These release notes include supplemental information about the EMC® Navisphere® Host Agent, CLI, Secure CLI, Server Utility and Storage System Initialization Utility for the AIX®, VMware®, HP-UX®, IRIX®, Linux®, NetWare®, Solaris™, Windows Server™ 2003, and Windows® 2000 operating systems.

This document uses the term “pre-FC4700” to refer to an FC4500, FC5300, FC5500, FC5700, or C-series storage system.

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Product description

The EMC SP Agent (Array Agent), which resides on the storage processors (SPs) in CX-series and FC4700-series storage systems, communicates with Navisphere client applications to manage CX-series and FC4700-series storage systems. The EMC Navisphere Host Agent is server-based software that communicates with Navisphere client applications, such as the Navisphere Command Line Interface (CLI) and Manager, to manage pre-FC4700 storage systems. A Host Agent automatically registers hosts and host bus adapters (HBAs) and also provides drive mapping information for the UI and CLI. The Host Agent has no direct user interface. Therefore, it must be configured with the remote agent configuration feature of Navisphere Manager or CLI or by editing the Host Agent configuration file.

Although Navisphere clients do not manage CX-series and FC4700-series storage systems through the Host Agent, the Host Agent is still required for the registration of the HBAs with the SPs to which they are connected and for integrating host-side information such as device and volume names. Several Navisphere clients can communicate with one Navisphere Host Agent. In addition, a Host Agent can manage several pre-FC4700 storage systems. A Host Agent, however, should have only one connection to a particular storage processor (SP).

For some operating systems (Windows, Solaris, AIX, and HP-UX), the Navisphere Host Agent can monitor storage-system events and take such actions as sending email or alerting a pager if specified events occur. Navisphere Manager provides an interactive way to define these events and actions. If you do not have Navisphere Manager, you can still define events and actions by editing the Event Monitor configuration file supplied with the Host Agent.

The CLI (also referred to as Classic CLI) is a client application that allows simple operations on a C-series, FC-series or CX-series storage system. The CLI issues commands to a Host or SP Agent, requests storage-system status, and displays the resulting output as a tool for problem determination.

The Secure CLI is a client application that allows simple operations on a CX-series storage system. The Secure CLI issues commands to an SP Agent, requests storage-system status, and displays the resulting output as a tool for problem determination. It is implemented using the Navisphere 6.X security model, which includes role-based management, auditing of all user change requests, management data protected via SSL, and centralized user account management.
You can use the CLI or Secure CLI in scripted applications to automate lengthy or repetitive management operations. It is also useful for obtaining quick status checks or for performing small, fast management changes.

Navisphere CLI is the client portion of a client-server application. If Navisphere CLI and Navisphere Host Agent are installed and running on the same host, this host may act as both the client and the server.

The Server Utility will scan for CLARiiON® devices and will display the list of discovered devices to the user. The utility is used for basic troubleshooting by verifying that both the connections to the storage system are correct and the mounted volumes are visible. It also allows a user to register the host with the attached storage system. Note that the Host Agent provides additional information that is not available from running the Server Utility. Drive mapping and OS information is not stored on CX-series or FC4700-series storage systems as a result of the push and therefore is available only through the Host Agent. If a user requires that information, the agent must be running on that host instead of the Server Utility.

The Storage System Initialization Utility is an application that EMC service personnel use to simplify the initialization and setup of a storage system. It provides a simple, straightforward user interface to discover and initialize storage systems. Using an existing LAN, both SPs can be set through the same operation.
New features and changes

This section describes any new features and changes for this release of the product.

- Support for 2-Gb point-to-point DAE (DAE2P)
- Greater than 2 TB of LUN support
- FSC ServerView support (improved storage-system monitoring)
- Manage security and domain settings with the CLI. New commands have been added in Secure CLI to allow you to manage your domain and security settings.
- Secure CLI support on Windows (2000 and 2003), Solaris (8, 9 and 10), and Linux (Red Hat 3.0 U1 and 4.0 U1, and AsianUX 1.0). Secure CLI provides the same level of security and functionality as Java CLI (without the JRE requirement) along with the functionality of Classic CLI. Please refer to “Technical notes” on page 24 regarding Secure CLI restrictions.
- Ability to manage AX100-series storage systems. With an optional Enabler you can manage AX100-series systems with Navisphere CLI and Secure CLI. There are some restrictions, so refer to “Technical Notes” on page 24.
Environment and system requirements

This section explains the minimum hardware and software environments for proper operation of this release of the Host Agent, CLI, Secure CLI, Server Utility, and Storage System Initialization Utility.

Note: See the EMC Support Matrix for specific supported OS versions.

Not all operating systems support Application Transparent Failover (ATF), CDE, or PowerPath® software.

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum hardware requirements</th>
<th>Minimum software requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solaris</td>
<td>Sun system capable of accepting PCI, Sbus, or cPCI HBAs with at least 30 MB of free disk space and 64 MB of RAM.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath</td>
</tr>
<tr>
<td>Windows</td>
<td>Intel-compatible PC with 64 MB of RAM and at least 30 MB of free disk space.</td>
<td>OS</td>
</tr>
</tbody>
</table>
### Environment and system requirements

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum hardware requirements</th>
<th>Minimum software requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AIX</strong></td>
<td>IBM AIX workstation with at least 64 MB of RAM and 14 MB of free disk space.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td><strong>HP-UX</strong></td>
<td>HP server with at least 30 MB of free disk space and 64 MB of RAM.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>
### Environment and system requirements

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum hardware requirements</th>
<th>Minimum software requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NetWare</strong></td>
<td>Novell NetWare server with 512 MB of RAM and at least 30 MB free disk space.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td><strong>Linux</strong></td>
<td>An Intel-compatible, processor-based system capable of accepting PCI HBAs, with at least 200 MB of free disk space and 64 MB of RAM.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath</td>
</tr>
<tr>
<td><strong>IRIX</strong></td>
<td>An SGI Origin 2000 or 3000 system with at least one XIO bus slot available, and at least 30 MB of free disk space and 64 MB of RAM.</td>
<td>OS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td><strong>Tru64</strong></td>
<td>DS, ES, GS series Alpha Server</td>
<td>OS</td>
</tr>
</tbody>
</table>

*Note*: There is no Host Agent for the Tru64 platform. See the document, *EMC Host Connectivity Guide for HP Tru64 UNIX* on the EMC Powerlink™ website for more information.
### Environment and System Requirements

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum Hardware Requirements</th>
<th>Minimum Software Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware</td>
<td>VMware ESX Server™ with sufficient memory and disk space.</td>
<td>OS ESX 2.1 with Native Failover only. ESX 2.5 with Native Failover only. ESX2.5.1 with Native Failover only.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PowerPath Not supported.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other None</td>
</tr>
</tbody>
</table>

**Note:** In addition to the software revisions previously listed, the operating system on the server that will run the Java-based CLI client must support Java JRE revision 1.4.0 or higher. The operating systems currently qualified to support this release of Java-based CLI are:

- Windows Server 2003
- Windows XP
- Windows 2000 with SP3 or SP4
- Sun Solaris 7, 8, 9 and 10
- Linux Red Hat Enterprise Linux 3.0 and 4.0
- Linux IA64 AS 3.0, AS 4.0
- SuSE Linux SLES 8.0
- IBM AIX 5.1, 5.2, and 5.3
- Hewlett-Packard HP-UX 11.0 and 11i
- IRIX 6.5
- Novell NetWare 6.0 and 6.5
- VMware ESX Server 2.5.1
Navisphere management software requirements

To take advantage of features introduced with this release, the software versions of all components of FLARE must be at version 02.19.yyy and of Navisphere software must be at 6.19. EMC recommends that you always use the current shipping version of Navisphere Agent and Navisphere Manager to manage domains and for off-array management stations. Navisphere Manager and Navisphere CLI are compatible with older versions of software but newer features will not be available depending on the combination of software versions in use.

The following table describes the compatibility matrix for Navisphere software:

<table>
<thead>
<tr>
<th>FLARE</th>
<th>CLI/Host Agent</th>
<th>Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.19 (AX)</td>
<td>6.19</td>
<td>6.19</td>
</tr>
<tr>
<td>8.51.20 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.51.70 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02.19 (CX)</td>
<td>6.19</td>
<td>6.19</td>
</tr>
<tr>
<td>8.51.10 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.51.60 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x.32 (Pre-FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02.17 (CX)</td>
<td>6.19</td>
<td>6.19</td>
</tr>
<tr>
<td>8.51.10 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.51.60 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x.32 (Pre-FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02.16 (CX)</td>
<td>6.19</td>
<td>6.19</td>
</tr>
<tr>
<td>8.51.10 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.51.60 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x.32 (Pre-FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02.07 (CX)</td>
<td>6.19</td>
<td>6.19</td>
</tr>
<tr>
<td>8.51.10 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.51.60 (FC4700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x.32 (Pre-FC4700)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Does not support new features.
NOTES:

1. Version 6.7 of Java CLI is not compatible with version 02.16 or later of FLARE.

2. The version of the Central Monitoring Host Agent must be at least as new as the newest revision of the monitored storage systems.

3. Secure CLI can be used only with version 02.19 of FLARE.

4. Use of older clients may result in anomalies in behavior. It is recommended to use a client that is at least of equal revision as the storage-system software.
Fixed problems

This section lists significant issues that were fixed in this release or that were called out in a previous version of the release notes.

Visit the EMC Powerlink™ Issue Tracker website at [http://Powerlink.EMC.com](http://Powerlink.EMC.com) for the most recent updates and information on previous Navisphere Host Agents, Navisphere CLI and Navisphere Server Utilities releases.

<table>
<thead>
<tr>
<th>Problem description</th>
<th>Solution description</th>
<th>Fixed release</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLI</strong> – When reconnecting hosts using the <code>storagegroup</code> command, the user is never informed that all failover-related initiator settings need to be consistent. <strong>Frequency</strong> – Always [131119]</td>
<td>Now the user is presented with the warning string: <strong>WARNING</strong>: Changing configuration options may cause the array to stop functioning correctly. Failover-related initiator settings for a single host MUST BE CONSISTENT for all paths from the host to the storage system. Please verify after reconnect.</td>
<td>Navisphere 6.19.2.6.0</td>
</tr>
<tr>
<td><strong>JAVA CLI</strong> – Sometimes the management server process will hang. This will cause all Java CLI commands to fail until the process is restarted. <strong>Frequency</strong> – Rare [131264]</td>
<td>There were certain situations that would cause two threads to become deadlocked. The lock contention between threads has been resolved.</td>
<td>FLARE OE 02.19.xxx.5.030</td>
</tr>
<tr>
<td><strong>CLI and Java CLI</strong> – Invalid SP hostnames can be set in the Setup page. These invalid hostnames may cause the SP Agent and management server processes to have problems starting up. This will cause CLI and Java CLI commands to fail. <strong>Frequency</strong> – Frequent when having invalid hostnames. [133422]</td>
<td>The Setup page will now prevent the user from entering a hostname that is not valid.</td>
<td>FLARE OE 02.19.xxx.5.030</td>
</tr>
</tbody>
</table>
### Fixed problems

<table>
<thead>
<tr>
<th>Problem description</th>
<th>Solution description</th>
<th>Fixed release</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLI and Java CLI</strong> – The SP panics when the management server process holds a PSM file open too long. A thread was incorrectly holding a lock for 2000 seconds. If a thread that had a PSM file open was also waiting for that lock, the PSM timer would run out and panic the SP.</td>
<td>The thread in question now correctly waits for 1 second instead of 2000 seconds.</td>
<td>FLARE OE 02.19.xxx.5.030</td>
</tr>
<tr>
<td><strong>Frequency</strong> – Rare.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Java CLI</strong> – If FLARE goes into degraded mode, the management server process cannot get the IP address of the SP and will not start.</td>
<td>The management server process was using an older version of FLARE API. It now uses the correct version and is able to get the IP address even if FLARE is in degraded mode.</td>
<td>FLARE OE 02.19.xxx.5.030</td>
</tr>
<tr>
<td><strong>Frequency</strong> – Rare</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Java CLI</strong> – The metaLun –list command does not accurately maintain the components in the same order in which they were added to the metaLUN.</td>
<td>The management server process changed how it stored the components by using a hash table instead of a standard list. The components are now also stored in a list to maintain the order in which they were added. This list is used only for the list command so that the other commands still get the performance of using a hash table.</td>
<td>FLARE OE 02.19.xxx.5.030</td>
</tr>
<tr>
<td><strong>Frequency</strong> – Always</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLI</strong> – MetaLUNs are not allowed to be added to the reserved LUN pool via the reserved command.</td>
<td>The checks were lifted so that metaLUNs can now be added to the reserved LUN pool.</td>
<td>Navisphere 6.19.2.6.5</td>
</tr>
<tr>
<td><strong>Frequency</strong> – Always</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLI</strong> – The getallvisualsan command will abort if there are any snapshots defined on the storage system.</td>
<td>The code was incorrectly checking for a certain property that does not exist when working with a snapshot. It was causing an exception that would abort the CLI output. A check was added to see if it is a snapshot before attempting to retrieve the property.</td>
<td>Navisphere 6.19.2.6.5</td>
</tr>
<tr>
<td>Problem description</td>
<td>Solution description</td>
<td>Fixed release</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
</tbody>
</table>
| **Navisphere Storage System Initialization** Utility – The Navisphere Storage System Initialization Utility will not discover a storage system that has a version of Management Server whose third field is greater than that of the Storage System Initialization Utility. For example, a 6.19.0.x.y Storage System Initialization Utility will not discover a storage system running 6.19.1.x.y of Management Server.  
[129027] | The Storage System Initialization Utility now checks only the first two fields of the Management Server version.  
[129027] | Navisphere – 6.19.1.0.0                                                              |
| **CLI and Java CLI** – Sometimes, the SP Agent will hang while it is trying to restart itself due to reaching one of its resource thresholds. The only way to restart it is to reboot the SP. While it is in this state the SP will go unmanaged, all CLI commands will fail, and Java CLI commands may have invalid data.  
[129924] | Call the correct system API to avoid getting stuck during shutdown.  
[129924] | FLARE OE – 02.19.xxx.5.016                                                          |
| **CLI & Java CLI** – A memory leak in the Management Server and SP Agent processes may cause them to restart. While the process is restarting, Java CLI and CLI commands will fail.  
[129928] | Fixed the memory leak.  
[129928] | FLARE OE – 02.19.xxx.5.016                                                          |
| **CLI (AIX Only)** – Issuing an `ndu –install` command from AIX will cause all subsequent CLI commands on that system to hang.  
[130025] | Correctly handle the shutdown of the network connection, leaving it ready for the next CLI command.  
[130025] | Navisphere – 6.19.1.3.0                                                              |
| **Host Agent** – The string “0x” is being added to the beginning of all event codes sent through Event Monitor’s email notification service.  
[131913] | Fixed event monitor to no longer add the “0x” to the event codes.  
[131913] | Navisphere – 6.19.1.3.0                                                              |
| **CLI** – A user cannot add LUNs to multiple storage groups.  
[118064] | The user will now receive an error message if they try to place an LU that is already in a storage group into another storage group and specify the “nonshared” switch. No warning is given if the switch is not explicitly specified.  
[118064] | Navisphere – 6.19.0.4.14                                                            |
Known problems and limitations

This section includes important information that does not appear anywhere else. This section consists of two major subsections:

- The first one describes problems and limitations that are common to Host Agents for all platforms.
- The second section describes problems and limitations for platform-specific Host Agents.

Visit the EMC Powerlink Issue Tracker website at http://Powerlink.EMC.com for the most recent updates and information on previous Navisphere Host Agents, Navisphere CLI, and Navisphere Server Utilities releases.

Problems and limitations common to all platforms

The information described in the following sections applies to all platforms that support the Navisphere Host Agent, CLI, Secure CLI, Server Utility and Storage System Initialization Utility software.
## Problem area and description

**Agent – Storage groups.** When using storage groups, it is not possible to properly log a host in to the storage system. These symptoms can be observed under any of the following circumstances:

- A multi-homed server has two IP addresses and possibly two hostnames.
- In a cluster, a host may have multiple IP addresses. Typically one is for the cluster and others are for each individual host in the cluster. This can lead to the same problems as above.
- Incorrect or incomplete server network settings can also lead to problems. One possible scenario is incorrect DNS settings.
- A host is not known to DNS or any other name service. As a result, the host can be contacted only by using its IP address.

## Workaround

Manually create a file named `agentID.txt` with the format in the following example:

```
hostname
128.221.41.34
```

**Note:** The location of this file depends upon the host type and the existence (or lack thereof) of an environment variable as follows: If environment variable `EV_AGENTID_DIRECTORY` is defined and not of zero length, its value is used. Otherwise, for Windows only, if the location of the agent configuration file can be found in the registry (HKEY_LOCAL_MACHINE\SOFTWARE\EMC\Agent\1.0\ConfigPath), its value will be used. Otherwise, directory `\` is used for Windows, `/` for UNIX systems, and `sys:\` for NetWare.

The purpose of this file is to tell the Host Agent what hostname/IP address to use, so that it matches the one the client uses. The fully qualified hostname must be on the first line of the file, and the host's dot-notation IP address must be on the second line. Comments are allowed in the file on lines following these two lines only. Lines are visible only if they are properly terminated; adding a blank line after the first two lines would ensure this. Lines may be empty, in which case the corresponding value defaults to what it would have been in the absence of this file.

Enter the IP address that you obtain when you perform a network name lookup from the client machine. Look for the hostname that the client will manage. One way to get a host's IP address to enter into this file is to ping the hostname from the client machine.

**Warning:** This is a change from Navisphere Host Agent 6.2 and earlier. The use of `agentID.txt` on UNIX platforms required that your current working directory be `"/"` when manually starting the Agent. Failure to do this resulted in the wrong hostname and/or IP address being used. Therefore, any assumptions that may have been made regarding the use of the current working directory are no longer valid.
### Known problems and limitations

<table>
<thead>
<tr>
<th>Problem area and description</th>
<th>Workaround</th>
</tr>
</thead>
</table>
| **Agent – Host information.** It is possible to have different host information displayed in the storage group Properties, Storage Access tab and the Host Access Table for hosts having the same zoning configuration. | To guarantee the removal of stale initiator records from the storage system:  
1. Ensure that all initiator records for the host on the troubled storage system are logged in, if they should be. Then delete not-logged-in initiator records for the host on the troubled storage system.  
2. Use CLI `register -list` to verify that the correct number of pushes was attempted, and that all such pushes succeeded, to the troubled storage system.  
3. Restart the Management Server(s) for the storage systems that were in a bad state that the host was connected to. |
<p>| <strong>CLI – Unbinding a LUN.</strong> When unbinding a LUN, you may receive the following error: LUN is being used by a feature of the storage system. [71764] | If MirrorView™, SnapView™, or SAN Copy™ software is using the LUN, you must remove that association before unbinding the LUN. If SnapView, MirrorView, or SAN Copy is not using the LUN, then create a snapshot session on the LUN and remove it. Then you can unbind the LUN. |
| <strong>CLI – LCC pulled.</strong> If one of the LCCs is pulled from bus x enclosure x, all data along that bus (after the LCC was pulled) appears faulted since the Agent cannot gather any information along that path. [75017] | Issue the CLI <code>getcrus</code> command to the peer SP. The CLI displays an accurate listing of the faulted components. |
| <strong>CLI – Binding PSM LUN (FC4700-series only).</strong> If you issue the <code>reboot</code> command against an FC4700-series storage system whose PSM LUN is currently binding (as a result of the <code>navicli initializearray -createpsm</code> command), the storage system rejects the reboot directive, but the SP Agent has already returned to the client, so no error displays. | Wait for the PSM LUN (LUN 223) to be fully bound before issuing the <code>reboot</code> command. |
| <strong>CLI – Active drives in a powered down enclosure.</strong> Drives that reside in a powered down enclosure might appear as active during a <code>getdisk</code> command. This will occur only if the drive is part of an active LUN. [83599] | None required. |
| <strong>CLI – Renaming LUNs on a storage system without Access Logix.</strong> Renaming a LUN on a storage system without Access Logix does not flag an error and appears successful. The LUN, however, does not get renamed and no error is reported. | Naming of LUNs is not supported on some older non-Access Logix storage systems. |</p>
<table>
<thead>
<tr>
<th>Problem area and description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLI – navicli.exe compatibility mode commands.</strong> If any navicli.exe compatibility mode commands (MirrorView, in this case) are issued anywhere outside of <code>/opt/Navisphere/bin/</code>, the Java will output the following exception: # navicli -h 10.15.23.118 mirrorview</td>
<td>Check with the JRE for the particular OS that you are working with for information on setting up environment variables to find the location of JAR files.</td>
</tr>
<tr>
<td>Exception in thread &quot;main&quot; java.util.zip.ZipException: No such file or directory at java.util.zip.ZipFile.open(Native Method) at java.util.zip.ZipFile.&lt;init&gt; (Unknown Source) at java.util.jar.JarFile.&lt;init&gt; (Unknown Source) at java.util.jar.JarFile.&lt;init&gt; (Unknown Source) at [97666]</td>
<td></td>
</tr>
<tr>
<td><strong>CLI – Binding LUNs.</strong> When binding LUNs, all LUNs within that RAID group go to the transitioning state even though they are not all binding. [103006]</td>
<td>Wait for all bindings to complete before attempting operations on any LUNs involved in that transitioning RAID group.</td>
</tr>
<tr>
<td><strong>Java CLI – Clones.</strong> Some clone fields will be shown as –1 if they are not applicable to the particular clone. For the listclonefeature subcommand of SnapView, the following fields will be shown as –1 if they are not applicable to the clone feature: MaxCloneGroupsUsingCPL MaxClonesPerGroup MaxLUNsPerSource MaxCloneMemory CplSPA CplSPB MinCplSize For the listclonegroup subcommand of SnapView, the following fields will be shown as –1 if they are not applicable to the clone group: QuiesceThreshold SourceLUNSize PercentSynced For the listclone subcommand of SnapView, the following field will be shown as –1 if it is not applicable to the clone: PercentSynced [82453]</td>
<td>None required.</td>
</tr>
</tbody>
</table>
## Known problems and limitations

<table>
<thead>
<tr>
<th>Problem area and description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Java CLI – MetaLUNs.</strong> When a metaLUN is owned by a particular SP, and that SP is removed, the metaLUN is still shown as being owned by that SP. [85120]</td>
<td>None required.</td>
</tr>
<tr>
<td><strong>Java CLI.</strong> Java CLI occasionally hangs when running from a multiprocessor system. [94478]</td>
<td>This is due to a bug in JRE 1.4 which has been fixed in JRE 1.4.1_02.</td>
</tr>
<tr>
<td><strong>Java CLI – Creating MetaLUNs.</strong> Java CLI cannot create a metaLUN that has a size of 2 TB. The largest capacity is 2 TB – 1 block or 4,294,967,295 blocks. (100008)</td>
<td>None</td>
</tr>
<tr>
<td><strong>Java CLI - Destroying MetaLUNs.</strong> When destroying a large number of metaLUNs in one operation, a timing condition in the Management Server may result in the CLI reporting the presence of the metaLUNs when in fact they have been successfully destroyed. [109415]</td>
<td>For each SP, enter &lt;ip address&gt;/setup to access the Storage Management Server setup page. After logging in, click the Restart Management Server button.</td>
</tr>
<tr>
<td><strong>Navisphere Server Utility.</strong> For multipath devices, the SP field under File Systems On Storage Systems in the Server Utility represents the first path that the OS sees and is not really the owner SP of the device [114201].</td>
<td>None.</td>
</tr>
<tr>
<td><strong>CLI – Primary mirror.</strong> The enable path CLI command that points to a version 02.07 storage system that is the primary mirror to a storage system running a revision later than version 02.07 will not work properly. Only one path will be enabled; the other path will have Unusable (one-way) status.</td>
<td>Use a version 02.16 or later storage system as the primary image storage system and issue the command to point to that storage system.</td>
</tr>
<tr>
<td><strong>CLI – Snapshots.</strong> When using a pre-version 6.19 client and a version 02.19 storage system to create a snapshot, the user receives an incorrect error message: error 0x7100808b -- Snapshot name already exists [122518]</td>
<td>The error is incorrect, with the snapshot actually being created. To get rid of the error message upgrade CLI to version 6.19.</td>
</tr>
<tr>
<td><strong>CLI – Unbinding a rebuilding LUN.</strong> When attempting to unbind a rebuilding LUN, the operation may fail. The following error message will be displayed: navicli -h &lt;= unbind &lt;lun_id&gt; -o Error: unbind command failed Error returned from Agent SP A: Unrecognized Error Code (0x40008053) [125099]</td>
<td>Try the command again.</td>
</tr>
</tbody>
</table>
Known problems and limitations

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<tr>
<th>Problem area and description</th>
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</thead>
<tbody>
<tr>
<td><strong>CLI – Changing fibre port speed on AX100</strong>. Changing the fibre port speed on an AX100 is not supported. Currently, the command <code>spportspeed –set</code> is not blocked, but it is not supported with AX100 storage systems. [129629]</td>
<td>Do not use the CLI command <code>spportspeed –set</code> with AX100-series storage systems.</td>
</tr>
<tr>
<td><strong>CLI – LUN name</strong>. A LUN name has missing or different characters in name. The CX700, CX500 and CX300 do not support ASCII characters that are greater than 128. These characters will appear as spaces or different characters when outputted. [129547]</td>
<td>Do not use characters whose ASCII value is greater than 128 when creating LUN names.</td>
</tr>
</tbody>
</table>

Problems and limitations for specific platforms

The information described in the following section applies to specific platforms that support the Navisphere Host Agent, CLI, Server Utility and Storage System Initialization Utility software. These platforms are listed alphabetically.

AIX operating system

<table>
<thead>
<tr>
<th>Problem area and description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agent – Registering host information</strong>. AIX agent does not register host information to an FC4700 storage system on startup.</td>
<td>For AIX 5.1+ attaches that now use ODM definitions rather than CLArray, without the CLArray driver to provide sp# devices, storage systems must be configured with <code>arraycommpath=1</code>, so that the OS creates appropriate <code>hdisk#</code> devices.</td>
</tr>
<tr>
<td><strong>Agent – Starting</strong>. Agent will not start at boot time. The agent may terminate when trying to start it at <code>/etc/inittab</code> time. [110422]</td>
<td>Use the following <code>/etc/inittab</code> entry to delay the start of the agent: <code>naviagent:2:once:at now + 4 minutes /etc/rc.agent &gt; /dev/console 2&gt;&amp;1</code></td>
</tr>
<tr>
<td><strong>Storage System Initialization Utility</strong>. The AIX version of the Storage System Initialization Utility has the limitation that storage systems cannot be discovered since the broadcast works only for IP-level broadcast addresses and not Ethernet-level broadcast addresses. [110605]</td>
<td>Use the utility on one of the other supported operating systems to initialize the storage system.</td>
</tr>
<tr>
<td><strong>Java CLI – managefiles –list command</strong>. The java CLI <code>managefiles –list</code> command fails on AIX platforms. [129339]</td>
<td>Use the classic CLI <code>managefiles –list</code> command instead.</td>
</tr>
<tr>
<td><strong>Installation from CD</strong>. Installing from the CD does not work for AIX host-based applications. [129338]</td>
<td>Please refer to the “Technical notes” section for the workaround.</td>
</tr>
</tbody>
</table>
**Known problems and limitations**

### HP-UX operating system

<table>
<thead>
<tr>
<th>Problem area and description</th>
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<tbody>
<tr>
<td><strong>CLI – NDU.</strong> NDU does not work. If you issue the <code>navicli</code> command <code>ndu -install &lt;package name&gt;</code> from an HP-UX host, the CLI will reject the command. [73044]</td>
<td>The NDU operation on HP-UX is not supported. You should use either Navisphere Manager UI or Navisphere <code>navicli</code> on a platform that supports the NDU operation (Windows, Solaris, Linux, Netware, AIX, SGI) to install software on a CX-series or FC4700-series storage system.</td>
</tr>
<tr>
<td><strong>CLI – CLI cores if Agent is not running.</strong> If you issue a <code>navicli</code> command at an IA64 Agent that is not currently running, <code>navicli</code> will core.</td>
<td>You should make sure the IA64 Agent is installed and running before issuing <code>navicli</code> commands to it.</td>
</tr>
</tbody>
</table>

### IRIX operating system

<table>
<thead>
<tr>
<th>Problem area and description</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>CLI – getlun command.</strong> The user may see slower performance when entering a <code>getlun</code> command without any switches or with a combination of switches that request idle and busy statistics for the disks. This is noticeable when issuing the command for all LUNs when there is a large number of LUNs. [124767]</td>
<td>None</td>
</tr>
</tbody>
</table>

### Linux operating system

<table>
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<tr>
<th>Problem area and description</th>
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<tr>
<td><strong>CLI – getlun command.</strong> The user may see slower performance when entering a <code>getlun</code> command without any switches or with a combination of switches that request idle and busy statistics for the disks. This is noticeable when issuing the command for all LUNs when there is a large number of LUNs. [124767]</td>
<td>None</td>
</tr>
<tr>
<td><strong>Agent – Heavy I/O.</strong> If the server is running heavy I/O to a storage system with a large number of LUNs (greater than 40), the server can use up memory resources and then crash.</td>
<td>Keep the number of LUNs to a number less than 40 until Linux is more refined. If you cannot do this, then unload the <code>sg</code> driver prior to running I/O.</td>
</tr>
<tr>
<td><strong>Agent – SuSE SLES 9 (64 bit) Agent script problems.</strong> The <code>/etc/init.d/naviagent start/stop/status</code> script uses the Checkproc and Killproc operating system calls, which do not work. [123433]</td>
<td>The user can manually stop and start the agent with the following commands: To stop: <code>kill &lt;pid_of_naviagent&gt;</code> To start: <code>/opt/Navisphere/bin/naviagent -f /etc/Navisphere/agent.config</code> This will be addressed in a future release.</td>
</tr>
<tr>
<td>Problem area and description</td>
<td>Workaround</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Agent – LINUX RHEL4 x86_64 Agent warning upon startup.</strong> The LINUX RHEL4 x86_64 Agent issues a nuisance warning upon startup. The /var/log/messages log will contain the following error message: <code>program scsi_unique_id is using a deprecated SCSI ioctl, please convert it to SG_IO</code> [126307]</td>
<td>Ignore the error.</td>
</tr>
</tbody>
</table>

### NetWare operating system

<table>
<thead>
<tr>
<th>Problem area and description</th>
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</thead>
<tbody>
<tr>
<td><strong>CLI – managefiles -retrieve command fails to upload files to NetWare servers when file is not in 8.3 naming format. The command will eventually time out.</strong></td>
<td>Run CLI command from a Windows server.</td>
</tr>
<tr>
<td><strong>CLI – getlun command.</strong> The user may see slower performance when entering a <code>getlun</code> command without any switches or with a combination of switches that request idle and busy statistics for the disks. This is noticeable when issuing the command for all LUNs when there is a large number of LUNs. [124767]</td>
<td>None</td>
</tr>
<tr>
<td><strong>CLI – Compatibility mode.</strong> Compatibility mode does not work on the NetWare operating system. Unable to launch the Java process from within the classic CLI process. [104623]</td>
<td>None</td>
</tr>
<tr>
<td><strong>Agent – Missing file error message.</strong> If you start the Host Agent when no PowerPath software is installed, you may see the following message: <code>Unable to find load file LIBEMCMP.nlm</code> [72697]</td>
<td>Ignore the message.</td>
</tr>
<tr>
<td><strong>Agent – Using the Access Logix option on existing storage systems.</strong> You want to create storage groups on storage systems with the Access Logix option that are connected to NetWare hosts.</td>
<td>You must unload and then reload the HBA driver after enabling data access for each storage system. You will first need to unload the Agent.</td>
</tr>
<tr>
<td><strong>Agent - Modifying LUN 0.</strong> NetWare identifies the first LUN you add to a storage group as LUN 0. If you modify LUN 0, the LUN may become unrecognized to NetWare.</td>
<td>You must unload and then reload the HBA driver. NetWare then recognizes the modified LUN 0. You will first need to unload the Agent.</td>
</tr>
<tr>
<td><strong>Agent – NetWare Agent terminating requests.</strong> If NetWare Agent receives requests from clients with unknown hostnames, it may terminate due to a compiler problem.</td>
<td>Ensure that all clients have their hostnames and IP addresses listed in the network address database.</td>
</tr>
</tbody>
</table>
### Known problems and limitations

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<tbody>
<tr>
<td><strong>Agent – NetWare 6.5.</strong> NetWare 6.5 appears to have a behavior change that causes an abend during a <strong>restart server</strong> but not an <strong>unload navagent</strong>. (Perhaps this is due to unmounting the <strong>sys</strong> volume before Navisphere Agent, which has a file open on that volume, is unloaded.)</td>
<td>The easiest way to avoid this problem is to type <strong>unload navagent</strong> before <strong>restart server</strong>.</td>
</tr>
</tbody>
</table>

### VMware operating system

<table>
<thead>
<tr>
<th>Problem area and description</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Agent.</strong> Do not run the Navisphere Agent from within a virtual machine. The registration to the attached storage system will overwrite ESX Server registration information.</td>
<td>Do not install a naviagent into a virtual machine. If this should happen accidentally, uninstall the agent and then restart the ESX console naviagent service.</td>
</tr>
<tr>
<td><strong>CLI.</strong> Five commands require a local Host Agent to be running. Since the naviagent should not be installed into a virtual machine, the following five commands will fail: <strong>getagent, remoteconfig, getatf, lunmapinfo and register.</strong></td>
<td>Do not issue these CLI commands from a virtual machine. These commands can still be issued if the commands are redirected via the <strong>-h</strong> switch.</td>
</tr>
<tr>
<td><strong>Navisphere Server Utility.</strong> Do not run this utility from within a virtual machine. The registration to the attached storage system will overwrite ESX Server registration information.</td>
<td>Do not install this utility into a virtual machine. If this utility is installed and run by accident, uninstall the utility and then restart the naviagent service from the ESX console.</td>
</tr>
<tr>
<td><strong>Navisphere Server Utility.</strong> This utility may not show all available paths to the attached storage system.</td>
<td>No workaround exists. Due to the VMware use of native failover software, the vmkernel may present only a subset of all paths to the same storage system. Sometimes just a single path will be presented while other times multiple paths to the same SP will be presented. However, there should always be at least one path. The Navisphere software cannot display paths that the VMware OS does not present.</td>
</tr>
<tr>
<td><strong>Navisphere Server Utility.</strong> On ESX Server with Navisphere Manager UI on an AX100, the ESX Server sees the LUNs but the utility does not when it scans for them. [127320]</td>
<td>Use Navisphere Express to manage the AX100.</td>
</tr>
</tbody>
</table>
### Windows operating systems

<table>
<thead>
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</tr>
</thead>
</table>
| **Java CLI – Completing time.** Sometimes commands may take a long time to complete. Commands may take as much as 7 to 8 seconds to complete. [84945] | Try either or both of the following:  
- Edit the `system32\drivers\etc\HOSTS` file and add the new mapping for the storage system IP address to a hostname (10.6.89.36 sphostname). This will avoid a delay during reverse DNS lookup.  
- Turn off Netbios for TCP/IP. |
| **Java CLI – Commands not returning to command prompt.** Sometimes commands do not return to the command prompt. On multiprocessor systems, a command will complete processing, but will not return to the command prompt. [94478] | Sun acknowledged a problem with JRE 1.4.1_01 and earlier. A fix is provided in JRE 1.4.1_02 and beyond. Upgrading to 1.4.1_02 is needed only for multiprocessor systems or if you are experiencing this problem. |
| **Java CLI – Executing mirror commands on UNIX.** When you attempt to execute a Java CLI or Mirror command on a UNIX platform you may see the following exception:  
```
Exception in thread "main"  
java.util.zip.ZipException: error in opening zip file at  
java.util.zip.ZipFile.open(Native Method)at  
java.util.zip.ZipFile.<init>(ZipFile.java:124)  
at java.util.jar.JarFile.<init>(JarFile.java:65)  
``` [113646] | The command must be executed from the same directory as the `navicli.jar` file. |
| **Installation – Navisphere Storage System Initialization Utility.** The Storage System Initialization Utility’s help files do not install with the utility. [123204] | Help works when running the initialization utility directly from the CD. |
**Technical notes**

This section includes important information that does not appear anywhere else. This section consists of two major subsections:

- The first one describes technical notes that are common to Host Agents, the CLI for all platforms, Server Utility, and Storage System Initialization Utility.
- The second section describes technical notes for platform-specific Host Agents, CLI, Server Utility, and Storage System Initialization Utility.

**Technical notes for all platforms**

The information described in the following sections applies to all platforms that support the Navisphere Agent, CLI, Server Utility, and Storage System Initialization Utility software.

**AX100-series restrictions**

- There are some restrictions on the AX100 system, which are summarized here with more details within the individual reference manuals:
  - SnapView sessions are always persistent.
  - SnapView sessions do not support consistent start.
  - SnapView clones are not supported.
  - SnapView rollback is not supported.
  - Only four SnapView snapshots (copies) are supported.
  - SAN Copy/E supports copying data only from the AX system to a CX400, CX500, CX600 or CX700 running SAN Copy.
  - Only RAID 5, RAID 1/0 and hot spare RAID types are allowed.
  - Only LUN expansion by concatenation is supported.
  - LUN migration is not supported.
  - Shutdown is supported.
  - No performance statistics for either SP or LUN are reported.
  - Software upgrade is disruptive, even with the Software Installation Wizard.
AX100 systems are preconfigured to block Navisphere CLI commands.

The `agent.config` file on the SP of AX100 systems is preconfigured with a user as part of the manufacturing process. This blocks Navisphere CLI commands to the SP. You must add a user to the privileged users list on the setup page (please refer to the Navisphere CLI reference manual for more information).

EMC highly recommends using Navisphere Secure CLI as the main CLI as it has enhanced security.

Host Agent

- UNIX platforms - HostIDFile.txt file is not removed – On UNIX platforms, when you uninstall the Host Agent, the file containing the Host ID (`HostIDFile.txt`) is not removed because the Host ID needs to be consistent for the life of the host machine (or as long as possible). Otherwise, the host may have multiple host IDs associated within the storage system.

- Invalid host configurations – A server cannot be connected to a CX-series storage system and an AX-series storage system at the same time.

- Device auto-detection – With the exception of JBOD devices, you can configure the Navisphere Agent to automatically detect the storage systems. To monitor JBOD devices, you need to enter JBOD device names in the `agent.config` file.

  EMC does not support the simultaneous use of device auto-detection and specific device entries in the `agent.config` file.

- Lengthy discovery process – To shorten the device discovery process at Agent startup, avoid restarting the Host Agent while I/O is occurring on the storage system.

Host Agent File for CX-series and FC4700-series storage systems

- Do not enter any device entries for CX-series and FC4700-Series storage systems into the Host Agent configuration file.

- None of the other parameters defined in the Host Agent configuration file affects CX-series and FC4700-series storage systems, except certain `Options Supported` directives.
CLI

- **Secure CLI.** The following information describes differences between Secure CLI, Classic CLI and Java CLI.
- **Script Changes Required** – Existing CLI scripts are compatible with the new Secure CLI with the following exception: The commands must be invoked with `naviseccli` instead of `navicli` and `java -jar navicli.jar`.
- **Setting up Valid Credentials** – For Secure CLI, valid credentials are required for each command. To maintain compatibility and avoid the need to specify the username and password for each command, user credentials need to be created using the `-AddUserSecurity` command in Secure CLI. This will store the credentials locally on the server in an encrypted file. Note that the credentials are slightly different than those used with Java CLI so there is no forward compatibility with a security file created by Java CLI and the security file required by Secure CLI.
- **Parsing Output** – Classic CLI displays information only about the targeted SP; Secure CLI displays information about both SPs. For example:
  - `getsp, getall` commands – Classic CLI returns `N/A` for the serial number of the nontargeted SP; Secure CLI returns the actual serial number.
  - `chglun` command – Executing `chglun` on an unbound LUN returns the string `SP A: Unit not bound` in Classic CLI, but will return the string `SP A: Unit not bound, SP B: Unit not bound` in Secure CLI.

Certain CLI commands prompt the user with multiple warnings to confirm. Secure CLI will display a single instance of all the pertinent warnings and prompt the user with a single confirmation. This is true of the following commands:
  - `alpa`
  - `firmware`
  - `networkadmin`
  - `port`
  - `storagegroup`
Managing pre-version 6.19 systems with Secure CLI does not include Classic CLI support – Using Secure CLI against a pre-version 6.19 Management Server will allow only the commands that Java CLI supports. To have both Classic and Java CLI support, the Management Server on the storage system you are attempting to manage must be at version 6.19.

Commands not currently supported in Secure CLI.

NDU - This function can be accomplished with Classic CLI.

The following commands are targeted to a Host Agent on a server:

- **register** - requests the Host Agent to do a push. This function can be accomplished with the Server Utility.
- **lunmapinfo** - targets both the Host Agent and the storage system and displays drive mappings. This function can be accomplished with Classic CLI.
- **remoteconfig** - sets privileged users on the server. This function can be accomplished with Classic CLI.
- **getagent** - provides revision information of the Host Agent. This function can be accomplished with Classic CLI.

Compatibility mode – MirrorView/Synchronous commands are now performed via Java CLI because the server is now located in a provider and not within the storage-system agent. To help with existing scripts that used the CLI MirrorView command set, a compatibility mode has been created. This will seamlessly route existing CLI MirrorView commands through Java CLI. There is no command line interaction required by the user for this compatibility mode to be engaged. It is automatically engaged when communicating with a 6.7 server.

Since Navisphere CLI will be launching its Java counterpart, you must have at least the 1.4.0 Java Runtime Environment on your system. This is available from http://Java.Sun.com. You will also have to configure security on your system and the storage systems with the new software. This entails the creation of accounts on your storage systems using the UI, with the usernames of your system login (the passwords can differ though). To establish the local security you must run the command `java -jar navicli.jar –password<password of array accounts> -scope 0 (for global) | –scope 1 (for local) -addusersecurity`. This creates an encrypted file on your host system with your username, the password, and scope to be sent to the storage systems during the execution of navicli.jar. The commands that will invoke navicli.jar are mirrorview, getall, and...
setfeature --feature rm (where rm stands for remote mirror). The observable behavior of mirrorview and setfeature should not change despite the differences under the covers, but getall and getlun, which do not even launch navicli.jar, will be altered. For getlun the change only occurs when addressing a storage system that supports the aforementioned software, and is at the line stating MirrorView Name if any: Instead of a value of either a name or Not Mirrored, it will display Unavailable. The getall command will show a similar line for all storage systems, and its section titled Mirrorviews.

EMC recommends that you use the Java version of all MirrorView commands.

- MirrorView/Synchronous commands – MirrorView/Synchronous commands are now accessible through Java CLI. Java CLI supports a mirror command set. A switch of --sync or --async must be the first argument to the mirror command. This switch indicates whether the operation is for synchronous (MirrorView/S) or asynchronous (MirrorView/A) mirrors.

- navicli -d command for CX-series and FC4700-series storage systems – When addressing a CX-series and FC4700-series SP Agent with the navicli command, you do not need to specify a device entry (-d <device name>) in the navicli command line. Most CLI commands require a device entry (-d <device name>) on the command line in order to direct the management request to the appropriate storage-system device. Because the CX-series or FC4700-series SP Agent is managing only the storage-system device (SP) on which it is installed, the CLI does not require the -d entry on the command line for these storage systems.

- Using the CLI to configure and manage remote mirrors – Since the CLI communicates with the CX-series and FC4700-series SP Agent through one SP at a time, using the CLI to configure and manage a remote mirror is inefficient. EMC recommends that you use Navisphere Manager for these tasks because it can monitor both SPs on the primary and secondary storage systems and can also provide a more complete picture of the remote mirror configuration and status.

- Comments removed from the Host Agent configuration file – When you use Navisphere Manager or CLI to rename a storage system or change the Host Agent configuration file, the comments in the file are removed. When the requested changes to the configuration file take effect, comments that previously resided in the file are permanently lost.
• **XML output changed with Java-based CLI** – The output for XML has changed since Navisphere 6.2. The new output represents true data type (for example, lun number would return as a signed integer; a boolean as a Boolean). A -1 will signify undefined, not available, or not applicable. Previously, the same information was returned as strings. This affects output data types only when using the XML switch.

• **Unsupported security encryption key error** – When upgrading from the Navisphere 6.2 Java-based CLI you will encounter this error if you are using a local security file. Navisphere 6.4 and greater requires JRE 1.4.0, which does not support the older JRE’s encryption methodologies. To resolve this issue, remove security credentials by issuing `-RemoveUserSecurity`.

• **Caller Not Privileged error** – If a `Caller Not Privileged` error is returned from a Java CLI command, it could either be that the command was issued with invalid security credentials (username, password, scope) or the command was issued without the required level of authorization (correct role) to perform the operation. [113871]

• **Scripting CLI** – Navisphere uses several internal databases to represent the state of the storage system, and updates their status through regular polls to the system software. It is possible that some automated CLI commands will fail if they are executed prior to Navisphere’s internal system polls. For example, immediately sending a request to allocate a newly bound LUN as a clone private LUN (CPL) may fail, since the clone database has not yet recognized that the LUN is fully bound. In such situations, short delays should be added to the script before sending the request. [116509]

**Technical notes for specific platforms**

The information described in the following section applies to specific platforms that support the Navisphere Agent, CLI, Server Utility, and Storage System Initialization Utility software. The platforms are listed alphabetically.
AIX - Host Agent

- **Installing the Agent** – On AIX 5.1 systems, you must use the *inutoc* command to create a .toc file before you install the Navisphere Agent. Type the following three commands at the command line prompt to create the .toc file:
  
  ```
  cd /usr/sys/inst.images
  rm .toc
  /usr/sbin/inutoc
  ```

- **Stopping the Agent** – When you use the *rc.agent stop* command to stop the Navisphere Agent, it may not stop. To ensure the agent has stopped:
  
  ```
  ps –e | grep agent (this returns the PID of the process)
  kill –9 <PID>
  ```

- **Instal script** – The *instal* script for NAVIAGENT and NAVICLI was modified to use executables from the /usr/sbin directory instead of from /etc. This eliminated the need for the *bos.compat.links* package that linked executables from /etc to /usr/sbin.

- **Installation from CD** – When you are attempting to install the Navisphere host software, you may have trouble installing the Navisphere packages directly from the CD. The problem is that smit looks for installable packages in *usr/sys/inst.images*. The top-level AIX directory on the CD causes smit to fail.

To install the software the user should:

1. Mount the CD.
2. Copy the contents of `<cd_mount_point>/AIX/usr/sys/inst.images` to `/usr/sys/inst.images`.
3. Run smit, and direct it to `/usr/sys/inst.images`. 
**HP-UX - Host Agent**

- **New Initiator Types** – The new HP initiator types added are:
  - HP_ALT_SYSTEM_TYPE 0x1D (decimal value = 29, CLI displays decimal values)
  - HP_ALT2_SYSTEM_TYPE 0x1E (decimal value = 30, CLI displays decimal values)

  The `agent.config` file (default directory where this file lives is in `opt/Navisphere/bin`) should be modified to push the initiator type we want.

  For example, if we want to push HP_ALT_SYSTEM_TYPE, an entry as follows is added to `agent.config` file

  ```
  OptionsSupported alt
  ```

  For example, if we want to push HP_ALT2_SYSTEM_TYPE, an entry as follows is added to `agent.config` file

  ```
  OptionsSupported alt2
  ```

  Every time the `agent.config` file is modified, the agent is restarted (bounced) to push these types into the storage system. Please make sure to clean the initiator records before bouncing the agent for testing purposes.

**HP-UX – Storage System Initialization Utility**

You can also run the Initialization Utility from the CX-Series Server Support CD as described below for your operating system.

1. Insert the CX-Series Server Support CD in the server’s drive.

2. At the command prompt (#) in an hpterm window, enter the following command to create a CD-ROM directory:

   ```
   mkdir /cdrom
   ```

   Identify the CD drive device file by executing the following command and looking for the CD in the drive listing:

   ```
   ioscan -funC disk
   ```

   This command lists all recognized drives and their associated device files. The CD device file will be similar to `/dev/dsk/c1t2d0`. 
3. Mount the CD drive.

   mount /dev/dsk/device_filename/cdrom

   where device_filename is the device filename from step 3. For example, mount /dev/dsk/c1t2d0/cdrom

4. Navigate to the HP-UX directory.

   cd /cdrom/hpux

5. Run the Navisphere Initialization Utility.

   ./naviinittool

IRIX - CLI

- Setting system type – The correct system type for interfacing the FC5500 with IRIX is type 0x17, which is called the SGI_NORESTRICT_SYSTEM_TYPE. The SGI_NORESTRICT_SYSTEM_TYPE supports mixing SGI disk drives with CLARiiON disk drives within the same FC5500 storage system. Because changing the system type will cause the storage system to reboot, do not change the system type unless the storage system has been quiesced. Do NOT change the system type of a CX-series or FC4700-series storage system unless it is in a direct attach configuration (that is, it is not connected to a switch fabric). Do NOT change the system type of an FC5500 storage system unless it has been quiesced. You can change the system type using the CLI systemtype command (Host Agent must be running and managing the FC5500 storage system).

Using the CLI systemtype command

For a CX-series or FC4700-series storage system, the following CLI command indicates what system type you are running:

   navicli [-h hostname] systemtype

For an FC5500 storage system, the following CLI command indicates what system type you are running:

   navicli [-d device] systemtype

For a CX-series or FC4700-series storage system, the following CLI command corrects an incorrect system type:

   navicli [-h hostname] systemtype -config 9

For an FC5500 storage system, the following CLI command corrects an incorrect system type:

   navicli [-d device] systemtype -config 17
The Host Agent asks you to verify that you want to execute this command with the following message:

```
The configured system type will be set to: 0x17
This operation will cause a storage subsystem reboot!!!
DO YOU WISH TO CONTINUE™? (y/n)
```

Enter `y` to proceed or `n` to cancel this operation.

For more information on the `systemtype` command, see the *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038).

- **CLI setloop command** – The CLI `setloop` command, documented in the *EMC Navisphere Command Line Interface (CLI) Reference* (P/N 069001038), is not supported by CLI versions 4.X or higher for IRIX.

### Linux – Host Agent

- **IA-64/Itanium Red Hat Linux 3.0 installation** – Before attempting to install Navisphere Agent on IA-64 machines make sure that you have installed Compatibility Arch Support packages. Failure to do so will result in Navisphere Agent installation aborting with errors about missing dependency libraries.

- **IA-64 Red Hat Enterprise Linux 4.0 installation** – If you get errors while trying to install Navisphere packages, you need install the IA-32 Execution Layer and required 32-bit compatibility packages to runtime support for 32-bit application on ia64. Please refer to the following procedure from Red Hat:


  Red Hat Enterprise Linux 4 for the 64-bit Intel Itanium2 architecture includes runtime support for 32-bit applications through the use of Intel’s IA-32 Execution Layer.

  The IA-32 Execution Layer is provided on the Extras disc for the Intel Itanium2 architecture. In addition, a set of 32-bit libraries and applications are provided on a separate 32-bit Compatibility Layer disc. The IA-32 Execution Layer and 32-bit compatibility packages together provide a runtime environment for 32-bit applications on the 64-bit native distribution.

  To install the IA-32 Execution Layer and required 32-bit compatibility packages, follow these steps:

  1. Install Red Hat Enterprise Linux 4 for the Intel Itanium2 Architecture.

  2. During the first system boot, the Additional CDs screen prompts you to insert the Red Hat Enterprise Linux Extras CD.
Insert the CD (which is where the ia32el package is located) and click the Install if you wish to run 32-bit applications.

3. When prompted, choose Misc from the available choices, which will install the ia32el and ksh packages. You can click on Details to verify the selection of packages to be installed. At this point the ia32el package will start itself as a service.

4. After the installation of the packages, you will be prompted again with the same Additional CDs screen as during installation. At this point you can choose to install compatibility libraries by inserting the 32-bit Compatibility Layer CD and selecting Install.

5. Select all of the packages, or the particular packages required in order to provide runtime support for your 32-bit applications.

6. To verify the installation of the 32-bit compatibility layer and libraries after installation, check that the /emul directory has been created and contains files.

   To verify that the 32-bit compatibility mode is in effect, type the following in a shell prompt:

   ```
   service ia32el status
   ```

   • **Naviagent start/stop script location** – The location of the Navisphere Agent stop/start script changed. For all versions of Linux, the script can be found at /etc/init.d/naviagent.

   • **Registration failures (not enough devices)** - Number of sg devices installed on both RedHat and SuSE systems by default (16 entries) is not enough in many cases and as a result some of the paths may not get registered. The solution would be to create an adequate number of these sg entries. The following script (or its equivalent) may be used by the system administrator to create these entries.

   ```bash
   #!/bin/bash
   
x=0
   while (($x < 256))
   do
     y=$((x++))
     fname="/dev/sg"y
     echo mknod $fname c 21 $y
     mknod $fname c 21 $y
   
done
   ```
Linux – Storage System Initialization Utility

You can also run the Initialization Utility from the CX-Series Server Support CD as described below for your operating system.

1. Insert the CX-Series Server Support CD into the server’s drive.
2. From a console window, mount the CD-ROM drive by entering the following command:
   ```
   mount /mnt/cdrom
   ```
3. Change to the CD-ROM directory by entering the following command:
   ```
   cd /mnt/cdrom
   ```
4. Navigate to the Linux directory.
   ```
   cd linux
   ```
5. Run the Navisphere Initialization Utility.
   ```
   ./naviinittoolcli
   ```

NetWare - Host Agent

- **Updating SP software with no host failover software running** – When you use Navisphere Manager to update software to the SPs, the SPs will reboot. This deactivates the storage-system LUN containing the cluster partition, prevents the cluster nodes from communicating with the cluster partition, and causes the server to terminate abnormally.

- **NavHstID.txt file is not removed** – When you uninstall the Host Agent, the file containing the Host ID (HostIDFile.txt) is not removed because the Host ID needs to be consistent for the life of the host machine (or as long as possible). Otherwise, the host may have multiple host IDs associated within the storage system.

- **CTRL-C command** – The NetWare CTRL-C command interrupts a program only if it is sending output to the screen. Since the Host Agent normally has no output to the screen, you must use the unload command to terminate the Agent. CTRL-C will not interrupt the program.

- **FLARE software dump filenames** – FLARE software (formerly called Core or Base software) upload-dump filenames conform to 8.3 formatting. This behavior supersedes any documentation referring to names of a more general format.
Technical notes

- **Version information format** – Earlier NetWare releases present version information in a format different from what the release information states. If the release notes state the version as 6.5.0, earlier Novell software reports this version as 6.05. The first digit is not translated (6), the second digit is converted to a 2-digit number (05) and the third digit, if it is any digit other than 0, is converted to an alphabetic character. NetWare displays the version during module load and by the modules command.

- **Server ABEND (abnormal termination)** – You should avoid unloading and loading the HBA driver with the Agent running. This can result in an ABEND (abnormal termination) of the server. We recommend that you unload the Agent before doing the unload/load of the HBA driver.

- **Agent configuration files** – If Navisphere Agent is run as a cluster service rather than on every node of a cluster, if possible, you should use the same Host Agent configuration file on all nodes in a cluster. This shared file should include the entry `device auto auto` instead of explicit device entries. Using the same shared file ensures that you need to update just one file when you want to make a change.

  If you cannot use the same Host Agent configuration file, you will need separate configuration files on each node. This means if you want to make a change to the file using Manager’s remote agent configuration feature, you have to migrate the Host Agent to each node to make the change.

  If the Host Agent cluster service migrates to a new node in the cluster and the managed device names change, you must restart Navisphere Manager (because Manager discovered the device names from a previous Host Agent).

  Alternately, and preferably, you may run separate Host Agents on all nodes of a cluster, and not as a cluster service. In this case, Agents are configured as if each cluster node were a separate host.

- **Adding cluster nodes to storage groups** – You can add a node of a cluster to a storage group in a storage system only if the Agent has been started up on that node while at least one device of that storage system is visible on each path. Therefore, you must pay attention to all the nodes of that cluster before adding a cluster node to a storage group. This requires running the Agent on each node and lastly adding all nodes to any storage groups before the storage group’s LUNs may be visible to the entire cluster.
• **To see new LUNs** – After unbinding a LUN, use the **List Devices** command to see the newly configured LUNs correctly. After binding a new LUN, use the **Scan all LUNs** and **List Devices** commands to see the newly configured LUNs.

• **LUN 0** – When binding or unbinding LUN 0, you will need to unload **NavAgent.nlm**. If you have previously loaded the driver, unload, and then reload the driver to see the changes to LUN 0.

**NetWare – Storage System Initialization Utility**

Running the Initialization Utility from CD is not supported; you must install it on the server.

**Solaris – Host Agent**

When EMC supports Sun StorEdge Traffic Manager for CX-series and AX-series storage systems, you cannot install the Host Agent on the same server on which you installed the Sun StorEdge Traffic Manager software. For information on how to register the server with the storage system, refer to the *EMC Installation Roadmap for CX-Series, AX-Series, and FC4700-Series Storage Systems* for CX and AX systems or the customized install document you created from the AX support website for AX systems.

**Solaris – Server Utility**

• When EMC supports Sun StorEdge Traffic Manager for CX-series and AX-series storage systems, you cannot install the Server Utility on the same server on which you installed the Sun StorEdge Traffic Manager software. For information on how to register the server with the storage system, refer to the *EMC Installation Roadmap for CX-Series, AX-Series, and FC4700-Series Storage Systems* for CX and AX systems or the customized install document you created from the AX support website for AX systems.

• **Running the Utility from CD with Solaris File Manager** – Exit (e) does not work when running the utilities from the CD with the Solaris File Manager. To exit use **CTRL-C**.

**Solaris – Storage System Initialization Utility**

• You can also run the Initialization Utility from the **CX-Series Server Support** CD as described below for your operating system.

1. Insert the **CX-Series Server Support** CD into the server’s drive.
2. Navigate to the Solaris directory.
   
   cd /cdrom/cxseries/solaris

3. Run the Navisphere Initialization Utility.
   
   ./naviinitool
Running the Utility from CD with Solaris File Manager – Exit (e) does not work when running the utilities from the CD with the Solaris File Manager. To exit use CTRL-C.

Windows - Host Agent

- Installing new agent uninstalls previously installed agent – When the agent is installed, any previously installed agent will be uninstalled as part of the new agent installation process.
- Auto-detect – The Host Agent configuration file should not contain any ATF, PowerPath or standard device entries for CX-series or FC4700-series storage systems. The auto-detect feature of the remote agent configurator does not detect CX-series or FC4700-series storage systems.
- Backup of Event Monitor Navimon.cfg file – For customers who use Event Monitor and are upgrading to version 6.19 from a pre-6.5 version of Navisphere, back up the <install drive>:\Program Files\EMC\Navisphere Agent\Navimon.cfg file before uninstalling that revision of Navisphere Agent. If you do not back up this file, you may lose any existing Event Monitor configuration. Once the 6.19 Navisphere Agent has been installed, you can stop it, copy the Navimon.cfg back to its original location, and then restart the Navisphere Agent.

Windows – CLI

iSCSI configurations – If you cannot add an iSCSI host to a storage group or the iSCSI host appears multiple times in the CLI portlist command, it may be due to incorrect handling of case in the Microsoft Initiator. [116814]

If you manually registered an iSCSI initiator followed by a restart of the Host Agent, you may experience these connection problems due to use of capital letters in hostnames. If you have capital letters in the hostname, perform the following steps (in the order specified) to correct the problem:

1. Start the iSCSI initiator applet in the Control Panel on your host.
2. Select the initiator settings tab.
3. Select the change button at the bottom of the dialog box. This will change the iSCSI name to lowercase.
4. Using CLI, remove the manually created initiator record.
5. Reboot the host or restart the Host Agent to push the initiator to the storage system.
Clusters

EMC recommends that you place all shared disks (LUNs), including the quorum disk, into the same storage group.

VMware – CLI

Virtual machines and Console support – For ESX 2.1, CLI is supported in the following virtual machines: Windows (Windows 2000, Windows Server 2003), Linux (Red Hat 2.1, SLES 8), NetWare.

For ESX 2.5 and 2.5.1, CLI is supported in the Console and the following virtual machines: Windows (Windows 2000, Windows Server 2003), Linux (Red Hat 2.1, SLES 8), NetWare.

VMware – Host Agent

The Host Agent is not supported for ESX 2.1. Only manual registration is supported. Support for the Host Agent begins with ESX 2.5 and is for the ESX console only. Do NOT run the Host Agent from a virtual machine.

• Not enough devices – By default only 16 sg devices are installed on the system. In many cases, this is not enough and as a result some of the paths may not get registered. The solution is to create an adequate number of these sg entries. The system administrator can use the following script (or its equivalent) to create these entries:

```
#!/bin/bash
x=0
while (($x < 256))
do
    y=$((x++))
    fname="/dev/sg"$y
    echo mknod $fname c 21 $y
    mknod $fname c 21 $y
done
```

VMware – Server Utility

Run the Server Utility only from the ESX Server Console. Do not RUN it from a virtual machine. Support for this begins with ESX 2.5.
VMware – Storage System Initialization Utility

You can run the Storage Initialization Utility on both the ESX Server Console and the virtual machines.
The following documents apply to this product release:

<table>
<thead>
<tr>
<th>Part number</th>
<th>Publication</th>
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</thead>
<tbody>
<tr>
<td>300-002-044</td>
<td>EMC CX-Series Server Support Products for AIX Installation Guide</td>
</tr>
<tr>
<td>300-002-043</td>
<td>EMC CX-Series Server Support Products for HP-UX Installation Guide</td>
</tr>
<tr>
<td>300-002-042</td>
<td>EMC CX-Series Server Support Products for IRIX Installation Guide</td>
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<td>300-002-041</td>
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<td>300-002-038</td>
<td>EMC CX-Series Server Support Products for Windows Installation Guide</td>
</tr>
<tr>
<td>069001166</td>
<td>EMC Installation Roadmap for CX-Series and FC-Series Storage Systems (Powerlink)</td>
</tr>
</tbody>
</table>

**Documentation updates**

This section describes changes to the CX-series documentation.

**Setup guides**

The following guides describe how to install the Navisphere Storage System Initialization Utility on a host:

- **CX300 2-Gigabit Fibre Channel Disk Processor Enclosure (DPE2) Setup Guide** (P/N 300-001-276)
- **CX300i 2-Gigabit iSCSI Disk Processor Enclosure (DPE2) Setup Guide** (P/N 300-002-174)
- **CX500 2-Gigabit Fibre Channel Disk Processor Enclosure (DPE2) Setup Guide** (P/N 300-001-275)
- **CX500i 2-Gigabit iSCSI Disk Processor Enclosure (DPE2) Setup Guide** (P/N 300-001-924)
- **CX700 2-Gigabit Fibre Channel Storage Processor Enclosure (SPE) Setup Guide** (P/N 300-001-274)
Software media, organization, and files

The following table lists the software and documentation media for this product release.

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<thead>
<tr>
<th>Part number</th>
<th>CD-ROM</th>
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<tbody>
<tr>
<td>053-001-356</td>
<td>EMC CX-Series Server Support CD</td>
</tr>
<tr>
<td>053-001-477</td>
<td>EMC CLARiiON Software and Hardware Documentation CD</td>
</tr>
</tbody>
</table>

Installation

For installation instructions, refer to the documents listed in the Documentation section.
Troubleshooting and getting help

This section provides specific instructions for contacting EMC Customer Service and obtaining additional information about EMC products.

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 Powerlink website (registration required) at:
http://Powerlink.EMC.com

Technical support
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9. Governing Law. Any action related to this Agreement will be governed by California law and controlling
U.S. federal law. No choice of law rules of any jurisdiction will apply.

10. Severability. If any provision of this Agreement is held to be unenforceable, this Agreement will remain in
effect with the provision omitted, unless omission would frustrate the intent of the parties, in which case this
Agreement will immediately terminate.

11. Integration. This Agreement is the entire agreement between you and Sun relating to its subject matter. It
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warranties and prevails over any conflicting or additional terms of any quote, order, acknowledgment, or other
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modification of this Agreement will be binding, unless in writing and signed by an authorized representative of
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JAVA(TM) INTERFACE CLASSES
JAVA API FOR XML PARSING (JAXP), VERSION 1.1
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