ABSTRACT

This document provides an overview of the migration process from a NetApp 7-Mode or Clustered Data ONTAP system to DellEMCs Isilon Scale-Out NAS, the leader in scale-out storage. The migration process covers available tools with an emphasis on Datadobi DobiMiner.

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EXECUTIVE SUMMARY

In the past, the process of migrating data, users, and existing applications was a time consuming, arduous process. DellEMC Isilon offers built-in migration tools in addition to third party tools. Datadobi’s DobiMiner reduces overall migration time, resources, and total cost. This document clarifies the concerns associated with migration, by describing the seamless transition process from NetApp 7-Mode or Clustered Data ONTAP (cDOT).
ISILON BUILT-IN MIGRATION TOOLS

Isilon’s OneFS distributed software provides built-in tools for migrating from traditional NAS platforms. These tools utilize the Network Data Management Protocol (NDMP), to transfer snapshots or an image, over the network, while allowing the source system to be client accessible. Migration includes all data within a specified volume or directory. The built-in tools migrate files, directories, NFS permissions, Windows ACLs, and Windows properties. System configuration settings are not migrated.

OneFS’ built-in migration tools are as follows:

- isi_vol_copy: Compatible with migrating from NetApp storage systems
- isi_vol_copy_vnx: Compatible with migrating from Celera and VNX Storage systems

These tools are recommended under the following conditions:

- Small data migrations
- New and existing storage system are on a local network
- NetApp system is in 7-Mode. Clustered Data ONTAP (cDOT) is not supported.
- NetApp system as a whole contains less than 10 million inodes

OneFS’ built-in migration tools provide basic data copy functions. For additional granularity and control over the migration, DellEMC recommends Datadobi’s DobiMiner.

For additional information on the usage of OneFSs built-in tools, please refer to the Built-In Migration Tools Guide.
DATADOBI DOBIMINER

Datadobi’s DobiMiner platform makes migrating to Isilon a simple, quick, and efficient process. DobiMiner is capable of handling significantly larger migrations to Isilon, compared to the built-in tools mentioned earlier. By reducing migration time, complexity, and resource utilization, DobiMiner provides substantial long term savings.

OVERVIEW

DobiMiner alleviates typical pain points and hurdles associated with a NAS migration, allowing customers to focus on enjoying the benefits of the Isilon Scale-Out NAS architecture, rather than the migration process itself. By minimizing the overall migration time and reducing labor requirements, DobiMiner streamlines the migration process, with automation and built-in intelligence.

ADVANTAGES

DobiMiner provides the following advantages over competing migration tools:

- Fast Migration: DobiMiner is up to 10 times faster than traditional migration tools such as Robocopy or Rsync. For more details see this independent report: Datadobi Migration Benchmark Testing: http://www.datadobi.com/wp-content/uploads/2016/04/Datadobi_N2N_Migration_Benchmark_Testing_April_2016_Edition_1.pdf

- Staff Utilization: DobiMiner automates many of its tasks and provides reporting mechanisms, including a dashboard and e-mail updates. IT staff now has the flexibility to work on other projects. Migration flexibility of files, directories, or volumes, minimizes the overall disruption, allowing staff to focus on business priorities.

- Risk Reduction: The overall risk of an end to end NAS migration is reduced significantly with DobiMiner’s automation and centralized management. DellEMCs Technology Transition Team performed over 200 NAS migrations while vetting DobiMiner. DobiMiner exceeded all expectations, establishing a relationship between DellEMC and Datadobi.

- Storage Analytics: DobiMiner extracts details from the source storage system to translate the source storage data characteristics. The details include what is being stored, by whom, and last accessed time. Further, this allows staff to make informed decisions with improved outcomes during the migration process.

- Total Migration Cost Savings: All of the above advantages provide a total migration cost savings. DobiMiner allows enterprises to consume minimal migration time with maximum resource utilization. For more details on the cost savings, try DobiMiner’s calculator: http://www.datadobi.com/calculator/

- Platform Scale-Out: DobiMiner’s architecture allows it to scale-out by allowing a custom number of proxies to be configured with the core, meeting the source, and target storage requirements.

- Migration Automation: Most of the migration functions can be automated through API, rather than SSH or RPC calls.

Figure 1. DobiMiner Advantages

<table>
<thead>
<tr>
<th>Transition Challenges</th>
<th>DobiMiner Benefits Over Traditional Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex: High level of effort required</td>
<td>Scalability</td>
</tr>
<tr>
<td>Expensive: High total cost considering migration times and staff</td>
<td>Automation</td>
</tr>
<tr>
<td>Inconsistent: High risk and inconsistent</td>
<td>Flexibility</td>
</tr>
<tr>
<td></td>
<td>Lower TCO – Time Savings</td>
</tr>
</tbody>
</table>
SOLUTION OFFERINGS
DobiMiner is offered through DellEMC in the following solutions:

- Software and Services: Customer purchases the DobiMiner software and selects services to add such as training or support.

- Services Only: DellEMC provides a comprehensive, turnkey, end-to-end migration including planning, design, and migration through Professional Services. Additionally, an overview is provided to the customer and they may continue to use the tool after the engagement is complete.

BUSINESS RISK
DobiMiner minimizes common risks associated with migrations as the software has scalability, flexibility, and continuously compares the source and target storage system. Consequently, this provides the ability to adapt to all migration requirements.

Pairing DobiMiner with DellEMC Professional Services, further minimizes this risk. During typical storage migrations, Professional Services writes custom scripts for a migration. The use of DobiMiner provides a tested and proven platform that automates the functions where custom scripts would be needed previously with other tools. Eliminating the human error factor, ensures a smooth and successful process.

Migrations lead to questions about the process and requirements. With Professional Services, the migration is managed end-to-end, making the process simple, and allowing the customer to focus on the benefits of migrating to DellEMC Isilon. Pairing Professional Services with DobiMiner, is the solution with the least risk for environments that require high availability with minimal outages.

MIGRATION OPTIONS
DobiMiner provides the following Migration Options that can be configured globally or at SMB and NFS levels:

- Global Options:
  - No deletes at root level
  - Copy root folder security settings
  - Interleave directory options
  - Exclusion patterns from the above options

- SMB Options:
  - Follow junctions
  - Copy hidden attributes
  - Preserving access times on source
  - Copying security descriptor and System Access Control List
  - Owner and Group SID options can be defined to copy from source, override or copy the owner or group, and define the new owner and group owner SIDS, if applicable.

- NFS Options:
  - Preserve access time on source

SID MAPPING
DobiMiner provides a method of updating SIDs. These can be provided during the migration phase. The mapping will include an “Old SID” and “New SID”.

MULTI-PROTOCOl MIGRATIONS
DobiMiner eliminates the challenges previously associated with multi-protocol migrations. The multi-protocol migrations are simplified by automating many of the manual tasks that are typical with other solutions. Each file has a unique security identity, which could be NTFS or UNIX, or both depending on the configuration, making it a multiprotocol file.

During the migration, DobiMiner handles multi-protocol data by first copying the content and metadata, using the first protocol, which includes the security settings. Once this is complete, the metadata is copied using the other protocol. The first and second protocols are configurable and are selected according to greater consumption.
**SUPPORTED CONFIGURATIONS**

<table>
<thead>
<tr>
<th>SOURCE/TARGET</th>
<th>EMC CELERRA</th>
<th>EMC VNX1 / VNX2</th>
<th>EMC UNITY</th>
<th>EMC ISILON</th>
<th>NETAPP 7-MODE</th>
<th>NETAPP CDOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMC CELERRA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EMC VNXE</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EMC UNITY</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>EMC ISILON</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>NETAPP 7-MODE</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>NETAPP CDOT</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
<td>✓ ✓</td>
</tr>
</tbody>
</table>

✓ Indicates only migration of data is supported
✓✓ Indicates migration of data and settings (share/export definitions, user mapping)
MIGRATION PROCESS

**SETUP**

The DobiMiner architecture is a distributed model with the ability to scale to the source and target system requirements, providing the capability to manage large scale end-to-end migrations. Throttling and scheduling at the server and network level are supported.

DobiMiner is composed of the Core and Proxies. The Core is the central point of management providing a single pane of glass to manage the migration end to end and track current status. The Proxies are controlled by the core and are protocol specific to NFS or SMB, with the ability to scan, create, copy or delete. Each of the Proxies can be allocated as needed with bandwidth management.

The Core can be deployed as a virtual machine or can be installed as a RPM on Linux Red Hat systems. The Proxies have similar deployment options for NFS. For SMB, they can be installed as an MSI file on Windows systems. At least one Core is required and proxies can be deployed according to the source storage architecture.

**Figure 2.** DobiMiner Core & Proxies
DISCOVER

Once DobiMiner is configured, it provides powerful insights into the source storage system by extracting metadata. These analytics provide information such as when a file was stored, by whom, and when last accessed. The analysis provides an in depth view of current data and users, enabling IT admins to plan accordingly.

DobiMiner reports capacity by files, directories, per user, per creation time, per modification time, or historical usage.

Figure 3. DobiMiner Discovery
To create a migration pair, schedules are configured defining the source and target storage systems. Once the migration pairs are created, the directory paths for the migration are defined.

**Figure 4. DobiMiner Source Paths**

<table>
<thead>
<tr>
<th>PATHS</th>
<th>NAME</th>
<th>SECURITY STYLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>/vol/vol1</td>
<td>administration</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol0</td>
<td>dev</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol0/home</td>
<td>documents</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol1</td>
<td>management</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol1/administration</td>
<td>marketing</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol1/dev</td>
<td>sales</td>
<td>NTFS</td>
</tr>
<tr>
<td>/vol/vol1/documents</td>
<td>unix1</td>
<td>Unix</td>
</tr>
<tr>
<td>/vol/vol1/management</td>
<td>unix2</td>
<td>Unix</td>
</tr>
<tr>
<td>/vol/vol1/marketing</td>
<td>unix3</td>
<td>Unix</td>
</tr>
<tr>
<td>/vol/vol1/sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/vol/vol1/unix1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/vol/vol1/unix2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>/vol/vol1/unix3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5. DobiMiner Destination Paths**

<table>
<thead>
<tr>
<th>PATHS</th>
<th>NAME</th>
<th>SECURITY STYLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>/fifs</td>
<td>vfiler0</td>
<td>Isilon</td>
</tr>
<tr>
<td>/fifs/data</td>
<td>Vnetapp2</td>
<td>Isilon</td>
</tr>
<tr>
<td>/fifs/home</td>
<td>test</td>
<td></td>
</tr>
<tr>
<td></td>
<td>test.txt</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6. “First Scan” and “First Copy”**

"First Scan" discovers the data that needs to be migrated. “First Copy” copies the migration paths to the target server.
DRY RUN

Once the migration paths above are in “Steady State”, switchover dates are defined, assigning a date with a Migration Path. DobiMiner’s Dry Run approach estimates the time required for the switchover and confirms migration details.

Figure 7. Dry Run

SWITCHOVER

After final compare and final copy, Switchover begins after the source system is placed in read-only mode. During the Switchover, DobiMiner provides current status and estimated time to completion. At this point, Migration Paths can be stopped, modified, or added. Once complete, administrators can update DNS to route to the new storage system.

Figure 8. Switchover

FINALIZE

Once the Switchover is complete, DobiMiner provides the current destination system status, allowing for any errors to be verified and provides potential fixes. For example, if shares were not found on the target system, these can be created with the appropriate user settings.
CONCLUSION

Seamlessly migrate to DellEMC Isilon Scale-Out NAS from a traditional NAS using built-in tools or Datadobi's DobiMiner. For large-scale migrations, DobiMiner automates many of the tasks and minimizes risk. Pairing DobiMiner with DellEMC Professional Services provides extensive planning and a turnkey end-to-end migration process.