display all the current logs available, type:

```
$ server_log server_2 -a
```

NAS LOG for slot 2:

```
------------------
1200152950: DPSVC: 6: refreshSnap: cur=1200152950, dl=1200152960, kbytes=0, setup=0, rate=666
1200152950: DPSVC: 6: SchedulerSrc=199_APM00062400708_0000_258_APM00062400708_0000, curState=active, input=refresh
1200152950: DPSVC: 6: DpRequest::execute() BEGIN reqType:DpRequest_VersionInt_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler reqMode:0
1200152950: DPSVC: 6: DpRequest::execute() END reqType:DpRequest_VersionInt_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler status:0 reqMode:0
1200152950: DPSVC: 6: SchedulerSrc=199_APM00062400708_0000_258_APM00062400708_0000, newState=active
1200152950: VBB: 6: VBB session list empty
```
The server Commands

Example #5

To display the current log in terse form, type:

```
$ server_log server_2 -t
```

Note: This is a partial listing due to the length of the output.
**The server Commands**

blocks 17534
1200229390: 26045513728: DpVersion::getTotalBlocksVolume 0 blocks for vnumber 10
38 totalB 0
1200229390: 26045513728: DpVersion::getTotalBlocksVolume found oldV 118.ckpt004
1200229390: 26045513728: DpVersion::getTotalBlocksVolume exit
1200229390: 26045513728: DpVersion::getTotalBytes 0 blocks 0 bytes
1200229390: 26045513728: SchedulerSrc=118_APM00062400708_0000_253_APM00062400708
_0000, newState=active
1200229390: 26042826752: D113118_736: After Merge err:4 full:0 mD:0
1200229390: 26042826752: D113118_737: Chunk:0 hdrAdd:50176 ==> prevChunk:82944 b
efore changePrevChunk
1200229390: 26042826752: D113118_737: Ch:0 hdr:50176 : prevCh:99328 after change
Prev
1200229510: 26045513728: refreshSnap: cur=1200229510, dl=1200229520, kbytes=0, s
etup=0, rate=1000
1200229510: 26045513728: SchedulerSrc=199_APM00062400708_0000_258_APM00062400708
_0000, curState=active, input=refresh
1200229510: 26045513728: DpRequest::execute() BEGIN reqType:DpRequest_VersionInt
_SchSrcRefresh reqCaller:DpRequest_Caller_Scheduler reqMode:0
1200229510: 26045513728: DpRequest::execute() END reqType:DpRequest_VersionInt_S

---More---

**Note:** This is a partial listing due to the length of the output.

**EXAMPLE #6** To display the current log in verbose form, type:

```sh
$ server_log server_2 -v
```

DART Work Partition Layout found @ LBA 0x43000 (134MB boundary)

slot 2) About to dump log @ LBA 0xc7800

NAS LOG for slot 2:
-------------------

About to print log from LBA c8825 to c97ff
0 keys=0 h=0 nc=0

logged time = 2008-01-13 08:03:10
id = 26043285504
severity = INFO
component = DART
facility = VRPL
baseid = 0
type = STATUS
argument name = arg0
argument value = 122: Allocating chunk:3 Add:50176 Chunks:24
argument type = string (8)
brief description = 122: Allocating chunk:3 Add:50176 Chunks:24
full description = No additional information is available.
recommended action = No recommended action is available. Use the text from the error message's brief description to search the Knowledgebase on Powerlink. After logging in to Powerlink, go to Support > Knowledgebase Search > Support Solutions Search.

logged time = 2008-01-13 08:03:10
id = 26042826752
severity = INFO
component = DART
facility = SVFS
baseid = 0
type = STATUS
argument name = arg0
argument value = Merge Start FsVol:118 event:0x0
argument type = string (8)
brief description = Merge Start FsVol:118 event:0x0

full description = No additional information is available.
recommended action = No recommended action is available. Use the text from the error message's brief description to search the Knowledgebase on Powerlink. After logging in to Powerlink, go to Support > Knowledgebase Search > Support Solutions Search.

--More--

Note: This is a partial listing due to the length of the output.
**server_mount**

Mounts file systems and manages mount options for the specified Data Movers.

**SYNOPSIS**

```
server_mount {<movername>|ALL}  
   -all  
   | -restore {-all|<fs_name>,...}  
   |[-Force][-check][-option options] <fs_name> [mount_point]  
```

options:
- ro rw [primary=movername]
- nonotify] [nooplock]
- notifyonaccess] [notifyonwrite]
- accesspolicy={NT|UNIX|SECURE|NATIVE|MIXED|MIXED_COMPAT}]
- nolock] [wlock] [rwlock]
- cvfsname=<newname>]
- noscan]
- noprefetch]
- uncached]
- cifssyncwrite]
- [triggerlevel=<value>]  
- ntcredential]  
- renamepolicy={CIFS|FULL|NO}]
- [cifssanoroundup]
- [ceppcifs|ceppnfs|ceppcifs,ceppnfs|nocepp]
- [nfsv4delegation={NONE|READ|RW}]
- [smbca]

**DESCRIPTION**

`server_mount` attaches a file system to the specified `<mount_point>` with the specified options, and displays a listing of mounted file systems. `server_umount` unmounts the file system.

The **ALL** option executes the command for all Data Movers.

---

**Note:** The `primary=movername` option is not used.

---

**OPTIONS**

No arguments

Displays a listing of all mounted and temporarily unmounted file systems.

- **-all**
  Mounts all file systems in the mount table.
-restore {-all | <fs_name>,...}
Restores either all the file systems of the DM or only those that are specified. If a file system is unmounted due to out-of-space handling, the mount status is shown as "oos,<unmounted>" in the CLI or as "Unmounted (Out of Space)" in Unisphere. If a file system is remounted as RO due to low space handling, the mount status is shown as "Read Only (Low Space)" in the CLI and Unisphere. Whether a file system is unmounted due to out-of-space handling or remounted as RO due to low space handling, the restore operation returns the file system to its original mount status, shown as "Normal". Note that a restore operation following low space handling is only successful if free space has been expanded.

-Force -option rw <fs_name> [mount_point]
Forces a mount of a file system copy (created using fs_timefinder) as read-write. By default, all file system copies are mounted as read-only.

[-check]
Checks if there is a diskmark value mismatch between NAS database and the Data Mover for the file system, and also checks if the diskmark on Data Mover exists. This option is required for SRDF STAR feature.

Note: If the check option is not used, the diskmark mismatch case or missing diskmark case could cause Data Mover panic.

<fs_name> [mount_point]
Mounts a file system to the specified <mount_point>. When a file system is initially mounted, the <mount_point> is required; however, remounting a file system after a temporary unmount does not require the use of a <mount_point>.

[-option options]
Specifies the following comma-separated options:

[ro | rw]
Specifies the mount as read-write (default), or read-only which is the default for checkpoints and TimeFinder/FS.

Note: MPFS clients do not acknowledge file systems that are mounted read-only and allow their clients to write to the file system.
[accesspolicy={NT|UNIX|SECURE|NATIVE|MIXED|MIXED_COMPAT}]
Indicates the access control policy as defined in the table.

**Note:** When accessed from a Windows client, ACLs are checked only if the CIFS user authentication method is set to the recommended default, NT. This is set using the `-add` security option in the `server_cifs` command.

<table>
<thead>
<tr>
<th>Access policy</th>
<th>CIFS clients</th>
<th>NFS clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATIVE (default)</td>
<td>ACL is checked.</td>
<td>UNIX rights are checked.</td>
</tr>
<tr>
<td>UNIX</td>
<td>ACL and UNIX rights are checked.</td>
<td>UNIX rights are checked.</td>
</tr>
<tr>
<td>NT</td>
<td>ACL is checked.</td>
<td>ACL and UNIX rights are checked.</td>
</tr>
<tr>
<td>SECURE</td>
<td>ACL and UNIX rights are checked.</td>
<td>ACL and UNIX rights are checked.</td>
</tr>
<tr>
<td>MIXED</td>
<td>ACL is checked. If there is not an ACL, one is created based on the UNIX mode bits. Access is also determined by the ACL. NFSv4 clients can manage the ACL. An ACL modification rebuilds the UNIX mode bits but the UNIX rights are not checked.</td>
<td>ACL is checked. If there is not an ACL, one is created based on the UNIX mode bits. Access is also determined by the ACL. NFSv4 clients can manage the ACL. A modification to the UNIX mode bits rebuilds the ACL permissions but the UNIX rights are not checked.</td>
</tr>
<tr>
<td>MIXED_COMPAT</td>
<td>If the permissions of a file or directory were last set or changed by a CIFS client, the ACL is checked and the UNIX rights are rebuilt but are not checked. If the permissions of a file or directory were last set or changed by an NFS client, the UNIX rights are checked and the ACL is rebuilt but is not checked. NFSv4 clients can manage the ACL.</td>
<td>If the permissions of a file or directory were last set or changed by an NFS client, the UNIX rights are checked and the ACL is rebuilt but is not checked. If the permissions of a file or directory were last set or changed by a CIFS client, the ACL is checked and the UNIX rights are rebuilt but are not checked. NFSv4 clients can manage the ACL.</td>
</tr>
</tbody>
</table>

**Note:** The MIXED policy translates the UNIX ownership mode bits into three ACEs: Owner, Group, and Everyone, which can result in different permissions for the Group ACE and the Everyone ACE. The MIXED_COMPAT policy does not translate a UNIX Group into a Group ACE. The Everyone ACE is generated from the UNIX Group.

[cvfsname=<newname>]  
Changes the default name of the checkpoint in each of the .ckpt directories. The default name is the timestamp of when the checkpoint was taken.
The server Commands

[noprefetch]
Turns prefetch processing off. When on (default), performs read ahead processing for file systems.

**CAUTION**
Turning the prefetch option to off may affect performance.

[uncached]
Allows well-formed writes (that is, multiple of a disk block and disk block aligned) to be sent directly to the disk without being cached on the server.

For CIFS clients only
When mounting a file system, if the default options are not manually entered, the options are active but not displayed in the listing of mounted file systems. Available options are:

[nonotify]
Turns notify off. When on (default), the notify option informs the client of changes made to the directory file structure.

[nooplock]
Turns opportunistic locks (oplocks) off. When oplocks are on (default), they reduce network traffic by enabling clients to cache the file and make changes locally. To turn Windows oplocks off, unmount the file system, then remount with `nooplock`.

[notifyonaccess]
Provides a notification when a file system is accessed. By default, `notifyonaccess` is disabled.

[notifyonwrite]
Provides a notification of write access to a file system. By default, the `notifyonwrite` option is disabled.

[noscan]
Disables the Virus Checker protocol for a file system. The Virus Checker protocol is enabled using `server_setup` and managed by `server_viruschk`.

[cifssyncwrite]
Performs an immediate synchronous write on disk independently of CIFS write protocol option. This can impact write performance.
The server Commands

[**triggerlevel**=<value>]
Specifies the deepest directory level at which notification occurs. The default is 512. The value -1 disables the notification feature.

[**ntcredential**]
Enables the VNX to take full account of a user’s Windows group memberships when checking an ACL for access through NFS. When a UNIX user initiates a full request for a file system object, the UNIX UID is mapped to the Windows SID, then merges the user’s UNIX and Windows groups together to generate a Windows NT Credential. This applies to **NT, SECURE, MIXED, and MIXED_COMPAT** access-checking policies.

[**renamepolicy**={CIFS|FULL|NO}]
Enables or disables control if any file or directory is opened on the current directory or any subdirectory, before the current directory is renamed. **CIFS** (default) stops the renaming of CIFS directories when in use by CIFS clients. **FULL** denies permission for the renaming of CIFS and NFS directories when in use by CIFS or NFS clients. **NO** automatically performs the directory rename without checking if a CIFS or NFS client is opening the directory.

**Note:** The **renamepolicy** is not supported by NFSv4.

**cifsnanoroundup**
Rounds up to the next second any date set by a CIFS client.

[**ceppcifs**]
It enables the CEPA events for CIFS on a file system. This option is enabled by default.

[**smbca**]
Sets the CA bit on a share, the primary file system must be mounted with the smbca option.

- The lock policy is RWLock (lock checking mandatory)
- The CIFS and NFS access to this file system is denied until the CIFS CA service is started up to the time in seconds defined by the parameters **cifs.smb2.maxCaTimeout** (default is 2 minutes)
- The CA attribute can be set on a share located on this file system.
For NFS clients only

[nolock | wlock | rwlock]
Indicates the impact of locking behavior on NFSv2 and NFSv3 clients against NFSv4 and CIFS file locking. In NFSv2 and NFSv3, locking rules are cooperative, so a client is not prevented from accessing a file locked by another client if it does not use the lock procedure. NFSv2 and NFSv3 locks as advisory. An advisory lock does not affect read and write access to the file, but informs other users that the file is already in use.

Note: NFSv4 and CIFS clients have mandatory locking schemes and do not require a locking policy.

<table>
<thead>
<tr>
<th>Locking policy</th>
<th>NFS clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>nolock</td>
<td>This (default) can open and write to a file when it is locked by CIFS or NFSv4 clients.</td>
</tr>
<tr>
<td>wlock</td>
<td>This can read but cannot write data to a file locked by CIFS or NFSv4 clients.</td>
</tr>
<tr>
<td>rwlock</td>
<td>This (recommended) cannot read or write data to files locked by CIFS or NFSv4 clients.</td>
</tr>
</tbody>
</table>

[ceppnfs]
It enables the CEPA events for NFS on a file system.

Note: If ceppnfs is used without the ceppcifs option, the CEPA events for CIFS are disabled. To enable CEPA events for NFS and CIFS on a file system, ensure that you add both these options in the command.

nfsv4delegation={NONE | READ | RW}
Indicates that specific actions on a file are delegated to the NFSv4 client. NONE indicates that no file delegation is granted. READ indicates only read delegation is granted. RW (default) indicates write delegation is granted.

EXAMPLE #1 To display all mounted file systems on server_2, type:

```
$ server_mount server_2
```

```
server_2 :
root_fs_2 on / uxfs,perm,rw
root_fs_common on /etc_common uxfs,perm,ro
ufs2 on /ufs2 uxfs,perm,rw
```

EXAMPLE #2 To restore a filesystems:

```
$server_mount server_2 -restore fs_name1,fs_name2, fs_name3
```

"Select 'yes' if you want to only restore specific file systems to service. However, associated File replication sessions are not automatically restarted with this option, and must be manually restarted. Select 'no', then use the 'server_mount server_x -restore -all' option to restore all file systems to service, and automatically restart File replication sessions. Do you wish to continue? [yes or no]"yes

```
server_2 : done
```

EXAMPLE #3 To restore all filesystems:

```
$server_mount server_2 -restore -all
```

"Select 'yes' if you want to restore all file systems to service, and automatically restart File replication sessions. This option automatically fails back the Data Mover. Select 'no', then use the 'server_mount server_x -restore fs1,fs2' option to restore specific file systems to service. However, associated File replication sessions are not automatically restarted with this option, and must be manually restarted. Do you wish to continue? [yes or no]"yes

```
server_2 : done
```

EXAMPLE #4 To mount all file systems temporarily umounted from the mount table of server_2, type:

```
$ server_mount server_2 -all
```

```
server_2 : done
```

EXAMPLE #5 To mount ufs1, on mount point /ufs1, and enable CEPP for both CIFS and NFS, type:

```
$ server_mount server_2 -o ceppcifs,ceppnfs ufs1 /ufs1
```

```
server_2 : done
```

EXAMPLE #6 To mount ufs1, on mount point /ufs1, with nonotify, nolock, and cifssyncwrite turned on, type:

```
$ server_mount server_2 -option nonotify,nolock,cifssyncwrite ufs1 /ufs1
```

```
server_2 : done
```

EXAMPLE #7 To mount ufs1, on mount point /ufs1, with the access policy set to NATIVE, and nooplock turned on, type:
EXAMPLE #8  To mount ufs1, on mount point /ufs1, with noscan and noprefetch set to on, type:

$ server_mount server_2 -option noscan,noprefetch ufs1 /ufs1

EXAMPLE #9  To mount ufs1, on mount point /ufs1, with notifyonaccess, notifyonwrite set to on, type:

$ server_mount server_2 -option notifyonaccess,notifyonwrite ufs1 /ufs1

EXAMPLE #10  To mount a copy of a file system ufs1_snap1 on mount point /ufs1_snap1 with read-write access, type:

$ server_mount server_2 -Force -option rw ufs1_snap1 /ufs1_snap1

EXAMPLE #11  To mount ufs1, on mount point /ufs1, with uncached writes turned on, type:

$ server_mount server_2 -option uncached ufs1 /ufs1

EXAMPLE #12  To mount ufs1, on mount point /ufs1, with the trigger level of notification change set to 256, type:

$ server_mount server_2 -option triggerlevel=256 ufs1 /ufs1

EXAMPLE #13  To mount ufs1, on mount point /ufs1, change the default name of the checkpoint in the .ckpt directory, and specify a mount point, type:

$ server_mount server_2 -option cvfsname=test ufs1 /ufs1

EXAMPLE #14  To mount ufs1, on mount point /ufs1, with the access policy set to MIXED, type:

$ server_mount server_2 -option accesspolicy=MIXED ufs1 /ufs1
EXAMPLE #15  To mount ufs1, on mount point /ufs1, with the access policy set to MIXED_COMPAT, type:

$ server_mount server_2 -option accesspolicy=MIXED_COMPAT
ufs1 /ufs1

server_2 : done

EXAMPLE #16  To mount ufs1, as a part of the nested file system nmfs1, type:

$ server_mount server_2 ufs1 /nmfs1/ufs1

server_2 : done

EXAMPLE #17  To mount ufs1, specifying that no file is granted to the NFSv4 client, type:

$ server_mount server_2 ufs1 nfsv4delegation=NONE

server_2 : done

EXAMPLE #18  To check diskmark value for the file system ufs1632_snap1, type:

$ server_mount server_2 -check ufs1632_snap1
/ufs1632_snap1

server_2 :

Error 13423542320: server_2 : The marks on disks rootd17 with file system ufs1632_snap1 are not the same on NAS_DB and the Data Mover.

EXAMPLE #19  To check if the diskmark for the file system ufs1632_snap1 exists, type:

$ server_mount server_2 -check ufs1632_snap1
/ufs1632_snap1

server_2 :

Error 13423542324: server_2 : The marks on disks rootd17 with file system ufs1632_snap1 cannot be found on the Data Mover.

EXAMPLE #20  To mount the file system named fs 105 on the VDM vdm1 to the mount point /fs 105, type:

$ server_mount vdm1 -o smbca fs105 /fs105

vdm1:done
server_mountpoint

Manages mount points for the specified Data Movers.

SYNOPSIS

server_mountpoint {<movername>|ALL} -list | {-create|-delete|-exist} <pathname>

DESCRIPTION

server_mountpoint creates, deletes, lists, or queries a mount point for the specified Data Mover or all Data Movers.

The ALL option executes the command for all Data Movers.

OPTIONS

-list
Lists all mount points for the specified Data Movers.

-create <pathname>
Creates a mount point. A <pathname> must begin with a slash (/).

-delete <pathname>
Deletes a mount point.

-exist <pathname>
Displays whether or not a mount point exists.

SEE ALSO


EXAMPLE #1

To create a mount point on server_2, type:

$ server_mountpoint server_2 -create /ufs1

server_2 : done

EXAMPLE #2

To list all mount points on server_2, type:

$ server_mountpoint server_2 -list

server_2 :
/.etc_common
/ufs1
/ufs1_ckpt1
/ufs2
/ufs3
EXAMPLE #3  To verify that the mount point /ufs1, exists on all Data Movers, type:

```bash
$ server_mountpoint ALL -exist /ufs1
```

server_2 : /ufs1 : exists
server_3 : /ufs1 : does not exist

EXAMPLE #4  To delete the mount point /ufs1, on server_2, type:

```bash
$ server_mountpoint server_2 -delete /ufs1
```

server_2 : done
**server_mpfs**

Sets up and configures MPFS protocol.

**SYNOPSIS**

```
server_mpfs {<movername>|ALL}
  -set <var>=<value>
  -add <number_of_threads>
  -delete <number_of_threads>
  -Stats
  -Default [...]<var>...
  -mountstatus
```

**DESCRIPTION**

`server_mpfs` sets up the MPFS protocol. The configuration values entered with this command are saved into a configuration file on the Data Mover. MPFS is not supported on the NS series.

`server_setup` provides information to start and stop MPFS for a Data Mover.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

No arguments

Lists the current MPFS configuration.

- **-set** `<var>=<value>`
  Sets the specified value for the specified variable. Currently, the only valid `<var>` is **threads**.

If this command is executed before the `server_setup -P mpfs -o start` command is issued, the system sets the number of threads that will be started with the `server_setup -o start` command, thereby overriding the default number of threads. If this command is executed after MPFS service is started, threads are to be added and removed dynamically.

- **-add** `<number_of_threads>`
  Increases the previously specified number of MPFS threads (default=16) by `<number_of_threads>` for the specified Data Movers.

- **-delete** `<number_of_threads>`
  Decreases the number of threads by the `<number_of_threads>` indicated for the specified Data Movers.

- **-Stats**
  Displays the current MPFS server statistics.
The server Commands

-mountstatus
Displays the mountability of file systems for MPFS.

Certain file systems cannot be mounted using MPFS, therefore before attempting to mount a file system on an MPFS client, compatibility should be determined. File systems that are not supported are running quotas, have checkpoints, or are using TimeFinder/FS.

-Default [<var>]
Without a <var> entry, resets all variables to their factory-default values. Currently, the only valid <var> is threads.

If a <var> is specified, only the specified value is reset to its factory-default value.

_note: Variable names are case-sensitive._

SEE ALSO Using VNX Multi-Path File System, server_setup, and server_mt.

**EXAMPLE #1**
To set a value for a specified MPFS variable, type:

```
$ server_mpfs server_2 -set threads=32
```

**EXAMPLE #2**
To display the MPFS stats for server_2, type:

```
$ server_mpfs server_2 -Stats
```

```
server_2 :
Server ID=server_2
FMP Threads=32
Max Threads Used=2
FMP Open Files=0
FMP Port=4656
HeartBeat Time Interval=30
```

**EXAMPLE #3**
To reset all variables back to their factory default value, type:

```
$ server_mpfs server_2 -Default
```

**EXAMPLE #4**
To check the mount status of a Data Mover, type:

```
$ server_mpfs server_2 -mountstatus
```

```
fs                          mpfs compatible?    reason
--                          ----------------    ------
no                          not a ufs file system
testing_renaming            no                          volume structure not FMP compatible
server2_fs1_ckpt            no                          not a ufs file system
```
The server Commands

mpfs_fs2_lockdb_ckpt_5
  no
mpfs_fs2_lockdb_ckpt_4
  no
mpfs_fs2_lockdb_ckpt_3
  no
mpfs_fs2_lockdb_ckpt_2
  no
mpfs_fs2_lockdb_ckpt_1
  no
mpfs_fs2_lockdb_ckpt_10
  no
mpfs_fs2_lockdb_ckpt_9
  no
mpfs_fs2_lockdb_ckpt_8
  no
mpfs_fs2_lockdb_ckpt_7
  no
mpfs_fs2_lockdb_ckpt_6
  no
root_fs_common   yes
mpfs_fs2        yes
mpfs_fs1        mounted
server2_fs1     yes
root_fs_2       yes

EXAMPLE #5
To add 16 threads to server_2, type:
$ server_mpfs server_2 -add 16

server_2 : done

EXAMPLE #6
To delete 16 threads from server_2, type:
$ server_mpfs server_2 -delete 16

server_2 : done

volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
volume structure not FMP compatible
not a ufs file system
volume structure not FMP compatible
**server_mt**

Manages the magnetic tape drive for the specified Data Mover.

**SYNOPSIS**

```
server mt <movername> [-f <device>] [-N] <command> [ <count> ]
```

**DESCRIPTION**

`server mt` sends commands to a magnetic tape drive located on the specified Data Mover.

By default, `server mt` performs the requested operation once. Specify `<count>` to perform multiple operations.

**OPTIONS**

```
<command> <count>
```

Operations for the command are as follows:

- **eof, weof**
  Write `<count>` EOF marks at the current position on the tape.

- **fsf**
  Forward space over `<count>` EOF marks. The tape is positioned on the first block of the file.

- **bsf**
  Back space over `<count>` EOF marks. The tape is positioned on the beginning-of-tape side of the EOF mark.

- **asf**
  Absolute space to `<count>` file number. This is equivalent to a rewind followed by a fsf `<count>`.

For the following commands, `<count>` is ignored:

- **eom**
  Space to the end of recorded media on the tape. This is useful for appending files onto previously written tapes.

- **rewind**
  Rewind the tape.

- **offline, rewoffl**
  Rewind the tape and, if appropriate, take the drive unit offline by unloading the tape.

- **status**
  Print status information about the tape unit.
**erase**
Erase the entire tape.

`-f <device>`
Specifies the magnetic tape device to which the command is applied, and the `<device>` which is the name of the tape drive.

`-N`
Indicates no rewind at the end of the tape.

The **server_devconfig** `<movername>` `-list -scsi -nondisks` command displays a listing of devices.

**EXAMPLE**
To send the **rewind** command to **tape1** (magnetic tape drive) on a Data Mover, type:

```
$ server_mt server_2 -f tape1 rewind
```

```
server_2: done
```
server_name

Manages the name for the specified Data Movers.

You must delete all user-defined interconnects configured for a Data Mover before you can rename it using this command. After you rename the Data Mover, you must re-create the source and peer interconnects with the new Data Mover name and then restart any associated replication sessions.

SYNOPSIS

server_name \{<movername>|ALL\} \[<new_name>\]

DESCRIPTION

server_name displays and renames the current movername for the specified Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments
Displays movernames for all Data Movers.

<new_name>
Changes the current movername to the newly specified movername. The movername is case-sensitive and supports the following characters: a through z, A through Z, 0 through 9, _(underscore), -(hyphen), though names may not start with a hyphen.

The ALL option is not available when renaming Data Movers.

SEE ALSO

nas_rp.

EXAMPLE #1

To change the current movername for a Data Mover, type:

$ server_name server_2 my_srv2

server_2 : my_srv2

EXAMPLE #2

To view all movernames, type:

$ server_name ALL

server_2 : my_srv2
server_3 : my_srv3
server_4 : my_srv4
server_5 : my_srv5
server_netstat

Displays the network statistics for the specified Data Mover.

SYNOPSIS

server_netstat {<movername>}
[-a][-i][-r][-s][-p {tcp|udp|icmp|ip}]

DESCRIPTION

server_netstat displays network statistics for the specified Data Mover.

OPTIONS

No arguments
Displays the active TCP connections.
-a
Displays the state of all the IP, ICMP, TCP, and UDP sockets.
-i
Displays a summary of the state of all physical interfaces including the total amount of data transferred both ways and the number of errors during this process as well as the MTU size and MAC address.
-r
Displays the routing table.
-s
Displays the statistics of each protocol.
-p {tcp|udp|icmp|ip}
Limits the display of the sockets, or the statistics of each protocol to the specified protocol. tcp is default.

SEE ALSO

server_ifconfig and server_route.

EXAMPLE #1
To display all active IP, ICMP, TCP, and UDP sockets, type:

$ server_netstat server_2

Proto Local Address                  Foreign Address       (state)
******************************************************************
tcp   172.24.102.237.2483            172.24.102.17.445     ESTABLISHED
tcp   172.24.102.237.netbios-ssn     172.24.103.63.3962    ESTABLISHED

EXAMPLE #2
To display the states of the IP, ICMP, TCP, and UDP sockets, type:

$ server_netstat server_2 -a

Proto Local Address                  Foreign Address       (state)
******************************************************************
tcp   172.24.102.237.2483            172.24.102.17.445     ESTABLISHED
**The server Commands**

```
tcp   172.24.102.237.netbios-ssn   172.24.103.63.3962   ESTABLISHED
tcp   *.microsoft-ds                *.*                     LISTEN
tcp   *.netbios-ssn                 *.*                     LISTEN
tcp   *.*12345                      *.*                     LISTEN
tcp   *.5080                        *.*                     LISTEN
tcp   *.2272                        *.*                     LISTEN
tcp   *.2271                        *.*                     LISTEN
tcp   *.2270                        *.*                     LISTEN
tcp   *.ftp                         *.*                     LISTEN
tcp   *.10000                       *.*                     LISTEN
tcp   *.4658                        *.*                     LISTEN
tcp   *.2269                        *.*                     LISTEN
tcp   *.2268                        *.*                     LISTEN
tcp   *.nfs                         *.*                     LISTEN
tcp   *.*1234                       *.*                     LISTEN
tcp   *.5033                        *.*                     LISTEN
tcp   *.8888                        *.*                     LISTEN
tcp   *.sunrpc                      *.*                     LISTEN
```

Proto Local Address
*******************
```
udp   *.sunrpc
udp   *.netbios-ns
udp   *.netbios-dgm
udp   *.snmp
udp   *.router
udp   *.*1024
udp   *.*1036
udp   *.*1037
udp   *.*1038
udp   *.*1046
udp   *.*1054
udp   *.*1065
udp   *.*1234
udp   *.nfs
udp   *.2268
udp   *.4646
udp   *.4647
udp   *.4658
udp   *.9999
udp   *.*12345
udp   *.*31491
udp   *.*38914
```

**EXAMPLE #3**
To display a summary of the state of all physical interfaces, type:

```
$ server_netstat server_2 -i
```

```
Name    Mtu     Ibytes  Ierror  Obytes  Oerror  PhysAddr
****************************************************************************
fxp0      1500    758568220  0       534867239  0       8:0:1b:43:49:9a
cge0      9000    18014329  0       7195540      0       8:0:1b:42:46:3
cge1      9000    306495706 0       9984        0       8:0:1b:42:46:4
```
The server Commands

EXAMPLE #4  To display routing table statistics, type:

```
$ server_netstat server_2 -r
```

```
Destination     Gateway         Mask            Type      Proto     Interface
*****************************************************************************
 0.0.0.0         172.24.102.254 255.255.255.0   DIRECT    RIP       cge0
128.221.253.0   128.221.253.2  255.255.255.0   DIRECT    RIP       fxp0
172.24.102.0    172.24.102.237 255.255.255.0   DIRECT    RIP       cge0
128.221.252.0   128.221.252.2  255.255.255.0   DIRECT    RIP       fxp0
```

EXAMPLE #5  To display the statistics of each protocol, type:

```
$ server_netstat server_2 -s
```

```
ip:
***
2315636 total packets received
0 bad header checksums
0 with unknown protocol
4 fragments received
0 fragments dropped (dup or out of space)
0 fragments dropped after timeout
4 packets reassembled
2 packets forwarded
13046 packets not forwardable
13046 no routes
2302596 packets delivered
2267772 total packets sent
3 packets fragmented
0 packets not fragmentable
6 fragments created

icmp:
*****
162 calls to icmp_error
Output histogram:
    echo reply: 1079145
    destination unreachable: 90
    echo: 1996
Input histogram:
    echo reply: 1993
    destination unreachable: 162
    routing redirect: 0
    echo: 1079145
    time exceeded: 0
    address mask request: 0
1081300 messages received
```
1081231 messages sent

tcp:
   ****
   437648 packets sent
   2 data packets retransmitted
   0 resets
   434138 packets received
   212 connection requests
   19 connections lingered

udp:
   ****
   0 incomplete headers
   27048 bad ports
   760361 input packets delivered
   744999 packets sent

EXAMPLE #6 To display TCP protocol statistics, type:

   $ server_netstat server_2 -s -p tcp

tcp:
   ****
   437690 packets sent
   2 data packets retransmitted
   0 resets
   434195 packets received
   212 connection requests
   19 connections lingered
server_nfs

Manages the NFS service, including secure NFS and NVSv4, for the specified Data Movers.

**SYNOPSIS**

```
server_nfs {<movername>|ALL}
-secnfs
  [-service {-start|stop}]
  [-user {-list|-info {principal=<user_principal>|handle=<handle_number>}}]
  [ -release {principal=<user_principal>|handle=<handle_number>}]}
  [-principal { -create <service@server> | -delete <service@server> }]
  [-mapper
    {-info|-set {-source {auto|nis|file [path=<file_path>]}}
    | -passwddb (nis|file) }
  | -mapping {-list [name=<user_name>|uid=<UID>]
    | -create {name=<user_name>|uid=<UID>}
    | -delete {name=<user_name>|uid=<UID>}}]
  -v4 {-service {-start|stop}]
  [-client {-list
    | -info {index=<index> | hostname=<host> | ipaddress=<ipaddr>}
    | -release {index=<index> | hostname=<host> | ipaddress=<ipaddr>}}}
  | -pnfs -service {-start | -stop}
  | -stats [-zero] [-rpc|nfs]
```

**DESCRIPTION**

`server_nfs` manages the NFS service, including secure NFS and NFSv4.

For secure NFS, `server_nfs` displays the status of the secure NFS service, stops and starts Kerberos authentication for secure NFS, and manages users authenticated through secure NFS. It also manages secure NFS security principals, releases the security context of a particular user, and manages the secure NFS user mapping service. Secure NFS supports UNIX-based, Linux-based, and Windows-based Kerberos KDCs.

For NFSv4, `server_nfs` stops and starts the NFSv4 service, lists NFSv4 clients, and displays information about those clients.

---

**Note:** NFSv2 and v3 services are not started or stopped by this command.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- **-secnfs**
  Maintains a list of secure NFS principals and displays the status of the secure NFS service. It supports the Data Mover and individual
VDMs, while the other options (-v4 and -pnfs) apply to the whole Data Mover (and any associated VDMs).

-service {-start | -stop}
Enables or disables the secure NFS service on the Data Mover.

-user -list
Lists all the NFS users authenticated by secure NFS.

-user -info {principal=<user_principal> | handle=<handle_number>}
Displays the attributes of an authenticated user as specified by the <user_principal> or <handle_number>. The <user_principal> is the Kerberos representation of a user. It is the username followed by the Kerberos realm name. The <handle_number> is the identifier of a secure NFS user authentication context and is displayed using -user-list.

-user -release {principal=<user_principal> | handle=<handle_number>}
Releases the authentication context of the specified user.

-principal {-create <service@server> | -delete <service@server>}
Creates or deletes a secure NFS service instance.

-mapper -info
Displays the secure NFS mapping service configurations for the local file.

-mapper -set {-source {auto|nis|file [path=<file_path>]}}
Sets the type of mapping provider and the file path if it is a local file (the default file is gsscred_db). These options are relevant only when using a Solaris UNIX Kerberos KDC. The default and recommended value is -source auto.

-mapper -set -passwd {nis|file}
Sets the location of the password database.

-mapper -mapping -list [name=<user_name> | uid=<UID>]
Lists one or more user-mapping records as specified by <user_name> or <UID>. This option is relevant only if you are using a local mapping file and a Solaris UNIX Kerberos KDC.

-mapper -mapping -create {name=<user_name> | uid=<UID>}
Creates a new mapping record. This option is relevant only if you are using a local mapping file and a Solaris UNIX Kerberos KDC.
The server Commands

-mapper -mapping -delete {name=<user_name>|uid=<UID>}
Deletes the mapping record from the database. This option is relevant only if you are using a local mapping file and a Solaris UNIX Kerberos KDC.

-v4
Displays the status of the NFSv4 service.

-service {-start|-stop}
Enables or disables the NFSv4 service on the Data Mover.

To start the NFSv4 service, the /nas/server/slot_<x>/config file, where <x> is the slot number of the Data Mover, must be configured so that the hivers argument is set to 4. If the hivers is not set to 4, append the nfs start line and ensure that the hivers value is set to 4. Restart the Data Mover to apply the change. Other versions of NFS can continue to run even if NFSv4 is disabled.

-client -list
Lists all NFSv4 client systems that have established state with the VNX NFSv4 server.

-client -info {index|hostname=<host>|ipaddress=<ipaddr>}
Displays the attributes of the client (clientID) as specified by the index, <host>, or <ipaddr>. The index value is obtained from the client list.

-client -release {index|hostname=<host>|ipaddress=<ipaddr>}
Releases the state of the client (clientID) as specified by the index, <host>, or <ipaddr>. The index value is obtained from the client list.

-pnfs -service {-start | -stop}
The pNFS is part of the NFS version 4.1 that allows clients to access storage devices directly and in parallel.

The pNFS service starts automatically once the NFSv4 starts. The pNFS service is stopped temporarily by using the -stop argument. The service can be restarted using the -start argument.

-stats [-zero]
Displays all statistics or resets to zero all NFS and RPC statistics.
The server Commands

[-rpc | -nfs]
Displays RPC statistics or displays NFS statistics.

[-zero] [-rpc]
Resets to zero all RPC statistics.

[-zero] [-nfs]
Resets to zero all NFS statistics.

SEE ALSO  Configuring NFS on VNX and server_kerberos.

EXAMPLE #1  To display the status of the secure NFS service, type:

$ server_nfs server_2 -secnfs

server_2 :
RPCSEC_GSS server stats
Credential count: 2
  principal: nfs@dm112-cge0.nasdocs.emc.com
  principal: nfs@dm112-cge0

  Total number of user contexts: 1
  Current context handle: 3

EXAMPLE #2  To enable secure NFS service on server_2, type:

$ server_nfs server_2 -secnfs -service -start

server_2 : done

EXAMPLE #3  To disable secure NFS service on server_2, type:

$ server_nfs server_2 -secnfs -service -stop

server_2 : done

EXAMPLE #4  To display all secure NFS service instances, type:

$ server_nfs server_2 -secnfs -user -list

server_2 :
RPCSEC_GSS server stats
Credential count: 2
  principal: nfs@dm112-cge0.nasdocs.emc.com
  principal: nfs@dm112-cge0

  Total number of user contexts: 1
  Current context handle: 3

  PARTIAL user contexts:
  Total PARTIAL user contexts: 0

  USED user contexts:
The server Commands

principal=nfsuser1@NASDOCS.EMC.COM, service=nfs@dm112-cge0.nasdocs.emc.com, handle=3, validity=35914s
Total USED user contexts: 1
EXPIRED user contexts:
Total EXPIRED user contexts: 0

EXAMPLE #5    To display the attributes of an authenticated server as specified by the handle, type:

server_2:
principal: nfsuser1@NASDOCS.EMC.COM
service: nfs@dm112-cge0.nasdocs.emc.com
handle: 3
validity: 35844s
GSS flags: mutl conf intg redy tran
credential: uid=1010, inuid=1010, gid=1000

EXAMPLE #6    To release the authentication context of the user specified by the handle, type:

server_2: done

EXAMPLE #7    To create a secure NFS service instance, type:

server_2: done

EXAMPLE #8    To delete a secure NFS service instance, type:

server_2: done

EXAMPLE #9    To set the mapping provider for the file, type:

server_2: done

EXAMPLE #10   To set the location of the password database, type:

server_2: done

EXAMPLE #11   To display the secure NFS mapping service configurations for the local file, type:

server_2:
Current NFS user mapping configuration is:
The server Commands

```bash
gsscred db = File /.etc/gsscred_db
```

EXAMPLE #12  To create a new mapping record, type:

```
$ server_nfs server_2 -secnfs -mapper -mapping -create
    name=nfsuser1
```

server_2 : done

EXAMPLE #13  To display a list of the mapping records, type:

```
$ server_nfs server_2 -secnfs -mapper -mapping -list
```

server_2 :
0401000B06092A864886F7120102020000001A7365636E667573657231407374617465732E65632E636F6D
632E636F6D 1000 nfsuser1, kerberos_v5

EXAMPLE #14  To delete a mapping record, type:

```
$ server_nfs server_2 -secnfs -mapper -mapping -delete
    name=nfsuser1
```

server_2 : done

EXAMPLE #15  To enable the NFSv4 service on server_2, type:

```
$ server_nfs server_2 -v4 -service -start
```

server_2 : done

EXAMPLE #16  To start the NFSv4 service, type:

```
$ server_nfs {<movername>|ALL} -v4 -service -start
```

server_2 : done

Note: The pNFS service starts automatically once the NFSv4 starts. To start
the NFSv4 service, ensure that the /nas/server/slot_<x>/config file has the
hivers set to 4, where <x> is the slot number, for example slot_2, slot_3, and
so on. The nfs entry in the above file should look like:
nfs config hivers=4.

EXAMPLE #17  To stop the pNFS service temporarily, type:

```
$ server_nfs {<movername>|ALL} -pnfs -service -stop
```

server_2 : done

Note: When the pNFS service is stopped, all granted layouts are recalled and
requests for new layouts are denied.

EXAMPLE #18  To restart the pNFS service while the NFSv4 service is running, type:

```
$ server_nfs {<movername>|ALL} -pnfs -service -start
```
To display the status of the NFSv4 service and the pNFS service, type:

```
$ server_nfs server_2 -v4
```

---

**EXAMPLE #19**

---

```
server_2 : done
```

---

```
EXAMPLE #19
To display the status of the NFSv4 service and the pNFS service, type:

```
$ server_nfs server_2 -v4
```

```
server_2 :
-------------- nfsv4 server status ---------------
*   Service Started   *
*   pNFS service Started   *
*   (yet operating)   *

-------- NFSv4 Clients --------
Confirmed Clients : 1
UnConfirmed Clients : 0
Number of users : 0
Number of lock owners : 0
Longest List : 0
Shortest List : 0
Greatest depth to date : 0
Average List length : 0.00
Domain Name : Not Defined

---------- NFSv4 State ----------
Opens : 4
Locks : 0
Delegations: 4
Layouts : 0
Free : 524280

```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirmed Clients</td>
<td>Active client (ready to work).</td>
</tr>
<tr>
<td>UnConfirmed Clients</td>
<td>Client in the process to establishing context.</td>
</tr>
<tr>
<td>Number of users</td>
<td>To be removed in non-debug images.</td>
</tr>
<tr>
<td>Longest List</td>
<td>To be removed in non-debug images.</td>
</tr>
<tr>
<td>Shortest List</td>
<td>To be removed in non-debug images.</td>
</tr>
<tr>
<td>Greatest depth to date</td>
<td>To be removed in non-debug images.</td>
</tr>
<tr>
<td>Average List length</td>
<td>To be removed in non-debug images.</td>
</tr>
<tr>
<td>Opens</td>
<td>Number of open files.</td>
</tr>
<tr>
<td>Locks</td>
<td>Number of locks being held.</td>
</tr>
<tr>
<td>Delegations</td>
<td>Number of granted delegations.</td>
</tr>
<tr>
<td>Free</td>
<td>To be removed in non-debug images.</td>
</tr>
</tbody>
</table>
EXAMPLE #20  To display all NFSv4 clients, type:

$ server_nfs server_2 -v4 -client -list

server_2 :
------------ nfsv4 server client list ------------
hostname/ip : Index
NFSCLIENT1.nasdocs.emc.com : 0xa5400000
--------------------------------------------------

EXAMPLE #21  To display the attributes of the NFSv4 client as specified by the index, type:

$ server_nfs server_2 -v4 -client -info index=0xa5400000

server_2 :
NFSCLIENT1.nasdocs.emc.com : 0xa5400000
user: nfsuser1 : inode# 81

EXAMPLE #22  To release the client ID of the client specified by the index, type:

$ server_nfs server_2 -v4 -client -release index=0xa5400000

server_2 : done

EXAMPLE #23  To disable the NFSv4 service on server_2, type:

$ server_nfs server_2 -v4 -service -stop

server_2 : done

EXAMPLE #24  To query a list of secure NFS clients connected to VDM vdm1, type:

$ server_nfs vdm1 -secnfs -user -list

RPCSEC_GSS server stats, server is enabled

Credential count: 2
  principal: nfs@dart15
  principal: nfs@dart15.eng.emc.com

  Total number of user contexts: 2
  Current context handle: 2

  PARTIAL user contexts:
  Total PARTIAL user contexts: 0

  USED user contexts:
  principal=nfs/client.eng.emc.com@ENG.EMC.COM, service=nfs@dart15.eng.emc.com, handle=1, validity=18090s
  principal=gerry@ENG.EMC.COM, service=nfs@dart15.eng.emc.com, handle=2, validity=19724s
  Total USED user contexts: 2

  EXPIRED user contexts:
  Total EXPIRED user contexts: 0
EXAMPLE #25  To query secure NFS client connected to VDM vdm1 using principal, type:

```
$ server_nfs vdm1 -secnfs -user -info
principal=nfs/client.eng.emc.com@ENG/EMC.COM
```

```
vdm1 :
principal: nfs/client.eng.emc.com@ENG.EMC.COM
service: nfs@dart15.eng.emc.com
handle: 1
validity: 18045s
GSS flags: mutl conf intg redy tran
credential: uid=-2, inuid=-2, gid=65534
```

EXAMPLE #26  To query secure NFS client connected to VDM vdm1 using handle, type:

```
$ server_nfs vdm1 -secnfs -user -info handle=1
```

```
vdm1 :
principal: gerry@ENG.EMC.COM
service: nfs@dart15.eng.emc.com
handle: 2
validity: 19692s
GSS flags: mutl conf intg redy tran
credential: uid=10000, inuid=10000, gid=10000
```

EXAMPLE #27  To delete secure NFS client from VDM vdm1 using principal, type:

```
$ server_nfs vdm1 -secnfs -user -release
principal=nfs/client.eng.emc.com@ENG/EMC.COM
```

```
server_2 : done
```

EXAMPLE #28  To delete secure NFS client from VDM vdm1 using handle, type:

```
$ server_nfs vdm1 -secnfs -user -release handle=1
```

```
server_2 : done
```
server_nis

Manages the Network Information Service (NIS) configuration for the specified Data Movers.

**SYNOPSIS**

```
server_nis {<movername>| ALL}
[-add] <domainname> {<hostname>|<ip_addr>},{<hostname>|<ip_addr>},...} ]
| -delete [-all | <domainname>]
| -query [<domainname>]
{<hostname>|<ip_addr>},{<hostname>|<ip_addr>},...]
| -status [-all | <domainname>]
```

**DESCRIPTION**

server_nis provides connectivity to the NIS lookup servers and supports multiple domain configuration.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

No arguments

Displays the NIS configuration.

```
[-add] <domainname> {<hostname>|<ip_addr>},{<hostname>|<ip_addr>},...} ]
```

Creates a list of up to 10 IP addresses to be used as NIS lookup servers for the specified <domainname>. Up to 10 NIS servers in a single NIS domain are supported for each Data Mover. A Data Mover can support only one NIS domain until **-add** option is used.

The **-add** option allows the user to extend the domain configuration to add more than one domain. The server_nis command’s behavior is constant until the **-add** option is used.

Each time an NIS domain is already configured, the previous configuration is overwritten.

To provide high availability, you must configure the environment with multiple NIS servers. If you configure only a single NIS server, any problem with this NIS server could result in data unavailability.

```
-delete [-all | <domainname>]
```

Deletes all the NIS lookup servers.

```
-query [<domainname>]
{<hostname>|<ip_addr>},{<hostname>|<ip_addr>},...]
```

Support of multiple domain allows the application running on the Data Mover to query the NIS client for an object of a specified
domain. This option is used when the application or service works for a VDM configured with a specific NIS domain.

The `-query` option queries the NIS lookup servers using either a <hostname> or IP address. Multiple hostnames or IP addresses can be queried. Prior to performing a query, the NIS server must be activated and operational.

```
-server_nis [options] [command] [options] [command] ...
```

- **-query** [options] [command] [options] [command] ...

- **-status** [-all | <domainname>]

Displays the status of the NIS lookup server even when the NIS server is not operational.

**Note:** The `server_nis` command requires the user to specify the domain name when more than one domain is configured for the `-delete` and `-status` options, and when performing a basic query testing.

**SEE ALSO** Configuring VNX Naming Services and `server_dns`.

**EXAMPLE #1** To provide connectivity to the NIS lookup server for the specified domain, type:

```
$ server_nis server_2 nasdocs 172.24.102.30
```

**EXAMPLE #2** To query NIS lookup servers using both a hostname and an IP address, type:

```
$ server_nis server_2 -query test40,172.24.102.36,test44
```

**EXAMPLE #3** To display the NIS configuration, type:

```
$ server_nis server_2
```

**EXAMPLE #4** To display the status of the NIS lookup servers, type:

```
$ server_nis server_2 -status
```

If NIS was not started, the output of this command will appear as:

```
$ server_nis server_2 -status
```

```
server_2 : 
NIS default domain: nasdocs
NIS server 172.24.102.30
```

```
server_2 : 
NIS not started
```
EXAMPLE #5  To delete all of the NIS lookup servers for a Data Mover, type:

$ server_nis server_2 -delete
server_2 : done

EXAMPLE #6  To configure the first domain, type:

$ server_nis server_2 emclab 192.168.67.11
server_2 : done
$ server_nis server_2
server_2 :
yp domain=emclab server=192.168.67.11

EXAMPLE #7  To configure the second domain, type:

$ server_nis server_2 -add eng 192.168.67.13
server_2 : done

Note: This operation requires the usage of -add option, otherwise the first domain is overwritten.

EXAMPLE #8  To query for the current configuration, type:

$ server_nis server_2
server_2 :
yp domain=emclab server=192.168.67.11
yp domain=emceng server=192.168.67.13

EXAMPLE #9  To query for all domain status, type:

$ server_nis server_2 -status -all
server_2 :
NIS emclab context (5):
   Servers:
      192.168.67.11 Online  (current server)
RPC failure
NIS eng context (4):
   Servers:
      192.168.67.13 RPC failure  (current server)

EXAMPLE #10  To delete a domain, type:

$ server_nis server_2 -delete emclab
server_2 : done
Note: Once multiple domains are configured, the delete operation requires specifying the domain name.

Example #11

To perform a single query on a particular domain, type:

```
$ server_nis server_2 -query emclab bbvm
```

```
server_2 :
bbvm = 192.168.67.237
```
server_nsdomains

Allows the user to manage the domain configuration per Data Mover or VDM.

SYNOPSIS

server_nsdomains <movername> [options]
'options' can be one of the following:

- { -enable | -disable }
- -set -resolver <resolver>=<value> [-resolver <resolver>=<value>...]
- -unset -resolver <resolver> [-resolver <resolver>...]

DESCRIPTION

server_nsdomains enables/disables the VDM domain configuration and allows to set/unset the resolver domains.

OPTIONS

{-enable | -disable}

Enables and disables the domain configuration for a physical Data Mover or VDM. By default, the domain configuration is disabled (the VDM works with the Data Mover resolver rules).

Enabling the domain configuration confines the resolution to the physical Data Mover or VDM:

- Local files (nsswitch, hosts, password, group, and netgroups) replace the files located in the Data Mover root file system.
- The NIS, LDAP, and DNS resolver are limited to the domains specified for the physical Data Mover or VDM.

The domain configuration includes the NIS, LDAP, and DNS domains specifications. The supported resolver keywords are ‘NIS’, ‘LDAP’, ‘NFSV4’, and ‘DNS’. The value for each keyword is the appropriate domain name.

-set -resolver <resolver>=<value> [-resolver <resolver>=<value>...]

The -set option is used to set the resolver value. If the domain is not specified for a resolver, the usage of such resolver is disabled for the physical Data Mover or VDM when the domain configuration is enabled.

-unset -resolver <resolver> [-resolver <resolver>...]

The -unset option allows clearing a domain name resolver.
**EXAMPLE #1**
To query the domain configuration, type:

```
$ server_nsdomains vdm1
```

```
vdm1 :
NSDOMAINS CONFIGURATION = Disabled
```

*Note: By default, the domain configuration is disabled.*

**EXAMPLE #2**
To enable the domain configuration, type:

```
$ server_nsdomains vdm1 -enable
```

```
vdm1 : done
```

*Note: By default, there is no domain configured. With such configuration, any NIS, LDAP, or DNS query will fail. Only local host resolution works assuming a hosts file exists in the physical Data Mover or VDM root file system.*

```
$ server_nsdomains vdm1
```

```
vdm1 :
NSDOMAINS CONFIGURATION = Enabled
NIS domain           : <not defined>
LDAP domain          : <not defined>
DNS domain           : <not defined>
NFSV4 domain         : <not defined>
```

**EXAMPLE #3**
To set the NIS domain for the VDM vdm1, type:

```
$ server_nsdomains vdm1 -set -resolver NIS=emclab
```

```
vdm1 : done
```

**EXAMPLE #4**
To unset the NIS domain for the VDM vdm1, type:

```
$ server_nsdomains vdm1 -unset -resolver NIS=emclab
```

```
vdm1 : done
```

**EXAMPLE #5**
To set all domains for the VDM vdm1, type:

```
$ server_nsdomains vdm1 -set -resolver NIS=emclab
  -resolver LDAP=eng.lcsc -resolver DNS=italie.lcsc
  -resolver NFSV4=eng.emc.com
```

```
vdm1 : done
```
EXAMPLE #6  To view the domain configuration for the VDM vdm1, type:

```
$ server_nsdomains vdm1
```

vdm1:
NSDOMAINS CONFIGURATION = Enabled
NIS domain       : emclab
LDAP domain      : eng.lcsc
DNS domain       : italie.lcsc
NFSV4 domain     : eng.emc.com
server_param

Manages parameter information for the specified Data Movers.

SYNOPSIS

server_param {<movername>|ALL} -info
| -facility {<facility_name>|-all}
  {-list|-info {<param_name> [-verbose]|-all}
| -facility <facility_name> -modify <param_name> -value <new_value>

DESCRIPTION

server_param modifies and displays information on parameters for the VNX.

The ALL option executes the command for all Data Movers.

OPTIONS

-info
Displays the facilities that can be modified.

-facility {<facility_name>|-all} -list
Lists all of the parameters with their default, current, and configured values for the specified facility or facilities.

-facility {<facility_name>|-all} -info {<param_name> [-verbose]|-all}
Displays information on the specified parameter or parameters for the specified facility or facilities. The -verbose option displays a more detailed description, if one is available, for the specified <param_name>.

-facility <facility_name> -modify <param_name> -value <new_value>
Modifies the value of the specified <param_name> and changes the value to <new_value>. The <facility_name> is the facility for <param_name>.

SEE ALSO


EXAMPLE #1

To view all facilities that can be modified on server_2, type:

$ server_param server_2 -info

server_2 :
facility       description
FLRCompliance File Level Retention
NDMP          Network Data Management Protocol
PAX           Data Backup/Restore facility for NDMP/server_archive
RCP           Replication Control Protocol
The server Commands

<table>
<thead>
<tr>
<th>command</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRPL</td>
<td>Volume replication control</td>
</tr>
<tr>
<td>ana</td>
<td>Adaptec Network Adapter</td>
</tr>
<tr>
<td>arp</td>
<td>Address Resolution Protocol</td>
</tr>
<tr>
<td>cfs</td>
<td>Common File System</td>
</tr>
<tr>
<td>cifs</td>
<td>Common internet FS (Microsoft Network File Protocol)</td>
</tr>
<tr>
<td>config</td>
<td>Misc. configuration parameters for CIFS</td>
</tr>
<tr>
<td>cvfs</td>
<td>Celerra Virtual File System</td>
</tr>
<tr>
<td>dedupe</td>
<td>File-level Data Deduplication</td>
</tr>
<tr>
<td>dns</td>
<td>Domain Name Service</td>
</tr>
<tr>
<td>ds</td>
<td>Domain Controller service for CIFS</td>
</tr>
<tr>
<td>fcTach</td>
<td>Agilent Fibre Channel Controller</td>
</tr>
<tr>
<td>file</td>
<td>Overall file system parameters</td>
</tr>
<tr>
<td>filesystem</td>
<td>File system</td>
</tr>
<tr>
<td>ftpd</td>
<td>File Transfer Protocol Daemon</td>
</tr>
<tr>
<td>http</td>
<td>Hypertext Transfer Protocol</td>
</tr>
<tr>
<td>ip</td>
<td>Internet protocol</td>
</tr>
<tr>
<td>iscsi</td>
<td>Internet Scsi Protocol</td>
</tr>
<tr>
<td>ldap</td>
<td>Lightweight Directory Access Protocol</td>
</tr>
<tr>
<td>lockd</td>
<td>Network Lock Manager</td>
</tr>
<tr>
<td>mount</td>
<td>NFS Mount Protocol</td>
</tr>
<tr>
<td>nbs</td>
<td>Network Block Service Protocol</td>
</tr>
<tr>
<td>nfs</td>
<td>Network File System</td>
</tr>
<tr>
<td>nfsv4</td>
<td>NFS version 4 protocol</td>
</tr>
<tr>
<td>quota</td>
<td>File system quota management</td>
</tr>
<tr>
<td>replication</td>
<td>Data replication facility</td>
</tr>
<tr>
<td>shadow</td>
<td>Cross Protocol naming support</td>
</tr>
<tr>
<td>ssl</td>
<td>SSL security network protocol</td>
</tr>
<tr>
<td>statd</td>
<td>Host status demon</td>
</tr>
<tr>
<td>streamio</td>
<td>Streaming tape I/O support</td>
</tr>
<tr>
<td>svtl</td>
<td>Software-Based Tape Library</td>
</tr>
<tr>
<td>tcp</td>
<td>Transmission Control Protocol</td>
</tr>
<tr>
<td>tftp</td>
<td>Trivial File Transfer Protocol Daemon</td>
</tr>
<tr>
<td>trunk</td>
<td>Network trunking support</td>
</tr>
<tr>
<td>vbb</td>
<td>Volume Based Backup</td>
</tr>
<tr>
<td>vdevice</td>
<td>Virtual IP Device Parameters</td>
</tr>
<tr>
<td>viruschk</td>
<td>Virus checking service</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>facility</td>
<td>Facility for the parameter.</td>
</tr>
<tr>
<td>description</td>
<td>Description of the facility.</td>
</tr>
</tbody>
</table>

**EXAMPLE #2**

To view the PAX parameters that can be modified, type:

```
$ server_param server_2 -facility PAX -list
```

<table>
<thead>
<tr>
<th>param_name</th>
<th>facility</th>
<th>default</th>
<th>current</th>
<th>configured</th>
</tr>
</thead>
<tbody>
<tr>
<td>checkUtf8Filenames</td>
<td>PAX</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>dump</td>
<td>PAX</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>nPrefetch</td>
<td>PAX</td>
<td>8</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>nThread</td>
<td>PAX</td>
<td>64</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>
writeToArch                          PAX          1          1
paxReadBuff                          PAX         64         64
writeToTape                          PAX          1          1
filter.numDirFilter                  PAX          5          5
paxWriteBuff                         PAX         64         64
filter.numFileFilter                 PAX          5          5
filter.dialect                       PAX         ''         ''
nFTSThreads                          PAX          8          8
paxStatBuff                          PAX        128        128
readWriteBlockSizeInKB               PAX         64         64
nRestore                             PAX          8          8
filter.caseSensitive                 PAX          1          1
scanOnRestore                        PAX          1          1
noFileStream                         PAX          0          0
allowVLCREstoreToFUS                  PAX          0          0

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>param_name</td>
<td>Name of the parameters with the specified facility that can be modified.</td>
</tr>
<tr>
<td>facility</td>
<td>Facility for the parameters.</td>
</tr>
<tr>
<td>default</td>
<td>Default value for the parameter.</td>
</tr>
<tr>
<td>current</td>
<td>Current value used by the Data Mover.</td>
</tr>
<tr>
<td>configured</td>
<td>Value set by the user. If some user action is pending (such as a Data Mover reboot), it might not have taken effect.</td>
</tr>
</tbody>
</table>

If the values for current and configured differ, refer to the user_action field of the -info option.

**EXAMPLE #3**

To view information on the nThread parameter, type:

```
$ server_param server_2 -facility PAX -info nThread
```

server_2 :
name          = nThread
facility_name = PAX
default_value = 64
current_value = 64
configured_value =
user_action = none
change_effective = immediate
range = (1,128)
description = Number of worker threads per backup session

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>facility_name</td>
<td>Facility for the parameter.</td>
</tr>
<tr>
<td>default_value</td>
<td>Default value set for the parameter.</td>
</tr>
<tr>
<td>current_value</td>
<td>Value set on the Data Mover.</td>
</tr>
</tbody>
</table>
The server Commands

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>configured_value</td>
<td>Value set by the user. If some user action is pending (such as a Data Mover reboot), it might not have taken effect.</td>
</tr>
<tr>
<td>user_action</td>
<td>Action necessary for the parameter to take effect.</td>
</tr>
<tr>
<td>change_effective</td>
<td>States when the change will be effective.</td>
</tr>
<tr>
<td>range</td>
<td>Range of possible parameter values.</td>
</tr>
<tr>
<td>description</td>
<td>Description of what the parameter does.</td>
</tr>
</tbody>
</table>

**EXAMPLE #4**

To modify the configured nThread parameter, type:

```
$ server_param server_2 -facility PAX -modify nThread
   -value 32
```

server_2 : done

**EXAMPLE #5**

To modify the configured cipher parameter, type:

```
$ server_param server_2 -facility PAX -modify cipher
   -value foobar
```

server_2 : done

Warning 17716815750: server_2 : You must reboot server_2 for paxReadBuff changes to take effect.

To verify the configured cipher parameter, restart the Data Mover and type:

```
$ server_param server_2 -facility ssl -info cipher
```

server_2 :

name = cipher
facility_name = ssl
default_value = ALL:!ADH:!SSLv2:@STRENGTH
current_value = ALL:!ADH:!SSLv2:@STRENGTH
configured_value = foobar
user_action = reboot DataMover
change_effective = reboot DataMover
range = *
description = Keyword specifying the default supported SSL cipher suites (e.g: ALL:!LOW:@STRENGTH)

**Note:** If the current_value and configured_value parameters differ and if the user_action and change_effective parameters display the text reboot Data Mover, restart the Data Mover. After restarting the Data Mover, if the current_value and configured_value parameters continue to differ, it indicates that the Data Mover encountered an error after it was restarted. Check the server_log output to view the error reported.

To view the server_log command output file, type:

```
$ server_log server_2 | grep param
```

```
```
EXAMPLE #6  To view the values of the NDMP port ranges on the Data Mover server_2, type:

```
$ server_param server_2 -facility NDMP -info portRange
```

- **name** = portRange
- **facility_name** = NDMP
- **default_value** = 1024-65535
- **current_value** = 1024-65535
- **configured_value** =
- **user_action** = none
- **change_effective** = immediate
- **range** = 1024-65535
- **description** = Port range for NDMP data connection listening

EXAMPLE #7  To set the values of the NDMP port ranges on the Data Mover server_2, type:

```
$ server_param server_2 -facility NDMP -modify portRange -value 50000-50100
```

server_2 : done

EXAMPLE #8  To display the parameters for the SSL facility, type:

```
$ server_param server_2 -facility ssl -info -all
```

- **name** = trace
- **facility_name** = ssl
- **default_value** = 0x00000000
- **current_value** = 0x00000000
- **configured_value** =
- **user_action** = none
- **change_effective** = immediate
- **range** = (0x00000000,0xffffffff)
- **description** = Define SSL traces displayed in the server log

- **name** = timeout
- **facility_name** = ssl
- **default_value** = 5
- **current_value** = 5
- **configured_value** =
- **user_action** = reboot DataMover
- **change_effective** = reboot DataMover
- **range** = (1,120)
- **description** = Timeout (in seconds) used to receive SSL packets from network during SSL handshake

- **name** = protocol
- **facility_name** = ssl
default_value = 0
current_value = 0
configured_value =
user_action = reboot DataMover
change_effective = reboot DataMover
range = (0,2)
description = Set the default ssl protocol. Possible values are:
0=all ssl/tls protocol are allowed, 1=only sslv3 is allowed, 2=only tlsv1
is allowed

name = threads
facility_name = ssl
default_value = 10
current_value = 10
configured_value =
user_action = reboot DataMover
change_effective = reboot DataMover
range = (4,30)
description = Number of SSL threads

name = cipher
facility_name = ssl
default_value = 'ALL:!ADH:!SSLv2:@STRENGTH'
current_value = 'ALL:!ADH:!SSLv2:@STRENGTH'
configured_value =
user_action = none
change_effective = reboot DataMover
range = '*'
description = Keyword specifying the default supported SSL cipher
suites (e.g: ALL:!LOW:@STRENGTH)

EXAMPLE #9  To display the default SSL parameters on server_2, type:

$ server_param server_2 -facility ssl -list

server_2 :
<table>
<thead>
<tr>
<th>param_name</th>
<th>facility</th>
<th>default</th>
<th>current</th>
<th>configured</th>
</tr>
</thead>
<tbody>
<tr>
<td>trace</td>
<td>ssl</td>
<td>0x00000000</td>
<td>0x00000000</td>
<td></td>
</tr>
<tr>
<td>timeout</td>
<td>ssl</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>protocol</td>
<td>ssl</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>threads</td>
<td>ssl</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>cipher</td>
<td>ssl</td>
<td>'ALL:!ADH:!SSLv2:@STRENGTH'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE #10  To modify the SSL dedicated threads to 20, type:

$ server_param server_2 -facility ssl -modify threads
-value 20

server_2 : done

Warning 17716815750: server_2 : You must reboot server_2 for threads changes to
take effect.
EXAMPLE #11  To modify the default cipher suite to all (except low-security algorithms and MD5), type:

```
$ server_param server_2 -facility ssl -modify cipher
   -value 'ALL:!LOW:!MD5:@STRENGTH'
```

server_2 : done

Warning 17716815750: server_2 : You must reboot server_2 for cipher changes to take effect.

EXAMPLE #12  To display the default ftpd parameters, type:

```
# server_param server_2 -facility ftpd -list
```

server_2 :

<table>
<thead>
<tr>
<th>param_name</th>
<th>facility</th>
<th>default</th>
<th>current</th>
<th>configured</th>
</tr>
</thead>
<tbody>
<tr>
<td>shortpathdir</td>
<td>ftpd</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>defaultdir</td>
<td>ftpd</td>
<td>/</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>wildcharsInDir</td>
<td>ftpd</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>bounceAttackChk</td>
<td>ftpd</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE #13  To display the parameters for the ftpd facility, type:

```
$ server_param server_2 -facility ftpd -info -all
```

server_2 :

- **name**: shortpathdir
  - **facility_name**: ftpd
  - **default_value**: 0
  - **current_value**: 0
  - **configured_value**: none
  - **change_effective**: immediate
  - **range**: (0,1)
  - **description**: Enable return file name instead of full pathname in DIR command

- **name**: defaultdir
  - **facility_name**: ftpd
  - **default_value**: /
  - **current_value**: /
  - **configured_value**: none
  - **change_effective**: immediate
  - **range**: *
  - **description**: Sets the default working directory for FTP

- **name**: wildcharsInDir
  - **facility_name**: ftpd
  - **default_value**: 0
  - **current_value**: 0
  - **configured_value**: none
  - **user_action**: change_effective: immediate
**The server Commands**

<table>
<thead>
<tr>
<th>range</th>
<th>= (0,1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>= Enable wild characters for directory names</td>
</tr>
<tr>
<td>name</td>
<td>= bounceAttackChk</td>
</tr>
<tr>
<td>facility_name</td>
<td>= ftpd</td>
</tr>
<tr>
<td>default_value</td>
<td>= 1</td>
</tr>
<tr>
<td>current_value</td>
<td>= 1</td>
</tr>
<tr>
<td>configured_value =</td>
<td></td>
</tr>
<tr>
<td>user_action</td>
<td>= none</td>
</tr>
<tr>
<td>change_effective</td>
<td>= immediate</td>
</tr>
<tr>
<td>range</td>
<td>= (0,1)</td>
</tr>
<tr>
<td>description</td>
<td>= Enable bounce attack check</td>
</tr>
</tbody>
</table>

**EXAMPLE #14**  
To display the detailed description of the shortpathdir parameter for the *ftpd* facility, type:

```
$ server_param server_2 -facility ftpd -info shortpathdir -verbose
```

**server_2** :
| name          | = shortpathdir                           |
| facility_name | = ftpd                                   |
| default_value | = 0                                      |
| current_value | = 0                                      |
| configured_value = |                                    |
| user_action   | = none                                   |
| change_effective | = immediate                           |
| range         | = (0,1)                                  |
| description   | = Enable return file name instead of full pathname in DIR command |  
| detailed_description | = Enable return file name instead of full pathname in the commands dir or ls. if wild char are used this parameter is inefficient. |
server_pax

Displays and resets backup and restore statistics and file system information for a backup session already in progress.

SYNOPSIS

server_pax {<movername>|ALL}
-stats [-reset|-verbose]

DESCRIPTION

server_pax displays and resets backup and restore statistics and file system information for a backup session already in progress.

OPTIONS

-stats
Displays backup and restore statistics for a backup or restore session in progress.

[-reset| -verbose]
The -reset option resets the statistics for a backup or restore session already in progress. The -verbose option displays backup performance statistics and file size distribution data for a backup or restore session in progress.

SEE ALSO


EXAMPLE #1
To reset the statistics for a backup session already in progress, type:

$ server_pax server_2 -stats -reset
server_2 : done

EXAMPLE #2
To view the verbose statistics for an active NDMP backup session on server_2, type:

$ server_pax server_2 -stat -verbose

************** SUMMARY PAX STATS ***************

----- NASS STATS ----
nass00 is not doing backup
nass01 is not doing backup
nass02 is not doing backup
nass03 is not doing backup

----- NASA STATS ----
** nasa thid 0 (RESTORE) **
Backup root directory: /16m_ok_1_0
Total bytes processed: 12140605440
Total file processed: 738
throughput: 68 MB/sec
average file size: 16065KB
Total nasa wait nass count: 0
Total nasa wait nass time: 0 msec
The server Commands

Total time since last reset: 170 sec
Tape device name: /dev/c80t0l0

- 0 size file processed: 13
- 1 -- 8KB size file processed: 1
- 8KB+1 -- 16KB size file processed: 0
- 16KB+1 -- 32KB size file processed: 0
- 32KB+1 -- 64KB size file processed: 0
- 64KB+1 -- 1MB size file processed: 0
- 1MB+1 -- 32MB size file processed: 724
- 32MB+1 -- 1GB size file processed: 0
- 1G more size file processed: 0

fs /16m_ok_1_0 size is: 12085445504 Bytes
Estimated time remain is 1524 sec

nasa01 is not doing backup/restore
nasa02 is not doing backup/restore
nasa03 is not doing backup/restore

---- NASW STATS ----
nasw00 RESTORE (in progress)
Session Total Time: 00:02:50 (h:min:sec)
Session Idle Time: 00:00:56 (h:min:sec)
KB Transferred: 11858820 Block Size: 61440 (60 KB)
Average Transfer Rate: 68 MB/Sec 239 GB/Hour
Average Burst Transfer: 101 MB/Sec 357 GB/Hour
__Point-in-Time__ (over the last 10 seconds):
Rate=69 MB/Sec Burst=96 MB/Sec Idle=283 msec/sec
Get Pool: 17 buffers Put Pool: 29 buffers
Compression Page not available
ReadC=0.00 WriteC=0.00 Read=0 KB Written=0 KB

nasw01 BACKUP (terminated)
nasw02 BACKUP (terminated)
nasw03 BACKUP (terminated)

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>NASS STATS</td>
<td>Thread responsible for traversing the file system and providing metadata for each directory or file or both.</td>
</tr>
<tr>
<td>Total file processed</td>
<td>Total number of files or directories or both for which metadata was processed.</td>
</tr>
<tr>
<td>Total NASS wait NASA count</td>
<td>The number of times NASS waited for NASA.</td>
</tr>
<tr>
<td>Total NASS wait NASA time</td>
<td>Amount of time NASS waited for NASA.</td>
</tr>
<tr>
<td>Total time since last reset</td>
<td>Time since the last reset; a reset occurs automatically when a backup completes.</td>
</tr>
<tr>
<td>fts_build time</td>
<td>Time spent building the file system or directory tree.</td>
</tr>
<tr>
<td>getstatpool</td>
<td>If the value is consistently 0, then NASA may be slowing down the backup.</td>
</tr>
<tr>
<td>putstatpool</td>
<td>If the value is consistently 0, then NASS may be slowing down the backup.</td>
</tr>
<tr>
<td>NASA STATS</td>
<td>Thread responsible for writing file header information, reading file data, and writing to the buffer.</td>
</tr>
<tr>
<td>Backup root directory</td>
<td>Directory being backed up.</td>
</tr>
<tr>
<td><strong>Value</strong></td>
<td><strong>Definition</strong></td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Total bytes processed</td>
<td>Bytes backed up since the last reset or start of the current backup.</td>
</tr>
<tr>
<td>Total file processed</td>
<td>Number of files backed up since the start or reset of the current backup.</td>
</tr>
<tr>
<td>Throughput</td>
<td>How fast NASA processed data.</td>
</tr>
<tr>
<td>Average file size</td>
<td>Average file size for the current backup.</td>
</tr>
<tr>
<td>Total nasa wait nass count time</td>
<td>Number of times NASA waited for NASS.</td>
</tr>
<tr>
<td>Total nasa wait nass time</td>
<td>Amount of time NASA waited for NASS.</td>
</tr>
<tr>
<td>Total time since last reset</td>
<td>Amount of time since the backup statistics were reset; a reset occurs automatically when a backup completes.</td>
</tr>
<tr>
<td>Tape device name</td>
<td>Target device for the backup data.</td>
</tr>
<tr>
<td>File size statistics</td>
<td>Statistics on the size of files backed up since the start or reset of the current backup.</td>
</tr>
<tr>
<td><strong>NASW STATS</strong></td>
<td>Thread responsible for getting data from the buffer pool, writing it to tape or sending it to a remote Data Mover.</td>
</tr>
<tr>
<td>Session total time</td>
<td>Total time of the current session.</td>
</tr>
<tr>
<td>Session idle time</td>
<td>Idle time for the current session.</td>
</tr>
<tr>
<td>KB transferred</td>
<td>Total KB transferred.</td>
</tr>
<tr>
<td>Average transfer rate</td>
<td>Average transfer rate for the current session’s data per second and per hour.</td>
</tr>
<tr>
<td>Average burst transfer</td>
<td>Burst transfer rate in MB/s and GB/s.</td>
</tr>
<tr>
<td>Write block counters (List/Direct)</td>
<td>Scatter/gather write count.</td>
</tr>
<tr>
<td><em>Point-in-time</em> (over the last 10 seconds)</td>
<td>Information on data processed during a 10 second interval.</td>
</tr>
<tr>
<td>Rate</td>
<td>Transfer rate in MB/s.</td>
</tr>
<tr>
<td>Burst</td>
<td>Burst transfer rate in MB/s.</td>
</tr>
<tr>
<td>Idle</td>
<td>Amount of time NASW was idle in msec.</td>
</tr>
<tr>
<td>Get pool</td>
<td>Number of buffers in get pool; if value is consistently 0, then NASA and NASS may be slowing down the backup.</td>
</tr>
<tr>
<td>Put pool</td>
<td>Number of buffers in put pool; if value is consistently 0, then the tape may be slowing down the backup.</td>
</tr>
<tr>
<td>Compression rate retrieved</td>
<td>Compression rate.</td>
</tr>
<tr>
<td>ReadC</td>
<td>Read compression rate at the tape device.</td>
</tr>
<tr>
<td>WriteC</td>
<td>Write compression rate at the tape device.</td>
</tr>
<tr>
<td>Read</td>
<td>Amount of data read in KB.</td>
</tr>
<tr>
<td>Written</td>
<td>Amount of data written in KB.</td>
</tr>
</tbody>
</table>
**EXAMPLE #3**

To view the verbose statistics for an active NDMP restore session on server_2, type:

```
$ server_pax server_2 -stats -verbose
```

```
server_2 :
*************** SUMMARY PAX STATS ***************
---- NASS STATS ----
nass00 is not doing backup
nass01 is not doing backup
nass02 is not doing backup
nass03 is not doing backup
---- NASA STATS ----
**  nasa thid 0 (non-DAR RESTORE) **
The first five entries of restore name list are:
original name: /filt, destination name /ufsvbbr/r_filter_pax
Total bytes processed: 172326912
Total file processed: 42
throughput: 7 MB/sec
average file size: 4006KB
Total nasa wait nass count: 0
Total nasa wait nass time: 0 msec
Total time since last reset: 21 sec
Tape device name: c0t0l1
dir or 0 size file processed: 17
  1 -- 8KB size file processed: 6
  8KB+1 -- 16KB size file processed: 18
16KB+1 -- 32KB size file processed: 0
32KB+1 -- 64KB size file processed: 0
64KB+1 -- 1MB size file processed: 1
  1MB+1 -- 32MB size file processed: 0
32MB+1 -- 1GB size file processed: 0
  1G more size file processed: 0
nasa01 is not doing backup/restore
nasa02 is not doing backup/restore
nasa03 is not doing backup/restore
---- NASW STATS ----
nasw00 RESTORE (in progress)
Session Total Time: 00:00:21 (h:min:sec)
Session Idle Time: 00:00:00 (h:min:sec)
KB Tranferred: 168384 Block Size: 32768 (32 KB)
Average Transfer Rate: 7 MB/Sec 27 GB/Hour
Average Burst Transfer: 7 MB/Sec 27 GB/Hour
__Point-in-Time__ (over the last 10 seconds):
Rate=6 MB/Sec Burst=7 MB/Sec Idle=0 msec/sec
Get Pool: 61 buffers Put Pool: 0 buffers
nasw01 No session found
nasw02 No session found
nasw03 No session found
```
server_ping

Checks the network connectivity for the specified Data Movers.

SYNOPSIS

server_ping {<movername>|ALL} [-send|-interface <interface>] {<hostname>|<ip_addr>}

DESCRIPTION

server_ping sends ICMP ECHO_REQUEST messages to a remote host and receives ICMP ECHO_REPLY messages back that verify and determine network connectivity.

As the transmission time is stamped into the ECHO_REQUEST message, server_ping displays the transmission delay between the Data Mover and the remote host.

The ALL option executes the command for all Data Movers.

OPTIONS

<hostname>|<ip_addr>
Provides a one-shot test to determine if the specified <hostname> or <ip_addr> is accessible. The IP address may be used if NIS or DNS or both are not operational.

-send {<hostname>|<ip_addr>}
Repeats sending/receiving ECHO_REQUEST messages to a specified <hostname> or <ip_addr> for a remote host. The IP address may be used if NIS or DNS or both are not operational.

Press Ctrl+C to quit.

When invoking server_ping with a hostname, the /.etc/hosts file is checked first, then the NIS and DNS servers (if operational on the Data Mover) are checked. If the name does not exist in either case, an error message is displayed.

-interface {<interface> <hostname>|<ip_addr>}
Uses the address of the specified interface name as the source address. If a route to the destination exists with a matching source interface, the requests will also be transmitted out the specified interface. Otherwise, the routing table will be searched for the most specific route to the destination and the interface associated with this route will be used to transmit the request.

SEE ALSO

Configuring and Managing Networking on VNX, server_dns, server_ifconfig, and server_nis.
EXAMPLE #1  To display connectivity from a Data Mover to the outside world, type:

```
$ server_ping server_2 172.24.102.2
```

server_2 : 172.24.102.2 is alive, time= 0 ms

or

```
$ server_ping server_2 172.24.102.5
```

server_2 :
Error 6: server_2 : No such device or address
no answer from 172.24.102.5

EXAMPLE #2  To display connectivity for a Data Mover to the outside world while sending continuous ECHO_REQUEST messages, type:

```
$ server_ping server_2 -send 172.24.102.2
```

server_2 :
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 3 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms
172.24.102.2 is alive, time= 0 ms

EXAMPLE #3  To display connectivity from a Data Mover to the outside world using the specified interface, type:

```
$ server_ping server_2 -interface cge0 172.24.102.2
```

server_2 : 172.24.102.2 is alive, time= 0 ms
server_ping6

Checks the IPv6 network connectivity for the specified Data Movers.

SYNOPSIS

server_ping6 {<movername>|ALL}
[-send|-interface <interface>] {<hostname>|<ip6_addr>}

DESCRIPTION

server_ping6 sends ICMP6_ECHO_REQUEST messages to a remote host and receives ICMP6_ECHO_REPLIES messages back that verify and determine network connectivity.

As the transmission time is stamped into the ECHO_REQUEST message, server_ping6 displays the transmission delay between the Data Mover and the remote host.

The ALL option executes the command for all Data Movers.

OPTIONS

<hostname>|<ip6_addr>
Provides a one-shot test to determine if the specified <hostname> or <ip6_addr> is accessible. The IP address may be used if NIS or DNS or both are not operational.

-send {<hostname>|<ip6_addr>}
Repeats sending/receiving ECHO_REQUEST messages to a specified <hostname> or <ip6_addr> for a remote host. The IP address may be used if NIS or DNS or both are not operational. Press Ctrl C to quit.

When invoking server_ping6 with a hostname, the /etc/hosts file is checked first, then the NIS and DNS servers (if operational on the Data Mover) are checked. If the name does not exist in either case, an error message is displayed.

Note: server_ping6 requests sent to a link-local or multicast destination address require the specification of a ‘%<intf>’ scope identifier.

-interface {<interface> <hostname>|<ip6_addr>}
Provides a one-shot test to determine if the specified <hostname> or <ip6_addr> is accessible through the specified <interface>. The IP address may be used if NIS or DNS or both are not operational.
EXAMPLE #1  To verify Data Mover connectivity from cge0_int1 on server_2 to a client at 3ffe:0000:3c4d:0015:0435:0200:0300:00aa, type:

```
$ server_ping6 server_2 -interface cge0_int1
3ffe:0000:3c4d:0015:0435:0200:0300:00aa
server_2 : 3ffe:0000:3c4d:0015:0435:0200:0300:00aa is alive, time= 0 ms
```

or

```
$ server_ping6 server_2 -interface cge0_int1
3ffe:0000:3c4d:0015:0435:0200:0300:00aa
server_2 :
Error 6: server_2 : No such device or address
no answer from client
```

EXAMPLE #2  To ping link-local address fe80::260:16ff:fe0c:205%cge0_0000_ll, type:

```
$ server_ping6 server_2
fe80::260:16ff:fe0c:205%cge0_0000_ll
server_2 : fe80::260:16ff:fe0c:205%cge0_0000_ll is alive, time= 0 ms
```

or

```
$ server_ping6 server_2
fe80::260:16ff:fe0c:205%cge0_0000_ll
server_2 :
Error 6: server_2 : No such device or address
no answer from client
```

EXAMPLE #3  To ping multicast address ff02::1%cge0_0000_ll, type:

```
$ server_ping6 server_2 ff02::1%cge0_0000_ll
server_2 : ff02::1%cge0_0000_ll is alive, time= 0 ms
```

or

```
$ server_ping6 server_2 ff02::1%cge0_0000_ll
server_2 :
Error 6: server_2 : No such device or address
no answer from client
```
server_reclaim

Manages the space reclaim operation within a production file system or checkpoint SavVol on a specific Data Mover or all Data Movers in a storage system.

SYNOPSIS

server_reclaim {<movername>|ALL} |
{-all|<fs_name>|id=<fs_id>} {[-status]|[-estimate]|[-start]|[-stop]} type={PFS|CKPT}

DESCRIPTION

server_reclaim starts, stops, and displays status on the space reclaim operation within a production file system or checkpoint SavVol for the specified Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

-all|<fs_name>|id=<fs_id>
Specifies running the command on all file systems or the specified file system.

-status
Displays status information of the space reclaim operation for the specified Data Mover(s).

-estimate
Displays the estimated reclaimable space available on the production file system or checkpoint.

-start
Starts the space reclaim operation on the specified Data Mover(s).

-stop
Stops the space reclaim operation on the specified Data Mover(s).

-type={PFS|CKPT}
Specifies whether space reclaim operation is from a production file system or checkpoint SavVol.

EXAMPLE #1

To estimate the reclaimable space available on Data Mover server_2 for a production file system with an ID of 23, type:

```
$ server_reclaim server_2 id=23 -estimate type=PFS
Reclaim estimated: Space = 0 KB, Percentage = 0%
```

EXAMPLE #2

To start the space reclaim operation on Data Mover server_2 for a production file system with an ID of 23, type:
The server Commands

EXAMPLE #3 To query the status of the space reclaim operation on Data Mover server_2 for a production file system with an ID of 23, type:

```bash
$ server_reclaim_server_2 id=23 -status type=PFS
On progress processing: 70%, Estimate left time: 12 mins.
```
server_rip

server_rip manages the Routing Information Protocol (RIP) configuration for the specified Data Movers.

SYNOPSIS

server_rip {<movername>|ALL}
status
| {{ripin|noripin}{<interface_name>[,...]}}

DESCRIPTION

server_rip disables and enables RIP processing for the specified interfaces on a specified Data Mover. server_rip displays the status of the RIP configuration for the specified Data Mover. By default, all the interfaces process RIP messages. server_setup provides information to start and stop RIP for a Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

status
Displays the status of the routed daemon, RIP processing, and the interfaces with RIP processing disabled.

ripin|noripin{<interface_name>[,...]}
ripin enables RIP processing and noripin disables RIP processing for the specified interfaces.

SEE ALSO

server_setup.

EXAMPLE #1
To disable an interface for RIP processing, type:

$ server_rip server_2 noripin cge0
server_2 : done

EXAMPLE #2
To display the status of RIP processing, type:

$ server_rip server_2 status
server_2 :
routed started, RIP processing is on
cge0 (172.24.102.237), ifp = 0x8d6a178, disabled

EXAMPLE #3
To enable RIP processing for a specified interface, type:

$ server_rip server_2 ripin cge0
server_2 : done
**server_route**

Manages the routing table for the specified Data Movers.

**SYNOPSIS**

```
server_route {<movername>|ALL}
    -flush
    -DeleteAll
    -list
    {-add|-delete} default <gateway>
    {-add|-delete} [host|net] <dest> <gateway> [<netmask>]
```

**DESCRIPTION**

`server_route` creates, displays, and deletes routing entries for the specified Data Movers.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- **-flush**
  Temporarily removes all manually configured routing entries for as long as the Data Mover remains up. System generated entries are not removed. A reboot of the Data Mover re-establishes the routing entries that were temporarily removed.

- **-DeleteAll**
  Permanently removes all the routing entries.

- **-list**
  Lists all routing entries including the subnet mask for each route.

To display the full routing table for a Data Mover, type:

```
$ server_netstat <movername> -r
```

{-add|-delete} default <gateway>
Adds or deletes a default gateway for all unspecified destinations. The Data Mover passes all packets not qualifying against a specific route entry to the specified gateway. The keyword **default** implies a network destination address of 0.0.0.0. A default route uses a fixed mask of 0.0.0.0.

{-add|-delete} net <dest> <gateway> [<netmask>]
Adds or deletes a routing entry to a network host as specified by the optional keyword **net** (default) to the specified destination and gateway address. The **<dest>** argument represents the network for the routing entry, while the **<gateway>** argument indicates the network gateway to which packets should be addressed.
The <netmask> is an optional field for network addresses. In case a netmask is not specified, a netmask will be assigned based on the class of the address and addresses assigned on the system. A <netmask> of 0.0.0.0 or 255.255.255.255 is invalid in the case of net routes. The default for the route is net.

{-add|-delete} host <dest> <gateway>
Adds or deletes a routing entry to a particular host as specified by the optional keyword host (net is the default) to the specified destination and gateway address. The <dest> argument represents the specific host for the routing entry, while the <gateway> argument indicates the network gateway to which packets should be addressed.

By default, a netmask of 255.255.255.255 is assigned to host routes.

SEE ALSO Configuring and Managing Networking on VNX, server_netstat, and server_ifconfig.

EXAMPLE #1 To list the routing table for server_2, type:

```bash
$ server_route server_2 -list
```

```
server_2 : 
net 128.221.253.0 128.221.253.2 255.255.255.0 el31
net 128.221.252.0 128.221.252.2 255.255.255.0 el30
net 172.24.102.0 172.24.102.238 255.255.255.0 cge0
host 127.0.0.1 127.0.0.1 255.255.255.255 loop
```

Where: The output displayed is as follows:

<routing type> <desintation> <gateway> <mask> <network interface>

EXAMPLE #2 To create a host routing entry, type:

```bash
$ server_route server_2 -add host 10.10.1.2 172.24.102.77
```

server_2 : done

EXAMPLE #3 To create a default gateway for all unspecified destinations, type:

```bash
$ server_route server_2 -add default 172.24.102.254
```

server_2 : done

EXAMPLE #4 To add a network routing entry with a netmask, type:

```bash
$ server_route server_2 -add net 192.162.0.0 172.24.102.238 255.255.0.0
```

server_2 : done
The server Commands

EXAMPLE #5  To delete a routing entry, type:

```
$ server_route server_2 -delete host 10.10.1.2
172.24.102.77
```

server_2 : done

EXAMPLE #6  To flush the routing table for a Data Mover, type:

```
$ server_route server_2 -flush
```

server_2 : done

EXAMPLE #7  To delete all routing entries, type:

```
$ server_route server_2 -DeleteAll
```

server_2 : done
The server Commands

server_security

Manages the security policy settings for the specified Data Movers. The VNX provides support for Group Policy Objects (GPOs) by retrieving and storing a copy of the GPO settings for each CIFS server joined to a Windows domain.

SYNOPSIS

server_security {<movername>|ALL} {{-update|-info} -policy gpo[server=<server_name>|domain=<domain_name>] | {-add|-delete|-modify} -policy chap -name <client_name> | -info -policy chap [-name <client_name>]}  

DESCRIPTION

server_security queries or updates the security policy settings on the Data Movers. The VNX stores the GPO settings in a GPO cache on the Data Mover. When you start the CIFS service on a Data Mover, the VNX reads the settings stored in the GPO cache, and then retrieves the most recent GPO settings from the Windows domain controller.

The ALL option executes the command for all Data Movers.

OPTIONS

-update -policy gpo
Forces an update of the specified GPO settings.

-info -policy gpo
Queries and displays the GPO settings.

[-server=<server_name>|domain=<domain_name>]
Limits operations to the specified server or domain. The server refers to the configured CIFS servers on the Data Movers. If no server or domain has been specified, the operations are performed to all configured servers.

-add -policy chap -name <client_name>
Adds a new Challenge Handshake Authentication Protocol (CHAP) security for the specified <client_name>.

-delete -policy chap -name <client_name>
Deletes a CHAP security for the specified <client_name>.

-modify -policy chap -name <client_name>
Modifies a CHAP security setting for the specified <client_name>.

-info -policy chap [-name <client_name>]
Displays current CHAP security settings for the Data Mover, or the specified <client_name>. 
SEE ALSO Configuring iSCSI Targets on VNX for File, server_kerberos, and server_checkup.

EXAMPLE #1 To query the GPO settings for all configured CIFS servers, type:

```bash
$ server_security server_2 -info -policy gpo
```

```bash
server_2:
Server compname: dm102-cge0
Server NetBIOS: DM102-CGE0
Domain: nasdocs.emc.com
Kerberos Max Clock Skew (minutes): 5
LAN Manager Auth Level: Not defined
Digitally sign client communications (always): Not defined
Digitally sign client communications (if server agrees): Not defined
Digitally sign server communications (always): Not defined
Digitally sign server communications (if client agrees): Not defined
Send unencrypted password to connect to third-party SMB servers: Not defined
Disable machine account password changes: Not defined
Maximum machine account password age: Not defined
Audit account logon events: Not defined
Audit account management: Not defined
Audit directory service access: Not defined
Audit logon events: Not defined
Audit object access: Not defined
Audit policy change: Not defined
Audit privilege use: Not defined
Audit process tracking: Not defined
Audit system events: Not defined
Back up files and directories: Not defined
Restore files and directories: Not defined
Bypass traverse checking: Not defined
Generate security audits: Not defined
Manage auditing and security log: Not defined
Access this computer from the network: Not defined
Deny access to this computer from the network: Not defined
Take ownership of files or other objects: Not defined
EMC Virus Checking: Not defined
Maximum security log size: Not defined
Restrict guest access to security log: Not defined
Retention period for security log: Not defined
Retention method for security log: Not defined
Maximum system log size: Not defined
Restrict guest access to system log: Not defined
Retention period for system log: Not defined
Retention method for system log: Not defined
Maximum application log size: Not defined
Restrict guest access to application log: Not defined
Retention period for application log: Not defined
Retention method for application log: Not defined
Disable background refresh of Group Policy: Not defined
Group Policy Refresh interval (minutes): 90
Refresh interval offset (minutes): Not defined
```
EXAMPLE #2  To add a new CHAP security for client1, type:

```bash
$ server_security server_2 -add -policy chap -name client1
```

server_2 : Enter Secret:****
done

EXAMPLE #3  To display CHAP information for client1, type:

```bash
$ server_security server_2 -info -policy chap -name client1
```

server_2 :
chapdb name=client1 pass=********

EXAMPLE #4  To update the GPO settings for the CIFS server, type:

```bash
$ server_security server_2 -update -policy gpo
```

server_2 : done

EXAMPLE #5  To modify a password for client1, type:

```bash
$ server_security server_2 -modify -policy chap -name client1
```

server_2 : Enter New Secret:****
done

EXAMPLE #6  To delete CHAP security for client1, type:

```bash
$ server_security server_2 -delete -policy chap -name client1
```

server_2 : done
server_setup

Manages the type and protocol component for the specified Data Movers.

SYNOPSIS

server_setup {<movername> | ALL}
- type {nas | standby}
| - Load <image_name>
| - Protocol {cifs | mpfs | viruschk | rip | cdms}
  - option {start [=<n>] | stop [, comment=<message>] | delete}

DESCRIPTION

server_setup sets up the type and protocol component for the specified Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

- type {nas | standby}
Reboots the Data Mover as the type specified. When setting up a standby relationship between a primary Data Mover and a standby, ensure that the standby Data Mover has the same disk configuration as the primary.

- Load <image_name>
Loads an image onto a Data Mover. The image may be an emergency patch or debug image provided by EMC. Do not use this option unless directed by EMC customer service.

- Protocol {cifs | mpfs | viruschk | rip | cdms}
Selects the protocol configuration to be managed. Multiple protocol configurations can be enabled for a Data Mover.

Note: NFS and RIP processing are enabled by default. NFS cannot be disabled.

- option
Specifies the following options for the specified protocol:

start
Starts the specified protocol configuration. To verify whether the protocol configuration has started, use the respective server command for the protocol.

[=<n>]
Indicates the number of threads for users of CIFS, virus checker, and CDMS. The recommended number of CIFS
threads for each user is based on the amount of memory on the Data Mover. If there is less than 1 GB memory, the default thread number is 96, but if the memory is greater than 1 GB, the default thread number is 256.

---

**Note:** The \[=<n>\] option is not available for RIP protocol configurations.

\section{stop}

Stops the protocol configuration.

\[ \text{[,comment=<message>]} \]

Allows a message enclosed with quotes to be entered. The message is delivered directly to CIFS clients.

---

**Note:** The \[,comment=<message>\] option is not available for RIP or virus checker protocol configurations.

\section{delete}

Deletes the protocol configuration.

---

**SEE ALSO**  
*Configuring Standbys on VNX, server_cdms, server_checkup, server_mpfs, server_rip, server_ssh, and server_viruschk.*

**EXAMPLE #1**  
To set up a Data Mover as a standby, type:

\[
$ \text{server_setup server_3 -type standby} \\
\text{server_3 : reboot in progress 0.0.0.0.0.0.0.1.3.3.3.3.3.4. done} \\
\text{done}
\]

**EXAMPLE #2**  
To set up a Data Mover as nas, type:

\[
$ \text{server_setup server_3 -type nas} \\
\text{server_3 : reboot in progress 0.0.0.0.0.0.0.1.1.3.3.3.3.4. done} \\
\text{server_3 : checking root filesystem ... done} \\
\text{done}
\]

**EXAMPLE #3**  
To start the CIFS protocol for a Data Mover, type:

\[
$ \text{server_setup server_2 -Protocol cifs -option start} \\
\text{server_2 : done}
\]

**EXAMPLE #4**  
To start the virus checker protocol for a Data Mover, type:

\[
$ \text{server_setup server_2 -Protocol viruschk -option start} \\
\text{server_2 : done}
\]
EXAMPLE #5  To stop the CIFS protocol for a Data Mover, type:

    $ server_setup server_2 -Protocol cifs -option stop,comment="CIFS is going down"

    server_2 : done

EXAMPLE #6  To delete the CIFS protocol configuration for a Data Mover, type:

    $ server_setup server_2 -Protocol cifs -option delete

    server_2 : done

Warning 4037: server_2 : CIFS configurations for server_2 and VDM(s) currently loaded on it

EXAMPLE #7  To load a new image onto a Data Mover, type:

    $ server_setup server_2 -Load nas.exe

    server_2: will load : nas.exe
server_snmpd

Manages the Simple Network Management Protocol (SNMP) configuration values for the specified Data Movers.

**SYNOPSIS**
```
server_snmpd {<movername>|ALL}
   -info
   -service {
      -status
      -stop
      -start
   }
   -modify [ -location <sys_location>]
      [ -contact <sys_contact>]
      [ -community [-clear|<community>]]
   -user {
      -list
      -create <name> -authpw -privpw
      -delete <name>
      -modify <name> -authpw -privpw
   }
```

**DESCRIPTION**
server_snmpd controls SNMP server agent and SNMP configuration for the specified Data Mover. The service can be started/stopped depending on user preferences; the location and contact can be configured. SNMPv1 community strings can be created and cleared. SNMPv3 users can be created or deleted, and modified.

The ALL option executes the command for all Data Movers.

**OPTIONS**
- **-info**
  Displays information about the SNMP server agent and configuration such as location, contact, and community.

- **-service { -status| -stop| -start}**
  Starts, stops, or displays the current SNMP service.

- **-modify**
  Modifies the configuration of the SNMP service.

  - **-location <sys_location>**
    Modifies the location value.

  - **-contact <sys_contact>**
    Modifies the syscontact value.
The server Commands

-community {-clear | <community>}
Modifies the community name being used by the server SNMPD agent and enables the SNMPv1/SNMPv2c access to the agent. The -clear option allows the administrator to disable the community.

-user {-list}
Lists the SNMPv3 users on the Data Mover.

-create <name> -authpw -privpw
Creates an SNMPv3 user on the Data Mover.

-delete <name>
Deletes an SNMPv3 user on the Data Mover.

-modify <name> -authpw -privpw
Modifies the SNMPv3 passwords of a user on the Data Mover. Both the passwords should be changed together.

EXAMPLE #1  To view the SNMP service properties of the Data Mover server_2, type:

$ server_snmpd server_2 -info

server_2:
enabled   = yes
location  = RTP, NC
contact   = John Doe
community = public

EXAMPLE #2  To view the SNMP service properties of all Data Movers, type:

$ server_snmpd ALL -info

server_2:
enabled   = yes
location  = RTP, NC
contact   = John Doe
community = public

server_3:
enabled   = no
location  = Bangalore, India
contact   = Pandu
community = testcommunity

EXAMPLE #3  To start the SNMP service on the Data Mover server_2, type:

$ server_snmpd server_2 -service -start

server_2:
OK
EXAMPLE #4   To stop the SNMP service on the Data Mover server_3, type:

$ server_snmpd server_2 -service -stop

server_3: OK

EXAMPLE #5   To view the SNMP service status for all Data Movers, type:

$ server_snmpd ALL -service -status

server_2: SNMP Running

server_3: SNMP Stopped

EXAMPLE #6   To modify the location, contact, and community values on Data Mover server_2, type:

$ server_snmpd server_2 -modify -location "RTP, NC" -contact "Anamika Kadian" -community public

server_2: OK

EXAMPLE #7   To clear the community value on Data Mover server_2, type:

$ server_snmpd server_2 -modify -community -clear

server_2: OK

EXAMPLE #8   To display the list of SNMPv3 users on all Data Movers, type:

$ server_snmpd ALL -user -list

server_2: user gsmith smith

server_3: user clowe

EXAMPLE #9   To create a new user John on Data Mover server_2, type:

$ server_snmpd server_2 -user -create john -authpw
   -privpw

Enter the authentication password:*********
Confirm the authentication password:*********
Enter the privacy password:*********
Confirm the privacy password:*********

server_2: OK
EXAMPLE #10  To delete the user John on Data Mover server_2, type:

$ server_snmpd server_2 -user -delete John

server_2:
OK

EXAMPLE #11  To modify the passwords of the user John on Data Mover server_2, type:

$ server_snmpd server_2 -user -modify John -authpw -privpw

Enter the authentication password:*********
Confirm the authentication password:*********
Enter the privacy password:*********
Confirm the privacy password:*********
server_2:
OK
server_ssh

Manages and configures the SSH server on the specified Data Mover.

SYNOPSIS

server_ssh serverX
   -info
   | -start
   | -stop
   | -modify { -banner <banner file> | -port <port number> | -threads <number> | -defaultdir <path> | -restricthomedi {enable|disable} | -application <application_name> | -cipher <keyword> | -compression {yes|delayed|no} | -mac <keyword> | -maxauthtries <number> | -passwordauthentication {enable|disable} | -permemptypassword {enable|disable} | -pubkeyauthentication {enable|disable} | -timeout <seconds> }
   | -append { -allowhosts <ip>[,<ip>...] | -allowgroups <group>[,<group>...] | -allowusers <user>[,<user>...] | -denyhosts <ip>[,<ip>...] | -denygroups <group>[,<group>...] | -denyusers <user>[,<user>...] }
   | -remove { -allowhosts <ip>[,<ip>...] | -allowgroups <group>[,<group>...] | -allowusers <user>[,<user>...] | -denyhosts <ip>[,<ip>...] | -denygroups <group>[,<group>...] | -denyusers <user>[,<user>...] }
   | -generate [-type {rsa|dsa} [-keysize <bits>]]
   | -delete [-type {rsa|dsa}]

OPTIONS

   -info
       Displays the current configuration and state of the SSH server.

   -start
       Starts the SSH server. Allocates the pools of SSH threads and applications threads, and listens to incoming client requests from the network.
If the SSH server is already active, an error is returned.

**-stop**

Stops the SSH server. Stops listening to incoming client requests, and releases all the SSH threads.

If the SSH server is inactive, an error is returned.

**-modify**

Modifies some configuration parameters of the SSH server. The arguments are:

[-banner <banner file>]

The filename specified should contain an absolute path on the Data Mover. The file contains an unformatted text, which is sent to the SSH clients during the authentication step of the connection. It is a welcome message. The filename is saved in the SSH configuration file on the Data Mover. If the filename is "" or an empty string, then the current filename is removed from the configuration. If the file does not exist or is unreadable, an error message is returned.

[-port <number>]

Changes the TCP lists port of the SSH server. The server must be stopped before executing this command. The SSH server listens on only one TCP port. This port number is saved in the SSH configuration file on the Data Mover. If this port is invalid, or already used by another active service of the Data Mover, an error message is returned.

[-threads <number>]

Allocates the number of threads dedicated to the SSH server. If the server is started, the threads are restarted by this action, and all the established SSH connections are disconnected. Ten default threads are started when the server starts. The supported values are from 4 to 128 threads.

[-defaultdir <path>]

Specifies the default directory of an authenticated user when the home directory is undefined or inaccessible. If the given path does not exist or is inaccessible, then an error message is returned. The default value is / or forward slash.
[-restricthomedir {enable|disable}]
Restricts authenticated users to their home directory tree, to
prevent them from accessing other user’s directories. If their
home directory is undefined or unreachable, the login is denied.
This feature is enabled, by default, for security reasons.

[-application <application_name>]
Enables or disables the specified SSH application. The names of
applications are case-insensitive. If an SSH client tries to execute a
disabled application, the Data Mover returns an error. The
applications supported by the SSH server in VNX version 7.0 are
SFTP and SCP. The default applications are disabled. To disable
an enabled application, use the same option with the name
no<application>. For instance, use the -application nosftp option
to disable SFTP.

[-cipher <keyword>]
Specifies the symmetric ciphers allowed to encrypt an SSH
connection. The openSSH documentation or
http://www.openssh.com provides more information on the
supported ciphers algorithms. The default option is undefined,
which means all these ciphers are allowed.

-compression {yes|delayed|no}
Specifies whether the compression of data inside an SSH
connection is allowed, disallowed, or delayed.
The argument must be:
◆ yes: always compressed, if possible
◆ delayed: compressed after the user has authenticated successfully,
if possible
◆ no: compression allowed
The default is delayed.

-mac <keyword>
Specifies the available Message Authentication Code or MAC
algorithms to guarantee the integrity of the SSH packets on the
network. The default value is undefined, which means all these
algorithms are allowed.

-maxauthtries <number>
Specifies the maximum number of authentication attempts
permitted per SSH connection. The supported values are between
1 and 99. The default value is 6.
-**passwordauthentication** {enable|disable}
Specifies whether password authentication is allowed during the establishment of an SSH connection. The parameters passwordAuthentication and pubkeyAuthentication cannot be disabled simultaneously. The default value is enabled.

-**permitemptypassword** {enable|disable}
When password authentication is allowed, it specifies whether the server allows log in to accounts with empty password strings. The supported values are disabled or not permitted, and enabled or permitted. The default value is disabled.

-**pubkeyauthentication** {enable|disable}
Specifies whether public key authentication is allowed during the establishment of an SSH connection. The options passwordAuthentication and pubkeyAuthentication cannot be disabled simultaneously. The default value is enabled.

-**timeout** <seconds>
Specifies the time out in seconds before a network disconnection in case of inactivity. The default value is 900 seconds or 15 minutes. The range is from 10 to 3600 seconds.

-**append**
Appends to the current configuration new allowed or denied host/group/user. The arguments are:

-**allowhosts** <ip> [, <ip> ...]
Defines new client IPs or client subnets that are allowed to connect through SSH to the Data Mover. IP is the IPv4 or IPv6 address or subnet. In case of subnets, the CIDR notation must be used (for instance: 192.168.0.0./16 or 2001:DB8::/48). Network names are ignored.

If specified, SSH connections are allowed only for clients if their IP matches one of the defined allowed hosts, that is, any client host not declared on that list receives systematically an access denied error. If a subnet is defined on the allowed hosts list, then the client IP must belong to this subnet to be allowed to connect to the Data Mover.

If no allowed host is defined, then all client hosts are allowed to connect by default.
The list of the allowed host is saved in the SSH configuration file on the Data Mover. Duplicate items of the allowed host are prohibited. The Data Mover can save up to 256 different allowed hosts.

-\texttt{allowgroups} \texttt{<group>[,<group>...]}

Defines new groups of users that are allowed to connect through SSH to the Data Mover. The group should be the name of the allowed group and numerical group ID are ignored.

If specified, SSH connections are allowed only for users whose primary or supplementary group list matches one of the defined allowed groups, which means any user not a member of one of these groups receives an access denied error.

If no allowed group is defined, then all users of the groups are allowed to connect by default.

The list of allowed groups is saved in the SSH configuration file on the Data Mover.

Duplicate names of an allowed group are prohibited.

The Data Mover can save up to 256 different allowed groups.

-\texttt{allowusers} \texttt{<user>[,<user>...]}

 Defines new users that are allowed to connect through an SSH server to the Data Mover. User ID should be the name of a user; numerical user IDs are ignored. If the user is a CIFS user, the format should be user@domain or domain\user.

If specified, SSH connections are allowed only for usernames that match one of the patterns, which means any user not listed as an allowed user receives an access denied error.

If no allowed user is defined, then all users are allowed to connect by default.

The list of the allowed users is saved in the SSH configuration file on the Data Mover.

Duplicate names of allowed users are prohibited.

The Data Mover can save up to 256 different allowed users.

-\texttt{denyhosts} \texttt{<ip>[,<ip>...]}

Defines new client IPs or client subnets that are disallowed to connect through an SSH server to the Data Mover. IP is the IPv4 or IPv6 address or subnet (CIDR notation) of the client host. Network names are ignored.
If specified, SSH connections are disallowed for clients whose IP address matches one of the defined denied host or IP addresses belonging to a defined subnet, which means any client host declared in that list receives systematically an access denied error.

If no denied host is defined, then all client hosts are allowed to connect. This is the default.

The list of the denied hosts is saved in the SSH configuration file on the Data Mover.

Duplicate items of denied hosts are prohibited.

The Data Mover can save up to 256 different denied hosts.

\texttt{-denygroups <group>[,<group>...]}  
Defines new groups of users that are disallowed to connect through SSH to the Data Mover. ‘group’ should be the name of the group and numerical group IDs are ignored.

If specified, SSH connections are disallowed for users whose primary group or supplementary group list matches one of the defined “denied group”, that is, any user member of one of these groups receives systematically an “Access denied” error.

If no “denied group” is defined, then all users of all groups are allowed to connect. This is the default.

The list of the denied groups is saved in the SSH configuration file on the Data Mover.

Duplicate names of “denied group” are prohibited.

The Data Mover can save up to 256 different denied groups.

\texttt{-denyusers <user>}  
Defines a new user that is disallowed to connect through SSH to the Data Mover. “user” should be the name of the user and numerical user IDs are ignored.

If the user is a CIFS user, the format should be user@domain or domain\user.

If specified, SSH connections are disallowed for usernames that match one of the patterns, that is, any user listed as a denied user receives systematically an access denied error.

If no denied user is defined, then all users are allowed to connect. This is the default.
The list of the denied users is saved in the SSH configuration file on the VNX Operating Environment (OE) for File.

Duplicate names of denied users are prohibited.

The Data Mover can save up to 256 different denied users.

**-remove**

Removes from the current configuration an allowed/denied group/user. The arguments are:

- **-allowhosts** <ip>[,<ip>...] 
  Removes the specified IPs or subnets from the allowed hosts list.

- **-allowgroups** <group>[,<group>...] 
  Removes the specified groups from the allowed groups list.

- **-allowusers** <user>[,<user>...] 
  Removes the specified users from the allowed users list.

- **-denyhosts** <ip>[,<ip>...] 
  Removes the specified IPs or subnets from the denied hosts list.

- **-denygroups** <group>[,<group>...] 
  Removes the specified groups from the denied groups list.

- **-denyusers** <user>[,<user>...] 
  Removes the specified users from the denied users list.

**-generate**

Generates new public and private keys and saves it as the host key of the Data Mover. This operation must be the first step during the setup procedure of SSH. It could take some minutes to complete.

By default, two host keys are generated: a 2048-bit RSA key and a 1024-bit DSA key.

If the host keys of the Data Mover do not exist when the SSH server is started the first time, the keys are automatically generated with the default parameters.

The host keys are stored in the /etc directory of the Data Mover in an inaccessible directory.

The options are:

- **-type {rsa|dsa}**
  Specifies the type of key to generate. The two valid types are: rsa and dsa. If not specified, both key types are generated.

- **-keysize <bits>**
The server Commands

Specifies the number of bits of the host key. Default is 2048 bits for RSA keys and 1024 bits for DSA keys.

Valid range for RSA keys is between 2048 and 8192 bits.

The length of a DSA key must be 1024 bits exactly, as specified by FIPS 186-2.

**-delete**

Deletes all the generated host keys of the Data Mover. This command is useful if the administrator needs to generate new host keys.

The options are:

```
-type {rsa|dsa}
```

This argument specifies the type of key to delete. The two valid types are: rsa and dsa. If not specified, both key types are deleted.

**GENERAL NOTES**

- The allow or deny directives are processed in the following order: denyhost, allowhost, denyusers, allowusers, denygroups, and finally allowgroups.

- The allow or deny directives can specify multiple items separated by a , or comma without spaces.

- It is recommended to encapsulate IPv6 address in [ ] or square brackets.

- The host keys are generated automatically when the SSH server is started for the very first time if no host key exists. In that case, both keys are generated with their default size (RSA and DSA keys each).

- VDM are not supported by the server_ssh command.

**EXAMPLE #1**

To display the current configuration, type:

```
$ server_ssh server_2 -info
```

```
server_2 : done
```

**SERVICE CONFIGURATION**

```
Port                      : 22
State                     : running
Thread count              : 4
Banner                    : /server2fs1/banner.txt
Default home directory    : /
Restrict home directory   : disabled
Application               : sftp,scp
Cipher                    : <all>
```

---

Command Line Interface Reference for File 8.1
The server Commands

Compression : delayed
Mac : <all>
Max authentication tries : 5
Password authentication : enabled
Permit empty password : disabled
Public key authentication : enabled
Timeout : 30 seconds

EXAMPLE #2 To display the current configuration including allow and deny directives, type:

$ server_ssh server_3 -info

server_3 : done

SERVICE CONFIGURATION
Port : 22
State : running
Thread count : 16
Banner : /fs40/banner.txt
Default home directory : /
Restrict home directory : disabled
Application : sftp,scp
Cipher : <all>
Compression : no
Mac : <all>
Max authentication tries : 10
Password authentication : enabled
Permit empty password : disabled
Public key authentication : enabled
Timeout : 900 seconds

ACCESS CONTROL
Allowed IPs : <all>
Denied IPs : 192.168.34.23,192.168.34.10
Allowed users : jack,tony,angela,root,sheila,Monica
Denied users : <none>
Allowed groups : <all>
Denied groups : <none>

EXAMPLE #3 To start the SSH server, type:

$ server_ssh server_3 -start

server_3 : done

EXAMPLE #4 To stop the SSH server, type:

$ server_ssh server_3 -stop

server_3 : done

EXAMPLE #5 To update the number of parameter threads, type:

$ server_ssh server_3 -modify -threads 16
EXAMPLE #6  To remove an allowed group, type:

$ server_ssh server_3 -remove -allowgroups guests

EXAMPLE #7  To modify the banner file, type:

$ server_ssh server_2 -modify -banner /server2fs1/banner.txt

Note: The file /server2fs1/banner.txt must exist for the Data Mover point of view.

EXAMPLE #8  To modify the timeout to 5 minutes, type:

$ server_ssh server_2 -modify -timeout 300

EXAMPLE #9  To add a new allowed user defined in NIS or LDAP, type:

$ server_ssh server_2 -append -allowusers john

EXAMPLE #10  To add a new allowed user defined in the dom10 Windows domain, type:

$ server_ssh server_2 -append -allowusers dom10\cindy

EXAMPLE #11  To add a new allowed group of users, type:

$ server_ssh server_2 -append -allowgroups admin

EXAMPLE #12  To add a new allowed client IP, type:

$ server_ssh server_2 -append -allowhosts 110.171.1.10

EXAMPLE #13  To add new allowed client hosts using their subnet, type:

$ server_ssh server_2 -append -allowhosts 110.121.0.0/16

EXAMPLE #14  To add a new denied user, type:

$ server_ssh server_2 -append -denyusers john

EXAMPLE #15  To add a new denied group of users, type:
The server Commands

server_2 : done

$ server_ssh server_2 -append -denygroups guest

EXAMPLE #16  To add a new denied client IP, type:

server_2 : done

$ server_ssh server_2 -append -denyhosts 110.171.1.54

EXAMPLE #17  To generate a new host key for the Data Mover, type:

server_2 : done

$ server_ssh server_2 -generate

Note: This operation may take a long time. The SSH server must be stopped
as the Data Mover does not have existing host keys.

EXAMPLE #22  To delete the existing host keys of the Data Mover, type:

server_2 : done

$ server_ssh server_2 -delete

Note: The SSH server must be stopped.

ERROR CASE #1  To change the banner file to a non-existing file, type:

server_2 :
Error 13163823109: server_2 : Invalid SSH configuration: Invalid banner file name.

ERROR CASE #2  To enable an unknown application on top of SSH, type:

server_2 :
Error 13163823110: server_2 : Invalid configuration value for the SSH server:
Unknown application 'foo'.

ERROR CASE #3  To change the number of SSHD threads to an unauthorized value,
type:

server_2 :
Error 13163823110: server_2 : Invalid configuration value for the SSH server: Bad
threads value specified, allowed range is (4-128).

ERROR CASE #4  To change the port of the SSH server to an already used port, type:

server_2 :
Error 13163823111: server_2 : The SSH server cannot bind the TCP port 445.
Note: 445 is used by the CIFS server.

**ERROR CASE #5**
To regenerate the Data Mover host keys while the SSH server is active, type:

```
$ server_ssh server_2 -generate
```

server_2 :
Error 13163823112: server_2 : The SSH server must be stopped before executing this command.

**ERROR CASE #6**
To generate the Data Mover host key, and specify an invalid key type, type:

```
$ server_ssh server_2 -generate -type foo
```

server_2 :
Error 13163823109: server_2 : Invalid SSH configuration: Bad KEYTYPE value attribute.

**ERROR CASE #7**
To generate the Data Mover host key, and specify an RSA key with an invalid size, type:

```
$ server_ssh server_2 -generate -type RSA -keysize 23
```

server_2 :
Error 13163823110: server_2 : Invalid configuration value for the SSH server: Bad keysize value specified.

**ERROR CASE #8**
To generate the Data Mover host key as a DSA key when a key of this type already exists, type:

```
$ server_ssh server_2 -generate -type dsa
```

server_2 :
Error 13163823123: server_2 : The command failed as the DSA host key is already defined.
server_standby

Manages the standby and RDF relationships for the specified Data Movers.

SYNOPSIS

server_standby {<movername>|ALL}
   -activate {mover|rdf}
   -restore {mover|rdf}
   -delete {mover[=<movername>]|rdf}
   -verify {mover}
   -create {mover=<source_movername> [-policy <policy_type>]|rdf[=<slot_number>]}
-create {mover=<source_movername> [-policy <policy_type>]}  
Designates the <source_movername> as the standby. The following rules apply when selecting a standby Data Mover:

◆ The primary Data Mover cannot be a standby Data Mover.
◆ A standby cannot be created for a standby.
◆ No file systems can be mounted on the standby.
◆ The standby must have the same disk configuration as the primary.
◆ One standby Data Mover can be created for multiple Data Movers. To do this, execute server_standby -create for each primary Data Mover.

-policy <policy_type>  
When a fault is detected on the primary Data Mover, the following -policy options apply:

  auto  
  Initiates immediate activation of the standby Data Mover.

  retry  
  Attempts to recover the primary Data Mover first, then if recovery fails, initiates activation of the standby.

  manual (default)  
  Reboots the primary Data Mover. No action on the standby is initiated.

-create rdf[=<slot_number>]  
Designates a remote RDF standby Data Mover as indicated by its slot number.

SEE ALSO  Configuring Standbys on VNX and server_setup.

EXAMPLE #1  To create a standby relationship between server_2 (primary) and server_3 (standby), type:

  $ server_standby server_2 -create mover=server_3 -create mover=server_3
  server_2 : server_3 is rebooting as standby

  Note: Before any other actions can take place, the reboot must be complete.
EXAMPLE #2  To activate the server_3 (standby) to take over for server_2 (primary), type:

```bash
$ server_standby server_2 -activate mover
```

server_2 :
server_2 : going offline
server_3 : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done

server_2 : renamed as server_2.faulted.server_3
server_3 : renamed as server_2

EXAMPLE #3  To restore server_3 as the standby Data Mover and server_2.faulted.server_3 as the primary, type:

```bash
$ server_standby server_2 -restore mover
```

server_2 :
server_2 : going standby
server_2.faulted.server_3 : going active
replace in progress ...done
failover activity complete
commit in progress (not interruptible)...done

server_2 : renamed as server_3
server_2.faulted.server_3 : renamed as server_2

EXAMPLE #4  To verify readiness of the standby Data Mover, type:

```bash
$ server_standby server_2 -verify mover
```

server_2 : ok

EXAMPLE #5  To delete the standby relationship for server_2, type:

```bash
$ server_standby server_2 -delete mover
```

server_2 : done

EXAMPLE #6  To create a standby relationship for three Data Movers, type:

```bash
$ server_standby server_2 -create mover=server_3
```

server_2 : server_3 is rebooting as standby

```bash
$ server_standby server_4 -create mover=server_3
```

server_4 : done

```bash
$ server_standby server_5 -create mover=server_3
```

server_5 : done

Note: Before any other actions can take place, the reboot must be complete.
server_stats

Displays sets of statistics that are running on the specified Data Mover.

SYNOPSIS

server_stats <movername>
   -list
   | -info [-all|<statpath_name>,...,]
   | -service { -start [-port <port_number>] | -stop | -delete | -status }
   | -monitor -action {status|enable|disable}
   | [{ -monitor {statpath_name|statgroup_name}[,...]
   | -monitor {statpath_name|statgroup_name}
   [-sort <field_name>]
   [-order (asc|desc)]
   [-lines <lines_of_output>]
   }...
   [-count <count>]
   [-interval <seconds>]
   [-terminationsummary {no|yes|only}]
   [-format (text [-titles {never|once|repeat}]|csv)]
   [-type {rate|diff|accu}]
   [-file <output_filepath> [-overwrite]]
   |-resolve

DESCRIPTION

server_stats provides real-time statistics for the specified Data Mover. Statistics are displayed in a time-series fashion at the end of each interval. The statistics are organized as a hierarchy of families that replaces the summary and table collections. Previously defined summary and table collections have been converted to system-defined statistics groups that can be used as arguments with the new -monitor option:

<table>
<thead>
<tr>
<th>System-defined statistics group name</th>
<th>User-defined statistics group name</th>
</tr>
</thead>
<tbody>
<tr>
<td>basic-std</td>
<td>-summary basic</td>
</tr>
<tr>
<td>caches-std</td>
<td>-summary caches</td>
</tr>
<tr>
<td>cifs-std</td>
<td>-summary cifs</td>
</tr>
<tr>
<td>nfs-std</td>
<td>-summary nfs</td>
</tr>
<tr>
<td>cifsOps-std</td>
<td>-table cifs</td>
</tr>
<tr>
<td>diskVolumes-std</td>
<td>-table dvol</td>
</tr>
</tbody>
</table>
The server Commands

<table>
<thead>
<tr>
<th>System-defined statistics group name</th>
<th>User-defined statistics group name</th>
</tr>
</thead>
<tbody>
<tr>
<td>metaVolumes-std</td>
<td>-table fsvol</td>
</tr>
<tr>
<td>netDevices-std</td>
<td>-table net</td>
</tr>
<tr>
<td>nfsOps-std</td>
<td>-table nfs</td>
</tr>
</tbody>
</table>

**Note:** The `-summary` and `-table` options are deprecated and will not be supported in future releases.

**IP Resolution**
The `nfs.client` and `cifs.client` stats are indexed by the client IP address. Customers requested that the client name be shown instead.

To implement this, IP addresses have to be resolved to client name. The `server_stats` command now does this resolution by default when a users requests these stats.

NIS, DNS, or a local hosts file must be set up for resolution to work.

**UID Resolution**
The `nfs.user` stat is indexed by user id (UID). To maintain consistency, UIDs need to be resolved to UserNames.

The `server_stats` command now does this resolution by default when a users requests this stat.

The NIS Service or a local password file must have user information for resolution to work.

**GID Resolution**
The `nfs.group` stat is indexed by group id (GID). To maintain consistency, GIDs need to be resolved to Group Names.

The `server_stats` command now does this resolution by default when a users requests this stat. This is a support stat that requires the `-vis support` argument.

The NIS Service or a local group file must have group information for resolution to work.

In addition, `server_stats` manages the Statistics Monitoring service (`statmonService`) running on Data Movers including the ability to disable and enable statistics.
The new statistics are:

**cifs.branchcache**

The cifs.branchcache counters provide the statistics about the SMB2 BranchCache functionality, a new feature introduced with Microsoft Windows 7 and Microsoft Windows 2008 R2. They are divided in two sections: the cifs.branchcache.basic branch and cifs.branchcache.usage branch.

**cifs.branchcache.basic**

Provides the counters related to the dialog with the BranchCache client.

The statistics contain the following information:

- Hit
- Miss
- hashCount
- hashSize
- hashTransferred
- hashError
- filtered
- taskQueued
- taskRunning

**cifs.branchcache.usage**

Provides the counters related to the generation of the hash files.

The statistics contain the following information:

- hashSizeMax
- hashSizeAvg
- hashSizeMin
- hashTimeMax
- hashTimeAvg
- hashTimeMin
- taskCount
- taskQueueFull
- maxUsedThread
cifs.user

Provides cifs read and write statistics by call and bytes correlated to cifs users. It displays the same data that cifs.client does but correlated to user as opposed to IP address.

This statistic provides the following information:

- Total CIFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

The default sort field is Total Ops/S.

cifs.server

Displays the same data as cifs.client but correlated to CIFS server name (as opposed to the CIFS client’s IP address for cifs.client).

This statistic provides the following information:

- Total CIFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

nfs.user

Provides nfs read and write statistics by call and bytes correlated to nfs users. It displays the same data that nfs.client does but correlated to user as opposed to IP address.

This statistic provides the following information:

- Total NFS Ops/S
- read Ops/S
The server Commands

- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

The default sort field is Total Ops/S.

**nfs.export**

Displays the same data as nfs.client, but correlated to NFS export (as opposed to the NFS client’s IP address).

This statistic provides the following information:

- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

**nfs.group**

Displays the same data as nfs.client, but correlated to NFS group ID (as opposed to the NFS client’s IP address).

This statistic provides the following information:

- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime
**nfs.vdm**

Name of VDMs configured on a DM will be the elements of this set statistic. Physical Data Mover name will also be one of the elements in this set statistic.

**nfs.vdm.*.client**

Displays the same data as nfs.client, but only for VDMs.

This statistic provides the following information:
- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write KiB/Sec
- avgTime

**nfs.vdm.*.user**

Displays the same data as nfs.user, but only for VDMs.

This statistic provides the following information:
- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write KiB/Sec
- avgTime

**nfs.vdm.*.group**

Displays the same data as nfs.group, but only for VDMs.

This statistic provides the following information:
- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
The server Commands

- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

**nfs.vdm.*.export**

Displays the same data as nfs.export, but only for VDMs.

This statistic provides the following information:
- Total NFS Ops/S
- read Ops/S
- write Ops/S
- Suspicious Ops Diff
- Total KiB/Sec
- Read KiB/Sec
- Write Ki B/Sec
- avgTime

**fs.filesystem**

Displays the most active files within each specified file system.

This statistic provides the following information:
- Total KiB/Sec
- readonlyBytes
- writtenBytes
- avgTime
- readAvgTime
- writeAvgTime

**Note:** File inodes will not be resolved until the file system is configured for file resolution using the `server_fileresolve` command.

**fs.qtreeFile**

Displays the most active files within each specified Qtree.

This statistic provides the following information:
- Total KiB/Sec
- readBytes
The server Commands

- writtenBytes
- avgTime
- readAvgTime
- writeAvgTime

**Note:** File inodes will not be resolved until the Quota Tree is configured for file resolution using the `server_fileresolve` command.

**store.volume**

Provides Disk Volume read and write statistics by blocks and bytes correlated to File System and Disk Volume. It displays top File Systems per disk volume. To list file systems for a specific disk volume (for example, a volume named `d133`), run the `server_stats` command as:

```bash
$ server_stats server_2 -m store.volume.d133
```

This statistic provides the following information:

- totalBlocks
- readBlocks
- writtenBlocks
- Total KiB/Sec
- readBytes
- writeBytes

The default sort field is totalBlocks.

**OPTIONS**

**No arguments**

Displays a basic summary of statistics for the specified Data Mover as defined by the basic-std Statistics Group.

**-list**

Displays all defined statistics starting with the statgroup names followed by statpaths and their types.

**-info**

Displays the statgroup and statpath information.

**-service**

Specifies whether to start, stop, delete, or query the status of the statmonService. The statmonService runs on the Data Mover and listens for the `server_stats` requests.
The server Commands

[-start]
Starts the statmonService on the Data Mover. If the -port argument is specified, it is used by the statmonManager service. These settings are persistent and execute as part of the Data Mover’s boot-up configurations.

[-stop]
Shuts down the statmonService on the specified Data Mover.

[-delete]
Deletes the statmonService persistent configurations so it does not execute as part of the Data Mover’s boot-up settings. If -delete is executed while the statmonService is running, the service stops and its configuration is deleted.

[-status]
Checks the status of the statmonService on the specified Data Mover.

-monitor [-action]
Enables, disables, or queries the state of the stats collection.

-monitor {statpath_name|statgroup_name}
Takes a comma-separated list of statpath and statgroup names. In cases where stats are available for multiple elements, the user can specify an element name or use 'ALL-ELEMENTS' to refer to all elements at once.

Since server_stats command considers periods within the statpath name as delimiters, statpath names with periods as part of the element name require those periods to be double escaped.

For example, statistics for a file system named ufs1.accounting should be requested using the following statpath name:
store.logicalvolume.metavolume.ufs1\.accounting

Any duplicate statpath or statgroup names is consolidated and reported once. The below options are only applicable to Set and Correlated Set statpath names:

[-sort <field_name>]
Sorts a Set based on <field_name> values.

[-order {asc|desc}]
Sorted Sets can be ordered in ascending or descending order.
The server Commands

[-lines <lines_of_output>]
Sets output can be limited to display the Set statistics <lines_of_output> lines.

Set statistics is not sorted if none of the above three options are specified. If some of these options are specified with a Set statpath name, the omitted options default as follows:

- **-sort** defaults to the element name
- **-lines** defaults to all
- **-order** default value depends on the **-sort** field. If the Set is being sorted on a numeric field, **-order** defaults to descending order; otherwise, it defaults to ascending order. For sorting based on the Set element name, **-order** always defaults to ascending order

Each Correlated Set is defined with a default sort field and order. If some of these options are specified with a Set statpath name, the omitted options default as follows:

- **-sort** default field is unique for each Correlated Set
- **-lines** always defaults to 20 for all Correlated Sets
- **-order** default value depends on the **-sort** field. If the Correlated Set is being sorted on a numeric field, **-order** defaults to descending order; otherwise, it defaults to ascending order. Correlated Sets cannot be sorted on non-numeric fields, including the Correlated Set element ID.

[-count <count>]
Specifies the number of reports that are generated. Reports are produced after each set interval of time. The <count> must be a positive integer. By default, reports are generated indefinitely till the user presses Ctrl-C.

[-interval <seconds>]
Specifies the number of seconds between samples. The <seconds> must be an integer, 1 through 300 or higher. The default is 15.

[-terminationsummary {no|yes|only}]
Enables, disables, or manages the termination summary that appears after the <count> lines have completed or a Ctrl-C interrupt is executed. All items, both active and inactive, are reported. The summary reports average, minimum, and maximum values for numeric fields collected over the complete run. The no and yes choices control the summary message. The only option suppresses
the reporting of the time series and reports only the summary. The default value is yes.

[-format {text|csv}]
Sets the format for printing statistics. The text (default) format prints statistics separated by a sequence of blank characters when rendered in a fixed-sized font. The time stamp that appears on the front of each snapshot is local time in the form hh:mm:ss.

The csv format supports the display of elements in dynamic Set statistic. A dynamic collection is a Set statistic where new elements are reported in any sample. In order to support this dynamic behavior for the csv format and keep the csv output consistent between the title line and the sample data lines, the title line is reprinted with samples where new elements are detected.

To avoid seeing multiple title lines in the csv output, use the -file option that saves the output to a specified file instead of outputting to the standard output.

The advantage of using the -file option is that server_stats prints samples to the file and does not print the title line except once at the end of the session when the title line is complete. In this case, the title line appears once in the output at the top of the file.

The csv format produces output in a comma-separated list and renders the local time in a yyyy/mm/dd hh:mm:ss format.

The csv output and the -file option:

- Without the -file option: The output to stdout may show multiple title lines where new elements were detected.
- With the -file option: The output is printed to the specified file so at the end of the session, the final titles line is printed once at the top of the file. The result is a cleaner output than multiple titles lines where new elements were detected.

[-titles {never|once|repeat}]
Controls the generation of titles. The never option indicates that titles are not printed, the once option indicates that they are only printed at the top of the report, and the repeat option indicates that they are repeated for each time-series snapshot. The default setting is once.
The -titles option cannot be combined with the -format csv option since titles could be dynamically updated based on the dynamic nature of some statistics. The -format option provides more information.

[-type {rate|diff|accu}]
Specifies the display type of value for statistics with monotonically increasing values. The display type applies to statistics that increase monotonically, for example, network in-bound bytes. Other statistics that represent a point-in-time value, for example, current CIFS connections, are not affected by this option. The rate value displays the rate of change since the previous sample, the diff value displays the change in value since the previous sample, and the accu value displays the change in value since the initial sample. The default display type is rate.

[-file <output_filepath> [-overwrite]]
Allows the users to specify a filename to save the output of session instead of printing to standard output (stdout). This is necessary to provide a cleaner csv output. Since the titles line continues to change each time a new element is detected, it is printed a number of times to stdout. However, with the -file option, the titles line appears once at the top of the output.

In case <output_filepath> exists, the results will be appended to it. The -overwrite argument can be used to change this behavior so that an existing file is deleted before the results are written to it.

The argument of the -file option is a valid filename and does not have a default argument.

In case that server_stats is killed abruptly, two temporary files can possibly be left behind depending on whether an append to a previous file was done earlier or not and whether csv format was used or not. These files will be in the same directory as the specified file and have the following formats:

    temp_<output_filepath><timestamp>
    orig_<output_filepath><timestamp>

Where <timestamp> is the timestamp of when the file was created. The output of these files may not include the most updated titles, but they will contain the statistical data up until program termination.

- noresolve
The -noresolve option is a new server_stats option that prevents any
id resolution of any kind. This includes: FS IDs, Volume IDs, MetaVolume IDs, Quota Tree IDs, IP Addresses, UIDs, and GIDs.

SEE ALSO Managing Statistics for VNX.

EXAMPLE #1 To display the basic-std group by indicating the rate of change since the previous sample, type:

```
$ server_stats server_2 -monitor basic-std -interval 5 -count 5 -type rate
```

```
server_2    CPU    Network     Network       dVol        dVol
Timestamp  Util         In         Out       Read       Write
%      KiB/s       KiB/s      KiB/s       KiB/s
02:53:09     33      88618         729       9988       89730
02:53:11     61     142057        1087      18632      167076
02:53:13     29      98110         762       8976       78599
02:53:15     46     109783         836      14288      125717
02:53:17     34     111847         886      10652       95719
```

```
server_2    CPU    Network     Network       dVol        dVol
Summary    Util         In         Out       Read       Write
%      KiB/s       KiB/s      KiB/s       KiB/s
Minimum      29      88618         729       8976       78599
Average      41     110083         860      12507      111368
Maximum      61     142057        1087      18632      167076
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>CPU Util</td>
<td>Disk utilized in percentage in this interval.</td>
</tr>
<tr>
<td>Network In</td>
<td>Network kibibytes received over all network interfaces.</td>
</tr>
<tr>
<td>Network Out</td>
<td>Network kibibytes sent over all network interfaces.</td>
</tr>
<tr>
<td>dVol Read</td>
<td>Storage kibibytes received from all server-storage interfaces.</td>
</tr>
<tr>
<td>dVol Write</td>
<td>Storage kibibytes sent to all server-storage interfaces.</td>
</tr>
</tbody>
</table>

EXAMPLE #2 To display the basic-std group by indicating the change in value since the previous sample, type:

```
$ server_stats server_2 -monitor basic-std -interval 5 -count 5 -type diff
```

```
server_2    CPU    Network     Network       dVol        dVol
Timestamp  Util         In         Out       Read KiB diff Write KiB diff
%      diff        diff    KiB/s       KiB/s
02:53:29     46      267660        2136      26128       232654
02:53:31     38      200668        1543      23144       211182
02:53:33     46      226761        1749      26488       230558
02:53:35     48      246921        1876      28720       255957
02:53:37     40      212353        1673      23016       210573
```
The server Commands

<table>
<thead>
<tr>
<th>server_2</th>
<th>CPU</th>
<th>Network</th>
<th>Network</th>
<th>dVol</th>
<th>dVol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>Util%</td>
<td>In KiB</td>
<td>Out KiB</td>
<td>Read KiB</td>
<td>Write KiB</td>
</tr>
<tr>
<td>Minimum</td>
<td>38</td>
<td>200668</td>
<td>1543</td>
<td>23016</td>
<td>210573</td>
</tr>
<tr>
<td>Average</td>
<td>44</td>
<td>230873</td>
<td>1795</td>
<td>25499</td>
<td>228185</td>
</tr>
<tr>
<td>Maximum</td>
<td>48</td>
<td>267660</td>
<td>2136</td>
<td>28720</td>
<td>255957</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>CPU Util %</td>
<td>Disk utilized in percentage in this interval.</td>
</tr>
<tr>
<td>Network In KiB diff</td>
<td>Network kibibytes received over all network interfaces per differential value.</td>
</tr>
<tr>
<td>Network Out KiB diff</td>
<td>Network kibibytes sent over all network interfaces per differential value.</td>
</tr>
<tr>
<td>dVol Read KiB diff</td>
<td>Storage kibibytes received from all server-storage interfaces per differential value.</td>
</tr>
<tr>
<td>dVol Write KiB diff</td>
<td>Storage kibibytes sent to all server-storage interfaces per differential value.</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To display the basic-std group by indicating the change in value since the first sample, type:

```
$ server_stats server_2 -monitor basic-std -interval 5 -count 5 -type accu
```

<table>
<thead>
<tr>
<th>server_2</th>
<th>CPU</th>
<th>Network</th>
<th>Network</th>
<th>dVol</th>
<th>dVol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Util</td>
<td>In KiB</td>
<td>Out KiB</td>
<td>Read KiB</td>
<td>Write KiB</td>
</tr>
<tr>
<td>02:53:48</td>
<td>42</td>
<td>236257</td>
<td>1880</td>
<td>25504</td>
<td>224832</td>
</tr>
<tr>
<td>02:53:50</td>
<td>54</td>
<td>505640</td>
<td>3983</td>
<td>55760</td>
<td>500538</td>
</tr>
<tr>
<td>02:53:52</td>
<td>29</td>
<td>686282</td>
<td>5377</td>
<td>74096</td>
<td>662494</td>
</tr>
<tr>
<td>02:53:54</td>
<td>46</td>
<td>922765</td>
<td>7183</td>
<td>101704</td>
<td>908813</td>
</tr>
<tr>
<td>02:53:56</td>
<td>41</td>
<td>1125518</td>
<td>8777</td>
<td>126640</td>
<td>1134362</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>CPU Util</td>
<td>Disk utilized in percentage in this interval.</td>
</tr>
<tr>
<td>Network In KiB</td>
<td>Network kibibytes received over all network interfaces per accumulated value.</td>
</tr>
<tr>
<td>Network Out KiB</td>
<td>Network kibibytes sent over all network interfaces per accumulated value.</td>
</tr>
<tr>
<td>dVol Read KiB</td>
<td>Storage kibibytes received from all server-storage interfaces per accumulated value.</td>
</tr>
<tr>
<td>dVol Write KiB</td>
<td>Storage kibibytes sent to all server-storage interfaces per accumulated value.</td>
</tr>
</tbody>
</table>
EXAMPLE #4  To display a list of statistics group names followed by statpaths and their types, type:

```shell
$ server_stats server_3 -list
```

```
server_3:
Type Stat Name
...
Correlated Set cifs.user
Counter cifs.user.ALL-ELEMENTS.totalCalls
Counter cifs.user.ALL-ELEMENTS.readCalls
Counter cifs.user.ALL-ELEMENTS.writeCalls
Fact cifs.user.ALL-ELEMENTS.suspectCalls
Counter cifs.user.ALL-ELEMENTS.totalBytes
Counter cifs.user.ALL-ELEMENTS.readBytes
Counter cifs.user.ALL-ELEMENTS.writeBytes
Fact cifs.user.ALL-ELEMENTS.avgTime
Fact cifs.user.ALL-ELEMENTS.server
Fact cifs.user.ALL-ELEMENTS.client
...
Correlated Set nfs.user
Counter nfs.user.ALL-ELEMENTS.totalCalls
Counter nfs.user.ALL-ELEMENTS.readCalls
Counter nfs.user.ALL-ELEMENTS.writeCalls
Fact nfs.user.ALL-ELEMENTS.suspectCalls
Counter nfs.user.ALL-ELEMENTS.totalBytes
Counter nfs.user.ALL-ELEMENTS.readBytes
Counter nfs.user.ALL-ELEMENTS.writeBytes
Fact nfs.user.ALL-ELEMENTS.avgTime
...
Set store.volume
Correlated Set store.volume.ALL-ELEMENTS.fileSystem
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.totalBlocks
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.readBlocks
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.writeBlocks
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.totalBytes
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.readBytes
Counter store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.writeBytes
...
```

EXAMPLE #5  To display the statgroup information, type:

```shell
$ server_stats server_2 -info statsb
```

```
server_2:
name = statsB
description = My group # 2
type = Group - user-defined
member_stats = nfs.basic,cifs.basic,iscsi.basic
member_elements =
member_of = statsA
```
EXAMPLE #6  To display information of statistics group names followed by statpaths, type:

```
$ server_stats server_2 -info
```

server_2 :
name = statsA
description = My group # 1
type = Group - user-defined
member_stats = statsB
member_elements =
member_of = ... 
name = cifs
description = The CIFS-protocol service
type = Family
member_stats = 
member_elements =
member_of = ... 

EXAMPLE #7  To start the statmonService, type:

```
$ server_stats server_2 -service -start -port 7777
```

statmonService started on port: 7777.

EXAMPLE #8  To stop the statmonService, type:

```
$ server_stats server_2 -service -stop
```

server_2: done.

EXAMPLE #9  To delete the statmonService configurations from the boot-up settings of the Data Mover, type:

```
$ server_stats server_2 -service -delete
```

server_2: done.

EXAMPLE #10  To query the status of the statmonService, type:

```
$ server_stats server_2 -service -status
```

server_2: The statmonService has started.
Interface=INTERNAL
Port=7777
The statmonService is listing for incoming network connections
Max Connections: 32, Current: 0

EXAMPLE #11  To enable stats collection, type:

```
$ server_stats server_2 -monitor -action enable
```

server_2: done.
EXAMPLE #12  To query the state of the stats collection, type:

```
$ server_stats server_2 -monitor -action status
```

server_2 : Statistics are enabled.

EXAMPLE #13  To display five iterations of the cifs-std statistics group with a three second interval, type:

```
$ server_stats server_2 -monitor cifs-std -i 5 -c 5
```

server_2   CIFS   CIFS   CIFS Avg   CIFS   CIFS Avg   CIFS CIFS
Timestamp Total Read Read Read Write Write Write Share Open
Ops/s Ops/s KiB/s Size KiB Ops/s KiB/s Size KiB Connections Files
02:54:31 2133 0 0 - 1947 110600 57 96 587
02:54:34 1895 0 0 - 1737 99057 57 96 631
02:54:37 2327 0 0 - 2104 119556 57 96 649
02:54:40 2109 0 0 - 1864 106081 57 96 653
02:54:43 2439 0 0 - 2172 123578 57 96 639

server_2   CIFS   CIFS   CIFS Avg   CIFS   CIFS Avg   CIFS CIFS
Summary Total Read Read Read Size Write Write Write Size   Active
Ops/s Ops/s KiB/s Size KiB Ops/s KiB/s Size KiB Connections Files
Minimum 1895 0 0 - 1737 99057 57 96 587
Average 2180 0 0 - 1965 111775 57 96 632
Maximum 2439 0 0 - 2172 123578 57 96 653

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>CIFS Total Ops/s</td>
<td>Total operations per second.</td>
</tr>
<tr>
<td>CIFS Read Ops/s</td>
<td>CIFS read operations per second in the interval.</td>
</tr>
<tr>
<td>CIFS Read KiB/s</td>
<td>CIFS read data response in kibibytes per second.</td>
</tr>
<tr>
<td>CIFS Avg Size Read KiB</td>
<td>Average read data response.</td>
</tr>
<tr>
<td>CIFS Write Ops/s</td>
<td>CIFS write operations per second.</td>
</tr>
<tr>
<td>CIFS Write KiB/s</td>
<td>CIFS write data response in kibibytes per second.</td>
</tr>
<tr>
<td>CIFS Avg Size Write KiB</td>
<td>Average write data size.</td>
</tr>
<tr>
<td>CIFS Share Connections</td>
<td>Number of CIFS protocol connections.</td>
</tr>
<tr>
<td>CIFS Open Files</td>
<td>Number of open CIFS files.</td>
</tr>
</tbody>
</table>

EXAMPLE #14  To display five iterations of the nfs-std statistics group with a three second interval, type:

```
$ server_stats server_2 -monitor nfs-std -i 5 -c 5
```

server_2   Total NFS  NFS  NFS Avg  NFS  NFS  NFS  NFS Avg  NFS
Timestamp nfs   Read  Read  Read  Size  Write  Write  Write  Size  Active
Ops/s Ops/s KiB/s Bytes Ops/s KiB/s Bytes Threads
13:44:53  20650  4121  67506   16774  2214  29737   13754   648
13:44:54  11663  2318  37140   16407  1238  17307   14316   648
13:44:55  8678  1790  30761   17597  945  12511   13557   648
The server Commands

<table>
<thead>
<tr>
<th>Time</th>
<th>Total NFS Ops/s</th>
<th>NFS Read Ops/s</th>
<th>NFS Read KiB/s</th>
<th>NFS Avg Read Size</th>
<th>NFS Write Ops/s</th>
<th>NFS Write KiB/s</th>
<th>NFS Avg Write Size</th>
<th>NFS Active Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>8678</td>
<td>1790</td>
<td>30761</td>
<td>16205</td>
<td>945</td>
<td>12511</td>
<td>13557</td>
<td>648</td>
</tr>
<tr>
<td>Average</td>
<td>15790</td>
<td>3161</td>
<td>51122</td>
<td>16656</td>
<td>1727</td>
<td>23620</td>
<td>13982</td>
<td>648</td>
</tr>
<tr>
<td>Maximum</td>
<td>20650</td>
<td>4121</td>
<td>67506</td>
<td>17597</td>
<td>2271</td>
<td>31469</td>
<td>14316</td>
<td>648</td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>Total NFS Ops/s</td>
<td>Total number of operations per second.</td>
</tr>
<tr>
<td>NFS Read Ops/s</td>
<td>NFS read operations per second in the interval.</td>
</tr>
<tr>
<td>NFS Read KiB/s</td>
<td>NFS read data response in kibibytes per second.</td>
</tr>
<tr>
<td>NFS Avg Read Size Bytes</td>
<td>Average read data response.</td>
</tr>
<tr>
<td>NFS Write Ops/s</td>
<td>NFS write operations per second.</td>
</tr>
<tr>
<td>NFS Write KiB/s</td>
<td>NFS write data response in kibibytes per second.</td>
</tr>
<tr>
<td>NFS Avg Write Size Bytes</td>
<td>Average write data size.</td>
</tr>
<tr>
<td>NFS Active Threads</td>
<td>Number of NFS active threads.</td>
</tr>
</tbody>
</table>

**Note:** Part of the accuracy of statistics can be linked to how often server_stats reports results. For example, statistics were used to monitor NFS write bytes to a Data Mover. The NFS client, swiftest, wrote a single byte by each second for 5 minutes. When server_stats was run with an interface of 10 minutes, all bytes written were accounted for. At smaller intervals, such as one second, bytes were lost.

**Detailed results are as follows:**

1 2 5 15 30 120 600

<table>
<thead>
<tr>
<th>S1</th>
<th>0.005</th>
<th>0.045</th>
<th>0.052</th>
<th>0.000</th>
<th>0.050</th>
<th>0.000</th>
<th>0.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2</td>
<td>0.002</td>
<td>0.000</td>
<td>0.043</td>
<td>0.050</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

To review, these numbers are the number of kilobytes per report lost at each reporting period. The first row (S1) is the result of a single server_stat session, the second (S2) is two (average to produce a single value). Each column is the server_stat interval value.

In context to informal numbers, the larger the amount of time between reporting periods, the more accurate the server_stat.
numbers. However, even when loss was prevalent at higher reporting periods, the loss rate was still very low.

**EXAMPLE #15** To display five iterations of the summary statistics for caches with a three second interval, type:

```
$ server_stats server_2 -monitor caches-std -i 3 -c 5
```

```
server_2  DNLC     OF Cache  Buffer
Timestamp  Hit  Hit  Cache
           Ratio %  Ratio %  Hit %
02:55:26   -    100   71
02:55:29   -    100   72
02:55:32   -    100   73
02:55:35   -    100   73
02:55:38   -    100   72

server_2  DNLC     OF Cache  Buffer
Summary   Hit  Hit  Cache
           Ratio %  Ratio %  Hit %
Minimum   -    100   71
Average   -    100   72
Maximum   -    100   73
```

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>DNLC Hit Ratio %</td>
<td>Directory Name Lookup Cache (DNLC) hit ratio.</td>
</tr>
<tr>
<td>OF Cache Hit Ratio %</td>
<td>Open file cache hit ratio.</td>
</tr>
<tr>
<td>Buffer Cache Hit %</td>
<td>Kernel buffer cache hit ratio.</td>
</tr>
</tbody>
</table>

**EXAMPLE #16** To display the netDevices-std statistics group with a three second interval, type:

```
$ server_stats server_2 -monitor netDevices-std -i 3 -c 3
```

```
server_2  device  Network In  Network In  Network Out  Network Out  Network Out
Timestamp          Pkts/s  Errors/s  KiB/s  Pkts/s  Errors/s  KiB/s  Pkts/s  Errors/s  KiB/s
02:55:52  mge0     2          0        0          1          0        0
mge1      17         0        23         9          0        1
cge0      3593       0        26566      2289       0        203
```

```
cge1      6912       0        50206      4444       0        378
```

```
cge2      3637       0        25570      2342       0        209
```

```
02:55:55  mge0     0          0        0          0          0        0
mge1      7          0        4          0          0        0
    cge0      3444       0        24744      2252       0        204
    cge1      7415       0        53354      4721       0        400
    cge2      3913       0        27796      2502       0        222
```

```
02:55:58  mge0     2          0        0          2          0        0
mge1      32         0        39         19         0        2
    cge0      4029       0        29334      2594       0        230
```
### The server Commands

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mge0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>mge1</td>
<td>7</td>
<td>0</td>
<td>9</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>cge0</td>
<td>3444</td>
<td>0</td>
<td>24744</td>
<td>2252</td>
<td>0</td>
<td>203</td>
</tr>
<tr>
<td>cge1</td>
<td>6912</td>
<td>0</td>
<td>50206</td>
<td>4444</td>
<td>0</td>
<td>378</td>
</tr>
<tr>
<td>cge2</td>
<td>3637</td>
<td>0</td>
<td>25570</td>
<td>2342</td>
<td>0</td>
<td>209</td>
</tr>
<tr>
<td>cge3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>Device</td>
<td>Name of the network device.</td>
</tr>
<tr>
<td>Network In Pkts/s</td>
<td>Network packets received per second.</td>
</tr>
<tr>
<td>Network In Errors/s</td>
<td>Network input errors encountered per second.</td>
</tr>
<tr>
<td>Network In KiB/s</td>
<td>Network kibibytes received per second.</td>
</tr>
<tr>
<td>Network Out Pkts/s</td>
<td>Network packets sent per second.</td>
</tr>
<tr>
<td>Network Out Errors/s</td>
<td>Network output errors encountered per second.</td>
</tr>
<tr>
<td>Network Out KiB/s</td>
<td>Network kibibytes sent per second.</td>
</tr>
</tbody>
</table>

### EXAMPLE #17

To display the netDevices-std statistics group without the summary and with a three second interval, type:

```
$ server_stats server_2 -monitor netDevices-std -i 3 -c 3 -terminationsummary no
```
The server Commands

EXAMPLE #18

To display the cifsOps-std statistics with a five second interval, type:

```bash
$ server_stats server_2 -monitor cifsops-std -i 5 -c 3
```

```
server_2 SMB Operation          Op      Min      Max        Avg
Timestamp                    Calls/s     uSec     uSec  uSec/call
02:57:00   SMB1_Close             89       45   406775      10273
SMB1_WriteX          1837       30  1618776     144030
SMB1_CreateNTX        84       51   458090        379
02:57:03   SMB1_Close            122       45   406775      10057
SMB1_WriteX          1867       30  1618776     133180
SMB1_CreateNTX        126       51   458090       1826
02:57:06   SMB1_Close            105       45   406775      14663
SMB1_WriteX          2119       30  1618776     121976
SMB1_CreateNTX        103       51   458090       1801
server_2 SMB Operation          Op      Min      Max        Avg
Summary                      Calls/s     uSec     uSec  uSec/call
Minimum    SMB1_Mkdir              0        0        0          -
SMB1_Rmdir              0        0        0          -
SMB1_Open               0        0        0          -
SMB1_Create             0        0        0          -
SMB1_Close             89       45   406775      10057
SMB1_Flush              0        0        0          -
SMB1_Unlink             0        0        0          -
SMB1_Rename             0        0        0          -
SMB1_GetAttr            0        0        0          -
SMB1_SetAttr            0        0        0          -
SMB1_Read               0        0        0          -
SMB1_Write              0        0        0          -
SMB1_Lock               0        0        0          -
SMB1_Unlock             0        0        0          -
SMB1_CreateTmp          0        0        0          -
SMB1_MkNew              0        0        0          -
SMB1_ChkPath            0        0        0          -
SMB1_Exit               0        0        0          -
SMB1_Lseek              0        0        0          -
SMB1_LockRead           0        0        0          -
SMB1_WriteUnlock        0        0        0          -
SMB1_ReadBlockRaw       0        0        0          -
```
### The server Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Calls</th>
<th>Min</th>
<th>Max</th>
<th>Ext</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMB1_WriteBlockRaw</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_SetAttrExp</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_GetAttrExp</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_LockingX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TransSec</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Copy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Move</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Echo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_WriteClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_OpenX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_ReadX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_WriteX</td>
<td>1837</td>
<td>30</td>
<td>1618776</td>
<td>121976</td>
</tr>
<tr>
<td>SMB1_CloseTreeDisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans2Prim</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans2Secd</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindClose2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindNotifyClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeDisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_NegProt</td>
<td>0</td>
<td>44</td>
<td>85</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_SessSetupX</td>
<td>0</td>
<td>1088</td>
<td>12058</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_UserLogoffX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeConnectX</td>
<td>0</td>
<td>82</td>
<td>499</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_DiskAttr</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Search</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindFirst</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindUnique</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TransNT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TransNTSecd</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_CreateNTX</td>
<td>84</td>
<td>51</td>
<td>458090</td>
<td>379</td>
</tr>
<tr>
<td>SMB1_CancelNT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_SendMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_BeginMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_EndMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_MessageText</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Negotiate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_SessionSetup</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Logoff</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_TreeConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_TreeDisConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Create</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Close</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Flush</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Read</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Write</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Lock</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_IOCTL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Cancel</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_Echo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB2_QueryDirectory</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>
### The server Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>SMB2_ChangeNotify</th>
<th>SMB2_QueryInfo</th>
<th>SMB2_SetInfo</th>
<th>SMB2_OplockBreak</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMB1_Mkdir</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Rmdir</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Open</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Create</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Close</td>
<td>105</td>
<td>45</td>
<td>406775</td>
<td>11664</td>
<td></td>
</tr>
<tr>
<td>SMB1_Flush</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Unlink</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Rename</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_CreateTemp</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_MkNew</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_ChkPath</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TransSec</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Copy</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Move</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Echo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_WriteClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_OpenX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_ReadX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_WriteX</td>
<td>1941</td>
<td>30</td>
<td>1618776</td>
<td>133062</td>
<td></td>
</tr>
<tr>
<td>SMB1_CloseTreeDisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans2Prim</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Trans2Secd</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindClose2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_FindNotifyClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeDisco</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_NegProt</td>
<td>0</td>
<td>44</td>
<td>85</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_SessSetupX</td>
<td>0</td>
<td>1088</td>
<td>12058</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_UserLogoffX</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_TreeConnectX</td>
<td>0</td>
<td>82</td>
<td>499</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_DiskAttr</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>SMB1_Search</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Command Name</td>
<td>SMB1_Count</td>
<td>SMB2_Count</td>
<td>SMB1_Rate</td>
<td>SMB2_Rate</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
<td>------------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>SMB1_FindFirst</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_FindUnique</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_FindClose</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_TransNT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_TransNTSecd</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_CreateNTX</td>
<td>104</td>
<td>51</td>
<td>458090</td>
<td>1335</td>
<td></td>
</tr>
<tr>
<td>SMB1_CancelNT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_SendMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_BeginMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_EndMessage</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_MessageText</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Negotiate</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_SessionSetup</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Logoff</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_TreeConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_TreeDisConnect</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Create</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Close</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Flush</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Read</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Write</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Lock</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_IOCTL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Cancel</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_Echo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_QueryDirectory</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_ChangeNotify</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_QueryInfo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_SetInfo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB2_OplockBreak</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMB1_Mkdir</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Rmdir</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Open</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Create</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Create</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Close</td>
<td>122</td>
<td>45</td>
<td>406775</td>
<td>14663</td>
<td></td>
</tr>
<tr>
<td>SMB1_Flush</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Unlink</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Rename</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_GetAttr</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_SetAttr</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Read</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Write</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Lock</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_Unlock</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_CreateTmp</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_MkNew</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_ChkPath</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_WriteUnlock</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SMB1_ReadBlockRaw</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
### The server Commands

| Command                        | SMB1_WriteBlockRaw | SMB1_SetAttrExp | SMB1_GetAttrExp | SMB1_LockingX | SMB1_Trans | SMB1_TransSec | SMB1_Copy | SMB1_Move | SMB1_Echo | SMB1_WriteClose | SMB1_OpenX | SMB1_ReadX | SMB1_WriteX | SMB1_CloseTreeDisco | SMB1_Trans2Prim | SMB1_Trans2Secd | SMB1_FindClose2 | SMB1_FindNotifyClose | SMB1_TreeConnect | SMB1_TreeDisco | SMB1_NegProt | SMB1_SessSetupX | SMB1_UserLogoffX | SMB1_TreeConnectX | SMB1_DiskAttr | SMB1_Search | SMB1_FindFirst | SMB1_FindUnique | SMB1_FindClose | SMB1_TransNT | SMB1_TransNTSecd | SMB1_CreateNTX | SMB1_CancelNT | SMB1_SendMessage | SMB1_BeginMessage | SMB1_EndMessage | SMB1_MessageText | SMB2_Negotiate | SMB2_SessionSetup | SMB2_Logoff | SMB2_TreeConnect | SMB2_TreeDisConnect | SMB2_Cancel | SMB2_Echo | SMB2_IOCTL | SMB2_Cancel | SMB2_Echo | SMB2_QueryDirectory |
|-------------------------------|--------------------|-----------------|-----------------|---------------|-------------|--------------|-----------|-----------|-----------|----------------|-------------|-----------|----------------|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Example Values               | 2119 30 1618776 144030 |                 |                 |               |             |              |           |           |           |                |             |           |               |                    |                |                |               |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |
The server Commands

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>SMB Operation</td>
<td>Name of the SMB operation.</td>
</tr>
<tr>
<td>Op Calls/s</td>
<td>Number of calls to this SMB operation per second.</td>
</tr>
<tr>
<td>Min uSec</td>
<td>Minimum time in microseconds per call.</td>
</tr>
<tr>
<td>Max uSec</td>
<td>Maximum time in microseconds per call.</td>
</tr>
<tr>
<td>Avg uSec/Call</td>
<td>Average time in microseconds consumed per call.</td>
</tr>
</tbody>
</table>

**EXAMPLE #19**
To display the cifsOps-std statistics group without the summary and with a five second interval, type:

```
$ server_stats server_2 -m cifsops-std -i 5 -c 3 -te no
```

```
server_2 SMB Operation        Op    Min      Max        Avg
Timestamp                  Calls/s   uSec     uSec  uSec/call
02:57:24   SMB1_Close           56     45   552768      25299
SMB1_WriteX        1360     29  1618776     161125
SMB1_CreateNTX       46     51   458090        971
02:57:27   SMB1_Close          130     45   568291      16814
SMB1_WriteX        1627     29  1618776     182622
SMB1_CreateNTX      147     51   458090        276
02:57:30   SMB1_Close           50     45   568291      29992
SMB1_WriteX        1615     29  1618776     151924
SMB1_CreateNTX       37     51   458090       2850
```

**EXAMPLE #20**
To display the nfsOps-std statistics group without the summary and with a five second interval, type:

```
$ server_stats server_2 -m nfsops-std -i 5 -c 3 -te no
```

```
server_2 NFS Op       NFS       NFS         NFS    NFS Op %
Timestamp                Op        Op          Op
Calls/s  Errors/s   uSec/call
03:18:21   v3Read     23442         0       63846          50
v3Write    23372         0       99156          50
03:18:24   v3Read     23260         0       65756          50
v3Write    23243         0      101135          50
03:18:27   v3Read     23385         0       66808          50
v3Write    23323         0      102201          50
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>NFS Op</td>
<td>Name of the NFS operation.</td>
</tr>
</tbody>
</table>
### EXAMPLE #21

To display the diskVolumes-std statistics group without the summary and with a five second interval, type:

```bash
$ server_stats server_2 -m diskVolumes-std -i 5 -c 3 -te
```

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>dVol</th>
<th>Queue</th>
<th>Read</th>
<th>Read Avg</th>
<th>Read Size</th>
<th>Write</th>
<th>Write Avg</th>
<th>Write Size</th>
<th>Util %</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:58:09</td>
<td>NBS1</td>
<td>0</td>
<td>0</td>
<td>8192</td>
<td>1</td>
<td>7</td>
<td>6827</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>root_ldisk</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>461</td>
<td>490</td>
<td>1090</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>d7</td>
<td>0</td>
<td>113</td>
<td>904</td>
<td>8192</td>
<td>530</td>
<td>19619</td>
<td>37881</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>d11</td>
<td>0</td>
<td>249</td>
<td>1995</td>
<td>8192</td>
<td>431</td>
<td>11640</td>
<td>27634</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>d8</td>
<td>0</td>
<td>68</td>
<td>547</td>
<td>8192</td>
<td>372</td>
<td>11472</td>
<td>31607</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>d12</td>
<td>33</td>
<td>424</td>
<td>3389</td>
<td>8192</td>
<td>609</td>
<td>20045</td>
<td>33705</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>d9</td>
<td>0</td>
<td>36</td>
<td>291</td>
<td>8192</td>
<td>592</td>
<td>20339</td>
<td>35161</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>d13</td>
<td>0</td>
<td>333</td>
<td>2664</td>
<td>8192</td>
<td>347</td>
<td>11925</td>
<td>35158</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>d10</td>
<td>0</td>
<td>24</td>
<td>189</td>
<td>8192</td>
<td>385</td>
<td>11896</td>
<td>31668</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>d14</td>
<td>36</td>
<td>573</td>
<td>4581</td>
<td>8192</td>
<td>454</td>
<td>20173</td>
<td>45468</td>
<td>100</td>
</tr>
<tr>
<td>02:58:12</td>
<td>root_ldisk</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>401</td>
<td>462</td>
<td>1182</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>NBS6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>3072</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>d7</td>
<td>0</td>
<td>78</td>
<td>624</td>
<td>8192</td>
<td>388</td>
<td>13851</td>
<td>36523</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>d11</td>
<td>0</td>
<td>216</td>
<td>1728</td>
<td>8192</td>
<td>470</td>
<td>11147</td>
<td>24268</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>d8</td>
<td>0</td>
<td>51</td>
<td>411</td>
<td>8192</td>
<td>333</td>
<td>10672</td>
<td>32850</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>d12</td>
<td>0</td>
<td>301</td>
<td>2408</td>
<td>8192</td>
<td>483</td>
<td>14411</td>
<td>30531</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>d9</td>
<td>0</td>
<td>24</td>
<td>192</td>
<td>8192</td>
<td>422</td>
<td>14285</td>
<td>34691</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>d13</td>
<td>0</td>
<td>290</td>
<td>2317</td>
<td>8192</td>
<td>340</td>
<td>10920</td>
<td>32856</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>d10</td>
<td>0</td>
<td>19</td>
<td>152</td>
<td>8192</td>
<td>346</td>
<td>10944</td>
<td>32389</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>d14</td>
<td>47</td>
<td>407</td>
<td>3259</td>
<td>8192</td>
<td>342</td>
<td>14288</td>
<td>42822</td>
<td>100</td>
</tr>
<tr>
<td>02:58:15</td>
<td>NBS1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>512</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>root_ldisk</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>409</td>
<td>454</td>
<td>1135</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>NBS5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>9</td>
<td>83</td>
<td>9070</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>d7</td>
<td>0</td>
<td>122</td>
<td>976</td>
<td>8192</td>
<td>471</td>
<td>20179</td>
<td>43839</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>d11</td>
<td>1</td>
<td>144</td>
<td>1149</td>
<td>8192</td>
<td>225</td>
<td>6608</td>
<td>30118</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>d8</td>
<td>2</td>
<td>33</td>
<td>261</td>
<td>8192</td>
<td>229</td>
<td>6515</td>
<td>29131</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>d12</td>
<td>41</td>
<td>424</td>
<td>3395</td>
<td>8192</td>
<td>666</td>
<td>20632</td>
<td>31722</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>d9</td>
<td>0</td>
<td>44</td>
<td>355</td>
<td>8192</td>
<td>577</td>
<td>20848</td>
<td>36999</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>d13</td>
<td>2</td>
<td>185</td>
<td>1483</td>
<td>8192</td>
<td>201</td>
<td>6768</td>
<td>34423</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>d10</td>
<td>0</td>
<td>13</td>
<td>101</td>
<td>8192</td>
<td>238</td>
<td>6789</td>
<td>29252</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>d14</td>
<td>0</td>
<td>583</td>
<td>4667</td>
<td>8192</td>
<td>521</td>
<td>21131</td>
<td>41505</td>
<td>95</td>
</tr>
</tbody>
</table>

**Where:**

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Time the poll was taken.</td>
</tr>
<tr>
<td>dVol</td>
<td>Name of the disk volume.</td>
</tr>
</tbody>
</table>

#### Value Definition

- **NFS Op Calls/s**: Number of calls to this NFS operation per second.
- **NFS Op Errors/s**: Number of times the NFS operation failed per second.
- **NFS Op uSec/Call**: Average time in microseconds consumed per call.
- **NFS Op %**: Percent of total NFS calls attributed to this operation.
EXAMPLE #22

To display the metaVolumes-std statistics group without the summary and with a five second interval, type:

```
$ server_stats server_2 -m metaVolumes-std -i 5 -c 3 -te
```

<table>
<thead>
<tr>
<th>server_2</th>
<th>MetaVol</th>
<th>Read Requests/s</th>
<th>Read Avg KiB/s</th>
<th>Read Avg Size Bytes</th>
<th>Write Requests/s</th>
<th>Write Avg KiB/s</th>
<th>Write Avg Size Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:58:37</td>
<td>SNBS6</td>
<td>0 0</td>
<td>- 0</td>
<td>1</td>
<td>3</td>
<td>3072 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>0 0</td>
<td>- 0</td>
<td>160</td>
<td>1285</td>
<td>8209 161</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>0 0</td>
<td>- 0</td>
<td>163</td>
<td>1299</td>
<td>8175 162</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_3</td>
<td>0 0</td>
<td>- 0</td>
<td>11</td>
<td>2155</td>
<td>200580 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_2</td>
<td>347 2776</td>
<td>8192 347</td>
<td>140</td>
<td>23544</td>
<td>172208 140</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_0</td>
<td>315 2517</td>
<td>8192 315</td>
<td>148</td>
<td>21427</td>
<td>147916 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_1</td>
<td>654 5229</td>
<td>8192 654</td>
<td>313</td>
<td>45512</td>
<td>148895 313</td>
<td></td>
</tr>
<tr>
<td></td>
<td>root_fs_3</td>
<td>1 11</td>
<td>8192 1</td>
<td>0</td>
<td>0</td>
<td>- 0</td>
<td></td>
</tr>
<tr>
<td>02:58:40</td>
<td>SNBS5</td>
<td>0 0</td>
<td>- 0</td>
<td>3</td>
<td>37</td>
<td>12743 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNBS1</td>
<td>0 0</td>
<td>- 0</td>
<td>3</td>
<td>1</td>
<td>512 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>0 0</td>
<td>- 0</td>
<td>159</td>
<td>1257</td>
<td>8089 157</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>0 0</td>
<td>- 0</td>
<td>160</td>
<td>1273</td>
<td>8158 159</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_3</td>
<td>0 0</td>
<td>- 0</td>
<td>2</td>
<td>511</td>
<td>224695 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_2</td>
<td>396 3166</td>
<td>8192 396</td>
<td>195</td>
<td>27326</td>
<td>143200 195</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_0</td>
<td>431 3446</td>
<td>8192 431</td>
<td>187</td>
<td>29574</td>
<td>162161 187</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_1</td>
<td>408 3262</td>
<td>8192 408</td>
<td>159</td>
<td>27782</td>
<td>178784 159</td>
<td></td>
</tr>
<tr>
<td></td>
<td>root_fs_3</td>
<td>1 5</td>
<td>8192 1</td>
<td>0</td>
<td>0</td>
<td>- 0</td>
<td></td>
</tr>
<tr>
<td>02:58:43</td>
<td>SNBS5</td>
<td>0 0</td>
<td>- 0</td>
<td>1</td>
<td>5</td>
<td>5461 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNBS6</td>
<td>0 0</td>
<td>- 0</td>
<td>1</td>
<td>3</td>
<td>4608 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>0 0</td>
<td>- 0</td>
<td>146</td>
<td>1159</td>
<td>8136 145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>0 0</td>
<td>- 0</td>
<td>148</td>
<td>1183</td>
<td>8174 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_3</td>
<td>0 0</td>
<td>- 0</td>
<td>8</td>
<td>1965</td>
<td>262144 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_2</td>
<td>522 4174</td>
<td>8192 522</td>
<td>219</td>
<td>35546</td>
<td>166238 219</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_0</td>
<td>492 3933</td>
<td>8192 492</td>
<td>222</td>
<td>33356</td>
<td>153886 222</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ufs_1</td>
<td>467 3736</td>
<td>8192 467</td>
<td>188</td>
<td>31955</td>
<td>173819 188</td>
<td></td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>MetaVol</td>
<td>Name of the meta volume associated with the file system.</td>
</tr>
<tr>
<td>Read Request/s</td>
<td>Number of read requests per second to this volume.</td>
</tr>
<tr>
<td>Read KiB/s</td>
<td>Kibibytes read per second.</td>
</tr>
</tbody>
</table>

Queue Depth | Queue depth of the disk volume.
Read Ops/s   | Number of read operations per second.
Read KiB/s   | Kibibytes read per second.
Avg Read Size Bytes | Average size in bytes of read requests per second.
Write Ops/s  | Number of write operations per second.
Write KiB/s  | Kibibytes written per second.
Avg Write Size Bytes | Average size in bytes for write requests per second.
Util %       | Disk utilized in percentage.
**EXAMPLE #23**  To display the nfsOps-std statistics group sorted by the percentage of all the NFS operations for the five second interval, type:

$ server_stats server_2 -monitor nfsOps-std -sort opPct -i 5 -c 3 -te

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>NFS Op</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>Op %</th>
</tr>
</thead>
<tbody>
<tr>
<td>03:18:57</td>
<td>v3Read</td>
<td>23263</td>
<td>0</td>
<td>81632</td>
<td>50</td>
</tr>
<tr>
<td>03:19:00</td>
<td>v3Write</td>
<td>23352</td>
<td>0</td>
<td>116645</td>
<td>50</td>
</tr>
<tr>
<td>03:19:03</td>
<td>v3Read</td>
<td>23431</td>
<td>0</td>
<td>82443</td>
<td>50</td>
</tr>
<tr>
<td>03:19:03</td>
<td>v3Write</td>
<td>23345</td>
<td>0</td>
<td>118088</td>
<td>50</td>
</tr>
</tbody>
</table>

**EXAMPLE #24**  To display the nfsOps-std statistics group sorted by the average time in microseconds used for the five second interval, in ascending order, type:

$ server_stats server_2 -m nfsops-std -sort avgTime -order asc -i 5 -c 3 -te no

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>NFS Op</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>Op %</th>
</tr>
</thead>
<tbody>
<tr>
<td>04:05:27</td>
<td>v3Write</td>
<td>605</td>
<td>0</td>
<td>8022318</td>
<td>100</td>
</tr>
<tr>
<td>04:05:30</td>
<td>v3Create</td>
<td>8</td>
<td>0</td>
<td>25304786</td>
<td>0</td>
</tr>
<tr>
<td>04:05:33</td>
<td>v3Create</td>
<td>579</td>
<td>0</td>
<td>8435543</td>
<td>99</td>
</tr>
<tr>
<td>04:05:33</td>
<td>v3Write</td>
<td>567</td>
<td>0</td>
<td>8690860</td>
<td>93</td>
</tr>
</tbody>
</table>

**EXAMPLE #25**  To display the nfsOps-std statistics group sorted by the average time in microseconds used for the five second interval, in descending order, and including the three counts of data output, type:

$ server_stats server_2 -m nfsops-std -sort avgTime -order desc -lines 3 -i 5 -c 3 -te no

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>NFS Op</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>Op %</th>
</tr>
</thead>
<tbody>
<tr>
<td>04:09:39</td>
<td>v3Create</td>
<td>1</td>
<td>0</td>
<td>31657550</td>
<td>0</td>
</tr>
<tr>
<td>04:09:39</td>
<td>v3Write</td>
<td>610</td>
<td>0</td>
<td>6223366</td>
<td>100</td>
</tr>
</tbody>
</table>
To display the Correlated Set list, type:

$ server_stats server_3 -l

**EXAMPLE #26**

```
server_3:
Type          Stat Name
...           
Correlated Set cifs.user
Counter       cifs.user.ALL-ELEMENTS.totalCalls
Counter       cifs.user.ALL-ELEMENTS.readCalls
Counter       cifs.user.ALL-ELEMENTS.writeCalls
Fact          cifs.user.ALL-ELEMENTS.suspectCalls
Counter       cifs.user.ALL-ELEMENTS.totalBytes
Counter       cifs.user.ALL-ELEMENTS.readBytes
Counter       cifs.user.ALL-ELEMENTS.writeBytes
Fact          cifs.user.ALL-ELEMENTS.avgTime
Fact          cifs.user.ALL-ELEMENTS.server
Fact          cifs.user.ALL-ELEMENTS.client
...           
Correlated Set nfs.user
Counter       nfs.user.ALL-ELEMENTS.totalCalls
Counter       nfs.user.ALL-ELEMENTS.readCalls
Counter       nfs.user.ALL-ELEMENTS.writeCalls
Fact          nfs.user.ALL-ELEMENTS.suspectCalls
Counter       nfs.user.ALL-ELEMENTS.totalBytes
Counter       nfs.user.ALL-ELEMENTS.readBytes
Counter       nfs.user.ALL-ELEMENTS.writeBytes
Fact          nfs.user.ALL-ELEMENTS.avgTime
...           
Set           store.volume
Correlated Set store.volume.ALL-ELEMENTS.fileSystem
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.totalBlocks
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.readBlocks
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.writeBlocks
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.totalBytes
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.readBytes
Counter       store.volume.ALL-ELEMENTS.fileSystem.ALL-ELEMENTS.writeBytes
...           
```

To display cifs.client information with an IP resolution, type:

$ server_stats server_2 -i 2 -m cifs.client -l 10

**EXAMPLE #27**

```
server_2  IP address  CIFS CIFS CIFS CIFS CIFS CIFS CIFS CIFS
Timestamp  Total  Read  Write Suspicious  Total  Read  Write
Ops/s     Ops/s  Ops/s   Ops   Kib/s  Kib/s  Kib/s  uSecs/call
09:46:49   id=10.103.11.105_20107  28  0   28   0   1627  0   1627   33106
            id=10.103.11.105_20363  27  0   27   0   1533  0   1533   27774
            id=10.103.11.105_18571  26  0   26   0   1470  0   1470   29917
```
The server Commands

EXAMPLE #28  To display nfs.client information with an IP resolution, type:

```
$ server_stats server_2 -monitor nfs.client -te no -c 2
```

<table>
<thead>
<tr>
<th>server_2</th>
<th>Client</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Total Ops/s</td>
<td>Read</td>
<td>Write</td>
<td>Suspicious Ops/s</td>
<td>Total KiB/s</td>
<td>Read KiB/s</td>
<td>Write KiB/s</td>
</tr>
<tr>
<td>09:48:09</td>
<td>id=10.103.11.106</td>
<td>83</td>
<td>0</td>
<td>83</td>
<td>0</td>
<td>42604</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=10.103.11.104</td>
<td>70</td>
<td>0</td>
<td>66</td>
<td>0</td>
<td>28448</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=10.103.11.105</td>
<td>52</td>
<td>0</td>
<td>52</td>
<td>0</td>
<td>26659</td>
<td>0</td>
</tr>
<tr>
<td>09:48:11</td>
<td>p25.perf1.com</td>
<td>97</td>
<td>0</td>
<td>97</td>
<td>0</td>
<td>49868</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p23.perf1.com</td>
<td>87</td>
<td>0</td>
<td>82</td>
<td>0</td>
<td>35815</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p24.perf1.com</td>
<td>61</td>
<td>0</td>
<td>57</td>
<td>0</td>
<td>29242</td>
<td>0</td>
</tr>
<tr>
<td>09:48:13</td>
<td>p25.perf1.com</td>
<td>116</td>
<td>0</td>
<td>116</td>
<td>0</td>
<td>59576</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p23.perf1.com</td>
<td>99</td>
<td>0</td>
<td>91</td>
<td>0</td>
<td>38273</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p24.perf1.com</td>
<td>51</td>
<td>0</td>
<td>51</td>
<td>0</td>
<td>26224</td>
<td>0</td>
</tr>
<tr>
<td>09:48:15</td>
<td>p25.perf1.com</td>
<td>85</td>
<td>0</td>
<td>85</td>
<td>0</td>
<td>43591</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p23.perf1.com</td>
<td>70</td>
<td>0</td>
<td>62</td>
<td>0</td>
<td>27396</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>p24.perf1.com</td>
<td>45</td>
<td>0</td>
<td>45</td>
<td>0</td>
<td>23214</td>
<td>0</td>
</tr>
</tbody>
</table>

EXAMPLE #29  To monitor cifs.user information, type:

```
$ server_stats server_2 -i 1 -m cifs.user
```

<table>
<thead>
<tr>
<th>server_2 User name</th>
<th>CIFS Ops/s</th>
<th>CIFS Read Op/s</th>
<th>CIFS Write Op/s</th>
<th>Suspicious CIFS Ops/s</th>
<th>CIFS CIFS KiB/s</th>
<th>CIFS CIFS KiB/s</th>
<th>CIFS CIFS KiB/s</th>
<th>Avg Server Client uSecs/call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>Total Ops</td>
<td>Read Op/s</td>
<td>Write Op/s</td>
<td>Suspicious CIFS Ops</td>
<td>Total KiB/s</td>
<td>Read KiB/s</td>
<td>Write KiB/s</td>
<td>Name</td>
</tr>
<tr>
<td>14:38:52 TESTDOMAIN\admin</td>
<td>1 1 0 0 0 0 0</td>
<td>135 PITTA-DM2-0</td>
<td>P27</td>
<td>14:38:57 TESTDOMAIN\admin</td>
<td>11 0 0 1 1 0 2257</td>
<td>257 PITTA-DM2-0</td>
<td>P27</td>
<td>14:39:02 TESTDOMAIN\admin</td>
</tr>
</tbody>
</table>
### Example #30
To monitor NFS User information, type:

```
$ server_stats server_2 -i 5 -m nfs.user
```

### Example #31
To view Correlated Statistics information for File system, type:

```
$ server_stats server_2 -c 2 -i 2 -m fs.filesystem
```
### The server Commands

<table>
<thead>
<tr>
<th>id</th>
<th>size</th>
<th>used</th>
<th>available</th>
<th>total</th>
<th>inodes</th>
<th>used_inodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>id=36:6701</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>62777</td>
<td>0</td>
<td>62777</td>
</tr>
<tr>
<td>id=36:8118</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>30374</td>
<td>0</td>
<td>30374</td>
</tr>
<tr>
<td>id=36:6054</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>31020</td>
<td>0</td>
<td>31020</td>
</tr>
<tr>
<td>ufs_4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>id=40:173</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2184</td>
<td>0</td>
<td>2184</td>
</tr>
<tr>
<td>id=40:156</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1722</td>
<td>0</td>
<td>1722</td>
</tr>
<tr>
<td>id=40:178</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1980</td>
<td>0</td>
<td>1980</td>
</tr>
<tr>
<td>id=40:144</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2167</td>
<td>0</td>
<td>2167</td>
</tr>
<tr>
<td>id=40:166</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2236</td>
<td>0</td>
<td>2236</td>
</tr>
<tr>
<td>ufs_5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_5/dir00005/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>raN_0000053252.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2199</td>
<td>0</td>
<td>2199</td>
</tr>
<tr>
<td>/server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_5/dir00005/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>jZE_0000057348.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2416</td>
<td>0</td>
<td>2416</td>
</tr>
<tr>
<td>/server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_5/dir00005/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gCw_0000008196.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2426</td>
<td>0</td>
<td>2426</td>
</tr>
<tr>
<td>/server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_5/dir00005/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNj_0000002052.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2654</td>
<td>0</td>
<td>2654</td>
</tr>
<tr>
<td>/server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_5/dir00005/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cdd_0000012292.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2454</td>
<td>0</td>
<td>2454</td>
</tr>
<tr>
<td>ufs_3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>id=39:169</td>
<td>2304</td>
<td>0</td>
<td>2304</td>
<td>34</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td>id=39:184</td>
<td>2304</td>
<td>0</td>
<td>2304</td>
<td>35</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>id=39:176</td>
<td>2304</td>
<td>0</td>
<td>2304</td>
<td>37</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>id=39:188</td>
<td>2304</td>
<td>0</td>
<td>2304</td>
<td>32</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>id=39:172</td>
<td>2048</td>
<td>0</td>
<td>2048</td>
<td>31</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>id=39:189</td>
<td>2048</td>
<td>0</td>
<td>2048</td>
<td>33</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>02:54:51 ufs_2</td>
<td>id=38:7238</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>27145</td>
<td>0</td>
</tr>
</tbody>
</table>

id=38:5616 512 0 512 201 0 201
id=38:6468 512 0 512 81317 0 81317
id=38:6913 512 0 512 78302 0 78302
id=38:6441 512 0 512 76825 0 76825

ufs_0 id=36:6565 512 0 512 4537 0 4537
id=36:6937 512 0 512 72659 0 72659
id=36:7716 512 0 512 11224 0 11224
id=36:7138 512 0 512 85855 0 85855
id=36:6233 512 0 512 68502 0 68502

ufs_4 id=40:173 2560 0 2560 3216 0 3216
id=40:185 2560 0 2560 3349 0 3349
### The server Commands

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>File</th>
<th>Total</th>
<th>Read</th>
<th>Written</th>
<th>Average</th>
<th>Read uSecs/Call</th>
<th>Write uSecs/Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs_1</td>
<td>id=37:9952</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>30769</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=37:10818</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>16503</td>
<td>0</td>
<td>16503</td>
</tr>
<tr>
<td></td>
<td>id=37:10053</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>13284</td>
<td>0</td>
<td>13284</td>
</tr>
<tr>
<td></td>
<td>id=37:10658</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>35439</td>
<td>0</td>
<td>35439</td>
</tr>
<tr>
<td></td>
<td>id=37:10676</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>10284</td>
<td>0</td>
<td>10284</td>
</tr>
<tr>
<td>ufs_5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/server_2/</td>
<td>ufs_5/dir00005/</td>
<td>testdir/</td>
<td>raN_0000053252.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>3299</td>
</tr>
<tr>
<td></td>
<td>/server_2/</td>
<td>ufs_5/dir00005/</td>
<td>testdir/</td>
<td>JeD_0000020484.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
</tr>
<tr>
<td></td>
<td>/server_2/</td>
<td>ufs_5/dir00005/</td>
<td>testdir/</td>
<td>jZE_0000057348.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
</tr>
<tr>
<td></td>
<td>/server_2/</td>
<td>ufs_5/dir00005/</td>
<td>testdir/</td>
<td>gCw_0000008196.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
</tr>
<tr>
<td>ufs_3</td>
<td>id=39:169</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>34</td>
<td>0</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>id=39:140</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>33</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>id=39:181</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>31</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>id=39:184</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>26</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>id=39:167</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>29</td>
<td>0</td>
<td>29</td>
</tr>
</tbody>
</table>

### Summary

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>File</th>
<th>Total</th>
<th>Read</th>
<th>Written</th>
<th>Average</th>
<th>Read uSecs/Call</th>
<th>Write uSecs/Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs_2</td>
<td>id=38:5616</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>201</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=38:5787</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>26397</td>
<td>0</td>
<td>26397</td>
</tr>
<tr>
<td></td>
<td>id=38:5939</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>73921</td>
<td>0</td>
<td>73921</td>
</tr>
<tr>
<td></td>
<td>id=38:6099</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>33244</td>
<td>0</td>
<td>33244</td>
</tr>
<tr>
<td></td>
<td>id=38:6136</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>17293</td>
<td>0</td>
<td>17293</td>
</tr>
<tr>
<td>ufs_1.op</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_0</td>
<td>id=36:5924</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>11537</td>
<td>0</td>
<td>11537</td>
</tr>
<tr>
<td></td>
<td>id=36:6054</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>31020</td>
<td>0</td>
<td>31020</td>
</tr>
<tr>
<td></td>
<td>id=36:6062</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>8021</td>
<td>0</td>
<td>8021</td>
</tr>
<tr>
<td></td>
<td>id=36:6140</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>93666</td>
<td>0</td>
<td>93666</td>
</tr>
<tr>
<td></td>
<td>id=36:6214</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>47252</td>
<td>0</td>
<td>47252</td>
</tr>
<tr>
<td></td>
<td>id=36:6233</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>68502</td>
<td>0</td>
<td>68502</td>
</tr>
<tr>
<td>ufs_4</td>
<td>id=40:129</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2416</td>
<td>0</td>
<td>2416</td>
</tr>
<tr>
<td></td>
<td>id=40:139</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2079</td>
<td>0</td>
<td>2079</td>
</tr>
<tr>
<td></td>
<td>id=40:144</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2167</td>
<td>0</td>
<td>2167</td>
</tr>
</tbody>
</table>
### The server Commands

| id=40:145 | 2560 | 0 | 2560 | 2507 | 0 | 2507 |
| id=40:156 | 2560 | 0 | 2560 | 1722 | 0 | 1722 |
| ufs_1 | id=37:10053 | 512 | 0 | 512 | 13284 | 0 |
| 13284 |
| id=37:10210 | 512 | 0 | 512 | 24623 | 0 | 24623 |
| id=37:10228 | 512 | 0 | 512 | 11273 | 0 | 11273 |
| id=37:10385 | 512 | 0 | 512 | 36637 | 0 | 36637 |
| id=37:10396 | 512 | 0 | 512 | 23479 | 0 | 23479 |

**ufs_5**

- /server_2/ufs_5/
- dir00005/testdir/
- D2K_0000014340.tmp: 2560 | 0 | 2560 | 2457 | 0 | 2457
- /server_2/
- ufs_5/dir00005/
- testdir/
- HNi_0000018436.tmp: 2560 | 0 | 2560 | 2727 | 0 | 2727

**ufs_3**

- id=39:140: 2560 | 0 | 2560 | 33 | 0 | 33
- id=39:143: 2560 | 0 | 2560 | 32 | 0 | 32
- id=39:146: 2560 | 0 | 2560 | 31 | 0 | 31
- id=39:177: 2560 | 0 | 2560 | 29 | 0 | 29
- id=39:169: 2304 | 0 | 2304 | 34 | 0 | 34

**root_fs_common**
- **root_fs_2**

**Average ufs_2**

- id=38:5616: 512 | 0 | 512 | 201 | 0 | 201
- id=38:5787: 512 | 0 | 512 | 26397 | 0 | 26397
- id=38:5939: 512 | 0 | 512 | 73921 | 0 | 73921
- id=38:6099: 512 | 0 | 512 | 33244 | 0 | 33244
- id=38:6136: 512 | 0 | 512 | 17293 | 0 | 17293

**ufs_1.op**

- ufs_0: id=36:5924: 512 | 0 | 512 | 11537 | 0 | 11537
- id=36:6054: 512 | 0 | 512 | 31020 | 0 | 31020
- id=36:6062: 512 | 0 | 512 | 8021 | 0 | 8021
- id=36:6140: 512 | 0 | 512 | 93666 | 0 | 93666
- id=36:6214: 512 | 0 | 512 | 47252 | 0 | 47252

**ufs_4**

- id=40:129: 2560 | 0 | 2560 | 2416 | 0 | 2416
- id=40:139: 2560 | 0 | 2560 | 2558 | 0 | 2558
- id=40:144: 2560 | 0 | 2560 | 2167 | 0 | 2167
- id=40:145: 2560 | 0 | 2560 | 2507 | 0 | 2507
- id=40:156: 2560 | 0 | 2560 | 2495 | 0 | 2495

**ufs_1**

- id=37:10053: 512 | 0 | 512 | 13284 | 0 | 13284
- id=37:10210: 512 | 0 | 512 | 24623 | 0 | 24623
- id=37:10228: 512 | 0 | 512 | 11273 | 0 | 11273
- id=37:10385: 512 | 0 | 512 | 36637 | 0 | 36637
- id=37:10396: 512 | 0 | 512 | 23479 | 0 | 23479

**ufs_5**

- /server_2/
- ufs_5/dir00005/
- testdir/
- D2K_0000014340.tmp: 2560 | 0 | 2560 | 2880 | 0 | 2880
- /server_2/
- ufs_5/dir00005/
- testdir/
<table>
<thead>
<tr>
<th>Path</th>
<th>Size (1GB)</th>
<th>Used (1GB)</th>
<th>Free (1GB)</th>
<th>Total (1GB)</th>
<th>Inode (1GB)</th>
<th>Free Inode (1GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNi_0000018436.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2824</td>
<td>0</td>
<td>2824</td>
</tr>
<tr>
<td>ufs_3 id=39:140</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>33</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>id=39:143</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:146</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:177</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:169</td>
<td>2432</td>
<td>0</td>
<td>2432</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>root_fs_common</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>root_fs_2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum ufs_2 id=38:5616</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>201</td>
<td>0</td>
<td>201</td>
</tr>
<tr>
<td>id=38:5787</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>26397</td>
<td>0</td>
<td>26397</td>
</tr>
<tr>
<td>id=38:5939</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>73921</td>
<td>0</td>
<td>73921</td>
</tr>
<tr>
<td>id=38:6099</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>33244</td>
<td>0</td>
<td>33244</td>
</tr>
<tr>
<td>id=38:6136</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>17293</td>
<td>0</td>
<td>17293</td>
</tr>
<tr>
<td>ufs_1.op</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ufs_0 id=36:5924</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>11537</td>
<td>0</td>
<td>11537</td>
</tr>
<tr>
<td></td>
<td>id=36:6054</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>31020</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=36:6062</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>8021</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=36:6140</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>93666</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=36:6214</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>47252</td>
<td>0</td>
</tr>
<tr>
<td>ufs_4 id=40:129</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2416</td>
<td>0</td>
<td>2416</td>
</tr>
<tr>
<td>id=40:135</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2656</td>
<td>0</td>
<td>2656</td>
</tr>
<tr>
<td>id=40:139</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>3037</td>
<td>0</td>
<td>3037</td>
</tr>
<tr>
<td>id=40:143</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2896</td>
<td>0</td>
<td>2896</td>
</tr>
<tr>
<td>id=40:144</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>2167</td>
<td>0</td>
<td>2167</td>
</tr>
<tr>
<td>ufs_1                   id=37:10053</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>13284</td>
<td>0</td>
<td>13284</td>
</tr>
<tr>
<td></td>
<td>id=37:10210</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>24623</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=37:10228</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>11273</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=37:10385</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>36637</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=37:10396</td>
<td>512</td>
<td>0</td>
<td>512</td>
<td>23479</td>
<td>0</td>
</tr>
<tr>
<td>ufs_5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/server_2/ufs_5/ dir00005/testdir/ D2K_0000014340.tmp 2560</td>
<td>0</td>
<td>2560</td>
<td>3302</td>
<td>0</td>
<td>3302</td>
<td></td>
</tr>
<tr>
<td>/server_2/ufs_5/ dir00005/testdir/ HNi_0000018436.tmp 2560</td>
<td>0</td>
<td>2560</td>
<td>2920</td>
<td>0</td>
<td>2920</td>
<td></td>
</tr>
<tr>
<td>ufs_3 id=39:140</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>33</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>id=39:143</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:146</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:161</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>id=39:167</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>root_fs_common</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>root_fs_2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** In order to have proper resolution, perform the following steps: 1. start the service (server_fileresolve movername -service -start) 2. Register file system (server_fileresolve movername -add /filesystem_mount_path). If,
however, the service is running, but the file system is not registered with it, one can resolve the filename manually: server_fileresolve movername -lookup -filesystem ufs_2 -inode 38

**EXAMPLE #32**
To monitor store.volume information, type:

```bash
$ server_stats server_2 -i 1 -m store.volume
```

<table>
<thead>
<tr>
<th>09:30:06</th>
<th>NBS1</th>
<th>id=0</th>
<th>71762</th>
<th>71762</th>
<th>35881</th>
<th>35881</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>root_fs_2</td>
<td>16</td>
<td>16</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d16</td>
<td>126</td>
<td>1087</td>
<td>1024</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d9</td>
<td>126</td>
<td>181</td>
<td>118</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ufs_4</td>
<td>47</td>
<td>24</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d10</td>
<td>63</td>
<td>213</td>
<td>181</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d18</td>
<td>79</td>
<td>1417</td>
<td>1378</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d11</td>
<td>63</td>
<td>220</td>
<td>189</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d19</td>
<td>126</td>
<td>732</td>
<td>669</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d12</td>
<td>110</td>
<td>126</td>
<td>71</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ufs_5</td>
<td>31</td>
<td>16</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d20</td>
<td>63</td>
<td>780</td>
<td>717</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d13</td>
<td>94</td>
<td>126</td>
<td>79</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ufs_3</td>
<td>47</td>
<td>24</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d21</td>
<td>94</td>
<td>961</td>
<td>913</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d14</td>
<td>126</td>
<td>386</td>
<td>323</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d22</td>
<td>63</td>
<td>1039</td>
<td>1008</td>
<td>31</td>
</tr>
</tbody>
</table>

**EXAMPLE #33**
To monitor NFS statistics information, type:

```bash
$ server_stats server_2 -i 1 -m nfs.client -noresolve
```

<table>
<thead>
<tr>
<th>timestamp</th>
<th>Client</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
<th>NFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:31:41</td>
<td>id=10.103.11.106</td>
<td>81</td>
<td>0</td>
<td>81</td>
<td>0</td>
<td>41307</td>
<td>0</td>
</tr>
<tr>
<td>09:31:42</td>
<td>id=10.103.11.106</td>
<td>79</td>
<td>0</td>
<td>79</td>
<td>0</td>
<td>40564</td>
<td>0</td>
</tr>
<tr>
<td>09:31:43</td>
<td>id=10.103.11.106</td>
<td>87</td>
<td>0</td>
<td>87</td>
<td>0</td>
<td>44384</td>
<td>0</td>
</tr>
<tr>
<td>09:31:44</td>
<td>id=10.103.11.106</td>
<td>58</td>
<td>0</td>
<td>58</td>
<td>0</td>
<td>29589</td>
<td>0</td>
</tr>
</tbody>
</table>
EXAMPLE #34

To display NFS statistics correlated by file system and NFS operation attributes, type:

```
$ server_stats server_2 -i 1 -m nfs.filesystem
```

<table>
<thead>
<tr>
<th>server_2</th>
<th>Filesystem</th>
<th>Client</th>
<th>NFS Op</th>
<th>NFS Op</th>
<th>NFS Op</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timestamp</td>
<td>ufs_5</td>
<td>id=10.103.11.18</td>
<td>v3Write</td>
<td>522</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>118.perf1.com</td>
<td>v3Lookup</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Write</td>
<td>1810</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Read</td>
<td>49</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Lookup</td>
<td>10</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Write</td>
<td>1311</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Read</td>
<td>47</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>117.perf1.com</td>
<td>v3Lookup</td>
<td>10</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>118.perf1.com</td>
<td>v3Write</td>
<td>7026</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>118.perf1.com</td>
<td>v3Read</td>
<td>52</td>
<td>248</td>
</tr>
<tr>
<td></td>
<td>ufs_5</td>
<td>117.perf1.com</td>
<td>v3Write</td>
<td>6347</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>ufs_3</td>
<td>id=10.103.11.16</td>
<td>v3Write</td>
<td>297</td>
<td>122</td>
</tr>
</tbody>
</table>
### The server Commands

<table>
<thead>
<tr>
<th>Time</th>
<th>Server</th>
<th>Client</th>
<th>Operation</th>
<th>Avg uSecs/Call</th>
<th>Calls/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:50:47</td>
<td>ufs_5</td>
<td>l18.perf1.com</td>
<td>v3Write</td>
<td>91</td>
<td>390</td>
</tr>
<tr>
<td></td>
<td>ufs_4</td>
<td>l17.perf1.com</td>
<td>v3Write</td>
<td>6701</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>v3Read</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>ufs_3</td>
<td>l16.perf1.com</td>
<td>v3Write</td>
<td>129</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>v3Read</td>
<td>123</td>
<td>38</td>
</tr>
</tbody>
</table>

### Summary

<table>
<thead>
<tr>
<th>Operation</th>
<th>Avg uSecs/Call</th>
<th>Calls/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>v3Read</td>
<td>522</td>
<td>1</td>
</tr>
<tr>
<td>v3Write</td>
<td>49</td>
<td>133</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>v3Write</td>
<td>1311</td>
<td>18</td>
</tr>
<tr>
<td>v3Read</td>
<td>47</td>
<td>39</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>10</td>
<td>220</td>
</tr>
<tr>
<td>v3Write</td>
<td>129</td>
<td>122</td>
</tr>
<tr>
<td>v3Read</td>
<td>91</td>
<td>38</td>
</tr>
<tr>
<td>v3Write</td>
<td>4015</td>
<td>79</td>
</tr>
<tr>
<td>v3Read</td>
<td>50</td>
<td>190</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>12</td>
<td>95</td>
</tr>
<tr>
<td>v3Write</td>
<td>4137</td>
<td>102</td>
</tr>
<tr>
<td>v3Read</td>
<td>72</td>
<td>170</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>10</td>
<td>220</td>
</tr>
<tr>
<td>v3Write</td>
<td>213</td>
<td>141</td>
</tr>
<tr>
<td>v3Read</td>
<td>107</td>
<td>214</td>
</tr>
<tr>
<td>v3Write</td>
<td>7026</td>
<td>161</td>
</tr>
<tr>
<td>v3Read</td>
<td>52</td>
<td>248</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>13</td>
<td>180</td>
</tr>
<tr>
<td>v3Write</td>
<td>6347</td>
<td>159</td>
</tr>
<tr>
<td>v3Read</td>
<td>121</td>
<td>354</td>
</tr>
<tr>
<td>v3Lookup</td>
<td>10</td>
<td>220</td>
</tr>
<tr>
<td>v3Write</td>
<td>297</td>
<td>160</td>
</tr>
<tr>
<td>v3Read</td>
<td>123</td>
<td>390</td>
</tr>
</tbody>
</table>
**EXAMPLE #35** To display a summary of NFS file system statistics correlated by single file system, type:

```
$ server_stats server_2 -m nfs.filesystem.ufs_4
```

| server_2   | Filesystem | Client      | NFS Op | NFS Op | NFS
|------------|------------|-------------|--------|--------|-----
|            |            |             | Avg uSecs/Call | Calls/s |
| Timestamp  |            |             |       |        |     |
| 02:46:00   | ufs_4      | 123.perf1.com | v3Write | 2569 | 132 |
| 02:46:15   | ufs_4      | 123.perf1.com | v3Write | 3313 | 132 |

**server_2** Filesystem| Client | NFS Op | NFS Op | NFS
|----------------------|--------|--------|--------|-----
| Summary              | Avg uSecs/Call | Calls/s |
| Minimum              | ufs_4 | 123.perf1.com | v3Write | 2569 | 132 |
| Average              | ufs_4 | 123.perf1.com | v3Write | 2941 | 132 |
| Maximum              | ufs_4 | 123.perf1.com | v3Write | 3313 | 132 |

**EXAMPLE #36** To display a summary of NFS file system statistics correlated by a specific file system and specific client, type:

```
$ server_stats server_2 -i 2 -m nfs.filesystem.ufs_4.client.10.103.11.23
```

| server_2   | Filesystem | Client      | NFS Op | NFS Op | NFS
|------------|------------|-------------|--------|--------|-----
|            |            |             | Avg uSecs/Call | Calls/s |
| Timestamp  |            |             |       |        |     |
| 02:41:36   | ufs_4      | 123.perf1.com | v3Write | 2083 | 120 |
| 02:41:38   | ufs_4      | 123.perf1.com | v3Write | 4318 | 132 |
| 02:41:40   | ufs_4      | 123.perf1.com | v3Write | 2660 | 116 |

**server_2** Filesystem| Client | NFS Op | NFS Op | NFS
|----------------------|--------|--------|--------|-----
| Summary              | Avg uSecs/Call | Calls/s |
| Minimum              | ufs_4 | 123.perf1.com | v3Write | 2083 | 120 |
| Average              | ufs_4 | 123.perf1.com | v3Write | 3020 | 116 |
| Maximum              | ufs_4 | 123.perf1.com | v3Write | 4318 | 132 |

**EXAMPLE #37** To display a summary of NFS file system statistics for a specific client and operation, type:

```
$ server_stats server_2 -i 2 -m nfs.filesystem.ufs_4.client.10.103.11.23.op.v3Write
```

| server_2   | Filesystem | Client      | NFS Op | NFS Op | NFS
|------------|------------|-------------|--------|--------|-----
|            |            |             | Avg uSecs/Call | Calls/s |
| Timestamp  |            |             |       |        |     |

server_stats

787
### The server Commands

<table>
<thead>
<tr>
<th>Time</th>
<th>Command</th>
<th>Client</th>
<th>Operation</th>
<th>uSecs/Call</th>
<th>Calls/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:42:39</td>
<td>ufs_4</td>
<td>123.perf1.com</td>
<td>v3Write</td>
<td>2335</td>
<td>123</td>
</tr>
<tr>
<td>02:42:41</td>
<td>ufs_4</td>
<td>123.perf1.com</td>
<td>v3Write</td>
<td>4836</td>
<td>134</td>
</tr>
<tr>
<td>02:42:43</td>
<td>ufs_4</td>
<td>123.perf1.com</td>
<td>v3Write</td>
<td>5093</td>
<td>142</td>
</tr>
<tr>
<td>02:42:45</td>
<td>ufs_4</td>
<td>123.perf1.com</td>
<td>v3Write</td>
<td>2129</td>
<td>142</td>
</tr>
</tbody>
</table>

#### server_2 Summary

<table>
<thead>
<tr>
<th>Minimum</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufs_4</td>
<td>123.perf1.com</td>
<td>v3Write</td>
</tr>
<tr>
<td>uSecs/Call</td>
<td>Calls/s</td>
<td></td>
</tr>
<tr>
<td>2129</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td>3598</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>5093</td>
<td>142</td>
<td></td>
</tr>
</tbody>
</table>

#### EXAMPLE #38

To monitor the BranchCache information while a SMB2 BranchCache client is reading a tree, type:

```
$ server_stats server_3 -i 3 -m cifs.branchcache.basic
```

#### server_stats server_3 -i 3 -m cifs.branchcache.usage

<table>
<thead>
<tr>
<th>Time</th>
<th>Files B</th>
<th>Files kB</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:16:39</td>
<td>24934</td>
<td>90</td>
<td>1268</td>
</tr>
<tr>
<td>18:16:42</td>
<td>24934</td>
<td>90</td>
<td>1268</td>
</tr>
<tr>
<td>18:16:45</td>
<td>24934</td>
<td>90</td>
<td>1268</td>
</tr>
</tbody>
</table>

#### EXAMPLE #39

To monitor NFS group statistics, type:

```
$ server_stats server_2 -m nfs.group
```
### The server Commands

#### server_stats

**server_stats**

- **id=0**
  - **Total Ops/s**: 264
  - **Read Ops/s**: 0
  - **Write Ops/s**: 213
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 108919
  - **Read KiB/s**: 0
  - **Write KiB/s**: 108919
  - **uSec/call**: 1683

- **id=0**
  - **Total Ops/s**: 416
  - **Read Ops/s**: 0
  - **Write Ops/s**: 416
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 212821
  - **Read KiB/s**: 0
  - **Write KiB/s**: 212821
  - **uSec/call**: 2184

- **id=0**
  - **Total Ops/s**: 432
  - **Read Ops/s**: 0
  - **Write Ops/s**: 432
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 221252
  - **Read KiB/s**: 0
  - **Write KiB/s**: 221252
  - **uSec/call**: 5206

---

#### server_2 NFS Group NFS

**Summary**

- **Total Ops/s**: 264
  - **Read Ops/s**: 0
  - **Write Ops/s**: 213
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 108919
  - **Read KiB/s**: 0
  - **Write KiB/s**: 108919
  - **uSec/call**: 1683

---

#### server_2 NFS Export

**Timestamp**

- **Total Ops/s**: 157
  - **Read Ops/s**: 0
  - **Write Ops/s**: 157
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 80213
  - **Read KiB/s**: 0
  - **Write KiB/s**: 80213
  - **uSec/call**: 3454

---

#### server_2 CIFS server

**Timestamp**

- **Total Ops/s**: 139
  - **Read Ops/s**: 0
  - **Write Ops/s**: 139
  - **Suspicious Ops/s**: 0
  - **Total KiB/s**: 71305
  - **Read KiB/s**: 0
  - **Write KiB/s**: 71305
  - **uSec/call**: 4863

---

### EXAMPLE # 40

To monitor NFS export statistics, type:

```bash
$ server_stats server_2 -m nfs.export
```

---

### EXAMPLE # 41

To monitor CIFS server statistics, type:

```bash
$ server_stats server_2 -m cifs.server
```
# The server Commands

<table>
<thead>
<tr>
<th>Time</th>
<th>Server Name</th>
<th>Ops</th>
<th>call</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:50:29</td>
<td>RAVEN-DM2-2</td>
<td>2176</td>
<td>135</td>
</tr>
<tr>
<td>14:38:57</td>
<td>TESTDOMAIN\admin</td>
<td>11</td>
<td>2257</td>
</tr>
<tr>
<td>14:39:02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:39:07</td>
<td>TESTDOMAIN\admin</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>14:39:22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**server_2**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EXAMPLE #42**

To monitor FS qtreefile statistics, type:

```
$ server_stats server_2 -i 1 -c 2 -m fs.qtreefile
```

<table>
<thead>
<tr>
<th>Time</th>
<th>Server Name</th>
<th>Quota Tree File</th>
<th>File</th>
<th>Total KiB/s</th>
<th>Read KiB/s</th>
<th>Written KiB/s</th>
<th>Average uSecs/call</th>
<th>Write Average uSecs/call</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
testdir/iv9_0000055303.tmp 2560 0 2560 1982 0 1982
/server_2/
ufsf_5/dirdir00005/
testdir/KRc_0000008199/tmp 2560 0 2560 2019 0 2019
ufs_3:/dirdir00003 id=39:243 2560 0 2560 26 0 26
id=39:248 2560 0 2560 29 0 29
server_2 Quota Tree File File Total Read Written Average Read Write Summary KiB/s KiB/s KiB/s uSecs/call Average Average uSecs/call uSecs/call Minimum ufs_2:/dirdir00002 id=38:10063 1024 0 1024 32177 0 32177
id=38:10066 1024 0 1024 18897 0 18897
ufs_2:/dirdir00008
ufs_2:/dirdir00014
ufs_2:/dirdir00020
ufs_2:/dirdir00026
ufs_0:/dirdir00000 id=36:10151 1024 0 1024 42949 0 42949
id=36:10155 1024 0 1024 60618 0 60618
ufs_0:/dirdir00006
ufs_0:/dirdir00012
ufs_0:/dirdir00018
ufs_4:/dirdir00004 id=40:183 2560 0 2560 3332 0 3332
id=40:194 2560 0 2560 1488 0 1488
ufs_4:/dirdir00010
ufs_4:/dirdir00016
ufs_4:/dirdir00022
ufs_4:/dirdir00028
ufs_1:/dirdir00001 id=37:15343 1024 0 1024 533 0 533
id=37:16235 1024 0 1024 2197 0 2197
ufs_1:/dirdir00007
ufs_1:/dirdir00013
ufs_1:/dirdir00019
ufs_1:/dirdir00025
ufs_5:/dirdir00005 /server_2/
ufsf_5/dirdir00005/
testdir/72n_00000028679tmp 2560 0 2560 1580 0 1580
/server_2/
ufsf_5/dirdir00005/
testdir/74u_00000022535.tmp 2560 0 2560 1547 0 1547
ufs_5:/dirdir00011
ufs_5:/dirdir00017
ufs_5:/dirdir00023
ufs_5:/dirdir00029
ufs_3:/dirdir00003 id=39:165 2560 0 2560 32 0 32
id=39:174 2560 0 2560 29 0 29
ufs_3:/dirdir00009
ufs_3:/dirdir00015
ufs_3:/dirdir00021
ufs_3:/dirdir00027
Average ufs_2:/dirdir00002 id=38:10063 1024 0 1024 32177 0 32177
id=38:10066 1024 0 1024 18897 0 18897
### The server Commands

<table>
<thead>
<tr>
<th>Directory Path</th>
<th>Inode</th>
<th>Size</th>
<th>Used</th>
<th>Blocks</th>
<th>Available</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/ufs_2/dir00008</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00014</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00020</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00026</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00000</code> id=36:10151</td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>42949</td>
<td>0</td>
<td>42949</td>
</tr>
<tr>
<td></td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>60618</td>
<td>0</td>
<td>60618</td>
</tr>
<tr>
<td><code>/ufs_0/dir00006</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00012</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00018</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00024</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_4/dir00004</code> id=40:183</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>3332</td>
<td>0</td>
<td>3332</td>
</tr>
<tr>
<td></td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1488</td>
<td>0</td>
<td>1488</td>
</tr>
<tr>
<td><code>/ufs_4/dir00010</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_4/dir00016</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_4/dir00022</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_4/dir00028</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_1/dir00001</code> id=37:15343</td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>533</td>
<td>0</td>
<td>533</td>
</tr>
<tr>
<td></td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>2197</td>
<td>0</td>
<td>2197</td>
</tr>
<tr>
<td><code>/ufs_1/dir00007</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_1/dir00013</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_1/dir00019</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_1/dir00025</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_5/dir00005</code> /server_2/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_5/dir00005/</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/72n_0000028679.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1724</td>
<td>0</td>
<td>1724</td>
</tr>
<tr>
<td><code>/ufs_5/dir00005/</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>testdir/74u_0000022535.tmp</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1756</td>
<td>0</td>
<td>1756</td>
</tr>
<tr>
<td><code>/ufs_5/dir00011</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_5/dir00017</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_5/dir00023</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_5/dir00029</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_3/dir00003</code> id=39:165</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>32</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>29</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td><code>/ufs_3/dir00009</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_3/dir00015</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_3/dir00021</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_3/dir00027</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00002</code> id=38:10063</td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>32177</td>
<td>0</td>
<td>32177</td>
</tr>
<tr>
<td></td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>18897</td>
<td>0</td>
<td>18897</td>
</tr>
<tr>
<td><code>/ufs_2/dir00008</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00014</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00020</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_2/dir00026</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00000</code> id=36:10151</td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>42949</td>
<td>0</td>
<td>42949</td>
</tr>
<tr>
<td></td>
<td>1024</td>
<td>0</td>
<td>1024</td>
<td>60618</td>
<td>0</td>
<td>60618</td>
</tr>
<tr>
<td><code>/ufs_0/dir00006</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00012</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00018</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_0/dir00024</code></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>/ufs_4/dir00004</code> id=40:183</td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>3332</td>
<td>0</td>
<td>3332</td>
</tr>
<tr>
<td></td>
<td>2560</td>
<td>0</td>
<td>2560</td>
<td>1969</td>
<td>0</td>
<td>1969</td>
</tr>
</tbody>
</table>
ufs_4:/dir00010
ufs_4:/dir00016
ufs_4:/dir00022
ufs_4:/dir00028
  ufs_1:/dir00001 id=37:15343  1024   0 1024   533        0         533
        id=37:16235   1024   0 1024  2197      0        2197
ufs_1:/dir00007
ufs_1:/dir00013
ufs_1:/dir00019
ufs_1:/dir00025
ufs_5:/dir00005 /server_2/
  ufs_5/dir00005/
        testdir/72n_0000028679.tmp 2560 0 2560 1867 0        1867
/server_2/
  ufs_5/dir00005/
        testdir/74u_0000022535.tmp 2560 0 2560 1964 0        1964
ufs_5:/dir00011
ufs_5:/dir00017
ufs_5:/dir00023
ufs_5:/dir00029
ufs_3:/dir00003 id=39:165 2560        0     2560          32 0          32
        id=39:168 2560       0  2560    29 0          29

EXAMPE # 43  To monitor NFS VDM client statistics, type:

$ server_stats server_3 -i 1 -m nfs.vdm.*.client -c 5 -te
server_2  VDM name Client NFS   NFS   NFS   NFS   NFS   NFS   NFS   NFS
Timestamp                 Total   Read Write Suspicious Total   Read Write Avg
Ops/s Ops/s Ops/s  Ops KiB/s KiB/s KiB/s uSecs/call
10:42:43  vdm_1 id=10.103.11.13  2      0   0   1   0     0     0     18857
        vdm_2 id=10.103.11.14  7      0   1   0   0     0     0     16378
10:42:44  vdm_1 id=10.103.11.13  2      0   0   1   0     0     0     7882
        vdm_2 id=10.103.11.14  8      0   1   0   0     0     0     11784
10:42:45  vdm_1 113.perf1.com    2      0   0   1   0     0     0     9762
        vdm_2 114.perf1.com    7      0   1   0   0     0     0     19813
10:42:46  vdm_1 113.perf1.com    2      0   0   1   0     0     0     69773
        vdm_2 114.perf1.com    7      0   1   0   0     0     0     8257
10:42:47  vdm_1 113.perf1.com    2      0   0   1   0     0     0     10473
        vdm_2 114.perf1.com    8      0   1   0   0     0     0     1835

EXAMPE # 44  To monitor NFS VDM user statistics, type:

$ server_stats server_3 -i 1 -m nfs.vdm.*.user -c 5 -te
server_2  VDM name NFS   NFS   NFS   NFS   NFS   NFS   NFS   NFS
Timestamp   User Total   Read Write Suspicious Total   Read Write Avg
Ops/s Ops/s Ops/s  Ops KiB/s KiB/s KiB/s uSecs/call
10:43:20  vdm_1   id=0   2    0      0      1     0    0    0     18791
The server Commands

```plaintext
EXAMPLE # 45  To monitor NFS VDM group statistics, type:

```
$ server_stats server_3 -i 1 -m nfs.vdm.*.group -c 5 -te
```

```
server_2  VDM name  NFS  NFS  NFS  NFS  NFS  NFS  NFS  NFS
Timestamp Group Total  Read  Write  Suspicious Total  Read  Write  Avg
Ops/s Ops/s Ops/s Ops KiB/s KiB/s KiB/s uSecs/call
10:43:46   vdm_1   id=0   2   0   0   1   0   0   0   6381
           vdm_2   id=0   5   0   1   0   0   0   0   7557
10:43:47   vdm_1   id=0   1   0   0   0   0   0   0   10
           vdm_2   id=0   5   0   1   0   0   0   0   29440
10:43:48   vdm_1   id=0   1   0   0   1   0   0   0   198524
           vdm_2   id=0   6   0   1   0   0   0   0   5877
10:43:49   vdm_1   id=0   2   0   0   1   0   0   0   52406
           vdm_2   id=0   5   0   1   0   0   0   0   34691
10:43:50   vdm_1   id=0   2   0   0   1   0   0   0   13695
           vdm_2   id=0   5   0   1   0   0   0   0   2984
```

EXAMPLE # 46  To monitor NFS VDM export statistics, type:

```
$ server_stats server_3 -i 1 -m nfs.vdm.*.export -c 5 -te
```

```
server_2  VDM name   NFS   NFS   NFS   NFS   NFS   NFS   NFS   NFS
Timestamp Export  Total  Read  Write  Suspicious Total  Read  Write  Avg
Ops/s Ops/s Ops/s Ops KiB/s KiB/s KiB/s uSecs/call
10:44:10   vdm_1 /demo_0  2   0   0   1   0   0   0   16975
           vdm_2 /demo_1  5   0   1   0   0   0   0   4755
10:44:11   vdm_1 /demo_0  2   0   0   1   0   0   0   42104
           vdm_2 /demo_1  5   0   1   0   0   0   0   75083
10:44:12   vdm_1 /demo_0  2   0   0   0   0   0   0   18991
           vdm_2 /demo_1  3   0   0   0   0   0   0   96
10:44:13   vdm_1 /demo_0  2   0   0   1   0   0   0   14357
           vdm_2 /demo_1  2   0   1   0   0   0   0   138779
10:44:14   vdm_1 /demo_0  2   0   0   1   0   0   0   137153
           vdm_2 /demo_1  5   0   1   0   0   0   0   9511
```
**server_sysconfig**

Manages the hardware configuration for the specified or all Data Movers.

**SYNOPSIS**

```
server_sysconfig {<movername>|ALL}

   {-Platform
   | -pci [<device>] [-option <options>]}
   | -virtual -delete [-Force] <device>
   | -virtual [-info <device>]
   | -virtual -name <device> -create trk
      -option "device=<device,..> [protocol=]lacp] [lb=<mac|ip|tcp]"
   | -virtual -name <device> -create fsn
      -option primary=<device> device=<device,..>}
```

**DESCRIPTION**

`server_sysconfig` displays and modifies the hardware configuration of the Data Movers.

To use Ethernet channels and link aggregations, a complimentary configuration on the switch is required. The switch must support:

- IEEE standard Ethernet, Fast Ethernet, or Gigabit Ethernet
- IEEE 802.3ad Link Aggregation protocol

`server_sysconfig` implements a virtual device which combines one or more devices on the same Data Mover into a single, logical device addressable as a unit. Fail-safe networks, Ethernet channels, and link aggregations are virtual devices. Both Ethernet channels and link aggregations are trunking devices. The **ALL** option executes the command for all Data Movers.

**OPTIONS**

- **-Platform**
  Displays the hardware configuration of the Data Mover, including processor type and speed, the bus speed in MHz, the main memory in MB, and the motherboard type.

- **-pci [<device>]**
  Displays the attributes of the specified network adapter card or for all devices.

- **-pci <device> -option <options>**
  Sets the attributes of the specified network adapter card installed in the Data Mover. Options must be comma-separated and double quoted.
The server Commands

**Ethernet**

- **speed**=\{10|100|1000|auto\}
  
  Sets the speed for the port. The **auto** (default) turns autonegotiation on; setting a fixed speed disables autonegotiation.

- **duplex**=\{full|half|auto\}
  
  Sets the duplex to **full**, **half**, or **auto**. The **auto** (default) turns autonegotiation on; setting a fixed duplex disables autonegotiation.

---

**CAUTION**

The speed and duplex settings on both sides of the physical connection must be the same. Mismatched speed and duplex settings can cause errors and impact network performance. For example, if the duplex is set to half on one end and full on the other, there might be network errors and performance issues.

---

**Gigabit Ethernet Fiber**

For Gigabit Ethernet Fiber connections, the speed is automatically set to 1000, and since it must remain at that setting, no speed setting is required.

- **linkneg**=\{enable|disable\}
  
  Disables autonegotiation on the network adapter card if it is not supported by the network Gigabit switch. The default is **enable**.

- **rxflowctl**=\{enable|disable\}
  
  Enables the ability to accept and process pause frames. The default is **disable**.

- **txflowctl**=\{enable|disable\}
  
  Enables pause frames to be transmitted. The default is **disable**.

---

**Gigabit Ethernet Copper**

- **speed**=\{10|100|1000|auto\}
  
  Sets the speed for the port. The **auto** (default) turns autonegotiation on; setting a fixed speed disables autonegotiation.

- **duplex**=\{full|half|auto\}
  
  Sets the duplex to **full**, **half**, or **auto**. The **auto** (default) turns autonegotiation on; setting a fixed duplex disables autonegotiation.
CAUTION

The speed and duplex settings on both sides of the physical connection must be the same. Mismatched speed and duplex settings can cause errors and impact network performance. For example, if the duplex is set to half on one end and full on the other, there might be network errors and performance issues.

\[ \text{rxflowctl} = \{\text{enable} | \text{disable}\} \]
Enables the ability to accept and process pause frames. The default is disable.

\[ \text{txflowctl} = \{\text{enable} | \text{disable}\} \]
Enables pause frames to be transmitted. The default is disable.

\[-\text{virtual} \quad -\text{delete} \quad [-\text{Force}] \quad <\text{device}>\]
Deletes an Ethernet channel, link aggregation, or fail-safe network device. Valid entries for a <device> are trk or fsn. The -Force option is required if an IP address has been assigned.

CAUTION

All of the IP interfaces configured over a virtual device are deleted when the -Force option is used. As a result, any applications on the VNX that use these interfaces might get disrupted. Among these applications are CIFS and VNX Replicator. If all of the interfaces used by a specific CIFS server get deleted by the server_sysconfig -Force command, the server does not communicate with clients any further, and Windows users lose access to their data.

\[-\text{virtual}\]
Information for all devices is displayed.

\[-\text{virtual} \quad -\text{info} \quad <\text{device}>\]
Displays information for the specified Ethernet channel, link aggregation, or fail-safe network device.

\[-\text{virtual} \quad -\text{name} \quad <\text{device}> \quad -\text{create trk} \quad -\text{option device}=<\text{device},...>\]
Creates a virtual device for trk (Ethernet channel or link aggregation). An Ethernet channel can combine two, four, or eight (must be a multiple of two) ports into a single virtual device. A maximum of eight devices for Fast Ethernet is allowed:

- For Fast Ethernet trunking, use ana0 through ana7.
The server Commands

- For Gigabit Ethernet trunking, use `ace0` and `ace1`.
- For Gigabit Ethernet using the NS series, use `cge0` through `cge5`.

The `-option` string defines one or more devices for the Ethernet channel or link aggregation. The `<device,...>` specifies the device or devices separated by commas. The `-option` string must have the options separated with a space, and must be enclosed with double quotes. If not, the command appears to execute, but does not pick up any options not contained within double quotes.

A gigabit trunk can be created on more than two gigabit devices. The VNX has only two gigabit devices (ace0, ace1), so two ports are created. The NS series has a six gigabit port, so a four port gigabit trunk can be created.

For link aggregation there can be one or more number of ports, up to a maximum of 12.

⚠️ **CAUTION**

The virtual device must be created before the IP interfaces can be configured for a trunk network device.

```
[protocol= lacp]
```

Initializes link aggregation control protocol for Ethernet devices that allows a non-exponential number of devices. For example, one, three, or five entries.

```
[lb=mac | ip | tcp]
```

Specifies the statistical load balancing method that applies to the aggregator/trunk. The `mac` option indicates that the output link on the trunk/aggregator is chosen based on source and destination MAC addresses. The `ip` (default) option indicates that the output link on the trunk/aggregator is chosen based on source and destination IP addresses. This is useful in the situation that the Data Mover is connected to a router or to a layer 3 switch. The `tcp` option indicates that the output link on the trunk/aggregator is chosen based on source and destination IP addresses as well as source and destination TCP ports.

```
-virtual -name <device> -create fsn -option
primary=<device> device=<device,...>
```

Creates a virtual device for `fsn` (fail-safe network). The fail-safe network device is a high-availability feature that provides switch-level redundancy. Configuring a failover channel is optional. Specifies the device name of the virtual device.
The -option string indicates a primary device for the fail-safe network device and a second device to be defined as the standby in case the primary device fails. The <device,...> specifies the device or devices separated by commas. The -option string must be defined in sequence, separated with a space, and enclosed with double quotes. If not, the command appears to execute, but does not pick up any options not contained within double quotes.

**CAUTION**
The virtual device must be created before the IP interfaces can be configured for the fail-safe network device.

**SEE ALSO** Configuring and Managing Networking on VNX, Configuring and Managing Network High Availability on VNX, server_dbms, and server_ifconfig.

**INTERFACE OUTPUTS** The network interface cards available are dependent on the type of system used.

For the VNX, the following NICs are available: loop, ace, ana, cge, el30, el31, fpa, and fa2. Note that loop, el30, and el31 are for internal use only.

For the NS series, the following NICs are available: loop, cge, el30, el31, and fge.

VDMs are included in both the CNS and NS series.

**EXAMPLE #1** For the NS series, to view the system configuration for a Data Mover, type:

```
$ server_sysconfig server_2 -Platform
```

server_2 :
Processor = Intel Pentium 4
Processor speed (MHz) = 3100
Total main memory (MB) = 4023
Mother board = Barracuda XP
Bus speed (MHz) = 533
Bios Version = 3.30
Post Version = Rev. 02.14

For the CNS series, to view the system configuration for a Data Mover, type:

```
$ server_sysconfig server_2 -Platform
```

server_2 :
Processor = Intel Pentium 4
Processor speed (MHz) = 1600
Total main memory (MB) = 3967
Mother board = CMB-400
Bus speed (MHz) = 400
Bios Version = No Ver Info
Post Version = No Ver Info

EXAMPLE #2 For the NS series, to view the installed PCI configuration for a Data Mover, type:

```bash
$ server_sysconfig server_2 -pci
```

server_2 : PCI DEVICES:

On Board:
   Agilent Fibre Channel Controller
   0: fcp-0 IRQ: 22 addr: 50060160006004f0
   0: fcp-1 IRQ: 21 addr: 50060161006004f0
   0: fcp-2 IRQ: 18 addr: 50060162006004f0
   0: fcp-3 IRQ: 20 addr: 50060163006004f0

   Broadcom Gigabit Ethernet Controller
   0: fge0 IRQ: 24
      linkneg=enable txflowctl=disable rxflowctl=disable
   0: fge1 IRQ: 23
      linkneg=enable txflowctl=disable rxflowctl=disable
   0: cge0 IRQ: 24
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable
   0: cge1 IRQ: 23
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable
   0: cge2 IRQ: 26
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable
   0: cge3 IRQ: 25
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable
   0: cge4 IRQ: 28
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable
   0: cge5 IRQ: 27
      speed=auto duplex=auto txflowctl=disable rxflowctl=disable

Command Line Interface Reference for File 8.1
For the CNS series, to view the installed PCI configuration for a Data Mover, type:

```
$ server_sysconfig server_2 -pci
```

server_2 : PCI DEVICES:

Slot: 1
- Emulex LP9000 Fibre Channel Controller
  - 0: fcp-0 IRQ: 23 addr: 10000000c92b5a10
  - 1: fcp-1 IRQ: 24 addr: 10000000c92b5a11

Slot: 2
- Emulex LP9000 Fibre Channel Controller
  - 0: fcp-2 IRQ: 22 addr: 10000000c92b514e

Slot: 4
- Intel 10/100/1K Ethernet Controller
  - 0: cge0 IRQ: 18
    speed=auto duplex=auto txflowctl=disable
  - 1: cge1 IRQ: 19
    speed=auto duplex=auto txflowctl=disable
  - 2: cge2 IRQ: 20
    speed=auto duplex=auto txflowctl=disable
  - 3: cge3 IRQ: 21
    speed=auto duplex=auto txflowctl=disable

Slot: 5
- Alteon Tigon-2 Gigabit Ethernet Controller
  - 0: ace0 IRQ: 25
    linkneg=enable txflowctl=disable
  - 0: ace0 IRQ: 25
    linkneg=enable txflowctl=disable

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Board</td>
<td>The names of each PCI card installed.</td>
</tr>
<tr>
<td>0</td>
<td>Port number inside the slot the card is plugged into. If the card put in the slot has 4 ports, the first port is marked as 0, second port as 1, third port as 2, and fourth port as 3.</td>
</tr>
<tr>
<td>IRQ</td>
<td>Interrupt vector.</td>
</tr>
<tr>
<td>speed</td>
<td>Speed configured. Possible values are: auto, 10, 100, 1000.</td>
</tr>
<tr>
<td>duplex</td>
<td>Duplex setting configured. Possible values are: auto, half, full.</td>
</tr>
<tr>
<td>txflowctl</td>
<td>Transmit MAC flow control. Possible values are: disable, enable.</td>
</tr>
<tr>
<td>rxflowctl</td>
<td>Receive MAC flow control. Possible values are: disable, enable.</td>
</tr>
</tbody>
</table>
EXAMPLE #3  To set the 100 Mbits speed and full duplex setting for cge0 interface, type:

$ server_sysconfig server_2 -pci cge0 -option speed=100,duplex=full

server_2 : done

EXAMPLE #4  To display the hardware configuration for network device, cge0, type:

$ server_sysconfig server_2 -pci cge0

server_2 :
On Board:
Broadcom Gigabit Ethernet Controller
  0:  cge0  IRQ:  24
    speed=100  duplex=full  txflowctl=disable  rxflowctl=disable

EXAMPLE #5  To create an Ethernet channel as a virtual device, type:

$ server_sysconfig server_2 -virtual -name trk0_ec -create trk -option "device=cge2,cge3"

server_2 : done

EXAMPLE #6  To display all virtual devices on server_2, type:

$ server_sysconfig server_2 -virtual

server_2 :
Virtual devices:

  trk0_ec      devices=cge2 cge3
  fsn          failsafe nic devices :
  trk          trunking devices : trk0_ec

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Devices</td>
<td>All the configured virtual devices (trunking or fail safe) on the server.</td>
</tr>
<tr>
<td>devices</td>
<td>Lists the virtual or physical device names that in the &lt;virtual device&gt;.</td>
</tr>
<tr>
<td>failsafe nic devices</td>
<td>Name of FSN virtual devices configured on the server.</td>
</tr>
<tr>
<td>trunking devices</td>
<td>Name of trunking virtual devices configured on the server.</td>
</tr>
</tbody>
</table>

EXAMPLE #7  To view information for the Ethernet channel, trk0_ec, type:

$ server_sysconfig server_2 -virtual -info trk0_ec

server_2 :
*** Trunk trk0_ec: Link is Up ***
*** Trunk trk0_ec: Statistical Load Balancing is IP ***
Device Link Duplex Speed
----------------------------------------
cge2 Up Full 1000 Mbs
 cge3 Up Full 1000 Mbs
The server Commands

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices</td>
<td>Name of devices participating in this trunk.</td>
</tr>
<tr>
<td>Link</td>
<td>Status of the link on the specified device (can be up or down).</td>
</tr>
<tr>
<td>Duplex</td>
<td>Value of negotiated duplex. Values can be full or half.</td>
</tr>
<tr>
<td>Speed</td>
<td>Value of negotiated speed.</td>
</tr>
</tbody>
</table>

**EXAMPLE #8** To create a fail-safe network device as a virtual device, type:

```
$ server_sysconfig server_2 -virtual -name fsn0 -create
fsn -option "primary=cge2 device=cge2,cge3"
```

server_2 : done

**EXAMPLE #9** To view the fail-safe network device, type:

```
$ server_sysconfig server_2 -virtual -info fsn0
```

server_2 :
*** FSN fsn0: Link is Up ***
active=cge2 primary=cge2 standby=cge3

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>active</td>
<td>Name of the active device in the FSN.</td>
</tr>
<tr>
<td>primary</td>
<td>Primary device in the FSN.</td>
</tr>
<tr>
<td>standby</td>
<td>Standby device in the FSN.</td>
</tr>
</tbody>
</table>

**EXAMPLE #10** To create an aggregated link using the LACP protocol with load balancing method set to `mac`, type:

```
$ server_sysconfig server_2 -virtual -name trk0_la
-create trk -option "device=cge2,cge3 protocol=lacp
lb=mac"
```

server_2 : done

**EXAMPLE #11** To delete an Ethernet channel, `trk0_ec`, type:

```
$ server_sysconfig server_2 -virtual -delete -Force
trk0_ec
```

server_2 : done
server_sysstat

Displays the operating system statistics for the specified Data Movers.

SYNOPSIS

server_sysstat {<movername>|ALL} [-blockmap]

DESCRIPTION

server_sysstat displays the operating system statistics and the status of blockmap memory for the specified Data Movers.

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments
Displays all operating system statistics.

[-blockmap]
Displays the status of blockmap memory in the Data Mover. Blockmaps are paged memory used by SnapSure to locate each block of data comprising the checkpoint. Twenty-five percent of physical RAM on the Data Mover is reserved for blockmap memory.

EXAMPLE #1

To display all operating system statistics, type:

$ server_sysstat server_2

server_2 :
threads runnable = 6
threads blocked = 1399
threads I/J/Z = 2
memory free(kB) = 2689924
cpu idle_% = 99

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>threads runnable</td>
<td>Threads running as well as the ones waiting for a cpu to become available.</td>
</tr>
<tr>
<td>threads blocked</td>
<td>Threads waiting on either a condition variable or a Sthread Mutex.</td>
</tr>
<tr>
<td>threads I/J/Z</td>
<td>Threads in the following state: IDLE, JOINED, and ZOMBIE.</td>
</tr>
<tr>
<td>memory free (kB)</td>
<td>The amount of free memory from the RAM that is available to Data Mover.</td>
</tr>
<tr>
<td>cpu idle_%</td>
<td>Idle time of the system averaged across all the processors.</td>
</tr>
</tbody>
</table>

EXAMPLE #2

To display current blockmap memory status, type:

$ server_sysstat server_2 -blockmap

server_2 :
total paged in = 0
total paged out = 1
page in rate = 0
The server Commands

page out rate                = 0
block map memory quota       = 1048576(KB)
block map memory consumed    = 624(KB)

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>total paged in</td>
<td>Total number of blockmap pages paged in since the system booted.</td>
</tr>
<tr>
<td>total paged out</td>
<td>Total number of blockmap pages paged out since the system booted.</td>
</tr>
<tr>
<td>page in rate</td>
<td>Number of blockmap pages paged in per second (over last 180 seconds).</td>
</tr>
<tr>
<td>page out rate</td>
<td>Number of blockmap pages paged out per second (over last 180 seconds).</td>
</tr>
<tr>
<td>block map memory quota</td>
<td>Current value of the blockmap memory quota.</td>
</tr>
<tr>
<td>block map memory consumed</td>
<td>Amount of memory consumed for blockmaps.</td>
</tr>
</tbody>
</table>
server_tftp

Manages the Trivial File Transfer Protocol (TFTP) for the specified Data Movers.

SYNOPSIS

server_tftp {<movername>|ALL}  
-service {<status>|stop|start|stats}  
-info  
-set [-path <pathname>] [-readaccess {all|none}] [-writeaccess {all|none}]  
-clear

DESCRIPTION

server_tftp provides a service to read and write files to and from a remote server, displays the status of the service, and the number of attempted transfers.

The ALL option executes the command for all Data Movers.

OPTIONS

-service {<status>|stop|start|stats}
Displays the status of the TFTP service, stops, and starts the service on the specified Data Mover, or displays TFTP statistics.

-info
Displays the number of attempted TFTP transfers and the status information for ongoing transfers.

-set [-path <pathname>]
Sets the directory <pathname> for the TFTP service to use for file transfers. If the -set option has been executed, re-executing the -set option with a different <pathname> overwrites the original <pathname>.

[-readaccess {all|none}]
Sets read access for all users or no users (default).

[-writeaccess {all|none}]
Sets write access for all users or no users (default).

-clear
Clears the path/readaccess/writeaccess settings the TFTP service for the specified Data Mover.

SEE ALSO

Using TFTP on VNX.
EXAMPLE #1  To start TFTP service for server_2, type:

$ server_tftp server_2 -service -start

server_2 : done

EXAMPLE #2  To display the status of the TFTP service for server_2, type:

$ server_tftp server_2 -service -status

server_2 :
Tftp Running

EXAMPLE #3  To modify a path on server_2 for TFTP service with read access for all, and write access for nobody, type:

$ server_tftp server_2 -set -path /ufs1 -readaccess all -writeaccess none

server_2 : done

EXAMPLE #4  To display TFTP information for server_2, type:

$ server_tftp server_2 -info

server_2 :
path="/ufs1/" readaccess=all writeaccess=none

EXAMPLE #5  To display statistics for server_2, type:

$ server_tftp server_2 -service -stats

server_2 :
Attempted Transfers:28
Successful Transfers:27
createdthrds:28
dele	edthrds:28
timedoutthrds:0
TotalBinds:28
TotalUnbinds:28
BindFailures:0
InvalidAttempts:0
AttemptedReadTransfers:19
SuccessfulReadTransfers:19
AttemptedWriteTransfers:9
SuccessfulWriteTransfers:8

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempted Transfers</td>
<td>Total TFTP transfers attempted by that time.</td>
</tr>
<tr>
<td>Successful Transfers</td>
<td>Total number of successful TFTP transfers.</td>
</tr>
<tr>
<td>createdthrds</td>
<td>Total number of TFTP threads created (equal to total transfers).</td>
</tr>
<tr>
<td>deletedthrds</td>
<td>Total number of threads deleted (equal to total created threads).</td>
</tr>
<tr>
<td>timedoutthrds</td>
<td>Number of timed-out threads. For TFTP transfers, in case of any failures, each thread will time out and free itself.</td>
</tr>
</tbody>
</table>
The server Commands

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TotalBinds</td>
<td>Total number of binds.</td>
</tr>
<tr>
<td>TotalUnbinds</td>
<td>Total number of unbinds.</td>
</tr>
<tr>
<td>BindFailures</td>
<td>Number of bind failures. If the port we try to bind to is in use, the bind fails, and retries with a different port.</td>
</tr>
<tr>
<td>InvalidAttempts</td>
<td>Invalid TFTP transfer requests from clients such as trying to transfer a non-existent file.</td>
</tr>
<tr>
<td>AttemptedReadTransfers</td>
<td>Total TFTP read transfers initiated.</td>
</tr>
<tr>
<td>SuccessfulReadTransfers</td>
<td>Total TFTP read transfers successfully completed.</td>
</tr>
<tr>
<td>AttemptedWriteTransfers</td>
<td>Total TFTP write transfers initiated.</td>
</tr>
<tr>
<td>SuccessfulWriteTransfers</td>
<td>Total TFTP write transfers successfully completed.</td>
</tr>
</tbody>
</table>

**EXAMPLE #6**  To stop TFTP service on server_2, type:

```bash
$ server_tftp server_2 -service -stop
```

server_2 : done

**EXAMPLE #7**  To delete the settings for the TFTP service on server_2, type:

```bash
$ server_tftp server_2 -clear
```

server_2 : done
server_umount

Unmounts file systems.

SYNOPSIS

server_umount {<movername>|ALL}
[-perm][-temp][-Force] {-all|<fs_name>|<mount_point>}

DESCRIPTION

server_umount permanently or temporarily (default) unmounts a mounted file system by its <mount_point> or <fs_name>, or unmounts all file systems.

The ALL option executes the command for all Data Movers.

OPTIONS

-all|<fs_name>|<mount_point>

Unmounts all file systems, a specific file system, or a file system specified by its mount point.

Note: A mount point always begins with a slash (/).

[ -perm ]
Permanently deletes the mount entry from mount table.

Note: The export table is not affected by deletes made with server_umount. Export entries remain in the export table regardless of the mount status.

[ -temp ]
Indicates that the unmount does not persist across reboots. The mount entry reappears after a reboot. Default is -temp.

[ -Force ]
Forces the unmount of a production file system.

CAUTION

Unmounting a PFS for which automatic checkpoint scheduling (configured using the VNX Web Manager or VNX Native Manager) has been implemented is not recommended. Doing so will corrupt the schedule and cause checkpoint data to be lost.

SEE ALSO

Managing Volumes and File Systems with VNX Automatic Volume Management,
Managing Volumes and File Systems for VNX Manually, Using VNX SnapSure, server_mount, server_mountpoint, and fs_ckpt.

**EXAMPLE #1**
To permanently unmount a file system, type:

```bash
$ server_umount server_2 -perm /bin
```

`server_2: done`

**EXAMPLE #2**
To temporarily unmount a file system by specifying its mount point as /bin, type:

```bash
$ server_umount server_2 -temp /bin
```

`server_2: done`

**EXAMPLE #3**
To temporarily unmount a file system by specifying its file system name as ufs1, type:

```bash
$ server_umount server_2 -temp ufs1
```

`server_2: done`
**server_uptime**

Displays the length of time that a specified Data Mover has been running since the last reboot.

**SYNOPSIS**

```
server_uptime {<movername>|ALL}
```

**DESCRIPTION**  
`server_uptime` displays the length of time that the specified Data Mover has been running since its last reboot.

The **ALL** option executes the command for all Data Movers.

**OPTIONS**  
**No arguments**
Displays the length of time that a Data Mover has been up.

**EXAMPLE #1**  
To display how long a Data Mover has been up, type:

```
$ server_uptime server_2
server_2 : up 28 days 0 hours 15 min 41 secs
```

**EXAMPLE #2**  
To display how long all the Data Movers have been up, type:

```
$ server_uptime ALL
server_2 : up 28 days 0 hours 15 min 41 secs
server_3 : up 2 days 5 hours 11 min 31 secs
```
server_user

Manages user accounts for the specified Data Movers.

SYNOPSIS

server_user {<movername>|ALL}
  -list
  -add [-md5][-passwd] <name>
  -modify <name>
  -delete <name>
  -passwd [-disable|-lock|-unlock [-force]] <name>

DESCRIPTION

server_user creates, modifies, or deletes a user account for a specified Data Mover. The server_user adds or disables, locks or unlocks an optional password for a user account. Data Mover user accounts provide administrative access to certain VNX features and third-party applications.

The ALL option executes the command for all Data Movers.

This command must be executed from the /nas/sbin directory. su to root to execute this command.

OPTIONS

-list
Lists the user accounts.

-add [-md5][-passwd] <name>
Adds a new user account with the login <name>.

The -md5 option allows you to specify MD5 password encryption for the new account.

The -passwd option allows you to specify a password for the new user account. Passwords have a six character minimum and cannot be empty.

-modify <name>
Modifies a user account.

-delete <name>
Deletes a user account.

-passwd [-disable|-lock|-unlock [-force]] <name>
Creates, changes, removes, locks, and unlocks the password for a user. If a password lock is applied, the user account is available to root only. The password does not have to be supplied during the execution of the server_user command. To unlock a password, use the -force option.
SEE ALSO  Using FTP on VNX, and Configuring NDMP Backups to Disk on VNX.

EXAMPLE #1  To create a user account for user1, type:

# /nas/sbin/server_user server_2 -add user1

Creating new user user1
User ID: 100
Group ID: 101
Comment:
Home directory:
Shell:

Note: Comment, Home directory, and Shell are optional, all others are required.

EXAMPLE #2  To create a user account for NDMP connections, with MD5 password encryption and to configure the password, type:

# /nas/sbin/server_user server_2 -add -md5 -passwd user_name

Creating new user user_name
User ID: 101
Group ID: 100
Home directory:
Changing password for user user_name
New passwd:
Retype new passwd:

EXAMPLE #3  To list the user accounts, type:

# /nas/sbin/server_user server_2 -list

server_2:
APM000438070430000_APM000420008180000:LNEa7Fjh/43jQ:9000:9000:ftsQgHsc2oMrdysaOnWeLhN8vB::ndmp_md5
user1:!1::100:101:
user_name:WX72mBTFp/qV.:101::W9z7HIndimdaHs2anCL20EBfNd::ndmp_md5

EXAMPLE #4  To modify account information for user1, type:

# /nas/sbin/server_user server_2 -modify user1

Modifying user account user1
1  User ID (100)
2  Group ID (101)
3  Home directory ()
4  Comment ()
5  Shell ()

Please select a field to modify, "done" to apply your changes or "quit" to cancel: 2
Group ID: 102
Please select a field to modify, "done" to apply your changes or "quit" to cancel: quit
EXAMPLE #5  To lock an account password for ndmp, type:

    # /nas/sbin/server_user server_2 -passwd -lock user_name

Changing password for user user_name
Locking password for user user_name

EXAMPLE #6  To disable the password for user1, type:

    # /nas/sbin/server_user server_2 -passwd -disable user1

Changing password for user user1
Removing password for user user1

EXAMPLE #7  To unlock an account password for user1, type:

    # /nas/sbin/server_user server_2 -passwd -unlock -force user1

Changing password for user user1
Unlocking password for user user1

EXAMPLE #8  To delete a user account for user1, type:

    # /nas/sbin/server_user server_2 -delete user1
server_usermapper

Provides an interface to manage the Internal Usermapper service.

SYNOPSIS

server_usermapper {<movername>|ALL} 
-enable [primary=<ip>][config=<path>] 
-disable 
-remove -all 
-Import {-user|-group} [-force] <pathname> 
-Export {-user|-group} <pathname>

DESCRIPTION

server_usermapper enables, disables, deletes, and displays the status of an Internal Usermapper service running on a Data Mover. Only one primary Usermapper service is recommended for a VNX environment. In a single VNX environment, there should only be one primary instance of the Usermapper service. All the other Data Movers in that environment are clients of the primary or secondary service.

server_usermapper displays whether the Usermapper service is configured as a primary or secondary service. Additionally, it displays information such as the operational status of the service and, if the service is a secondary service, the IP address of the primary Usermapper service used by the secondary.

This command is relevant only for Internal Usermapper, which runs on the Data Mover. It cannot be used to manage External Usermapper, which runs on the Control Station or an external host.

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments
Displays the state of the Internal Usermapper service.

-enable
Enables the Usermapper service. You do not need to issue this option if you are using the default Internal Usermapper configuration. In this case, primary Usermapper is automatically enabled when the NAS software is installed. You only need to issue this option if you are modifying a default Internal Usermapper configuration, or if you are upgrading from External to Internal Usermapper.

Use the -enable command with caution. It changes the relationship between the Data Mover and the Usermapper without confirming the change.
The server Commands

[primary=<ip_address>][config=<pathname>]
The primary option designates the local Usermapper service as secondary by indicating which primary service it depends on. The primary Usermapper is identified by its network IP address.

The config option indicates that the Usermapper service should use an existing Usermapper configuration file to define UID/GID ranges. This option is relevant only if you are upgrading from External to Internal Usermapper.

**Note:** If there is no specific reason to use particular UID and GID ranges for your environments’ domains, EMC encourages you to use the automatic mapping method and let Internal Usermapper automatically assign new UIDs/GIDs based on the next available values. If you need to use an existing Usermapper configuration file, you must specify the config option during the upgrade procedure, that is, before Internal Usermapper has begun issuing default UIDs and GIDs.

**-disable**
Disables the Usermapper service.

**-remove -all**
Removes all entries from the Usermapper databases and destroys the database structure. The Usermapper service must be disabled before you can issue this option.

**CAUTION**
It is recommended that you consult with Customer Support before issuing the -remove -all option. This option deletes all Usermapper database entries and may result in users losing access to file systems. If you decide to use the -remove -all option, you should first back up your existing Usermapper database file and usormap.cfg file (if one is in use).

**-Import {user|group} [-force] <pathname>**
Imports Usermapper database information from the file specified by <pathname>.

By default, only new entries are added to the Usermapper database. If an entry in the imported file does not match a similar entry in the existing database, the entry in the imported file is ignored unless the -force option is selected. If the -force option is selected, the existing database is deleted and replaced with new entries.
CAUTION
It is recommended that you consult with Customer Support before issuing the -force option. This option overwrites the existing Usermapper database file and may result in users losing access to file systems. If you decide to use the -force option, you should first back up your existing Usermapper database file and usrmap.cfg file (if one is in use).

-Export {-user | -group} <pathname>
Exports all the SID, user, and group information from the Usermapper database to the file specified by <pathname>. You can specify any filename but the name should include the suffix .passwd or .group depending on the file type.

The -Export option is relevant only for a primary Usermapper service.

SEE ALSO
Using ntxmap for CIFS User Mapping on VNX.

EXAMPLE #1
To verify the status of Internal Usermapper, type:

$ server_usermapper server_2
server_2 : Usrmapper service: Enabled
Service Class: Primary

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usrmapper service:</td>
<td>The operational status of the service.</td>
</tr>
<tr>
<td>Service Class:</td>
<td>If the service is a primary or secondary service.</td>
</tr>
<tr>
<td>Primary</td>
<td>The IP address of the primary Usermapper service used by a secondary service. The (c) against the IP address indicates that the primary Usermapper is available and has been connected.</td>
</tr>
</tbody>
</table>

EXAMPLE #2
To enable a secondary Usermapper service, type:

$ server_usermapper server_4 -enable
primary=172.24.102.238
server_4 : done

EXAMPLE #3
To verify the status of Internal Usermapper for the primary Usermapper, type:

$ server_usermapper server_2
server_2 : Usrmapper service: Enabled
Service Class: Primary
EXAMPLE #4 To verify the status of Internal Usermapper for the secondary Usermapper, type:

```
$ server_usermapper server_4
```

server_4 : Usrmapper service: Enabled
Service Class: Secondary
Primary = 172.24.102.238 (c)

EXAMPLE #5 To export user information from the Usermapper database, type:

```
$ server_usermapper server_2 -Export -user
/home/nasadmin/users_server_2.passwd
```

server_2 : done

EXAMPLE #6 To export group information from the Usermapper database, type:

```
$ server_usermapper server_2 -Export -group
/home/nasadmin/group_server_2.group
```

server_2 : done

EXAMPLE #7 To import the user file users_server_2.passwd for server_2, type:

```
$ server_usermapper server_2 -Import -user
/home/nasadmin/users_server_2.passwd
```

server_2 : done

EXAMPLE #8 To import the group file group_server_2.group for server_2, type:

```
$ server_usermapper server_2 -Import -group
/home/nasadmin/group_server_2.group
```

server_2 : done

EXAMPLE #9 To disable an Internal Usermapper service, type:

```
$ server_usermapper server_2 -disable
```

server_2 : done

EXAMPLE #10 To remove all entries from the Usermapper database, type:

```
$ server_usermapper server_2 -remove -all
```

server_2 : Warning: This operation will erase all user/group mappings. CIFS users may lose access.
Continue(Y/N):
done
server_version

Displays the software version running on the specified Data Movers.

SYNOPSIS

server_version {<movername>|ALL}

DESCRIPTION

server_version displays the version of the software for the specified Data Mover.

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments

Displays the software version.

SEE ALSO

nas_version.

EXAMPLE #1

To display the software version for a Data Mover, type:

$ server_version server_2

server_2 : Product: EMC Celerra File Server Version: T5.5.80.0

EXAMPLE #2

To display the system software version for all Data Movers, type:

$ server_version ALL

server_2 : Product: EMC Celerra File Server Version: T5.5.80.0
server_3 : Product: EMC Celerra File Server Version: T5.5.80.0
server_4 : Product: EMC Celerra File Server Version: T5.5.80.0
server_5 : Product: EMC Celerra File Server Version: T5.5.80.0
server_viruschk

Manages the virus checker configuration for the specified Data Movers.

SYNOPSIS

server_viruschk {<movername>|ALL}

[-audit | -update]

| [-set accesstime=(now|none|[[[<yy><mm><dd><hh><mm><.<ss>]])]]

-fsscan [<fs_name> {list|create [offline]|delete}]]

DESCRIPTION

server_viruschk displays, audits, and updates the virus checker configuration file for the specified Data Mover.

The virus checker configuration file is named viruschecker.conf and is located on the Control Station in the /nas/sys directory. This is a template file and should not be edited directly. Copy the viruschecker.conf file to another directory for edits using a text editor, then once the changes have been saved, the file must be copied to a Data Mover using the server_file command.

To start and stop the virus checker for a Data Mover, server_setup provides information.

The ALL option executes the command for all Data Movers.

OPTIONS

No arguments
Displays the virus checker configuration.

-audit
Displays the status of virus checker, including the number of files checked, and their progress.

-update
Integrates the changes made to the virus configuration file without stopping the virus checker.

-set accesstime={now|none|[[[<yy><mm><dd><hh><mm><.<ss>]])]]
Sets the reference time on the virus checker configuration file to now, disables the time scan, or sets the access time in the specified format.

-fsscan
Displays the file system scan status for all file systems.
The server Commands

[<fs_name> { -list | -create [offline] | -delete }]

The -list option displays the scan status for the specified file system. The -create option initializes a full scan on the file system <fs_name> and the offline options allow the file system scan on all offline files. By default, offline file systems are not included. The -delete option stops the scan.

SEE ALSO Using Common AntiVirus Agent, server_checkup, and server_setup.

EXAMPLE #1 To display the virus checker configuration, type:

$ server_viruschk server_2

server_2 :
10 threads started
1 Checker IP Address(es):
172.24.102.18 ONLINE at Mon Jan 31 18:35:43 2005 (GMT-00:00)

RPC program version: 3
CAVA release: 3.3.5, AV Engine: Network Associates
Last time signature updated: Thu Jan 27 19:38:35 2005 (GMT-00:00)

31 File Mask(s):
*.zip *.tar *.arj *.arc *.z
No File excluded
Share \\DM112-CGE0\CHECK$
RPC request timeout=25000 milliseconds
RPC retry timeout=5000 milliseconds
High water mark=200
Low water mark=50
Scan all virus checkers every 60 seconds
When all virus checkers are offline:
Continue to work with Virus Checking and CIFS
Scan on read if access Time less than Thu Jan 27 19:38:35 2005 (GMT-00:00)
Panic handler registered for 65 chunks

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>threads started</td>
<td>The number of threads that have been started.</td>
</tr>
<tr>
<td>Checker IP Address(es)</td>
<td>The number of VC servers defined in /etc/viruschecker.conf.</td>
</tr>
<tr>
<td>version=2</td>
<td>CAVA uses RPC program version 2.</td>
</tr>
<tr>
<td>Share</td>
<td>The UNC name used by CAVA to access the Data Mover.</td>
</tr>
<tr>
<td>RPC request timeout=</td>
<td>Time out for the full CAVA request.</td>
</tr>
<tr>
<td>RPC retry timeout=</td>
<td>Time out for one unitary CAVA request.</td>
</tr>
<tr>
<td>High water mark=</td>
<td>A log event is generated when the number of files in the request queue becomes greater than 200.</td>
</tr>
<tr>
<td>Low water mark=</td>
<td>A log event is generated when the number of files in the request queue becomes less than 50.</td>
</tr>
</tbody>
</table>
EXAMPLE #2  To display the status of the virus checker, type:

$ server_viruschk server_2 -audit

server_2 :
Total Requests                          : 138
Requests in progress                    : 25
NO ANSWER from the Virus Checker Servers: 0
ERROR_SETUP                             : 0
FILE_NOT_FOUND                          : 0
ACCESS_DENIED                           : 0
FAIL                                    : 0
TIMEOUT                                 : 0
Total Infected Files                    : 875
Deleted Infected Files                  : 64
Modified Infected Files                 : 811
min=70915 uS, max=1164891 uS, average=439708 uS

15 File(s) in the collector queue
10 File(s) processed by the AV threads
Read file ‘/etc/viruschecker.audit’ to display the list of pending requests

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panic handler registered for 65 chunks</td>
<td>Panic is used to memorize name of unchecked files.</td>
</tr>
<tr>
<td>ERROR_SETUP</td>
<td>List of errors reported by CAVA.</td>
</tr>
<tr>
<td>min=, max=, average=</td>
<td>Min, max, and average time for CAVA requests.</td>
</tr>
</tbody>
</table>

Value Definition

Value Definition

Total Infected Files
The number of files found that contained viruses. This displays only if infected files are found and remains visible until the Data Mover is rebooted or the CAVA viruschecking service has been restarted.

Deleted Infected Files
The number of files that contained viruses that were deleted. This displays only if infected files are found and remains visible until the Data Mover is rebooted or the CAVA viruschecking service has been restarted.

Renamed Infected Files
The number of files that contained viruses that were renamed. This displays only if infected files are found and remains visible until the Data Mover is rebooted or the CAVA viruschecking service has been restarted.

Modified Infected Files
The number of files that contained viruses that were modified. This displays only if infected files are found and remains visible until the Data Mover is rebooted or the CAVA viruschecking service has been restarted.
EXAMPLE #3  To update the virus checker configuration file that is resident on the Data Mover, type:

```
$ server_viruschk server_2 -update
```

server_2 : done

EXAMPLE #4  To set the access time for the virus checker configuration file, type:

```
$ server_viruschk server_2 -set accesstime=now
```

server_2 : done

EXAMPLE #5  To start a scan on the file system, type:

```
$ server_viruschk server_2 -fsscan ufs1 -create
```

server_2 : done

EXAMPLE #6  To check the scan of a file system, type:

```
$ server_viruschk server_2 -fsscan ufs1 -list
```

server_2 :
FileSystem 24 mounted on /ufs1:
  8 dirs scanned and 22 files submitted to the scan engine
  firstFNN=0x0, lastFNN=0xe0f34b70, queueCount=0, burst=10

EXAMPLE #7  To check the scan status on all file systems, type:

```
$ server_viruschk server_2 -fsscan
```

server_2 :
FileSystem 24 mounted on /ufs1:
  8 dirs scanned and 22 files submitted to the scan engine
  firstFNN=0x0, lastFNN=0xe0f34b70, queueCount=0, burst=10
FileSystem 25 mounted on /ufs2:
  9 dirs scanned and 11 files submitted to the scan engine
  firstFNN=0x0, lastFNN=0xe0010b70, queueCount=0, burst=10

EXAMPLE #8  To stop a scan on a file system, type:

```
$ server_viruschk server_2 -fsscan ufs1 -delete
```

server_2 : done
server_vtlu

**SYNOPSIS**  Configures a virtual tape library unit (VTLU) on the specified Data Movers.

```
server_vtlu {<movername>|ALL}  
   -service <service_options>  
   -tlu <tlu_options>  
   -storage <storage_options>  
   -tape <tape_options>  
   -drive <drive_options>  
   -help
```

**DESCRIPTION**  

server_vtlu creates, configures, and displays information on virtual tape library units on the specified Data Movers. At this time, server_vtlu supports only NDMP backups.

To get detailed options for VTLU service, TLU, storage, tape, and drive, type `-help` for the full usage, or type only `-service`, `-tlu`, `-tape`, and `-drive`, respectively, after typing the `<movername>`.

The ALL option executes the command for all Data Movers.

**SERVICE OPTIONS**  

```
-service {-info|-set -chain <chain_id>}
```

The -info option lists the chain IDs for the VTLU service on the Data Mover. The -set-chain option specifies a <chain_id> for the VTLU device connection. The default chain ID is 0.

**TLU OPTIONS**

```
-tlu  
   {-list  
   | -info <tlu_id>  
   | -new [-robot {[-vendor <vendor>][-product <product>][-revision <revision>]}[-slots <num_slots>]][-impexp <num_impexp_slots>][-drives <num_drives>][-drive {[-vendor <vendor>][-product <product>][-revision <revision>]}]  
   | -modify <tlu_id>  
   |{-robot {[-vendor <vendor>][-product <product>][-revision <revision>]}[-slots <num_slots>]][-impexp <num_impexp_slots>][-drives <num_drives>][-drive {[-vendor <vendor>][-product <product>][-revision <revision>]}]  
   | -delete <tlu_id>  
   -tlu -list
```

Lists all VTLUs configured on the specified Data Movers.
-tlu -info <tlu_id>
Displays information for the specified VTLU.

-tlu -new [-robot {{-vendor <vendor>} [-product <product>][-revision <revision>]}]
Creates a VTLU on the specified Data Mover with the specified robot’s vendor, product, and revision information. If this information is not specified, the default values of EMC, svtlRobot, and 1.0 are used. These values have character limits of 8, 16, and 4, respectively.

[-slots <num_slots>]
Configures the number of slots in the VTLU. If no value is defined, then the default value of 32 is used.

[-impexp <num_impexp_slots>]
Configures the number of import/export slots in the VTLU. If no value is defined, then the default value of 8 is used.

[-drives <num_drives>]
Configures the number of virtual tape drives in the VTLU. If no value is defined, then the default value of 4 is used.

[-drive {{-vendor <vendor>} [-product <product>][-revision <revision>]}]
Specifies the vendor name, product name, and revision number of the virtual drive. If no values are defined, the default values of EMC, svtlDrive, and 1.0 are used. These values have character limits of 8, 16, and 4, respectively.

-tlu -modify <tlu_id> [-robot {{-vendor <vendor>} [-product <product>][-revision <revision>]}]
Modifies the vendor name, product name, and revision number for the virtual robot.

[-slots <num_slots>]
Modifies the number of virtual slots in the VTLU.

[-impexp <num_impexp_slots>]
Modifies the number of virtual import/export slots in the VTLU.

[-drives <num_drives>]
Modifies the number of virtual tape drives in the VTLU.

[-drive {{-vendor <vendor>} [-product <product>][-revision <revision>]}]
Modifies the vendor name, product name, and revision number for the VTLU drive.
The server Commands

- tlu -delete <tlu_id>
Deletes a configured VTLU. The storage associated with a VTLU must be deleted before the VTLU can be deleted.

STORAGE OPTIONS

- storage
  -list [<tlu_id>]
  | -new <fs_name> -tlu <tlu_id> [-tapesize <size>G][-tapes <num_tapes>]
  | [-barcodeprefix <barcode_prefix>]
  | [-destination {slot|impexp|vault}]
  | -extend <fs_name> -tlu <tlu_id> [-tapesize <size>G][-tapes <num_tapes>]
  | [-destination {slot|impexp|vault}]
  | -import <fs_name> -tlu <tlu_id>
  | -export <fs_name> -tlu <tlu_id>
  | -delete {<fsname>|-barcodeprefix <barcode_prefix> -tlu <tlu_id>}

- storage -list [<tlu_id>]
Lists storage information on the specified VTLU.

- storage -new <fs_name> -tlu <tlu_id>
Creates storage on an existing VTLU.

  [-tapesize <size>G]
  Specifies the size of the virtual tapes in the file system. If no value is defined, and the -tape <num_tapes> option is not defined, then the default value of 50 GB is used. If <num_tapes> is defined but the tape size is not, then the tape size is determined by the number of tapes and the file system size.

  [-tapes <num_tapes>]
  Specifies the number of virtual tapes in the file system. The default value is determined by the file system size and the value of -tapesize <size>.

  [-barcodeprefix <barcode_prefix>]
  Specifies the barcode prefix for the virtual tapes. The barcode prefix is the same across a file system. If no value is defined, then a four-character string is assigned automatically.

  [-destination {slot|impexp|vault}]
  Specifies the destination of the virtual tape as a slot, an import/export slot, or the vault. Slot is the default location.

- storage -extend <fs_name> -tlu <tlu_id>
Adds more tapes to a file system that has been extended.
[-tapesize <size>G]
Specifies the size of the virtual tape. If no value is defined, and the
-tapes <num_tapes> is not defined, then the default value of 50
GB is used. If the <num_tapes> is defined but <size> is not, then
the tape size is determined by the number of tapes and the file
system size.

[-tapes <num_tapes>]
Specifies the number of tapes to be added to a VTLU. The default
value is determined by the size of the file system and the tape
size.

[-destination {slot|impexp|vault}]
Specifies the destination of the virtual tape as a slot, an
import/export slot, or the vault. Slot is the default location.

-storage -import <fs_name> -tlu <tlu_id>
Imports a file system that was exported from another VTLU. The
configuration of a file system persists when it is imported.

[-destination {slot|impexp|vault}]
Specifies the destination of the imported storage as a slot, an
import/export slot, or the vault. Slot is the default location.

-storage -export <fs_name> -tlu <tlu_id>
Exports storage from a VTLU, which breaks the association between
the file system and the VTLU. Tapes must be ejected from the VTLU
and placed in the vault before you can export storage.

-storage -delete {<fs_name>|-barcodeprefix
<barcode_prefix>} -tlu <tlu_id>
Deletes the association between storage and the VTLU and cleans up
related metadata.

TAPE OPTIONS

-tape
{-list <tlu_id> [-storage <fs_name>]}
| -info {<tape_barcode>|-all} -tlu <tlu_id>
| -insert <tape_barcode> -tlu <tlu_id>
| -eject <tape_barcode> -tlu <tlu_id>
| -drive {-list <tlu_id>
  | -info <drive_id> -tlu <tlu_id>
  | -unmount <drive_id> -tlu <tlu_id>}

-tape {-list <tlu_id> [-storage <fs_name>]}
Lists the tapes configured on a VTLU, along with their associated file
systems.
-tape -info <tape_barcode>-all -tlu <tlu_id>
Lists information on a particular tape, or on all tapes in a VTLU.

-tape -insert <tape_barcode> -tlu <tlu_id>
Moves a virtual tape from the vault to an import/export slot.

-tape -eject <tape_barcode> -tlu <tlu_id>
Ejects a tape from the import/export slot and places it in the vault.

-drive {-list <tlu_id>}
Lists the virtual tape drives associated with the specified VTLU.

-info <drive_id> -tlu <tlu_id> -id
Displays information on the specified tape drive.

-unmount <drive_id> -tlu <tlu_id>
Unmounts the tape from the drive and places it in its original source slot. If the source slot is unavailable, the tape is placed in another available slot.

SEE ALSO  Configuring NDMP Backups to Disk on VNX, Parameters Guide for VNX for File, and nas_fs.

EXAMPLE #1  To set the chain_ID for server_2, type:

$ server_vtlu server_2 -service -set -chain 1
server_2 : done

EXAMPLE #2  To list the chain_ID for the VTLU service on server_2, type:

$ server_vtlu server_2 -service -info
server_2 :
starting chain id = 1

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>starting chain id</td>
<td>Starting chain of the VTLU device name. The device name format is c&lt;x&gt;t&lt;y&gt;l&lt;z&gt;, where</td>
</tr>
<tr>
<td></td>
<td>&lt;x&gt; is the starting chain. &lt;y&gt; and &lt;z&gt; are the target and LUN, respectively. The target and</td>
</tr>
<tr>
<td></td>
<td>LUN values cannot be modified.</td>
</tr>
</tbody>
</table>

EXAMPLE #3  To create and configure a new VTLU on server_2, type:

$ server_vtlu server_2 -tlu -new -robot -vendor EMCCorp -product vtluRobot -revision 1.1a -slots 256 -impexp 64 -drives 2 -drive -vendor EMCCorp -product vtluDrive -revision 2.2a

server_2 :
id = 3
slots = 256
import/export slots = 64
robot vendor = EMCCorp
The server Commands

robot product           = vtluRobot
robot revision          = 1.1a
robot serial number     = P8gIgqs2k5
robot device name       = c1t0l0
drives                  = 2
drive vendor            = EMCCorp
drive product           = vtluDrive
drive revision          = 2.2a

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique VTLU identifier that is assigned automatically.</td>
</tr>
<tr>
<td>slots</td>
<td>Number of virtual slots in the VTLU.</td>
</tr>
<tr>
<td>import/export slots</td>
<td>Number of virtual import/export slots in the VTLU.</td>
</tr>
<tr>
<td>robot vendor</td>
<td>Vendor name of the virtual robot; maximum length is eight characters.</td>
</tr>
<tr>
<td>robot product</td>
<td>Product name of the virtual robot; maximum length is 16 characters.</td>
</tr>
<tr>
<td>robot revision</td>
<td>Revision number of the virtual robot; maximum length is four characters.</td>
</tr>
<tr>
<td>robot serial number</td>
<td>Serial number of the virtual robot that is assigned automatically.</td>
</tr>
<tr>
<td>robot device name</td>
<td>Device name of the virtual robot; only the first number, the starting chain, can be modified.</td>
</tr>
<tr>
<td>drives</td>
<td>Number of virtual drives in the VTLU.</td>
</tr>
<tr>
<td>drive vendor</td>
<td>Vendor name of the virtual drive; maximum length is eight characters.</td>
</tr>
<tr>
<td>drive product</td>
<td>Product name of the virtual drive; maximum length is 16 characters.</td>
</tr>
<tr>
<td>drive revision</td>
<td>Revision number of the virtual drive; maximum length is four characters.</td>
</tr>
</tbody>
</table>

**EXAMPLE #4** To list all the VTLUs on server_2, type:

```
$ server_vtlu server_2 -tlu -list
```

server_2 :

```
id    vendor     product    revision   serial_number     device_name
3     EMCCorp    vtluRobot  1.1a       P8gIgqs2k5        c1t0l0
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Unique VTLU identifier that is assigned automatically.</td>
</tr>
<tr>
<td>vendor</td>
<td>Vendor name of the virtual robot; maximum length is eight characters.</td>
</tr>
<tr>
<td>product</td>
<td>Product name of the virtual robot; maximum length is 16 characters.</td>
</tr>
<tr>
<td>revision</td>
<td>VTLU robot’s revision number; maximum length is four characters.</td>
</tr>
<tr>
<td>serial_number</td>
<td>VTLU serial number that is assigned automatically.</td>
</tr>
<tr>
<td>device_name</td>
<td>The device name of the VTLU robot; only the first number, the starting chain, can be modified.</td>
</tr>
</tbody>
</table>

**EXAMPLE #5** To display the information for the VTLU on the Data Mover identified by its ID, type:

```
$ server_vtlu server_2 -tlu -info 3
```

server_2 :

```
id = 3
```

**server_vtlu** 829
### The server Commands

- slots = 256
- import/export slots = 64
- robot vendor = EMCCorp
- robot product = vtluRobot
- robot revision = 1.1a
- robot serial number = P8gIgqs2k5
- robot device name = c1t0l0
- drives = 2
- drive vendor = EMCCorp
- drive product = vtluDrive
- drive revision = 2.2a

**EXAMPLE #6**
To modify vendor, product, and revision information for the robot and drive of VTLU 3 for server_2, type:

```bash
$ server_vtlu server_2 -tlu -modify 3 -robot -vendor EMC -product vRobot -revision 1.1b -drives 3 -drive -vendor EMC -product vDrive -revision 2.2b
```

server_2 : done

**EXAMPLE #7**
To modify the number of virtual import/export slots and number of virtual slots of VTLU 1 for server_2, type:

```bash
$ server_vtlu server_2 -tlu -modify 3 -slots 8 -impexp 4
```

server_2 : done

**EXAMPLE #8**
To add new storage for VTLU 3 on server_2, with 5 virtual tapes of 1 GB located in slots each with barcode prefix dstpre, using ufs1 file system, type:

```bash
$ server_vtlu server_2 -storage -new ufs1 -tlu 3 -tape size 1G -tapes 5 -barcodeprefix dstpre -destination slot
```

server_2 : done

**EXAMPLE #9**
To extend VTLU 3 on server_2 by adding 2 virtual tapes of 1 GB and placing them in the import/export virtual slots, type:

```bash
$ server_vtlu server_2 -storage -extend ufs1 -tlu 3 -tapesize 1G -tapes 2 -destination impexp
```

server_2 : done

**EXAMPLE #10**
To export storage from VTLU 3 stored on ufs1 located on server_2, type:

```bash
$ server_vtlu server_2 -storage -export ufs1 -tlu 3
```

server_2 : done

**EXAMPLE #11**
To import the ufs2 file system to VTLU 3 and place the virtual tapes in the vault, type:

```bash
$ server_vtlu server_2 -storage -import ufs1 -tlu 3 -destination vault
```
The server Commands

EXAMPLE #12  To list the storage on VTLU 3, type:

$ server_vtlu server_2 -storage -list 3

server_2 :

<table>
<thead>
<tr>
<th>tlu_id</th>
<th>filesystem</th>
<th>barcode_prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ufs1</td>
<td>dstpre</td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>tlu_id</td>
<td>Unique VTLU identifier that is assigned automatically.</td>
</tr>
<tr>
<td>filesystem</td>
<td>Name of the file system associated with the VTLU.</td>
</tr>
<tr>
<td>barcode_prefix</td>
<td>Modifiable prefix assigned to virtual tapes that is constant across a file system.</td>
</tr>
</tbody>
</table>

EXAMPLE #13  To list VTLU information on VTLU 3, type:

$ server_vtlu server_2 -tape -list 3

server_2 :

<table>
<thead>
<tr>
<th>barcode</th>
<th>filesystem</th>
<th>capacity(GB)</th>
<th>location</th>
<th>source_slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>dstpre0001</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0002</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0003</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0004</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0005</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0006</td>
<td>ufs1</td>
<td>1</td>
<td>vault</td>
<td></td>
</tr>
<tr>
<td>dstpre0000</td>
<td>ufs1</td>
<td>1</td>
<td>impexp:0</td>
<td></td>
</tr>
</tbody>
</table>

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>barcode</td>
<td>Virtual tape barcode, consisting of the modifiable barcode prefix and a four-digit number that is assigned automatically.</td>
</tr>
<tr>
<td>filesystem</td>
<td>Name of the file system.</td>
</tr>
<tr>
<td>capacity(GB)</td>
<td>Virtual tape capacity in GB.</td>
</tr>
<tr>
<td>location</td>
<td>Element type and element ID of the virtual tape; possible element types are slot, drive, import/export, robot, and vault.</td>
</tr>
<tr>
<td>source_slot</td>
<td>Slot ID of the tape's previous location.</td>
</tr>
</tbody>
</table>

EXAMPLE #14  To insert the specified tape in a virtual import/export slot on VTLU 3, type:

$ server_vtlu server_2 -tape -insert dstpre0001 -tlu 3

server_2 : done

EXAMPLE #15  To eject the specified tape from VTLU 3, type:

$ server_vtlu server_2 -tape -eject dstpre0001 -tlu 3

server_2 : done
EXAMPLE #16  To list the storage drive on VTLU 3, type:

```
$ server_vtlu server_2 -drive -list 3
```

```
server_2 :
drive_id  device_name   serial_number  status    tape_barcode
0         c1t0l1        NXB2w4W000     empty
1         c1t0l2        3u0bx4W000     empty
2         c1t0l3        g0pgy4W000     empty
```

Where:

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>drive_id</td>
<td>Unique VTLU drive identifier that is assigned automatically.</td>
</tr>
<tr>
<td>device_name</td>
<td>The device name of the VTLU drive.</td>
</tr>
<tr>
<td>serial_number</td>
<td>The VTLU serial number that is automatically assigned.</td>
</tr>
<tr>
<td>status</td>
<td>Status of the virtual tape drive; possible values are empty, loaded, and in use.</td>
</tr>
<tr>
<td>tape_barcode</td>
<td>Barcode of the virtual tape if status is not empty.</td>
</tr>
</tbody>
</table>

EXAMPLE #17  To display information for drive 0 on VTLU 3, type:

```
$ server_vtlu server_2 -drive -info 0 -tlu 3
```

```
server_2 :
id             = 0
device_name    = c1t0l1
serial_number  = NXB2w4W000
status         = empty
tape_barcode   =
```

EXAMPLE #18  To delete storage from VTLU 3, type:

```
$ server_vtlu server_2 -storage -delete ufs1 -tlu 3
```

```
server_2 : done
```

EXAMPLE #19  To delete VTLU 3 from server_2, type:

```
$ server_vtlu server_2 -tlu -delete 3
```

```
server_2 : done
```
This appendix contains information about command scripts that can be used to automate many VNX tasks. Topic is:

◆ Scripting guidelines ................................................................. 834
Scripting guidelines

Table 2 on page 834 lists guidelines to keep in mind when creating VNX command scripts.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling</td>
<td><strong>NAS Database Backups:</strong> The VNX backs up the NAS database that stores specific configuration information required for each Data Mover every hour, at one minute after the hour. During part of the backup, the database is locked, and some commands that rely on the database might not have access. It is recommended that command scripts avoid starting at one minute after the hour. Note that scripts with complex commands that run for an extended period may overlap the backup period. The duration of the backup may vary. Use the following Linux command to check the state of the backup process prior to executing scripts: `ps -ef</td>
</tr>
<tr>
<td>Command sequencing</td>
<td>Some commands must lock the database in order to execute. If multiple user-entered commands or scripts are active at the same time, some of these commands may lock the database and prevent other commands from executing. To avoid this, you should arrange commands whenever possible.</td>
</tr>
<tr>
<td>Sleep statements</td>
<td>Some processes within a script can take time to complete. Use proper timing and adequate sleep statements to prevent timing-related issues.</td>
</tr>
<tr>
<td>Pipe and grep</td>
<td>Piping script outputs through <code>grep</code> is a helpful tool to check the status of the script. Use periodic checks to grep for file or database locked messages, timeouts, resource unavailable warnings, and other failure or success messages, and use this information to check status, pause the script, or halt it. Detailed information about error messages can be found in the error messages guide.</td>
</tr>
<tr>
<td>Return code check</td>
<td>All commands return a UNIX-style return code (for example: 0 for success or 1 for failure) or a text-based status code (for example, done) which can be used to help determine if the command completed or if there was an error or a conflict with the NAS database backup, or other commands being run. If a lock condition occurs, wait a few minutes and retry. If you create and run scripts, be sure to incorporate return code checks and verify for proper return codes from individual operations.</td>
</tr>
</tbody>
</table>
Scripting examples

The RECOVERABLE variable contains the following errors to retry on:

- Unable to acquire lock
- Resource temporarily unavailable
- Unable to connect to host
- Connection timed out
- NAS_DB locked object is stale

An example of what the RECOVERABLE variable looks like is as follows:

```
RECOVERABLE="unable to acquire lock|Resource temporarily unavailable|unable to connect to host|socket: All ports in use|database resource vanished|Connection timed out|NAS_DB locked object is stale".
```

The res variable contains the command output:

```
#!/bin/sh
########################################################
# File: nas_cmdrcvr.sh
# Created by: NAS Engineering
# Date: Thursday, May 25, 2006
# Version: 1.0
# Notes:
# 1) script will retry commands for specified period of time
#2) script will log messages to file only if there's available disk space
########################################################
NAS_DB=/nas
export NAS_DB
PATH=$PATH:$NAS_DB/bin:$NAS_DB/sbin:/usr/sbin:. export PATH
RETRIES=60
SLEEPTIME=30
LOGDIR="/home/nasadmin"
LOGFILE="$0.log"
LOGLAST="$0.last"
DISKFULL=98
RECOVERABLE="Resource temporarily unavailable\nunable to acquire lock\n"
unable to connect to host\nsocket: All ports in use\ndatabase resource vanished\nConnection timed out\nNAS_DB locked object is stale"

# function to log messages to a file
#
nas_log()
{
  DISKCHK=`df -k $LOGDIR|awk 'NR>1{print $5}'|sed 's/\%/\''`
  # if there's enough free disk space, append to log
  if [ $DISKCHK -lt $DISKFULL ]; then
    TDSTAMP=`date +%Y-%m-%d' '%T`
    echo $TDSTAMP: $LOGMSG >> $LOGDIR/$LOGFILE
  fi
  # regardless of available space, always write last error
  echo $TDSTAMP: $LOGMSG > $LOGDIR/$LOGLAST
}

# function to execute (and potentially retry) commands
#
nas_cmd()
{
  # initialize variable(s)
  retry_count=0
  # loop until either successful or retry count exceeded
  while [ $retry_count -le $RETRIES ]; do
    # execute command and gather response
    RES=`$CMD 2>&1`
    # check if response means command is recoverable
    if [ `echo "$RES"|egrep -c "$RECOVERABLE"` -ne 0 ]; then
      # check retry count
      if [ $retry_count -ne $RETRIES ]; then
        # retry count has not been exceeded
        LOGMSG="Command ($CMD) failed with ($RES)...retrying in $SLEEPTIME s"
        nas_log
        sleep $SLEEPTIME
      else
        # retry count has been exceeded
        break
      fi
    fi
  done
}

# function to execute (and potentially retry) commands
#
nas_cmd()
{
  # initialize variable(s)
  retry_count=0
  # loop until either successful or retry count exceeded
  while [ $retry_count -le $RETRIES ]; do
    # execute command and gather response
    RES=`$CMD 2>&1`
    # check if response means command is recoverable
    if [ `echo "$RES"|egrep -c "$RECOVERABLE"` -ne 0 ]; then
      # check retry count
      if [ $retry_count -ne $RETRIES ]; then
        # retry count has not been exceeded
        LOGMSG="Command ($CMD) failed with ($RES)...retrying in $SLEEPTIME s"
        nas_log
        sleep $SLEEPTIME
      else
        # retry count has been exceeded
        break
      fi
    fi
  done
}
EMC has partially changed the layout or format of VNX internal databases. This change can impact the use of **awk** or **grep** utilities when used in scripts that assume specific positions of fields in databases.

To enable searching of the NAS database, VNX has developed a new query subsystem that appears as a hidden option on some of the **nas_commands**. This query subsystem enables you to specify the information you are interested in, allows you to format the output, and is independent of the database format.

**CAUTION**

Do not use **grep** and **awk** to scan the database files. Database positions may change and substrings may return false matches for database objects.

Following is an example of a query to view unused disks:

```
nas_disk -query:inuse=n -format:'%s\n' -Fields:Id
```
To filter root disks, refer to the *List all non-root disks that are not in use.*

**Examples**

Use the following commands to view the tags (fields) that you can query:

- `nas_disk -query:tags`
- `nas_fs -query:tags`
- `nas_volume -query:tags`
- `nas_slice -query:tags`

*Table 3 on page 838* contains a list of examples to help you get started. Note that these commands can be run on the Control Station CLI, so the hardcoded values can be replaced with shell script variables.

### Table 3: Task and query examples (page 1 of 2)

<table>
<thead>
<tr>
<th>Task</th>
<th>Example</th>
</tr>
</thead>
</table>
| Query the ID of a named file system            | `nas_fs -query:Name==RLL_fs10 -format:'%s
' -Fields:Id`                |
| Query the ID of a named file system without the new line | `nas_fs -query:Name==RLL_fs10 -format:'%s' -Fields:Id`                  |
| Query the name of a file system ID that corresponds to a particular ID | `nas_fs -query:id==20 -format:'%s
' -Fields:Name`                     |
| List of all server IDs                         | `nas_server -query:* -format:'%s
' -Fields:Id`                        |
| List of all server names                       | `nas_server -query:* -format:'%s
' -Fields:Name`                      |
| List of all the checkpoint file systems        | `nas_fs -query:type==ckpt -fields:name -format:'%s
'`                   |
| List type of file system with ID 20            | `nas_fs -query:id==20 -format:'%s
' -Fields:Type`                      |
| List the file systems that are in use          | `nas_fs -query:inuse==y -format:'%s
' -Fields:Name` or `nas_fs -query:inuse==y -format:'%s
' -Fields:Id` |
| Identify file system of which file system ID 28 is a backup | `nas_fs -query:id==28 -format:'%s' -Fields:BackupOf` |
| List the name of the server with ID 2          | `nas_server -query:id==2 -format:'%s
' -fields:name` `"`             |
| View which volume file system is built on      | `nas_fs -query:Name==my_fs -format:%d -fields:VolumeID`               |
### Query operators

Use the operators in the table below when building your queries:

<table>
<thead>
<tr>
<th>Operator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>Having the pattern (sub-string match)</td>
</tr>
<tr>
<td>==</td>
<td><em>Exact</em> string match</td>
</tr>
<tr>
<td>=&lt;</td>
<td>Integer Minimum (not less than)</td>
</tr>
<tr>
<td>=&gt;</td>
<td>Integer Maximum (not more than)</td>
</tr>
<tr>
<td>=*</td>
<td>Any</td>
</tr>
<tr>
<td>=^</td>
<td>NOT having the pattern</td>
</tr>
<tr>
<td>=^=</td>
<td>NOT an exact match</td>
</tr>
<tr>
<td>=^&lt;</td>
<td>NOT Integer Minimum (is less than)</td>
</tr>
<tr>
<td>=^&gt;</td>
<td>NOT Integer Maximum (is more than)</td>
</tr>
<tr>
<td>=^*</td>
<td>NOT Any (None)</td>
</tr>
</tbody>
</table>

---

**Table 3**  
**Task and query examples (page 2 of 2)**

<table>
<thead>
<tr>
<th>Task</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>View the block count of meta volume</td>
<td><code>nas_volume -query:Name==my_meta3 -format:%d -fields:Blocks</code></td>
</tr>
<tr>
<td>View the block size of meta volume</td>
<td><code>nas_volume -query:Name==JAH_meta3 -format:%d -fields:BlockSize</code></td>
</tr>
</tbody>
</table>
| Find which server IDs use fs123                | `nas_fs -query:name==fs123 -format:'%s
' -fields:ServerNumeric`                                                   |
| List all non-root disks that are not in use   | `nas_disk -query:inuse==n:IsRoot==False -format:'%s
' -fields:name`         |
| List unused volumes that contain "dc" in the volume name | `nas_volume -query:inuse==n:IsRoot==False:name=dc -format:'%s
' -fields:name` |
| List all available disks on a particular storage device (symm_id is a script/env variable) | `nas_disk -query:inuse==n:SymmID==$symm_id:IsRoot==False -format:'%s
' -fields:name` |
This section contains the GNU General Public License (GPL). The GPL is the license for the Linux operating system. All EMC software, including the VNX software, is licensed by the EMC Software License included in the software kit. Topic is:

- GNU General Public License

842
GNU General Public License

Version 2, June 1991

Copyright © 1989, 1991 Free Software Foundation, Inc.
59 Temple Place, Suite 330
Boston, MA 02117-1307
USA

Everyone is permitted to copy and distribute verbatim copies of this
license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your
freedom to share and change it. By contrast, the GNU General Public
License is intended to guarantee your freedom to share and change
free software--to ensure the software is free for all its users. This
General Public License applies to most of the Free Software
Foundation's software and to any other program whose authors
commit to using it. (Some other Free Software Foundation software is
covered by the GNU Library General Public License instead.) You can
apply it to your programs, too.

When we speak of free software, we are referring to freedom, not
price. Our General Public Licenses are designed to ensure that you
have the freedom to distribute copies of free software (and charge for
this service if you wish), that you receive source code or can get it if
you want it, that you can change the software or use pieces of it in
new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid
anyone to deny you these rights or to ask you to surrender the rights.
These restrictions translate to certain responsibilities for you if you
distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether
gratis or for a fee, you must give the recipients all the rights that you
have. You must ensure that they, too, receive or can get the source
code. And you must show them these terms so they know their
rights.

We protect your rights with two steps: (1) copyright the software, and
(2) offer you this license which gives you legal permission to copy,
distribute, and modify the software.
Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions to copy, distribute, and modify follow.

**Terms and conditions for copying, distributing, and modifying**

This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The “Program”, below, refers to any such program or work, and a “work based on the Program” means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term “modification.”) Each licensee is addressed as “you.”

Activities other than copying, distributing, and modifying are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does. This license states that:

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.
You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

   a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

   b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

   c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on
a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, or distribute the Program is void, and will automatically terminate your rights under this License.
However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing, or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute, or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that
system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and “any later version,” you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM “AS IS”
WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS
This appendix lists the VNX Command Set provided for managing, configuring, and monitoring of Data Movers. The commands are prefixed with migrate, and appear alphabetically. The command line syntax (Synopsis), a description of the options, and an example of usage are provided for each command. Commands included are:

- migrate_system_conf ................................................................. 850
- Roll back script ........................................................................ 854
migrate_system_conf

Migrates Data Mover level or cabinet level configurations from source system.

SYNOPSIS

migrate_system_conf {
  -mover
    -source_system {<celname> | id=<celId>}
    -source_user <username>
    -source_mover <movername>
    -destination_mover <movername>
    -service
    {-all
      |{
        [ldap,] [ftp,] [sftp,] [http,] [nis,] [dns,] [ntp,] [passwd,] [group,] [cepp,] [cava,] [server_param,] [usermapper_client,] [netgroup,] [nsswitch,] [hosts,] [cifs]
      }
    [-overwrite_destination]
  }
  -cabinet
    -source_system {<celname> | id=<celId>}
    -source_user <username>
    -service usermapper
    [-overwrite_destination]
}

DESCRIPTION

Migrates configurations from source system to destination system. These configurations can be Data Mover level configuration or cabinet level configurations.

OPTIONS

-mover
Migrates mover-level configuration.
  -source_system {<celname> | id=<celId>}
  Specifies a name or an ID of the source system.
  -source_user <username>
  Specifies an SSH user of the source system. A hidden option, "-p <passwd>" can be specified, or the command prompts for user input by default. The system will not prompt for a password if passwordless login is configured.
  -source_mover <movername>
  Specifies the name of a Data Mover in the source system.
  -destination_mover <movername>
  Specifies the name of a Data Mover in the destination system.
The migrate Commands

-service
Migrates services of different types. The -service option can be executed either by using the -all option or by specifying the following individual services: ldap, ftp, sftp, http, nis, dns, ntp, passwd, group, cepp, cava, server_param, usermapper_client, netgroup, nsswitch, hosts, cifs.

When the -all option is used, all mover configurations are migrated. If not, uses comma-separated format to include names of service types to migrate.

Note: Whenever server parameters are migrated the destination DM will be rebooted, even if no actual parameter values have been changed. The migrate_system_conf script does not support the migration of server parameters if a file system is mounted as RW on the destination DM.

[-overwrite_destination]
Configures services identical to those of the source system, if the source system has services configured. Otherwise, resets the services to the default value, which are customized for destination VNX system version.

-cabinet
Migrates cabinet-level configuration.

-source_system {<celname | id=<celld>}
Specifies a name or an ID of the source system.

-source_user <username>
Specifies an SSH user of the source system. A hidden option, "-p <passwd>" can be specified, or the command prompts for user input by default.

-service usermapper
Migrates the usermapper service. For cabinet level configuration, only usermapper service is available.

[-overwrite_destination]
Configures services identical to those of the source system, if the source system has services configured. Otherwise, resets the services to the default value, which are customized for destination VNX system version.

SEE ALSO nas_cel, server_file, server_ldap, server_ssh, server_http, server_nis, server_dns, server_setup, server_viruschk, server_cepp, server_param, server_cifs, server_usermapper, and server_certificate.
The migrate Commands

**EXAMPLE #1**
To migrate configuration of DNS and NTP from a source Data Mover, type:

```
$ migrate_system_conf.pl -mover -source_system 145_16 -source_user nasadmin -source_mover server_2 -destination_mover server_2 -service dns,ntp
```

Check network connnection.....................................started
Please Input password for SSH to login nasadmin@10.244.82.52:
Check network connnection...................................succeeded
Check DNS conflict............................................started
Check DNS conflict..........................................succeeded
Check NTP conflict............................................started
Check NTP conflict..........................................succeeded
DNS migiration................................................started
DNS migiration..............................................succeeded

----------------------------------------------------------------------------------------------------------------------------------
Succeed to copy:  [ntp dns]

**EXAMPLE #2**
To migrate configuration of DNS and NTP from a source Data Mover, when SSH passwordless is configured, type:

```
$ migrate_system_conf.pl -mover -source_system 145_16 -source_user nasadmin -source_mover server_2 -destination_mover server_2 -service dns,ntp
```

Check network connnection.....................................started
Check network connnection...................................succeeded
Check DNS conflict............................................started
Check DNS conflict..........................................succeeded
Check NTP conflict............................................started
Check NTP conflict..........................................succeeded
[INFO]:DNS DNS migiration.....................................started
[INFO]:DNS DNS migiration...................................succeeded

----------------------------------------------------------------------------------------------------------------------------------
Succeed to copy:  [ntp dns]
EXAMPLE #3 To migrate configuration of CAVA from a source Data Mover, when
the destination overwritten option is specified, type:

```
$ migrate_system_conf.pl -mover -source_system 145_16
   -source_user nasadmin -source_mover server_2
   -destination_mover server_2 -service cava
   -overwrite_destination
```

Check network connection....................................started
Check network connection..................................succeeded
CAVA migration...............................................started
CAVA migration.............................................succeeded

Succeed to copy: [cava]

[WARNING]: The virus checking rights on the local group of the source data mover
has not been migrated to the destination.
You will need to reconfigure the virus checking rights on the destination using
the MMC Snap-in.

EXAMPLE #4 To migrate usermapper service from a source cabinet, type:

```
$ migrate_system_conf.pl -cabinet -source_system id=1
   -source_user nasadmin -service usermapper
```

Check network connection...................................started
Check network connection.................................succeeded
Check USERMAPPER conflict..................................started
Check USERMAPPER conflict................................succeeded
USERMAPPER migration...........................................started
Backup destination usermapper user database on DataMover [server_2] to
/tmp/root/migrate_system_conf/usermapper_backup/server_2_user_db_2013-Apr-25-09:27:23.gz
Backup destination usermapper group database on DataMover [server_2] to
/tmp/root/migrate_system_conf/usermapper_backup/server_2_group_db_2013-Apr-25-09:27:23.gz
Start to import usermapper [USER] database.. Done
Start to import usermapper [GROUP] database.. Done
USERMAPPER migration......................................succeeded

Succeed to copy: [usermapper]
Roll back script

You can roll back a VDM or FS level migration using a roll back script, which runs the commands for a migration roll back. For information about the commands to run a roll back, see the Using VNX File Migration Technical Notes.

SYNOPSIS

migrate_utility
  -migration {<migname> | id=<migId>}
  -rollback
  | -usermapper
  | -rollback -source_system {<celname> | id=<celId>}
  -source_user <username>

DESCRIPTION

After the Complete process ends and before a Delete process is initiated during a VDM or FS level migration, you can execute a manual roll back of the VDM or FS level migration. To roll back a migration or a usermapper service using the roll back script, use this command syntax:

OPTIONS

-migration {<migname | id=<migId>}
Specifies a migration roll back and the name or ID of the migration to roll back.

-rollback {<celname | id=<celId>}
Runs the commands to roll back a VDM or a FS level migration.

-usermapper -rollback -source_system {<celname | id=<celId>}
-sorce_user <username>
Specifies a usermapper roll back and runs the commands to roll back the usermapper service to the source system given the name or ID of the source system. Also, username on the source is required. You will be prompted subsequently for the related password.
EXAMPLE #1 The following is a sample of running the roll back script:

```
$ /nas/tools/migration_utility  -migration vdmMig3001 -rollback
Query information of migration (vdmMig3001)  ... succeeded
Rollback migration (vdmMig3001) ...
Check pre-conditions ...
Check migration state ...
Check migration dr solution and state ...
Check migration state ... succeeded
Check replication status ...
  - Replication (MIGVDM_vdm3001_3001) at remote: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3003) at remote: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3004) at remote: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3002) at remote: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3001) at local: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3003) at local: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3004) at local: SYNCING (destination->source)
  - Replication (MIGVDM_vdm3001_3002) at local: SYNCING (destination->source)
Check replication status ... succeeded
Check pre-conditions ... succeeded
Set migration state(ROLLING_BACK) ...
Check migration state ...
Check migration dr solution and state ...
Check migration dr solution and state ... succeeded
Set migration state ... succeeded
Get read-only file systems ...
  - 2 Source File Systems to become read-only:fs3002, fs3003
Get read-only file systems ... succeeded
Refresh replications ...
  - 4 Replication(s):MIGVDM_vdm3001_3001, MIGVDM_vdm3001_3002, MIGVDM_vdm3001_3003, MIGVDM_vdm3001_3004
Refresh replications ... succeeded
Get interfaces attached ...
  - 2 Interface(s):eth32, eth33
Get interfaces attached ... succeeded
Cut over the migration ...
---------------------------------------
Cut-over start time: 2014-02-12 02:20:28
Turn down destination interfaces ...
  - 2 Interface(s):eth32, eth33
Turn down destination interfaces ... succeeded
Reverse replications(FS) ...
  - 3 Replication(s):MIGVDM_vdm3001_3002, MIGVDM_vdm3001_3003, MIGVDM_vdm3001_3004
Reverse replications(FS) ... succeeded
Restore FS back to Read-Only ...
  - 2 Source File Systems:fs3002, fs3003
  - Retry 1 ...
Restore FS back to Read-Only ... succeeded
Reverse replications(VDM) ...
```
- 1 Replication(s): MIGVDM_vdm3001_3001
  Reverse replications (VDM) ... succeeded
  Turn up source interfaces ...
- 2 Interface(s): eth32, eth33
  Turn up source interfaces ... succeeded
  ---------------------------------------
  Cut over the migration ... succeeded
- Start time: 2014-02-12 02:20:28
- End time: 2014-02-12 02:21:20
- Duration: 52 secs
  Set migration state (READY_TO_COMPLETE) ...
  Check migration state ...
  Check migration dr solution and state ...
  Check migration dr solution and state ... succeeded
  Check migration state ... succeeded
  Set migration state ... succeeded
  Check post-conditions ...
  Check replication status ...
- Replication (MIGVDM_vdm3001_3001) at remote: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3003) at remote: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3004) at remote: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3002) at remote: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3001) at local: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3003) at local: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3004) at local: SYNCING (source->destination)
- Replication (MIGVDM_vdm3001_3002) at local: SYNCING (source->destination)
  Check replication status ... succeeded
  Check post-conditions ... succeeded
  Rollback migration ... succeeded

OK
Symbols
/.etc/homedir 519
/etc/passwd 131
/nas/sys directory 820

A
Access control levels
creating 131
deleting 131
file systems 231, 400, 426, 460
storage systems 196, 426
volumes 459
Access procedures
local 13
remote 14
ACL database 269, 528
action, nas_event 222
Activating
license keys 281
time services 561
Active Directory database 525
addressing
link-local 630
Aliases, using server_cifs 521
Antivirus 500
ARP table 483
Attached storage system, displaying 425
Auditing
CIFS configuration 518
AUTH_SYS 587
Authentication
CIFS 517
Data Mover 140

B
Backing up file systems 469
bcpio 476
BCV 200, 204, 321, 330
Block limit, quotas 337
Blockmap memory 804
Bus speed 799, 800

C
Case-sensitive, names and options 17
Celerra FileMover 65, 66, 67
CIFS connections 71
creating an HTTP connection 621
HTTP configuration file 620
HTTP connections 73, 77
NFS connections 66, 68
NFS server 70
parameters 66

HTTP 621
kerberos 521
Automatic checkpoint scheduling 809
Automatic Data Mover reboot 560
Automatic File System Extension 229
Auto-migration processes 491
Automount map 134
automount daemon 134
conflicting list 134
infile 134
outfile 134
Automounting 134
Autonegotiation 796
Autonegotiation, for Gigabit Ethernet 796
Celerra Replicator 372
Chain number, SCSI 573, 574
CHAP security 723
Checking configuration parameters 500
Checkpoint 36
Checkpoint file system 38
creating 38
refreshing 38
Checkpoint scheduling 160
CIFS 517
  ACL database 528
  activating 726
  adding NFS service 524
  alias 521
  auditing configuration 518
  authentication 517
  computer name 520
  configuration 288, 517
  connections 71
  creating a share 585
  dialect 526
  DNS 521
  FQDN 524
  homedir 519
  local users 519
  NetBIOS 519
  network backups 66
  Network neighborhood 519
  passwords 524
  security 525
  security IDs 528
  security, CIFS
    Kerberos 517
    usermapper 517
CIFS client 66
CIFS shares 585
cifsnanoroundup 666
cifssyncwrite 667
CLARiiON 425
CLARiiON array properties 426
CLARiiON pools 233, 240, 243
CLATA 200, 203, 321, 330
Clone volumes 459
Clone, volume 460
CLSTD 200, 203, 321, 330
CMATA 200, 203, 321, 330
CMSTD 200, 203, 321, 330
CNS series 801
Command set
  conventions 16
  synopsis 16
Command-line interface
  local access 13
  remote access 13
Comments 9
COMPAT, MPD 265
Component 500
Configuration parameters 500
Configuration settings 175
Connection ID 67
Control Station 13
  accessing the command-line interface 13
dual Control Stations 32
  external Usermapper 815
  failover 32
  local access 13
  NAS database 231
  nas_commands 17
  remote access 13
  starting NFSv4 service 687
  volume table 459
Conventions 16
Converting hostnames
  using DNS 583
Converting IP addresses
  using DNS 583
cpio 476
CPU, monitoring 559
Creating
  TimeFinder/FS copy 108
Current log 658
cvfsname 666

D
Daemons
  automount 134
Data Mover
  activating the standby 745
  authentication 140
  current log 658
date and time 561
device configuration 573
disk space 581
halting 559
hardware configuration 573
inodes 581
internal Usermapper 815
listing the server table 399
mounting file systems 664
operating system statistics 804
pinging 713, 715
rebooting 559
security policy settings 723
standby
designating a policy 746
policy types 746
system software version 819
time zone 561
types
nas 399
rdf 399
standby 399
vdm 399
unmounting file systems 809, 820
user accounts 812
usermapper 815
Data Mover, GPO, using server_security 723
Data Mover, motherboard type 795
Data Mover, protocol 726
Data Movers
standby 745
Dependency 500
Destination Celerra Network Servers 195
Destination file, using server_file 599
Destination volume 460
Device configuration 573
probe, save, display 573
Devices 573
Diagnostic messages
server_archive 470
Dialect, using server_cifs 526
DIR3, MPD 265
Disk space 581
Disk table 199
deleting disks 199
Disk types
BCV 200, 203, 321, 330
CLATA 200, 203, 321, 330
CLSTD 200, 203, 321, 330
CMATA 200, 203, 321, 330
CMSTD 200, 203, 321, 330
R1BCV 200, 203, 321, 330
R2BCV 200, 203, 321, 330
R2STD 200, 203, 321, 330
STD 200, 203, 321, 330
Displaying
disk space 581
Displaying system parameters 701
Distinguished name 647
DNLC 766
DNS 521, 583
activating 583
lookup server 583
server 583
Documentation, related 7
Domain, Windows NT 519
Dual Control Stations, cs_standby 32
E
ECHO_REPLY
messages receive 713, 715
ECHO_REQUEST 713, 715
messages send 713, 715
EMC Active Directory 525
emctar 477
Enabling
licenses 281
software 281
Enabling software 281
Error messages
server_archive 482
Ethernet
changing default values 796
speed, duplex 796
Event configuration file 228
Event configuration files 222
Event store 222
Events, nas_event 214
F
facility, nas_event 222
Failover
activating a standby 745
Control Station 32
Fail-safe network device 797, 803
FarCopy environment 20
Index

Fiber channel 573
File system
    access control values 231, 400, 426, 460
    aclchk 269
    Auto extension 229
    checking inodes 581
    checkpoint 36, 38
    connections 65
    default type 237, 239, 243
    deleting 50, 230, 633, 634
    extending 232
    file-level retention 240
    fsck 269
    high watermark 242
    information 231
    maximum size 242
    minimum volume size 460
    mixed-access checking 232
    mounting 664
    nbpi 239, 242
    percentage threshold 37, 38, 39
    read-only 665
    read-write 665
    renaming 231
    size 231
    total capacity 581
    types
        ckpt 230
        group 230
        mgfs 230, 491
        mirrorfs 230
        nmfs 230
        rawfs 230
        uxfss 230
        UNIX permissions 232
        virtual provisioning 229
        Windows permissions 232
File systems
    mount points 673
    notifications 667
File-Level Retention 98, 229, 238
FileMover
    HTTP 621
    FileMover connections 88
FQDN 71
Free disk space 581
FTP users 234
FTP, using server_file 599
Full sanity check 500

G
Gateway address 721
getreason 33
GID 131
GID, quotas 332, 334
Gigabit Ethernet 628
Gigabit Ethernet Copper 796
Gigabit Ethernet Fiber 796
Gigabit Ethernet, autonegotiation 796
Gigabit switch 796
GPO settings 724
GPO, group policy object 723
Group policy object 723
Group quotas 331
Group, file system 94

H
Halting a Data Mover 559
Health checkup 155
High watermark 242
Home directory, enabling 519
Hostname requirement
    server_ping 713, 715
HTTP
    authentication 621
    client 75, 78
    configuration file 620
    connections 74
    for Celerra FileMover 620
    protocol 624
    requests 74, 78
    threads 621
HTTP connections, Celerra FileMover 73, 77
HTTPS
    connections 77

I
I18N 402, 403
ICMP
    ECHO_REPLY 713, 715
    ECHO_REQUEST 713, 715
Inodes 581
Inodes, displaying 581
Internal Usermapper service 815
IP protocol, assigning 627
iPlanet
  client 645, 646
  domain 647
IP-to-MAC address 483
  setting 483
iSCSI replication
  nas_replicate 179, 229, 348, 372, 450, 680, 701
iSCSI replication 372
  nas_replicate 638, 645

K
Kadmin 640
KDC 638
Kerberos authentication 685
Kerberos configuration 638
  domain 638
  Kadmin 640
  KDC 638
  realm 638
Kerberos Domain Controller 525
Kerberos, authentication 521
Kerberos, user and data authentication 587
  keyword, nas_event 222

L
LACP, aggregation 798
Ldap 647
License key 281
License, software 281
Licensing
  nas_license 281
Link aggregation 797, 798
Link Aggregation protocol 795
Linked Celerra Network Servers 139, 450
link-local address 630
Linux 32
Load balancing 798
Loading a debug/patch image 726
Local access 13
Log files 283, 657
LUNs, for Mirror View/S 195

M
MAC addresses 798
Magnetic tape drive 678
Managing protocols 726
Maximum Transmission Unit size 627
MD5 password encryption 812
MGFS 491
mgfs 491
Migrated file system 491
MirrorView/S 195, 305
MirrorView/Synchronous 195, 305
Mixed access-checking, for file systems 232
Mixed backend system 460
Mother board 799
Mount options 665
  read-only 665
  read-write 665
Mount points
  creating, listing, deleting 673
Mount protocol 492
mountd daemon 69
Mounting a file system 664
MPD 231, 264
MPFS 675
  protocol 675
  threads 675, 676
MPFS client 676
MPFS clients 665, 669
MTU 627
MTU size
  for Ethernet 628
  for Gigabit Ethernet 628
Multi-Protocol Directory 265
Multiprotocol directory 231

N
NAS 726
NAS database 231
nbpi 239, 242
NDMP
  connections 813
    creating user accounts 814
    passwords 814
NDMP backups 824
NearCopy environment 20
Nested mount file system 230
Nested mountpoints 230
NetBIOS name 521
NetBIOS name, alias 521
NetBIOS names 592
Netgroup 589
Netgroups 589
Network
  activate DNS client 583
  display statistics 681
  operating system statistics 804
  send ECHO_REQUEST messages 713, 715
Network adapter card 795
Network interface cards
  speed 795
Network interfaces
  creating an interface 627
  enabling and disabling 627
  IP protocol 627
  MTU size 627
Network interfaces, changing default values 796
Network Neighborhood 519
NFS connections 68
NFS connections, Celerra FileMover 66, 68
NFS port 492
NFS protocol 68
NFS server, Celerra FileMover 70
nfsd daemon 69
NFSv2 491, 685
NFSv3 491, 685
NFSv4 685, 687
NFSv4 clients 692
nfsv4delegation 669
NIS
  activating 694
  deleting 694
NIS client 694
NIS domain 647
NIS server requirement
  server_ping 713, 715
NMFS 243
nonotify 667
nooplock 667
noprefetch 667
noscan 667
Notifications, for mounted file systems 667
notifyonaccess 667
notifyonwrite 667
ntcredential 668
NTLM 521, 522
O
Offset default 414
Offset, Slice Volume 414
OpenLDAP
  client 646
OpenLDAP client 645
OpenLDAP domain 647
Operating system statistics 804
Oplock, default 667
P
Parameters 701, 702
  PAX 702
Password encryption 812
Password, for users 812
PAX 709
PAX parameters 702
Permissions, for UNIX and Windows 232
PFS 36
Ping 713, 715
Policy type, for Standby
  auto 746
  manual 746
  retry 746
Portmapper 492
POSIX compatibility 472
Power fail/crash recovery 560
Primary Control Station 32
Primary Data Mover
  activating the standby 745
  restoring the standby 745
Production file system 36
Production file system (PFS) 36
Protocol, setting up 726
Protocols
  CDMS 726
  CIFS 726
  ICMP 681
  IP 681, 798
  MAC 798
  managing 726
  MPFS 675, 726
  NFS 687
RIP 719
RPC 687
TCP 681, 798
TFTP 806
UDP 681
virus checker 820
VIRUSCHK 726

Q
Quota configuration 332
Quotas
   edit 332, 334
   group 331, 332, 334
   proto user 332, 334
   report 332, 334
   user 331
Quotas, block limit 337

R
R1 20
R1 and R2 20
R1BCV 200, 204, 321, 330
R1STD 200, 204, 321, 330
R2 20
R2BCV 200, 204, 321, 330
R2STD 200, 204, 321, 330
RDF file systems 98
RDF relationship for remote Celerra 140, 451
RDF relationships 745
Realm, for Kerberos 640
Rebooting a Data Mover 559
Remote access 14
Remote Celerra
   cel_fs 20
   R1 and R2 20
   SRDF 20
Remote Celerra Network Server 140, 451
Remote disk 200
Remote file system 20
Remote NFS server, communicating with 491
Remotely-linked, Celerra Network Server 20
Remotely-linked, file systems 20
Replication for iSCSI 372
Replication for remote Celerra 140, 451
Restoring the standby Data Mover 745
RIP 719

RIP configuration 719
Root 588
root 131
Routing entries 720
Routing table 681
RPC bind 492
RPC statistics 688

S
Sanity check 500
SavVol 36
sbin 33
Scheduling 160
SCSI device table 574
   listing 574
SCSI devices 207, 573
   health check failures 574
   listing 574
Secondary file system 66, 68, 71, 73, 77
Secure NFS service 685
Security IDs 528
Security modes 526
Security policy settings 723
Security, CIFS 517
Security, for CIFS 525
Server tables, listing 399
Server types
   nas, standby 726
server_log
   examples 657
Slice entry
   deleting 414
Slice information
   displaying 414
Slice table
   listing 414
Slice Volume
   offset 414
Slice volumes
   creating 414
SnapSure 36
SnapSure checkpoint 160
SnapSure checkpoints 231
SNMP
   agent 729
   values 729
Software packages, nas_license 281
Software version, for Data Movers 819
Source file, using server_file 599
Source volume 460
SRDF link 139
SRDF relationship, initializing 351
SRDF-linked, Celerra 139
Standalone CIFS server 522
Standby
    activating 745
    restoring 745
    setting policy type 746
Standby Data Mover, activating 726
Statistics
    network 681
    NFS 687
    operating system 804
    routing table 681
    RPC 687
STD 200, 204, 321, 330
Storage pools
    creating 314
    extending 314
    system-defined 314
    user-defined 314
Storage systems 196, 426
Stub files 67
Subnet 589
sv4cpio 477
sv4crc 477
Symmetrix backend support 244, 320, 404
Symmetrix pools 233
Symmetrix storage pools 244, 320, 404
Synchronizing time 561
Synopsis 16
syslog file 37
System events 214
System health checkup 155
System parameters 701
System version, displaying 457
systems 664

NIS 694
    routing 720
    SCSI device table 574
    slice 414
Tape backup 678
tar 477
TCP 492, 583, 628
TFTP 806
Threads
    for CIFS, CDMS, or virus checker 726
    HTTP 621
    MPFS 675
Time services
    using server_date 561
Time synchronization 561
Time zone 561
TimeFinder/FS 94, 105, 106
TimeFinder/FS Far Copy 98
Timing sources 561
Trap, nas_event 222
Tree IDs 336
Tree quotas 334
triggerlevel 668
Trivial File Transfer Protocol (TFTP) 806
Trunked Ethernet channel 798
Trusted relationship 140

U
UDP 492, 583, 628
UDP sockets 681
UID 131
UID, quotas 332, 334
Umask 591
uncached 667
UNIX permissions 232
UNIX/Linux Kerberos KDC 638
User accounts 812
User accounts for NDMP 814
User-defined storage pools 314
Usermapper 528, 815
Usermapper database 818
Usermapper, CIFS 517
usrmap.cfg file 816
ustar 477
UTC 533
UTF-8 525, 526
Utilities
   aclchk 268
   fsck 268

V
VDMs
   displaying 400
   loading 401
Virtual Data Movers 399
virtual device 798
Virtual devices 797
Virtual provisioning 229, 234, 242
Virtual robot 825
Virtual tape library unit 824
Virtual tapes 830
Virtual devices
   displaying 400
   loading 401
Windows NT 4.0 493
Windows NT 4.0 domain 519
Windows NT Credential 668
Windows permissions 232
Windows popups 66
WINS server(s) 526
Virus Checker
   noscan 667
Virus checker 820, 821
   auditing 820
   configuration file 820
   upgrading 820
   viruschecker.conf 820
VLAN 628
VLTU 824
Volume table 459
Volumes
   access control levels 459
   cloning 459
   creating 459
   deleting 459
   displaying information 459
   extending 460
   getting info 459
   listing 459
   minimum size for file system 460
   renaming 459
W
Windows NT 4.0 493
Windows NT 4.0 domain 519
Windows NT Credential 668
Windows permissions 232
Windows popups 66
WINS server(s) 526