Dell™ NetVault™ Backup Plug-in for NDMP 10.0.5

Application Notes for EMC Isilon IQ Cluster NAS Device (OneFS 7.0 and 7.1)

Legend

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.

IMPORTANT NOTE, **NOTE**, **TIP**, **MOBILE**, or **VIDEO:** An information icon indicates supporting information.

Plug-in for NDMP Application Notes for EMC Isilon IQ Cluster NAS Device (OneFS 7.0 and 7.1)
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Introduction

About this document

This document provides information about using the Dell™ NetVault™ Backup Plug-in for NDMP (Plug-in for NDMP) with an EMC® Isilon® IQ Cluster NAS Device. It is intended as a supplement to the *Dell NetVault Backup Plug-in for NDMP User's Guide* that describes the common procedures for installing and configuring the plug-in.

Target audience

This document is intended for system administrators and others responsible for installing, configuring, and using the Plug-in for NDMP. An understanding of filer administration and the host platform is assumed.

Recommended additional reading

- NetVault Backup documentation
    - *Dell NetVault Backup Installation Guide:* This guide provides information about installing the NetVault Backup Server and Client software.
    - *Dell NetVault Backup Administrator's Guide:* This guide provides information about configuring and using NetVault Backup to protect your data. It provides comprehensive information about all NetVault Backup features and functionality.
    - *Dell NetVault Backup Command Line Interface Reference Guide:* This guide provides information about using the NetVault Backup command-line utilities.
    - *Dell NetVault Backup Plug-in for NDMP Application Notes*: These notes provide filer-specific information.

  You can download these guides from https://support.software.dell.com/.

  IMPORTANT: Starting with 10.0, NetVault Backup provides a web-based user interface to configure, manage, and monitor your NetVault Backup system and installed plug-ins. The procedures described in this document are intended for the new NetVault WebUI. For procedures based on the NetVault Backup Console (user interface available with NetVault Backup 9.x), see the documentation for an earlier version of the plug-in.

- Administrator's Guide for your NDMP-based NAS appliance

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Installation and configuration prerequisites

Installation prerequisites

In addition to the installation prerequisites covered in the *Dell NetVault Backup Plug-in for NDMP User's Guide*, verify that the following requirements are met:

- **Hardware requirements:** For information about Isilon NAS devices, see the EMC Isilon website at: http://www.emc.com/isilon
- **Software requirements:** For information about software requirements and supported filer operating systems, see the *Dell NetVault Backup Compatibility Guide* available at: https://support.software.dell.com/

NOTE: The installation and configuration procedures are described in the *Dell NetVault Backup User's Guide*.

Configuration prerequisites

In addition to the configuration prerequisites covered in the *Dell NetVault Backup Plug-in for NDMP User's Guide*, verify that the following requirements are met:

- **User account for NDMP backups and restores**: Create an NDMP Administrator account for backups and restores.

  Use this account when adding the NDMP Server.
- **Direct Access Recovery (DAR) requirements:** To use DAR, enable this feature on the filer.
- **Backup device configuration:** Isilon Clusters that are not configured with a Backup Accelerator can only use devices that are attached to the NetVault Backup Server or Client. Isilon Clusters that are configured with a Backup Accelerator can use locally attached devices.

Isilon Backup Accelerator configuration

Before you add Isilon Backup Accelerator-attached devices to NetVault Backup Server, complete the following steps on the Isilon Cluster to verify that the device has been correctly added to the Backup Accelerator:

1. After connecting the tape device or library to the Backup Accelerator through the Fibre Channel ports, verify that the ports are enabled:

   ```
   isi fc ls
   ```

2. Scan the Backup Accelerator Fibre Channel ports, and add libraries and tape devices to the Backup Accelerator devices:

   ```
   isi tape rescan [--reconcile]
   ```

   The `-- reconcile` argument removes tape devices that are no longer detected from the Backup Accelerator devices pool. If this argument is not specified, tape devices are not removed from the devices pool.

   After adding the tape devices to the Backup Accelerator devices pool, you can add any of the listed devices to NetVault Backup Server.

3. To list the devices added in the Backup Accelerator devices pool, type:

   ```
   isi tape ls -v
   ```

4. Note the serial numbers listed for the drives. This information is required for adding the drives in proper order in NetVault Backup.

NOTE: Workflow scenarios that include a significant number of small files can affect system performance.

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Backing up data

About backup dump levels

Backup dump levels indicate the type of backup that you want to perform.

OneFS supports the following dump levels:

- **Level 0:** Level 0 indicates a Full Backup. A Full Backup backs up all the data in the specified path.
- **Level 1 to 9:** Level 1 to 9 indicate Incremental Backups. Incremental Backups are based on the most recent lower-level Incremental Backup, and include any data that has changed or is new since the last Full or Incremental Backup.

  For instance, Level 1 Incremental Backup includes any data that has changed or is new since the last Level 0 or Full Backup. Similarly, Level 2 Incremental Backup includes any data that has changed or is new since the last Level 1 Incremental Backup, and so on, up to dump level 9.
- **Level 10:** Level 10 indicates “unlimited” Incremental Backups. A Level 10 Incremental Backup includes any data that has change since the last Incremental Backup (Level 1 to 10).

IMPORTANT: Level 10 Incremental Backups are only supported in OneFS® 7.1 and later.

Important notes

- If a directory is included in a dump level 0 backup, it is included in all future dumps even if no changes have occurred. In this instance, the directory is empty and does not contain content. However, it does not negatively affect the recovery of data.
- Only one dump level is maintained for each selected set of data. For example, after performing Level 1, Level 2, and Level 3 Incremental Backups, if you perform a Full Backup, the dump level is reset to 0. The next instance of the Incremental Backup is based on the Full Backup.
- If an Incremental Backup fails, the subsequent backup is based on the most recent backup of a lower level. For example, if dump level 1 is completed successfully, but dump level 2 fails, dump level 3 is based on dump level 1. The failure of an Incremental Backup is noted in the NetVault Backup logs.

Backing up data using the plug-in

To back up data using the plug-in

1 In the Navigation pane, click **Create Backup Job**.

— or —

In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Create Backup Jobs**.

2 In **Job Name**, specify a name for the job. Assign a descriptive name that allows you to easily identify the job for monitoring its progress or restoring data.

The job name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

3 Click **Create New** next to the **Selections** list.

4 On the **NetVault Backup Selections** page, open the NetVault Backup Server, and then open **NDMP Client**.

5 Select the applicable filer, and in the **Actions** list, click **Enter Backup Path**.

6 In the **NDMP Backup Request** dialog box, configure the following settings.

Table 1. NDMP Backup Request

Option	Description
Directory	Type the complete path to the directory that you want to back up. Use the following format to specify the backup path: `/ifs/data/<named directory>` The plug-in does not support back up of individual files.
Dump Level	The dump level indicates the type of backup that you want to perform. OneFS supports the following dump levels: • **Level 0:** Performs a Full Backup. • **Level 1 to 9:** Performs an Incremental Backup at the specified level. • **Level 10:** Performs unlimited Incremental Backups. Level 10 Incremental Backups are only supported in OneFS 7.1 and later.
Update Incremental Backup Database	If you do not want to record dump dates in the NetVault Database, elect this check box. For example, after completing Level 0, 1, and 2 backups for the directory **/ifs/data/test**, you want to perform a Full Backup of the directory while retaining the Incremental Backups, select this check box. This tells the system to create a Level 0 Backup, and then perform a Level 3 later to pick up files that have changed since Level 2.
Save File Information	This option allows you to browse individual files and directories while selecting data during restore. You cannot restore individual files and directories if you clear this check box. We recommend that you leave this check box selected.
Do Direct Backup if Possible	To use DAR during restores, leave this check box selected. DAR enables precise tape positioning, which allows quick recovery of individual or a small set of files. Without DAR, the backup saveset is read sequentially to restore files. To use this feature, the OS version running on the filer must support DAR.

Table 1. NDMP Backup Request

Option	Description
Exclude	This option allows you to pass an exclusion list to a backup job. The list can contain any number of filenames or patterns, but the total length must not exceed 1024 characters. The values must be separated by white-space characters. For more information, see Exclude and Include patterns.
Include	This option allows you to pass an inclusion list to a backup job. The list can contain any number of filenames or patterns, but the total length must not exceed 1024 characters. The values must be separated by white-space characters. For more information, see Exclude and Include patterns.
Backup Mode	By default, the **Backup Mode** option is set to **TIMESTAMP**. In this mode, a directory is scanned during Incremental Backups to identify the files that need to be backed up. To enable snapshot-based Incremental Backups, set the **Backup Mode** option to **SNAPSHOT**. Snapshot-based backups improve backup speed by quickly identifying the changed data. In this mode, the snapshot taken for a backup is retained until a new backup of the same or lower level is performed. During an Incremental Backup, the previous and current snapshots are compared, and all the data that has changed is backed up.

7 Click **OK** to save the settings.

8 Select or create the Schedule Set, Target Set, and Advanced Options Set. For more information about these sets, see the *Dell NetVault Backup Administrator's Guide*.

9 To submit the job for scheduling, click **Save & Submit**. You can monitor the job progress from the **Job Status** page and view the logs from the **View Logs** page.

To save the job definition without scheduling it, click **Save**. You can view, edit, or run this job from the **Manage Job Definitions** page. This job is not displayed on the **Job Status** page until you submit it.

For more information about **Job Status**, **View Logs**, and **Manage Job Definitions**, see the *Dell NetVault Backup Administrator's Guide*.

Exclude and Include patterns

When specifying exclude and include patterns, review the following notes:

- The **Exclude** and **Include** options are only available in OneFS® 6.x and later versions. The **Exclude** option works only in OneFS 6.5.3 and later versions.
- All patterns are relative to the **<FILESYSTEM>/** root directory. For example, "tmpdir work/project1" in **Exclude**, excludes all the items in the "<FILESYSTEM>/tmpdir" and "<FILESYSTEM>/ work/project1" directories.
- Use a backslash ("\") to specify a white-space character in the name or pattern. For example, enter "new\ file" to exclude or include a file named "new file".
- A pattern can contain wildcard characters and range expressions.

  Examples:

  - ?: Matches zero or one character.
  - *: Matches any number of characters.
  - [a-z]: Matches the letters a through z.
  - [abc]: Matches the letters a, b or c.
- Consecutive slash characters ("//") are resolved to a single slash character ("/"). For example, the pattern "ab//cd///ef" is resolved to "ab/cd/ef".
- Consecutive asterisk characters ("**") are resolved to a single asterisk ("*")'. For example, the pattern "a***b" is resolved to "a*b"

- The path references “.” and “..” are resolved to actual paths. For example, “a/b/../c” is resolved to “a/c” and “a/b/./c” is resolved to “a/b/c”.
- The path reference “..” at the beginning is ignored. For example, “../home/usr1” is resolved to “/home/usr1” and “/../home/usr2” resolved to “/home/usr2”.
- The “.” and “..” characters in filenames are not changed.

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Restoring data

Restoring data using the plug-in

To restore data using the plug-in

1 In the Navigation pane, click **Create Restore Job**.

2 In the saveset table, select the saveset that you want to use, and click **Next**.

The table displays the saveset name (Job Title and Saveset ID), creation date and time, and saveset size. Note the following:

- The list is sorted alphabetically by saveset name. You can sort the list by a different column or reverse the sort order by clicking the column heading. The arrowhead next to the column name indicates the sort order.
- You can use one or more filters to display specific savesets on this page. You can also search for a data item in savesets and view the media list for a saveset. For more information about the additional features, see Using additional features available on the Choose Saveset page.
- When you select a saveset, the following details are displayed in the **Saveset Information** area: Job ID, Job Title, name of the NetVault Backup Server, name of the client from which the data was backed up, plug-in used to create the saveset, saveset creation date and time, saveset retirement setting, whether Incremental Backup or not, whether Archive or not, and saveset size.

3 On the **Create Selection Set** page, select the data that you want to restore:

- **Restore entire saveset**: Select the root node.
- **Restore individual files and directories:** Select the target files and directories in the selections tree. The selections tree can only be browsed if the **Save File Information** option was selected during backup.

NOTE: If you omit child-level items after selecting the parent node, the job fails. To perform selective restores, open the parent node, and select each item that you want to restore.

4 Click **Edit Plugin Options**, and configure the following settings.

Table 1. Restore options

Option	Description
NDMP Server	This option specifies the target filer name. It is only required when you want to restore data to an alternate filer. By default, it is set to the name of the original filer from which the data was backed up. Do not change the NDMP Server while restoring data to the same filer.
Direct Access Restore Mode	Select the appropriate DAR mode from the following: • **Use Direct Access Restore if Possible:** Select this option to perform a direct access restore if the backup was direct and the mover and data server can complete a Direct Access Restore. If these conditions are not met, a non-direct access restore is performed. • **Use Direct Access Restore by Recovering Individual Files:** Select this option to restore a directory and its file contents. When you use this option, empty directories in the saveset are ignored. You must select this option if any item was omitted during data selection; otherwise, the restore job fails. • **Only Do Direct Access Restore:** Select this option to force a Direct Access Restore. It can be only used if the backup was direct and the mover and data server can complete a Direct Access Restore; otherwise the restore job fails. • **Never Do Direct Access Restore**: Select this option to perform a standard non-Direct Access Restore.
Restore Hard Links	If hard links are incorrectly backed up, the restore job fails and the following message appears in the NDMP backup logs: Bad hardlink path for <path> If the restore jobs are failing due to this error, select the **Restore Hard Links** check box. When this check box is selected, hard links are recovered by building a hard-link table.

IMPORTANT:

- When individual files are selected for a Direct Access Restore, their parent-level directory permissions are not restored.
- When running a Direct Access Restore, NetVault Backup organizes the restore requests into groups of 1024 files at a time. When a restore job consists of more than 1024 total files, multiple restore requests are issued. Accordingly, multiple log entries are displayed for the job.

5 Click **OK** to save the settings, and then click **Next**.

6 In **Job Name**, specify a name for the job.

Assign a descriptive name that allows you to easily identify the job for monitoring its progress. The job name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction. However, a maximum of 40 characters is recommended on all platforms

7 In the **Target Client** list, the client from which data was backed up is selected by default. Do not change this setting.

8 Select or create the Schedule Set, Restore Source Set, and Advanced Options Set. For more information about these sets, see the *Dell NetVault Backup Administrator's Guide*.

9 Click **Submit** to submit the job for scheduling.

You can monitor the job progress from the **Job Status** page and view the logs from the **View Logs** page. For more information about these functions, see the *Dell NetVault Backup Administrator's Guide*.

Restoring Incremental Backups

The incremental restores build on each other. To restore an Incremental Backup, you must have all the backups from Level-0 through the last backup in the backup sequence that you want to restore.

To restore an Incremental Backup

1 Restore the Full or Level 0 Backup. For more information, see Restoring data using the plug-in.

2 Restore each Incremental Backup in the backup sequence, starting with the lowest-level backup and going to the last backup that you want to restore (that is, in the same order in which they were created). For each dump level, follow the steps outlined in the section Restoring data using the plug-in.

IMPORTANT: All NDMP backups are effectively snapshots of the volume. When you restore a dump backup in an increment series, it restores all the data in the saveset. At the same time, it deletes the files present on the filer, but not available in that saveset. Thus, it reconstructs the subtree as it was at the time of backup.

Renaming or relocating data

When restoring a backup, you can rename the directories to create a copy of the data instead of overwriting of the existing versions. You can also relocate the data to a different volume. This procedure can be useful if the original volume is down or if you are dealing with limited bandwidth or capacity.

NOTE: This feature is only available to savesets that were created with the **Save File Information** option.

To rename or relocate data during restore

1 Complete Step 1 through Step 3 in the section Restoring data using the plug-in

2 Select the volume that you want to rename, and in the **Actions** list, click **Rename**.

3 In the **Restore Rename** dialog box, provide the following information.

- To rename a file or directory, type the new name.
- To relocate the item to a different volume, type the volume name. You can also rename while relocating by specifying a new path. The volume to which you are relocating must already exist.

Click **OK** to close the dialog box.

After you close the dialog box, the plug-in updates the corresponding node in the selections tree to display the new name and location for the file or directory.

4 Complete Step 4 through Step 9 in the section Restoring data using the plug-in.

Restoring data to an alternate filer

To relocate a backup to an alternate filer, use the following procedure. This procedure can be useful during a server migration or disaster recovery operation.

Prerequisites

Before you start the restore procedure, add the target filer to the plug-in. For more information, see the *Dell NetVault Backup Plug-in for NDMP User's Guide*.

Restore procedure

To restore data to an alternate filer

1. Complete Step 1 through Step 3 in the section Restoring data using the plug-in.
2. To rename or relocate data during restore, complete steps 2 and 3 in the section Renaming or relocating data.
3. Click **Edit Plugin Options**, and in the **NDMP Server box**, type the name of the target filer.
4. Select the appropriate DAR method. For more information about the available options, see Restore options.
5. Complete Step 5 through Step 9 in the section Restoring data using the plug-in.

Using additional features available on the Choose Saveset page

This section describes how to use the additional features available on the **Create Restore Job — Choose Saveset** page. These features are common to all NetVault Backup plug-ins.

Filtering the saveset list

By default, the saveset table on the **Create Restore Job — Choose Saveset** page lists all available savesets. You can use the following filters to display specific savesets on this page.

Table 2. Saveset filters

Filter	Description
Client	Displays savesets created for particular clients. *To use this filter* • Click the **Client** box, and in the **Choose Client** dialog box, select the applicable clients. Click **OK** to close the dialog box. The default selection is **Any**.
Plugin Type	Displays savesets created using a particular plug-in. *To use this filter* • Click the **Plugin Type** box, and in the list, select the applicable plug-in. The default selection is **Any**.

Table 2. Saveset filters

Filter	Description
Date	Displays savesets created during a specified period. *To use this filter* • Click the **Date** box, and in the list, select the option that you want to use. The available options are Last 24 hours, Last Week, Last Month, Last 6 Months, Last Year, and Any. The default selection is **Any**.
Job	Displays savesets created for particular job IDs. *To use this filter* • Click the **Job** box, and in the **Choose Job** dialog box, select the applicable jobs. Click **OK** to close the dialog box. The default selection is **Any**.

Searching for files in savesets

The **Search** option on the **Create Restore Job — Choose Saveset** page allows you to find specific files or data items without opening a saveset or browsing through its contents. You can use filenames or regular expressions to find the data items that you want to restore.

To search for data items in savesets

1 On the **Create Restore Job — Choose Saveset** page, click **Search**.

2 In the **Search for files in savesets** dialog box, configure the following options:

- **Search String:** Type the search string.
- **Regular expression search:** To use POSIX (Portable Operating System Interface for Unix) regular expressions in the **Search String** box, select this check box.
- **Case sensitive:** To perform a case-sensitive search, select this check box.

3 Click **Search**.

On the **Search Results** page, you can view the savesets that contain the specified files or data items. Select the items you want to restore. You can only restore items from one saveset.

Viewing media list

To view media list for a saveset

1 On the **Create Restore Job — Choose Saveset** page, select the applicable saveset.

2 In the **Saveset Information** area, click **Media List**.

3 In the dialog box that appears, you can view the data and index segment details. For each data segment, you can view the media label, media group, offset, segment size, and media location. For index segments, you can view the media label, media group, and media location.

4 Click **Close** to close the dialog box.

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Troubleshooting

Common errors

The following is a list of some common errors and their solution.

Table 1. Troubleshooting

Description	Symptom	Solution
The NetVault Backup Service fails to start on a Windows®-based NetVault Backup Server.	Check the Windows Event Viewer to see if it displays the following message: PDT FATAL: lock file "postmaster.pid" already exists	NetVault Backup cannot start if the PostgreSQL database that is used to store the system data does not start. To correct this issue, delete the **“postmaster.pid”** file from the location referenced in the log and restart the NetVault Backup Server.
After restarting the machine, the NetVault Backup Service sometimes fails to start on a Windows-based NetVault Backup Server.	Check the Windows Event Viewer to see if it displays the following message: FATAL: could not create any TCP/IP sockets " for a PostgreSQL source	NetVault Backup cannot start if the PostgreSQL database that is used to store the system data does not start. To correct this issue, start the Task Manager, and click **Show processes from all users**. You can see multiple instances of **postgres32.exe** running on the system. Select any one instance of this process, and click **End Process** to remove all instances of **postgres32.exe**. Then, start the NetVault Backup Service from the Configurator.
The NetVault Backup Service starts, and then stops immediately on a Linux-based machine.	No error messages are displayed.	This issue can occur if the Postgres service cannot resolve the host name **localhost**, and fails to start. Check the /etc/hosts file, and if the file does not contain an entry for **localhost**, add the entry.

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The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. In addition, the Support Portal provides direct access to product support engineers through an online Service Request system.

The Support Portal enables you to:

- Create, update, and manage Service Requests (cases).
- View Knowledge Base articles.
- Obtain product notifications.
- Download software. For trial software, go to Trial Downloads.
- View how-to videos.
- Engage in community discussions.
- Chat with a support engineer.