Dell EMC Isilon OneFS

Version 7.x

Upgrade Planning and Process Guide

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DELL EMC

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CONTENTS

CHAPTER 1

Introduction to this guide

This section contains the following topics:

About this guide

This guide provides important information and steps that you must review and follow when upgrading from OneFS 7.x.

Read this guide in its entirety before upgrading your cluster. Complete all of the steps in the checklists in this document during each stage of the upgrade process.

Note: For upgrades from OneFS 8.x to a later version of OneFS, see the OneFS 8.x Upgrade Planning and Process Guide.

Provide feedback about this document

Your suggestions help to improve the accuracy, organization, and overall quality of the documentation. Send your feedback to http://bit.ly/isilon-docfeedback. If you cannot provide feedback through the URL, send an email message to docfeedback@isilon.com.

Where to go for support

This topic contains resources for getting answers to questions about Isilon products.

Online support	• Live Chat • Create a Service Request For questions about accessing online support, send an email to support@emc.com.
Telephone support	• United States: 1-800-SVC-4EMC (1-800-782-4362) • Canada: 1-800-543-4782 • Worldwide: 1-508-497-7901 • Local phone numbers for a specific country are available at Dell EMC Customer Support Centers.
Isilon Community Network	The Isilon Community Network connects you to a central hub of information and experts to help you maximize your current storage solution. From this site, you can demonstrate Isilon products, ask questions, view technical videos, and get the latest Isilon product documentation.
Isilon Info Hubs	For the list of Isilon info hubs, see the Isilon Info Hubs page on the Isilon Community Network. Use these info hubs to find product documentation, troubleshooting guides, videos, blogs, and other information resources about the Isilon products and features you're interested in.

CHAPTER 2

Planning an upgrade

Plan your upgrade

Performing the tasks described in this chapter helps you to plan your upgrade. Use the checklist to track your progress.

- ☐ Review required documentation
- ☐ Decide which type of upgrade you are going to perform
- ☐ Verify the upgrade path
- ☐ Check system requirements
- ☐ Assess upgrade impact
- ☐ Plan an upgrade schedule
- ☐ Upgrade a test cluster

Note: If you have a performance-sensitive workload, Isilon recommends that you consult your Sales Engineer for assistance during the pre-upgrade planning process.

Upgrade planning overview

This chapter provides information to help you create an upgrade plan. Your upgrade plan helps you estimate the time it will take to complete tasks and determine who needs to complete them.

Create an upgrade plan by evaluating how the upgrade will affect users and workflow, assessing the impact of the new version of OneFS on your Isilon cluster, and analyzing upgrade risks.

The services team is available to perform OneFS pre-upgrade health checks and will complete the OneFS upgrade remotely for some customers. Contact your Account Team for more information.

Note: Clusters running a version of OneFS that has reached the End of Service Life milestone will also need a Time & Materials engagement for upgrade. To confirm whether the version of OneFS you are upgrading from has reached the End of Service Life, review the Isilon Product Availability Guide. If your version of OneFS has reached End of Service Life, contact your Account Team to discuss the available options and to develop an upgrade strategy.

Prerequisites for completing an upgrade

Permissions and interfaces

To complete the tasks described in this guide, you must be able to log in to the cluster as the root user through the following interfaces:

- OneFS command-line interface
- OneFS web administration interface

Note: If you are not logged into the OneFS cluster with root privileges, you might not be able to run all of the commands in this guide.

Reviewing documentation

Reviewing the documentation in this list helps you to understand the upgrade process and the impact the upgrade could have on your workflow.

- OneFS 7.x Upgrade Planning and Process Guide
  Read the Upgrade Planning and Process Guide for the version of OneFS from which you are upgrading.
- Isilon OneFS Upgrade Process Flowchart
  Review this step-by-step reference guide for OneFS upgrades.
- OneFS Upgrades – Isilon Info Hub
  Review the resources listed on the OneFS Upgrades – Isilon Info Hub for an an overview of the upgrade process and links to important resources.
- OneFS Release Notes and Maintenance Release Notes
  Read the OneFS release notes for information about new features and changes, resolved issues, known issues, and supported upgrade paths.
- Current Isilon Software Releases
  Confirm which current OneFS releases have reached *Target Code* status.
- Isilon Supportability and Compatibility Guide
  Confirm that your Isilon software and Isilon hardware is compatible with the version of OneFS to which you are upgrading.
- Isilon OneFS CLI Mappings

Confirm whether any OneFS CLI commands have changed or are deprecated.

- Current Isilon OneFS Patches
  Review patches that have been released for the version of OneFS to which you are upgrading.
- Isilon OneFS Technical Specifications Guide
  Confirm the recommended settings and thresholds for the version of OneFS to which you are upgrading.
- Isilon Technical and Security Advisories
  Determine whether any Isilon Technical Advisories or Security Advisories have been issued for the version of OneFS to which you are upgrading.
- OneFS 7.1.1 and Later Best Practices for Upgrading Clusters Configured with Access Zones
  If you store shared data in access zones, review this best practice guide to learn about changes to access zones in OneFS 7.1.1 and later.

Types of OneFS upgrades

There are two options available for upgrading the OneFS operating system: a simultaneous upgrade or a rolling upgrade.

Simultaneous upgrades

A simultaneous upgrade installs the new operating system and restarts all nodes in the OneFS cluster at the same time. Simultaneous upgrades are faster than rolling upgrades but require a temporary interruption of service during the upgrade process. All client connections to the cluster must be terminated prior to completing the upgrade and data is inaccessible until the installation of the new OneFS operating system is complete and the cluster is back online.

Note: You cannot designate which nodes to upgrade when performing a simultaneous upgrade. You must upgrade all of the nodes in the cluster when performing a simultaneous upgrade.

Rolling upgrades

A rolling upgrade individually upgrades and restarts each node in the Isilon cluster so that only one node is offline at a time.

A rolling upgrade takes longer to complete than a simultaneous upgrade. Whichever node the upgrade is started from is the last node to be upgraded. From the starting node, nodes are upgraded and restarted in sequential order. The upgrade process can be monitored from the starting node.

During a rolling upgrade, nodes that are not actively being upgraded remain online and can continue serving clients. However, clients that are connected to a restarting node are disconnected and reconnected. How the client connection behaves when a node is restarted depends on several factors including client type, client configuration (mount type, timeout settings), IP allocation method, and how the client connected to the cluster.

Note: Rolling upgrades are not available between all OneFS versions. See the Verify the upgrade path topic for information about which types of upgrades are supported between OneFS versions.

Verify the upgrade path

Verify that the current version of OneFS on your cluster can be upgraded to the target version. You might be required to upgrade to the target version then add patches to reach bug fix and feature parity, or you might be required to upgrade to an intermediate version before you can upgrade to the target version.

To view which version of OneFS is running on all nodes in the cluster, run the following command:

```
isi_for_array uname -r
```

Review the supported upgraded paths to confirm which version of OneFS you can upgrade your cluster to.

Upgrade Paths from OneFS 7.x to OneFS 7.x

Upgrade Paths from OneFS 7.x to OneFS 7.x

The following table can be used to determine the supported upgrade paths from your installed version of OneFS 7.x to a newer version of OneFS 7.x.

Key:

- "O" = Rolling and Simultaneous upgrades available
- "/" = Simultaneous upgrade only
- Empty cells are not supported upgrade paths

	Upgrade to version													
Upgrade from version	7.1.1.11	7.2.0.0	7.2.0.1	7.2.0.2	7.2.0.3	7.2.0.4	7.2.0.5	7.2.1.0	7.2.1.1	7.2.1.2	7.2.1.3	7.2.1.4	7.2.1.5	7.2.1.6
7.1.1.0, 7.1.1.1	O	O	O	O	O	O	O							
7.1.1.2, 7.1.1.3	O		O	O	O	O	O							
7.1.1.4	O			O	O	O	O	O	O	O	O	O	O	O
7.1.1.5, 7.1.1.6	O				O	O	O		O	O	O	O	O	O
7.1.1.7	O					O	O		O	O	O	O	O	O
7.1.1.8	O									O	/	O	O	O
7.1.1.9	O										/	O	O	O
7.1.1.11													O	O
7.2.0.0			O	O	O	O	O							
7.2.0.1				O	O	O	O							
7.2.0.2					O	O	O	O	O	O	O	O	O	O
7.2.0.3						O	O		O	O	O	O	O	O
7.2.0.4							O		O	O	O	O	O	O
7.2.0.5										O	O	O	O	O
7.2.1.0									O	O	O	O	O	O
7.2.1.1										O	O	O	O	O
7.2.1.2											O	O	O	O
7.2.1.3												O	O	O
7.2.1.4													O	O
7.2.1.5														O

Upgrade Paths from OneFS 7.x to OneFS 8.x

Upgrade Paths from OneFS 7.x to OneFS 8.x

The following table can be used to determine the supported upgrade paths from your installed version of OneFS 7.x to a version of OneFS 8.x.

Note: Upgrades from OneFS 7.x to OneFS 8.2.x are not supported. If you are upgrading your OneFS 7.x cluster to OneFS 8.2.x, you must first perform an intermediate upgrade to a supported version of OneFS before you can upgrade to 8.2.x.

Note: Intermediate upgrades must be treated like full upgrades, with all the recommended planning and preparations that apply. If you must upgrade to an intermediate version of OneFS before you can upgrade to the target version, complete the pre-upgrade and post-upgrade steps in the *OneFS Upgrade Planning and Process Guide* first for the intermediate upgrade, and then complete the pre-upgrade and post-upgrade steps again for the upgrade to the target version. Follow the instructions in the version of the *OneFS Upgrade Planning and Process Guide* that matches the OneFS version that you are upgrading from. For more information, see the OneFS Upgrades - Isilon Info Hub.

Note: Following an upgrade to OneFS 8.1.0.0 or later, you must update your OneFS license by generating a license activation file and submitting it to Software Licensing Central (SLC). For instructions on how to create a new license file for your OneFS cluster, refer to the Licensing section of the *OneFS Administration Guide*.

Key:

- "O" = Rolling and Simultaneous upgrades available
- "/" = Simultaneous upgrade only
- Empty cells are not supported upgrade paths

	Upgrade to version																		
Upgrade from version	8.0.0.0	8.0.0.1	8.0.0.2	8.0.0.3	8.0.0.4	8.0.0.5	8.0.0.6	8.0.0.7	8.0.1.0	8.0.1.1	8.0.1.2	8.1.0.0	8.1.0.1	8.1.0.2	8.1.0.3	8.1.0.4	8.1.1.0	8.1.1.1	8.1.2.0	8.1.3
7.1.1.0 - 7.1.1.3																			
7.1.1.4 - 7.1.1.7	/	/	/	/	/	/	/	/	/	/	/								
7.1.1.8, 7.1.1.9		/	/	/	/	/	/	/	/	/	/								
7.1.1.11					/	/	/	/		/	/						/	/	/	/
7.2.0.0, 7.2.0.1																			
7.2.0.2 - 7.2.0.4	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7.2.0.5		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7.2.1.0, 7.2.1.1	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

7.2.1.2		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7.2.1.3			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
7.2.1.4				/	/	/	/	/		/	/	/	/	/	/	/	/	/	/
7.2.1.5					/	/	/	/		/	/	/	/	/	/	/	/	/	/
7.2.1.6						/	/	/		/	/		/	/	/	/	/	/	/

Check supportability and compatibility requirements

Review the Isilon Supportability and Compatibility Guide to confirm that your current hardware components, software components, and protocol versions are compatible with the version of OneFS to which you are upgrading.

For information about OneFS compatibility with Hadoop, see the Hadoop - Isilon Info Hub page on the Isilon Community Network website.

Assess upgrade impact

Consider all the areas of your environment that might be affected by upgrading to a new version and plan a strategy for performing the tasks that need to be completed and addressing issues that might occur. Assessing the impact of the upgrade on your environment, clients, and performance helps ensure that the upgrade does not disrupt your Isilon cluster, workflow, or users.

Note: If you have a performance-sensitive workload, Isilon recommends that you consult your Sales Engineer for assistance during the pre-upgrade planning process.

Consider upgrade limitations

The OneFS upgrade process has limitations that should be considered before you begin the upgrade.

- If the upgrade cannot be completed for any reason—for example, if there is insufficient space on the cluster or on the /var partition or if the upgrade process detects a stalled drive—the system will revert to the existing version and the upgrade will be cancelled. You cannot pause the upgrade process in order to resolve the blocking issue. Preparing your cluster as recommended in the *Completing pre-upgrade tasks* section will help you to avoid situations that might result in a cancelled upgrade.
- After you upgrade from OneFS 7.x, to a new version of OneFS, you cannot restore the previous version. A OneFS version upgrade consists of re-imaging the kernel and file system and copying user changes from the old file system to the new one. Once the OneFS kernel is re-imaged, there is no mechanism for rolling back to the previous version. For example, if you upgrade from OneFS 7.2.0.5 to OneFS 8.0.0, you cannot roll the upgrade back to OneFS 7.2.0.5.

Review feature changes and known issues

Familiarize yourself with new, modified, and deprecated features as well as known issues in the target version of OneFS to which you are upgrading.

Functionality changes and new features in the target version might impact the performance, configuration, or functionality of your cluster after upgrading. If the target version contains an issue that affects your environment, you should consider waiting to upgrade until after the issue is resolved in a later version of OneFS.

See the *OneFS Release Notes* for a summary of new features, feature changes, and known issues in the target version of OneFS. See the Isilon OneFS CLI Mappings guide for information about command name changes. You can find links to these documents, as well as other resources, on the Isilon Info Hubs and by searching the Online Support site.

Plan an upgrade schedule

Consider all the factors that go in to preparing and carrying out the upgrade and create an upgrade schedule.

An upgrade schedule can help ensure that the upgrade goes smoothly. The schedule should estimate how long each stage of the upgrade process might take.

The upgrade process begins with ensuring that your Isilon cluster is ready to be upgraded. Cluster preparation is important to minimize upgrade errors or failure. It is recommended that you set aside two weeks to check the cluster health and resolve issues before performing the upgrade itself. The two-week period allows time for shipping and replacing degraded hardware.

The main factors that you should consider when estimating a schedule include:

Data back-up and information collection

Estimate the time that it will take to back up your data. Consider cluster size, number of files, types of files, and file size. Also include time to collect information about the cluster such as status, logs, and settings.

Cluster preparation and readiness

Schedule time for node and drive health checks and replacement of bad hardware. Include time to update configurations and settings that are not supported in the new version.

Upgrade maintenance window

Estimate the time that it will take to run the upgrade. Consider cluster size and upgrade type (rolling or simultaneous). If performing rolling upgrade, consider whether you will configure client connection drain times, which will extend the required maintenance window, but lower the impact on client connections. Build in time to let the upgrade jobs run to completion and to re-establish permissions and connections. A best practice is to upgrade the cluster during an off-hours maintenance window. Schedule time to inform users when the upgrade will take place and how they might be affected. Client connections might be slow, file access might be affected, and clients might be disconnected.

If you have upgraded the cluster previously, use the time it required to perform the previous upgrade to estimate how long the next upgrade will take. You can view the amount of time the previous upgrade required by viewing the `update_handler` file on the node that started the last upgrade. The file is located under `/var/log`, and is named according to the following format:

```
/var/log/update_handler_<date_upgrade_started>.txt
```

Troubleshooting

Schedule time or extend the maintenance window to accommodate post-upgrade tasks such as reconfiguring custom settings, updating scripts to reflect command and functionality changes in the upgrade version, and potential troubleshooting.

Upgrade a test cluster

If available, upgrade a test cluster that has the same version of OneFS and the same software configurations as your production cluster.

Upgrading a test cluster before you upgrade your production cluster can expose issues that could slow down or prevent the upgrade of your production system.

After you upgrade a test cluster, verify that the cluster is operational and validate key workflows on the test cluster by simulating how administrators, users, and applications interact with the system.

CHAPTER 3

Completing pre-upgrade tasks

Perform the required pre-upgrade tasks.

Performing the tasks described in this chapter helps you to prepare to upgrade your cluster. Use the checklist to track your progress.

- ☐ Collect cluster information
- ☐ Collect cluster status
- ☐ Gather cluster logs
- ☐ Run the Isilon Advisor diagnostic tool
- ☐ Check hardware health
- ☐ Check available space
- ☐ Check NFS exports for non-UTF-8 encoded file or directory names
- ☐ Resolve outstanding events and errors
- ☐ Reconfigure unsupported SMB settings
- ☐ Verify global namespace requirements
- ☐ Configure the NIC aggregation method
- ☐ Preserve the Kerberos keytab file
- ☐ Install supported version of InsightIQ
- ☐ Run the upgrade compatibility check utility
- ☐ Back up data
- ☐ Back up custom settings
- ☐ Complete NDMP backup
- ☐ Complete system jobs
- ☐ Update drive firmware
- ☐ Disconnect IPMI ports
- ☐ Enable ESRS

About pre-upgrade tasks

Performing the pre-upgrade tasks described in this guide helps to ensure that the OneFS cluster hardware, software modules, configuration, features, and file system do not have preexisting issues that could adversely affect the upgrade process. Performing the pre-upgrade tasks also ensures that important cluster data is collected, the current configuration settings are recorded, and the potential for data loss is minimized.

Collect cluster information

Before you upgrade, collect and record key information about your OneFS cluster and how it is configured.

Collect information about your cluster configuration and environment

About this task

Collect and record the requested information in the table below before you upgrade the cluster. This information can be used to:

- Verify that your settings were preserved following the upgrade
- Verify that your hardware and software modules are compatible with the target version
- Enable you to quickly reconfigure the cluster to match the pre-upgrade configuration, if necessary
- Provide important information to Isilon Technical Support if you encounter issues during the upgrade

Information to collect	Information
Date and time the cluster will be upgraded	
Name of the cluster	
Current version of OneFS	
Target version of OneFS	
Location of the cluster	
Types of nodes in the cluster	
Quantity of each type of node	
Which software modules are licensed on the cluster?	
Is the cluster a SyncIQ source or SyncIQ target cluster?	
How is the cluster used?	*(example: production, test, development, evaluation)*
What data protection level is set on the cluster?	
What data protection levels are set on each pool?	*(example: disk pools, node pools, cloud pools)*

Information to collect	Information
If custom protection levels are set, what data protection levels are set on those objects?	*(example: directories, files, pools)*
What type of switch is installed?	
What MTU is configured?	*(example: 9,000 or 1,500)*
Which file sharing protocols are enabled?	*(example: SMB, NFS)*
What method do you use to administer the cluster?	*(example: serial console, SSH, web administration interface)*
Is SRS enabled?	
What local accounts are configured and what are their passwords?	
If protocol auditing is enabled, which protocols are being audited?	*(example: SMB or NFS)*
Do you run any custom scripts?	
Do you use OneFS API calls?	
If you have static routes configured, what is the configuration?	
If any sysctl parameters have been modified, what was the value set?	
Do you have certificates configured?	

Review and save information about cluster status

Before you upgrade, run the `isi status` command to get the status of your Isilon cluster and save the information to a file.

About this task

Run the `isi status` command with the `-D` and `-w` parameters to get the status of your cluster, events, and jobs.

For more information, see the OneFS CLI Administration Guide for your version of OneFS.

Procedure

1. Run the `isi status -D -w` command to view the status of the cluster, events, and jobs.
2. Run the `isi status -D -w > /ifs/data/isi_status_output` command to save the output of the `isi status -D -w` command to a file named `isi_status_output` in the `/ifs/data` directory.

Gathering cluster logs

You can gather cluster logs and send the logs to Isilon for analysis. Cluster logs can be sent automatically or manually through the cluster command-line and web administration interfaces.

Note: Your cluster must be connected to the internet to be able to send log files directly. If your cluster does not have an internet connection or if your upload has failed, you can copy the log file from the cluster and upload the log file with an FTP client to an Isilon FTP server. For more information about the `isi_gather_info` command, including the command parameters for configuring how logs are uploaded to Isilon Technical Support, see the OneFS CLI Administration Guide or knowledge base article 304468.

Gather cluster logs through the command-line interface

You can gather and send cluster logs from each node in the cluster to Isilon Technical Support.

Before you begin

You must have root access to run the `isi_gather_info` command.

Procedure

1. To gather the log files, run the following command.

   ```
   isi_gather_info
   ```

   The files generated by this command are stored in the `/ifs/data/Isilon_Support/pkg` directory.

   For more information about the `isi_gather_info` command, including the command parameters for configuring how logs are uploaded to Isilon Technical Support, see the OneFS CLI Administration Guide or knowledge base article 304468.

Gather cluster logs through the OneFS web administration interface

You can gather and send cluster logs from each node in the cluster to Isilon Technical Support.

Before you begin

You must have root access to the cluster or be assigned to the SystemAdmin role to start a log gather from the web administration interface.

Procedure

1. In the web administration interface, navigate to **Cluster Management** > **Diagnostics**.
2. Click **Start Gather**.

   After the log gathering process is complete, a link to the file that the process generates appears under **Filename** in the **Archived Info Manager** section. The files generated during the gathering process are stored on the cluster in the `/ifs/data/Isilon_Support/pkg` directory.

Check cluster readiness

Completing pre-upgrade tasks such as checking the health of the hardware components on the cluster, ensuring that storage space requirements are met, and managing outstanding cluster events and errors are recommended for a successful upgrade.

Run the Isilon Advisor diagnostic tool

It is recommended that you run the Isilon Advisor diagnostic tool before and after upgrading OneFS. This tool includes pre- and post-upgrade checks and can be used to assess the health of the cluster.

About this task

The Isilon Advisor is an off-cluster log analyzer that inspects and reports on cluster logs. It is the same tool that Isilon Technical Support and Isilon field representatives use to identify, troubleshoot, and prevent a wide range of known issues that can occur on Isilon clusters.

Procedure

- To download the Isilon Advisor and user guide, go to the Isilon Advisor website.

Check hardware health

About this task

Run the following commands from the OneFS command-line interface as root user to evaluate the health of the cluster's hardware components and the status of job engine jobs.

Procedure

1. Run the following command to return information about cluster health and check for jobs or devices that report a status of `ATTENTION`, `SMARTFAIL`, or `DOWN`.

   ```
   isi status -v
   ```

2. Run the following command to check for drives that do not report a status of `HEALTHY`, `L3`, or `JOURNAL`.

   ```
   isi_for_array -s 'isi devices drive list | egrep -v "HEALTHY|L3|
   JOURNAL"'
   ```

3. Run the following command to check the mirror status of the boot drives on each node.

   ```
   isi_for_array -s 'gmirror status'
   ```

   Note: If a drive is degraded, do not continue with the upgrade until the issue is resolved.

4. If the cluster has an InfiniBand network, run the following command to confirm whether a node has been assigned the OpenSM (subnet manager) master role.

   ```
   isi_for_array -s 'ps -auwwwx | grep master | grep opensm'
   ```

Confirm that the output displays only one node in the cluster with the phrase `master (opensm)`. The output should be similar to the following:

```
node-2: root   1610   0.0   2.3   436292   384672   ??   Ss   19May15
97:31.63
opensm: 0x00151b00007a671b master (opensm)
```

Note:
If the command does not return output that includes `master (opensm)` for any node, then another device has assumed the OpenSM master role. In that case, confirm cables from another cluster are not connected to this cluster's primary or secondary InfiniBand switch, and then run the command again. For more information, contact Isilon Technical Support

5. Isilon recommends that you enable the Virtual Hot Spare (VHS) feature. VHS ensures that the cluster has enough free space available to smartfail a drive and re-protect the drive's data. See article 471814, *How to enable and configure Virtual Hot Spare (VHS)* for instructions.
6. In the OneFS web administration interface, perform the following steps for each node in the cluster.
   a. Click **Dashboard** > **Cluster Overview** > **Cluster Status**.
   b. In the **Status** area, click the ID of a node.
   c. In the **Chassis and drive status** area, click **Platform** .
   d. If any `correctable` or `fatal` errors are reported, do not continue with the upgrade. If the errors cannot be resolved, contact Isilon Technical Support

Results

Note: For more information on these commands and checking hardware health, please see the following articles:

- See article 317462, *How to determine why a node is in an attention state*.
- See article 456690, *Cannot perform upgrade with degraded boot drive*.
- Article 424865, *ECC error policy violation alert does not clear after replacement*
- Article 424324, *Physical memory low*
- Article 471897, *Temperature sensitivity in the DIMM module used in the Isilon IQ 10000X-SSD, IQ 5000S-SSD, and IQ*
- Article 471888, *DIMM replacement policy for Isilon nodes*

Check the available free space

Ensure that the minimum available-space requirements for the cluster, nodes, node pools, and critical directories are met before you upgrade. Do not continue with the upgrade if the minimum available-space requirements are not met.

Available space requirements for clusters, nodes, node pools, and directories

The cluster, nodes, node pools, and several critical directories in the file system must meet available space requirements prior to upgrading OneFS. If the available space for any of these items falls below the minimum requirement, make more space available before upgrading. Otherwise, the upgrade process will fail and might not return an error indicating available space as the cause.

Item	Minimum Requirement	Task
Cluster	The cluster cannot be more than 90 percent capacity.	Make more available space.
Node	Each node cannot be more than 92 percent capacity.	Make more available space.
Node pool	Each node pool cannot be more than 90 percent capacity.	Make more available space.
root partition (`/`)	The root partition cannot be more than 97 percent capacity.	If this directory is at or near the minimum available-space requirement, see the following resources for steps to address the issue: • Knowledge base article 464118, *Node reached 95% used capacity on the root file system*. • Event ID 100010003, *The /(root) partition is near capacity*, is the OneFS event reference.
`/ifs`	The `/ifs` directory cannot be more than 90 percent capacity.	If this directory is at or near the minimum available-space requirement, see the following resources for steps to address the issue: • Knowledge base article 471816, *"There is at least one SmartPool at or over capacity " or "The SmartPool '[name]' is near or over capacity"*. • Event ID 100010004, *The cluster's `/ifs` partition is near capacity*, is the OneFS event reference.
`/var`	The `/var` partition cannot be more than 90 percent capacity.	If this directory is at or near the minimum available-space requirement, see the following resources for steps to address the issue: • Knowledge base article 471789, *The /var partition is near capacity (95% used)*. • Event ID 100010001, *The `/var` partition is near capacity*, is the OneFS event reference.
`/var/crash`	The `/var/crash` directory cannot be more than 90 percent capacity.	If this directory is at or near the minimum available-space requirement, see the following resources for steps to address the issue:

Item	Minimum Requirement	Task
		• Knowledge base article 458364, *The crash partition of a node in the cluster has reached 90% capacity alert*. • Event ID 100010002, *The /var/crash partition is near capacity*, is the OneFS event reference.

For more information, see the Best Practices Guide for Maintaining Enough Free Space on Isilon Clusters and Pools.

Confirm used and available space

Procedure

- To confirm how much space is being used on the cluster and on each node, run the following command:

```
isi stat
```

- To confirm how much space is being used in each node pool, run the following command:

```
isi stat -p
```

- To confirm how much space is being used by critical directories on the cluster, run the following command:

```
isi_for_array -s 'df -h'
```

Results

The `isi_for_array` output is similar to the following for each node in the cluster:

```
virtual-demo-3: Filesystem   Size  Used  Avail  Capacity  Mounted on
-----------------------------------------------------------------------
virtual-demo-3: /dev/imdd0a  495M  418M  38M    92%       /
virtual-demo-3: devfs        1.0K  1.0K  0B     100%      /dev
virtual-demo-3: /dev/imdd1a  495M  6.7M  449M   1%        /var
virtual-demo-3: /dev/imdd2a  496M  5.9M  451M   1%        /var/crash
virtual-demo-3: OneFS        40G   283M  20G    1%        /ifs

virtual-demo-2: Filesystem   Size  Used  Avail  Capacity  Mounted on
-----------------------------------------------------------------------
virtual-demo-2: /dev/imdd0a  495M  417M  38M    92%       /
virtual-demo-2: devfs        1.0K  1.0K  0B     100%      /dev
virtual-demo-2: /dev/imdd1a  495M  6.1M  449M   1%        /var
virtual-demo-2: /dev/imdd2a  496M  5.9M  451M   1%        /var/crash
virtual-demo-2: OneFS        40G   283M  20G    1%        /ifs
```

Check NFS exports for file and directory names that are not UTF-8 encoded

If you are upgrading from OneFS 7.1.1.9 or earlier to OneFS 7.2.0 or later, run the EncodingCheck job before you upgrade to check for files and directories that are accessed by NFS clients but are not UTF-8 encoded.

About this task

In OneFS 7.2.0 and later, the OneFS NFS server requires that file and directory names be translated to UTF-8 encoding for on-disk storage. This requirement allows for more flexible cross-protocol access. Because an NFS client might access files and directories that are created over other protocols—for example, SMB, SSH and FTP—the NFS server might not accurately translate the names of files and directories that are not UTF-8 encoded, which could cause the NFS server to provide inaccurate file or directory names to NFSv3 and NFSv4 clients.

In addition, in versions of OneFS earlier than 7.2.0.0, the NFS server might not have enforced consistency between client character encoding and export character encoding, which could have allowed file and directory names to be stored on the cluster in an encoding that is incompatible with UTF-8. This could cause the NFS server in OneFS 7.2.0.0 and later to provide inaccurate file or directory names to NFSv3 and NFSv4 clients. For more detailed information about this issue, see ETA 483840, *ETA 483840: Isilon OneFS: OneFS: Non-UTF-8 encoded files or directories may be inaccessible to NFSv3 and NFSv4 clients after upgrading OneFS clusters from version 7.1.1.9 or earlier to 7.2.0.0 or later*.

If either of these issues occurs, the affected files and directories might not be available to NFSv3 and NFSv4 clients.

For detailed information and steps to run the EncodingCheck job, see knowledge base article 487130, *OneFS: How to run the UTF-8 EncodingCheck job on OneFS clusters before and after upgrading from OneFS 7.1.1.9 and earlier to OneFS 7.2.x and later*.

Procedure

1. After reviewing article 487130, if necessary, install the patch for your version of OneFS.

   The EncodingCheck job is included in OneFS 7.1.1.11 and OneFS 7.2.1.4 and later 7.2.1 releases.

2. Follow the steps in the article to run the EncodingCheck job.
3. If the EncodingCheck job detects affected files and directories, run the `isi_encoding_update` command to update the encoding tags applied to the affected files and directories.

   For more information and steps for running the `isi_encoding_update` command, see knowledge base article 489803, *OneFS 7.1 - 7.2: How to use the isi_encoding_update command.*

Resolve outstanding events and errors

Before you upgrade, resolve outstanding critical events, errors, and failures.

About this task

Unresolved events and errors can disrupt the OneFS upgrade process.

Procedure

1. Run the following command to view all events on the cluster:

```
isi event events list
```

- If the command returns any critical errors, check the log files in the following directories for more information:
  - `/var/log`
  - `/var/log/messages`
  - `/var/crash`
- If the `/var/log/idi.log` file or the `/var/log/messages` file contains messages about a dynamic sector recovery (DSR) failure or an Isilon Data Integrity (IDI) failure, contact Isilon before you upgrade.

2. Cancel non-critical events before upgrading to prevent a recurrence of notifications that you know to be harmless.

   See the following knowledge base articles for more information about cancelling non-critical events:

   - Article 317661, *How to quiet or cancel an event (alert)*
   - Article 304312, *How to reset the CELOG database and clear all historical alerts*

   For information about specific events, see the OneFS Event Reference for the version of OneFS from which your are upgrading

   See the following knowledge base articles that address specific events. If OneFS reports or logs any of these events, follow the instructions in the associated article to resolve the issue:

   - Article 471816, *There is at least one smartpool at or over capacity*
   - Article 454806, *Detected IDI failure, attempting DSR*
   - Article 373706, *DSR - Dynamic Sector Recovery Failure*
   - Article 373712, *IDI error. Shallow verification failure in block*
   - Article 447864, *Detected IDI network checksum error on path*
   - Article 454399, *Cluster needs to be restriped but FlexProtect is not running*

Verify configurations and settings

Confirm that your OneFS configurations for CloudPools, NIC aggregation, Kerberos, InsightIQ, and SMB are supported by the target version of OneFS to which your are upgrading.

Reconfigure unsupported SMB settings

About this task

If the SMB settings on the cluster are not supported by the target version of OneFS to which you are upgrading, the upgrade might fail. Run the upgrade compatibility check utility to confirm whether your current settings are supported.

If the upgrade compatibility check utility detects unsupported SMB settings, remove or modify the unsupported SMB settings through the command-line interface or web administration interface before you upgrade.

Verify global namespace requirements

Verify that your Isilon cluster meets the minimum requirements for Global Namespace Acceleration (GNA).

About this task

If you are upgrading to OneFS 7.0 or later and GNA is enabled, the cluster must meet the following requirements before you upgrade:

- 20% or more of the nodes in the cluster must contain at least one SSD
- SSDs must make up at least 1.5% of the total storage capacity on the cluster; Isilon recommends that SSDs make up at least 2% of the cluster.

If the cluster does not meet these requirements before you upgrade the cluster to OneFS 7.0 or later, the upgrade process will fail and GNA will be disabled.

Run the following command to view the size and capacity of the SSDs in the cluster:

```
isi status -q
```

For more information, see article 447292, *Upgrade to OneFS 7.0.1.2 and later is halted if Global Namespace Acceleration is enabled and SSD storage is less than the enforced minimum of 1.5 percent of total storage*.

Configure the NIC aggregation method

Support for the Legacy Fast EtherChannel (FEC) link aggregation method was removed in OneFS 8.0.0.

About this task

Network interface card (NIC) aggregation, also known as link aggregation, enables you to combine the bandwidth of a node's physical network interface cards into a single logical connection.

Note: Configuring link aggregation is an advanced function of network switches. Consult the network switch documentation before configuring the cluster for link aggregation.

Procedure

- If the cluster has one or more IP address pools that use the Legacy FEC link aggregation method, you should configure the link aggregation method before upgrading to OneFS 8.0.0 or later. If the Legacy FEC link aggregation method is selected, the OneFS upgrade process automatically resets the Legacy FEC link aggregation method to standard FEC. For information about NIC aggregation, see the OneFS CLI Administration Guide or the OneFS Web Administration Guide for the version of OneFS to which you are upgrading .

Preserve the Kerberos keytab file

About this task

If Kerberos authentication is configured on the cluster, upgrading OneFS might delete the local `/etc/<name>.keytab` file that is on each node. Choose one of the following methods to preserve the keytab file during the upgrade:

- Copy the keytab file to the `/ifs` directory where it can be accessed by all nodes on the cluster instead of saved locally on each node.

- Add the following text to the `/etc/mcp/override/user_preserve_files.xml` file of each node on the cluster where *<name>* is the name of the keytab file:

```
<?xml version="1.0" encoding="UTF-8"?>
<user_preserve>
<files>
<file name="etc/allow_unsupported_boot" recursive="no">
</file>
...
...
<file name="etc/<name>.keytab" recursive="no" />

</files>
</user_preserve>
```

For more information, see article 304460, *How to configure the Isilon cluster to use Kerberos with NFS in a non-Active Directory environment*.

Install a supported version of InsightIQ

About this task

Before you upgrade OneFS, confirm the version of InsightIQ you are running is compatible with the target version of OneFS to which you are upgrading. If the versions are not compatible, upgrade InsightIQ before upgrading OneFS.

Note: See the InsightIQ 4.1.3 guides for additional information about monitoring OneFS 8.2.0 clusters.

Note: If you are upgrading from OneFS 8.1.x or older to OneFS 8.2.x or newer, a maximum of 99 FSA reports will be retained after the upgrade. For more information, see KB article 540000.

Procedure

- To determine whether InsightIQ is licensed on the cluster, run the following command:

```
isi license view insightiq
```

See the Isilon Supportability and Compatibility Guide for OneFS and InsightIQ compatibility information.

See the InsightIQ - Isilon Info hub for documents and content that is related to InsightIQ, including release notes, installation guides, user guides, and troubleshooting guides.

Upgrade compatibility check utility

The upgrade compatibility check utility examines cluster settings, activities, and statuses to verify whether your cluster is compatible with the target version of OneFS to which you are upgrading.

The upgrade compatibility check utility is included in each OneFS installation package. You can run the utility alone or as part of the upgrade process.

Download the OneFS installation file

Procedure

1. From the Isilon OneFS Downloads page on the Online Support site, under **Browse Product**, select your target version of OneFS.

2. Download the installation file for the target version of OneFS to which you are upgrading.
   a. Optional: To validate the integrity of the installation file after downloading, click **Checksum** and record the MD5 or SHA-256 checksum value displayed.
3. Open a secure shell (SSH) connection to any node in the cluster and log in using the root account.
4. Move the installation file you downloaded into the `/ifs/data` directory on the cluster you want to upgrade.
   a. Optional: To validate the integrity of the downloaded installation file, run the following command for your checksum type where *<installation-file-name>* is the name of the downloaded installation file:
      - md5 */ifs/data/<installation-file-name>*
      - sha256 */ifs/data/<installation-file-name>*
   b. Optional: To validate the integrity of the downloaded installation file, compare the MD5 or SHA-256 checksum value that you recorded from the downloads page on the Online Support site to the checksum value returned from the MD5 or SHA-256 command. If the values do not match, re-download the installation file.

Run the upgrade compatibility check utility

To confirm that your OneFS cluster is compatible with the target version that you are upgrading to, run the upgrade compatibility check utility.

About this task

Note: The upgrade compatibility check utility is included in each OneFS installation package, which must be downloaded and accessible in an `/ifs` directory.

Procedure

1. Open a secure shell (SSH) connection to any node in the cluster and log in to the cluster with the root account.
2. Start the upgrade compatibility check utility by running the following command, where *<install-image-path>* is the file path of the upgrade installation file.

   ```
   isi upgrade cluster assess <install-image-path>
   ```

   Note: The upgrade compatibility check utility might take several minutes to run. If the utility returns errors, resolve the errors before continuing with the upgrade. Warnings are informational and do not prevent an upgrade.

Upgrade compatibility checks

The upgrade compatibility check utility examines the following areas of the cluster and returns warnings or errors if an area is not compatible with the version of OneFS to which you are upgrading.

Check	Description	Recommendation
Disk load	Checks the cluster usage level and returns a warning if the disk load is greater than 50 percent.	Isilon recommends that you disconnect all client connections and stop all system jobs before upgrading. A disk load that is greater than 50 percent might indicate that multiple clients are connected to the cluster or that system jobs are running.

Check	Description	Recommendation
Free space	Checks cluster free space and returns a warning or an error if capacity thresholds are exceeded for the following partitions and node pools: **/** Returns a warning if the root partition exceeds 97 percent of its capacity. Returns an error if the partition reaches 100 percent capacity. **/var** Returns a warning if the `/var` partition is more than 90 percent full. Returns an error if the partition reaches 100 percent full. **/ifs** Returns a warning if the `/ifs` partition exceeds 95 percent of its capacity. Returns an error if the partition reaches 100 percent capacity. **Node pools** Returns a warning if one or more node pools exceed 90 percent of its capacity. Returns an error if all the node pools reach 90 percent capacity.	Do not continue with the upgrade if the utility reports a capacity-related error. See the *Check the available free space* section of the *Upgrade Planning and Process Guide* for more information.
Drive stalls	Checks the health of the drives in the cluster and returns a warning if the cluster contains stalled drives.	If the utility reports a stalled drive, do not continue with the upgrade until you smartfail and replace the stalled drive or resolve the stall. See article 466391, *Introduction to drive stalls*, for information about resolving drive stalls.

Check	Description	Recommendation
Smartfail operation status	Determines whether a smartfail operation is running on any drives or nodes in the cluster.	If a smartfail operation is running, the utility returns an error. Wait for the smartfail operation to complete before continuing with the upgrade.
IntegrityScan job status	Determines whether the integrityScan job is running.	If the integrity scan job is running, wait for the job to complete before continuing with the upgrade.
Unresolved critical events	Checks for unresolved, critical events.	If the utility reports that there are unresolved critical events, do not continue with the upgrade until you resolve the issues. See the OneFS Event Reference for more information.
Unsupported chmod_mask_nfs_only ACL policy	Checks whether the chmod_mask_nfs_only ACL policy is set. This policy is not available in OneFS 7.2 and later.	If the utility returns an error, the ACL policy is set. Upgrades will succeed regardless of whether the policy is set; however, the policy will not be available after the upgrade completes.
Unsupported SMB configuration	Checks for unsupported SMB settings.	If the utility reports that the SMB configuration is not supported, do not continue with the upgrade until you remove the unsupported settings and reconfigure SMB. See the *Reconfigure unsupported SMB settings* section for more information.
SMB access zone association	Checks if one or more SMB shares are associated with multiple access zones where the share paths overlap.	If the utility reports an error, the upgrade will succeed. However, you cannot create access zones until the path overlap is fixed.
Kerberos keytab	Checks whether Kerberos settings have been configured to preserve the keytab file.	If the utility reports an error, you must configure Kerberos settings before upgrading OneFS. See the *Preserve the Kerberos keytab file* section for more information. The keytab file is used to migrate Kerberos settings into the OneFS web administration interface and command-line interface.
HDFS Kerberos keytab	Checks whether HDFS Kerberos settings have been configured to preserve the keytab file.	If the utility reports an error, you must configure Kerberos settings before upgrading OneFS.See the *Preserve the Kerberos keytab file* section for more information. The keytab file is used to migrate Kerberos settings into the OneFS web administration interface and command-line interface. **Note:** This check was first added for upgrades to OneFS 7.2. If you are upgrading to an earlier version of OneFS, you must manually make sure that Kerberos settings have been configured correctly.

Back up data

It is recommended that you back up all files and data on your OneFS cluster immediately before you upgrade.

Allow sufficient time for a full and an incremental backup, if needed. Depending on the size of your cluster and the file types stored, a back up can take one or more days.

- Back up modified files from:
  - `/usr/`
  - `/usr/local/`
  - `/usr/libexec/`
  - `/var/`
  - `/var/crash/`
- Back up all files from:
  - `/etc/mcp/override/`

Note: You should validate that you can restore the data from your backup system before you upgrade.

SyncIQ backup

SyncIQ enables you to retain a consistent backup copy of your data on another OneFS cluster. SyncIQ creates and references snapshots to replicate a consistent point-in-time image of a root directory.

Note: If you're upgrading your cluster from OneFS 8.1.0.x or earlier to OneFS 8.1.1.x, 8.1.2.x, or 8.1.3.x, and your cluster is in Compliance mode, you must upgrade both the SyncIQ source and SyncIQ target clusters to the newer version of OneFS before restarting SyncIQ backups. If the SyncIQ source and SyncIQ target clusters are different versions of OneFS, SyncIQ backups will fail. This issue is resolved in OneFS 8.2.x.

For more information, see the OneFS CLI Administration Guide or the OneFS Web Administration Guide for your version of OneFS.

NDMP backup

You can back up the data on your OneFS cluster through the Network Data Management Protocol (NDMP).

From a backup server, you can direct backup and recovery processes between a cluster and backup devices such as tape devices, media servers, and virtual tape libraries (VTLs). You can perform both NDMP three-way backup and NDMP two-way backup. In both backup models, file history data is transferred from the cluster to a backup server over the network.

See the OneFS Web Administration Guide or the OneFS CLI Administration Guide for information about backing up data with NDMP.

Back up custom settings

Most settings are preserved during a OneFS upgrade. However, documenting and backing up custom settings enables you to reapply any settings that are not preserved during the upgrade process.

Document and back up the following custom settings:

Setting	Description	Recommendation
SMB audit logging	If you have an audit log directory in `/ifs`, you might have custom SMB logging settings configured.	After upgrading, you must reconfigure SMB audit logging. See File System Auditing with Isilon and Common Event Enabler (CEE) for more information about SMB audit logging.
Passwords for local user accounts	After you upgrade, you might have to reset the passwords of the local user accounts that you configured on the cluster. Other users should be prepared to reset the passwords of their local accounts after the upgrade.	Make a list of the local accounts and their passwords before you upgrade.
`sysctl` parameters	If you changed the default value assigned to one or more `sysctl` parameters by editing either the `/etc/mcp/override/sysctl.conf` file or the `/etc/local/sysctl.conf` file, you might need to reset the parameter after you upgrade. If you modified a`sysctl` parameter by editing another file—for example, the `/etc/sysctl.conf` file—the change will not be preserved during the upgrade.	Isilon does not recommend modifying `sysctl` parameters unless you are instructed to do so by Isilon Technical Support. If you must modify a `sysctl` parameter, configure the parameter in the `/etc/mcp/override/sysctl.conf` file to ensure that the change is preserved when you upgrade a node or a cluster. Before you upgrade, document your custom `sysctl` parameters and back up the `/etc/mcp/override/sysctl.conf` and `/etc/local/sysctl.conf` files. For more information, see article 462759, *Configuring sysctls and making sysctl changes persist through node and cluster reboots and upgrades*.
Aspera for Isilon	You must reinstall and reconfigure Aspera after you upgrade.	Before you upgrade, back up the Aspera configuration files in the following directories: • `/ifs/.ifsvar/aspera/etc/` • `/ifs/.ifsvar/aspera/www/` • `/usr/local/aspera/var/aspera-prepost` To determine which version of Aspera is compatible with the version of OneFS to which you are upgrading, see the Isilon Supportability and Compatibility Guide, and then visit the Aspera website to download the Aspera install files. For more information, see article 493022, *How to download Aspera for OneFS*.

Setting	Description	Recommendation
Cron jobs	Cron jobs settings that were not configured in the `/etc/mcp/override/crontab.smbtime` file are not preserved during an upgrade.	Document and back up custom cron job settings or configure them in the `/etc/mcp/override/crontab.smbtime` file before you upgrade. After you upgrade, you might have to modify a cron job to accommodate changes to OneFS commands. Check the Isilon OneFS CLI Mapping Guide for command syntax changes between versions of OneFS.

Complete or stop jobs in progress

You should ensure that there are no jobs running on your OneFS cluster before beginning the upgrade. Wait for jobs to fully complete or stop jobs before upgrading.

Complete NDMP backups

About this task

Before you upgrade, you must wait for Network Data Management Protocol (NDMP) backups to finish so you have saved copies of your data.

Note: If you cannot wait for NDMP backups to finish, stop the active NDMP backups 30– 60 minutes before the upgrade, as the NDMP backup process requires this additional time to come to a halt.

For instructions on how to stop backup jobs, see the documentation for your backup application.

Complete system jobs

About this task

Ensure that no system jobs are running during the upgrade by allowing system jobs to finish before the upgrade starts, or by cancelling them. OneFS performs system jobs through a service that runs in the background, and if any system jobs are running during the upgrade, the upgrade process might fail.

Procedure

1. To check for running system jobs, run the following command, and make a note of the job ID for any jobs that you want to cancel:

   ```
   isi job status
   ```

2. To cancel a job, run the following command where *<job_id>* is the ID of the job you want to cancel:

   ```
   isi job jobs cancel <job_id>
   ```

   Note: Do not cancel the Upgrade, FlexProtect, FlexProtectLin, or IntegrityScan jobs. If any of these four system jobs are running, you cannot continue with the upgrade. If an Upgrade, FlexProtect, FlexProtectLin, or IntegrityScan system job takes longer than expected to complete, contact Isilon Technical Support.

Note: Sync polices and jobs must be canceled or paused in order for the upgrade to complete successfully.

Update drive firmware

About this task

Ensure that your OneFS cluster is running the most recent version of supported drive firmware before upgrading the cluster.

Note: After a cluster upgrade, OneFS might upgrade the file system, which causes nodes to experience higher levels of drive I/O than usual.

For information about installing drive firmware, see OneFS Drive Firmware, available on the Online Support site.

Disconnect IPMI ports

About this task

If you have enabled IPMI ports, it is recommended that you change the IPMI port IP configuration to static in the BIOS settings for each affected node before the upgrade. If you change the IPMI port configuration during the upgrade process, and your workflow requires the IPMI ports to be enabled, you must manually re-enable the ports after the upgrade process is complete.

Note: Use of IPMI ports is not supported and we do not recommend connecting IPMI ports to a network.

For more information, see article 466057, *Unsupported IPMI port is active and uses DHCP on X200, S200, X400, and NL400 nodes*

Secure Remote Services (SRS)

About this task

SRS can enable remote access, which allows Isilon Technical Support personnel to troubleshoot the cluster remotely and run scripts to request log files on the cluster, and then upload the logs to a secure location.

You must enable and configure SRS before Isilon Technical Support can gather data or access your cluster remotely.

See the SRS product page for documentation on how to enable and configure SRS. See the OneFS CLI Administration Guide or the OneFS Web Administration Guide for more information about SRS.

CHAPTER 4

Performing the OneFS upgrade

Perform the upgrade tasks.

Performing the tasks described in this chapter helps you to upgrade your cluster. Use the checklist to track your progress.

☐ Perform the OneFS upgrade

☐ Verify the OneFS installation

☐ Troubleshooting your upgrade on page 63

Upgrade process overview

The OneFS upgrade process consists of installing the upgrade image, starting the upgrade, and verifying that the upgrade completed.

To download the installation image, navigate to the Online Support site and download the installation image for the OneFS version you are upgrading to. See the Download the OneFS image section for more information.

Note: You can upgrade OneFS using the command-line interface or the web administration interface.

Completing a simultaneous upgrade of OneFS

If you run a simultaneous upgrade, the OneFS cluster is upgraded simultaneously and then all of the nodes in the cluster are restarted simultaneously. During a simultaneous upgrade, the entire cluster is down and unavailable for client connections.

Perform a simultaneous upgrade through the command-line interface in OneFS 7.2 and earlier

You can upgrade OneFS through the command-line interface.

Before you begin

Download the OneFS installation image from the Online Support site. If you have not already done so, you must run the Upgrade compatibility check utility and resolve all compatibility issues found by the utility before you upgrade. See the Upgrade compatibility check utility section for more information.

Procedure

1. Open a secure shell (SSH) connection to the lowest-numbered node in the cluster and log in with the root account.

   You can verify the IP address of the lowest numbered node by running the `isi status` command.

2. Run the following command to perform a simultaneous upgrade:

   ```
   isi update
   ```

3. At the prompt, specify the location of the OneFS installation image that you downloaded and press **Enter**.

Results

After the upgrade, a number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

Perform a simultaneous upgrade through the web interface in OneFS 7.2 and earlier

You can upgrade OneFS through the web administration interface.

Before you begin

Download the OneFS installation image from the Online Support site. If you have not already done so, you must run the Upgrade compatibility check utility and resolve all compatibility issues found by the utility before you upgrade. See the Upgrade compatibility check utility section for more information.

Procedure

1. Log in to the lowest-numbered node in the cluster through the OneFS web administration interface with the root account.

   You can verify the IP address of the lowest numbered node by viewing the **Dashboard** > **Cluster Overview** page.

2. Navigate to the **Upgrade OneFS** page.
   - In OneFS 6.5 and earlier, click **Cluster** > **Cluster Management** > **Upgrade Summary**.
   - In OneFS 7.0 through OneFS 7.2, click **Help** > **About This Cluster**, and then click **Upgrade**.
3. Browse to the location of the installation image that you want to install, and then click **Submit**.
4. In the **Upgrade Mode** area, select `Simultaneous upgrade`, and then click **Continue**.

   The cluster displays status updates and a prompt to continue the upgrade process.
5. Click **yes** to begin the upgrade process.

   The cluster might display several confirmation messages. You must confirm each message to continue the upgrade process.

Results

After OneFS is upgraded, the cluster restarts, and then the web administration interface login page appears. If the login page does not appear, clear your web browser cache and reload the page. A number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

Completing a rolling upgrade of OneFS

If you perform a rolling upgrade, the OneFS cluster nodes are restarted sequentially. During a rolling upgrade, client connections to the restarting node will be disconnected, but other nodes will remain available for client connection.

Rolling upgrades are not available between all OneFS versions. See the Verify the upgrade path section of this document to determine whether your upgrade path supports the rolling upgrade option.

Note: When you perform a rolling upgrade between OneFS releases, you can upgrade all the nodes in the cluster, or you can select specific nodes to upgrade. Also, you can specify the upgrade order of the nodes. If you upgrade only some of the nodes, the remaining nodes in the cluster are not upgraded but can be upgraded later in the upgrade process. Only one upgrade

can be in progress at a particular time. Also, you cannot upgrade some nodes to one version of OneFS and then upgrade another group of nodes to a different version of OneFS.

Perform a rolling upgrade through the CLI

You can upgrade OneFS through the command-line interface.

Before you begin

Download the OneFS installation image from the Online Support site. If you have not already done so, you must run the Upgrade compatibility check utility and resolve all compatibility issues found by the utility before you upgrade. See the Upgrade compatibility check utility section for more information.

Procedure

1. Open a secure shell (SSH) connection to the highest numbered node in the cluster and log in with the root account.

   You can verify the IP address of the highest numbered node by running the `isi status` command.

2. Run the following command to perform a rolling upgrade:

   ```
   isi update --rolling
   ```

3. (Optional) You can specify the following rolling upgrade options:

Options	Description
Connection ***drain time***	You can specify a timeout period to enable clients to disconnect from an upgraded node before the node is restarted by using the `--drain-time` option. You can assign an integer to the `--drain-time` option that represents the number of seconds, minutes, hours, days, or weeks that the upgrade process will wait before restarting a node. The default unit of time assigned to the option is seconds. You can specify a different unit of time by appending one of the following letters to the integer assigned to the option: • m: Specifies minutes • h: Specifies hours • d: Specifies days • w: Specifies weeks **Note:** If client connections are not disconnected within the specified period of time, the upgrade will halt or fail. If this occurs, you must manually disconnect the client connections and restart the upgrade from the node that the upgrade failed on. To identify which node the upgrade failed on, view the `update_handler` file. The file is located under `/var/log`, and is named according to the following format: `/var/log/update_handler_<date_upgrade_started>.txt` The node that the upgrade failed on is the last node mentioned in the file.

Options	Description
Manual restart	You can configure the upgrade process to display a confirmation prompt before each node restarts by including the `--manual` option. If you do not include this option, each upgraded node is automatically restarted without a prompt. **Note:** This option requires that you stay connected to the session to confirm each reboot. You must respond to each prompt to reboot a node within 15 minutes. If a prompt to reboot is not answered within the 15-minute time-out period, the rolling upgrade process will stop progressing.

The following example starts a rolling upgrade, sets a *drain time* of ten minutes and specifies that the upgrade prompts you to restart each node within 15 minutes of displaying the prompt:

```
isi update --rolling --drain-time=10m --manual
```

4. At the prompt, specify the location of the OneFS installation image that you downloaded and press **Enter**.

Results

After OneFS is upgraded on the last node and the node restarts, a number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

Perform a rolling upgrade through the web interface

You can upgrade OneFS through the web administration interface.

Before you begin

Download the OneFS installation image from the Online Support site. If you have not already done so, you must run the Upgrade compatibility check utility and resolve all compatibility issues found by the utility before you upgrade. See the Upgrade compatibility check utility section for more information.

Procedure

1. Log in to the highest numbered node in the cluster through the OneFS web administration interface with the root account.

   You can verify the IP address of the highest numbered node by viewing the **Dashboard** > **Cluster Overview** page.

2. Navigate to the **Upgrade OneFS** page.
   - In OneFS 6.5 and earlier, click **Cluster** > **Cluster Management** > **Upgrade Summary**.
   - In OneFS 7.0 through OneFS 7.2, click **Help** > **About This Cluster**, and then click **Upgrade**.
3. Browse to the location of the installation image that you want to install, and then click **Submit**.
4. In the **Upgrade Mode** area, select `Rolling upgrade`, and then click **Continue**.

   The cluster displays status updates and a prompt to continue the upgrade process.
5. (Optional) Specify how to terminate client connections before upgrading the node.

Options	Description
To immediately terminate client connections	Click **Immediately terminate TCP connections**.
To allow client connections to terminate after a wait period	a. Click **Wait for TCP connections to terminate**. b. In the **Wait time** field, type an integer that represents how long to wait in seconds, minutes, hours, days, weeks, or months. **Note:** If any client connections are not terminated within the specified drain time, the upgrade will halt or fail. You must manually disconnect client connections and restart the upgrade. You must restart the upgrade from the node that the upgrade failed on. To identify which node the upgrade failed on, view the `update_handler` file. The file is located under `/var/log`, and is named according to the following format: `/var/log/update_handler_<date_upgrade_started>.txt` The node that the upgrade failed on is the last node mentioned in the file.

6. (Optional) Specify whether you want to confirm restarting each node during the upgrade process.

Options	Description
To display a notification and a prompt before each upgraded node is restarted	Click **Confirm before rebooting nodes**. **Note:** This option requires that you stay connected to the session to confirm each reboot. You must respond to each prompt to reboot a node within 15 minutes. If a prompt to reboot is not answered within the 15-minute time-out period, the rolling upgrade process will stop progressing.
To automatically restart each upgraded node without a prompt	Click **Reboot nodes without confirmation**.

7. Click **yes** to begin the upgrade process.

   The cluster might display several confirmation messages. You must confirm each message to continue the upgrade process.

Results

After OneFS is upgraded on the last node and the node restarts, the web administration interface login page appears. If the login page does not appear, clear your web browser cache and reload the page. A number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

Configuration changes during a rolling upgrade

You can continue to manage data and modify some cluster configurations during a rolling upgrade. For example, you can modify SMB shares and NFS exports. Dell EMC recommends that you make

configuration changes from the node with the highest devid. The node with the highest devid will be the last node to be upgraded and restarted and will help you avoid being disconnected during the upgrade process.

Attempts to enable or configure settings on a node that has already been upgraded will fail until the upgrade is complete. New OneFS features and software modules are not functional until all of the nodes in the cluster have been updated.

Client connections during rolling upgrades

Rolling upgrades allow users to access data before, during, and after the upgrade. However, as nodes are upgraded and restarted, users may experience brief pauses in the time it takes to complete a read or write operation.

If the cluster is configured for dynamic IP allocation, client connections to restarted nodes are automatically reconnected. If a client is reconnected to a node that has not yet been upgraded and restarted, the client might be required to re-establish a connection to the cluster more than once.

The following table describes the expected behavior when a client is connected to a node that is restarted on a cluster that is configured for dynamic IP allocation:

Client	Expected client behavior
SMB2	Client quickly re-establishes a connection to a new node after the connection to the restarting node is disrupted.
SMB3	Client transitions from the restarted node to a new node without disruption.
NFSv2 and NFSv3	Client transitions from the restarting node to a new node without disruption.
NFSv4	Clients that are connected to the cluster using static IP addresses wait for NFS serviceability to resume on the nodes that they are connected to. Clients that are connected to the cluster using dynamic IP addresses use NFSv4 failover support. The clients transition from the restarting node to a new node without disruption.

Note: For more information, see article 457328, *Best practices for NFS client settings*.

Committing an upgrade of OneFS

You must commit an upgrade to complete the upgrade process. Once you commit the upgrade, you cannot roll back to the previous version of OneFS.

New features in the target version of OneFS are not available until the upgrade has been committed.

Commit an upgrade through the web interface

You can use the web interface to commit an upgrade of OneFS.

About this task

Once you commit the upgrade, you cannot roll back to the previous version of OneFS. After the upgrade is committed, all the new features in the upgrade are available.

Procedure

1. Log in to any node in the cluster through the web administration interface with the root account.

2. Click **Cluster Management** > **Upgrade**.
3. Click the **Commit Upgrade to OneFS <version>** button.

   The cluster might display several confirmation messages. Confirm each message to continue the commit process.

Commit an upgrade

About this task

You can commit an upgrade through the web administration interface or the command-line interface. Once you commit the upgrade, you cannot roll back to the previous version of OneFS. Command-Line Interface instructions:

Procedure

1. Open a secure shell (SSH) connection on the lowest-numbered node in the cluster and log in with the root account.
2. To commit the upgrade, run the following command:

```
isi upgrade cluster commit
```

About this task

Note: Once you commit the upgrade, you cannot roll back to the previous version of OneFS. After the upgrade is committed, all the new features are available.

Web Administration Interface instructions:

Procedure

1. Log in to any node in the cluster through the web administration interface with the root account.
2. Click **Cluster Management** > **Upgrade**.
3. Click the **Commit Upgrade to OneFS <version>** button.

   The cluster might display several confirmation messages. Confirm each message to continue the commit process.

Rolling back an upgrade of OneFS

The upgrade rollback feature allows you to stop the upgrade that is in progress and restore all the upgraded nodes to the previous committed version of OneFS.

Note: You can roll back an upgrade only if the upgrade process is still active and the upgrade has not been committed. A committed upgrade cannot be rolled back.

Roll back an upgrade through the web interface

You can use the web administration interface to stop an upgrade and return to the previous committed version of OneFS.

About this task

Note: The rollback process must restart all the upgraded nodes simultaneously. This will temporarily disrupt cluster services and data availability.

Procedure

1. Log in to any node in the cluster through the web administration interface with the root account.
2. Click **Cluster Management** > **Upgrade**.
3. Click the **Roll Back to OneFS <version>** button.

   The cluster might display several confirmation messages. Confirm each message to continue the rollback process.

   The cluster displays the rollback progress.

Results

The rollback process must restart all the upgraded nodes simultaneously. This will temporarily disrupt cluster services and data availability. After the OneFS image is updated on the final node and the node restarts, the web administration interface login page appears. If the login page does not appear, clear the web browser cache and reload the page. A number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

Roll back an upgrade

Rolling back will stop an upgrade and return to the previous committed version of OneFS.

About this task

Note: The rollback process must restart all the upgraded nodes simultaneously. This will temporarily disrupt cluster services and data availability.

Command-Line Interface instructions:

Procedure

1. Open a secure shell (SSH) connection on the lowest-numbered node in the cluster and log in with the root account.
2. To roll back the upgrade, run the following command:

   ```
   isi upgrade cluster rollback
   ```

Results

The rollback process must restart all the upgraded nodes simultaneously. This will temporarily disrupt cluster services and data availability. After the OneFS image is updated on the final node and the node restarts, the web administration interface login page appears. If the login page does not appear, clear the web browser cache and reload the page. A number of upgrade-related jobs may continue to run on the cluster for some time. During this time, the cluster is accessible, but

you might experience a decrease in cluster performance. After the jobs complete, performance will return to normal.

About this task

Note: The rollback process must restart all the upgraded nodes simultaneously. This will temporarily disrupt cluster services and data availability.

Web Administration Interface instructions:

Procedure

1. Log in to any node in the cluster through the web administration interface with the root account.
2. Click **Cluster Management** > **Upgrade**.
3. Click the **Roll Back to OneFS <version>** button.

   The cluster might display several confirmation messages. Confirm each message to continue the rollback process.

   The cluster displays the rollback progress.

Adding a node to the cluster while an upgrade is in progress

In some circumstances, you might need to add a node to the cluster while an upgrade is in progress and before the upgrade has been committed.

To add a node during an upgrade, at least one node in the cluster must have been successfully upgraded to the target version of OneFS. When a new node is added to the cluster during an upgrade, the system images the new node with the previously committed version of OneFS. Then as the cluster upgrade continues, the new node is upgraded to the target version of OneFS. If the cluster upgrade is stopped and rolled back, all the nodes in the cluster are returned to the previously committed version of OneFS.

Note: Before adding new hardware to the cluster, first confirm that the hardware is compatible with the current version of OneFS that is installed and the target version of OneFS that you are upgrading to. See the Isilon Supportability and Compatibility Guide for more information.

Verify the OneFS installation

After you install OneFS, verify that the installation was successful.

Procedure

1. Confirm that the health of all the nodes in the cluster is `OK` by running the following command:

   ```
   isi stat
   ```

2. Remove the installation files from the `/ifs/data` directory by running the following command where *<installation_file_name>* is the name of the installation file:

   ```
   rm /ifs/data/<installation_file_name>
   ```

3. Collect information about the cluster by running the following command:

```
isi_gather_info
```

CHAPTER 5

Completing post-upgrade tasks

Performing the tasks described in this chapter helps to ensure that your upgrade is successful and minimizes down-time. Use the checklist to track your progress.

- ☐ Allow upgrade-related jobs to run
- ☐ Verify operational status
- ☐ Re-establish user privileges
- ☐ Restore client connections and test your workflow
- ☐ Restore custom settings
- ☐ Configure base directories for access zones
- ☐ Reconfigure SMB shares within access zones
- ☐ Reconfigure home directory templates within access zones
- ☐ Reconfigure HDFS settings within access zones
- ☐ Verify Kerberos migration
- ☐ Migrate to L3 cache
- ☐ Update SMB auditing
- ☐ Reinstall Aspera
- ☐ Modify custom scripts
- ☐ Install recommended patches
- ☐ Implement the OneFS API

About post-upgrade tasks

After an upgrade, you should perform a number of restoration and change management tasks to ensure that your cluster performs and behaves as expected. It is important that you build time into your upgrade plan to re-establish custom settings and privileges, and re-enable connections and features. You should also make time to modify settings for new and changed features.

Note: Once the cluster has been upgraded, the system might run an **Upgrade** job that must be allowed to finish.

Allow the Upgrade job to run

About this task

After an upgrade to OneFS 8.x, an important job titled **Upgrade** that upgrades on-disk data structures, might continue to run for a while. The **Upgrade** job must be allowed to run to completion.

Note: If the Upgrade job fails, OneFS will retry the job. If the Upgrade job is canceled, OneFS will queue the job for the next time a device joins or rejoins the cluster.

Although the cluster remains accessible while the **Upgrade** job is running, the job might temporarily decrease the cluster's performance.

Procedure

- To check for running system jobs, run the following command:

```
isi job status
```

Verify operational status

You can run a series of commands as root to help verify that the Isilon cluster is working correctly after an upgrade.

About this task

If you find an unresolvable issue, contact Isilon Technical Support.

Procedure

1. Check the new version number of the cluster:

```
isi_for_array -s uname -a
```

2. View the status of the cluster and ensure all the nodes are operational:

```
isi status
```

3. Ping all the cluster's internal and external interfaces to verify network connectivity and to help verify that SmartConnect works correctly.

4. Review the list of events and address any critical events:

```
isi event events list
```

5. Check the status of jobs and resume the jobs that you paused for the upgrade:

```
isi job status
```

6. Verify the network interfaces:

```
isi network interfaces list
```

7. Verify the subnets:

```
isi network subnets list --verbose
```

8. Verify the pools:

```
isi network pools list --verbose
```

9. Review the cluster's other log files to check for stray problems:

```
cat /var/log/messages
```

10. Review the list of SyncIQ jobs:

```
isi sync jobs list
```

11. Check the SyncIQ job reports:

```
isi sync reports list
```

12. Review the list of the scheduled snapshots:

```
isi snapshot schedules list
```

13. Check the cluster's input and output:

```
isi statistics system
```

14. Check the devices in the nodes to validate the status of the drives:

```
isi_for_array -s "isi devices list"
```

15. Check the global SMB settings:

```
isi smb settings global view
```

16. Check the status of the firmware to ensure that the firmware is consistent across nodes:

```
isi upgrade firmware devices
```

17. Ensure that all the licenses carried over and remain up-to-date:

```
isi license licenses list
```

18. Check the status of the authentication providers to ensure that they remain active:

```
isi auth status --verbose
```

Re-establish user privileges

About this task

After you upgrade, re-establish user privileges and roles. You can log in to the cluster through SSH as root or though an administrator account if that role has been assigned to any users.

Note: If the system administered the user roles through RBAC before the upgrade, any custom roles that existed are still in place. However, if the privileges assigned to built-in roles have changed in the new version, the users who are assigned to those built-in roles will have those new privileges.

See the OneFS CLI Administration Guide or the OneFS Web Administration Guide for more information.

Restore client connections, and test the workflow

About this task

After the OneFS upgrade, restore client connections and confirm that all users, clients, and applications can access the cluster.

Test your workflows to ensure that they function correctly.

Note: If you are using NDMP backups on your cluster, re-enable the NDMP service and test that it's working correctly.

Reapply custom settings

About this task

Some custom settings might not have been preserved during the upgrade. Reapply the custom settings that you backed up and recorded when you performed the pre-upgrade tasks.

The custom settings include:

- SMB audit logging
- Passwords for local user accounts
- Changes to system controls
- Aspera
- Cron jobs
- Certificates
- Static routes

Configuring base directories for access zones

If you upgrade to OneFS 7.1.1 or later, you cannot create new access zones until you reconfigure any zones that were migrated during the OneFS upgrade.

In OneFS 7.1.1 and later, access zone functionality changed in the following ways:

- A base directory must be specified for each access zone.
- Each base directory cannot overlap with another base directory.
- The base directory of the default System access zone is `/ifs` and cannot be modified.

If you have upgraded to OneFS 7.1.1 or later, each migrated access zones now specifies `/ifs` as the base directory. Connections to access zones and data will continue to work as normal. However, this configuration is not recommended, and you will not be able to create new access zones until you reconfigure the base directories. However, the migrated configuration in which `/ifs` is the base directory for all of the access zones is not recommended, and you will not be able to create new access zones until you reconfigure each zone with a unique base directory.

Access zones upgrade example

The following example illustrates access zones before and after upgrading to OneFS 7.1.1 or later.

Before upgrading	After upgrading

Global List of Shares:
• Finance = /ifs/data/Finance
• Engineering = /ifs/data/Engineering
• Human Resources = /ifs/data/Human Resources
ZoneA:
• Shares:
  ▪ Finance
• Home directory template:
  ▪ local-provider:ZoneA = /ifs/home/%U
ZoneB:
• Shares:
  ▪ Human Resources
  ▪ Engineering
• Home directory template:
	ZoneA:
	• Base directory = /ifs
	• Shares:
	  ▪ Finance = /ifs/data/Finance
	• Home directory template:
	  ▪ local-provider:ZoneA = /ifs/home/%U
	ZoneB:
	• Base directory = /ifs
	• Shares:
	  ▪ Human Resources = /ifs/data/Human Resources
	  ▪ Engineering = /ifs/data/Engineering
	• Home directory template:
	  ▪ local-provider:ZoneB = /ifs/home/%U

Before upgrading	After upgrading
▪ local-provider:ZoneB = /ifs/home/%U	

After the upgrade, both ZoneA and ZoneB point to `/ifs` as the base directory and the home directory template in each zone points to the same directory.

Configure base directories in access zones

You can configure the base directory for each access zone that was migrated upon upgrading to OneFS 7.1.1 or later.

Before you begin

Before modifying base directories, you should complete that following actions:

- Create new directories, if needed.
- Move data to the new directories. It is recommended that you move directories, rather than files, through the `mv` command.
- Modify the home directory template path of the local provider for each access zone.
- Modify the SMB share paths in each access zone to point to the directories that data was moved to.

Procedure

1. Run the `isi zone zones modify` command.

   The following example command changes the base directory for ZoneA to `/ifs/ZoneA`:

   ```
   isi zone zones modify ZoneA --path=/ifs/ZoneA
   ```

Reconfiguring SMB shares within access zones

OneFS 7.1.1 introduced changes to access zones that affect SMB shares.

In OneFS 7.1.1 and later, SMB share functionality changed in the following ways:

- Shares are not stored in a global list; shares are stored in access zones.
- A share path must match or fall under the base directory path of the access zone.
- Share names must be unique only within an access zone, not on the cluster.

The following configuration changes occur upon upgrade to OneFS 7.1.1 or later:

- If an SMB share was listed in multiple access zones before you upgraded, the upgrade process makes duplicate copies of the share and places them in their respective zones. Each share references the same directory. This is not a recommended configuration. Reconfigure the shares after you upgrade.
- OOneFS 7.1.0 enabled you to assign a display name to an SMB share. This feature is not supported in OneFS 7.1.1 and later. During the upgrade, display names are replaced with the SMB share name.

SMB shares upgrade example

The following example illustrates SMB shares before and after upgrading to OneFS 7.1.1 or later.

Before upgrading	After upgrading

Global List of Shares:
• Finance = /ifs/data/Finance
• Engineering = /ifs/data/Engineering
• Human Resources = /ifs/data/Human Resources
ZoneA:
• Shares:
  ▪ Human Resources
  ▪ Finance
ZoneB:
• Shares:
  ▪ Human Resources
  ▪ Engineering
	ZoneA:
	• Base directory = /ifs
	• Shares:
	  ▪ Human Resources = /ifs/data/Human Resources
	  ▪ Finance = /ifs/data/Finance
	ZoneB:
	• Base directory = /ifs
	• Shares:
	  ▪ Human Resources = /ifs/data/Human Resources
	  ▪ Engineering = /ifs/data/Engineering

Reconfigure SMB shares

If you upgrade to OneFS 7.1.1 or later, SMB shares are assigned to access zones.

About this task

An SMB share path must match or fall under the base directory path of the access zone. You can modify SMB shares to adhere to zone requirements.
Modify SMB share paths prior to reconfiguring home directory template paths and access zone base directories.

Procedure

1. If it does not exist, create the directory the SMB share will reference.
2. Move SMB share data from the current directory to the new directory by running the `mv` command.

   It is recommended that you move entire directories rather than directory contents. Moving entire directories results in a single node update and is very fast; moving contents only might affect permission inheritance and takes a very long period of time.

   The following example command moves data from the `/ifs/data/Finance` directory to a new `/ifs/ZoneA/Finance` directory:

   ```
   mv /ifs/data/Finance /ifs/ZoneA/Finance
   ```

3. Run the `isi smb shares modify <share name>` command.

The following example command changes the directory of the Finance share in ZoneA to `/ifs/ZoneA/Finance`:

```
isi smb shares modify Finance --path=/ifs/ZoneA/Finance --zone=ZoneA
```

Reconfiguring home directory templates within access zones

OneFS 7.1.1 introduced changes to access zones that affect home directory templates.

Each access zone that is configured with the local authentication provider contains a home directory template. In OneFS 7.1.1 and later, the path of the home directory template must match or fall under the base directory path of the access zone.

Home directory template upgrade example

The following example illustrates the home directory template before and after upgrading to OneFS 7.1.1 or later.

Before upgrading	After upgrading
Global List of Shares: • HOMEDIR = /ifs/home/%U ZoneA: • Shares: HOMEDIR • local-provider:ZoneA = /ifs/home/%U ZoneB: • Shares: HOMEDIR • local-provider:ZoneB = /ifs/home/%U	ZoneA: • Base directory = /ifs • Shares: HOMEDIR = /ifs/home/%U • local-provider:ZoneA = /ifs/home/%U ZoneB: • Base directory: /ifs • Shares: HOMEDIR = /ifs/home/%U • local-provider:ZoneB = /ifs/home/%U

Reconfigure home directory templates

If you have upgraded to OneFS 7.1.1 or later, home directory templates are assigned to local provider access zones. This procedure is available only through the command-line interface (CLI).

About this task

A home directory template path must match or fall under the base directory path of the access zone. You can modify the template path to adhere to zone requirements.
Modify home directory template paths prior to reconfiguring SMB share paths and access zone base directories.

Procedure

1. If it does not exist, create the directory the home directory template will reference.
2. Run the `isi auth local modify <zone name>` command to change the template path.

   The following example command changes the template directory in ZoneA to `/ifs/ZoneA/home/%U`:

   ```
   isi auth local modify ZoneA --home-directory-template=/ifs/ZoneA/home/%U
   ```

3. Run the `isi smb shares modify HOMEDIR` command to change the HOMEDIR path to the template path.

   The following example command changes the HOMEDIR directory in ZoneA to `/ifs/ZoneA/home/%U`:

   ```
   isi smb shares modify HOMEDIR --path=/ifs/ZoneA/home/%U --zone=ZoneA
   ```

4. Move all home directories for users in the specified zone to the new HOMEDIR path.

Reconfiguring HDFS settings within access zones

OneFS 7.1.1 introduced changes to access zones that affect HDFS.

In OneFS 7.1.1 and later, HDFS functionality changed to allow you to configure the following settings within each access zone instead of globally on the cluster:

- HDFS root directory
- Authentication
- WebHDFS

The following configuration changes occur when you upgrade to OneFS 7.1.1 or later:

- By default, the HDFS root directory of each migrated access zone is set to the base directory of the zone. This is not a recommended configuration and should be reconfigured.
- Settings for authentication and keytab files are copied and applied to each migrated access zone.
- WebHDFS is enabled by default in each access zone.

Reconfigure HDFS settings

If you have upgraded to OneFS 7.1.1 or later, HDFS settings are no longer global; they are configured in each access zone. This procedure is available only through the command-line interface (CLI).

About this task

You can specify values for the following HDFS attributes within each access zone:

- HDFS root directory
- Authentication method
- WebHDFS support

Procedure

1. Run the `isi zone zones modify <zone name>` command.

   The following example command sets the root directory to `/ifs/ZoneA/Hadoop`, sets the authentication method to simple only, and disables WebHDFS in ZoneA:

   ```
   isi zone zones modify ZoneA \
     --hdfs-root-directory=/ifs/ZoneA/Hadoop \
     --hdfs-authentication=simple_only --webhdfs-enabled=no
   ```

Verify Kerberos migration

If you are using Kerberos authentication, you must verify that the Kerberos providers and settings have been migrated successfully.

About this task

Command-Line Interface instructions:

Procedure

1. Verify that Kerberos authentication providers and settings are correctly represented in the output of each of these commands:
   - `isi auth krb5 realm list`
   - `isi auth krb5 domain list`
   - `isi auth krb5 spn list`
   - `isi auth settings krb5 view`

About this task

Web Administration Interface instructions:

Procedure

1. Click **Access** > **Authentication Providers** > **Kerberos Provider**.
2. In the **Kerberos Realms**, **Kerberos Domains**, and **Kerberos Providers** tables, verify the Kerberos providers are correct.
3. In the **Kerberos Settings** area, verify the Kerberos authentication settings are correct.

Migration to L3 cache

L3 cache is enabled by default on new nodes.

You can enable L3 cache as the default for all new node pools or manually for a specific node pool, either through the command line or from the web administration interface. L3 cache can be enabled only on node pools with nodes that contain SSDs. When you enable L3 cache, OneFS migrates data that is stored on the SSDs to HDD storage disks and then begins using the SSDs as cache.

When you enable L3 cache, OneFS displays the following message:

```
WARNING: Changes to L3 cache configuration can have a long completion time. If
this is a concern, please contact Isilon Technical Support for more information.
```

You must confirm whether OneFS should proceed with the migration. After you confirm the migration, OneFS handles the migration as a background process, and, depending on the amount of data stored on your SSDs, the process of migrating data from the SSDs to the HDDs might take a long time.

Note: You can continue to administer your cluster while the data is being migrated.

Update SMB auditing

SMB auditing changed in OneFS 7.1. If you are upgrading from OneFS 7.0 or earlier and if the environment is configured for SMB auditing, after you upgrade, you must reconfigure the cluster to use the new auditing tool.

For more information, see the *Auditing* section in the OneFS CLI Administration Guide or the OneFS Web Administration Guide.

Reinstall Aspera

If you were running Aspera for Isilon before you upgraded your cluster, you might need to reinstall Aspera after you upgrade.

Procedure

1. Run the following command to verify that the upgrade process enabled the Aspera Central service and the Aspera node daemon:

   ```
   isi services
   ```

2. If the Aspera service is not running properly, you need to download and re-install a compatible version of Aspera from the Aspera Enterprise Server for Isilon website.
   - For information about downloading and installing Aspera for OneFS, see article 493022, How to download Aspera for OneFS.
   - For information about which versions of Aspera are compatible with your version of OneFS, see the Isilon Supportability and Compatibility Guide.

3. Run the following command to verify that the installation script enabled the Aspera Central service and the Aspera node daemon:

   ```
   isi services
   ```

Modify custom scripts

Review Isilon OneFS CLI Mappings to confirm whether any command syntax changes were implemented in the target version of OneFS to which you upgraded. If command syntax changes were implemented that affect your custom scripts, you must update and test your customer scripts.

Note: Custom scripts might not be compatible between OneFS versions. Ensure that your scripts work on a test cluster before implementing them on your production systems.

Install recommended patches

Install patches for the target version of OneFS to which you upgraded.

Procedure

1. See Current Isilon OneFS Patches to view a list of patches that are available for your version of OneFS.

2. Install any patches that address issues that might affect your environment.

Implement the OneFS API

You can implement the latest version of the OneFS application programming interface (API).

About this task

The OneFS RESTful application programming interface was introduced in OneFS 7.0 to automate access, configuration, and monitoring. For example, you can retrieve performance statistics, provision users, and create SMB shares in an access zone. In addition, the OneFS API, which requires no license, integrates with OneFS role-based access control to improve security.

See the Isilon SDK Info Hub and OneFS 8.0.0 API Reference guide for more information.

CHAPTER 6

Troubleshooting your upgrade

This section contains the following topics:

Troubleshooting overview

If you experience problems with your upgrade, check the upgrade logs and review common upgrade issues. Additionally, you can search for OneFS documentation, troubleshooting guides, and knowledge base articles on the Online Support site. See Isilon Customer Troubleshooting Guide: Upgrades From OneFS 8.x to a later version for troubleshooting information that is related to upgrade failures and upgrade error messages. If you need help with troubleshooting, contact Isilon Technical Support.

Review the upgrade log files

After an upgrade, you can run the `isi_upgrade_logs` command to retrieve and review errors that were logged during the upgrade.

Note: If no errors were logged, the following message appears on the console:

```
No Upgrade Process Errors Found, if you ran an assessment please use the -a option
```

Common issues

About this task

Some problems with cluster upgrades might be caused by the following common upgrade issues:

Dropped node

About this task

If a node does not successfully reboot after a OneFS upgrade, you will not be allowed to commit the upgrade. If the upgrade is not committed, then you will not be allowed to make changes to certain features, such as SMB shares and NFS exports.

Follow these steps for any node that didn't successfully reboot:

Procedure

1. Smartfail the node that did not come back after rebooting.
2. Check to ensure that the name of the smartfailed node is removed from the cluster node list.

   This operation might take some time depending on the amount of data that is migrated off of the node.
3. Reboot any node in the cluster.

SMB client connections

About this task

If any of the following SMB2 client connection errors occur, you might need to adjust the SMB client-credit minimum:

- The SMB clients show system "error 51" or "error 0x80070033."

- The Microsoft Windows event log contains the following entry:

```
Operating system error 64 (The specified network name is no  longer
available.)
```

- An error similar to the following appears in the packet captures on the servers:

```
58031 9.752678000 10.232.21.62 146.168.81.131 SMB2 131 Write Response,
Error: STATUS_INSUFF_SERVER_RESOURCES
```

For information on how to adjust the SMB client-credit minimum, see article 460492, *SMB2 connections stop responding because client credit minimum value is too high*.

NFS performance

About this task

If you are experiencing lower than expected NFS performance after the upgrade, it might be due to the min and max number of NFS server threads.

It is recommended that you set threads_min and threads_max to the same value. Increasing the number of threads can improve performance at the expense of stability. Before you change the number of threads, contact Isilon Technical Support to determine the values that work best for your cluster; the values vary by CPUs, memory, the number of nodes, and other factors.

You can adjust the number of NFS threads by running the following commands as root, where x is the number of threads.

Procedure

1. To modify the minimum number of threads, run the following command:

```
isi_sysctl_cluster vfs.nfsrv.rpc.threads_min=x
```

2. To modify the maximum number of threads, run the following command:

```
isi_sysctl_cluster vfs.nfsrv.rpc.threads_max=x
```

Custom 32-bit applications

About this task

The OneFS system user space is 64-bit. If you are running any custom tools that require a 32-bit user space, you must recompile them after the upgrade.

Note: Running your own 32-bit applications on an Isilon cluster is neither recommended nor supported.

Linking Node Serial Numbers to a OneFS License ID

If a node serial number is not linked with the OneFS software license ID when that node dials home, it might delay the response from the Remote Support team.

About this task

The workaround for this issue is to add the OneFS software license ID to the Secondary Name field in the cluster contacts.

See article 517765, *How to match a dialhome from any Isilon hardware node serial to an existing OneFS License ID to be able to use Servicelink*, for more information.