# Dell™ NetVault™ Backup 10.0.5

Administrator's Guide

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NetVault Backup Administrator's Guide
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# 1

# Introduction



## About Dell™ NetVault™ Backup

Dell NetVault Backup (NetVault Backup) offers the most advanced, cross-platform data protection capabilities on the market as well as unsurpassed ease of use, out-of-the-box deployment, and pain-free scalability. NetVault Backup allows you to safeguard your data and applications in both physical and virtual environments from one intuitive user interface and to protect a massive number of servers that contain many petabytes of data. NetVault Backup also features heterogeneous support, so you can safeguard data on a wide range of operating systems, applications, databases, processor architectures, and networked storage devices. Such cross-platform versatility makes it easy for you to tailor NetVault Backup to match the ever-changing and growing landscape of your IT infrastructure.

## Key benefits

- Simple, out-of-the-box deployment for fast time to value
- Protection for both physical and virtual environments for cost savings
- Heterogeneous server support for flexibility to adjust to changing conditions
- Extensive application support
- Disk-based backup and deduplication to significantly improve storage efficiency
- Seamless integration with the Dell DR Series appliances for source-side deduplication and WAN-optimized replication
- Comprehensive Network Attached Storage (NAS) protection to safeguard critical data
- Powerful, flexible encryption when and where you need it
- Bare metal recovery to drastically reduce the time it takes to recover a failed disk drive
- Extensive storage attachment options allow for distributed backup targets and workload
- Dynamic device sharing to optimize backup data transfers and reduce points of failure

# Feature summary

- **Back up to disk and tape:** Leverage disk- and tape-based backups to a wide range of storage targets, including NAS devices and third-party deduplication appliances. NetVault Backup also allows you to move data from one storage target to another for off-site storage and disaster recovery purposes.
- **Data deduplication:** Reduce your data storage footprint by up to 90 percent with deduplication provided by Dell™ NetVault™ SmartDisk (NetVault SmartDisk). Its patented byte-level, variable-block size deduplication packs up to 12 times more protected data into the same storage area.

  NetVault Backup also integrates seamlessly with the Dell DR Series disk backup appliances, enabling you to take full advantage of the powerful deduplication, compression, and replication capabilities offered by these appliances.
- **Virtualization support:** Extend advanced data protection to VMware® and Hyper-V® environments. NetVault Backup gives you consistent, reliable, point-and-click backup and restore for virtual environments without requiring you to be an expert.
- **Application protection:** Ensure the availability of business-critical applications such as Oracle®, SQL Server®, Exchange, SharePoint®, MySQL, PostgreSQL, Domino®, DB2®, Informix®, SAP®, and Sybase® with application plug-ins. These plug-ins complement native solutions to save you time on integration. No scripting is required to run backup and recovery jobs.
- **NAS protection:** Get advanced data protection for information stored on NAS appliances, including those made by Dell, EMC®, Hitachi, IBM®, NetApp, and Sun. You can reduce traffic over the LAN and maximize performance by backing up data using Network Data Management Protocol (NDMP). NetVault Backup supports many different storage topologies and configurations, allowing you to perform backups directly to a locally attached SCSI device, a SAN-attached device, or a storage device elsewhere on the network.
- **Enterprise-wide control:** Give backup administrators the flexibility to define, manage, and monitor jobs from remote locations of their choice. Automated features for global event notification and policy-based job management simplify their tasks across heterogeneous storage networks.
- **Strong security:** Meet regulatory requirements without sacrificing backup windows or deduplication performance with encryption plug-ins for CAST-128, AES-256, and CAST-256 algorithm support. Flexible job-level encryption lets you easily select which data to encrypt.
- **Flexible storage attachment**: Avoid data transfers over the network by attaching a target storage device directly to a source server. With LAN-free backups, you can easily distribute the workload throughout the backup domain.
- **Dynamically shared device:** Share stand-alone and library-based tape drives among backup server and clients in SAN or shared-SCSI environments. This capability allows you to optimize workloads and maximize your equipment investments.
- **Simple, straight-forward licensing:** License NetVault Backup by capacity or by component. This option gives you incredible flexibility to choose the model that best meets the organization's needs**.**

# About this document

This guide describes how to configure and use NetVault Backup to protect your data. It provides comprehensive information about all NetVault Backup features and functionality.

**IMPORTANT:**

- NetVault Backup uses a PostgreSQL database to store the system data. The NetVault Database is created on the server during installation. You should not attempt to modify the NetVault Database directly using any PostgreSQL tools unless directed by Dell Software Technical Support. Improper changes to the database can cause irrecoverable data corruption. Before modifying the NetVault Database, make sure that you create a backup copy of the database. For more information about backing up the NetVault Database, see the *Dell NetVault Backup Plug-in for Databases*.
- NetVault Backup stores the system configuration settings in **".cfg"** files in the **config** directory (<NetVault Backup home>\config on Windows and <NetVault Backup Home>/config on Linux). The settings in these files should only be modified under the guidance of Dell Software Technical Support. Improper changes to these files can cause errors and other unexpected behavior. Before modifying a configuration file, make sure that you create a backup copy of the file.

# Target audience

This guide is intended for backup administrators and other technical personnel who are responsible for designing and implementing a backup strategy for the organization. A good understanding of the operating systems on which the NetVault Backup Server and Clients are running is assumed.

# Recommended additional reading

- *Dell NetVault Backup Installation Guide:* This guide provides information about installing the NetVault Backup Server and Client software.
- *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 FileSystem User's Guide:* This guide provides information about installing, configuring, and using NetVault Backup Plug-in for FileSystem.
- *Dell NetVault Backup Built-in Plug-ins User's Guide:* This guide provides information about configuring and using the following plug-ins:
  - NetVault Backup Plug-in for Consolidation
  - NetVault Backup Plug-in for Data Copy
  - NetVault Backup Plug-in for Databases
  - NetVault Backup Plug-in for Raw Devices
- *Dell NetVault Backup Workstation Client Administrator's Guide:* This guide provides information about administering the NetVault Backup Workstation Client software.
- *Dell NetVault Backup Workstation Client User's Guide:* This guide provides information about using the NetVault Backup Workstation Client software.
- *Dell NetVault SmartDisk Installation/Upgrade Guide:* This guide provides information about installing the NetVault SmartDisk software.
- *Dell NetVault Backup SmartDisk Administrator's Guide*: This guide provides information about administering a NetVault SmartDisk instance.

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

# 2

# Getting started

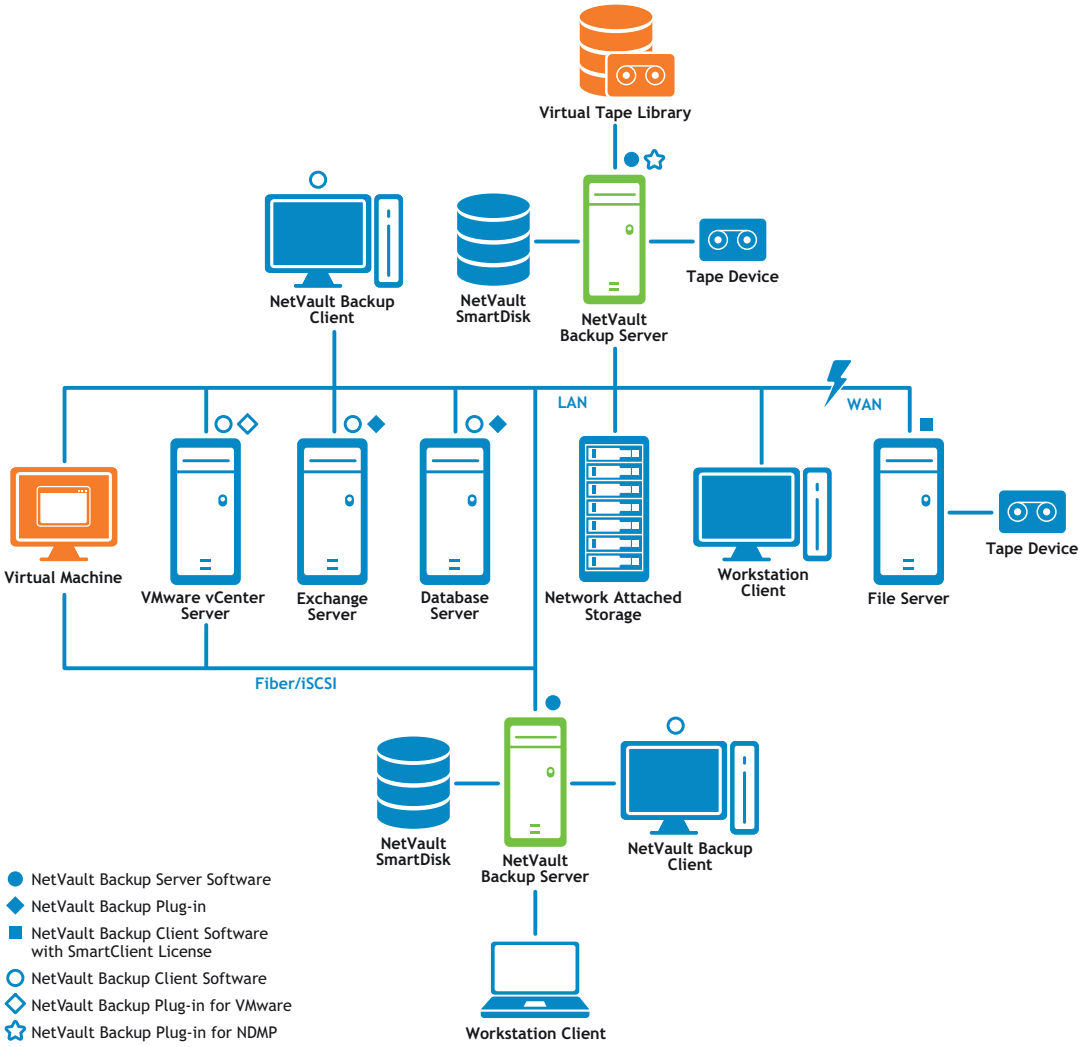


## About deploying NetVault Backup

NetVault Backup is designed to work in an environment in which one machine is configured as the NetVault Backup Server and various other machines throughout the network act as NetVault Backup Clients assigned to it. The server is deployed first, followed by the individual clients. This arrangement of a single server and its associated clients constitutes a NetVault Backup Domain.

The following diagram depicts a NetVault Backup deployment.

**Figure 1. NetVault Backup deployment overview**




# About NetVault Backup components

A NetVault Backup deployment consists of the following components:

- NetVault Backup Server
- NetVault Backup Clients
- NetVault Backup plug-ins
- NetVault WebUI
- NetVault Backup Command Line Interface

# NetVault Backup Server

The NetVault Backup Server is the main component of the NetVault Backup solution. The server provides the core services such as schedule management, job management, device management, media management, user management, notification management, and log management. It administers the backup and restore jobs for all assigned clients. Various types of physical and virtual storage devices can be locally attached to the server.

The NetVault Backup Server can run on Windows® and Linux® operating systems.

# NetVault Backup Clients

The NetVault Backup Client is installed on machines that you want to protect using the NetVault Backup solution. These machines can be file servers, database servers, email servers, application servers, and workstations. The NetVault Backup Clients are assigned to a NetVault Backup Server that manages the data protection operations for the clients. A single server and its associated clients constitute a NetVault Backup Domain.

The NetVault Backup Client can run on AIX®, FreeBSD®, HP-UX, Linux, Mac OS X, Solaris, and Windows operating systems.

A NetVault Backup SmartClient license is required to attach physical or virtual storage devices locally to a NetVault Backup Client.

**NOTE:** Dell™ NetVault™ Backup Workstation Client extends the NetVault Backup enterprise-class data protection to workstations by enabling protection for vital intellectual property stored in documents, spreadsheets, and data files on desktops and laptops. Its Shadowing process creates local redundant copies to protect data against corruption and accidental deletion. Seamless integration with the NetVault Backup Server protects the Shadow Area for long-term retention or disaster recovery to ensure business continuity. For more information about the NetVault Backup Workstation Clients, see the *Dell NetVault Backup Workstation Client Administrator's Guide*.

# NetVault Backup plug-ins

The NetVault Backup Plug-ins are used to protect various applications and data stored on the server and client machines. There are two categories of NetVault Backup plug-ins:

- Built-in plug-ins
- Licensed plug-ins

## Built-in plug-ins

The built-in plug-ins are packaged with the NetVault Backup software, and automatically installed on the respective machines when you install the NetVault Backup Server and Client software. NetVault Backup offers the following types of built-in plug-ins:

- **NetVault Backup Plug-in for FileSystem (Plug-in for FileSystem):** The Plug-in for FileSystem protects critical file system data, and minimizes downtime by allowing you to restore full volumes, individual partitions, or individual directories and files quickly and reliably with minimal interaction.
- **NetVault Backup Plug-in for Consolidation (Plug-in for Consolidation)**: The Plug-in for Consolidation lets you create a composite saveset by combining a Full Backup and its associated Incremental Backups. You can use this consolidated saveset as the base for subsequent Incremental Backups. The Plug-in for Consolidation does not back up data from a client; it just creates a composite set from existing savesets.
- **NetVault Backup Plug-in for Data Copy (Plug-in for Data Copy):** The Plug-in for Data Copy lets you create one or more copies of backups for off-site storage and disaster recovery purposes. The Plug-in for Data Copy does not back up data from a client; it just creates a copy of an existing backup.

- **NetVault Backup Plug-in for Databases (Plug-in for Databases)**: The Plug-in for Databases protects system data (such as, configuration files, system settings, backup indexes, backup media details, job schedule, license keys, and other data) stored in the NetVault Database. You can use this backup to recover a functional NetVault Backup Server after a failure.
- **NetVault Backup Plug-in for Raw Devices (Plug-in for Raw Devices)**: The Plug-in for Raw Devices protects data stored on physical disks. The plug-in lets you recover the Master Boot Record (MBR), system partitions, and individual user partitions from a point-and-click user interface without writing any complex scripts.

For more information about built-in plug-ins, see the *Dell NetVault Backup Built-in Plug-ins User's Guide*.

## Licensed plug-ins

The licensed plug-ins are available as separate products, and installed on the NetVault Backup Server and Client machines to protect specific applications and appliances. NetVault Backup offers the following types of licensed plug-ins:

- **Plug-ins for applications:** These plug-ins provide data protection to business-critical applications such as Oracle, SQL Server, Exchange, SharePoint, MySQL, PostgreSQL, Domino, DB2, Informix, SAP, and Sybase.
- **Plug-ins for NDMP-based NAS appliances:** These plug-ins enable NDMP-based backups and restores for appliances that support this protocol. NetVault Backup also offers specialized plug-ins that integrate the NetApp SnapMirror, SnapVault, and Snapshot technologies to provide advanced data protection to NetApp appliances.
- **Plug-ins for virtual environments:** These plug-ins provide data protection to virtual machines in VMware and Hyper-V environments.
- **Plug-ins for backup encryption:** These plug-ins provide support for CAST-128, AES-256, and CAST-256 algorithms to meet regulatory backup security requirements.
- **Plug-ins for device integration:** These plug-ins enable configuration of specialized tape libraries for use in a NetVault Backup environment.
- **Plug-ins for bare metal recovery:** These plug-ins let you recover an entire system, including the operating system, applications, system settings, partition information, and data stored on the supported Windows and Linux operating systems.

Additionally, NetVault Backup offers cluster-aware versions of various plug-ins that enable data protection for distributed data.

For more information about the licensed plug-ins, see the respective plug-in user's guide.

# NetVault WebUI

NetVault Backup offers a web-based user interface, called the NetVault WebUI, to configure, manage, and monitor your NetVault Backup system. You can use the NetVault WebUI to perform various tasks such as the following:

- Configure performance, security, and other options
- Manage clients, storage devices, and storage media
- Perform backups and restores
- Monitor jobs, device activities, and logs
- Set up notifications
- Generate and view reports

You can access the NetVault WebUI from any standard browser. The NetVault WebUI is automatically installed on the NetVault Backup Server. You can use the WebUI to remotely administer a NetVault Backup Server from any system on which you can run a supported web browser and connect to the server (over HTTP or HTTPS).

# NetVault Backup Command Line Interface

NetVault Backup also provides a Command Line Interface that allows you to configure and manage a NetVault Backup system from a command prompt or terminal session window. You can use the NetVault Backup CLI utilities to perform various tasks such as the following:

- Start and stop the NetVault Backup Service
- Configure performance, security, and other options
- Manage clients, storage devices, and storage media
- Perform backups and restores
- Generate and view reports

The NetVault Backup CLI is automatically installed on the NetVault Server and Client machines. For more information about the command-line interface, see the *Dell NetVault Backup Command Line Interface Reference Guide*.

# Starting and stopping the NetVault Backup Service

The NetVault Backup Service is automatically started on the server and client machines. You can use the NetVault Configurator or CLI to manually start or stop the NetVault Backup Service.

### *To manually start or stop the NetVault Backup Service using the Configurator*

1. On Windows, log on to the system with Administrator privileges.

   On the **Start** menu, click **NetVault Configurator**. If this program is not available on the **Start** menu, click **All Program**, click **Dell**, click **NetVault Backup**, and then click **NetVault Configurator**.

2. On Linux and UNIX®, log on to the system with root user privileges.

   Start a terminal session, and type:

   ```
   nvconfigurator
   ```

   — or —

   ```
   nvconfigurator &
   ```

   You can run this command from any directory.

3. In the **Configurator** window, click the **Service** tab.
4. To stop the NetVault Backup Service, click **Stop Service**.
5. To start the NetVault Backup Service, click **Start Service**.
6. Click **OK** to apply the changes and exit the Configurator.

# Troubleshooting

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:<br>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.<br>To correct this issue, delete the **“postmaster.pid”** file from the location referenced in the log and restart the NetVault Backup Server. For more information, see https://support.software.dell.com/netvaultbackup/kb/122475. |
| 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:<br>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.<br>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.<br>Check the /etc/hosts file, and if the file does not contain an entry for **localhost**, add the entry. |

# Configuring Web Service settings

*To configure the Web Service settings for NetVault Backup*

1 On Windows-based systems, log on to the system with Administrator privileges. On the **Start** menu, click **NetVault Configurator**. If this program is not available on the **Start** menu, click **All Program**, click **Dell**, click **NetVault Backup**, and then click **NetVault Configurator**.

2 On Linux-based systems, log on to the system with root user privileges. Start a terminal session, and type:

```
nvconfigurator
```

— or —

```
nvconfigurator &
```

3 In the **Configurator** window, click the **Web Service** tab.

4 To access the NetVault WebUI through HTTP, configure the following settings:

- **Enable Web Service over HTTP:** Select this check box.
- **HTTP Listen port for incoming Web Service connections:** The default HTTP port is 80. If this port is in use by any other server or application, configure an alternate port.

5 To access the NetVault WebUI through HTTPS, configure the following settings:

- **Enable Web Service over HTTPS:** This protocol is selected by default.

  HTTPS is the preferred protocol. This protocol provides encrypted communication between the client and server. It protects sensitive data such as NetVault Backup passwords passed between the browser and NetVault Web Service.
- **HTTPS Listen port for incoming Web Service connections:** By default, NetVault Backup uses port 8443 for HTTPs. If this port is in use by any other server or application, configure an alternate port.
- **WebService security certificate file:** To use HTTPS, provide an SSL certificate and private key. NetVault Backup provides a self-signed certificate **(server.crt)**, but this certificate generates warnings in most browsers. You can find **server.crt** in <NetVault Backup home>\etc on Windows and <NetVault Backup home>/etc on Linux.

  For the browser to accept a certificate without warnings, provide a valid certificate file signed by a trusted certificate authority.
- **WebService private key file:** Provide the private key file required for HTTPS communications. The default key file is **server.key**. You can find this file in <NetVault Backup home>\etc on Windows and <NetVault Backup home>/etc on Linux.

6 Click **OK** to apply the changes and exit the Configurator.

**NOTE:** You can view and modify these settings from the WebUI using the **Change Settings** link. In the **Navigation** pane, click **Change Settings**. On the **Configuration** page, click **Server Settings**, and on the **NetVault Server Settings** page, click **Web Service**.

# Logging in to NetVault Backup

**IMPORTANT:** To use NetVault Backup, you must be logged-in with Administrator privileges on Windows-based systems and root user privileges on Linux- and UNIX-based systems.

*To log in to NetVault Backup*

1 Open a browser window. In the address bar, type:

```
https://<machine-name>:8443
```

Press **Enter**.

2 In the Login dialog box, type your user name and password.

**NOTE:** There are two predefined user accounts in NetVault Backup:

- **admin:** The Administrator account for NetVault Backup.
- **default:** A standard user account that can be used to perform various operations in NetVault Backup.

After installing NetVault Backup, you can use either the **admin** or the **default** user account to log in to NetVault Backup. By default, no password is assigned to these user accounts. For more information about NetVault Backup user accounts, see Managing user accounts.

3 To save the user name, select the **Remember Me** check box.

4 Click **Log In**.

After you log in, the WebUI opens the **Server Monitor** page in your browser window.

**Additional notes:**

- After any change in the IP address of the NetVault Backup Server (for example, due to reassignment at reboot by DHCP), you must clear the browser cache before logging in to the NetVault WebUI. If you fail to do so, the login may fail with a message that the server is not accessible.

  Alternatively, you can assign a static IP address to the NetVault Backup Server.

- The NetVault WebUI cannot be run in Compatibility View in Internet Explorer.

# Quitting NetVault Backup

*To quit NetVault Backup*

- Click the arrow next to the user name at upper-right corner of the NetVault WebUI, and select **Logout**.

# Overview of NetVault WebUI

The NetVault WebUI consists of the Header pane, Navigation pane, and Operations pane.

**Figure 2. NetVault WebUI home page**


The following table provides a brief description of the WebUI panes.

**Table 2. NetVault WebUI panes**

| Pane | Description |
|---|---|
| **Header pane** | This pane includes the following items:<br>• **Video Tutorial:** Provides access to the video tutorial for the currently loaded page. The link opens in a new browser window or tab.<br>• **Current user:** Shows the user icon and user name. To quit NetVault Backup, click the link, and select **Logout**.<br>• **Information button:** Shows the About dialog box. |
| **Navigation pane** | This pane provides links to set up, manage, and monitor various aspects of NetVault Backup. The navigation links are organized into the following sections:<br>• **Monitoring**<br>• **Jobs**<br>• **Reporting**<br>• **Configuration**<br>• **Help**<br>For more information about this pane, see Navigation pane. |
| **Operations pane** | This pane is the main area where you perform all NetVault Backup operations. The Operations pane loads various WebUI pages depending on the item you select in the Navigation pane. |

# Navigation pane

The following table provides a brief description of the links available in the Navigation pane.

**Table 3. Navigation pane**

| Section | Item | Description |
|---|---|---|
| **Monitoring** | **Server Monitor** | Opens the **Server Monitor** page.<br>Use this page to view the overall status of your NetVault Backup Server. The Activity Chart shows the data transfer rate for jobs. The chart also shows the number of active jobs and events that occurred during the selected time window.<br>For more information, see Monitoring the NetVault Backup Server. |
| | **Job Status** | Opens the **Job Status** page.<br>Use this page to view job activities, monitor job progress and job logs, and perform various job-related tasks. For more information, see Managing jobs. |
| | **Device Activity** | Opens the **Device Activity** page.<br>Use this page to monitor data flows and data transfer rates for devices that are in use. For more information, see Monitoring device activity. |
| | **View Logs** | Opens the **View Logs** page.<br>Use this page to view log messages. You can also use this page to export and purge log messages. For more information, see Monitoring logs. |
| | **View Events** | Opens the **View Events** page.<br>Use this page to view events logs for NetVault Backup. For more information, see Viewing event logs. |
| **Jobs** | **Create Backup Job** | Starts the backup job wizard.<br>For more information about creating and scheduling a backup job, see Creating a backup job. |
| | **Create Restore Job** | Starts the restore job wizard.<br>For more information about creating and scheduling a restore job, see Creating a restore job. |
| | **Manage Sets** | Opens the **Set Management** page.<br>Use this page to modify or remove existing sets. For more information, see Managing sets. |
| | **Manage Job Definitions** | Opens the **Manage Job Definitions** page.<br>Use this page to view, modify, and remove job definitions. For more information, see Managing job definitions. |
| | **Manage Policies** | Opens the **Policy Management** page.<br>Use this page to create and manage policy-based backups. For more information, see Managing policies. |
| | **Explore Storage** | Opens the **Explore Storage** page.<br>Use this page to explore and manage disk- and tape-based storage media, and perform various other media-related tasks. For more information, see Managing storage media. |

**Table 3. Navigation pane**

| Section | Item | Description |
|---|---|---|
| **Reporting** | **View Reports** | Opens the **View Reports** page.<br>Use this page to generate and view canned reports. These reports provide information about backup and restore jobs, storage devices, clients, media utilization, and other aspects of NetVault Backup. For more information, see Using canned reports. |
| | **Job History** | Opens the **Historic Job Activity** page.<br>Use this page to view completed jobs, modify job definitions, and view job logs. For more information, see Viewing job history. |
| **Configuration** | **Guided Configuration** | Starts the NetVault Configuration Wizard.<br>The wizard guides you through the various aspects of setting up a NetVault Backup Server, including adding clients, configuring storage devices, installing plug-ins and product licenses, and scheduling a backup job. For more information, see Using the configuration wizard. |
| | **Manage Clients** | Opens the **Manage Clients** page.<br>Use this page to add and manage clients, client groups, and virtual clients. For more information, see Configuring clients and Working with client clusters. |
| | **Manage Devices** | Opens the **Device Management** page.<br>Use this page to add and manage disk- and tape-based storage devices. For more information, see Managing storage devices. |
| | **Manage Users** | Opens the **Manage User Accounts** page.<br>Use this page to create and manage user accounts, create user notification profile, and set user password policy. For more information, see Managing user accounts. |
| | **Configure Notifications** | Opens the **Editing Global Notification Profile** page.<br>Use this page to configure global notification method for one or more NetVault Backup events. For more information, see Using global notification methods. |
| | **Change Settings** | Opens the server and client settings pages.<br>Use these pages to customize the NetVault Backup system and change the default settings for NetVault Backup Server and Client machines. For more information, see Configuring default settings for NetVault Backup. |
| **Help** | **Documentation** | Provides access to the product documentation. The link opens in a new browser window or tab. |
| | **Video and Tutorials** | Provides access to the video tutorial page. The link opens in a new browser window or tab. |

# Using the configuration wizard

The NetVault WebUI provides a configuration wizard that helps you to set up the NetVault Backup Server and complete the initial configuration requirements. You can access this wizard from the **Guided Configuration** link in the Navigation pane, and use it to add clients and devices, install plug-ins and licenses, and schedule backup jobs.

*To use the configuration wizard*

1 Start the NetVault WebUI, and log in to NetVault Backup.

2 In the Navigation pane, click **Guided Configuration** to start the NetVault Configuration wizard.

3 Select the type of task that you want to perform.

**Table 4. Guided configuration options**

| Option | Description |
|---|---|
| **Add Clients** | Adds a NetVault Backup Client to the Server. Without completing this configuration step, you cannot access a client for backup or restore operations in NetVault Backup. For more information, see Adding a client to the NetVault Backup Server. |
| **Install Plugins** | Installs a NetVault Backup plug-in on one or more clients. For more information, see Installing plug-ins using the configuration wizard. |
| **Install Licenses** | Installs product license keys for the server and plug-ins. For more information, see Installing product license keys using the configuration wizard. |
| **Add Storage Devices** | Adds a storage device to the NetVault Backup Server. The available options are:<br>• **Single virtual disk device:** Adds a virtual standalone drive. For more information, see Virtual standalone drive.<br>• **Virtual tape library/media changer:** Adds a Virtual Tape Library (VTL). For more information, see Virtual Tape Libraries.<br>• **Shared virtual tape library:** Adds a Shared Virtual Tape Library (SVTL). For more information, see Shared Virtual Tape Libraries.<br>• **Single physical tape device:** Adds a standalone tape drive. For more information, see Physical tape devices.<br>• **Tape library/media changer:** Adds a tape library. For more information, see Physical tape devices.<br>• **Add NetVault SmartDisk:** Adds a NetVault SmartDisk. For more information, see Dell NetVault SmartDisk.<br>• **Add Dell RDA Device**: Adds a Dell DR Series System. For more information, see Dell DR Series Systems.<br>• **Add Data Domain Boost Device:** Adds an EMC® Data Domain® System. For more information, see EMC Data Domain Systems. |
| **Create Backup Jobs** | Creates and schedules backup jobs.<br>For more information, see Creating a backup job. |

4 Follow the instructions to complete the configuration steps.

5 After a task is completed successfully, a message is displayed.

To continue, click a button in the Operations pane. Alternatively, click a link in the Navigation pane to exit the configuration wizard and open a different page.

# Installing plug-ins using the configuration wizard

NetVault Backup offers a selection of licensed plug-ins that can be installed on the NetVault Backup Server or Clients to protect specific applications and appliances. You can use the configuration wizard to install a plug-in on multiple clients at the same time. Alternatively, you can install a plug-in from the **Manage Clients** page. For more information about this method, see Installing plug-ins.

**NOTE:** The configuration wizard lets you install the plug-in on multiple clients at the same time (if the selected clients are all of the same type). When installing the plug-in on multiple clients, verify that the binary file is compatible with the client OS and platform.

From the **Manage Clients** page, you can only select one client for installing the plug-in.

*To install a NetVault Backup plug-in using the configuration wizard*

1. In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Install Plugins**.
2. In the **NetVault Backup Clients** list, select the clients on which you want to install the plug-in.
3. Click **Choose Plug-in File**, and in the browse window, navigate to the location of the **".npk"** installation file for the plug-in (on the installation CD or the directory to which the file was downloaded from the website).
4. Select the platform-specific binary file for the plug-in, and click **Next** to begin installation.
5. After the plug-in is installed successfully, a message is displayed.

# Installing product license keys using the configuration wizard

The evaluation license for the NetVault Backup products is valid for 30 days. To continue using the product after the expiry of the evaluation period, you must install the permanent license keys for the server and installed plug-ins. The server is licensed based on the NetVault Backup Server Edition and the additional options that you have purchased. The clients require a permanent license key only if a licensed plug-in has been installed on the machine. For more information about obtaining the license keys, see the *Dell NetVault Backup Installation Guide*.

You can use the NetVault Configuration Wizard to install the product license keys. Alternatively, you can install the license keys from the **Manage Clients** page. For more information about this method, see Installing license key.

*To install the license keys using the configuration wizard*

1. In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Install Licenses**.
2. In the **NetVault Backup Clients** list, select the client on which you want to install the license key, and Click **Next**.

   **NOTE:** The permanent license keys for NetVault Backup are tied to the Machine ID of the NetVault Backup machine. While installing the license keys, verify that you select the correct server or client machine for which the license was obtained.

3. In the **Enter the license key string** box, type or copy and paste the license key. Click **Apply**.
4. After the key is applied successfully, a message is displayed.

# Monitoring the NetVault Backup Server

You can use the **Server Monitor** page to monitor the overall status of your NetVault Backup Server, and track the status of clients, devices, regular jobs, and policy jobs. You can also use this page to monitor the data transfer rate, number of active jobs, and events that occurred during the selected time window.

*To monitor the NetVault Backup Server*

1 In the Navigation pane, click **Server Monitor**.

> **NOTE:** The **Server Monitor** page is automatically loaded when you log on to the WebUI.

2 On the **Server Monitor** page (see Figure 2, NetVault WebUI home page), you can view the following information.

**Table 5. Server Monitor page**

| Item | Description |
|---|---|
| **Client Status** | This area shows the number of online clients and total client count.<br>You can click this area to open the **Manage Clients** page. |
| **Storage Devices** | This area shows the number of online devices and total device count.<br>You can click this area to open the **Manage Devices** page |
| **Total Data Stored** | This area shows the total amount of data backed up from various clients.<br>You can click this area to open the **Explore Storage** page. |
| **Activity Chart** | This chart displays the data transfer rate for active jobs. The chart also shows the number of active jobs and events that occurred during the selected time window.<br>You can use the following settings to modify the Activity Chart:<br>• **Time window:** This setting allows you to change the time window for the Activity Chart. The available options are 10 minutes, 1 hour, 8 hours, 12 hours, and 24 hours.<br>By default, the time window is set to 1 hour.<br>• **Event type:** This setting allows you to change the event type displayed on the page. The available options are **Errors Only**, **Key Events**, and **All Events**.<br>By default, the event type is set to **Errors Only**. |
| **Job Activity Charts** | This area displays bar charts for the following:<br>• **Current Activity:** The individual bars represent the active, waiting, pending, and scheduled jobs.<br>• **Policies:** The individual bars represent the policy jobs that have completed successfully, completed with warnings, and failed.<br>• **Regular Jobs:** The individual bars represent the regular jobs that have completed successfully, completed with warnings, and failed.<br>You can click a bar to open the **Job Status** page and view the job details for that category. For example, you can click the **Active** bar in the **Current Activity** area to view the jobs that are running. Similarly, you can click the **Errors** bar in the **Regular Jobs** area to view the regular jobs that have failed. |

3 To open a page, click the corresponding link in the Navigation pane.

# 3

# Configuring clients



## About NetVault Backup Clients

The NetVault Backup Clients are machines that you want to protect using the NetVault Backup solution. These machines require at least the client version of NetVault Backup and TCP/IP connectivity to the server. You can attach physical and virtual storage devices locally to a client after installing the NetVault Backup SmartClient license on it.

To use a client in a backup or restore operation, you must first add the client to the NetVault Backup Server. A single server and its associated clients constitute a NetVault Backup Domain. A NetVault Backup Server acts as a client to itself, and it can also be added as a client to other NetVault Backup Servers.

**NOTE:** To allow a NetVault Backup Server to function as a client to a different server, you must enable the security setting **This machine may be added as a client to a server** on the server. For more information, see Adding a server as a client.

## Adding clients

This section includes the following topics:

# Adding a client to the NetVault Backup Server

To use a client in a backup or restore operation, you must first add the client to the NetVault Backup Server. You can use the configuration wizard to add and configure a NetVault Backup Client.

For information about adding Workstation Clients to the NetVault Backup Server, see the *Dell NetVault Backup Workstation Administrator's Guide*.

**NOTE:** A NetVault Backup Server can only support clients of the same version as itself or older. The NetVault Backup Client software version cannot be higher than the NetVault Backup Server software version.

### *To add a client to the NetVault Backup Server*

1 Start the configuration wizard:

- In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Clients**.
- Alternatively, in the Navigation pane, click **Manage Clients**, and then click **Add Client**.

2 In the **NetVault Backup Clients** table, locate the client that you want to add.

The table provides a list of NetVault Backup machines automatically discovered on the network broadcast range. It includes all systems on which you have installed either the server or the client software.

The table includes the following columns:

- **Status:** Displays the status icons, which indicate whether the client is online of offline. The following table lists the client status icons.

**Table 1. Client status icons**

| Icon | Description |
|---|---|
|  | The client is online. You can add the client to the NetVault Backup Server. |
|  | The client is online, but it is password-protected. To add the client, you require its NetVault Backup password. |
|  | The client is offline. Try adding the client later when it is online. |

- **Client:** Displays the NetVault Backup name assigned to the client.
- **Version:** Displays the NetVault Backup version installed on the machine.
- **Description:** Displays the client description.

**NOTE:** The clients that reside in a different subnet are not listed in the **NetVault Backup Clients** table. To add such clients, use the **Find Machine** option. For more information, see Locating a client.

Select the client that you want to add, and click **Next**.

3 If the client is password-protected, type the NetVault Backup password for the client, and click **Next**.

If no NetVault Backup password is set for the client, provide the system's root or administrator password.

This page is not displayed if security is disabled on the client. For more information, see Configuring security settings.

4 Type a descriptive text for the client, and click **Next**.

5 If the client resides on a network that is outside the firewall, select the **Client is Outside Firewall** check box to configure the firewall settings. For more information, see Configuring firewall settings.

Click **Next**.

6 After the client is successfully added to the server, a message is displayed.

# Configuring firewall settings

Firewall settings are required to communicate with the NetVault Backup Clients located outside the firewall. You can use these settings to specify the TCP/IP ports that are used to establish data transfer channels, message channels, and broadcast channels through the firewall.

The following table provides a brief description of the firewall settings.

**Table 2. Firewall settings**

| Option | Description |
|---|---|
| **Listen ports for devices** | Ports to listen on for device requests.<br>Configure this option on the NetVault Backup machines that have a locally attached device (for example, NetVault Backup Server or NetVault Backup Client with SmartClient license).<br>Requirement: Two ports per drive. |
| **Connect ports for devices** | Ports that plug-ins use to connect to remote storage devices.<br>Configure this option on clients that connect to remote devices.<br>Requirement: Two ports per drive. |
| **Listen ports for NetVault Backup message channels** | Ports for receiving messages during data transfers.<br>Configure this option on both the NetVault Backup Server and the Client. NetVault Backup requires a two-way connection between the Server and the Client for message channels.<br>Requirement: Three ports per client.<br>To run two or more plug-ins simultaneously on a client, configure two ports per plug-in plus an extra port per client. For example, to run two plug-ins simultaneously, configure (2 * 2) + 1 = 5 ports for a client. |
| **Connect ports for NetVault Backup message channels** | Ports for sending messages during data transfers.<br>Configure this option on both the NetVault Backup Server and the Client. NetVault Backup requires a two-way connection between the Server and the Client for message channels.<br>Requirement: Three ports per client.<br>To run two or more plug-ins simultaneously on a client, configure two ports per plug-in plus an extra port per client. For example, to run two plug-ins simultaneously, configure (2 * 2) + 1 = 5 ports for a client. |
| **Connect ports for NDMP control channels** | Ports for sending NDMP messages (NDMP control channels).<br>Configure this option on the NetVault Backup Server (on which the plug-in is installed) when a firewall separates an NDMP filer and the NetVault Backup Server. By default, NetVault Backup uses port number 10000. You can change it, if necessary. |
| **Listen ports for NDMP data channels** | Ports to listen on for NetVault Backup devices operating as NDMP movers.<br>Configure this option on the NetVault Backup Server or Client to which the device is attached. These ports are used for data transfers between the NDMP filer and storage device when a firewall separates the two networks. |
| **Connect ports for inter-machine setup** | Ports for establishing initial contact (broadcast channels) while adding a NetVault Backup Client, and later to ascertain its availability.<br>Requirement: Two ports per client. |

You can use the following formats to specify the ports or port ranges for data channels, message channels, and broadcast channels:

- A comma-separated list (for example, 20000, 20050)
- A port-range separated by a dash (for example, 20000-20100)
- A combination of comma-separated list and port-range (for example, 20000-20100, 20200)

To simplify administration, we recommend that you configure the same port-range for data, message, and broadcast channels across all NetVault Backup machines.

For more information, see Firewall rules. To check communication through a firewall, see Checking communication through a firewall.

# Important notes

- NetVault Backup uses port number 20031 for TCP and UDP messaging. Verify that this port is open on the firewall.
- NetVault Backup does not support firewalls using NAT (Network Address Translation)/IP Masquerading.
- The firewall configuration settings are not displayed when you add a legacy client (a client running 9.x or a previous version of NetVault Backup). To add such clients, see Adding a legacy client that is outside the firewall.
- To configure firewall ports before adding a client, use the NetVault Configurator. You can specify the port numbers on the **Firewall** tab.

  The **Firewall** tab is not available on clients running 10.0. On these clients, you must manually modify the **firewall.cfg** file. You can find this file in the <NetVault Backup home>\config on Windows and the <NetVault Backup home>/config on Linux-based machines.

# Firewall rules

When creating firewall rules on the server and client machines, verify that you open the following ports to send and receive traffic from NetVault Backup.

**Table 3. Firewall filtering rules**

| From | To | TCP/UDP | Source port | Destination port |
|---|---|---|---|---|
| Server | Client | TCP | Connect ports for inter-machine connection setup specified on the NetVault Backup Server | 20031 |
| Client | Server | TCP | Connect ports for inter-machine connection setup specified on the NetVault Backup Clients | 20031 |
| Server | Client | TCP | Connect ports for message channels specified on NetVault Backup Server | Listen Ports for Message Channels specified on the NetVault Backup Clients |
| Client | Server | TCP | Listen ports for message channels specified on the NetVault Backup Clients | Connect Ports for Message Channels specified on the NetVault Backup Server |
| Server | Client | UDP | 20031 | 20031 |
| Client | Server | UDP | 20031 | 20031 |
| Server | Client | TCP | Listen ports for devices specified on the NetVault Backup Server and Clients | Connect ports for devices specified on the NetVault Backup Clients |
| Client | Server | TCP | Connect ports for devices specified on NetVault Backup Clients | Listen ports for devices specified on NetVault Backup Server and Clients |

# Example

Consider a NetVault Backup system with the following configuration:

- Number of drives: 6
- Number of clients with one plug-in: 10
- Number of clients with two plug-ins: 2

The following table illustrates the port requirements for this system.

**Table 4. Example: Port requirement calculation**

| NetVault Backup machine | Port type | Requirement | Total ports | Example port range |
|---|---|---|---|---|
| **Server (with locally attached storage device)** | **Connect ports for inter-machine connection setup** | Minimum two ports per client | 24 | 50300-50323 |
| | **Connect ports for NetVault Backup message channels** | Minimum three ports per client | 38 | 50200-50237 |
| | **Listen ports for devices** | Minimum two ports per drive | 12 | 50100-50111 |
| **Client** | **Connect ports for inter-machine connection setup** | Minimum two ports per client<br>(These ports can be the same as the ports specified on the server side.) | 24 | 50300-50323 |
| | **Listen ports for NetVault Backup message channels** | Minimum three ports per client | 38 | 50500-50537 |
| | **Connect ports for devices** | Minimum two ports per drive | 12 | 50400-50411 |

The following table illustrates the filtering rules for this system.

**Table 5. Example: Firewall filtering rules**

| From | To | TCP/UDP | Source port | Destination port |
|---|---|---|---|---|
| Server | Client | TCP | 50300-50323 | 20031 |
| Client | Server | TCP | 20031 | 50300-50323 |
| Server | Client | TCP | 50200-50237 | 50500-50537 |
| Client | Server | TCP | 50500-50537 | 50200-50237 |
| Server | Client | UDP | 20031 | 20031 |
| Client | Server | UDP | 20031 | 20031 |
| Server | Client | TCP | 50100-50111 | 50400-50411 |
| Client | Server | TCP | 50400-50411 | 50100-50111 |

# Locating a client

The clients that reside in a different subnet are not displayed in the **NetVault Backup Clients** table. To locate and add such clients, use the following procedure.

*To locate a client that is not discovered automatically*

1 Start the client addition wizard, and then click **Find Machine**.

2 On the Find Client page, type the Fully Qualified Domain Name (FQDN) or IP address of the client.

3 Click **Find**.

4 Once the machine is located, complete steps 3 through 6 in the section Adding clients.

**NOTE:** The **Find** command reports an error if it cannot locate the specified client on the network. This error can occur for several reasons such as the following:

- NetVault Backup is not installed on the client.
- NetVault Backup is not running on the client.
- DNS lookup table or host table cannot be contacted.

# Checking communication through a firewall

*To check if the server and client can communicate through a firewall*

1 Start the client addition wizard, and then click **Firewall Test**.

2 In the **Check Connection** dialog box, provide the following details.

**Table 6. Check connection**

| Option | Description |
|---|---|
| **Netvault Client Name** | Provide the NetVault Backup name of the machine that you want to locate. |
| **NetVault Client Address** | Provide the IP address of the machine that you want to locate. |
| **UDP Port** | The default UDP port for NetVault Backup. It is set to 20031. If you have configured NetVault Backup to use a different port, change this value. |
| **TCP Port** | The default UDP port for NetVault Backup. It is set to 20031. If you have configured NetVault Backup to use a different port, change this value. |
| **Timeout** | The timeout interval is set to 15 seconds by default. |

Click **Test**.

This command checks if TCP, UDP, and messaging connectivity is available between the server and client, and displays the result in the dialog box.

**NOTE:** You can also use the **Test** command to check connectivity to clients that are already added to the server. Open the **Manage Clients** page. Select the client, and then click **Firewall Test**.

For existing clients, the NetVault Backup Client Name and Address are displayed as read-only strings in the dialog box.

**IMPORTANT:** The firewall test option checks the connectivity to the Stats Manager process on the specified server or client machine. If this process is not running on the client, the test fails. However, the client may still be accessible for backup. In any case, it is an abnormal situation and should be corrected.

# Adding a server as a client

The security settings on a NetVault Backup Server prevent the server from being added as a client to a different server. Before adding a server, you must enable the configuration option **"This machine may be added as a client to a server"** on the server.

*To allow a NetVault Backup Server to function as a client to a different server*

1. In the Navigation pane, click **Change Settings**, and then on the **Configuration** page, click **Server Settings**.
2. Under **System and Security**, click **Security**.
3. In the **Security** dialog box, select the **This machine may be added as a client to a server** check box.

   For more information about this setting, see Configuring security settings.

# Adding a legacy client that is outside the firewall

The firewall settings are not displayed when you add a client that is running NetVault Backup 9.x or a previous version. If a legacy client is outside the firewall, you must manually modify **firewallrelationships.dat** and **machine.dat** files on the server and client.

*To add a legacy client that is outside the firewall*

1. On the NetVault Backup Server, open the **firewallrelationships.dat** and **machines.dat** files.

   You can find **firewallrelationships.dat** file in the **config** directory (<NetVault Backup home>/config on Windows and in <NetVault Backup home>\config on Linux) and **machines.dat** file in the **etc** directory (<NetVault Backup home>/etc on Windows and in <NetVault Backup home>\etc on Linux).

   **NOTE:** If you cannot find the **firewallrelationships.dat** file on the server or client, manually create the file and save it in the **config** directory.

2. In the **[<Client Name>]** section, set the value for the **Outside Firewall** option to **TRUE**:

   ```
   Outside Firewall=TRUE
   ```

   For example, if you are trying to add Client-A, locate the section `[Client-A]`, and modify the **Outside Firewall** setting.

   If you cannot find the section or the **Outside Firewall** entry, add them.

3. Save and close the files.
4. On the NetVault Backup Client, open the **firewallrelationships.dat** and **machines.dat** files.

   You can find **firewallrelationships.dat** file in the **config** directory (<NetVault Backup home>/config on Windows and in <NetVault Backup home>\config on Linux) and **machines.dat** file in the **etc** directory (<NetVault Backup home>/etc on Windows and in <NetVault Backup home>\etc on Linux).

5. In the **[<Server Name>]** section, set the value for the **Outside Firewall** option to **TRUE**.

   ```
   Outside Firewall=TRUE
   ```

   For example, if you are trying to add the client to Server-A, locate the section **[Server-A]**, and modify the **Outside Firewall** setting.

   If you cannot find the section or the **Outside Firewall** entry, add them.

6. Save and close the files.
7. Restart the NetVault Backup Service on the server and client machines.

# Removing a client from the available clients list

*To remove a defunct client from the available clients list*

1 Start the client addition wizard.

2 In the **NetVault Backup Clients** table, select the defunct client, and click **Remove**.

In the confirmation dialog box, click **Remove**.

3 If NetVault Backup has been removed or stopped, the following message is displayed:

"Client <client name> is not responding. Unable to remove this client."

When this error occurs, click **Force Removal** in the **Error** dialog box to remove the client.

# Managing clients

This section includes the following topics:

- Viewing client details
- Installing plug-ins
- Removing plug-ins
- Installing license key
- Checking client access
- Configuring default settings for a client
- Removing a client from the NetVault Backup Server

# Viewing client details

*To view client details*

1 In the Navigation pane, click **Manage Clients**.

2 The **NetVault Backup Clients** table provides a list of clients added to the NetVault Backup Server. It includes NetVault Backup Clients, Workstation Clients, and Virtual Clients.

The following table provides a brief description of the client icons.

**Table 7. Client icons**

| Icon | Description |
|---|---|
|  | Client is up and running. |
|  | Client is online. It is in the process of being added, or the NetVault Backup password for the client has changed since it was added. |
|  | Client is unavailable. The system is offline or the NetVault Backup Service is not running. |
|  | Represents a Virtual Client that consists of a cluster of Clients. For more information about Virtual Clients, see Working with client clusters. |

**Table 7. Client icons**

| Icon | Description |
|---|---|
|  | Workstation Client is online. It is powered on and has network connectivity to the NetVault Backup Server. |
|  | Workstation Client is offline. It is powered off, or does not have any network connectivity to the NetVault Backup Server. |

Select the client, and click **Manage**.

3 On the **View Clients** page, you can view the following details:

- **Client Summary:** The **Client Summary** table displays the machine name and description, NetVault Backup version and build number, machine ID, network name of the machine, IP address, release information, and OS version.

  You can click the **Server Capabilities** and **License Key Details** links to view the corresponding details.

- **Installed Plug-ins:** The Installed Plug-ins table displays the plug-ins installed on the selected client. The details include the plug-in name, version number, and installation date.

4 To perform a client-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Installing plug-ins

NetVault Backup offers a selection of licensed plug-ins that can be installed on the NetVault Backup Server or Clients to protect specific applications and appliances. You can use the configuration wizard to install a plug-in on multiple clients at the same time. Alternatively, you can install a plug-in from the **Manage Clients** page. For more information about installing plug-ins using the configuration wizard, see Installing plug-ins using the configuration wizard.

**NOTE:** The configuration wizard lets you install the plug-in on multiple clients at the same time (if the selected clients are all of the same type). When installing the plug-in on multiple clients, verify that the binary file is compatible with the client OS and platform.

From the **Manage Clients** page, you can only select one client for installing the plug-in.

### *To install plug-ins on the NetVault Backup Server or Client*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 At the lower-right corner of the Installed Plug-ins table, click the Install Plugin button ( ).

4 Select the platform-specific **".npk"** binary file for the plug-in, and click **Next** to begin installation.

After the plug-in is installed successfully, a message is displayed.

# Removing plug-ins

*To remove a plug-in from the NetVault Backup Server or Client*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 In the Installed Plug-ins table, select the plug-in, and click the Remove Plugin button ( ).

4 In the confirmation dialog box, click **Remove**.

# Installing license key

The evaluation license for the NetVault Backup products is valid for 30 days. To continue using the product after the expiry of the evaluation period, you must install the permanent license keys for the server and installed plug-ins. The server is licensed based on the NetVault Backup Server Edition and the additional options that you have purchased. The clients require a permanent license key only if a licensed plug-in has been installed on the machine. For more information about obtaining the license keys, see the *Dell NetVault Backup Installation Guide*.

You can use the NetVault Configuration Wizard to install the product license keys. Alternatively, you can install the license keys from the **Manage Clients** page. For more information about installing plug-ins using the configuration wizard, see Installing product license keys using the configuration wizard.

*To install the license keys on the NetVault Backup Server or Client*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 On the **View Clients** page, click **Install License**.

4 In the **Install License** dialog box, type or copy and paste the license key, and click **Apply**.

After the key is installed successfully, a message is displayed on the page. Click the Close button to close the dialog box.

# Checking client access

*To check access to a client*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 On the **View Clients** page, click **Check Access**.

The NetVault Backup Server tries to connect to the client, and returns a message indicating the current accessibility status of the client. Click the Close button to close the dialog box.

# Configuring default settings for a client

NetVault Backup runs with some default settings, which can be customized to suit your environment. You can view and modify these settings from the **Change Settings** and **Manage Clients** links in the Navigation pane. This section describes how to access the configuration pages from the **Manage Clients** link.

*To change the default settings for a NetVault Backup Client*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 On the **View Clients** page, click **Configure**.

4 On the **Client Settings** page, select the applicable item, and configure the default settings for that item. For more information about the default settings, see Configuring default settings for NetVault Backup.

# Removing a client from the NetVault Backup Server

*To remove a client from the NetVault Backup Server*

1 In the Navigation pane, click **Manage Clients**.

2 In the **NetVault Backup Clients** list, select the client, and click **Manage**.

3 On the **View Clients** page, click **Remove Client**.

4 In the confirmation dialog box, click **Remove**.

# Managing client groups

This section includes the following topics:

- About client groups
- Creating a client group
- Modifying a client group
- Removing a client group

# About client groups

NetVault Backup Clients can be grouped into one or more logical units. Client Groups are used to create policy-based jobs, which target one or more similar clients. You can create any number of client groups on the server and add a client to multiple client groups.

NetVault Backup includes a pre-configured client group named **default**, which is automatically created on the NetVault Backup Server. This group is originally configured to include **All Clients**. Therefore, when you add a client, it is automatically added to the default group, unless you have reconfigured this group to not include **All Clients**.

# Creating a client group

*To create a client group*

1. In the Navigation pane, click **Manage Clients**, and then on the **Manage Clients** page, click **Manage Client Groups**.
2. Click **New Group**, and provide the following information:
   - In **Group Name**, type a name for the client group.
   - In **Group Description**, provide a detailed description for the client group.
   - To add all clients to the group, select the **All Clients** check box. When you select this check box, the new clients are automatically added to the group.

     To add a specific client, select the target client in the **Available Clients** table, and click the Add button ( + )to the left of the item. When you click this button, the selected client is moved to the **Chosen Clients** table.
   - To remove a client from the group, select the target client in the **Chosen Clients** table, and click the Remove button ( - )to the left of the item. When you click this button, the selected client is moved to the **Available Clients** table.
3. To add the group, click **Create Group**.

# Modifying a client group

*To modify a client group*

1. In the Navigation pane, click **Manage Clients**, and then on the **Manage Clients** page, click **Manage Client Groups**.
2. Select the client group, and click **Edit**.
3. Modify the client group settings, as necessary. For more information, see Creating a client group.
4. To save the settings, click **Create Group**.

# Removing a client group

*To remove a client group*

1. In the Navigation pane, click **Manage Clients**, and then on the **Manage Clients** page, click **Manage Client Groups**.
2. Select the client group, and click **Remove**.
3. In the confirmation dialog box, click **Remove**.

4

# Configuring storage devices



## About storage devices

NetVault Backup supports a wide range of devices for storing backups. The supported devices include:

- Physical tape libraries, autoloaders, and tape drives
- NetVault Backup Virtual Tape Libraries (VTLs) and Shared Virtual Tape Libraries (SVTLs)
- Dell NetVault SmartDisk (NetVault SmartDisk) with optional deduplication
- Deduplication appliances, including Dell DR Series Systems and EMC Data Domain Systems

You can attach the storage devices to the NetVault Backup Server, Clients, or NAS filers in a NetVault Backup Domain. The physical storage devices can be configured for single or shared use, and connected through SCSI, iSCSI, IP, SAS, or Fibre Channel SAN interfaces. A NetVault Backup SmartClient license is required to attach physical or virtual storage devices locally to a NetVault Backup Client.

To use a storage device in a backup or restore operation, you must first add the device to the NetVault Backup Domain. A device attached to a NetVault Backup Client is only recognized after you add the client to the NetVault Backup Server. Similarly, a device attached to a filer is only recognized after you add the filer to the server using NetVault Backup Plug-in for NDMP (Plug-in for NDMP).

## SAN considerations

- In a SAN environment, you must use persistent binding (also known as SCSI mapping, persistent reservation, or persistent naming). NetVault Backup cannot communicate with a library if its logical address changes as a result of changes in the SAN. Persistent binding assigns a fixed logical address to the device. This address does not change as devices are added or removed in the SAN.

  For Fibre Channel Host Bus Adapters (HBAs), you can map the Fibre Channel device address (World Wide Name (WWN) or World Wide Identifier (WWID)) or Loop ID to the logical SCSI address. This configuration ensures that the changes in the SAN have no impact on the NetVault Backup operations.
- You must also use persistent binding when the server and fibre devices are attached to separate switches or when zoning is implemented. NetVault Backup does not support multipathing to a tape library or device. To ensure consistent communication path, you must configure only one logical or physical channel for use.

You should not use the tape libraries or drives on the same switch or in the same zone that has disk devices attached. Problems might be encountered if packets from both device types co-exist in a SAN environment. Therefore, you should use separate HBAs for these devices.

- Apple supports multipathing in FC Host Adapter and XserveRAID. Multipathing is often the default setting after installation. However, multipathing is not supported in NetVault Backup. Therefore, the connections should be logically or physically separated to ensure a consistent communication path.

# Dell DR Series Systems

This section includes the following topics:



## About Dell DR Series Systems

The Dell DR Series disk-based data protection appliances optimize utilization with in-line deduplication and compression, and reduce network bandwidth requirements with client-side deduplication processing and deduplicated replication. The appliances incorporate innovative deduplication and compression technology to help you achieve a data-reduction level up to 15:1. As a result, you can retain more backup data for a longer period in the same footprint.

For more information about the Dell DR Series systems, see the *Dell DR Series System Administration Guide*.

## Dell DR Series Systems prerequisites

Before adding a Dell DR Series system to a NetVault Backup Server, verify that the following requirements are met:

- **Create a storage container:** Create the required storage container on the DR Series system. NetVault Backup requires an RDA connection type container. While creating a container, verify that you set the RDA type to **RDS**.

  You must create the container before adding the device to the NetVault Backup Server.

- **Configure the required storage options:** On the DR Series system, configure the storage options for the container. For more information about the storage options, see the *Dell DR Series System Administration Guide*.

- **Configure Ports for Replication:** To perform replication operations across a firewall, configure the following fixed TCP ports on the DR Series system to support replication operations:

  - port 9904
  - port 9911
  - port 9915
  - port 9916

# Adding a Dell DR Series System

To use a Dell DR Series System for backups and restores, you must first add the device to the NetVault Backup Server. You can use the configuration wizard to add and configure this device.

*To add a Dell DR Series System to the NetVault Backup Server*

1 Start the configuration wizard:

- In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
- Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.

2 Select the **Dell RDA Device** option, and click **Next**.

3 On the **Add Dell RDA Storage** page, provide the following details.

**Table 1. Add Dell DR Series system**

| Option | Description |
|---|---|
| **Network name/IP address** | Type the Fully Qualified Domain Name (FQDN) or IP address of the Dell DR Series system.<br>If the server is unable to resolve the host name, it fails to add the device. |
| **Username** | Specify a user account that can be used to log on to the device.<br>On the Dell DR Series system, only one user account exists, and the user ID for that account is "backup_user." You can only change the password for this account; you cannot create an account or delete an existing account. |
| **Password** | Type the password for the user account. |
| **LSU** | Type the name of the storage container. Verify that the container is created before you add the device. The server does not add the device if the specified container is not available on the device.<br>Each Dell DR Series system added to NetVault Backup represents a storage container. |
| **Block size** | The default block size is 512KiB. The block size cannot be changed for Dell DR Series systems. |
| **Stream Limit** | The default value for this setting is 32 streams. This setting applies to all NetVault Backup Servers to which the container is added. If the number of data streams exceeds the defined limit for the container, the Media Manager reports an error ("Device has too many streams").<br>You can set the soft stream limit to any value between 1 and 256.<br>If the container is added to more than one NetVault Backup Server, set the same soft stream limit on all servers. |
| **Force add** | If the device is already added to another NetVault Backup Server with the same name, select the **Force add** check box. This option can be useful if you have performed a disaster recovery to rebuild the NetVault Backup Server. |

4 Click **Next** to add the device.

5 After the device is successfully added and initialized, a message is displayed.

## Additional notes

- The Dell DR Series Systems do not support backups over Wide Area Networks (WAN).
- The DR Series systems support two deduplication modes:
    - **Passthrough:** When this mode is selected, deduplication processing occurs on the DR Series system. The passthrough mode requires at least 200MB of free memory on the NetVault Backup Client.
    - **Dedupe:** When this mode is selected, deduplication processing occurs on the NetVault Backup Client. The dedupe mode requires at least 4GB of free memory on the NetVault Backup Client.

# Dell NetVault SmartDisk

This section includes the following topics:



## About NetVault SmartDisk

Dell NetVault SmartDisk (NetVault SmartDisk) provides disk-based storage with optional data deduplication capability. It uses powerful byte-level, variable block-based software deduplication that packs up to 12 times more protected data into the same storage area for a 92 percent reduction in storage footprint. NetVault SmartDisk is installed and licensed separately from NetVault Backup.

A NetVault SmartDisk instance consists of one or more Storage Pools and a set of processes that perform disk-based backups and byte-level variable block software deduplication. An instance can be deployed on a dedicated NetVault SmartDisk Server, NetVault Backup Server, or NetVault Backup Client. It can accept data streams from heterogeneous platforms. A Storage Pool consists of one or more file system volumes. It can be easily extended by adding additional file system paths.

For more information about installing and configuring NetVault SmartDisk, see the *Dell NetVault SmartDisk Installation Guide* and *Dell NetVault SmartDisk Administrator's Guide*.

## Adding a NetVault SmartDisk

To use a NetVault SmartDisk for backups and restores, you must first add the device to the NetVault Backup Server. You can use the configuration wizard to add and configure this device.

*To add a NetVault SmartDisk to the NetVault Backup Server*

1 Start the configuration wizard:
    - In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
    - Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.
2 Select the **NetVault SmartDisk** option, and click **Next**.

3 On the **Add NetVault SmartDisk Instance** page, provide the following details.

**Table 2. Add NetVault SmartDisk**

| Option | Description |
|---|---|
| **Network name/IP address** | Type the Fully Qualified Domain Name (FQDN) or IP address of the host on which NetVault SmartDisk is installed. Provide this information even if the device is deployed on the NetVault Backup Server.<br>If the server is unable to resolve the host name, it fails to add the device. |
| **Network port** | The default value for this setting is zero (0). If the device is listening on the default port, do not change this value.<br>If the device is listening on a non-default port, type the port number configured as the **Network Settings:Remote Listen Port** in the **percolator.cfg** file. For more information about configuring a non-default port for a NetVault SmartDisk, see the *Dell NetVault SmartDisk Administrator's Guide*. |
| **Force add** | If the device is already added to another NetVault Backup Server with the same name, select the **Force add** check box. This option can be useful if you have performed a disaster recovery to rebuild the NetVault Backup Server. |
| **Configure WebDAV credentials** | To prevent unauthorized access to data, you can set up WebDAV authentication for server requests on NetVault SmartDisk. NetVault SmartDisk uses Digest Access Authentication with WebDAV. For more information about setting up authentication on the NetVault SmartDisk Server, see the *Dell NetVault SmartDisk Administrator's Guide*.<br>If WebDAV authentication is enabled on the NetVault SmartDisk, select this check box, and provide the following information:<br>• **Username:** Specify the user account configured on the NetVault SmartDisk Server.<br>• **Password:** Type the password for the user account.<br>• **Confirm Password:** Re-type the password for confirmation.<br>**NOTE:** If you enable WebDAV authentication on the NetVault SmartDisk Server, but do not configure the authentication details on the NetVault Backup Server, the backups and restores using that device fails without reporting any proper error messages. The scan operation also fails for the device. |

4 Click **Next** to add the device.

5 After the device is successfully added and initialized, a message is displayed.

# Disabling WebDAV authentication for NetVault SmartDisk

NetVault Backup does not provide any method to disable WebDAV authentication once it has been enabled for a NetVault SmartDisk. The only way to disable WebDAV authentication is to remove the NetVault SmartDisk from the NetVault Backup Server, and re-add the device.

# EMC Data Domain Systems

This section includes the following topics:



# About EMC Data Domain Systems

EMC Data Domain Systems provide disk-based storage with inline deduplication capabilities that reduce storage requirements by 10 to 30 times. NetVault Backup provides seamless integration with Data Domain systems through the EMC DD Boost™ software, allowing you to minimize your backup window and perform optimized disk-based backups while reducing your storage and network bandwidth requirements.

**NOTE:** The NetVault Backup Starter Edition does not support DD Boost.

## DD Boost components

The DD Boost software includes two components:

- **DD Boost Library:** This component runs on the NetVault Backup Server, and provides the interface to communicate with the DD Boost Server running on the Data Domain system.
- **DD Boost Server**: This component runs on the Data Domain systems.

## DD Boost features

DD Boost offers the following features.

- **Distributed segment processing:** DD Boost offloads parts of the deduplication process to the backup server, enabling the server to send only unique data segments to the Data Domain system.

  Distributed segment processing offers the following advantages:

  - It increases the aggregate backup throughput of the storage system and reduces the amount of data transferred over the network.
  - It decreases processor utilization on the backup server because sending data over the network is more CPU-intensive than the distributed deduplication process.

  Without this feature, the DD Boost Library sends all data (unique or redundant) to a Data Domain system for deduplication processing.
- **Advanced load balancing and link failover:** This feature lets you combine multiple Ethernet links into a group, and register a single interface with the backup application. The Data Domain system automatically balances the load for backup and restore jobs on multiple interfaces, and routes the jobs to the available interfaces if one of the interfaces in the group goes down.
- **File replication:** File-level replication enables transfer of deduplicated data directly between two or more DD Boost-enabled Data Domain systems, and thus reduces WAN bandwidth requirement by up to 99 percent. The Data Domain systems create and transfer the duplicate copies without using any resources on the backup server.

  Replication requires optional DD Boost Replicator license. The license must be installed on all participating Data Domain systems.

  If the source and target Data Domain systems are running different versions of the Data Domain OS, then for replication to be successful, the target system must be running the higher version of the OS.

# Data Domain System prerequisites

Before adding a Data Domain system to a NetVault Backup Server, verify that the following requirements are met:

- **Install DD Boost license on the Data Domain System:** To use a Data Domain system for backups and restores, install the required DD Boost license and enable DD Boost on the Data Domain systems.
- **Create a DD Boost user account:** On the Data Domain system, create a DD Boost user account that can be used to log on to the device for backups and restores.
- **Configure the required DD Boost features:** On the Data Domain system, configure the features that you want to use. For more information about enabling and configuring DD Boost features, see the **DD Boost** section in the *DD OS Administration Guide*.
- **Open the required firewall ports:** To perform DD Boost backups and replication across a firewall, open the following ports on the Data Domain system:
  - TCP 2049 (NFS)
  - TCP 2051 (Replication)
  - TCP 111 (NFS portmapper)
  - TCP xxx (select a random port for NFS mountd)
- **Install Microsoft Visual C++ 2005 SP1 Redistributable Package on Windows:** Install the Microsoft Visual C++ 2005 SP1 Redistributable Package on Windows-based NetVault Backup Server. This requirement applies to all supported Windows platforms. The DD Boost library fails to load if you do not install this package on Windows.
- **Configure network time-outs:** Backup and restore jobs often take a long time to complete. Although the DD Boost Library can recover from temporary network interruptions, the operating system on the data protection application system might terminate a job prematurely if the data protection application time-outs are set too low. To avoid this, Data Domain recommends setting time-outs to at least 30 minutes (1800 seconds).

# Adding a Data Domain System

To use a Data Domain system for backups and restores, you must first add the device to the NetVault Backup Server. You can use the configuration wizard to add and configure this device.

### *To add a Data Domain system to the NetVault Backup Server*

1 Start the configuration wizard:
   - In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
   - Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.

2 Select the **EMC DataDomain Boost Device** option, and click **Next**.

3 On the **Add EMC DDBoost Storage** page, provide the following details.

**Table 3. Add Data Domain system**

| Option | Description |
|---|---|
| **Network name/IP address** | Type the Fully Qualified Domain Name (FQDN) or IP address of the Data Domain system.<br>If the server is unable to resolve the host name, it fails to add the device. |
| **Username** | Specify a DD Boost user account that can be used to log on to the device for backups and restores. Verify that the user account is created on the Data Domain system before you add the device to the NetVault Backup Server. |

**Table 3. Add Data Domain system**

| Option | Description |
|---|---|
| **Password** | Type the password for the user account. |
| **LSU** | Type the name of the Logical Storage Unit (LSU). If the specified LSU does not exist on the Data Domain system, NetVault Backup automatically creates it when you add the device to the server. You can configure multiple LSUs on a single Data Domain system.<br>Each Data Domain system added to NetVault Backup represents an LSU. |
| **Block size** | Type or select the block size for data transfers. The block size is specified in KiB. The default block size is 128 KiB. |
| **Stream Limit** | The default value for this setting is 32 streams. This setting applies to all NetVault Backup Servers to which the container is added. If the number of data streams exceeds the defined limit for the container, the Media Manager reports an error ("Device has too many streams").<br>You can set the soft stream limit to any value between 1 and 256.<br>If the container is added to more than one NetVault Backup Server, set the same soft stream limit on all servers. |
| **Force add** | If the device is already added to another NetVault Backup Server with the same name, select the **Force add** check box. This option can be useful if you have performed a disaster recovery to rebuild the NetVault Backup Server. |

4 Click **Next** to add the device.

5 After the device is successfully added and initialized, a message is displayed.

**NOTE:** When you add a Data Domain system, NetVault Backup creates several metadata files on the device. Each NetVault Backup Server (to which you add the Data Domain system) creates is its own set of metadata files.

NetVault Backup also writes the data transfer statistics to the **stats.stnz** file. The **nvstatsmngr** process uses this file and requires that it is regularly updated. However, frequent updates can have a significant performance impact on the system. By default, NetVault Backup updates the file after every 5 seconds or 10 blocks of data transfer. To change the default setting, see Configuring foreign RAS device settings.

# Using DD Boost commands

This section provides a brief description of the DD Boost commands that you can use to manage the DD Boost features on a Data Domain system. For a detailed description of these commands, see the **DD Boost** section in the *DD OS Administration Guide*. For information about configuring DD Boost from the graphical-user interface-based Enterprise Manager, see the *DD OS Administration Guide*.

## DD Boost Access

- Add clients to DD Boost access list:

  ```
  ddboost access add clients <client-list>
  ```

- Delete clients from DD Boost access list:

  ```
  ddboost access del clients <client-list>
  ```

- Reset DD Boost access list to factory default:

  ```
  ddboost access reset
  ```

- Enable DD Boost:

  ```
  ddboost enable
  ```

- Disable DD Boost:

  ```
  ddboost disable
  ```

- Display DD Boost access list:

  ```
  ddboost access show
  ```

- Display DD Boost status (whether enabled or disabled):

  ```
  ddboost status
  ```

- Display number of active clients and connections:

  ```
  ddboost show connections
  ```

  This command displays the number of active clients, connections used for DD Boost, and connections used for a given group. It also provides an overview of the available interfaces.

- Delete all storage units and their contents from the Data Domain system:

  ```
  ddboost destroy
  ```

  This command removes all data from the storage units. The corresponding catalog entries must be removed manually.

# DD Boost User

- Set DD Boost user:

  ```
  ddboost set user-name <user-name>
  ```

- Display the current user:

  ```
  ddboost show user-name
  ```

- Reset the DD Boost user:

  ```
  ddboost reset user-name
  ```

# Distributed Segment Processing

- Enable or disable Distributed Segment Processing:

  ```
  ddboost option set distributed-segment-processing {enabled | disabled}
  ```

- Display status of the Distributed Segment Processing option (whether enabled or disabled):

  ```
  ddboost option show distributed-segment-processing
  ```

- Reset Distributed Segment Processing to the default option (that is, enabled):

  ```
  ddboost option reset distributed-segment processing
  ```

# File Replication

- Enable file replication:

  ```
  ddboost file-replication option set {encryption {enabled | disabled}|
  low-bw-optim {enabled | disabled}
  ```

  Note the following:

  - To enable file replication, this option should be set on both the source and destination Data Domain systems. Only an administrator can set this option.
  - To use encryption, the encryption option should be enabled on both the source and destination systems.

    - Low-bandwidth optimization option is only recommended for networks with less than 6 Mbps aggregate bandwidth. This option is disabled by default. For maximum filesystem write performance, leave this option disabled.

- Display status of the encryption or low-bandwidth optimization options (whether enabled or disabled):

  ```
  ddboost file-replication option show [low-bw-optim]| [encryption]
  ```

- Reset the low-bandwidth optimization or encryption option for file replication:

  ```
  ddboost file-replication option reset {low-bw-optim | encryption}
  ```

- Display file replication statistics:

  ```
  ddboost file-replication show stats
  ```

- Reset file replication statistics:

  ```
  ddboost file-replication reset stats
  ```

- Display the status of a DD Boost file replication transfer:

  ```
  ddboost file-replication show active
  ```

- Display the data transfer history between the source and destination systems:

  ```
  ddboost file-replication show history [duration duration{day | hr}]
  [interval hr]
  ```

  This command displays the amount of pre- and post-compressed data, network transfer data, low-bandwidth optimization factor, and number of errors.

# Interface Group (ifgroup)

- Add an interface:

  ```
  ddboost ifgroup add interface <IP Address>
  ```

- Remove an interface from the group:

  ```
  ddboost ifgroup del <IP Address>
  ```

  Before you issue this command, verify that the interface that you want to remove is not in use by any backup or restore job.

- Enable Advanced Load Balancing and Link Failover:

  ```
  ddboost ifgroup enable
  ```

- Disable Advanced Load Balancing and Link Failover:

  ```
  ddboost ifgroup disable
  ```

- Remove the interfaces for Advanced Load Balancing and Link Failover and disable the ifgroup:

  ```
  ddboost ifgroup reset
  ```

  This command is equivalent to issuing the `ddboost ifgroup disable` command followed by multiple `ddboost ifgroup del interface ipaddr` commands.

- Display interfaces added to an ifgroup:

  ```
  ifgroup show config
  ```

- Display Link Aggregation status:

  ```
  ifgroup status
  ```

## Storage Unit

- Create a storage unit:

  ```
  ddboost storage-unit create <storage-unit-name>
  ```

- Delete a storage unit:

  ```
  ddboost storage-unit delete <storage-unit-name>
  ```

  The corresponding catalog entries should be removed manually.

- Display the names of all storage units or the names of all files in a specified storage unit:

  ```
  ddboost storage-unit show [compression] [storage-unitname]
  ```

  Use the compression option to display the original byte size, global compression, and local compression for all storage units.

## Statistics

- Show the read-write statistics, including number of errors

  ```
  ddboost show stats [interval seconds] [count count]
  ```

- Reset all statistics or clear all job connections when a network connection is lost

  ```
  ddboost reset stats
  ```

# Virtual Tape Libraries

This section includes the following topics:



# About Virtual Tape Library

Virtual Tape Libraries (VTLs) emulate tape libraries on disk. VTLs are included in NetVault Backup as a licensable option. With VTLs, you have the flexibility to perform quick backups to disks, and during off-peak hours migrate or duplicate the backups to physical devices for off-site storage. The Media Manager does not distinguish between virtual and physical tapes. Therefore, you can use the same process to set up backup policies, including retirement period and rotation schemes.

VTLs are represented as directories on the disk. Each VTL contains three directories: **drives**, **slots**, and **media**. These directories contain numbered subdirectories. The virtual drives reside as files in the **drives** subdirectories. These files contain links to the media files. The virtual tapes reside as media files in the **media** directory. When a virtual tape is moved between slot and drive, the media file itself stays in the **media** directory, while the drives and slots files are modified to emulate the moving of the media.

A VTL can handle any number of concurrent NetVault Backup Client backups. As with a physical library, the number of drives contained in the VTL dictate how many simultaneous operations can be performed. The number of slots should be the same as or more than the number of configured drives. Different operating systems may impose maximum file-size limits, which can affect the maximum VTL media size.

**NOTE:** VTLs are independent of file systems (for example, NTFS, UFS, ext3, and others) and disk systems (for example, IDE, SCSI, iSCSI, and others), but VTLs do not support file systems residing on removable drives.

# Virtual Tape Library Considerations

While creating a Virtual Tape Library, consider the following:

- Before creating a VTL, NetVault Backup performs a disk space check to ensure that the target disk has sufficient space to accommodate the new VTL. On normal file systems you can use the disk space check feature to avoid errors during VTL creation. When creating a VTL on a third-party deduplication appliance or compressed file system, you should disable this feature. For more information, see Configuring default options for Disk Devices Plug-in.
- During disk space checks the free space required on the disk is calculated as follows:

  `Number of Slots * Media Capacity + <x>`

  Here `<x>` is the additional disk space considered for the following requirements:

  - Disk space required to create the directory structure for VTL. The requirement varies for different file systems.
  - Disk space required by other applications running on the system.

  By default, the additional space requirement is set to 20MB. To change this setting, see Configuring default options for Disk Devices Plug-in.
- If the target disk does not have sufficient space to accommodate the specified VTL, the device emulation process is terminated and a message is displayed.

# Creating and adding a Virtual Tape Library

*To create and add a Virtual Tape Library*

1. Start the configuration wizard:
   - In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
   - Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.
2. Select the **Virtual tape library/media changer** option, and click **Next**.
3. In the list of NetVault Backup machines, select the machine on which you want to create the device, and click **Next**.
4. On the **Add Virtual Tape Library** page, provide the following details.

**Table 4. Add Virtual Tape Library**

| Option | Description |
|---|---|
| **Choose the location on disk where you wish to create the new device** | Specify the location where you want to create the VTL.<br>Verify that the path is already created on the selected machine. NetVault Backup does not create any non-existing directories in the path. |
| **Choose a name for the device** | Specify a unique name for the device. |
| **Device display name** | Specify a display name for the device. |
| **Choose a 5 character media barcode prefix** | The NetVault Backup Server automatically generates a barcode prefix and assigns it to the VTL media.<br>If you want to change it, type a unique code for the device. |
| **Specify the media capacity** | Type or select the size of the virtual tape.<br>The media size is specified in GiB. Each slot contains a piece of media of the given size. The default value is 32GiB. |

**Table 4. Add Virtual Tape Library**

| Option | Description |
|---|---|
| **Choose number of drives** | Type or select the number of drives for the VTL. You can create maximum of 100 drives. The default value is two drives. |
| **Choose number of slots** | Type or select the total number of slots that hold the media. You can specify a maximum of 999 slots. The default value is 16 slots. |

5 Click **Next** to create and add the device.

6 After the device is successfully added and initialized, a message is displayed.

## Re-adding a previously created VTL

*To re-add a previously created VTL*

1 Start the configuration wizard.

2 On the **NetVault Configuration Wizard** page, select the **Virtual tape library/media changer** option and the **Re-add previously generated virtual device** check box.

3 In the list of NetVault Backup machines, select the machine on which the device was created. Click **Next** to scan the selected client and list the discovered VTLs.

4 In the **Device** list, select the device that you want to add, and click **Next**.

5 After the device is successfully added and initialized, a message is displayed.

# Virtual standalone drive

This section includes the following topics:

- About virtual standalone drive
- Creating and adding a virtual standalone drive

## About virtual standalone drive

The virtual standalone drives emulate tape drives on disk. Virtual standalone drives are included in NetVault Backup as a licensable option. With these devices, you have the flexibility to perform quick backups to disks, and during off-peak hours migrate or duplicate the backups to physical devices for off-site storage. The Media Manager does not distinguish between virtual and physical tapes. Therefore, you can use the same process to set up backup policies, including retirement period and rotation schemes.

Virtual standalone drives are represented as directories on the disk. The virtual tapes reside as media files in the directory.

## Creating and adding a virtual standalone drive

*To create and add a Virtual Standalone Drive*

1 Start the configuration wizard:

- In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
- Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.

2 Select the **Single virtual disk device** option, and click **Next**.

3 In the list of NetVault Backup machines, select the machine on which you want to create the device, and click **Next**.

4 On the **Add Single Virtual Disk Device** page, provide the following details.

**Table 5. Add virtual standalone drive**

| Option | Description |
|---|---|
| **Choose the location on disk where you wish to create the new device** | Specify the location where you want to create the device.<br>Verify that the path is already created on the selected machine. NetVault Backup does not create any non-existing directories in the path. |
| **Choose a name for the device** | Specify a unique name for the device. |
| **Choose a 5 character media barcode prefix** | The NetVault Backup Server automatically generates a barcode prefix and assigns it to the virtual tape.<br>If you want to change it, type a unique code for the device. |
| **Specify the media capacity** | Type or select the size of the virtual tape.<br>The media size is specified in GiB. Verify that sufficient space is available on the disk to create the virtual media. The default value is 32GiB. |

5 Click **Next** to create and add the device.

6 After the device is successfully added and initialized, a message is displayed.

# Shared Virtual Tape Libraries

This section includes the following topics:

- About Shared Virtual Tape Libraries
- Planning for SVTL
- SVTL prerequisites
- Creating and adding an SVTL
- Re-adding a previously created SVTL

## About Shared Virtual Tape Libraries

NetVault Backup Shared Virtual Tape Libraries (SVTLs) extend the VTL implementation and allow you to share a VTL with multiple NetVault Backup machines for LAN-free backups. SVTLs are supported on the following platforms:

- Windows
- Linux (x86 and x86-64)
- Solaris SPARC and Solaris x86-64

The interface can be Fibre Channel, iSCSI, or SCSI. On Linux and Solaris platforms, SCSI_FCP protocol is also supported. The disks can be of any size. However, operating system-imposed limitations do apply. The SVTL size can be changed during runtime using CLI utilities.

# Planning for SVTL

Before setting up an SVTL, consider the following:

- The SVTL size depends on your disk size. Therefore, select a disk that meets your SVTL size requirements.
- Verify that the disk is physically connected to all clients that access the SVTL. The number of virtual drives for the SVTL depends on the number of machines that access the SVTL. However, it is not limited by the number of machines currently connected to the disk. You can configure additional drives for future use.
- Select the machine that controls the virtual arm changer. Although the SVTL drives can be shared or distributed among multiple clients, only one client controls the virtual arm changer.

# SVTL prerequisites

This section includes the following topics:



## General requirements

Before creating an SVTL, verify that the following requirements are met:

- Connect the disk array to all NetVault Backup Clients that will share the SVTL. The interface can be Fibre Channel, iSCSI, or SCSI. On Linux and Solaris platforms, SCSI_FCP protocol is also supported.
- Use an unformatted disk that contains no mounted partitions or volumes as an SVTL. A partition on a hard disk cannot serve as an SVTL. The additional requirements include the following:
  - The disk should allow multiple interfaces.
  - On Windows, any non-ejectable disk can serve as an SVTL.
  - NetVault Backup does not support Multipath, Powerpath, or software RAID technologies.
- On Windows, delete the existing volumes on a disk or LUN before using it to create an SVTL.
- On Windows 2008, Windows 7, and Windows Vista, use the Disk Management administrative utility to bring the disk online. When prompted to initialize the disk, select "No." If you do not perform these steps, NetVault Backup cannot create an SVTL on the disk.
- On Linux, bind the pool of raw device nodes to a block device before performing any raw I/O on it. There is a raw device controller that acts as the central repository of raw to block device binding information.

  Binding is performed using a utility named `raw`, which is normally supplied by the Linux distributor.
- On Solaris systems hosting the SVTL or sharing the drives, specify the SCSI ID and LUN values for the applicable disks and volumes in the file **/kernel/drv/sd.conf**. This requirement is applicable only if you are using a disk or RAID volume on a SAN. Use the following format to specify the values:

  ```
  name="sd" class="scsi" target=6 lun=5;
  ```
- On Solaris systems, create a single large partition named "Backup" on the hard disk. Use the applicable commands to set up the target hard disk so that it contains a single partition.
- Determine the client that controls the virtual arm changer.

# Setting up raw I/O on Linux-based systems

To set up raw I/O on Linux-based systems, you require the following:

- One or more free IDE or SCSI disk partitions.
- A raw device controller named **/dev/rawctl** or **/dev/raw**. If the controller is not present, type the following command to create a symbolic link:

  ```
  ln -s /dev/your_raw_dev_ctrl /dev/rawctl
  ```

*To set up raw I/O*

1. At the prompt, type the following command to display information from the file **devices.txt**. You can find this file in the **/usr/src/linux/Documentation** directory:

   ```
   ls /dev/rawctl
   ```

   — or —

   ```
   ls /dev/raw/raw1
   ```

2. Logged in as root, type the following command to create the device:

   ```
   mknod /dev/rawctl c 162 0
   ```

3. Set the following permissions:

   ```
   crw-rw
   ```

If you require **/dev/raw/raw1** and **/dev/raw/raw2**, follow the same procedure using the proper numbers listed in the **devices.txt** file and set the same permissions.

# Setting up raw I/O on RedHat Linux

The following example shows how to set up raw I/O on RedHat Linux. The raw partition used is **/dev/sda**.

1. Calculate the number of 4096-byte pages in this partition, as shown in the following example:

   ```
   fdisk /dev/sda

   Disk /dev/sda: 255 heads, 63 sectors, 1106 cylinders

   Units = cylinders of 16065 * 512 bytes

   num_pages = floor( ((1106-524+1)*16065*512)/4096 )

   num_pages = 11170736
   ```

2. Bind an unused raw device node to this partition. Binding is required each time the machine is rebooted. You must be logged in as root to run this command:

   ```
   raw /dev/raw/raw1 /dev/sda
   ```

3. For persistent binding, open the **/etc/sysconfig/rawdevices** file and append the following line:

   ```
   dev/raw/raw1 /dev/sda
   ```

   Restart the system or type the following command:

   ```
   /etc/rc.d/init.d/rawdevices start
   ```

4. Set appropriate read permissions on the raw device controller and the disk partition. Set appropriate read and write permissions on the raw device.

## Setting up raw I/O on RedHat Enterprise Linux 5

The raw devices interface has been deprecated in Red Hat Enterprise Linux 5; the raw device mapping is now performed using **udev** rules. To correctly map the raw device, add the appropriate entries to the **/etc/udev/rules.d/60-raw.rules** file in the following format:

- For device names:

  ```
  ACTION=="add", KERNEL=="<device name>", RUN+="/bin/raw /dev/raw/rawX %N"
  ```

- For major or minor numbers:

  ```
  ACTION=="add", ENV{MAJOR}=="A", ENV{MINOR}=="B", RUN+="/bin/raw /dev/raw/rawX
  %M %m"
  ```

Here `<device name>` is the name of the device that you want to bind (for example, **/dev/sda1**), A and B are the major or minor numbers of the device you want to bind, and X is the raw device number that you want the system to use.

If you have a large pre-existing **/etc/sysconfig/rawdevices** file, convert it using the following script.

```
#!/bin/sh

grep -v "^ *#" /etc/sysconfig/rawdevices | grep -v "^$" |

while read dev major minor;

do

if [-z "$minor"]; then

echo "ACTION==\"add\", KERNEL==\"${major##/dev/}\",

RUN+=\\"/bin/raw $dev%N\""

else

echo "ACTION==\"add\", ENV{MAJOR}==\"$major\",

ENV{MINOR}==\"$minor\", RUN+=\\"/

bin/raw $dev%M%m\"$dev%M%m\""

fi

done
```

## Setting up raw I/O on SUSE Linux

On SUSE Linux, administer the raw disk partitions in the **/etc/raw** file. This plain text file contains comments and examples for possible configurations. After creating the raw devices, bind the raw devices by starting them with the script **/etc/init.d/raw**. Use the **chkconfig(8)** utility to ensure that the raw device binding occurs after any restart.

# Creating and adding an SVTL

*To create an SVTL*

1. Start the configuration wizard:
   - In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
   - Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.
2. Select the **Shared virtual tape library** option, and click **Next**.

3 In the list of NetVault Backup machines, select the machine on which you want to create the device, and click **Next**.

4 On the **Add Shared virtual tape library** page, provide the following details.

**Table 6. Add SVTL**

| Option | Description |
|---|---|
| **Library Device** | Select the target drive. Depending on the operating system, the list includes the following items:<br>• **Windows:** PhysicalDrive1, PhysicalDrive2, and so on<br>• **Linux:** /dev/raw/raw1, /dev/raw/raw2, and so on<br>• **Solaris:** /dev/rdsk/c0t0d0s0, /dev/rdsk/c1t1d0s0, and so on |
| **Device Description** | Displays the disk type. |
| **Device Size** | Displays the disk size. |
| **Device Block Size** | Displays the block size. |
| **Previously Formatted as SVTL?** | Indicates whether the selected disk was previously formatted as an SVTL. |
| **Barcode Prefix** | The NetVault Backup Server automatically generates a barcode prefix and assigns it to the media used by the device.<br>If you want to change it, type a unique code for the device. |
| **Number of Drives** | Type or select the number of drives for the SVTL. The number of drives can be more than the number of NetVault Backup Clients currently connected to the disk. The additional drives can be used in future to connect more clients. |
| **Number of Media Items** | Type or select the total number of slots that hold the media. |
| **Media Capacity** | Type or select the media size. The media size is specified in MiB.<br>When creating an SVTL, NetVault Backup uses a few megabytes of space to store some information about the SVTL on the disk. Take this requirement into consideration when you configure the media capacity. |

5 To determine the disk space requirements for the SVTL, click **Calculate Size Required**. If the required disk size is larger than the actual disk size, reduce the **Media Items** and **Media Capacity**.

6 Click **OK**.

7 To create an SVTL, NetVault Backup formats the specified disk. To complete this step, provide the following details:

- **Password:** Type the NetVault Backup password for the server.
- **Confirmation Phrase:** Type the text **FORMAT SVTL**.

Click **Format** to format the disk and create the SVTL.

8 After the SVTL is created, and the tape drives are automatically discovered and assigned to the appropriate storage bays, a message is displayed.

You can use this default configuration if all the drives are to be controlled by the client selected in Step 3. In this case, no further action is required. You can exit the configuration wizard.

9 To assign the drives to a different client or to share the drive with multiple clients, click **Add Drives Manually**, and complete the following steps:

a In the **Choose Machine** table, select the client to which the drive is attached. If the device is connected to multiple clients, select any one client. Click **Next** to scan the selected client and list the attached devices.

Alternatively, to skip this bay and configure the next bay, click **Leave bay empty**.

b In the **Choose drive for bay** table, select the device that you want to add, and click **Next**.

c If the device is connected to multiple clients (for example, in a SAN setup), all the host clients are listed in the **Choose Machines** table. To share the drive with multiple clients, select the additional clients in the **Choose Machines** table, and click **Next**.

d After the drive is successfully assigned to the selected clients, a message is displayed.

To manually assign additional drives for the library, click **Add more devices**.

Alternatively, exit the configuration wizard and open a different page.

# Re-adding a previously created SVTL

*To re-add a previously created SVTL*

1 Start the configuration wizard.

2 On the **NetVault Configuration Wizard** page, select the **Shared virtual tape library** option and the **Re-add previously generated virtual device** check box.

3 In the list of NetVault Backup machines, select the machine on which the device was created. Click **Next** to scan the selected client and list the discovered SVTLs.

4 In the **Device** list, select the device that you want to add, and click **Next**.

5 After the SVTL is added, and the tape drives are automatically discovered and assigned to the appropriate storage bays, a message is displayed.

You can use this default configuration if all the drives are to be controlled by the client selected in Step 4. In this case, no further action is required. You can exit the configuration wizard.

To assign the drives to a different client or to share the drive with multiple clients, click **Add Drives Manually**, and complete the following steps:

a In the **Choose Machine** table, select the client to which the drive is attached. If the device is connected to multiple clients, select any one client. Click **Next** to scan the selected client and list the attached devices.

Alternatively, to skip this bay and configure the next bay, click **Leave bay empty**.

b In the **Choose drive for bay** table, select the device that you want to add, and click **Next**.

c If the device is connected to multiple clients (for example, in a SAN setup), all the host clients are listed in the **Choose Machines** table. To share the drive with multiple clients, select the additional clients in the **Choose Machines** table, and click **Next**.

d After the drive is successfully assigned to the selected clients, a message is displayed.

To manually assign additional drives for the library, click **Add more devices**.

Alternatively, exit the configuration wizard and open a different page.

# Physical tape devices

This section includes the following topics:



**NOTE:** On Windows-based machines, you must disable the Removable Storage Service before adding a device to the NetVault Backup Server. For more information about disabling this service, see the *Dell NetVault Backup Installation Guide*.

## Adding a standalone tape drive

*To add a standalone tape drive to the NetVault Backup Server*

1 Start the configuration wizard:

- In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
- Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.

2 Select the **Single physical tape device** option, and click **Next**.

3 In the list of NetVault Backup Clients, select the client that is physically connected to the target device. If the device is connected to multiple clients, select any one client.

Click **Next** to scan the selected client and list the attached devices.

4 In the **Choose drive** table, select the device that you want to add, and click **Next**.

5 If the device is connected to multiple clients (for example, in a SAN setup), all the host clients are listed in the **Choose Machines** table. To share the drive with multiple clients, select the additional clients in the **Choose Machines** table, and click **Next**.

This page is not displayed if the drive is connected to a single client.

6 After the device is successfully added and initialized, a message is displayed on the page.

## Adding a tape library

*To add a tape library to the NetVault Backup Server*

1 Start the configuration wizard:

- In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Add Storage Devices**.
- Alternatively, in the Navigation pane, click **Manage Devices**, and then click **Add Device**.

2 Select the **Tape library/media changer** option, and click **Next**.

3 In the list of NetVault Backup Clients, select the client that is physically connected to the target device. If the device is connected to multiple clients, select the client that you want to designate as the library controller.

**NOTE:** In NetVault Backup, a library changer is always controlled by a single machine. The drives can be shared among multiple clients.

Click **Next** to scan the selected client and list the attached devices.

4 In the **Choose library** table, select the device that you want to add.

In the **Device display name** box, specify a display name for the tape library.

Click **Next**.

5 After the tape drives are discovered and assigned to the appropriate storage bay, a message is displayed.

To use this default configuration, no further action is required. You can exit the configuration wizard.

6 To assign the drives to a different client or to share the drive with multiple clients, click **Add Drives Manually**, and complete the following steps:

a In the **Choose Machine** table, select the client to which the drive is attached. If the device is connected to multiple clients, select any one client. Click **Next** to scan the selected client and list the attached devices.

Alternatively, to skip this bay and configure the next bay, click **Leave bay empty**.

b In the **Choose drive for bay** table, select the device that you want to add, and click **Next**.

c If the device is connected to multiple clients (for example, in a SAN setup), all the host clients are listed in the **Choose Machines** table. To share the drive with multiple clients, select the additional clients in the **Choose Machines** table, and click **Next**.

This page is not displayed if the drive is connected to a single client.

d After the drive is successfully assigned to the selected clients, a message is displayed.

To manually assign additional drives for the library, click **Add more devices**.

Alternatively, exit the configuration wizard and open a different page.

5

# Backing up data



## About backing up data

A backup is a copy of data, which can be used to restore and recover the original data after a data loss event.

NetVault Backup offers a selection of plug-ins, which integrate with the native APIs to provide application-consistent backups and recovery of data. Depending on the application type, these plug-ins provide multiple methods and options to back up the selected data.

In general, NetVault Backup supports the following features:

- Full and selective backups
- Primary and secondary backups
- Normal and deduplicated backups
- Encrypted and non-encrypted backups
- Repeating and non-repeating backups

## Backup job definition

To back up data, you must create and submit a backup job. The NetVault WebUI provides a configuration wizard that helps you to perform this task. You can run the wizard from the **Guided Configuration** or **Create Backup Job** link in the Navigation pane.

A backup job definition includes the following components:

- Selection list
- Plug-in options
- Scheduling options

- Source device options (available only to the Plug-in for Consolidation, Plug-in for Data Copy, and Secondary Copy jobs)
- Target device and media options
- Advanced backup options

These components are stored in NetVault Backup Sets. For more information about NetVault Backup Sets, see About NetVault Backup Sets.

Each backup job has a Job ID and a Job Name. The Job ID is an auto-generated number. The Job Name is a user-defined string, which allows you to easily identify the job when monitoring its progress, viewing the job logs, or selecting a backup to restore data. The backup data is stored as a **Saveset** on the media.

# Secondary Copy

With a backup job, you can choose to run a Phase 2 job to create a Secondary Copy, which can be used for off-site storage and disaster recovery purposes. NetVault Backup offers the following methods to create a Secondary Copy:

- Duplicate
- Data Copy

## Duplicate

The Duplicate method creates an exact copy which is linked to the original backup. This method breaks down the backup into segments and copies the segments to the storage device. During restore, the segments from the primary backup and secondary copy can be interchanged. As it is not possible to mix unencrypted segments with encrypted segments during restore, you cannot enable or disable encryption for the Duplicate. If the original saveset is encrypted, the Duplicate method creates an encrypted copy. If the original saveset is not encrypted, this method creates an unencrypted copy.

## Data Copy

The Data Copy method breaks down the backup into segments and copies the segments to the backup device. During restore, either the primary backup or the secondary copy is used to recover data; the segments from the primary backup and secondary copy are not interchanged. Therefore, it is possible to enable encryption for the Data Copy when the primary copy is unencrypted. This option is useful when you want to use the deduplication option for primary backups.

**NOTE:** If the primary copy is encrypted, the Data Copy method automatically creates an encrypted saveset.

# Backup indexes

NetVault Backup generates a backup index for each backup, and writes this index to the backup media and the NetVault Database. The backup index includes a header which contains information required for restoring data. There is no maximum limit on the index file size or the number of items that you can include in a backup job.

Backup indexes stored in the NetVault Database are called **Online Indexes**. Online indexes allow you to quickly scan through the contents of a saveset without loading the media.

## Backup retirement

NetVault Backup allows you to set a generation-based or time-based retirement period for backups:

- **Generation-based retirement period:** This method specifies the number of Full Backups that are retained for the same data set. It can only be used for Full Backups.
- **Time-based retirement period:** This method specifies the length of time a backup is retained. The retention period can be specified in number of days, weeks, or years. The time-based retirement period can be used for all backup types (that is, Full, Incremental, and Differential).

When a backup is retired, its index is deleted from the NetVault Database. The indexes for the Incremental and Differential backups are automatically deleted when the base Full Backup is retired.

**NOTE:** When a backup stored on a disk-based storage device (such as NetVault SmartDisk, Dell DR Series System, or Data Domain System) is retired, that backup is deleted from the device. You cannot import the deleted backup by scanning the device.

# About NetVault Backup Sets

NetVault Backup Sets are used to create backup and restore jobs. The sets store data selections, backup and restore options, scheduling options, device and media options, and other advanced options. The data selections and options stored in the sets can be quickly and easily applied to one or more jobs. For example, you can save the data selections in a Backup Selection Set and use this set to create Full, Incremental, and Differential Backup jobs. Sets eliminate the need to manually select the data items each time a backup is performed, and ensure that the same data set is selected for the subsequent backups. Similarly, you can change the day, date, or time in a Schedule Set to automatically change the job schedule for multiple jobs, or specify a new device for backups by changing the Target Set.

## Set types

The following table describes the set types that are available in NetVault Backup.

**Table 1. Set types**

| Set type | Descriptions |
|---|---|
| **Backup Selection Set** | This set is used to specify data selections for backup jobs. |
| **Backup Options Set** | This set is used to specify plug-in-specific backup options, such as backup method, backup type, and other options. |
| **Schedule Set** | This set is used to specify scheduling options for backup and restore jobs. These options specify when and at what intervals a job runs.<br>NetVault Backup provides the following predefined Schedule Sets:<br>• Immediate<br>• Daily 10 PM<br>• Friday 10 PM<br>• Week Night 10 PM |
| **Source Set** | This set is used to specify source device options for the following jobs:<br>• Plug-in for Consolidation jobs<br>• Plug-in for Data Copy jobs<br>• Secondary Copy jobs<br>• Restore jobs<br>NetVault Backup provides the following predefined Source Set:<br>• Any Device |

**Table 1. Set types**

| Set type | Descriptions |
|---|---|
| **Target Set** | This set is used to specify target device and media options for backup jobs.<br>NetVault Backup provides the following predefined Target Sets:<br>• Default Backup Target Options<br>• Local Only<br>• Reuse Old Media<br>• Stand-alone |
| **Backup Advanced Options Set** | This set is used to specify advanced options, such as backup retirement period, deduplication, encryption, secondary copy, and other options for backup jobs.<br>NetVault Backup provides the following predefined Backup Advanced Options Sets:<br>• Default Advanced Backup Options<br>• Keep forever (Archive)<br>• Encrypt |
| **Restore Selection Set** | This set is used to specify data selections for restore jobs. |
| **Restore Advanced Options Set** | This set is used to specify advanced options for restore jobs.<br>NetVault Backup provides the following predefined Restore Advanced Options Set:<br>• Restore from selected backup |

# Defining a backup and recovery strategy

The primary objective of backing up data is to recover from the damages caused by a data loss event and resume normal operations quickly. This objective requires a good backup strategy, which maximizes data availability and minimizes data loss and downtime, while balancing your business requirements with costs, resources, and other factors.

To create a good backup plan, consider the possible failure modes, like hardware failure, data corruption, human error, or loss of a data center, and select the suitable backup methods and features to recover from these scenarios.

Typically, your backup plan should define what backup methods are used, when and at what intervals the backups are performed, how the backups are stored, how long the backups are retained, and how the backup media are re-used.

# Creating a backup job

*To create a backup job*

1 In the Navigation pane, click **Create Backup Job** to start the configuration wizard.

You can also start the wizard from the **Guided Configuration** link. In the **Navigation** pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Create Backup Jobs**.

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

A 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 In the **Selections** list, select an existing Backup Selection Set, or click **Create New**, and select the items that you want to back up. The selection tree is plug-in specific. For more information about selecting data for backups, see the relevant plug-in user's guide.

4 In the **Plugin Options** list, select an existing Backup Options Set, or click **Create New**, and configure the options that you want to use. These options are plug-in specific. For more information about these options, see the relevant plug-in user's guide.

5 In the **Schedule** list, select an existing Schedule Set, or click **Create New**, and configure the schedule type and schedule method. For more information, see Creating a Schedule Set.

The predefined set **"Immediate"** is selected by default. To run the job as soon as it is submitted, use this set.

6 In the **Target Storage** list, select an existing Target Set, or click **Create New**, and configure the target device and media options for the job. For more information, see Creating a Target Set.

The predefined set **"Default Backup Target Options"** is selected by default.

7 In the **Advanced Options** list, select an existing Backup Advanced Options Set, or click **Create New**, and configure the options that you want to use. For more information, see Creating a Backup Advanced Options Set.

The predefined set **"Default Advanced Backup Options"** is selected by default.

8 Select one of the following methods to save or schedule the job:

- **Schedule the job:** 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. For more information, see Viewing job activity and status and Viewing log messages.

- **Save the definition without scheduling the job:** To save the job definition without scheduling it, click **Save**.

  You can view, edit, or run this job from the **Manage Job Definitions** link. For more information, see Managing job definitions. This job is not displayed on the **Job Status** page until you submit it.

**NOTE:** A job that uses the Schedule Type "Triggered" is only scheduled when you run the script.

# Creating a Schedule Set

*To create a Schedule Set*

1 Start the job configuration wizard, and click **Create New** next to the **Schedule** list.

2 Select the **Schedule Type** from the following options.

**Table 2. Schedule type**

| Schedule type | Description |
|---|---|
| **Immediate** | To run a job as soon as it is submitted, select this option. |
| **Once** | To run a job once on the specified days, select this option, and configure the following options:<br>• **Run at:** Type the start time for the job, or click, and select the start time.<br>• **Starting from**: Type the date on which the schedule takes effect, or click, and select the start date.<br>• **Schedule method:** Select a scheduling method and configure the required options. For more information, see Scheduling methods and options for non-repeating jobs. |

**Table 2. Schedule type**

| Schedule type | Description |
|---|---|
| **Repeating** | To create a recurring schedule for jobs that are performed regularly, select this option, and configure the following options:<br>• **Run at**: Type the start time for the job, or click , and select the start time.<br>• **Starting from:** Type the date on which the schedule takes effect, or click , and select the start date.<br>• **Schedule method:** Select a scheduling method and configure the required options. For more information, see Scheduling methods and options for repeating jobs.<br>**NOTE:** For repeating jobs, the first instance is scheduled when you submit the job. The next instance is scheduled when the current instance becomes active, and this procedure is repeated for each subsequent instance. |
| **Triggered** | To schedule a job from an external script, select this option.<br>The most common use of this option is to run a job independently of the NetVault Backup Scheduler such as from a 3rd-party scheduler or an automation interface.<br>To schedule a triggered job, do the following:<br>• Create an external script file, and include the following command in the script:<br>`nvtrigger <trigger_name>`<br>A trigger name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 64 characters. On Windows OS, there is no length restriction, but a maximum of 20 characters is recommended. On Windows OS, the following characters are not supported:<br>`" / \ : ; \| * ? < >^`<br>The **nvtrigger** utility is stored in <NetVault Backup home>\bin on Windows and <NetVault Backup home>/bin on Linux. If this path is not configured in the path variable, provide the complete file path. Alternatively, include commands to change to the appropriate directory in the script.<br>You can run the script from the command line interface<br>• When creating the Schedule Set, select the **Triggered** option. In the **Trigger Name** box, provide the same trigger name that was specified with the **nvtrigger** command in the external script file. |

3 Under **Job Options**, configure the following settings.

**Table 3. Job retry and priority settings for Schedule Set**

| Option | Description |
|---|---|
| **Job Retries** | This setting is used to automatically reschedule a job after a failed attempt.<br>To schedule retry attempts for a job, do the following:<br>• Select the **Job Retries** check box, and in the value box type or select a value from 1 through 10. You can set a maximum of 10 retries for a job.<br>• In the **Retry After** box, type the interval between two attempts, or click , and select the interval. By default, the job is scheduled to run immediately after a failed attempt.<br>**NOTE:** For each retry attempt, the same Job ID is used, but the instance ID is increased by 1. |
| **Job Priority** | This setting is used to prioritize resource allocation when two or more jobs are scheduled to run at the same time. The default priority level for a backup job is 30.<br>To override the default priority settings for an individual job:<br>• In the **Job Priority** box, type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero (0) runs as a background task.<br>To change the priority level settings globally for all jobs, see Configuring Schedule Manager settings. |

4 Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Schedule Set.

# Scheduling methods and options for non-repeating jobs

The Schedule Type **"Once"** offers the following methods and options.

**Table 4. Scheduling methods for non-repeating jobs**

| Schedule Method | Description |
|---|---|
| **Any day** | Run a job on any day after the schedule takes effect. |
| **On days of week** | Run a job on specific days of the week.<br>**Options**<br>• **Days:** Select the check boxes corresponding to the days on which you want to run the job.<br>• **Weeks:** Select the check boxes corresponding to the weeks on which you want to run the job. To run the job on the last week of a month, select the **Last** check box. |

**Table 4. Scheduling methods for non-repeating jobs**

| Schedule Method | Description |
|---|---|
| **On days of month** | Run a job on specific days of month.<br>**Options**<br>• Select the check boxes corresponding to the days on which you want to run the job. To run the job on the last day of a month, select the **Last** check box. |
| **On specified date** | Run a job on a specific date. |

# Scheduling methods and options for repeating jobs

The Schedule Type **"Repeating"** offers the following methods and options.

**Table 5. Scheduling methods and options for repeating jobs**

| Schedule Method | Description |
|---|---|
| **Every day** | Run a job daily at the specified time. |
| **On days of week** | Run a job on specific days of the week.<br>**Options**<br>• **Days:** Select the check boxes corresponding to the days on which you want to run the job.<br>• **Weeks:** Select the check boxes corresponding to the weeks on which you want to run the job. To run the job on the last week of a month, select the **Last** check box. |
| **On days of month** | Run a job on specific days of month.<br>**Options**<br>• Select the check boxes corresponding to the days on which you want to run the job. To run the job on the last day of a month, select the **Last** check box. |
| **Every** | Select this option to run a job at every <n> interval. The time interval can be specified in hours, days, weeks, or months.<br>**Options**<br>• **Run every:** Type or select the interval at which you want to run the job, and select **Hours**, **Days**, **Weeks**, or **Months**. |

# Creating a Target Set

*To create a Target Set*

1 Start the backup job wizard, and click **Create New** next to the **Target Storage** list.

2 Configure the following options:

- **Device Selection:** See Specifying device type.
- **Media Options**: See Specifying media options.
- **Media Sharing:** See Configuring media sharing options.

3 Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Target Set.

# Specifying device type

*To specify device type for a backup job*

1 On the Create Target Set page, click **Device Selection**, and configure the following settings.

**Table 6. Device Selection options for Target Set**

| Option | Description |
|---|---|
| **Any Device** | This option is selected by default. If you do not specify a device type, NetVault Backup uses any suitable device for a job. |
| **Specify Device** | To use particular devices for a job, select this option. In the associated box, clear the check marks for the devices that you do not want to use. When you exclude a library, the associated drives are automatically excluded.<br>You can also use the following buttons to select or deselect devices:<br>• **Unselect all:** Deselects all devices.<br>• **Toggle selection:** Deselect all the selected devices and select all the unselected devices. |
| **Local Drives Only** | To use only devices that are locally attached to the target client, select this check box.<br>**NOTE:** NetVault SmartDisk is considered a network-attached device or a non-local device. |

2 Click **Set** to save the settings and close the dialog box.

# Specifying media options

*To configure media options for a backup job*

1 On the Create Target Set page, click **Media Options**, and configure the following settings.

**Table 7. Media Options for Target Set**

| Option | Description |
|---|---|
| **Target media by** | Select one of the options from the following:<br>• **Any media not in a group:** This option is selected by default. To use media that do not belong to any media group, leave this option selected.<br>• **Any media:** To use any suitable media regardless of its group association, select this option.<br>• **Specific Media ID:** To use particular media, select this option. In the media list to the right, click the label for the target media.<br>• **Media in group:** To use media that belong to a particular media group, select this option. In the media group list to the right, click the group label for the target media. Media group labels are case-insensitive. |

**Table 7. Media Options for Target Set**

| Option | Description |
|---|---|
| **Automatically label BLANK media** | To automatically label blank media during backup, select this check box.<br>By default, NetVault Backup assigns a system-generated label to blank media. The label consists of the NetVault Backup Server Name, the current date, and a seed number. To use media barcodes as the default labels, see Configuring general settings for Media Manager.<br>**NOTE:** If a piece of media that previously appeared to contain data becomes unexpectedly blank, it is marked as "suspect" to ensure that auto-labeling does not occur for it. NetVault Backup does not permit the use of same label, whether user-specified or system-generated, to ensure that only one label is associated with a piece of media. A notification event occurs when any piece of media becomes unexpectedly blank. |
| **Reuse media** | Select the appropriate option from the following:<br>• **Never:** This option is selected by default. To ensure that media marked for re-use are not used for backup, leave this option selected.<br>• **Any:** To allow any suitable reusable backup media regardless of the group association, select this option.<br>• **With the same group label as target media:** To reuse media that belong to same media group as the target media, select this option. This option can only be set if you have specified a group label for the **Target media by** option.<br>**NOTE:** A piece of media is automatically marked for reuse when the last saveset stored on it is retired. To manually mark a piece of media for re-use, see Marking a tape for reuse. |
| **Media request timeout** | Type or select the amount of time NetVault Backup waits for the backup media. The timeout value is specified in number of minutes. If the required media item is not available within the specified interval, the job is automatically aborted.<br>The default value is zero (0). With the default setting, the job waits indefinitely until the media is provided or the job is manually aborted.<br>The maximum timeout period that can be set is 1440 minutes (24 hours), which ensures that current instance is aborted before NetVault Backup runs the next instance of a Daily job.<br>**NOTE:** The timeout interval for media requests cannot be less than 5 minutes. The interval is automatically set to the nearest 5 minutes, if you specify a value that is not a multiple of 5. For example, if you specify 8 minutes, the timeout value is set to 10 minutes, and if you specify 23 minutes, the timeout value is set to 25 minutes. |

2 Click **Set** to save the settings and close the dialog box.

# Configuring media sharing options

*To configure media sharing options*

1 On the Create Target Set page, click **Media Sharing**, and configure the following settings.

**Table 8. Media Sharing options for Target Set**

| Option | Description |
|---|---|
| **Ensure backup is the first on target media** | To write a backup at the beginning of a tape, select this check box. The data can be restored quickly if the saveset is located at the beginning of a physical tape.<br>Only new or blank media are eligible for backups that use this option. |
| **Protect media from further writes after backup** | To write-protect a piece of media as soon as the backup is completed, select this option.<br>**NOTE:** To mark any existing tapes as "read-only," see Marking a tape as read-only. |
| **Only use media with a minimum of <x> gigabytes of free space** | To specify the minimum amount of space required on the target media, type or select the value. The value must be specified in GB. |

2 Click **Set** to save the settings and close the dialog box.

# Creating a Source Set

A Source Set specifies the device in which the source media that you want to use for a job resides. This set is required for the following jobs:

- Plug-in for Consolidation jobs
- Plug-in for Data Copy jobs
- Secondary Copy jobs

A Source Set is useful when you want to copy backups from disk-based devices to tape-based devices.

*To create a Source Set*

1 Start the backup job wizard, and click **Create New** next to the **Source Options** list.

2 Click **Device Selection**, and configure the following settings.

**Table 9. Device Selection options for Source Set**

| Option | Description |
|---|---|
| **Any Device** | This option is selected by default. If you do not specify a device type, NetVault Backup uses any suitable device for a job. |
| **Specify Device** | To use particular devices for a job, select this option. In the associated box, clear the check marks for the devices that you do not want to use. When you remove a library, the associated drives are automatically removed. |
| **Local Drives Only** | To use only devices that are locally attached to the target client, select this check box.<br>**NOTE:** NetVault SmartDisk is considered a network-attached device or a non-local device. |

3 Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Restore Source Set.

# Creating a Backup Advanced Options Set

*To create a Backup Advanced Options Set*

1 Start the backup job wizard, and click **Create New** next to the **Advanced Options** list.

2 Configure the following options:

- **Backup Life:** See Setting backup retirement options.
- **Additional Options:** See Specifying additional options.
- **Secondary Copy**: See Creating a Secondary Copy.
- **Pre & Post Scripts:** See Configuring pre- and post-script options.
- **Events**: See Configuring user-defined events for backup jobs.

3 Click **Save**, and in **Advanced Options Set Name**, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Advanced Options Set.

# Setting backup retirement options

*To set the backup retirement options*

1 On the **Advanced Options** page, click **Backup Life**, and configure the following settings.

**Table 10. Backup Life options**

| Option | Description |
|---|---|
| **Archive** | To archive the selected data, select this option.<br>An archive cannot be used as a base for Incremental or Differential backups. While archiving data, you must always select the Full Backup type. If you select Incremental or Differential Backup type, the restore job fails. |
| **Backup** | This option is selected by default. To create a backup, use this option. |

**Table 10. Backup Life options**

| Option | Description |
|---|---|
| **Backup Life** | This option specifies how long a backup is retained.<br>A backup can be retained indefinitely or retired after a specified period. NetVault Backup allows you to set a generation-based or time-based retirement period for backups. For more information about these methods, see Backup retirement. There are two ways to set the backup retirement period:<br>• Configure the **Backup Life** option in the Backup Advanced Options Set while creating a backup job.<br>• Alternatively, use the **Change Expiry** method to set or change the retirement period for an existing saveset. For more information about this method, see Configuring retirement period for a saveset.<br>To configure the Backup Life option, do the following:<br>• To set a generation-based retirement period, select the **Discard After Full Backup Count** option, and type or select the number Full Backups in the associated list.<br>• To set a time-based retirement period, select the **Discard After** option. Type or select the length of time that you want to retain the backup, and in the associated list, select the **Days**, **Weeks**, or **Months** option.<br>By default, the **Backup Life** option is set to **Discard After** and the retirement period is set to three months.<br>• To retain a backup indefinitely, select the **Don't Discard based on Full Backup Count** and **Don't Discard based on Time** options.<br>**NOTE:** When you configure a time-based retirement period, the time component (HH:MM) is automatically set to the job save or job submit time.<br>**NOTE:** In a time-based retirement period, the time component (HH:MM) does not represent the actual retirement time. It only represents the time due for backup retirement. The actual time of retirement is determined by the interval at which Media Manager scans the Media Database to identify the backups that it needs to retire. The default interval between two scans is 60 minutes. Thus, if the retirement time is set to 10:20, the backup is actually retired at 11:00. To change the default interval for backup retirement scans, see Configuring default interval for backup retirement scans. |
| **Offline Index After** | To remove the online index after a specified period, select this option. Type or select the length of time that you want to retain the index, and in the associated list, select the **Days**, **Weeks**, or **Months** option. |

2 Click **Set** to save the settings and close the dialog box.

**NOTE:** When a backup stored on a disk-based storage device (such as NetVault SmartDisk, Dell DR Series System, or Data Domain System) is retired, that backup is deleted from the device. You cannot import the deleted backup by scanning the device.

# Specifying additional options

*To specify additional options for a backup job*

1 On the **Advanced Options** page, click **Additional Options**, and configure the following settings.

**Table 11. Additional backup job options**

| Option | Description |
|---|---|
| **Enable Encryption** | NetVault Backup offers two encryption products:<br>• NetVault Backup Plug-in for Standard Encryption (Plug-in for Standard Encryption)<br>• NetVault Backup Plug-in for Advanced Encryption (Plug-in for Advanced Encryption)<br>These plug-ins provide support for CAST-128, AES-256, and CAST-256 algorithms to meet regulatory backup security requirements. For more information about these plug-ins, see the relevant plug-in user's guide.<br>Once the Plug-in for Standard Encryption or Plug-in for Advanced Encryption is installed on a client, you can do either of the following:<br>• Configure the plug-in to encrypt all backups originating for the client where the plug-in is installed. For more information about this setting, see relevant the plug-in user's guide.<br>• Use the job-level encryption option to encrypt specific backups for the client. You can also select encryption only for the secondary copy.<br>The job-level encryption option is useful in the following situations:<br>• Any plug-in installed on the server or client is incompatible with the encryption plug-ins.<br>• Only specific backups on the server or client require encryption.<br>• Primary backups do not require encryption while secondary backups for offsite protection require encryption.<br>• Primary backups are targeted to storage devices that support deduplication.<br>To perform job-level encryption for a primary backup, select the **Enable Encryption** check box. For more information about using job-level encryption for a secondary copy, see Encrypt Secondary Copy Only. |
| **Enable Deduplication** | Deduplication is enabled by default. Clear this check box if the target device does not support data deduplication.<br>While performing backups to devices that support deduplication, we recommend that you clear this check box for the following jobs:<br>• Backups that use the encryption option. Encrypted backups do not deduplicate well and should not be deduplicated.<br>• Incremental Backups that you want to consolidate using the Plug-in for Consolidation. By not selecting this option, you eliminate the unnecessary overhead of rehydrating the deduplicated Incremental Backups during the consolidation process. You can enable deduplication while backing up the Consolidated Full Backup.<br>**NOTE:** You cannot completely disable deduplication for a DR Series system. The DR Series systems provide a configuration mode for deduplication that controls whether deduplication is performed on the client or on the DR Series system. You can turn off client-side deduplication by setting the **Dedupe** mode to **Passthrough**. For more information about this setting, see the *Dell DR Series System Administration Guide*. |

**Table 11. Additional backup job options**

| Option | Description |
|---|---|
| | **NOTE:** When backups stored on the Dell DR Series systems are selected for backup consolidation jobs, the overhead of rehydrating the deduplicated data can have a negative impact on performance. |
| **Verify After Backup** | To verify the stream length written to the media and ensure that no blocks were dropped during backup, select this check box. Backup verification is performed as Phase 2 job after the actual backup is completed. If any dropped blocks are detected, the verification phase reports an error and fails.<br>**NOTE:** You must run the backup again if the verification phase fails.<br>The Phase 2 backup verification job does not verify the integrity of data. This phase only verifies that the backup was actually written to the media.<br>By default, the verification job runs on the NetVault Backup Server. To configure a different client to run the verification phase, see Configuring backup verification settings. |
| **Use Network Compression** | To use network compression while transferring data over the network, select this check box.<br>The data is compressed on the backup client before being transferred over the network. On the machine to which the target device is attached, the data is decompressed before being written to the media.<br>Network compression does not work for the following types of jobs:<br>• Backups to NetVault SmartDisk<br>• Backups to devices attached to NDMP-based NAS filers<br>• Jobs using the NetVault Backup Plug-in for NDMP, NetVault Plug-in for NetWare, and NetVault Bare Metal Recovery products |

2 Click **Set** to save the settings and close the dialog box.

# Creating a Secondary Copy

*To create a secondary copy*

1 On the **Advanced Options** page, click **Secondary Copy**, and configure the following settings.

**Table 12. Secondary Copy options**

| Option | Description |
|---|---|
| **Secondary Copy** | To create a Secondary Copy, select this check box and configure the options that are displayed on the dialog box. |
| **Copy with** | Select the method that you want to use to create the Secondary Copy. The available methods are:<br>• Duplicate<br>• Data Copy<br>For more information about these methods, see Secondary Copy. |
| **Run copy job on** | By default, the secondary copy job runs on the NetVault Backup Server. If you want to run the job on a particular client, select the target client.<br>You can use this option to perform backups on a client with a locally attached physical or virtual tape device. |
| **Use Schedule Set** | Select an existing Schedule Set, or click **Create New**, and configure the schedule type and schedule method. For more information, see Creating a Schedule Set. |

**Table 12. Secondary Copy options**

| Option | Description |
|---|---|
| **Use Target Set** | Select an existing Target Set, or click **Create New**, and configure the target device and media options for the job. For more information, see Creating a Target Set.<br>**NOTE:** We recommend that you select the same drives for all secondary copy jobs. For example, in a library with four drives, select drives 1 and 2 for the primary backups and drives 3 and 4 for the secondary copies targeted to tape devices. This type of selection avoids deadlocks when running several duplication jobs at the same time. |
| **Use Source Set** | Select an existing Source Set, or click **Create New**, and configure the target device and media options for the job. For more information, see Creating a Source Set. |
| **Maximum Streams for Data Copy** | Type or select the maximum number of parallel streams that can be generated for the data copy job. |
| **Media Request Timeout** | Type or select the amount of time NetVault Backup waits for the backup media. This timeout value is specified in number of seconds. If the required media item is not available within the specified interval, the job is automatically aborted.<br>The default value is 10 minutes. If you set the value to zero (0), the Secondary Copy job waits indefinitely until the media is provided or the job is manually aborted.<br>The maximum timeout period that can be set is 1440 minutes (24 hours), which ensures that current instance is aborted before NetVault Backup runs the next instance of a Daily job.<br>**NOTE:** The media request timeout for Phase 1 Data Copy jobs (created using the Plug-in for Data Copy) is controlled by the **Media Request Timeout** setting in the Backup Options Set; it is not controlled by the **Media Request Timeout** setting in the Target Set. The media request timeout for Phase 2 (Secondary Copy) Data Copy and Duplicate jobs is controlled by the **Media Request Timeout** specified in the Backup Advanced Options Set. |
| **Encrypt Secondary Copy Only** | To perform job-level encryption for a secondary copy, select the **Enable Encryption** check box. This option can only be used with the **Data Copy** method. To use this option, the Plug-in for Standard Encryption or the Plug-in for Advanced Encryption must be installed on the client.<br>Note the following:<br>• If the primary copy is encrypted, the Data Copy method automatically creates an encrypted saveset whether you select the **Encrypt Secondary Copy Only** check box or not. Therefore, this option is only useful when you want to create an encrypted secondary copy from an unencrypted primary copy.<br>• Encrypted primary backups are not encrypted again if you select the **Encrypt Secondary Copy Only** check box for a Data Copy. For restoring data from an encrypted Data Copy, you must use the primary copy's Encryption Key.<br>For more information about using job-level encryption for a primary backup, see Enable Encryption. |

**Table 12. Secondary Copy options**

| Option | Description |
|---|---|
| **Migrate (Discard Original)** | To migrate the backup instead of creating a copy, select this check box. After copying the data, NetVault Backup deletes the index for the original backup.<br>**NOTE:** When creating copies of the Plug-in for FileSystem backups, the **Migrate** option can only be selected for Full Backups that do not have any associated Incremental or Differential Backups. If you select this option for a Full Backup that has an associated Incremental or Differential Backup, NetVault Backup creates the secondary copy successfully, but it does not delete the index for the primary or original backup. For such backups, after creating the copy, you must manually retire the primary or original backup. |
| **Allow Streams to Share Media** | You can use this option to convert multiple data streams into a sequential data stream and write it to the media item.<br>If you do not select this option, each stream is written to a separate media item. |
| **Use Optimised Replication Between Devices that Support this Feature** | Optimized replication enables transfer of deduplicated data directly from one device to another device of the same type during a Data Copy or Duplicate operation. It provides an efficient method to create secondary copies and offers the following advantages:<br>• Copies data in its deduplicated form, which greatly reduces the amount for data transferred over the network.<br>• Copies data directly from the source to the destination without using any resources on the NetVault Backup Server.<br>The following storage devices support optimized replication:<br>• **Dell DR Series Systems:** To perform optimized replication, both the source and target DR Series systems must be running the same release version of the DR OS. Replication is not supported between systems that run different releases of the OS.<br>For example, to replicate data from a source system that is running DR OS 3.x, the target system must be running the same OS release version. Replication is unsuccessful if the target system is running DR OS release 2.0.x or 3.0.x.<br>**NOTE:** When optimized replication and backups are performed simultaneously on a Dell DR Series system, the backup throughput is affected.<br>• **NetVault SmartDisk devices:** To perform optimized replication, you require NetVault SmartDisk 2.0 or later.<br>If the login credentials configured for the source and destination NetVault SmartDisk Servers do not match, replication fails. To ensure a successful replication, do one of the following:<br>- Disable WebDAV authentication on both NetVault SmartDisk Servers.<br>- Enable WebDAV authentication only on the source.<br>- Configure the same login credentials on both servers.<br>**NOTE:** When copying a backup from a NetVault SmartDisk to a different device type (for example, VTL, Dell DR Series System, or Data Domain System), you must clear this check box. If you do not clear this check box, the Data Copy or Duplicate job fails or stops responding. |

**Table 12. Secondary Copy options**

| Option | Description |
|---|---|
| | • **DD Boost-enabled Data Domain Systems:** The secondary copy backups between two DD Boost-Enabled Data Domain Systems use the managed file-level replication feature provided by DD Boost.<br>File-level replication requires the DD Boost Replicator license, which must be installed on both the source and the destination Data Domain systems.<br>**NOTE:** If the source and target Data Domain systems are running different versions of the Data Domain OS, then for replication to be successful, the target system must be running the higher version of the OS. |
| **Select Source Media Before Target Media** | When you select this check box, NetVault Backup tries to acquire the source media before it attempts to acquire the target media for the Data Copy and Duplicate backups. |
| **Use Life of Original** | To use the original saveset's retirement period, select this option. |
| **Discard After** | To set a different retirement period for the copy, select this option. Type or select the length of time that you want to retain the backup, and in the associated list, select the **Days**, **Weeks**, **Months**, or **Years** option. You can set only time-based retirement period for the copy. |

2 Click **Set** to save the settings and close the dialog box.

# Configuring pre- and post-script options

NetVault Backup lets you add user-defined scripts to backup jobs and run the scripts before a job starts or after a job completes. You can use these scripts to perform tasks such as dismounting or shutting down a database before the job starts or mounting or starting the database after the job completes.

The script must be an executable file, for example, **".bat"** files on Windows and **".sh"** files on Linux. After creating the script, you must copy the file to the **scripts** directory on the target client (<NetVault Backup home>\scripts on Windows and <NetVault Backup home>/scripts on Linux).

The scripts can contain run-time parameters. These parameters are stored in the environment variable **NV_USER_ARG**. You can also use other NetVault Backup environment variables in the scripts. For a list of available environment variables, see Using environment variables.

NetVault Backup provides two predefined script files that can be used as post-scripts:

- **psmail:** Use this script to send job completion status to the specified email addresses.
- **psmail_logs:** Use this script to send job completion status and job logs to the specified email addresses.

On Linux and UNIX, the predefined scripts do not any filename extension. On Windows, the scripts have the filename extension **".bat."** To run these scripts, specify the following in the **Post Script** box:

- **Linux and UNIX: psmail** or **psmail_logs**
- **Windows**: **psmail.bat** or **psmail_logs.bat**

*To specify pre- and post-scripts*

1 On the **Advanced Options** page, click **Pre & Post Scripts**, and configure the following settings.

**Table 13. Pre- and post-script options for backup jobs**

| Option | Description |
|---|---|
| **Pre Script** | This option allows you to run a user-defined script before a job starts. You can use this script to perform any pre-backup preparation, like dismounting or shutting down a database.<br>To run a pre-script, do the following:<br>• In the **Pre Script** box, specify the script filename.<br>• In the **User Parameter** box, provide the values for the run-time parameters. The value should be valid and conform to its usage in the script. NetVault Backup does not perform any validity checks for the user parameters. |
| **Post Script** | This option allows you to run a user-defined script after a job completes. You can use this script to perform any post-backup processing, like mounting or starting a database after a job completes.<br>To run a post-script, do the following:<br>• In the **Post Script** box, specify the script filename.<br>• In the **User Parameter** box, provide the values for the run-time parameters. The value should be valid and conform to its usage in the script. NetVault Backup does not perform any validity checks for the user parameters. |

The following table illustrates the effect of script exit status on the overall execution and job status.

**Table 14. Script execution and backup job status**

| Process | Result | | | | |
|---|---|---|---|---|---|
| **Pre script** | Success | Success | Success | Fail | Fail |
| **Backup job** | Success | Success | Fail | Does not run | Does not run |
| **Post script** | Success | Fail | Success | Success | Fail |
| **Overall job status** | Job completes successfully. | Job completes, but a post-script error is reported. | Job fails, but the post-script runs. An error is reported. | Job fails, and a pre-script error is reported. | Job fails, pre- and post-script errors are reported. |

2 Click **Set** to save the settings and close the dialog box.

# Configuring user-defined events for backup jobs

NetVault Backup includes a set of predefined events that are associated with various job-related and non-job-related occurrences in the system. You can configure one or more notification methods to receive notifications when these events occur. For more information about events and notification methods, see Monitoring events and configuring notifications.

You can also create user-defined events in NetVault Backup to monitor specific events associated with backup jobs, restore jobs, policies, report jobs, and log messages. The user-defined events for a backup job can be associated with the following events:

- Job is Successful
- Job has Warnings
- Job Fails

You can specify the user-defined events in the Backup Advanced Options Set. Once you create a user-defined event, you can raise it for any backup job. NetVault Backup adds these events to the event class **Jobs — User defined**.

*To raise user-defined events for a backup job*

1 On the **Advanced Options** page, click **Events**, and configure the following settings.

**Table 15. User-defined event types for backup jobs**

| Option | Description |
|---|---|
| **Job is Successful** | Type or select the event that you want to raise when the job completes successfully. |
| **Job has Warnings** | Type or select the event that you want to raise when the job completes with warnings. |
| **Job Fails** | Type or select the event that you want to raise when the job fails. |

2 Click **Set** to save the settings and close the dialog box.

3 To receive a notification when an event occurs, set up a notification method for the event. For more information, see the Setting up a global notification method.

# Managing sets

This section includes the following topics:

- Modifying a set
- Deleting a set

# Modifying a set

*To modify a set*

1 In the Navigation pane, click **Manage Sets**.

2 In the **Set Type** list, select the type of set that you want to modify.

3 In the list of available sets, select the set, and click **Edit**.

4 Modify the data selections or required options.

5 Click **Save**, and in the **Edit Set** dialog box, click **Save** again.

**NOTE:** Editing a set affects the existing jobs using that set.

# Deleting a set

*To delete a set*

1. In the Navigation pane, click **Manage Sets**.
2. In the **Set Type** list, select the type of set that you want to delete.
3. In the list of available sets, select the set, and click **Delete**.

   To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.
4. In the confirmation dialog box, click **OK**.

**NOTE:** Deleting a set affects the existing jobs using that set.

6

# Managing policies



## About policies

A policy can be used to submit one or more jobs that target one or more similar clients. You can use a policy to administer backup strategies such as following:

- Daily Incremental and Weekly Full Backups of file servers
- Full backups of multiple Windows workstations
- Full and Incremental Backups of multiple databases

The following plug-ins support policy-based backups:

- NetVault Backup Plug-in for FileSystem
- NetVault Backup Plug-in for Consolidation
- NetVault Backup Plug-in for Data Copy
- NetVault Backup Plug-in for Databases (plug-in for backing up the NetVault Database)

You can create and submit backup policies from the **Manage Policies** page and monitor the policy jobs from the **Job Status** page.

## Creating a policy

*To create a policy*

1 In the Navigation pane, click **Manage Policies**, and then click **Add** to open the **Edit Policy** page.

2 In **Policy Name**, type a name for the policy.

3 To add a policy job, click **Add Job**.

On the **Create Policy Job** page, configure the following settings.

**Table 1. Policy job definition**

| Option | Description |
|---|---|
| **Job Name** | Type a name for the job. Assign a descriptive name that allows you to easily identify the job for monitoring its progress or restoring data.<br>A 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. |
| **Selections** | Select an existing Backup Selection Set, or click **Create New**, and select the items that you want to back up. The selection tree is plug-in specific. For more information about selecting data for backups, see the relevant plug-in user's guide. |
| **Plugin Options** | Select an existing Backup Options Set, or click **Create New**, and configure the options that you want to use. These options are plug-in specific. For more information about these options, see the relevant plug-in user's guide. |
| **Schedule** | Select an existing Schedule Set, or click **Create New**, and configure the schedule type and schedule method. For more information, see Creating a Schedule Set.<br>The predefined set **"Immediate"** is selected by default. To run the job as soon as it is submitted, use this set. |
| **Target Storage** | Select an existing Target Set, or click **Create New**, and configure the target device and media options for the job. For more information, see Creating a Target Set.<br>The predefined set **"Default Backup Target Options"** is selected by default. |
| **Advanced Options** | Select an existing Backup Advanced Options Set, or click **Create New**, and configure the options that you want to use. For more information, see Creating a Backup Advanced Options Set.<br>The predefined set **"Default Advance Backup Options"** is selected by default. |

Click **Save** to save the job definition.

4 To add more jobs, repeat step 3.

5 Click **Next**.

6 To apply the policy to one or more clients or client groups, do the following:

**Table 2. Client and client group selection for backup policy**

| Option | Description |
|---|---|
| **Add clients or client groups** | In the **Available** table, select the clients and client groups that you want to add, and click **Add**.<br>To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.<br>The selected items are moved to the **Selected** table. |
| **Remove clients or client groups** | In the **Selected** table, select the clients and client groups that you want to remove, and click **Remove**.<br>The selected items are moved to the **Selected** table. |

7 Click **Next**.

8 NetVault Backup includes a set of predefined events that are associated with various job-related and non-job-related occurrences in the system. You can configure one or more notification methods to receive notifications when these events occur. For more information about events and notification methods, see Monitoring events and configuring notifications.

You can also create user-defined events in NetVault Backup to monitor specific events associated with backup jobs, restore jobs, policies, report jobs, and log messages. The user-defined events for a policy can be associated with the following events:

- Policy has warnings
- Policy has errors

To raise a user-defined event for the policy, configure the following settings. Once you create a user-defined event, you can raise it for any policy. NetVault Backup adds these events to the event class **Policy — User defined**.

**Table 3. User-defined events for backup policy**

| Option | Description |
|---|---|
| **Raise event if policy has warnings** | Type or select the event that you want to raise when one or more policy jobs complete with warnings. |
| **Raise event if policy has errors** | Type or select the event that you want to raise when one or more policy jobs fail. |

To receive a notification when an event occurs, set up a notification method for the event. For more information, see the Setting up a global notification method.

9 Click **Save Policy** to save the policy definition.

# Modifying a backup policy

This procedure can be used to modify a backup policy that is in “dormant” (or “quiesced”) state. A backup policy is said to be in dormant (or inactive) state if no policy jobs are currently running. A policy is said to be in active state if one or more policy jobs are currently running. Before modifying an active backup policy, you must place the policy in quiesced state. For more information about this procedure, see Quiescing a backup policy.

### *To modify a policy that is in dormant or quiesced state*

1 In the Navigation pane, click **Manage Policies**.

2 In the **Available Policies** table, select the policy that you want to modify, and click **Edit**.

3 To change the job definitions for a policy, do the following:

- **Add job:** On the Edit Policy page, click **Add Job**, and create the job definitions. For more information about the job components, see Policy job definition.

  Click **Save** to the save the job definition.

- **Edit job:** In the Jobs table, select the job that you want to change, and click **Edit Job**.

  On the **Edit Policy Job** page, modify the applicable job components. For more information, see Policy job definition.

  Click **Save** to the save the job definition.

- **Delete job:** In the Jobs table, select the job that you want to delete, and click **Delete Jobs**. In the confirmation dialog box, click **OK**.

4 Click **Next**.

5 To change the client or client groups for the policy, see Client and client group selection for backup policy.

6 Click **Next**.

7 To change the user-defined events for the policy failures or policy warnings, see User-defined events for backup policy.

8 Click **Save Policy** to save the policy definition.

# Quiescing a backup policy

Before modifying an active backup policy, you must place the policy in quiesced state. A policy is temporarily disabled when it is placed in quiesced state.

*To quiesce an active backup policy*

1 In the Navigation pane, click **Manage Policies**.

2 In the **Available Policies** table, select the policy, and click **Quiesce**.

In the policy table, the policy status is set to "**Quiescing.**"

3 During this state, NetVault Backup completes the following tasks:

- Deletes all the scheduled instances for the policy jobs.
- Completes the jobs that are in progress.
- Complete phase 2 (for example, a Secondary Copy job) for the active jobs.

4 After these operations are completed, the policy status is set to "**Quiesced**."

In this state, you can change the policy definition.

5 A **"Quiesced"** policy remains in that state until you open and save the policy again. When you save the policy, all policy jobs are scheduled again.

# Deleting a backup policy

*To delete a backup policy*

1 In the Navigation pane, click **Manage Policies**.

2 In the **Available Policies** table, select the policy that you want to delete, and click **Delete**.

3 In the confirmation dialog box, click **OK**.

7

# Restoring data



## About restoring data

Restore refers to reconstructing all or part of a system from a backup. A restore can be performed for the following reasons:

- To recover lost data (for example, a file that was accidentally deleted)
- To recover database or files that have been corrupted
- To copy or move data to a different database or directory
- To recover to a previous point-in-time, if some operation goes wrong
- To migrate data when upgrading to a new system
- To copy or move data to a test or production server
- To recover from media failure, OS corruption, loss of physical system

The NetVault Backup plug-ins integrate with the native APIs to restore and recover application-specific data from backups. Depending on the application type, these methods provide different methods and options to restore data.

In general, NetVault Backup offers the following restore features:

- Full and selective restores
- Disaster recovery
- Restores to alternate location
- Restores to alternate server

## Restore job definition

To restore data, you need to create and submit a restore job. You can create a restore job definition from the **Create Restore Job** link in the Navigation pane.

A restore job definition includes the following components:

- Selection list
- Plug-in options

- Target client name (when restoring to an alternate server)
- Scheduling options
- Source device options
- Advanced restore options

These components are stored in NetVault Backup Sets. For more information about NetVault Backup Sets, see About NetVault Backup Sets.

Each restore job has a Job ID and a Job Name. The Job ID is an auto-generated number. The Job Name is a user-defined string that allows you to easily identify the job when monitoring its progress or viewing the job logs.

# Creating a restore job

*To create a restore job*

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 items that you want to restore. The selection tree is plug-in specific. For more information about selecting data for restores, see the relevant plug-in user's guide.

4 Click **Edit Plugin Options**, and configure the options that you want to use. These options are plug-in specific. For more information about these options, see the relevant plug-in user's guide.

Click **Next**.

5 On the **Create Restore Job** page, specify a name for the job. Assign a descriptive name that allows you to easily identify the job for monitoring its progress.

A 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.

6 In the **Target Client** list, select the restore target. To restore data to the same client (from which data was backed up), use the default setting.

To restore data to an alternate client, select the target client in the list. Alternatively, click **Choose**. In the **Choose the Target Client** dialog box, select the client, and click **OK**.

7 In the **Schedule** list, select an existing Schedule Set, or click **Create New**, and configure the schedule type and schedule method. For more information. For more information, see Creating a Schedule Set.

The predefined set **“Immediate”** is selected by default. To run the job as soon as it is submitted, use this set.

8 In the **Source Options** list, select an existing Source Set, or click **Create New**, and configure the source device options. For more information, see Creating a Source Set.

The predefined set **"Any Device"** is selected by default. To select any available device for the job, use this set.

9 In the **Advanced Options** list, select an existing Restore Advanced Options Set, or click **Create New**, and configure the options that you want to use. For more information, see Creating a Restore Advanced Options Set.

The predefined set **"Restore from selected backup"** is selected by default.

10 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, see Viewing job activity and status and Viewing log messages.

# 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.

This section includes the following topics:

- Filtering the saveset list
- Searching for files in savesets
- Viewing media list

## 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 1. Saveset filters**

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

**Table 1. Saveset filters**

| Filter | Description |
|---|---|
| **Date** | Displays savesets created during a specified period.<br>*To use this filter*<br>• 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.<br>The default selection is **Any**. |
| **Job** | Displays savesets created for particular job IDs.<br>*To use this filter*<br>• Click the **Job** box, and in the **Choose Job** dialog box, select the applicable jobs. Click **OK** to close the dialog box.<br>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.

# Creating a Source Set

*To create a Source Set*

1 Start the restore job wizard, and click **Create New** next to the **Source Options** list.

2 Click **Device Selection**, and configure the following settings.

**Table 2. Device Selection options for Restore Source Set**

| Option | Description |
|---|---|
| **Any Device** | This option is selected by default. If you do not specify a device type, NetVault Backup uses any suitable device for a job. |
| **Specify Device** | To use particular devices for a job, select this option. In the associated box, clear the check marks for the devices that you do not want to use. When you remove a library, the associated drives will be automatically removed. |
| **Local Drives Only** | To use only devices that are locally attached to the target client, select this check box.<br>**NOTE:** NetVault SmartDisk is considered a network-attached device or a non-local device. |

3 Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Restore Source Set.

# Creating a Restore Advanced Options Set

*To create a Restore Advanced Options Set*

1 Start the restore job wizard, and click **Create New** next to the **Advanced Options** list.

2 Configure the following options:

- **Restore Type:** See Setting restore type.
- **Additional Options:** See Specifying additional options.
- **Pre & Post Scripts**: See Configuring pre- and post-scripts.
- **Events:** See Configuring user-defined events for restore jobs.

3 Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

A set name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

Click **Save** to save the Restore Advanced Options Set.

# Setting restore type

*To specify the restore type*

1 On the Advanced Options page, click **Restore Type**, and select one of the following options.

**Table 3. Restore type**

| Option | Description |
|---|---|
| **Restore from selected backup** | Use this option to restore data from the selected backup.<br>This option is selected by default. |
| **Restore from latest backup** | Use this option to restore data from most recent backup that was performed using a particular Backup Selection Set regardless of which saveset you use to create the restore job. |

The following example illustrates the difference between these two options:

a Create a test directory and create a Backup Selection Set "SelectionSet-1" to back up the test directory.

b Create a file named "first.txt" in the test directory.

c Perform a Full Backup (TestBackup1) using "SelectionSet-1."

d Delete "first.txt" and create a file named "last.txt" in the test directory.

e Perform a second Full Backup (TestBackup2) using "SelectionSet-1."

f Restore TestBackup1 using the **Restore from selected backup** option. This job restores the file "first.txt."

g Restore TestBackup1 using the **Restore from latest backup** option. This job restores the file "last.txt."

2 Click **Set** to save the settings and close the dialog box.

# Specifying additional options

*To specify additional options for a restore job*

1 On the Advanced Options page, click **Additional Options**, and configure the following setting:

- **Use Network Compression:** To use network compression while transferring data over the network, select this check box. The data is compressed on the server or client to which the source device is attached before being transferred over the network. On the target client, the data is decompressed before being restored to the original or alternate location.

  Network compression does not work for the following types of jobs:

  - Restores from NetVault SmartDisk
  - Restores from devices attached to NDMP-based NAS filers
  - Jobs using the Dell NetVault Backup Plug-in for NDMP, Dell NetVault Plug-in for NetWare, and NetVault Bare Metal Recovery products

2 Click **Set** to save the settings and close the dialog box.

# Configuring pre- and post-scripts

NetVault Backup lets you add user-defined scripts to backup jobs and run the scripts before a job starts or after a job completes. You can use these scripts to perform tasks such as dismounting or shutting down a database before the job starts or mounting or starting the database after the job completes.

The script must be an executable file, for example, **".bat"** files on Windows and **".sh"** files on Linux. After creating the script, you must copy the file to the **scripts** directory on the target client (<NetVault Backup home>\scripts on Windows and <NetVault Backup home>/scripts on Linux).

The scripts can contain run-time parameters. These parameters are stored in the environment variable **NV_USER_ARG**. You can also use other NetVault Backup environment variables in the scripts. For a list of available environment variables, see Using environment variables.

NetVault Backup provides two predefined script files that can be used as post-scripts:

- **psmail**: Use this script to send job completion status to the specified email addresses.
- **psmail_logs:** Use this script to send job completion status and job logs to the specified email addresses.

On Linux and UNIX, the predefined scripts do not any filename extension; on Windows, the scripts have the filename extension **".bat."** To run these scripts, specify the following in the **Post Script** box:

- **Linux and UNIX: psmail** or **psmail_logs**
- **Windows: psmail.bat** or **psmail_logs.bat**

### *To specify pre- and post-scripts*

1 On the Advanced Options page, click **Pre & Post Scripts**, and configure the following settings.

**Table 4. Pre- and post-script options for restore jobs**

| Option | Description |
|---|---|
| **Pre Script** | This option allows you to run a user-defined script before a job starts. You can use this script to perform any pre-backup preparation, like dismounting or shutting down a database.<br>To run a pre-script, do the following:<br>• In the **Pre Script** box, specify the script filename.<br>• In the **User Parameter** box, provide the values for the run-time parameters. The value should be valid and conform to its usage in the script. NetVault Backup does not perform any validity checks for the user parameters. |
| **Post Script** | This option allows you to run a user-defined script after a job completes. You can use this script to perform any post-backup processing, like mounting or starting a database after a job completes.<br>To run a post-script, do the following:<br>• In the **Post Script** box, specify the script filename.<br>• In the **User Parameter** box, provide the values for the run-time parameters. The value should be valid and conform to its usage in the script. NetVault Backup does not perform any validity checks for the user parameters. |

The following table illustrates the effect of script exit status on the overall execution and job status.

**Table 5. Script execution and restore job status**

| Process | Result | | | | |
|---|---|---|---|---|---|
| **Pre script** | Success | Success | Success | Fail | Fail |
| **Restore job** | Success | Success | Fail | Does not run | Does not run |
| **Post script** | Success | Fail | Success | Success | Does not run |
| **Overall job status** | Job completes successfully. | Job completes, but a post-script error is reported. | Job fails, but the post-script runs. An error is reported. | Job fails, and a pre-script error is reported. | Job fails and an error is reported. |

2 Click **Set** to save the settings and close the dialog box.

# Configuring user-defined events for restore jobs

NetVault Backup includes a set of predefined events that are associated with various job-related and non-job-related occurrences in the system. You can configure one or more notification methods to receive notifications when these events occur. For more information about events and notification methods, see Monitoring events and configuring notifications.

You can also create user-defined events in NetVault Backup to monitor specific events associated with backup jobs, restore jobs, policies, report jobs, and log messages. The user-defined events for a restore job can be associated with the following events:

- Job is Successful
- Job has Warnings
- Job Fails

You can specify the user-defined events in the Restore Advanced Options Set. Once you create a user-defined event, you can raise it for any restore job. NetVault Backup adds these events to the event class **Jobs — User defined**.

### *To raise user-defined events for a restore job*

1 On the Advanced Options page, click **Events**, and configure the following settings.

**Table 6. User-defined event types for restore jobs**

| Option | Description |
|---|---|
| Job is Successful | Type or select the event that you want to raise when the job completes successfully. |
| Job has Warnings | Type or select the event that you want to raise when the job completes with warnings. |
| Job Fails | Type or select the event that you want to raise when the job fails. |

2 Click **Set** to save the settings and close the dialog box.

3 To receive a notification when an event occurs, set up a notification method for the event. For more information, see the Setting up a global notification method.

# Additional notes

- **Restoring data on Itanium platforms:** When you try to restore a backup with an index larger than 2GB in size, the job may fail on Itanium platforms. If the job fails with the error message "Failed when sorting items to restore," use one of these methods to manually increase the stack size:
  - On the standard UNIX platforms, edit the **ulimit** setting from the CLI to increase the stack size. The following is a list of available options:
    - `ulimit -a`

      Displays all the settings for the environment.
    - `ulimit -s`

      Displays the current stack size setting.
    - `ulimit -s unlimited`

      Sets an unlimited stack size.
    - `ulimit -s <n>`

      Sets stack size to the specified value.
    - `man ulimit`

      Provides information about the **ulimit** command.

    After changing the value, run the `ulimit -a` command to ensure that the setting has been changed.
  - On HP-UX Itanium platforms, use the bash command **kmtune** or **kctune** (depending on the operating system) to access to the kernel stack size information. The stack variables are **maxssiz** for 32-bit applications and **maxssiz_64bit** for 64-bit applications. The following is a list of available options:
    - `kmtune -l -q maxssiz`

      Displays the setting information for a 32-bit application.
    - `kmtune -l -q maxssiz_64bit`

      Displays the setting information for a 64-bit application.
    - `kmtune -u -s maxssiz=<n>`

      Sets the new stack size to the specified value for a 32-bit application.
    - `kmtune -u -s maxssiz_64bit =<n>`

      Sets the new stack size to the specified value for a 64-bit application.
    - `kmtune -u -s maxssiz+<n>`

      Increases the stack size by the specified value for a 32-bit application.
    - `kmtune -u -s maxssiz_64bit +<n>`

      Increases the stack size by the specified value for a 64-bit application.

# Managing online backup indexes

Backup indexes stored in the NetVault Database are called **Online Indexes**. Online indexes allow you to quickly scan through the contents of a saveset without loading the media. However, these indexes increase the disk space used by the NetVault Database. To manage disk space consumption, you can either delete or compress the online indexes.

This section covers the following topics:

- Deleting online indexes
- Loading offline indexes
- Compressing online indexes
- Uncompressing online indexes

# Deleting online indexes

You can delete the online backup indexes either automatically or manually. To automatically delete online indexes after a specified period, configure the retention period in the Advanced Options Set while creating the job. For more information, see Setting backup retirement options.

To manually delete online indexes for existing savesets, use the procedure described in this section.

**NOTE:** Deleting a backup index is not the same as setting the retirement period for a saveset:

- When a saveset is retired, NetVault Backup discards all information about it from the NetVault Database. When you scan the media to retrieve the index for a retired saveset, it is loaded as a new index in the NetVault Database.
- When you delete online indexes, NetVault Backup still retains some information about the saveset. This information allows NetVault Backup to quickly reload the saveset index from the backup media.

*To manually delete online indexes*

1. In the Navigation pane, click **Create Restore Job**, and then on the Choose Saveset page, click **Manage Indexes**.
2. Click **Choose Client**, and select the client for which the backup was created. Click **OK** to close the dialog box.
3. Optionally, click **Choose Plugin**, and select the plug-in that was used to create the backup. Click **OK** to close the dialog box.
4. Click the View icon to display the savesets for the selected client and plug-in.
5. In the savesets list, all items are selected by default.

   To delete indexes for specific savesets, either clear the check marks for the savesets that you want to exclude. Alternatively, click the check box in the header row to remove all check marks, and select the individual savesets.
6. Click **Offline**.

# Loading offline indexes

To restore data from a saveset with an offline index, you must reload the backup index from the backup media.

*To load offline indexes*

1. In the Navigation pane, click **Create Restore Job**, and then on the Choose Saveset page, click **Manage Indexes**.
2. Click **Choose Client**, and select the client for which the backup was created. Click **OK** to close the dialog box.
3. Optionally, click **Choose Plugin**, and select the plug-in that was used to create the backup. Click **OK** to close the dialog box.
4. Click the View icon to list the savesets for the selected client and plug-in.
5. In the savesets list, all items are selected by default.

   To load indexes for specific savesets, either clear the check marks for the savesets that you want to exclude. Alternatively, click the check box in the header row to remove all check marks, and select the individual savesets.
6. Click **Load**, and in the **Load Index** dialog box, provide the following details:
   - Select the **Use any storage to load index from** check box, or in the **Storage containing index** list, select the storage media.
   - In the **Days to Keep Index** box, type or select the number of days you want to retain the index in the NetVault Database.
7. Click **OK** to close the dialog box.

# Compressing online indexes

NetVault Backup automatically compresses online indexes after 30 days of inactivity. You can customize this policy from the **Change Settings** page. For more information, see Configuring general settings for Media Manager.

To manually compress indexes for existing backups, use the procedure described in this section.

*To manually compress online indexes*

1. In the Navigation pane, click **Create Restore Job**, and then on the Choose Saveset page, click **Manage Indexes**.
2. Click **Choose Client**, and select the client for which the backup was created. Click **OK** to close the dialog box.
3. Optionally, click **Choose Plugin**, and select the plug-in that was used to create the backup. Click **OK** to close the dialog box.
4. Click the View icon to list the savesets for the selected client and plug-in.
5. In the savesets list, all items are selected by default.

   To compress indexes for specific savesets, either clear the check marks for the savesets that you want to exclude. Alternatively, click the check box in the header row to remove all check marks, and select the individual savesets.
6. Click **Compress**.

# Uncompressing online indexes

When you try to browse or restore data from savesets with compressed indexes, NetVault Backup will automatically de-compress the index to a temporary directory, and delete the directory after the operation completes. You can also de-compress an index manually.

*To manually uncompress online indexes*

1. In the Navigation pane, click **Create Restore Job**, and then on the Choose Saveset page, click **Manage Indexes**.
2. Click **Choose Client**, and select the client for which the backup was created. Click **OK** to close the dialog box.
3. Optionally, click **Choose Plugin**, and select the plug-in that was used to create the backup. Click **OK** to close the dialog box.
4. Click the View icon to list the savesets for the selected client and plug-in.
5. In the savesets list, all items are selected by default.

   To de-compress indexes for specific savesets, either clear the check marks for the savesets that you want to exclude. Alternatively, click the check box in the header row to remove all check marks, and select the individual savesets.
6. Click **Uncompress**.

# 8

# Managing jobs



## Viewing job activity and status

You can use the **Job Status** page to view job activity, progress, and status.

*To view job activity and status*

1 In the Navigation pane, click **Job Status**.

2 On the **Job Status** page, you can view the following information.

**Figure 1. Job Status page**

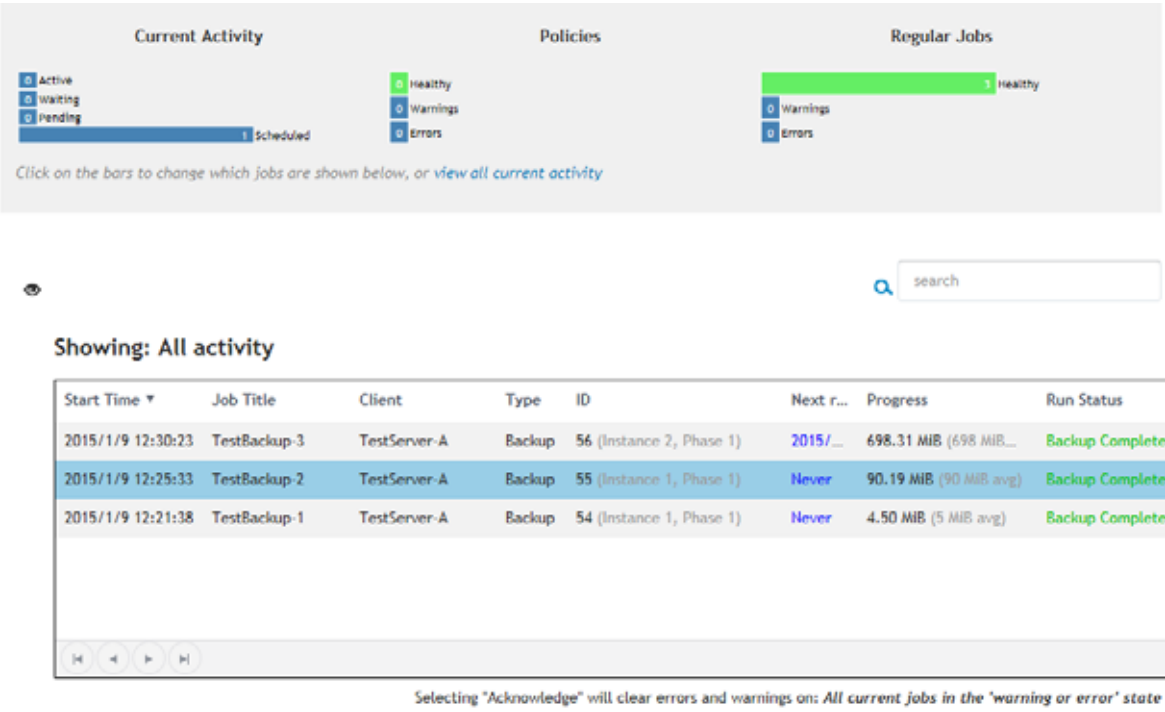


**Table 1. Job Status page**

| Item | Description |
|---|---|
| **Job activity charts** | This area displays bar charts for the following:<br>• **Current Activity:** The individual bars represent the number of active, waiting, pending, and scheduled jobs.<br>• **Policies:** The individual bars represent the number of policy jobs that have completed successfully, completed with warnings, and failed.<br>• **Regular Jobs**: The individual bars represent the number of regular jobs that have completed successfully, completed with warnings, and failed.<br>You can click a bar to view the job details for that category in the activity table. For example, you can click the **Active** bar in the **Current Activity** area to view the jobs that are running. Similarly, you can click the **Errors** bar in the **Regular Jobs** area to view the regular jobs that have failed<br>To view all current job activities, click the **View all current activity** link. |
| **Job activity table** | By default, the table lists all current job activities.<br>You can click a bar in the activity chart area to filter the list for that category. You can further filter the list, by clicking the View icon, and selecting the plug-in type.<br>The activity table includes the following details:<br>• **Start Time**<br>• **Job Title**<br>• **Client**<br>• **Type:** Job type (backup or restore)<br>• **ID**: Job identification number<br>• **Next Run Time:** Date and time when the next instance is scheduled to run<br>• **Progress**: Current or average transfer rate<br>• **Run Status** |

3 To perform a job-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Managing jobs

This section includes the following topics:

# Running a job immediately

*To run a job immediately*

1 In the Navigation pane, click **Job Status** or **Manage Job Definitions**.

> **NOTE:** If the job that you want to run was only saved and not submitted for scheduling, use the **Manage Job Definitions** link.

2 In the list of jobs, select the job, and click **Run Now**.

3 In the confirmation dialog box, click **OK**.

> **NOTE:** If you select a Phase 2 job, only that phase is started; phase 1 is not run. If a backup job includes Phase 2 jobs, selecting Phase 1 runs both Phase 1 and Phase 2 jobs. Phase 1 runs immediately, and when it completes successfully, Phase 2 is scheduled to run as per the job definition.

When the job is successfully started, a message is displayed at the upper-right corner of the NetVault WebUI.

# Aborting a job

*To abort a job*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Abort**.

3 In the confirmation dialog box, click **OK**.

When the job is successfully aborted, a message is displayed at the upper-right corner of the NetVault WebUI.

# Stopping and restarting a job

The **Stop** and **Restart** methods allow you to stop a backup job at any point and resume it later from the same point. These methods are only available to the Plug-in for FileSystem. To use this option, you must select the backup option **Enable Restartable Backup** for the job. For more information about this option, see the user's guide for the Plug-in for FileSystem.

When you stop the job, the plug-in generates an index for all items that have been processed up to that point and writes the index to the backup media and NetVault Database. The job status is then set to **Job Stopped**. If the plug-in is writing a large backup index, the jobs status continues to be reported as "Writing to Media: Storing Backup Index" until the index is written. When you restart the job later, the plug-in runs an Incremental Backup job to back up the remaining files and folders.

> **NOTE:** The **Stop** and **Restart** methods do not work if you select multiple job instances simultaneously.

*To stop a job*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Stop**.

3 In the confirmation dialog box, click **OK**.

## Restarting a job

*To restart a job*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Restart**.

# Placing a job on hold

When you place a job on hold, its schedule is disabled until you resume the job.

*To place a job on hold*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Hold Schedule**.

**NOTE:** If you restart NetVault Backup, a job on hold remains in the same state, but it is rescheduled to run at its next scheduled time. If the job cannot be rescheduled because it was scheduled to run once and this time has now elapsed, the job status is set to "Did not Run." Warning messages are generated in the NetVault Backup Logs explaining why the job did not run.

## Resuming a job

*To resume a job that was placed on hold*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Resume Schedule**.

# Viewing media request details

When a job is in **"Waiting for Media"** state, it implies that the job is unable to initiate data transfer as the target drive or media is unavailable. This state may be caused by any of the following reasons:

- The target media or device is in use by a different job
- The target device is offline
- The target media is not loaded
- The Reuse Media option was not selected for a job. Therefore, the job is waiting for new media.
- No blank or reusable media is available for the job.

*To determine the exact reason for the "Waiting for Media" status*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Diagnose Job**.

3 On the **Diagnose Media Request** page, you can view the following information:

- **Media Request ID**
- **Request Type**
- **Status**
- **Priority:** Media request priority
- **Client:** NetVault Backup Client on which the job is running

- **Media:** Target media and group label (if no specific media is targeted, “Any not in a group” is displayed)
- **Reuse Media:** If the **“Reuse Media”** option is selected
- **Required Space:** Amount of space required on the media to complete the current request
- **Force First Backup:** If the **“Ensure This Backup is First on the Media”** option is selected
- **Auto-Label:** If the **“Label Blank Media Automatically”** option is selected
- **Mark Read-Only After**: If the **“Mark Media Read-Only”** option is selected
- **Media Format**
- **Unload on Completion**
- **Drives**: Drive on which the tape resides
- **Force Local:** If the **“Local Drives Only”** option is selected
- **Network Compression:** If the **“Network Compression”** option is selected

The **Reasons** table lists the reasons why the specified device or media cannot be used for the job. The following list provides some examples:

- Not enough space.
- Currently unavailable.
- The 'force local drives' option is set. This type of device is considered network attached.

**NOTE:** We recommend that you perform the steps described in this section and generate a binary log dump when logging a case with Dell Software Technical Support.

# Viewing log messages for a job instance

*To view log messages for the latest instance of a job*

1. In the Navigation pane, click **Job Status**.
2. In the list of jobs, select the job, and click **View Logs**.

   The **View Logs** page displays logs for the latest instance of the job. For more information about logs, see Viewing log messages.

*To view log messages for any job instance*

1. In the Navigation pane, click **Manage Job Definitions** or **Job History**.
2. In the list of available job definitions, select the job, and click **View Job**.
3. On the **Manage Job Definitions - View Job**, select the instance, and click **View Logs**.

   The **View Logs** page displays logs for the selected job instance. For more information about logs, see Viewing log messages.

# Monitoring job progress

*To monitor the progress of a backup or restore job*

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the applicable job, and click **Monitor**.

3 On the **Monitor Job** page, you can view the following information:

- **Job details**: This area displays the Job ID, title, phase, instance, client, plug-in, start time, expected completion time, run count, duration, size, and status.
- **Data transfer chart:** This area displays the data transfer chart.
- **Job logs:** This area displays the log pertaining to the job.

4 To view the job definition or abort the job, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page

# Clearing job errors and warnings

*To clear job errors or warnings*

1 In the Navigation pane, click **Job Status**.

2 Do one of the following:

- To clear errors and warnings for all current jobs, click **Acknowledge**. Check that the view is set to "All activity."
- To clear warnings for regular or policy jobs, click the "Warnings" bar in the Regular Jobs or Policies category, and click **Acknowledge**.
- To clear errors for failed regular or policy jobs, click the "Errors" bar in the Regular Jobs or Policies category, and click **Acknowledge**.
- To clear error or warning for a specific job, select the job in the table, and click **Acknowledge**.

# Removing a job schedule

1 In the Navigation pane, click **Job Status**.

2 In the list of jobs, select the job, and click **Remove Schedule**.

3 In the confirmation dialog box, click **OK**.

When the schedule is successfully deleted, a message is displayed at the upper-right corner of the NetVault WebUI.

# Managing job definitions

This section includes the following topics:



# Viewing a job definition

Job definitions are stored in the NetVault Scheduler Database. You can access the job definitions for all scheduled, saved, completed, and active jobs from the **Manage Job Definitions** page. From this page, you can view, edit, and delete a job definition.

*To view a job definition*

1 In the Navigation pane, click **Manage Job Definitions**.

2 On the **Manage Job Definitions** page, a list of all job definitions available in the NetVault Jobs Database is displayed. The list includes all scheduled, saved, completed, and active jobs.

The details include Job Title, ID, Policy name, Type, Plugin, Client, Selection Set, and Next Run Time.

3 By default, the list is sorted by Job ID (descending order).

To sort the list by a different column, click the heading of the column. The arrowhead next to the column header name indicates the sort order (up for ascending order and down for descending). To reverse the sort order, click the column heading again.

4 Select the job definition that you want to view, and click **View Job**.

5 On the **Manage Job Definitions — View Jobs** page, you can view the following information:

- **Job Summary:** This area shows the following information:
  - Job title, job ID, and job type (backup or restore)
  - Client, plug-in, creation date, and modification date
  - Run count, average duration, and average size (in MiB)
  - Backup jobs: Backup Selection Set, Backup Options Set, Schedule Set, Target Set, and Backup Advanced Options Set
  - Restore jobs: Restore Selection Set, Schedule Set, Source Set, and Restore Advanced Options Set

**NOTE:** You can use the Set links in the Job Summary area to modify a set, but you cannot use these links to specify a new set for the job. To modify the job definition, use the **Edit Job** button.

- **Recent Instances:** This table lists the recent instances of the job. It shows the following information:
  - Run time, duration, and job size
  - Instance, phases, run status (for example, Succeeded, Failed, Aborted, and others)

6 To perform a job-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Editing a job definition

*To edit a job definition*

1. In the Navigation pane, click **Manage Job Definitions**.
2. In the list of available job definitions, select the job, and click **Edit Job**.
3. Depending on the type of job, the backup or restore job wizard is started.
4. Modify the required items, and save or schedule the job. For more information, see Creating a backup job or Creating a restore job.

# Deleting a job definition

1. In the Navigation pane, click **Manage Job Definitions**.
2. In the list of available job definitions, select the jobs that you want to delete.

   To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.
3. Click **Remove**, and in the confirmation dialog box, click **OK**.

# Viewing job history

*To view job history*

1. In the Navigation pane, click **Job History**.
2. On the **Job History** page, you can view the following information:
   - Job title, end time, job ID, phase number, and instance number.
   - Job type, plug-in, Backup Selection Set, and client.
   - Run status.
3. To list particular jobs, click **Filter Options**, and configure the filter options. The available options are:
   - **Job Title:** Specify the job title to list jobs with that title.
   - **Job ID**: Specify the job ID to list jobs with that ID.
   - **Job Phase:** Specify the job phase number(1 or 2) to list those job phases.
   - **Job Instance:** Specify the job instance number to list those job instances.
   - **Client:** Select the client name to list jobs for that client.
   - **Plugin:** Select the plug-in name to list jobs for that plug-in.
   - **Job Type:** Select Backup, Restore, or Reporting to list those job types.
   - **Run Status:** Select the run status (for example, Succeeded, Failed, Aborted, and others) to list those jobs.
   - **Start Time:** Type or select the start time to list jobs that started at the specified time.
   - **End Time**: Type or select the end time to list jobs that completed at the specified time.
4. Click **OK** to set the filter, and close the dialog box.

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# Monitoring logs



## About NetVault Backup logs

NetVault Backup logs contain messages generated by various processes. These messages can include status information, warnings, errors, and other types of information. Log messages can be used to track activities and troubleshoot problems. Log messages are managed by the Logging Daemon. This process runs on the NetVault Backup Server.

You can access the log messages from the **View Logs** page. From this page, you can perform the following functions:

- View log messages
- Set log filters
- Export log messages to a binary or text file
- Manually purge log messages
- Set up a log event

## Viewing log messages

*To view log messages*

1 In the Navigation pane, click **View Logs**.

2 The **View Logs** page displays the following information.

- **Severity:** Depending on their severity, the log messages are classified as Background messages, Information messages, Job messages, Warning messages, Error mesasges, and Severe error messages.

**Table 1. Log warning levels**

| Icon | Severity | Description |
|---|---|---|
|  | Background | General log messages. |
|  | Information | Log messages related to media, scheduler, and system activities. |
|  | Job message | Log messages related to backup, restore, and report jobs. |
|  | Warning | Problems that might not have caused a job to fail. |
|  | Error | Problems that might have caused a job to fail. |
|  | Severe error | Critical problems that might have caused a job to fail. |

**NOTE:** The warning-level icon for some log messages can contain an exclamation mark. This mark indicates that you can view the log context or additional information about the log message by clicking the **More Info** button. The dialog box that appears can include data transfer details, execution scripts, or any other information generated by the plug-in.

- **Date**: Date and time when the log was generated.
- **Job ID:** Job ID for job-related logs.
- **Class:** Type of operation that generated the logs. It can be one of the following:
  - System
  - Schedule
  - Jobs
  - Media
  - Database
  - Plugins
  - UI
- **Client:** Name of the client for which the log was generated.
- **Message:** Detailed log message or description.

3 To sort the logs by any column, click the heading of the column. The arrowhead next to the column header name indicates the sort order (up for ascending order and down for descending). To reverse the sort order, click the column heading again.

By default, the logs are sorted by **Date**.

4 To filter the logs based on their severity, select the minimum severity level in the **Display Level** list. When you set the filter, only messages of the selected severity or higher are displayed on the page.

By default, the severity level is set to Job Messages. With this setting, you can view Job Messages, Warnings, Errors, and Severe errors on the page.

5 To stop or resume live updates, click the Pause/Resume button  .

6 To perform a log-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Setting log filter

*To set log filters*

1 In the Navigation pane, click **View Logs**.

2 On the **View Logs** page, click **Filter**.

3 In the **Set Log Filter** dialog box, configure the settings that you want to use.

**Table 2. Log filter options**

| Filter option | Description |
|---|---|
| **From** | Select one of the following options:<br>• **First Event:** To start from the first log message, select this option.<br>— or —<br>• **Specific Time:** To start from specific date and time, select this option, and do the following:<br>Type the start date, or click the calendar button, and select the start date.<br>Type the start time, or click the button next to the box, and select the start time. |
| **To** | Select one of the following options:<br>• **Last Event**: To list up to the last log message, select this option.<br>— or —<br>• **Specific Time:** To list up to specific date and time, select this option, and do the following:<br>Type the start date, or click the calendar button, and select the start date.<br>Type the start time, or click the button next to the box, and select the start time. |
| **Classes** | By default, all log classes are selected. To remove logs for a particular category, clear the check box for it. |
| **Only display logs for Job ID** | To display logs for a particular job, type the Job ID. |
| **Only display logs containing text** | To display logs that contain a particular string, type the filter string. |

4 Click **Filter** to set the filter, and close the dialog box.

5 To clear the filter settings, click **Clear Filter** on the **View Logs** page.

# Exporting logs

NetVault Backup logs can be exported to external files in binary or text format. This option can be used to create a copy of the logs before purging them from the NetVault Database. By default, all current logs are exported to the specified file. If you want to export logs generated during a specific period, set a time-based filter criterion, and then use the export option. For example, to export all logs generated during the previous month, set a filter to display only those logs, and then select this option.

*To export logs to binary or text file*

1 In the Navigation pane, click **View Logs**.

2 On the **View Logs** page, click **Export**.

3 In the **Export Logs** dialog box, configure the following options.

**Table 3. Export logs**

| Option | Description |
|---|---|
| **File Name** | Type a filename for the log file. You can also select an existing log dump file in the binary or text log file list. If you select or specify an existing file, NetVault Backup overwrites the file.<br>By default, NetVault Backup creates the binary files in the following location:<br>• **Windows**: <NetVault Backup home>\log\dumps\binary<br>• **Linux**: <NetVault Backup home>/log/dumps/binary<br>By default, NetVault Backup creates the text files in the following location:<br>• **Windows:** <NetVault Backup home>\log\dumps\text<br>• **Linux:** <NetVault Backup home>/log/dumps/text<br>To create the file in a different location, specify the full path. |
| **Binary Log** | Select this option to export the logs to a binary file **(.nlg)**. When you send the logs to Dell Software Technical Support, use the binary format. |
| **Text Log** | Select this option to export the logs to a text file. |

4 Click **Export** to export the logs.

After the logs are successfully exported, a message is displayed at the upper-right corner of the NetVault WebUI.

# Manually purging the log messages

To manage the size of log tables, you can configure the Logging Daemon to automatically delete messages that are older than a specified number of days. By default, the Logging Daemon deletes the messages that are older than 30 days. You can change this behavior by creating a user-defined purge policy for log messages. For more information about this method, see Creating a user-defined purge policy for log messages.

You can also use the **Purge** method available on the **View Logs** page to manually delete the log messages from the NetVault Database.

*To manually purge the log messages*

1 In the Navigation pane, click **View Logs**.

2 On the **View Logs** page, click **Purge**.

3 In the **Purge Logs** dialog box, configure the following option:

- **Delete log entries before:** Type or select the date and time to delete all log messages created before the specified time.

4 Click **Purge**.

5 After the logs are successfully deleted, a message is displayed at the upper-right corner of the NetVault WebUI.

# Setting up a log event

To receive a notification when a log message is generated, you can set up a user-defined log event for that message. The user-defined log event is added to the event class **Log Daemon**.

*To set up a log event*

1 In the Navigation pane, click **View Logs**.

2 In the logs table, select the log message, and click **Set Log Event**.

3 In the **Set Log Event** dialog box, configure the following options.

**Table 4. Set log event**

| Option | Description |
|---|---|
| Event Name | Specify the event name. |
| Event Description | Provide a detailed description for the event. |

4 Click **Set Event**.

After the event is successfully added, a message is displayed at the upper-right corner of the NetVault WebUI.

5 To receive a notification when the event occurs, set up a notification method for the event. For more information, see the Setting up a global notification method. NetVault Backup adds the user-defined backup events to the event class **Log Daemon**.

# Removing a log event

*To remove a log event*

1 In the Navigation pane, click **View Logs**.

2 In the logs table, select the log message for which the event was set, and click **Set Log Event**.

3 In the **Set Log Event** dialog box, click **Remove**.

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# Managing storage devices



# Monitoring device activity

You can use the **Device Activity** page to monitor data flows and data transfer rates for devices that are in use.

*To view device activities*

1 In the Navigation pane, click **Device Activity**.

2 On the **Device Activity** page, you can view the following information.

**Figure 1. Device Activity page**

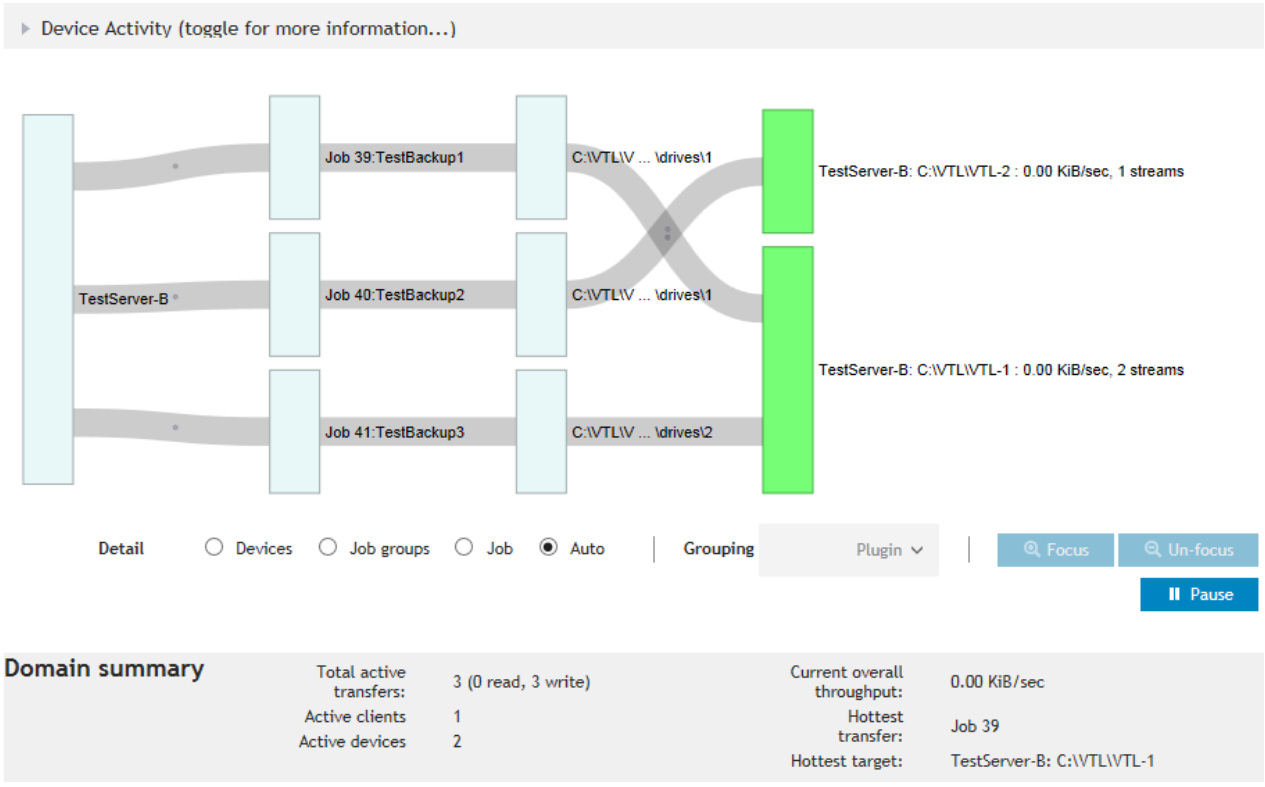

**Table 1. Device Activity page**

| Item | Description |
|---|---|
| **Device activity** | This area shows data transfers from clients to jobs on the left and jobs to storage devices on the right. Gray lines depict data flow; the thicker the line, the higher the rate of flow. Boxes represent clients, jobs, and devices; the taller the box, the higher the rate of flow.<br>You can use the following settings available in the **Detail** area to modify the data flow view:<br>• **Devices**: Select this option to view data transfers from all jobs to a storage device.<br>• **Job groups:** Select this option to view data transfers from a job group (plug-in or policy) to a storage device. The job group can be selected in the **Grouping** list.<br>• **Job:** Select this option to view data transfers from client to jobs and from jobs to storage devices.<br>• **Focus and Un-focus:** Use these buttons to show and hide data flow details for a specific device. Click the device box, and click **Focus**. To hide the details for that device, click **Un-focus**.<br>• **Pause and Play:** Use these buttons to pause and resume data flow updates. To stop data flow updates, click **Pause**, and to resume updates, click **Play**.<br>The transfer rate shows "unknown" for backups running on older NetVault Backup Clients. |
| **Summary** | This area shows the following information: total active transfers, active clients, active devices, current overall throughput, hottest transfer, and hottest target.<br>You can click a box representing the client, job, or storage device in the **Device Activity** area to view information about that component. |

3 To perform a job-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Managing disk-based storage devices

This section includes the following topics:

# Viewing storage details

*To view device details*

1 In the Navigation pane, click **Manage Devices**.

On the **Manage Devices** page, you can view the list of storage devices added to the NetVault Backup Server. The device status is indicated using the following icons.

**Table 2. Device status icons**

| Icon | Description |
|---|---|
|  | Device is online and available for use. |
|  | Device is offline. NetVault Backup is able to detect the device, but unable to access it for backup or restore jobs. |
|  | Device is unavailable. NetVault Backup is unable to detect the device. |

2 To view the details of a particular device, click the corresponding Manage Device icon.

3 On the **RAS Device Management** page, you can view the following information:

- **Device details:** Depending on the device type, the **Device details** area displays the following information:

  **Dell DR Series Systems and Data Domain Systems:**

  - **Name:** The name of the storage device. The name is derived from the LSU name (container name) and the DNS name or IP address of the device.
  - **Status:** The status of the device. AVAILABLE specifies that the device is available for backups and restores, while OFFLINE specifies that the device is unavailable and cannot be used for backups or restores.
  - **Data Stored:** The total amount of data stored on the device.
  - **Space Used:** The total space used by the NetVault Backup Servers to which this device has been added.
  - **Space Available:** The total disk space available on the storage device.
  - **Deduplication ratio:** The Deduplication Ratio is calculated as follows:

    ```
    Deduplication ratio = Data Deduplicated / Disk Used by Deduplicated Data
    ```

    The **Deduplication ratio** is not displayed for Dell DR Series systems.

  **NetVault SmartDisk devices:**

  - **Name**: The name of the storage device. The name is derived from the host name and IP address of the device.
  - **Status:** The status of the device. AVAILABLE specifies that the device is available for backups and restores, while OFFLINE specifies that the device is unavailable and cannot be used for backups or restores.
  - **Data Stored:** The total amount of data stored on the device.
  - **Space Used:** The total space used by the NetVault Backup Servers to which this device has been added.
  - **Data Deduplicated:** The total amount of data that has been submitted for deduplication.
  - **Data In Staging:** The amount of data stored in the Staging Store.

- **Space Available:** The total disk space available on the storage device.

  This option shows the total disk space available across all configured Storage Volumes regardless of their deny/favour configuration. It does not include the Garbage Collection Reserve or Last Resort Threshold (LRT).

- **Deduplication ratio:** The Deduplication Ratio is calculated as follows:

  ```
  Deduplication ratio = Data Deduplicated / Disk Used by Deduplicated Data
  ```

- **Staging Status:** The status of the Staging Store. It can be one of the following:
  - AVAILABLE: Staging Store is available for writing.
  - FULL: Staging Store is full; no more space is available for writing.
  - UNAVAILABLE: Disk index is unavailable.
  - UNLICENCED: NetVault SmartDisk is not licensed, the license has expired, or the license limit has exceeded.
  - NONE: The status is unknown.
- **Storage Status**: The status of the Storage space. It can be one of the following:
  - AVAILABLE: Storage is available for deduplication and rehydration.
  - FULL: Storage is full; no more space is available for data deduplication.
  - UNAVAILABLE: Chunk Index is unavailable; no data deduplication or rehydration is available.
  - UNLICENCED: NetVault SmartDisk is not licensed, the license has expired, or the license limit has exceeded.
  - NONE: The status is unknown.
- **Group:** The media group name. **"None"** indicates that the device is not added to any group. To add the device to a storage group, click the Edit icon, and in the **Edit Media Group** dialog box, specify the media group name. Click **Save** to save the details and close the dialog box.
- **Version**: The version number of the device.
- **License Type:** License type being used.
- **License Capacity:** License capacity.
- **License Expiration:** License validity period.
- **Dedupe Licensed**: If the deduplication option is licensed?
- **Garbage Collection State:** The current phase of Garbage Collection.
- **Deduplication Queue Length:** The number of elements or NetVault Backup segments currently waiting to be deduplicated.

- **Activity chart:** This area displays the activity graph if the device is in use by a backup or restore job.
- **Job details:** This area displays the following information about the active jobs:
  - Data transfer rate
  - Name or title of the job, job ID, instance number, and phase number (1 or 2)

4 To perform a device-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Modifying Dell DR Series System settings

*To modify the settings for a Dell DR Series System*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the device, and click the corresponding Manage Device icon.
3. Click **Update**, and in the **Update Device Details** dialog box, change the settings, as necessary:
   - **Username:** The user account cannot be changed for a Dell DR Series system.
   - **Password:** Type the new password.
   - **Stream Limit:** Type or select the new stream limit.

   For more information about these options, see Add Dell DR Series system.
4. Click **Update** the save the settings.

# Modifying Data Domain System settings

*To modify the settings for a Data Domain System*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the device, and click the corresponding Manage Device icon.
3. Click **Update**, and in the **Update Device Details** dialog box, change the settings, as necessary:
   - **Username:** Type the new user name.
   - **Password:** Type the password for the user account.
   - **Stream Limit:** Type or select the new stream limit.
   - **Block size:** Type or select the block size.

   For more information about these options, see Add Data Domain system.
4. Click **Update** the save the settings.

# Checking a disk-based storage device

*To check the status of an offline device*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the device, and click the corresponding Manage Device icon.
3. Click **Check**, and then in the confirmation dialog box, click **Check** again.

   If the device is operational, its status is changed to **"Available."**

# Changing the status of a disk-based storage device

*To change the current status to online or offline*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the device, and click the corresponding Manage Device icon.
3. If the device is offline, click **Online** to bring it back online.

4 If the device is online, click **Offline** to take it offline.

The **Offline** method marks the device as offline and makes the device unavailable to NetVault Backup. This method does not physically take the system offline.

# Scanning a disk-based storage device

The scanning process queries all backups stored on a disk-based storage device, and imports those backups that are not indexed in the given NetVault Backup Server's database. The backups on a device can only be scanned into a NetVault Backup Server that has the identical NetVault Backup Machine Name as the original server which performed the backups. The amount of time taken by the scanning process depends on the number of backups that need to be imported and the size of the backup indexes.

### *To scan a disk-based storage device*

1 In the Navigation pane, click **Manage Devices**. In the list of devices, locate the device, and click the corresponding Manage Device icon.

— or —

In the Navigation pane, click **Explore Storage**. Click **Explore Disk Storage**, and in the repository list, select the device.

2 On the **RAS Device Management** or **Explore Disk Storage** page, click **Scan**. In the confirmation dialog box, click **Scan** again.

**NOTE:** When a saveset is retired, it is deleted from the disk-based storage device. You cannot use the scan process to import retired savesets from such devices.

**NOTE:** If a backup stored on a Dell DR Series System was performed using a non-standard block size, the scan process is unable to read the index for that backup from the device. To import indexes for such backups, you can configure an alternate index read block size in the **mediamgr.cfg** file. For more information, see Configuring an alternate index read block size for Dell DR Series Systems.

# Removing a disk-based storage device

When you remove a device, the backups stored on the device are not deleted. You can add the device to the same or different NetVault Backup Server to use the backups. If you add the device to a different server, you must scan the device to access the backups stored on it.

### *To remove a disk-based storage device*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, locate the device, and click the corresponding Manage Device icon.

3 Click **Remove**, and then in the confirmation dialog box, click **Remove** again.

4 If NetVault Backup fails to remove the device, select the **Force Removal** check box in the confirmation dialog, and click **Remove**.

**NOTE:** You can use the **Force Removal** option to remove a device that is not in use. However, the device may still try to communicate with the NetVault Backup Server.

# Managing tape libraries

This section includes the following topics:



**NOTE:** To configure advance settings for tape devices, you can use the **deviceconfig** utility. For more information, see Using the deviceconfig utility.

# Viewing tape library details

1. In the Navigation pane, click **Manage Devices**.
2. On the **Manage Devices** page, you can view the list of storage devices added to the NetVault Backup Server. The device status is indicated using various status icons. For more information, see Device status icons.

   To view the details of a particular tape library, click the corresponding Manage Library icon.
3. On the **Tape Library Management** page, you can view the following information:
   - **Library details:** This area shows the following information:
     - Library name, vendor name, product name
     - Number of drives and slots
     - Client to which the device is attached
     - Device status (online or offline) and door status (open or close)
   - **Drives table:** The Drives table lists all tape drives for the library. It shows the following information:
     - Drive bay number, drive name, and drive status (online or offline)
     - Label of the tape loaded in the drive
4. To perform a library-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Blanking tape media

*To blank one or more tapes in a library*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, locate the library, and click the corresponding Manage Library icon.

3 On the **Tape Library Management** page, click **Bulk Blank**, and configure the following options.

**Table 3. Bulk blank**

| Option | Description |
|---|---|
| **All media in list** | To blank all media items in the **Media that can be blanked** list, select this check box. |
| **Media that can be blanked** | To blank specific media items, select the items in this list.<br>To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button. |
| **Password** | Type the password for the NetVault Backup Server.<br>If no password is set for the NetVault Backup Server, provide the system's root or administrator password. |
| **Enter 'BLANK' to confirm request** | To confirm, type BLANK in this box. This string is case-insensitive. |

**NOTE:** To blank a single tape, see Blanking a tape.

4 Click **OK**.

**IMPORTANT:**

- The blanking operation removes the NetVault Backup header from a tape and deletes the media label and removes any group association. After blanking, a tape becomes available to NetVault Backup for storing future backups.
- The blanking operation deletes or erases the backup data residing on a tape. To purposely destroy the data that is stored on a tape, you must blank it from NetVault Backup and have its data securely removed by tools that are designed for such purposes.
- The blanking operation removes the indexes for backups stored on the selected tapes from the NetVault Database.

# Labeling tape media

Each piece of media, whether a tape cartridge or a virtual tape in a VTL, uses a label for identification. The media labels can be of the following types:

- Media barcode
- A system-generated string consisting of the NetVault Backup Server name, the current date, and a seed number
- A user-defined string

You can manually assign labels to blank media or automatically label the media during a backup. The default label consists of a system-generated string. To use media barcodes as the default labels, see Configuring general settings for Media Manager.

*To label one or more tapes in a library*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, locate the library, and click the corresponding Manage Library icon.

3 On the **Tape Library Management** page, click **Media Label**, and configure the following options.

**Table 4. Tape media labeling**

| Option | Description |
|---|---|
| **Type of Media** | Select the type of media that you want to label. The available options are:<br>• **Blank:** Select this check box to label any blank, non-labeled piece of media in a device that is accessible to the NetVault Backup Server.<br>• **Other**: Select this check box to label media types that do not belong to any category listed here.<br>• **NetVault 5:** Select this check box to label any piece of media that was used to back up data with NetVault Backup 5.x.<br>• **Reusable**: Select this check box to label reusable media items. |
| **Type of Label** | Select the type of media label. The available options are:<br>• **Barcode:** To use media barcodes as the media labels, select this option.<br>• **Machine and Date:** To use a system-generated string as the media label, select this option. This string consists of the NetVault Backup Server Name, the current date, and a seed number.<br>• **User Defined:** To assign user-defined label, select this option, and provide the following details:<br>**– Label:** Specify the string that you want to use as the media label.<br>A label can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. NetVault Backup does not support a "%" character in the string.<br>There is no length restriction on media and group labels. However, the combined display range for the media label, barcode and group label is 100 characters. Therefore, a maximum of 40 to 50 characters is recommended for the media and group labels.<br>**– Seed:** To identify individual media items, a sequential number is added to the user-defined string. The option defines the initial value for the sequence. This value is increased by one for each item. The default value for this option is one. |
| **Group Label** | To add media items to a group, select the group label in the list. If you want to create a group label, type the string.<br>A label can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters.<br>Group labels are case-insensitive. |
| **All Media in List** | To label all media items in the selected library, select this check box. |
| **Media to Label** | To label specific media items, select the individual media items in the list.<br>To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button. |

**NOTE:** To label a single tape, see Labeling a tape.

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

# Scanning all foreign tapes in a library

A piece of media is marked as “foreign” if no information for that item is available in the NetVault Database. This issue can occur for several reasons, for example, when a piece of media is swapped between libraries, removed from the NetVault Backup Server, or loaded on a device controlled by a different NetVault Backup Server. NetVault Backup cannot process data stored in a foreign tape until you scan the tape and import the backups and backup indexes into the NetVault Database. The scanning process retrieves the header information from backup media and adds this information to the NetVault Database. This process removes the “foreign” tag for the tape.

*To scan all foreign tapes in a library*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the library, and click the corresponding Manage Library icon.
3. On the **Tape Library Management** page, click **Scan All**, and in the confirmation dialog box, click **OK**.
4. If NetVault Backup fails to scan the tapes, click **Force Scan**, and in the confirmation dialog box, click **OK**.

   The scanning process is started, and a message is displayed at the upper-right corner of the NetVault WebUI.

**NOTE:** The scanning process does not read the data on the tape. This process skips between the beginning and end of backups to read the on-tape index for each backup saveset.

# Opening and closing library door

Before opening a library door, you must issue the **Open Door** command from the WebUI. NetVault Backup puts a software lock on the library door to prevent anyone from opening the door without issuing the **Open Door** command. If you do not issue this command, NetVault Backup does not know when tapes are added, removed, or rearranged, and it may attempt to load non-existent media.

*To open a library door from WebUI*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the library, and click the corresponding Manage Library icon.
3. On the **Tape Library Management** page, click **Open Door**.

   The library goes offline when you open the door.
4. To bring it back online, click **Close Door**.

# Exporting tapes to entry/exit ports

*To export a tape to an entry/exit port*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, open the applicable library, and then click the **Slots** link or the corresponding Manage Slots button to open the Slot Browser.
3. In the Slots table, select the slot that contains the tape, and click **Export**.

   After sending a request to export the tape to an entry/exit port, the WebUI opens the Port Browser page. In the Ports table, you can view the exported tape.
4. To export more tapes, go back to the Slot Browser page (click **> Slots**), and repeat step 3.

5 In the Ports table, select the tape, and click **Open Port**.

When you issue the **Open Port** command, NetVault Backup puts a software lock on library so that it knows that the port door is going to be opened.

6 Physically open the port door, and after removing the tape from the entry/exit port, close the port door. For more information about these procedures, see the device manual.

7 On the Slot Browser page, click **Close Door**.

When you issue the **Close Door** command, NetVault Backup knows that you have physically closed the port door, and it removes the lock on the library.

# Restarting ACSLS or NDMP Libraries

If an ACSLS or NDMP library encounters a network problem, restart the library as described in this section.

*To restart an ACSLS or NDMP library*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, locate the library, and click the corresponding Manage Library icon.

3 On the **Tape Library Management** page, click **Restart**.

The **Restart** method restarts the network and socket connections by removing them and adding the library again.

# Importing shadow tapes (NetApp VTL)

The NetApp VTL Shadow Tape option allows you to quickly import a tape from the shadow tape pool whenever possible instead of obtaining the physical tape. To use shadow tapes, configure the **Enable Shadow Tapes** option on the filer and library containing the virtual tapes. For more information about enabling shadow tapes, consult the relevant NetApp VTL documentation. Additionally, select barcodes as the default labels for virtual tapes in NetVault Backup. NetVault Backup requires this method of labeling media to be fully functional. You can use barcodes as default labels by selecting the **Use Barcodes as Labels** check box in the Media Manager settings dialog box. For more information, see Configuring general settings for Media Manager.

With shadow tapes enabled, whenever a virtual tape is exported to a physical tape, the virtual tape is moved to the shadow tape pool. The shadow tape pool is invisible to the backup application and it is not listed as part of a virtual library, but it is available for quick access if the physical tape is later imported. It is also available for reading if the physical tape is stored off-site or is otherwise unavailable.

The NetApp VTL manages the space used by shadow tapes. It can delete a shadow tape if more space is required for the new backup data. The administrator can set a preferred retention time for shadow tapes. If the retention period has not expired, the NetApp VTL sends a notification before deleting the shadow tape.

*To import virtual tapes*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, locate the library, and click the corresponding Manage Library icon.

3 On the **Tape Library Management** page, click **Import Media**.

4 In the **Media Barcode** list, select or type the barcode for the tapes that you want to import.

5 Click **Import**.

The requested tapes are imported to the medium changer from the shadow tape pool or physical library. When both shadow tapes and physical tapes are available, the shadow tapes are converted to read-only virtual tapes and imported to the entry/exit port. When only the physical tapes are available, virtual tapes are created from the physical tapes and imported to the entry/exit port.

Note the following:

- The media requests for shadow tapes can only be used for Restore or Duplication tasks because the shadow tapes are converted to virtual tapes with the read-only attribute set.
- No permanent records are created in the NetVault Database for shadow tape media. The database only stores details of the actual media. The shadow tape attribute is associated with the media when they are imported to the library as shadow tapes. Therefore, you must export all shadow media before stopping or restarting NetVault Backup. If you fail to export the media, they lose the shadow attribute and are converted to read-only items. For the same reason, you must export the shadow tapes before opening a library door.
- Error messages are displayed if you try to import media when nothing is available in the shadow tape pool or when the shadow tapes option is not supported on the device.

## Removing a tape library

When you remove a tape library, it does not delete the media information from the NetVault Database. You can use the media on any other library that supports the media type. Scanning is not required if you use the media in the same NetVault Backup domain. In a different NetVault Backup Domain, you must scan the media to access the backups.

*To remove a tape library*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, locate the library, and click the corresponding Manage Library icon.
3. On the **Tape Library Management** page, click **Remove**, and then in the confirmation dialog box, click **OK**.

# Managing tape drives

This section includes the following topics:

**NOTE:** To configure advance settings for tape devices, you can use the **deviceconfig** utility. For more information about this utility, see Using the deviceconfig utility.

# Viewing tape drive details

1 In the Navigation pane, click **Manage Devices**.

On the **Manage Clients** page, you can view the list of storage devices added to the NetVault Backup Server.

2 In the list of devices, open the applicable library to list the available drives and slots. For each drive, the activity and status messages (for example, Idle, Writing, Loading media, and others) are displayed on the page. The device status is indicated using various status icons. For more information, see Device status icons.

3 To view the details of a particular tape drive, click the drive or the corresponding Manage Device icon.

4 On the **Tape Drive Management** page, you can view the following information:

- **Drive Info:** This area shows general information about the drive. The details include:
  - Drive name, vendor name, and product name
  - Client to which the device is attached
  - Media label of the tape loaded in the drive
  - Drive bay number
  - Media block size and transfer buffer size
- **Statistics Info:** This area displays the drive usage statistics. The details include:
  - Total data written and read
  - Number of write and read errors
  - Date on which the last write and read operations were performed
- **Cleaning Info:** This area displays the drive cleaning statistics. The details include:
  - Date on which the drive last cleaning operation was performed
  - Time elapsed since the last automatic or manual cleaning operation
  - Number of times the drive has been cleaned
  - Amount of data read or written since the last cleaning operation
  - Number of times the drive has been used for read or write operations since the last cleaning operation
  - Number of read or write errors reported since the last cleaning operation
- **Activity chart:** This area displays the activity graph if the device is being used by a backup or restore job.
- **Job details:** This area displays the following information for active jobs:
  - Data transfer rate
  - Name or title of the job, job ID, instance number, and phase number (1 or 2)

5 To view the slot details, click the **Slots** link or the Manage Slots icon. On the Slot Browser page, you can view the following information:

- **Drives table:** The Drives table lists all tape drives for the library. It shows the following information:
  - Drive bay number, drive name, and drive status (online or offline)
  - Label of the tape loaded in the drive

- **Slots table:** The Slots table lists all slots. It shows the following information:
  - Slot number and status (Empty or Has media)
  - Barcode, label, and group label of the tape loaded in the slot
  - Space available

6 To perform a device-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Configuring performance options for a tape drive

*To configure performance options for a tape drive*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.

3 On the **Tape Drive Management** page, click **Performance**.

4 In the **Drive Performance Options**, configure the following settings.

**Table 5. Drive performance options**

| Option | Description |
|---|---|
| **Drive Block Size** | This option specifies the block size used for read and write operations. The default value is 64KiB.<br>You can change the media block size in increments of 1KiB, but many devices may only accept a value in the multiples of 4KiB or 32KiB.<br>**NOTE:** The changes to the media block size settings are only applied to blank media items. If you are reusing a media item, blank it first for these changes to take effect.<br>Increasing the block size can reduce the number of times a backup needs to read data and write it to media. However, large media block sizes do not always imply an overall faster backup. The maximum block size is limited by several factors, such as the OS, SCSI adapter, drive make, drive model, and drive type.<br>On Linux and UNIX systems, you can increase the media block size for optimum performance.<br>On Windows, you might be required to change the registry setting **MaximumSGList** to use block sizes larger than 64KB. Before changing this setting, check that the SCSI bus is only used by the tape devices. If other devices also use the SCSI bus, this registry change might prevent them from working. If you want to apply these changes only to a specific channel on the HBA, consult the hardware vendor.<br>To change the registry setting on Windows, follow these steps:<br>1 Start the Registry Editor.<br>2 Open the key `[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\<HBA Vendor>\Parameters` (where `<HBA Name>` is specific to your SCSI card — for example, QL2200 for a Qlogic 2200 card).<br>3 Create the **Parameters** key if not present.<br>4 Under **Parameters**, create the **Device** key if not present.<br>5 Under the **Device** key, add the **DWORD** registry value **MaximumSGList** if not present. |

**Table 5. Drive performance options**

| Option | Description |
|---|---|
| | 6 Calculate the hexadecimal value of **MaximumSGList**:<br>**On 32-bit systems:**<br>`MaximumSGList = (Maximum Block Size / 4KiB) + 1`<br>For example, if the block size is set to 256KiB, the value for this key is:<br>`(256KiB/4KiB) + 1 = 65`<br>The decimal value is 65 and the hexadecimal value is 0x41.<br>You can set the block size to any value from 64KiB through 1012KiB. The maximum value 255 is internally converted to 257 to make a block size of 1 MiB (1024 KiB).<br>**On 64-bit systems:**<br>On 64-bit systems, the default OS page size is 8KiB. The formula for calculating **MaximumSGList** is:<br>`MaximumSGList = (Maximum Block Size / 8KiB) +1`<br>Thus, the maximum value of 255 corresponds to a maximum media block size of 2MiB.<br>7 Reboot the system to apply the changes. |
| **Drive Transfer Buffer Size** | The transfer buffer or the shared memory is allocated in blocks of 32KiB. The default value is 8193KiB.<br>Increasing the transfer buffer size can improve backup performance. To calculate the buffer size, use the following formula:<br>`(<Total number of buffers> x 32KiB) + 1 byte`<br>On Linux and UNIX systems, you require sufficient RAM and large Shared Memory segment. Before increasing the transfer buffer size, check the following settings on these platforms:<br>• Maximum size of a shared memory segment (SHMMAX)<br>• Minimum size of shared memory segment (SHMMIN)<br>• Maximum number of shared memory identifiers in the system (SHMMNI)<br>• Maximum number of shared memory segments a user process can attach (SHMSEG)<br>• Maximum number of semaphore identifiers in the system (SEMMNI)<br>• Maximum number of semaphores in a set (SEMMSL)<br>• Maximum number of semaphores in the system (SEMMNS)<br>• Maximum number of operations per semop call (SEMOPM)<br>• Semaphore maximum value (SEMVMX)<br>The total allowed shared memory is determined by the formula `SHMMAX * SHMSEG`. These values are often limited by the **ulimit** setting, and the command `ulimit -a` can be used to view these system settings.<br>On Windows, you require at least 2GB RAM and large virtual memory. You might also have to change the **MaximumSGlist** setting on the SCSI card.<br>For examples, see the Optimal transfer buffer size. |
| **Software Data Compression** | To perform software compression, select this check box. The data is compressed when it is transferred to the device during backup. |

**Table 5. Drive performance options**

| Option | Description |
|---|---|
| **Compression Threshold** | The value set for this option determines the minimum level of compression that must be achieved when data is compressed during a backup. For example, if you set the value to 80 percent, one of the following occurs:<br>• If the compressed data size is less than 80 percent of the original data size, the data is backed up in its compressed form.<br>• If the compressed data size is more than 80 percent of the original data size, the data is backed up in its uncompressed form.<br>If you specify 80 percent, a file size of a 100MB must be <= 80MB after compression. If the specified level is not achieved, NetVault Backup backs up the file in its uncompressed form. The extent that data can be compressed depends on the data contents. Encrypted data cannot be compressed. With some files, compression may actually result in a file that is larger than the original uncompressed file. |
| **Compression Data Blocks** | Type or select the number of data blocks per compression unit. The default block size is 8KiB. |

5 Click **OK** to save the settings and close the dialog box.

## Optimal transfer buffer size

The following table provides examples of the optimal values that can be used for some drive types.

**Table 6. Optimal transfer buffer size of different drive types**

| Drive type | Optimal transfer buffer size (in KiB) |
|---|---|
| Fast Modern Tape Drives<br>For example, LTO series, SDLT, and SAIT | 65537 (64MiB + 1KiB) |
| Medium Speed Tape Drives<br>For example, DLT8000, DLT7000, and AIT-3 | 32769 (32MiB + 1KiB) |
| Older Professional Tape Drives<br>For example, DLT2000, DLT4000, and AIT-2 | 16385 (16MiB + 1KiB) |
| Older Low Capacity Low-end Drives<br>For example, EXB-8505, AIT-1, and DAT | 8193 (8MiB + 1KiB) |

# Checking a tape drive

*To check the status of an offline tape drive*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.

3 On the **Tape Drive Management** page, click **Check**, and then in the confirmation dialog box, click **Check** again.

If the device is operational, its status is changed to **"Available."**

# Changing the status of a tape drive

*To change the drive status to online or offline*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.

3 On the **Tape Drive Management** page, click the applicable button:

- If the device is offline, click **Online** to bring it back online.
- If the device is online, click **Offline** to take it offline.

  The **Offline** method marks the device as offline and makes the device unavailable to NetVault Backup. This method does not physically take the system offline.

# Configuring automatic cleaning options for a tape drive

*To configure automatic cleaning options for a tape drive*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.

3 On the **Tape Drive Management** page, click **Cleaning**.

4 In the **Drive Cleaning Options** dialog box, configure the following options.

**Table 7. Drive Cleaning Options**

| Option | Description |
|---|---|
| **Days** | To perform drive cleaning after every x days, select the **Apply** check box to the left, and type or select the value. |
| **Data Transferred** | To perform drive cleaning after every x GiB of data transfer, select the **Apply** check box to the left, and type or select the value. |
| **Hours of Use** | To perform drive cleaning after every x hour, select the **Apply** check box to the left, and type or select the value. |
| **Soft Read/Write Errors** | To perform drive cleaning after every x*100 soft read/write errors, select the **Apply** check box to the left, and type or select the value. |

5 Click **OK** to save the settings and close the dialog box.

# Manually submitting a drive cleaning job

*To manually submit a drive cleaning job*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.

3 On the **Tape Drive Management** page, click **Clean**.

After the task is completed, a message is displayed.

# Configuring cleaning slots

*To configure cleaning slots for a library*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the applicable library, and then click the **Slots** link or the corresponding Manage Slots icon to open the Slot Browser.

3 In the Slots table, select the slot that you want to use, and click **Set Slot**.

The slot must be empty.

4 In the **Slot Settings** dialog box, configure the following options.

**Table 8. Slot Settings**

| Option | Description |
|---|---|
| **Set as cleaning slot** | Select the check box if the slot will hold a cleaning tape. |
| **Cleaning slot** | Type or select the slot number. |

5 Click **OK** to save the settings and close the dialog box.

6 After the dialog box is closed, a message stating "Library device needs to be restarted" is displayed.

7 Access the **Manage Devices** page, and restart the library.

8 When you open the Slot Browser again, the slot status is set to **CLN Slot**.

# Configuring the cleaning lives option

**NOTE:** To configure the cleaning lives option, a cleaning tape must be placed in the designated slot.

*To configure the cleaning lives for a tape*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the applicable library, and then click the **Slots** link or the corresponding Manage Slots icon to open the Slot Browser.

3 In the Slots table, select the slot that contains the cleaning tape, and click **Set Cleaning Life**.

4 In the **Set Cleaning Life** dialog box, configure the following option:

- **Set media lives:** Type or select the number of times the tape can be used for cleaning a drive. The default value is 1.

5 Click **OK** to save the settings and close the dialog box.

# Labeling a tape

You can manually assign labels to blank media or automatically label the media during a backup. The default label consists of a system-generated string. To use media barcodes as the default labels, see Configuring general settings for Media Manager.

*To label a single tape*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the applicable library.

3 If the tape is loaded in a drive, click the applicable drive or the corresponding Manage Device icon.

4 If the tape is not loaded in a drive, click the **Slots** link or the corresponding Manage Slots icon to open the Slot Browser. In the list of slots, select the slot that has the tape.

5 On the **Tape Drive Management** page, click **Label**.

6 In the **Medial Label** dialog box, configure the following options.

**Table 9. Labeling a single tape**

| Option | Description |
|---|---|
| **Label** | Specify a label for the tape.<br>A label can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. NetVault Backup does not support a "%" character in the string.<br>There is no length restriction on media and group labels. However, the combined display range for the media label, barcode and group label is 100 characters. Therefore, a maximum of 40 to 50 characters is recommended for the media and group labels. |
| **Group Label** | To add the tape to a media group, specify the group label.<br>A label can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. Group labels are case-insensitive. |
| **Offsite Location** | Specify the off-site location for the tape. |

7 Click **OK** to save the settings and close the dialog box.

# Blanking a tape

*To blank a single tape*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the applicable library.

3 If the tape is loaded in a drive, click the applicable drive or the corresponding Manage Device icon.

4 If the tape is not loaded in a drive, click the **Slots** link or the corresponding Manage Slots icon to open the Slot Browser. In the list of slots, select the slot that has the tape.

5 On the **Tape Drive Management** page, click **Blank**, and then in the confirmation dialog box, click **OK**.

**NOTE:** To blank multiple tapes in a library, see Blanking tape media.

**IMPORTANT:**

- The blanking operation removes the NetVault Backup header from a tape and deletes the media label and removes any group association. After blanking, a tape becomes available to NetVault Backup for storing future backups.
- The blanking operation deletes or erases the backup data residing on a tape. To purposely destroy the data that is stored on a tape, you must blank it from NetVault Backup and have its data securely removed by tools that are designed for such purposes.
- The blanking operation removes the indexes for backups stored on the selected tapes from the NetVault Database.

# Scanning a foreign tape

A piece of media is marked as “foreign” if no information for that item is available in the NetVault Database. This issue can occur for several reasons, for example, when a piece of media is swapped between libraries, removed from the NetVault Backup Server, or loaded on a device controlled by a different NetVault Backup Server. NetVault Backup cannot process data stored in a foreign tape until you scan the tape and import the backups and backup indexes into the NetVault Database. The scanning process retrieves the header information from backup media and adds this information to the NetVault Database. This process removes the “foreign” tag for the tape.

*To scan a foreign tape*

1 In the Navigation pane, click **Manage Devices**. In the list of devices, open the library, and then click the applicable drive or the corresponding Manage Device icon.

— or —

In the Navigation pane, click **Explore Storage**. Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.

2 On the **Tape Drive Management** or **Explore Tape Media** Item page, click **Scan**.

The scanning process is started, and a message is displayed.

**NOTE:** The scanning process does not read the data on the tape. This process skips between the beginning and end of backups to read the on-tape index for each backup saveset.

**NOTE:** To scan all foreign tapes in a library, see Scanning all foreign tapes in a library.

# Unloading a tape

*To unload a tape*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library, and then click the applicable drive or the corresponding Manage Device icon.

3 Click **Unload**.

After unload request is sent successfully, a message is displayed.

In a library, the tape is moved to an available slot, while in a standalone drive the tape is ejected.

# Loading a tape

*To load a tape*

1 In the Navigation pane, click **Manage Devices**.

2 In the list of devices, open the library, and then click **Slots** to open the Slot Browser.

3 In the list of slots, select the slot that contains the tape, and click **Load**.

After the load request is sent successfully, a message is displayed.

The tape is loaded in an available drive.

# Opening and closing entry/exit ports

*To open or close an entry/exit port*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, open the applicable library, and then click the **Ports** link or the corresponding Manage Ports button to open the Port Browser.
3. To open an entry/exit port, select the port in the Ports table, and click **Open Port**.

   When you issue the **Open Port** command, NetVault Backup puts a software lock on library so that it knows that the port door is going to be opened.
4. To close the port after placing a tape, select **Close Port**. If you have placed a cleaning tape in the port, select **Close port with cleaning media**.

   When you issue the **Close Port** command, NetVault Backup knows that you have physically closed the port door, and it removes the lock on the library.

# Unloading tapes from entry/exit ports

*To unload a tape from an entry/exit port*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, open the applicable library, and then click the **Ports** link or the corresponding Manage Ports button to open the Port Browser.
3. In the Ports table, select the slot that contains the tape, and click **Unload from Port**.

   The tape is moved to a drive or slot:

   - If the media barcode is available in the NetVault Database, the tape is loaded to a free slot.
   - If the tape does not have a barcode or the barcode information is not available in the NetVault Database, the tape is loaded to a drive to read the header.

# Removing a tape drive

When you remove a tape drive, the information about the tape that is loaded is not deleted from the NetVault Database. You can use the tape on any other drive that supports the media type. Scanning is not required if you use the tape in the same NetVault Backup domain. In a different NetVault Backup Domain, you must scan the tape to access the backups.

*To remove a tape drive*

1. In the Navigation pane, click **Manage Devices**.
2. In the list of devices, open the library that contains the drive, and then click the applicable drive or the corresponding Manage Device icon.
3. On the **Tape Drive Management** page, click **Remove**, and then in the confirmation dialog box, click **OK**.

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# Managing storage media



## Viewing disk storage details

1 In the Navigation pane, click **Explore Storage**.

On the **Explore Storage** page, you can view the following information:

- **Backup saveset summary:** This area shows the total backup savesets stored in the disk and tape storage devices.
- **Disk storage summary:** This area shows the total data stored in disk storage devices, amount of physical space used, and deduplication ratio.
- **Tape and VTL storage summary:** This area shows the total data stored in tapes and VTLs, number of media items used, and number of blank media items in the added libraries.

2 To view disk storage details, click **Explore Disk Storage**.

On the **Explore Disk Storage** page, you can view the repository list. The page displays the following information:

- **Repository Name:** The name of the device, LSU, or storage container.
- **Type:** Device type (for example, NetVault SmartDisk, Dell DR Series system, or Data Domain system).
- **Record Count:** Number of data records stored in the device.
- **Saveset Count:** Number of savesets stored in the device.
- **Space Free:** Amount of space available.
- **Space Used:** Amount of space used.
- **Deduplication ratio:** The ratio of data before deduplication to the amount of data after deduplication.

To view the details of a particular repository, select the item in the repository list, and click **Explore Repository**.

3 On the **Explore Disk Storage Repository** page, you can view the following information:

- **Repository summary:** This area shows the following information:
  - Repository name and amount of data stored in the repository.
  - Physical space used and amount of space available.
  - Deduplication ratio.
  - Percentage of storage used by various plug-ins.

- **Saveset table**: The Saveset table lists all backups stored in the repository. It shows the saveset creation date, saveset name, and saveset size.

  To filter the saveset list, click **Filter Options**, and set the filter criteria:

  - To view savesets created for a particular client, click the **Client** arrow, and select the client in the list.
  - To view savesets created during a particular period, click the **Saveset Date** arrow, and select one of the following options: Last 24 hours, Last Week Last Month, Last 6 Months, Last Year, or Any.

# Viewing tape storage details

1 In the Navigation pane, click **Explore Storage**.

On the **Explore Storage** page, you can view the following information:

- **Backup saveset summary:** This area shows the total backup savesets stored in the disk and tape storage devices.
- **Disk storage summary**: This area shows the total data stored in disk storage devices, amount of physical space used, and deduplication ratio.
- **Tape and VTL storage summary:** This area shows the total data stored in tapes and VTLs, number of media items used, and number of blank media items in the added libraries.

2 To view tape storage details, click **Explore Tape Storage**.

On the **Explore Tape Storage** page, you can view the media list. The page displays the following information:

- **Label:** Media label.
- **Group**: Media group label.
- **Barcode:** Media barcode.
- **Library:** Name of the library.
- **Record Count:** Number of data records stored in the tape.
- **Saveset Count**: Number of savesets stored in the tape.
- **Space Free**: Amount of space available.

  **NOTE:** The amount of free space available on a tape is not calculated in NetVault Backup. This information is obtained from the tape drive and displayed on the **Explore Tape Storage** page.

- **Space Used**: Amount of space used.
- **Online**: If the tape is online.

To view the details of a particular tape, select the item in the media list, and click **Explore Media**.

3 On the **Explore Tape Media Item** page, you can view the following information:

- **Tape summary:** This area shows the following information:
  - Media barcode, label, and group label.
  - Library name, off-site location, media type (disk file or tape).
  - Amount of data stored and amount of space available.
  - If the tape can be reused.
  - The number of times the tape has been reused.
  - Date on which the last write and read operations were performed.

- Number of read and write errors.
- If the tape is usable.
- If the tape is marked read-only.
- Percentage of storage used by different savesets.

- **Saveset table:** The Saveset table lists all backups stored in the repository. It shows the saveset creation date, saveset name, and saveset size.

# Managing tape storage media

This section includes the following topics:



## Marking a tape as unusable

If a piece of media is damaged or not suitable for use, you can mark it as “unusable” so that it is not selected for any job.

*To mark a tape as unusable*

1. In the Navigation pane, click **Explore Storage**.
2. Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.
3. To mark the tape as unusable, click **Mark Unusable**.
4. To change this property, select the tape, and click **Mark Usable**.

## Marking a tape as read-only

*To mark a tape as read-only*

1. In the Navigation pane, click **Explore Storage**.
2. Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.
3. To mark the tape as read-only, click **Mark Read Only**.
4. To change this property, select the tape, and click **Mark Writable**.

**IMPORTANT:** A piece of media can be marked as “read-only” to stop further writes if a SCSI error occurs during a write operation. When this error occurs, check for hardware errors. If no tape or media error is found, set the tape as “writable.”

**NOTE:** To write-protect a piece of media, you can also set the **Protect Media from Further Writes after Backup** option in the Target Set. For more information, see Configuring media sharing options.

# Scanning a foreign tape

A piece of media is marked as “foreign” if no information for that item is available in the NetVault Database. This issue can occur for several reasons, for example, when a piece of media is swapped between libraries, removed from the NetVault Backup Server, or loaded on a device controlled by a different NetVault Backup Server. NetVault Backup cannot process data stored in a foreign tape until you scan the tape and import the backups and backup indexes into the NetVault Database. The scanning process retrieves the header information from backup media and adds this information to the NetVault Database. This process removes the “foreign” tag for the tape.

*To scan a foreign tape*

1 In the Navigation pane, click **Manage Devices**. In the list of devices, open the library, and then click the applicable drive or the corresponding Manage Device icon.

— or —

In the Navigation pane, click **Explore Storage**. Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.

2 On the **Tape Drive Management** or **Explore Tape Media** Item page, click **Scan**.

The scanning process is started, and a message is displayed.

**NOTE:** The scanning process does not read the data on the tape. This process skips between the beginning and end of backups to read the on-tape index for each backup saveset.

**NOTE:** To scan all foreign tapes in a library, see Scanning all foreign tapes in a library.

# Blanking a tape

*To blank a tape*

1 In the Navigation pane, click **Explore Storage**.

2 Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.

3 Click **Blank**, and then in the confirmation dialog box, click **OK**.

**NOTE:** To blank multiple tapes in a library, see Blanking tape media.

**IMPORTANT:**

- The blanking operation removes the NetVault Backup header from a tape and deletes the media label and removes any group association. After blanking, a tape becomes available to NetVault Backup for storing future backups.
- The blanking operation deletes or erases the backup data residing on a tape. To purposely destroy the data that is stored on a tape, you must blank it from NetVault Backup and have its data securely removed by tools that are designed for such purposes.
- The blanking operation removes the indexes for backups stored on the selected tapes from the NetVault Database.

# Marking a tape for reuse

A piece of media is automatically marked for reuse when the last saveset stored on it is retired. You can also set this property manually. When a piece of media is manually marked for re-use, NetVault Backup retains its media label and group associations. To reuse such media, you must set the **Reuse Media** option in the Target Set to one of the following:

- **Any**
- **With the same group label as target media**

NetVault Backup overwrites any existing data on the media when they are reused.

*To manually mark a tape for reuse*

1 In the Navigation pane, click **Explore Storage**.

2 Click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.

3 Click **Reuse**, and then in the confirmation dialog box, click **OK**.

# Managing savesets

This section includes the following topics:



# Viewing saveset details

*To view the details of a saveset*

1 In the Navigation pane, click **Explore Storage**.

2 If the saveset is stored in a disk-based storage device, click **Explore Disk Storage**. In the repository list, select the device, and click **Explore Repository**.

3 If the saveset is stored in a physical or virtual tape, click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.

4 In the saveset list, select the target saveset, and click **Examine Saveset**.

5 On the Saveset Information page, you can view the following details:

- Job ID, job title, and tag
- Server, client, and plug-in name
- Saveset creation and retirement date
- Whether the saveset is an Incremental Backup
- Whether the saveset is an Archive
- Saveset size

6 Click **Media list** to view the offset, segment position, segment length, and on-tape index information.

# Configuring retirement period for a saveset

A backup can be retained indefinitely or retired after a specified period. NetVault Backup allows you to set a generation-based or time-based retirement period for backups. For more information about these methods, see Backup retirement. There are two ways to set the backup retirement period:

- Configure the **Backup Life** option in the Backup Advanced Options Set while creating a backup job. For more information about this method, see Setting backup retirement options.
- Alternatively, use the **Change Expiry** method to set or change the retirement period for an existing saveset.

*To configure the retirement period for an existing saveset*

1. In the Navigation pane, click **Explore Storage**.
2. If the saveset is stored in a disk-based storage device, click **Explore Disk Storage**. In the repository list, select the device, and click **Explore Repository**.
3. If the saveset is stored in a physical or virtual tape, click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.
4. In the saveset list, select the target saveset, and click **Examine Saveset**.
5. Click **Change Expiry**, and configure the following settings.

**Table 1. Change saveset expiry period**

| Option | Description |
|---|---|
| **Change Expiry Date** | To set a time-based retirement period, select this check box, and do one of the following:<br>• Select the **On** option, and type or select the date and time in the respective boxes.<br>— or —<br>• Select the **Never** option to retain the backup indefinitely.<br>**NOTE:** In a time-based retirement period, the time component (HH:MM) does not represent the actual retirement time. It only represents the time due for backup retirement. The actual time of retirement is determined by the interval at which Media Manager scans the Media Database to identify the backups that it needs to retire. The default interval between two scans is 60 minutes. Thus, if the retirement time is set to 10:20, the backup is actually retired at 11:00. To change the default interval for backup retirement scans, see Configuring default interval for backup retirement scans. |
| **Change Generation Cycle** | To set a generation-based retirement period, select this check box, and do one of the following:<br>• Select the **Discard** after option, and in the associated box, type or select the number of Full Backups.<br>— or —<br>• Select the **Never** option to retain the backup indefinitely. |

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

**NOTE:** When a backup stored on a disk-based storage device (such as NetVault SmartDisk, Dell DR Series System, or Data Domain System) is retired, that backup is deleted from the device. You cannot import the deleted backup by scanning the device.

# Deleting savesets

Deleting a saveset essentially involves removing its index from the NetVault Database. You can still scan the media to import the backup index into the NetVault Database, and use the backup.

## Deleting savesets from disk-based storage devices

*To delete one or more savesets from a disk-based storage device*

1. In the Navigation pane, click **Explore Storage**.
2. On the **Explore Storage** page, click **Explore Disk Storage**. In the repository list, select the device, and click **Explore Repository**.
3. In the saveset list, select the savesets that you want to delete.

   To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.
4. Click **Remove Savesets**.
5. In the **Remove Saveset** dialog box, select the **Remove all duplicates associated with selected saveset(s)** check box if you also want to remove the Duplicates of the selected savesets.
6. Click **OK**.

*To delete a single saveset from a disk-based storage device*

1. In the Navigation pane, click **Explore Storage**.
2. If the saveset is stored in a disk-based storage device, click **Explore Disk Storage**. In the repository list, select the device, and click **Explore Repository**.
3. In the saveset list, select the saveset that you want to delete, and click **Examine Saveset**.
4. Click **Remove**.
5. In the **Remove Saveset** dialog box, select the **Remove all duplicates associated with this saveset** check box if you also want to remove the Duplicates of the selected saveset.

Click **OK**.

## Deleting savesets from tape-based storage devices

*To delete a single saveset from a tape-based storage device*

1. In the Navigation pane, click **Explore Storage**.
2. On the **Explore Storage** page, click **Explore Tape Storage**. In the media list, select the tape, and click **Explore Media**.
3. In the saveset list, select the saveset that you want to delete, and click **Examine Saveset**.
4. Click **Remove**.
5. In the **Remove Saveset** dialog box, select the **Remove all duplicates associated with this saveset** check box if you also want to remove the Duplicates of the selected saveset.
6. Click **OK**.

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# Managing user accounts



## About user accounts

NetVault Backup allows the system administrator to create one or more user accounts and assign privileges to perform various tasks. This feature can be used to prevent unauthorized access to the NetVault Server and implement role-based access restrictions. For example, the system administrator can create a user account for the Database Administrator role and grant this account the privileges to perform backups and restores of database systems. Similarly, the system administrator can create a user account for the network administrator role and grant this account the privileges to add and remove storage devices.

There are two predefined user accounts in NetVault Backup:

- **admin:** The Administrator account for NetVault Backup.
- **default**: A standard user account that can be used to perform various operations in NetVault Backup.

The **admin** and **default** user accounts are assigned all privileges in NetVault Backup. For more information about user privileges, see User privileges. These user accounts cannot be deleted. By default, no password is assigned to the **admin** and **default** user accounts. To prevent unauthorized access to the NetVault Server, you can assign a secure password is assigned to these user accounts.

**NOTE:** Non-administrator user accounts can only change or reset their passwords.

## Creating a user account

*To create a user account*

1. In the Navigation pane, click **Manage Users**.
2. On the **Manage User Accounts** page, click **Add**.

   NetVault Backup creates a user account and assigns the default name “New User” (or “New User <n>” if the default name is in use) to this user.

   **NOTE:** The NetVault Backup Server does not delete the user account if you exit without completing the user addition procedure. If you do not require the user account, you must delete it manually from the **Manage Users** page. For more information, see Deleting a user account.

3 Configure the following settings:

- **Password:** See Setting user password.
- **Details**: See Configuring user details.
- **Client and media memberships:** See Configuring client and media group memberships for a user.
- **Privileges and quotas:** See Granting privileges and quota to a user account.
- **Notification Profile:** See Setting up user notification profile.

4 Click **Done** to save the user details.

# Setting user password

*To set or change password for a user account*

1 On the Editing User page, click **Password**.

2 To remove the existing password and reset it to blank, select the **Reset password to blank** check box.

— or —

To set or change the user password, configure the following options.

**Table 1. User password**

| Item | Description |
|---|---|
| **Current Password** | Type the current password for the user account. Leave it blank if no password is set for the account. |
| **New Password** | Type a new password for the user account.<br>A password can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. A password can contain a maximum of 100 characters. |
| **Confirm Password** | Re-type the password for confirmation. |

3 Click **Done** to save the user details, and return to the Editing User page.

# Configuring user details

*To modify the user name, contact information, and other details*

1 On the Editing User page, click **Details**.

2 Update the details as described in the following table.

**Table 2. User details**

| Item | Description |
|---|---|
| **Identification** | Under **Identification**, provide the following details:<br>• In **User Name**, type a unique name for the user account. You can assign a name based on the user group, role, or actual name.<br>A user name can contain alphanumeric and non-alphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction, but a maximum of 20 characters is recommended on all platforms. The following characters are not supported in user names:<br>" / \ : ; \| * ? < >^<br>• In **Real Name**, specify the actual name of the user. |

**Table 2. User details**

| Item | Description |
|---|---|
| **Contact Information** | Under **Contact Information**, provide the following details:<br>• **Email-1**: Use this box to specify the primary email addresses for the user account.<br>• **Email-2**: Use this box to specify any additional email address for the user account.<br>• **Email-3**: Use this box to specify any additional email address for the user account.<br>• **Telephone**: Use this box to specify the telephone number for the user account.<br>• **Cellular**: Use this box to specify the mobile phone number for the user account.<br>• **Pager**: Use this box to specify the pager number for the user account.<br>**NOTE:** The email ID configured in the **Email-1** box is used for email notifications if you set up a notification profile for the user account. For more information, see Setting up user notification profile. |
| **Details** | Under **Other Details**, provide the following details:<br>• **Workstation**: Use this box to specify the workstation name.<br>• **Description**: Use this box to specify the workstation description.<br>• **Location:** Use this box to specify the workstation location. |

3 Click **Done** to save the user details, and return to the Editing User page.

# Configuring client and media group memberships for a user

*To modify client and media group memberships for a user account*

1 On the Editing User page, click **Client and media group memberships**.

2 Update the details as described in the following table.

**Table 3. User client and media memberships**

| Item | Description |
|---|---|
| **Client group memberships** | To add or remove the client groups, do the following:<br>• To grant access to all client groups, select the **User is a member of ALL client groups** check box.<br>When you select this check box, the user account is automatically granted access to all new clients and client groups that are added to the NetVault Backup Server.<br>• To grant access to specific client groups, select the groups in the **Not a member of** list, and click **Join**.<br>To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.<br>The selected client groups are moved to the **Member of** list. |

**Table 3. User client and media memberships**

| Item | Description |
|---|---|
| | • To remove a client group, select the group in the **Member of** list, and click **Leave**.<br>• To allow access to a client only when the user is locally logged on to the client, select the **Local access only** check box. When you select this check box, the client cannot be accessed for backups from the NetVault Backup Server or a different NetVault Backup Client. |
| **Media group memberships** | To add or remove the media groups, do the following:<br>• To grant access to all media groups, select the **User is a member of ALL media groups** check box.<br>When you select this check box, the user account is automatically granted access to all new media groups that are added to the NetVault Backup Server.<br>• To grant access to specific media groups, select the media groups in the **Not a member of** list, and click **Join**.<br>To select consecutive items, hold down the Shift key while clicking with the mouse button; to select non-consecutive items, hold down the Ctrl key while clicking with the mouse button.<br>The selected media groups are moved to the **Member of** list.<br>• To remove a media group, select the group in the **Member of** list, and click **Leave**. |

3 Click **Done** to save the group membership information for the user, and return to the Editing User page.

# Granting privileges and quota to a user account

*To change user privileges and job and media quota for a user account*

1 On the Editing User page, click **Privileges and Quotas**.

2 Update the details as described in the following table.

**Table 4. User privileges and quotas**

| Item | Description |
|---|---|
| **User Privileges** | To grant or revoke user privileges, do the following:<br>• To grant all privileges to a user account, select the **User is granted ALL privileges** check box.<br>• To grant specific privileges, select the privileges in the **Denied** list, and click **Add**. The selected privileges are moved to the **Granted** list.<br>• To revoke privileges, select the privilege in the **Granted** list, and click **Remove**. |
| **Media Quota** | To assign media quota, configure the applicable option:<br>• **Infinite:** This option is selected by default. To allow access to infinite amount of media, use this option.<br>• **Up to:** To assign specific media quota, select this option. Type or select the amount of media that is available to the user. The usage quota is specified in terabytes.<br>When usage reaches the defined quota, the jobs submitted by the user fail. The media usage amount is calculated from the existing records in the Media Database. When a saveset is retired, the amount of media used by it is added to the available pool. |

**Table 4. User privileges and quotas**

| Item | Description |
|---|---|
| **Job Quota** | To assign job quota, configure the applicable option:<br>• **Infinite:** This option is selected by default. To allow access to infinite number of jobs, use this option.<br>• **Up to:** To assign specific job quota, select this option. Type or enter the maximum number of jobs the user can perform.<br>When number of jobs performed by the user reaches the defined quota, the user is not allowed to submit any other job. The number of jobs performed by a user is derived from the existing records in the Scheduler Database. For any deleted job definitions, a user can submit an equal number of new jobs. |

3 Click **Done** to save the group membership information for the user, and return to the Editing User page.

# Setting up user notification profile

*To set up notification profile for a user account*

1 On the Editing User page, click **Notification Profile**.

2 In the events table, open the event class and event type, and select the notification method that you want to use.

**Table 5. User notification profile**

| Item | Description |
|---|---|
| **E-mail** | Select this method to send an email notification to the user when the event occurs. The user notifications are delivered to the email ID configured in the **E-mail-1** box on the **User Details** page. |
| **Windows Pop-up Message** | Select this method to display pop-up messages to the user when the event occurs. This method is only supported on Windows-based clients. The pop-up messages are not displayed if a firewall or any other tool is configured to block such messages. The pop-up message notification method is not available in the recent versions of Windows. |

3 Click **Done** to save the user details, and return to the Editing User page.

# Modifying a user account

*To modify a user account*

1 In the Navigation pane, click **Manage Users**.

2 On the **Manage User Accounts** page, select the user account, and click **Edit**.

3 Modify the user account details, as necessary:

- **Password:** See Setting user password.
- **Details**: See Configuring user details.
- **Client and media memberships:** See Configuring client and media group memberships for a user.
- **Privileges and quotas:** See Granting privileges and quota to a user account.
- **Notification Profile:** See Setting up user notification profile.

4 Click **Done** to save the user details.

# Deleting a user account

*To delete a user account*

1 In the Navigation pane, click **Manage Users**.

2 On the **Manage User Accounts** page, select the user account that you want to remove, and click **Delete**.

3 In the confirmation dialog box, click **Remove** to remove the user account from the NetVault Backup Server.

# Setting a password policy

The password policy defines the maximum age for a user password and applies globally to all NetVault Backup users.

*To set a password policy*

1 In the Navigation pane, click **Manage** Users.

2 On the **Manage User Accounts** page, click **Set Password Policy**.

3 On the **Set Password Policy** page, provide the following information:

- Select the **Passwords expire after** check box, and type or select the maximum number of days a password can be used before the user is required to change it.
- Select the **Display reminder** check box, and specify how many days in advance users are notified to change their password. The message is displayed every time the user logs on to NetVault Backup.

4 Click **Done** to save the password policy.

# User privileges

The following table provides a brief description of the user privileges in NetVault Backup.

**Table 6. User privileges in NetVault Backup**

| Privilege | Description |
|---|---|
| Clients — Add/remove clients | Permission to add and remove NetVault Backup Clients. |
| Clients — Add/remove virtual/clustered clients | Permission to add and remove virtual clients. |
| Clients — Administer client groups | Permission to create, modify, and delete client groups. |
| Clients — Configure client | Permission to configure clients. |
| Clients — Get client properties | Permission to view client properties. |
| Clients — Set firewall relationship | Permission to set firewall relationship between the NetVault Backup Server and Client. |
| Devices — Add libraries | Permission to add tape libraries to the NetVault Backup Server. |
| Devices — Add Random Access Store | Permission to add disk-based backup devices. |
| Devices — Add simple drives | Permission to add standalone drives to the NetVault Backup Server. |
| Devices — Clean drives | Permission to run the Clean command for a drive. |
| Devices — Manage devices | Permission to perform device management tasks. |
| Devices — Open and close entry/exit ports | Permission to issue commands to open or close the entry/exit ports. |

**Table 6. User privileges in NetVault Backup**

| Privilege | Description |
|---|---|
| Devices — Open and close library doors | Permission to issue commands to open or close the library doors. |
| Devices — Perform device checks | Permission to run check off-line devices. |
| Devices — Reconfigure devices | Permission to reconfigure added devices. |
| Devices — Remove devices | Permission to remove devices from the NetVault Backup Server. |
| Devices — Set drive cleaning properties | Permission to set the drive cleaning options. |
| Devices — Update Random Access Store | Permission to modify disk-based backup devices. |
| Jobs — Abort jobs | Permission to abort active jobs. |
| Jobs — Acknowledge policy errors | Permission to acknowledge policy errors and remove the error flags. |
| Jobs — Administer backup/restore sets | Permission to create, modify, and delete NetVault Backup Sets. |
| Jobs — Administer policies | Permission to create and manage policies. |
| Jobs — Delete job | Permission to delete NetVault Backup jobs. |
| Jobs — Delete scheduled phase | Permission to delete scheduled jobs. |
| Jobs — Hold job | Permission to place jobs on hold. |
| Jobs — Jobs owned by this user may run | Permission to submit and run NetVault Backup jobs.<br>**NOTE:** This user privilege lets you submit or run a job, but it does not let you create or modify jobs. To create backup and restore jobs, you require the user privileges Jobs — Submit/update backup Jobs and Jobs — Submit/update restore Jobs. |
| Jobs — Quiesce policy | Permission to place backup policies in quiesced state. |
| Jobs — Restart job | Permission to restart Plug-in for FileSystem backups. |
| Jobs — Resume job | Permission to resume jobs placed on hold. |
| Jobs — Run predefined jobs instantly | Permission to issue the **Run Now** command. |
| Jobs — Stop Job | Permission to stop active Plug-in for FileSystem backups. |
| Jobs — Submit/update backup Jobs | Permission to create and modify backup jobs.<br>**NOTE:** This user privilege lets you create and modify backup jobs, but it does not let you run a backup job. To run a job, you require the user privilege Jobs — Jobs owned by this user may run. |
| Jobs — Submit/update restore Jobs | Permission to create and modify restore jobs.<br>**NOTE:** This user privilege lets you create and modify restore jobs, but it does not let you run a restore job. To run a restore job, you require the user privilege Jobs — Jobs owned by this user may run. |
| Jobs — View backup jobs | Permission to view backup job definitions. |
| Jobs — View backup/restore sets | Permission to view set definitions. |
| Jobs — View policies | Permission to view policy definitions. |
| Jobs — View restore jobs | Permission to view restore job definitions. |
| Media — Blank ANSI media | Permission to blank ANSI media. |
| Media — Blank bad media | Permission to blank a bad media item. |
| Media — Blank media | Permission to blank media. |
| Media — Blank non-NetVault media | Permission to blank non-NetVault media. |
| Media — Export media | Permission to export media to entry/exit port. |
| Media — Get media or device item status | Permission to view device and media status. |
| Media — Import media | Permission to import NetApp VTL's shadow tapes. |
| Media — List media | Permission to view media list. |
| Media — Load/unload media from drives | Permission to load and unload media from drives. |

**Table 6. User privileges in NetVault Backup**

| Privilege | Description |
|---|---|
| Media — Manage media requests | Permission to change media request priority and place media request on hold. |
| Media — Mark media for re-use | Permission to manually mark media for reuse. |
| Media — Modify backup expiry data | Permission to modify the retirement period for backups. |
| Media — Remove media | Permission to remove media information from the NetVault Database. |
| Media — Scan foreign media | Permission to scan foreign media items and import backups residing on them. |
| Media — View and diagnose media requests | Permission to view and diagnose Media requests. |
| Media — View backup expiry data | Permission to view the retirement period for backups. |
| Media — View media properties | Permission to view media properties. |
| Media — Write media labels | Permission to perform individual and bulk media labeling operations. |
| Reports — Modify/edit report Jobs and components | Permission to create and modify user-defined reports and report components. |
| Reports — View and run reports | Permission to generate and view reports. |
| System — Change global notification profile | Permission to set up global notification profile for NetVault Backup. |
| System — Dump log entries | Permission to export log message to binary or text files. |
| System — Install/remove software packages | Permission to install and remove NetVault Backup plug-ins. |
| System — Install license key | Permission to install product license keys. |
| System — Permitted to use CLI tools | Permission to use the CLI utilities. |
| System — Purge log entries | Permission to delete log messages from the NetVault Database. |
| Users — Administer user accounts | Permission to create, modify, or delete user accounts. |
| Users — Reset password for user | Permission to reset password for user accounts. |

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# Monitoring events and configuring notifications



## About NetVault Backup events

An event can be described as any significant occurrence in the NetVault Backup system. It can indicate a problem that requires your response or a condition that you want to be notified about.

NetVault Backup includes a set of predefined events, which are associated with various job-related and non-job-related occurrences in the system. The predefined events are organized into different categories or classes. Each category or class includes one or more event types. For a list of predefined event classes and event types, see Event classes and Events types.

You can also create user-defined events in NetVault Backup to monitor specific events associated with backup jobs, restore jobs, policies, report jobs, and log messages. For example, you can create a user-defined event for a backup job and receive notification if the job completes successfully, completes with warnings, or fails.

There are different methods available in NetVault Backup for sending notifications when an event occurs. The global notification methods include SysOp Email, Simple Network Management Protocol (SNMP) Traps, Print Report, and Run a Job. For more information about these methods, see Using global notification methods. You can also set up a user notification profile or create a custom notification method for these events. For more information, see Setting up user notification profile and Using custom notification methods.

Events are recorded in the event logs. You can view the event logs from the **View Events** page. Event logs can be used to track activities or respond to problems or errors reported by the system.

## Event classes

The predefined events in NetVault Backup are organized into different categories or classes.

**Table 1. Event classes**

- Audit
- BakBone Time
- Device
- Job
- Licensing
- Log Daemon
- Machines
- Media
- Media Database
- Policy
- Scheduler Database
- Stats Collection

# Events types

The following table provides a brief description of the predefined event types available in various event classes.

**Table 2. Events types**

| Event class | Event type | Description |
|---|---|---|
| **Audit** | Failed to Update Audit File | Occurs when NetVault Backup is unable to update the audit logs. |
| | Update Session Map Failed | Occurs when NetVault Backup is unable to update the session owner mapping file. |
| **BakBone Time** | No Time Source | Occurs when a BakBone Time Server is not configured for the Domain. |
| | Server Time Inconsistency | Occurs when the BakBone Time on two or more controlling servers do not match. (This event can occur when a client is added to two or more NetVault Backup Servers.) |
| | Server Time Unknown | Occurs when the Time Server is unable to fetch BakBone Time from the Source. |
| | Time Server Changed | Occurs when the Time Server is changed for a NetVault Backup Domain. |
| | Time Server Not Responding | Occurs when the Time Server is not responding to a time request. |
| | Time Server Removed | Occurs when the Time Server is removed from the NetVault Backup Domain. |
| **Device** | Check | Occurs when a request is received to check a device. |
| | Check Serial Number of Drive | Occurs when a request is received to check the serial number of a drive. |
| | Check Serial Number of All Drives | Occurs when a request is received to check the serial numbers of all drives. |
| | Close Door | Occurs when a request is received to close a library door |
| | Close EEPort | Occurs when a request is received to close an entry/exit port. |
| | Close EEPort Clean | Occurs when a request is received to close an entry/exit port containing cleaning media. |
| | Device Forced Offline | Occurs when the offline command is selected for a device. |
| | Device Gone Offline | Occurs when a device becomes offline. |
| | Drive Unavailable | Occurs when a drive becomes offline. |
| | Library Gone Offline | Occurs when a library becomes offline. |
| | Library Scan Completed | Occurs when a media scan request is completed. |
| | Map | Occurs when an ACSLS drive is mapped. |
| | No Suitable Drive | Occurs when NetVault Backup is unable to find a suitable drive to run a backup or restore job. |
| | Open Door | Occurs when a request is received to open a library door. |
| | Open EEPort | Occurs when a request is received to open an entry/exit port. |
| | Reconfigure Device | Occurs when a device is modified. |
| | Remove | Occurs when a device is removed. |
| | Restart Library | Occurs when a library is restarted. |
| | Synchronize Silo Media | Occurs when silo media items are synchronized. |
| | Unmap | Occurs when an ACSLS drive is un-mapped. |
| | Update Serial Number of Drive | Occurs when a request is received to update the serial number of a drive. |

**Table 2. Events types**

| Event class | Event type | Description |
|---|---|---|
| | Update Serial Number of all Drives | Occurs when a request is received to update the serial number of all drives. |
| **Job** | All Job Retries Failed | Occurs when all retry attempts for a job have failed. |
| | Job Abort Requested | Occurs when a request is received to abort a job. |
| | Job Aborted | Occurs when a job is aborted. |
| | Job Completed Successfully | Occurs when a job completes successfully. |
| | Job Completed with Warnings | Occurs when a job completes with warnings. |
| | Job Created | Occurs when a job is created. |
| | Job Deleted | Occurs when a job is deleted. |
| | Job Died | Occurs when a job terminates unexpectedly. |
| | Job Failed | Occurs when a job fails. |
| | Job Finished | Occurs when a job is completed. |
| | Job Hold | Occurs when a job is put on hold. |
| | Job Modified | Occurs when a job is modified. |
| | Job Phase Starting | Occurs when phase 1 or phase 2 starts for a job. |
| | Job Resume | Occurs when a job that was placed on hold is resumed. |
| | Job Retry Scheduled | Occurs when a job is rescheduled after a failed attempt. |
| | Job Run Now | Occurs when a job is submitted to run immediately. |
| | Job Scheduled | Occurs when a job is submitted. |
| | Job Stop Requested | Occurs when a request is received to stop a job. |
| | Job Stopped | Occurs when a job is stopped. |
| | Scheduled Phase Deleted | Occurs when a scheduled phase is deleted for a job. |
| | Set Created | Occurs when a set is created. |
| | Set Deleted | Occurs when a set is deleted. |
| | Set Modified | Occurs when a set is modified. |
| **Licensing** | License Exceeded | Occurs when usage exceeds the available licenses. |
| | License Expiring | Occurs when the evaluation license is nearing expiry or has expired. This event occurs when the validity period for the evaluation license is less than or equal to seven days. |
| **Log Daemon** | Home Drive Becoming Full | Occurs when disk space usage reaches warning or critical threshold. |
| **Machines** | Client Added | Occurs when a NetVault Backup Client is added to the domain. |
| | Client Down | Occurs when a NetVault Backup Client becomes offline. |
| | Client Group Created | Occurs when a client group is created. |
| | Client Group Deleted | Occurs when a client group is deleted. |
| | Client Group Modified | Occurs when a client group is modified. |
| | Client Group Renamed | Occurs when a client group is renamed. |
| | Client Removed | Occurs when a client is removed. |
| | Virtual Client Added | Occurs when a cluster-aware plug-in is installed on the server. For more information about virtual clients and cluster-aware plug-ins, see Working with client clusters. |
| | Virtual Client Removed | Occurs when a cluster-aware plug-in is removed. For more information about virtual clients and cluster-aware plug-ins, see Working with client clusters. |

**Table 2. Events types**

| Event class | Event type | Description |
|---|---|---|
| | Workstation Client Added | Occurs when a Workstation Client is added to the NetVault Backup Server. |
| **Media** | Blank | Occurs when a request is received to blank a media item. |
| | Delete Group | Occurs when a media group is deleted. |
| | Delete Job Instance | Occurs when a job instance is deleted. |
| | Export | Occurs when a piece of media is exported to an entry/exit port. |
| | Import | Occurs when a request is received to import a piece of media. |
| | Import Clean | Occurs when a request is received to import a cleaning tape. |
| | Label | Occurs when a label is assigned to a piece of media. |
| | Load | Occurs when a piece of media is loaded into a drive. |
| | Media Blanked | Occurs when a piece of media is blanked. |
| | Media Deleted | Occurs when a piece of media is removed from the NetVault Database. |
| | Medial Full | Occurs when a piece of media becomes full. |
| | Media Labeled | Occurs when a media label request is completed. |
| | Medial Loaded | Occurs when a media load request is completed. |
| | Media Marked Bad | Occurs when a piece of media is marked bad. |
| | Media Request Change Priority | Occurs when a media request priority is changed. |
| | Media Request Timeout Expired | Occurs when a media request has timed out for a backup job. This event occurs when NetVault Backup is unable to find suitable media within the specified timeout interval. |
| | Media Suspect | Occurs when a piece of media is marked suspect. |
| | Media Unexpectedly BLANK | Occurs when a piece of media is found to be unexpectedly BLANK when it is selected for use. |
| | Media Unloaded | Occurs when a piece of media is unloaded. |
| | Media Unusable | Occurs when a drive rejects a piece of media. |
| | No Suitable Media | Occurs when NetVault Backup is unable to find a suitable media to complete the backup job. |
| | Request Off Hold | Occurs when a media request is taken off hold. |
| | Request On Hold | Occurs when a media request is placed on hold. |
| | Reuse | Occurs when a piece of media is marked for re-use. |
| | Scan Request | Occurs when a request is received to scan a foreign media. |
| | Unload | Occurs when a piece of media is unloaded. |
| | Update Properties | Occurs when media properties are modified. |
| **Media Database** | Backup Added | Occurs when a backup record is added to the Media Database. |
| | Backup Deleted | Occurs when a backup record is deleted from the Media Database. |
| | Backup Modified | Occurs when a new backup record is modified. |
| | Backup Retired | Occurs when a saveset is retired and its information is deleted from the NetVault Database. |
| | Index Compressed | Occurs when a backup index is compressed. |
| | Index Compression Failure | Occurs when NetVault Backup fails to decompress a backup index due to insufficient disk space. |

**Table 2. Events types**

| Event class | Event type | Description |
|---|---|---|
| | Index Loaded | Occurs when an offline index is temporarily loaded. |
| | Index Offlined | Occurs when the backup index for a saveset is deleted from the NetVault Database. |
| | Index Offlining Failure | Occurs when NetVault Backup fails to delete the backup index for a saveset from the database. |
| | Index Read Failure | Occurs when NetVault Backup fails to read the index for a saveset. |
| | Index Uncompressed | Occurs when a backup index is de-compressed. |
| | Media Database Check Failed | Occurs when the database integrity or reference check fails for the Media Database. |
| | Media Database Check Passed | Occurs when the Media Database check completes successfully. |
| | Media Database Check Passed with Warnings | Occurs when the Media Database check generates warnings. |
| | Media Database Compacted | Occurs when the database compact action is completed successfully for the Media Database. |
| | Media Database Compaction Failed | Occurs when the database compact action fails for the Media Database. |
| | Modify Backup Expiry | Occurs when the retirement period is modified for a saveset. |
| **Policy** | Policy Branch Errors Acknowledged | Occurs when policy branch errors or warnings are acknowledged. |
| | Policy Created | Occurs when a policy is created. |
| | Policy Deleted | Occurs when a policy is deleted. |
| | Policy Errors Acknowledged | Occurs when policy errors or warnings are acknowledged. |
| | Policy Modified | Occurs when a policy is modified. |
| | Policy Quiesce | Occurs when a request is received to quiesce a policy. |
| | Policy Quiesced | Occurs when a policy is placed in a quiesced state. |
| **Scheduler Database** | Scheduler Database Check Failed | Occurs when the database integrity or reference check fails for the scheduler database. |
| | Scheduler Database Check Passed | Occurs when the Scheduler Database check is completed successfully. |
| | Scheduler Database Check Passed with Warnings | Occurs when the Scheduler Database check generates warnings. |
| | Scheduler Database Compacted | Occurs when the database compact action is completed successfully for the Scheduler Database. |
| | Scheduler Database Compaction Failed | Occurs when the database compact action fails for the Scheduler Database. |
| **Stats Collection** | Cache Too Small | Occurs when cache memory is running low for the Statistics Manager; this would result in the process running slowly. |
| | Cannot Accept Records | Occurs when the Statistics Manager refuses to accept data from other processes. |
| | Lost Server | Occurs when the Statistics Manager discards the I/O data collected for a server on polling timeout. |
| | Stats Manager Ready | Occurs when NetVault Backup starts the Statistics Manager. |

# Viewing event logs

*To view event logs*

1 In the Navigation pane, click **View Events**.

2 On the **View Events** page, you can view the following information:

- **Date:** Date and time when the event was raised
- **Class**: Event class
- **Event**: Event type
- **Message:** Detailed log message or description

3 To sort the logs by any column, click the heading of the column. The arrowhead next to the column header name indicates the sort order (up for ascending order and down for descending). To reverse the sort order, click the column heading again.

By default, the logs are sorted by **Date**.

4 To stop or resume live updates, click the Pause/Resume button  .

5 To perform a logs-related task, click the corresponding button in the Operations pane. Alternatively, click a link in the Navigation pane to open a different page.

# Setting event log filters

*To set event log filters*

1 In the Navigation pane, click **View Events**.

2 On the **View Events** page, click **Filter**.

3 In the **Set Event Filter** dialog box, configure the settings that you want to use.

**Table 3. Log filter options**

| Filter option | Description |
|---|---|
| **From** | Select one of the following options:<br>• **First Event:** To start from the first event, select this option.<br>— or —<br>• **Specific Time:** To start from specific date and time, select this option, and do the following:<br>Type the start date, or click the calendar button, and select the start date.<br>Type the start time, or click the button next to the box, and select the start time. |
| **To** | Select one of the following options:<br>• **Last Event:** To list up to the last event, select this option.<br>— or —<br>• **Specific Time:** To list up to specific date and time, select this option, and do the following:<br>Type the start date, or click the calendar button, and select the start date.<br>Type the start time, or click the button next to the box, and select the start time. |

**Table 3. Log filter options**

| Filter option | Description |
|---|---|
| **Classes** | By default, all event classes are selected. To remove log messages for a particular category, clear the check box for it. |
| **Only display event containing text** | To display log messages that contain a particular string, type the filter string. |

4 Click **Filter** to set the filter, and close the dialog box.

5 To clear the filter settings, click **Clear Filter** on the **View Events** page.

# Using global notification methods

## About global notification methods

The global notification methods provide different mechanisms for sending notifications when an event occurs. The available methods include the following:

- **Sysop Email:** Use this method to send an email notification to the Administrator when the event occurs.
- **Print Report**: Use this method to generate a report when the event occurs.
- **Run a Job**: Use this method to run a job when the event occurs.
- **SNMP Trap**: Use this method to send SNMP traps (notification) to a network manager host when the event occurs.

  The Simple Network Management Protocol (SNMP) provides a method to monitor and control the network devices on TCP/IP-based networks. An SNMP trap is a notification (message) sent from a managed device to the network management host when a significant event occurs. The event does not have to be an outage, a fault, or a security violation. The SNMP Trap method allows the administrator to monitor the NetVault Backup events from an SNMP-based network management interface as a part of the network management operations.

## Setting up a global notification method

*To set up a global notification method*

1 In the Navigation pane, click **Configure Notifications**.

2 On the **Editing Global Notification Profile** page, open the event class, and then open the event type that you want to be notified about.

3 Select the notification method that you want to use. NetVault Backup offers the following global notification methods:

**Table 4. Setting up global notification method**

| Notification method | Description |
|---|---|
| **Sysop Email** | Select this method to send an email notification to the Administrator (Sysop) when the event occurs.<br>Before you can use this method for sending notifications, you must configure the Outgoing Email Server (SMTP) settings and the SysOp email address from the **Change Settings** link. For more information, see the following sections:<br>• Configuring email server settings for notifications<br>• Configuring SysOp email ID for notifications |
| **Print Report** | Select this method to generate a report when the event occurs.<br>To use this method on Windows-based machines, you must do one of the following:<br>• Configure a default printer. For more information, see Configuring a default printer for notifications.<br>The Print Report method uses this printer for all events.<br>• Alternatively, set the variable NVPRINTER in the **Notification method** box:<br>`NVPRINTER=<Printer URL>`<br>The Print Report method uses for an individual event. You can use the variable NVPRINTER to override the default printer setting for an individual event. |
| **Run a Job** | Select this method to run a NetVault Backup job when the event occurs.<br>To use this method, you must do the following:<br>• Create the job that you want to run when the event occurs<br>• Set the JOBID variable in the **Notification method** box:<br>`JOBID=<Job ID for the job that you want to run>` |
| **SNMP Trap** | Select this method to send SNMP traps (notification) to a network manager host when the event occurs.<br>Before you can use this method for sending notifications, you must complete the following configuration tasks:<br>• Copy the file **nvnotifications.mib** to the **".mib"** files directory on the host system running the network management software.<br>The **".mib"** (Management Information Base) file describes the format of SNMP Traps that NetVault Backup sends. You can find **nvnotifications.mib** in <NetVault Backup home>\etc on Windows and <NetVault Backup home>/etc on Linux. For more information about the location of the **".mib"** files on the host, see the relevant network management software documentation.<br>• Configure the network manager host settings from the **Change Settings** link. For more information, see Configuring network manager host settings for notifications. |

4 Click **Save** to save the global notification profile.

# Using custom notification methods

## About custom notification methods

Custom Notification Methods are created using external scripts, and typically used to perform some task when an event occurs in the NetVault Backup system.

The script file contains a header and body. The header specifies the script name and provides a brief description about the script. The script body contains the commands. You can use any text editor to create the script file. After creating the script, save it in the **global** subdirectory in the **scripts** directory (<NetVault Backup home>\scripts\global on Windows and <NetVault Backup home>/scripts/global on Linux).

Only users with good knowledge of scripting using NetVault Backup executable files and environmental variables should use this feature.

## Creating a custom notification method

*To create a custom notification method*

1 Open a new script file in a text editor.

2 Create the script header:

- Specify the method name on the first line. Enclose the name within the NVNAMESTART and NVNAMEEND tags.

  On Linux and UNIX platforms, specify the interpreter name on the first line of the script (for example, #!\bin\sh).

- To include a description about the script, enclose the text within the NVCOMMENTSTART and NVCOMMENTEND tags. You can use multiple lines of text. Script description is optional.

- Begin each header line with a REM tag on Windows and the "#" character on Linux and UNIX to mark the line as a comment.

  **Example (Windows):**

  ```
  REM NVNAMESTART My Custom MethodNVNAMEEND

  REM NVCOMMENTSTART Start a new

  REM occurrence of this event.

  REM NVCOMMENTEND
  ```

3 Create the script body and specify the syntax for the commands. You can open the NetVault Backup scripts in the **util** directory using any text editor to view the proper structure and use them as a template for custom scripts.

  To use NetVault Backup scripts residing in the **scripts** directory, provide the complete path:

- **Windows:** `%NVHOME%\scripts\<command>`
- **Linux and UNIX:** `$NVHOME/scripts/<command>`

  Verify that the script has a valid exit status.

4 Save the script:

- On Windows, assign **".bat"** extension and save the file in <NetVault Backup home>\scripts\global.
- On Linux, assign **".sh"** extension and save the file in <NetVault Backup home>/scripts/global.

# Setting up a custom notification method

*To set a custom notification method*

1. In the Navigation pane, click **Configure Notifications**.
2. On the **Editing Global Notification Profile** page, open the event class, and then open the event type that you want to be notified about.
3. Select the custom notification method.
4. In the **Notification Method** box, set the environment variables:
   - To specify multiple arguments, you can use a Comma (“,”), Carriage Return (CR), or Line Feed (LF) as a delimiter.

     **Example: Comma as a delimiter**

     ```
     ARG0=NVTEST.NV_Test_SP_v2, ARG1=1, ARG2=NETVAULT, ARG3=NVRelease, ARG4=1,
     ARG5=1, ARG6=p_return_msg, ARG7=p_status
     ```

     **Example: CR or LF (that is, a new line) as a delimiter**

     ```
     ARG0=NVTEST.NV_Test_SP_v2

     ARG1=1

     ...

     ARG7=p_status
     ```
   - To include special characters in the value string, use the Exclamation Mark (“!”) escape character:
     - To specify Comma (“,”) in the value string, enter “!,”
     - To specify Exclamation Mark (“!”) in the value string, enter “!!”
     - To specify Equals (“=”) in the value string, enter “!=”

     You cannot use Escape characters in the name string.
5. Click **Save** to save the global notification profile.

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# Using canned reports



## About canned reports

Canned reports are predefined reports that provide information about the backup and restore jobs, storage devices, clients, media utilization, and other aspects of NetVault Backup. These reports use built-in template files that determine the content, layout, and format of the report. You can find the report templates in <NetVault Backup home>\reports\templates on Windows <NetVault Backup home>/reports/templates on Linux.

NetVault Backup lets you generate and view canned reports in the following formats:

- HTML
- Text
- Comma Separated Value (CSV)

The reporting functionality is integrated with the event notification system. You can configure user-defined events for a report job and receive notifications when a job completes successfully or fails. NetVault Backup adds these events to the event class **Report Job**. You can use this feature to send reports as email attachments to the Administrator and other NetVault Backup users.

## Generating a canned report

*To generate a canned report*

1 In the Navigation pane, click **View Reports**.

2 On the **View Reports** page, select the report.

3 To specify a Schedule Set or create user-defined events for the job, click **Edit Report**.

On the **Edit Report Job Definition** page, configure the following options.

**Table 1. Edit report job definition**

| Option | Description |
|---|---|
| **Schedule** | Select an existing Schedule Set, or click **Create New**, and configure the schedule type and schedule method. For more information, see Creating a Schedule Set.<br>The predefined set **"Immediate"** is selected by default. To run the job as soon as it is submitted, use this set. |
| **Report Completed Event** | Specify the event that you want to raise when the job completes successfully. |
| **Report Failure Event** | Specify the event that you want to raise when the job fails. |

Click **Save**, and in the **Save Report Job** dialog box, click **OK**.

The configured events are added to the event class **Report Job** when you save the job. To receive a notification when an event occurs, set up a notification method for the event. For more information, see the Setting up a global notification method.

> **NOTE:** To send a report as an email attachment to the Administrator, set up the Sysop E-mail notification method. For more information, see Setting up a global notification method. To send a report as an email attachment to any other user, set up a notification profile for that user. For more information, see Setting up user notification profile.

4 To run the report, click **Run & View**.

— or —

To raise the associated events and receive a notification, click **Run and Notify**.

5 If the report includes any filter conditions (for example, start date, job ID, client name, and others), the **Set filters for report** dialog box is displayed.

Set the filters that you want to use. For more information, see Setting filters for report.

Click **OK**.

6 The report is displayed in a new browser window.

# Setting filters for report

When you run a canned report that includes any filter conditions, the **Set filters for report** dialog box is displayed. You can set one or more conditions, based on which the Reporting system generates the output. For each filter field that you want to use, you must select the filter operator and specify the comparison value.

### *To set report filters*

1 In the list corresponding to the filter field, select the comparison operator. You can use the following comparison operators: =, !=, >, <, >= or <=.

2 In the associated box, type the comparison value. The value must match the field data type. The field data type can be date, integer, string, or time.

To specify date values, you can use the following formats:

- YYYY/MM/DD
- YYYYMMDD
- Relative date: `TODAY-n[time variable]`

  The time variable can be: YE = Year, MO = Month, WE = Week, DA = Date, HO = Hour, MI = Minute, SE = Second.

  **Example:** `TODAY-7DA`.

To specify time values, you can use the following formats:

- HH:MM:SS
- HHMMSS
- Relative time: `NOW-n[timevaribale]` or `TODAY-n[time variable]`

  The time variable can be: YE = Year, MO = Month, WE = Week, DA = Date, HO = Hour, MI = Minute, SE = Second.

  **Example:** `NOW-12HO`.

3 Some reports may include the following additional options:

- **State:** You can select this check box to compare the field state as opposed to the value it contains. The field state comparison option is designed for advanced users who have a good understanding of the NetVault Backup Reporting system.

  The field status can be:

  - Normal
  - N/A
  - Unknown
  - Never
  - Unlimited

  For example, you can specify the state **Unknown** to find or exclude records that are not available in one of the tables.
- **Regexp:** You can select this check box to match a regular expression instead of a constant value. The expression can contain text and wildcard characters.
- **As above:** The **As above** check box is shown when the same filter field is applied to multiple report components. You can select this check box to use the same comparison value that is configured for the preceding field.

4 After setting the filters, click **OK** to close the dialog box.

# Available canned reports

NetVault Backup offers the following types of canned reports.

**Table 2. Canned reports**

| Report title | Description |
|---|---|
| Client Details | Displays the client details. The report shows the following information: client name, machine ID, client type, description, NetVault Backup version, NetVault Backup Release, client accessibility status, and client status (up or down). |
| Client Groups | Provides a list of client groups. The report shows the following information: group name, group description, if the all clients are members of the group, and group members. |
| Client Statuses | Displays the status of clients. The report shows the following information: client name, NetVault Backup version, client accessibility status, and client status (up or down). |
| Data Stored By Client | Displays client-wise list summary of backups performed during the specified period. The report includes client name, transfer size, start date, start time, end date, end time, run length, and plug-in name. |
| Disk Storage Devices — General | Provides a list of disk-based storage devices added to the NetVault Backup Server. The report shows the following information: device name, host name, media group, status, licensed protected capacity, actual protected capacity, space used in staging, space used in deduplication store, and total space available. |
| Expired Offline Media | Provides a summary of retired offline media that can be reused. |
| Failed ULA Requests | Provides a summary of failed user requests for the specified period. |
| Full Online Storage | Provides a list of online storage devices that are full. |
| Global Notifications | Provides a list of events included in the global notification profile. The report shows the following information: event class, event type, notification method, and environment variables. |

**Table 2. Canned reports**

| Report title | Description |
|---|---|
| Historic Jobs — by date | Displays date-wise summary of jobs performed during the specified period. The report includes job ID, transfer size, run length, job completion status and other details. |
| Historic Jobs — by size | Displays size-wise summary of jobs performed during the specified period. The report includes job ID, transfer size, run length, job completion status and other details. |
| Historic Jobs Duration — by date | Displays date-wise summary of jobs performed during the specified period. You can use this report to filter jobs based on the run length. The report includes start date, start time, run length, job ID, instance Id, transfer size, and other details |
| Historic Jobs Encrypted — by date | Provides date-wise summary of encrypted primary or secondary backups performed during the specified period. The report includes start time, start date, run length, job title, job ID, instance ID, client name, selection set, transfer size, exit status, enable encryption, and encrypt secondary copy. This report does not list jobs performed without encryption. |
| Historic Jobs Encrypted — by size | Provides size-wise summary of encrypted primary or secondary backups performed during the specified period. The report includes start time, start date, run length, job title, job ID, instance ID, client name, selection set, transfer size, exit status, enable encryption, and encrypt secondary copy. This report does not list jobs performed without encryption. |
| Historic Jobs Failed — by date | Provides date-wise summary of jobs that failed during the specified period. The report includes start time, start date, run time, job title, job ID, instance ID, client name, selection set name, transfer size, and exit status. |
| Historic Jobs Successful — by date | Provides date-wise summary of jobs that completed successfully during the specified period. The report includes start time, start date, run time, job title, job ID, instance ID, client name, selection set name, transfer size, and exit status. |
| Historic Jobs Warnings — by date | Provides date-wise summary of jobs that completed with warnings during the specified period. The report includes start time, start date, run time, job title, job ID, instance ID, client name, selection set name, transfer size, and exit status. |
| Job Definitions | Provides user-wise summary of backup, restore, and report jobs:<br>• The **Backup Job Definitions** component shows the following information: job ID, job title, client name, policy name, plug-in name, Schedule Set, Backup Target Set, Advanced Options Set, Backup Selection Set, Backup Options Set, and Creator ID (NetVault Backup User).<br>• The **Restore Job Definitions** component shows the following information: job ID, job title, client name, policy name, plug-in name, Schedule Set, Advanced Options Set, Restore Selection Set, Restore Options Set, and Creator ID (NetVault Backup User).<br>• The **Report Job Definitions** component shows the following information: job ID, job title, client name, policy name, Schedule Set, and Creator ID (NetVault Backup User).<br>**NOTE:** The canned reports always run in the context of “default” user. |
| Library Contents | Displays a summary of online media items. The report includes the current location (whether a piece of media is in a drive or slot in a library), used space and available space on the media. |
| Media General | Provides a summary of used media items. The report includes the current location, used and available space, saveset expiry date, and other details. |
| Media Quotas and Usage | Provides a summary of used and assigned media quota for each user. |

**Table 2. Canned reports**

| Report title | Description |
|---|---|
| Monthly Job Summary | Provides a summary of jobs performed during the given month. The report shows amount of data stored, number of jobs that completed successfully, number of jobs that failed, and number of jobs that completed with warnings. Additionally, the report shows the details of active jobs and jobs that failed during the period. |
| NDMP Jobs | Displays a summary of NDMP filer backups. The report includes Job ID, title, start time, run length, client name, transfer size and the job completion status. |
| NetVault Error Logs | Provides a list of error log messages generated during a specified period. The report shows the following information: date, time, client name, job ID, instance ID, message, and warning level. |
| NetVault Events | Provides a list of events raised during a specified period. The report includes the following information: date, time, event type, event class, event description, and event message. |
| NetVault Logs | Displays system log messages generated during the specified period. The report includes job ID, event class, warning level, time, date, client, and message. |
| NetVault Logs — Most Recent | Displays system log messages generated during the specified period.<br>This report only reads logs for recent two days, and thus improves the time taken to generate the output and amount of system memory used while generating the output. The report includes job ID, event class, warning level, time, date, client, and message. |
| Offline Devices | Provides a list of devices that are currently offline. |
| Overnight Duplication Job Summary | Provides a summary of overnight duplication jobs. The report includes the total amount of data written, the number of successful jobs, failed jobs and jobs completed with warnings |
| Overnight Job Summary | Provides a summary of overnight jobs. The report includes the total amount of data written, the number of successful jobs, failed jobs and jobs completed with warnings. |
| Policies Summary | Provides a summary of policy backups performed during the specified period. The report includes policy name, number of clients and jobs, policy status, list of clients, number of failed jobs, number of jobs completed with warnings, and details of failed jobs. |
| Restore Summary | Provides a summary of restore jobs. The report includes job ID, target client, job completion status, and other details. |
| Server Daily Summary | Provides a summary of backups and backup media. The report includes the following components:<br>• Jobs in Progress<br>• Jobs Status Check (jobs that failed)<br>• Jobs Completed with Warnings<br>• Jobs Completed OK (jobs that completed successfully)<br>These Job components show the following details: client name, job title, policy name, start date, start time, end date, end time, run length, transfer rate, transfer size, and exit status.<br>• The Media component shows the following details: media barcode, media group, media expiry date, media expiry time, media label, physical slot position, marked for reuse, space left, and space used. |
| Server License — Capabilities and Usage | Displays available and used licenses for NetVault Backup. |
| Single Job Summary | Displays job details, drive events, media transfer details, logs, and media used for a single job. |

**Table 2. Canned reports**

| Report title | Description |
|---|---|
| Single Policy Summary | Displays policy status, target clients, job details, number of failed jobs, transfer size, and transfer rate for a single policy. |
| Single User's Audit Trail | Displays the audit log messages generated for a particular user. The output can be further filtered for a specific period. |
| Storage Contents Query | Provides a summary of data stored on individual media items and NetVault SmartDisk devices. The report includes job title, plug-in name, saveset expiry date, and other details. The filter criteria include client name, media label, media group, job title, plug-in name. |
| Storage Segment Contents Query | Provides a summary of data stored on each segment. The report includes plug-in name, job title, client name, and other details. |
| Storage Utilization | Displays the storage utilization statistics for devices controlled by the NetVault Backup Server. The report includes a summary of used media, count of blank media items, and storage space statistics for NetVault SmartDisk devices. |
| Storage Utilization — RAS | Displays the storage utilization statistics for disk-based storage devices. The report shows device name, media group, space used, space available, and other details. |
| User Details | Displays the details of NetVault Backup users. |
| User Notifications | Provides a list of all events that have been included in any user notification profile. |
| User Privileges | Provides a list of privileges granted to individual users. |
| User-Defined Event Types | Provides a list of all user-defined events. |
| Weekly Job Summary | Provides a summary of jobs performed during the given week. The report shows number of jobs that completed successfully, number of jobs that failed, and number of jobs that completed with warnings. Additionally, the report shows the details of active jobs and the jobs that failed during the period. |
| Workstation Client failed jobs | Provides a list of failed backups jobs for Workstation Clients. |
| Workstation Client Jobs — by client | Displays client-wise summary of Workstation Client backup jobs. |
| Workstation Client Jobs — by date | Displays date-wise summary of Workstation Client backup jobs (latest first). |
| Workstation Client successful jobs | Provides a list of successful backup jobs for Workstation Clients. |
| Workstation Client Inactive for a Week | Provides a list of Workstation Clients that have not had a backup attempted for more than seven (7) days. This report can be used to determine which Workstation Clients have not connected to the network where the NetVault Backup Server resides long enough for a backup to occur. It helps you to identify the workstation data that may be at risk by not being protected for long-term retention or disaster recovery. |

# Additional notes

## Unknown values in the Storage Contents Query and Storage Segment Contents Query reports

- In the Storage Contents Query and Storage Segment Contents Query reports, the following columns are not applicable to a NetVault SmartDisk. These fields show the value “Unknown” in the entries related to a NetVault SmartDisk.

  **Table 3. Storage contents reports: Columns not applicable to a NetVault SmartDisk**

  - Barcode
  - Media expiry date
  - Media expiry time
  - Write errors
  - Read errors
  - Media type
  - Format
  - Library ID
  - Media ID
    (NetVault SmartDisk uses Device ID)
  - Segments
  - Space used
  - Space Left
    (NetVault SmartDisk uses Total Space Available)
  - Data Written
    (NetVault SmartDisk uses Transfer Size)
  - Data Read
    (NetVault SmartDisk uses Transfer Size)

- The following fields are not related to individual segments or media items. Their values remain the same for all segment entries for a NetVault SmartDisk:
  - Space Used in Staging (displays 0B if deduplication is enabled)
  - Space Used by Dedupe Store
  - Total Space Available
- When you select the **Delete Auto-Generated Backup Jobs on Completion** option for the Plug-in for NDMP backups, the plug-in deletes all the subjob details from the NetVault Database, including the transfer statistics for the jobs. As a result, the following fields are displayed as “Unknown” in the entries related to these backups.

  **Table 4. Storage contents reports: Columns not applicable to a NetVault SmartDisk**

  - Start date
  - Start time
  - End date
  - End time
  - Backup type
  - Filer
  - Transfer size
  - Transfer rate
  - Exit status
  - For job type
  - Type
  - Run length

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# Working with client clusters



## About client cluster support

NetVault Backup offers cluster-aware versions of various plug-ins that enable data protection for distributed data. These plug-ins require Cluster Support License Keys. The cluster nodes are grouped into a Virtual Client on which the cluster-aware plug-in is installed. The backups and restores of cluster nodes are performed through the virtual client.

The following table lists the NetVault Backup plug-ins that can be used in a cluster setup.

**Table 1. Cluster-aware NetVault Backup Plug-ins**

| Plug-in | Description |
|---|---|
| Dell NetVault Backup Plug-in for FileSystem | This plug-in is shipped with the NetVault Backup software and can be used to back up the shared file system data on the following platforms:<br>• Windows Server Clusters<br>• Linux Clusters<br>• Sun Clusters (Solaris SPARC)<br>For more information about the supported cluster software versions, see the *Dell NetVault Backup Compatibility Guide*. You can download this guide from https://support.software.dell.com/.<br>A default installation of NetVault Backup does not require licensing of its native Plug-in for FileSystem. However, to use this plug-in a cluster setup, a File System Cluster Support license key is required. |
| Dell NetVault Backup Plug-in for Exchange | This plug-in can be deployed in an Exchange Server Single Copy Cluster (SCC)/Failover Cluster or Cluster Continuous Replication (CCR) setup to back up the distributed Exchange Server data. For more information, see the *Dell NetVault Backup Plug-in for Exchange User's Guide*. |

**Table 1. Cluster-aware NetVault Backup Plug-ins**

| Plug-in | Description |
|---|---|
| Dell NetVault Backup Plug-in for Oracle | This plug-in can be used in Oracle's Real Application Clusters (RAC) setup to back up the distributed Oracle database. For more information, see the *Dell NetVault Backup Plug-in for Oracle User's Guide*. |
| Dell NetVault Backup Plug-in for SQL Server | This plug-in can be used in an SQL Server Failover Cluster setup to back up the distributed SQL Server database. For more information, see the *Dell NetVault Backup Plug-in for SQL Server User's Guide*. |

# Virtual clients

A virtual client is created when you install a cluster-aware plug-in. All nodes in a cluster are grouped to form a virtual client.

A virtual client is managed like any other NetVault Backup Client. It can be browsed and added to client groups and policies, granted user access, and included in reports. The NetVault Backup Server administers the creation and configuration of a virtual client. The cluster-aware version of the plug-in runs locally on the cluster nodes and the data is processed locally. A cluster node configured as a SmartClient sends data directly to the locally attached storage device.

# Configuring tape devices in cluster environment

In a cluster setup, a backup device can be connected in different ways. This section describes the pros and cons of some of the device configuration methods.

- **Connecting a device to the NetVault Backup Server or Client:** This type of configuration allows the control of a robotic arm. However, during backups and restores, the data is transferred over the network.
- **Sharing drives:** A derivative of the previous method can be used by connecting the physical library to the NetVault Backup Server, thus, giving it the control of the robotic arm, and sharing the drive with the cluster nodes. This configuration allows the control of the robotic arm and at the same time enables local data transfers.

  This configuration offers high drive availability. With all cluster nodes sharing the control of drives, the drives are always available. However, the cluster node that currently controls the drive does not need to be the node that currently controls the cluster.
- **Connecting a device to a cluster node:** This configuration offers the fastest method of data transfer as the data is routed directly to a locally attached device.

  However, the disadvantage is that the robotic arm cannot be controlled by a machine within the cluster, limiting the device type usage for this type of configuration to standalone drives. Moreover, the drive becomes unavailable when the cluster node is down.

# Installing a cluster-aware plug-in

## Prerequisites

Before you start the installation procedure for a cluster-aware plug-in, verify that the following requirements are met:

- **Install NetVault Backup Server**: Install the NetVault Backup Server software on the designated machine. The server must be a separate machine outside the cluster setup. For instructions on installing the server software, see the *Dell NetVault Backup Installation Guide*.
- **Install the NetVault Backup Client:** Install the NetVault Backup Client software on the individual cluster nodes. For instructions on installing the client software, see the *Dell NetVault Backup Installation Guide*.
- **Add NetVault Backup Clients:** Add the clients to the NetVault Backup Server. For information about adding a client, see Adding clients.
- **Copy the installation file:** Copy the **".npk"** installation file for the cluster-aware plug-in to the NetVault Backup Server. The path to copy the file is <NetVault Backup home>\packages\standard on Windows and <NetVault Backup home>/packages/standard on Linux. The installation file for the Plug-in for FileSystem (for the Server operating system) is already available in this directory. You can also copy the installation files to subdirectories in the **standard** directory.

## Installation procedure

*To install a cluster-aware plug-in*

1. In the Navigation pane, click **Manage Clients**.
2. On the **Manage Clients** page, and click **Add Virtual Client**.
3. On the **Virtual Client** page, provide the following information:
   - In **Virtual Client Name**, type a name for the virtual client. The name must be unique. Spaces are not recognized in a virtual client name and are replaced with an underscore ("_") character. The virtual client name cannot be changed once it is configured.
   - In **Virtual Client Address**, type the IP address for the cluster application.
   - In the Package list, select the installation file for the plug-in. This list contains all the cluster-aware **".npk"** files copied to the packages directory and its subdirectories The following table provides the filenames for the installation files. Here **x-x- x-x** represents the version, build, and platform numbers.

**Table 2. Installation files for cluster-aware plug-ins**

| Option | Description |
|---|---|
| Plug-in for FileSystem (for Windows) | win-x-x-x-x.npk |
| Plug-in for FileSystem (for Linux) | nvf-x-x-x-x.npk |
| Plug-in for FileSystem (for Solaris (SPARC)) | nvf-x-x-x-x.npk |
| Plug-in for Exchange | exs-x-x-x-x.npk |
| Plug-in for Oracle | ora-x-x-x-x.npk |
| Plug-in for SQL Server | sql-x-x-x-x.npk |

- To add a cluster node to the virtual client, select it in the **Available Clients** table, and click the Add button to the left of the item. The selected client is moved to the **Chosen Clients** table.
- To remove a cluster node from the virtual client, select it in the **Chosen Clients** table, and click the Remove button to the left of the item. The selected client is moved to the **Available Clients** table.

4 Click **Create Virtual Client**.

The NetVault Backup Server starts installing the plug-in on the selected cluster nodes. This process overwrites the standard version of the same plug-in installed on the cluster nodes. However, you can use the cluster-aware version to perform backups of the local non-shared data. When the installation completes, the virtual client is added to the NetVault Backup Clients table on the Manage Clients page.

## Upgrading a cluster-aware plug-in

*To upgrade a cluster-aware plug-in*

1 Remove the virtual client that was created with the previous version of the plug-in. For more information about removing a virtual client, see Removing a virtual client.

2 Create a new virtual client using the upgraded version of the cluster-aware plug-in. For more information about installing the plug-in, see Installing a cluster-aware plug-in.

You must assign the old virtual client's name to the new virtual client. If you change the name for the new virtual client, you cannot run the jobs that were defined for the old virtual client.

# Configuring a cluster-aware plug-in

The configuration procedure for a cluster-aware plug-in includes the steps outlined in the following sections:

- Configuring the preferred network address
- Configuring default settings

## Configuring the preferred network address

A cluster node has at least two network addresses:

- **Public IP Address**: The address that is used by machines outside the cluster to communicate with cluster nodes.
- **Private IP Address:** The address that is used by a cluster node to communicate with other machines within the cluster.

For each cluster node, you must configure the machine's public IP address as the "Preferred Network Address" for the node.

*To configure the preferred address for a cluster node*

1 Obtain the IP address for the cluster node.

You can use the **ifconfig** utility on Linux and UNIX and the **ipconfig** utility on Windows to complete this step.

2 In the Navigation pane, click **Change Settings**.

3 On the **Configuration** page, click **Client Settings**. In the clients table, select the target client, and click **Next**. The **Client Settings** page appears.

4 Under **Services**, click **Network Manager**.

5 In the **Network Manager** dialog box, specify the preferred network address for the cluster node in the corresponding box.

6 Click **Apply** to apply the new settings and close the dialog box.

7 Repeat steps 1 through 6 for each cluster node.

## Configuring default settings

*To configure the default settings for a cluster-aware plug-in*

1 In the Navigation pane, click **Create Backup Job**, and then click the **Create New** button next to the Selections list.

2 On the **NetVault Backup Selections** page, double-click the NetVault Backup Server. In the list of plug-ins, select the cluster-aware plug-in, and in the **Actions** list, click **Configure**.

> **NOTE:** The default settings for a cluster-aware plug-in can only be set from the **NetVault Backup Selections** page. For cluster-aware plug-ins, configuring these options from the **Change Settings** link is not supported.

3 In the **Configure** dialog box, set the required options. The configuration options for the cluster-aware version are the same as the standard version of the plug-in. For more information about these options, see the relevant plug-in user's guide.

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

These settings are stored on the NetVault Backup Server in configuration files specific to the virtual client, and applied during backups and restores of shared data performed through the virtual client.

# Managing virtual clients

This section includes the following topics:

- Modifying a virtual client
- Checking access to a virtual client
- Locating the real client
- Removing a virtual client

## Modifying a virtual client

Once a virtual client is created, you can add or remove the cluster nodes or change the IP address for the cluster application.

*To modify a virtual client*

1 In the Navigation pane, click **Manage Clients**.

2 In the list of NetVault Backup Clients, select the target virtual client, and click **Manage**.

3 On the **Virtual Client** page, modify the applicable settings:

- To modify the IP address for the cluster application, type the new address in **Virtual Client Address**.
- To add a cluster node to the virtual client, select it in the **Available Clients** table, and click the Add button to the left of the item. The selected client is moved to the **Chosen Clients** table.

- To remove a cluster node from the virtual client, select it in the **Chosen Clients** table, and click the Remove button to the left of the item. The selected client is moved to the **Available Clients** table.

4 To save the modified settings, click **Save Virtual Client**.

# Checking access to a virtual client

For a backup or restore job to complete successfully for a virtual client, at least one member client must be online and active.

*To check the current status of a virtual client*

1 In the Navigation pane, click **Manage Clients**.

2 In the list of NetVault Backup Clients, select the target virtual client, and click **Manage**.

3 On the **Virtual Client** page, click **Check Access**.

NetVault Backup tries to connect to each member of the virtual client, and returns a message indicating the current accessibility status of the member clients.

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

# Locating the real client

*To determine the machine that is currently in control of the cluster application*

1 In the Navigation pane, click **Manage Clients**.

2 In the list of NetVault Backup Clients, select the target virtual client, and click **Manage**.

3 On the **Virtual Client** page, click **Current Real Client**.

In the dialog that appears, the NetVault Backup name of the controlling node is shown.

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

# Removing a virtual client

*To remove a virtual client*

1 In the Navigation pane, click **Manage Clients**.

2 In the list of NetVault Backup Clients, select the target virtual client, and click **Manage**.

3 On the **Virtual Client** page, click **Remove**.

4 In the **Confirm** dialog box, click **Remove**.

When you remove a virtual client, the cluster nodes added as NetVault Backup Clients are not removed from the server. However, it removes the ability of the plug-in to back up the cluster data.

# Backing up data using a cluster-aware plug-in

The procedure for performing backups using the Plug-in for FileSystem is similar for both the standard and virtual clients. The cluster-aware version of the plug-in can be used in the same manner as the standard version to select the data items. However, when you open the virtual client node on the **NetVault Backup Selections** page, only the cluster-aware plug-in is listed under the node. The plug-in displays both the shared and local drives and mount points in the selection tree. You must make a note of the drive letter or mount point for the shared resource and select the data accordingly. The backup options that can be set for the standard version are also available with the cluster-aware version.

For information about backing up data in the Exchange Server Clustered environment, Oracle RAC setup, and SQL Server Failover Cluster, see the relevant plug-in user's guide.

**Additional notes:**

- While backing up cluster data using a virtual client, only the LUNs owned by the active node are backed up; LUNs owned by passive nodes are not backed up.
- In an Active/Active cluster setup, the NetVault Backup Server may start a backup on a secondary node even if the "primary only" option is selected for the backup. In such cases, the backup is redirected to the primary node, but the server only communicates with the secondary node to which it sent the message to start the backup. If the secondary node becomes unavailable while the backup is in progress, the server loses communication with the parent process running on this client. This process is not restarted even if the secondary node becomes available immediately. Consequently, the backup job becomes unresponsive.

## Cluster failover during backups

If a failover occurs during a backup, the job is aborted and the status "Job Failed" is returned. You can use the **Job Retry** scheduling option to run the job again after the failover completes.

With the Plug-in for FileSystem, when a failover occurs on Windows, the reason for the failover has a direct bearing upon the status of the aborted job:

- If the machine in control of the cluster resources goes offline during a backup, the job is aborted and the status "Job Failed" is returned. You can use the job retry feature to run the backup again.
- If the machine in control of the cluster remains online but the actual cluster resource that is being backed up fails, the job is aborted and the status "Backup Completed with Warnings" is returned. The scheduled job retries do not work for such jobs. In this scenario, examine the job logs to find the missing data or run the job again to back up the data.

# Restoring data using a cluster-aware plug-in

The procedure for performing restores using the Plug-in for FileSystem is similar for both the standard and virtual clients. The backups are restored from the virtual client node and not the actual client node. When you submit a restore job, the plug-in communicates with the cluster service to determine the controlling node and targets this machine for the restore.

For information about restoring data in the Exchange Server Clustered environment, Oracle RAC setup, and SQL Server Failover Cluster, see the relevant plug-in user's guide.

# Viewing logs and job status

When you back up a virtual client, the data is backed up from a single client and it is accessed from the controlling node. For cluster backups and restores, the virtual client name is displayed on the **Job Status** page and the actual client name is displayed on the **View Logs** page.

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# Configuring default settings for NetVault Backup

# About configuring default settings

NetVault Backup runs with some default settings that can be customized to suit your environment. You can view and modify these settings from the **Change Settings** link in the Navigation pane. The default settings are available for the following services and components.

**Table 1. Client and server settings**

| Group | Setting |
|---|---|
| Plugins | • Encryption<br>• Plugin Options<br>• Script<br>• Verify |
| Services | • Job Manager<br>• Logging Daemon<br>• Media Manager<br>• Network Manager<br>• Process Manager<br>• Schedule Manager<br>• Web Service |
| System and Security | • Auditing<br>• Firewall<br>• General<br>• Security<br>• Time Sync |
| User Interface | • Notification<br>• Reporting<br>• Trace Level |

**NOTE:** You can also view and modify the default settings for NetVault Backup from the **Manage Clients** link. In the **Navigation** pane, click **Manage Clients**. In the NetVault Backup Clients list, select the client, and click **Manage**. On the **View Clients** page, click **Configure**.

# Configuring encryption settings

NetVault Backup offers two encryption products:

- NetVault Backup Plug-in for Standard Encryption (Plug-in for Standard Encryption)
- NetVault Backup Plug-in for Advanced Encryption (Plug-in for Advanced Encryption)

These plug-ins provide support for CAST-128, AES-256, and CAST-256 algorithms to meet regulatory backup security requirements. You can install these plug-ins on the NetVault Backup Server or Clients to perform encrypted backups for that machine.

To use the encryption plug-ins, you must configure the default settings. These settings specify the encryption algorithm and encryption key that you want to use. For more information about configuring the default settings for encryption, see the *Dell NetVault Backup Plug-in for Standard Encryption User's Guide* or *Dell NetVault Backup Plug-in for Advanced Encryption User's Guide*.

# Configuring plug-in options

This section includes the following topics:



# About plug-in options

The plug-in options specify the default settings for the built-in and licensed plug-ins installed on a NetVault Backup machine. You can configure the plug-in options from the **Change Settings** or **Create Backup Job** links. The default settings for various plug-ins are covered in the respective plug-in user's guide.

This section covers the default settings for the Disk Devices Plug-in and **nvjobstart** utility.

# Configuring default options for Disk Devices Plug-in

NetVault Backup uses the Disk Devices Plug-in to create Virtual Tape Libraries (VTLs). VTLs emulate tape libraries on disk. VTLs are included in NetVault Backup as a licensable option. For more information, see About Virtual Tape Library.

*To configure the default options for the Disk Devices Plug-in*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Plugins**, click **Plugin Options**.

4 In the **Plugin Options** dialog box, under **Disk Devices Plugin**, configure the following options.

**Table 2. Default settings for Disk Devices Plug-in**

| Setting | Description |
|---|---|
| **Allow disk libraries to have entry/exit ports** | To create Virtual Tape libraries that have entry/exit ports (EEPorts), select this check box. |
| **Check available disk space before creating disk libraries** | Before creating a VTL, NetVault Backup performs a disk space check to ensure that the target disk has sufficient space to accommodate the new VTL. On normal file systems you can use the disk space check feature to avoid errors during VTL creation. When creating a VTL on a third-party deduplication appliance or compressed file system, you should disable this feature. |

**Table 2. Default settings for Disk Devices Plug-in**

| Setting | Description |
|---|---|
| **Free disk space margin to be used when calculating available disk space** | The free space required on the disk is calculated as follows:<br>`Number of Slots * Media Capacity + <x>`<br><x> is the additional disk space considered for the following requirements:<br>• Disk space required to create the directory structure for the VTL. This requirement varies for different file systems.<br>• Disk space required by other applications running on the system.<br>The default value is 20MB. To change this requirement, type or select the new value. |
| **Unit used to express the free disk space margin in** | Type or select the unit used to specify disk space margin. The unit can be MB or GB. The default unit is MB. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring default options for nvjobstart

You can use the CLI utility nvjobstart to run a job using its Job ID, phase number, and instance number. For more information about this utility, see the *Dell NetVault Backup Command Line Interface Reference Guide*.

### *To configure the default options for nvjobstart*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Plugins**, click **Plugin Options**.

4 In the **Plugin Options** dialog box, under **CLI**, configure the following setting:

- **nvjobstart Enhanced Job Completion Status:** By default, the **nvjobstart** utility returns the following messages depending on the job exit codes.

**Table 3. Default job exit codes and status messages**

| Exit code | Status message |
|---|---|
| 0 | Job completed successfully |
| 1 | Job failed with error: 'Job Failed'<br>This message is returned for the following job completion states:<br>• Job failed<br>• Job completed with warnings<br>• Job aborted<br>• Job stopped<br>• Job died |

If you select the **nvjobstart Enhanced Job Completion Status** check box, the utility returns the following codes and messages.

**Table 4. Enhanced job exit codes and status messages**

| Exit code | Status message |
|---|---|
| 0 | Job completed successfully |
| 1 | Job Failed |
| 2 | Job Completed with Warnings |
| 3 | Job Aborted |
| 4 | Job Stopped |
| 5 | Job Died |
| -1 | Job Failed with Undefined Error |

**NOTE:** You must configure this option on the NetVault Backup machine on which you run the **nvjobstart** utility.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring default settings for post-scripts

NetVault Backup lets you add user-defined scripts to backup jobs and run the scripts before a job starts or after a job completes. You can use these scripts to perform tasks such as dismounting or shutting down a database before the job starts or mounting or starting the database after the job completes.

By default, the post-script execution is terminated when a job is aborted. You can change this behavior, if necessary.

### *To change the default setting for post-scripts*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Plugins**, click **Script**.

4 In the **Script** dialog box, configure the following setting:

- **Terminate running script on Job Abort:** This check box is selected by default. If you want to continue script execution even when the associated job is aborted, clear this check box.

  This setting applies to all post-scripts defined for the backup, restore, and report jobs performed on the given NetVault Backup Client.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring backup verification settings

With a backup job, you can choose to run the verification phase to check the correctness and completeness of a backup at the end of data transfer. NetVault Backup uses the built-in Verify plug-in to perform the verification phase. The Verify plug-in verifies the stream length written to the media and ensures that no blocks were dropped during backup. While the actual backup runs as Phase 1, backup verification runs as Phase 2 of the backup job.

*To configure backup verification settings*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click **Server Settings**.

3 On the **NetVault Server Settings** page, under **Plugins**, click **Verify**.

4 In the **Verify** dialog box, configure the following settings.

**NOTE:** You must configure these settings on the NetVault Backup Server.

**Table 5. Default settings for Verify plug-in**

| Setting | Description |
|---|---|
| **Always run Verify locally** | By default, the verification phase runs on the NetVault Backup Server. To avoid data transfers over the network, you can choose to run verification locally on the clients to which the device used for backup is attached.<br>This option is globally applied to all clients. It does not work for clients that do not have a locally attached backup device. |
| **Comma separated list of clients that verify locally** | If your backup jobs are distributed across multiple client-attached devices, use this setting to specify a comma-separated list of clients that can run the verification phase locally. |
| **Default client to run Verify** | To configure an alternate client to run all verification jobs, specify the client name. This setting is useful if you use a client-attached device for your backups. It allows you to select the same client to run backup verification jobs. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring Job Manager settings

This section includes the following topics:

- About Job Manager
- Configuring default settings for Job Manager

## About Job Manager

The Job Manager (**nvjobmgr**) runs on the NetVault Backup Server and manages job execution. This process is initiated by the Schedule Manager. A single instance of Job Manager runs for each job until the completion of a job. The Job Manager relays job status information. It coordinates with the Data Plug-in and fetches the required information from the server. It is also responsible for sending drive and media requests to the Media Manager process.

# Configuring default settings for Job Manager

*To configure the default settings for Job Manager*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Job Manager**.

4 In the **Job Manager** dialog box, configure the following settings.

**Table 6. Job Manager settings**

| Setting | Description |
|---|---|
| **Job Keep Alive rate** | Keep-alive messages are used to verify network connection between two NetVault Backup machines and to keep this connection intact.<br>This setting controls how often keep-alive messages are sent between the Job Manager running on the server and the Data Plug-in running on a client. The default value is 5 minutes. To change the interval, type or select a new value. The keep-alive rate is specified in number of minutes. |
| **CLI utility nvjobcreate will return exit status** | By default, when a job is successful, the **nvjobcreate** utility returns the Job ID, and when a job fails, the utility returns "0."<br>When you select this check box, the **nvjobcreate** utility returns "0" when a job is successful and "1" when a job fails. To determine the Job ID when the **nvjobcreate** command has been configured to return the exit status, you can use the **-jobidfile** option to output the Job ID to a specified file. For more information about this utility, see the *Dell NetVault Backup Command Line Interface Reference Guide*. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring Logging Daemon settings

This section includes the following topics:



## About Logging Daemon

The Logging Daemon (**nvlogdaemon**) runs on the NetVault Backup Server. This process starts along with the NetVault Backup Service and performs the following functions:

- **Manages NetVault Backup logs:** The Logging Daemon manages the log messages generated by various processes. These messages are stored in NetVault Database tables.

  By default, the log messages are retained for 30 days. The Logging Daemon automatically deletes the messages that are older than 30 days. You can change this behavior by creating a user-defined purge policy for log messages. You can also use the **Purge** method available on the **View Logs** page to manually delete the log messages from the NetVault Database.

- **Performs periodic disk space checks:** The Logging Daemon performs periodic disk space checks, and issues alert messages when the space usage level reaches the Warning or Critical Threshold. The Warning and Critical thresholds are set to 85 and 95 percent of the total disk space, respectively. The disk space check applies to the NetVault Backup Home, Database, Logs, and Reports directories. The default interval between two disk space check events is one hour.

# Configuring disk space alert thresholds

NetVault Backup defines two alert thresholds for the disk space usage levels: Warning and Critical. By default, the Warning Threshold is set to 85 percent and the Critical Threshold is set to 95 percent of the total disk space.

**NOTE:** You must restart the NetVault Backup Service to apply any changes to the Warning and Critical Threshold values.

*To change the default alert threshold settings*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Logging Daemon**.

4 In the **Logging Daemon** dialog box, configure the following settings.

**Table 7. Disk space alert threshold settings**

| Setting | Description |
|---|---|
| **Disk Space Warning Threshold** | Type or select the Warning Threshold level. The default value is 85 percent of the total disk space.<br>When the disk space usage reaches or exceeds the Warning Threshold, the following events occur:<br>• The Logging Daemon reports an error.<br>• The Auditor Daemon logs a message.<br>• NetVault Backup raises the **Home Drive Becoming Full** event.<br>You can set up a global notification method to receive notification when this event is raised. For more information, see Using global notification methods. |
| **Disk Space Critical Threshold** | Type or select the Critical Threshold level. The default value is 95 percent of the total disk space.<br>When the disk space usage reaches or exceeds the Critical Threshold, the following events occur:<br>• NetVault Backup sends an error message to the Event Viewer on Window and syslog on Linux and UNIX.<br>• The Logging Daemon reports an error.<br>**NOTE:** If the disk space is critically low when the NetVault Backup Service starts, the errors are only logged through the Event Viewer or syslog.<br>• The NetVault Backup Service shuts down automatically and the service status is set to **"Stopped Disk Full."**<br>You can restart the service only when the disk usage percentage drops below the configured Critical Threshold level. |

**Table 7. Disk space alert threshold settings**

| Setting | Description |
|---|---|
| **Time interval between disk space full checks** | Type or select the interval between two disk space check events. It is specified in number of hours. The default value is one hour.<br>To disable disk space checks, set the value to zero (0).<br>**NOTE:** Regardless of this setting, the Logging Daemon performs disk space check when the NetVault Backup Service is restarted. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Creating a user-defined purge policy for log messages

To manage the size of the log tables, you can configure the Logging Daemon to automatically delete the messages that are older than a specified number of days. By default, the Logging Daemon deletes the messages that are older than 30 days. You can change this behavior by creating a user-defined purge policy for log messages.

You can also use the **Purge** method available on the **View Logs** page to manually delete the log messages from the NetVault Database. For more information about this method, see Manually purging the log messages.

### *To create a user-defined purge policy for logs*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Logging Daemon**.

4 In the **Logging Daemon** dialog box, configure the following settings.

**Table 8. Auto-purge settings for logs**

| Setting | Description |
|---|---|
| **Auto-purge method** | By default, the **Auto-purge method** is set to **"Exceeds log age."**<br>Use this setting to delete logs that are older than a specified number of days.<br>To disable automatic purging of log files, set the **Auto-purge method** to **"None."**<br>**NOTE:** Log messages can consume a considerable amount of disk space. Therefore, periodic purging of the log messages is necessary. If automatic purging is disabled, use the **Purge** method available on the **View Logs** page to manually delete the log messages at regular intervals. |
| **Auto-purge entries that are older than** | When the **Auto-purge method** is set to **"Exceeds log age,"** use this setting to specify the maximum age for logs. The log age is specified in number of days. The default value is 30 days. |
| **Select the time interval to auto-purge** | The default interval between two auto-purge events is three hours. To change the interval, type or select a new value. The purge interval is specified in number of hours. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring additional settings for Logging Daemon

*To configure additional settings for the Logging Daemon*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Logging Daemon**.

4 In the **Logging Daemon** dialog box, configure the following settings.

**Table 9. Additional settings for Logging Daemon**

| Setting | Description |
|---|---|
| **Message Response Interval** | This setting determines the amount of time the NetVault WebUI waits for the Logging Daemon to send all log messages before displaying a progress dialog box. This dialog box displays the number of log messages loaded against the total number of log messages. If the response is delayed, you can cancel the operation by clicking **Cancel** on the progress dialog box.<br>The default response time for the Logging Daemon is 256 milliseconds. To change default setting, type or select a new value. The minimum value can be 100 milliseconds.<br>If the NetVault WebUI receives all log messages within the specified interval, the progress dialog box is not displayed (for example, if there are only a few log messages, the dialog box is not displayed). |
| **Outgoing message bundle size** | To improve performance, the logging daemon sends messages in bundles. Each bundle contains 64 messages by default. To change the number of messages per bundle, type or select the bundle size in **Outgoing Message Bundle Size**. |
| **Minimum time between progress updates** | By default, the progress dialog box is refreshed every 256 milliseconds. To change the refresh rate, type or select the time interval. |
| **Minimum warning level to send to system log** | By default, NetVault Backups sends log messages with warning code 64 and above to the OS. You can view these messages from the Event Viewer (on Windows) or syslog (on Linux and UNIX).<br>To change the severity level of messages that NetVault Backup sends to the OS, specify the warning level code in the **Minimum warning level to send to system log** box. The following list provides the warning codes and the corresponding severity level of the messages:<br>• **112**: Severe errors<br>• **96:** Severe errors and errors<br>• **80**: Severe errors, errors and warnings<br>• **64:** Severe errors, errors, warnings, and startup messages<br>• **48**: Severe errors, errors, warnings, startup messages, and job messages<br>• **32**: Severe errors, errors, warnings, startup messages, job messages, and informational messages<br>• **16:** Severe errors, errors, warnings, startup messages, job messages, informational messages, and background messages<br>• **0:** All messages |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring Media Manager settings

This section includes the following topics:



## About Media Manager

The Media Manager (**nvmedmgr**) runs on the NetVault Backup Server and performs the following functions:

- It manages the Media Database that contains information about the media contents and online savesets.
- It stores the device configuration details. The Media Manager manages backup devices through the Device Manager processes. The Media Manager issues high-level instructions for loading and unloading media, and the Device Manager carries out these instructions.
- It controls the selection of device and media based on the media requests submitted by the Job Manager.

**NOTE:** You must restart the NetVault Backup Service to apply any changes to the Media Manager settings.

## Configuring general settings for Media Manager

*To configure general settings for Media Manager*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **General Settings**, configure the following settings.

**Table 10. General settings for Media Manager**

| Setting | Description |
|---|---|
| **Minimum life for imported backups** | A piece of media is marked as "foreign" if no information for that item is available in the NetVault Database. This issue can occur for several reasons, for example, when a piece of media is swapped between libraries, removed from the NetVault Backup Server, or loaded on a device controlled by a different NetVault Backup Server.<br>The retention period for the imported data is determined by the backup life set for the savesets. If the saveset is already retired, the data is temporarily stored for seven days. To change the default retention period, type or select a new value. The retention period is specified in number of days. |
| **Use barcodes as labels** | By default, NetVault Backup assigns a system-generated string as the media label to blank media items. The string consists of the NetVault Backup Server Name, the current date, and a seed number.<br>To assign media barcodes as the default label for blank media during backups, select this check box. |
| **Continuation Restore Request Priority Boost** | A continuation restore request occurs when an active restore job requires additional media for completion. By default, these requests are assigned a priority level of 5 so that they are not preempted by other media requests and the active job is completed without any interruption.<br>To change the default setting, type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero (0) runs as a background task. |
| **Continuation Backup Request Priority Boost** | A continuation backup request occurs when an active backup job requires additional media for completion. By default, these requests are assigned a priority level of 5 so that they are not preempted by other media requests and the active job is completed without any interruption.<br>To change the default setting, type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero (0) runs as a background task. |
| **Label Request Priority** | NetVault Backup assigns a priority level of 10 to bulk media labeling requests.<br>To change the default priority setting, type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero runs as a background task. |
| **Blank Request Priority** | NetVault Backup assigns a priority level of 10 to bulk media blanking requests.<br>To change the default setting, type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero (0) runs as a background task. |
| **Bulk Label Callback Timeout** | The callback timeout for bulk media labeling controls how long NetVault Backup waits for user inputs before ending these requests. By default, NetVault Backup waits for 120 seconds for user confirmation. If confirmation is not received within the specified interval, the request is not carried out.<br>To change the default setting, type or select a new value. The timeout value is specified in number of seconds. |

**Table 10. General settings for Media Manager**

| Setting | Description |
|---|---|
| **Bulk Blank Callback Timeout** | The callback timeout for bulk media blanking controls how long NetVault Backup waits for user inputs before ending these requests. By default, NetVault Backup waits for 120 seconds for user confirmation. If confirmation is not received within the specified interval, the request is not carried out.<br>To change the default setting, type or select a new value. The timeout value is specified in number of seconds. |
| **Minimum interval between reporting online capacity** | This setting determines how frequently the online media status is updated on the NetVault WebUI.The default value is 10 minutes.<br>To change the default setting, type or select a new value. The update interval is specified in number of minutes. |
| **Mark expired Read Only media as writable** | This option prevents automatic reuse of retired read-only media.<br>When you select this check box, the read-only tag for a media item is automatically removed when the last saveset stored on it is retired, and the media item becomes available for re-use. |
| **Days of inactivity before an index is compressed** | Backup indexes stored in the NetVault Database are called Online Indexes. The online indexes are automatically compressed after 30 days of inactivity.<br>To change the default inactivity period for index compression, type or select the new value.<br>To disable automatic compression of online indexes, set this option to zero (0). |
| **Hours between scans for indexes to be compressed** | This setting determines the interval at which the Media Manager scans the Media Database to identify backup indexes that can be compressed. The default value is 12 hours.<br>To change the default interval, type or select a new value.<br>To disable Media Manager scans for index compression, set this option to zero (0). |
| **Maximum number of indexes to be compressed/ uncompressed/offlined at a time** | This setting determines the maximum number of backup indexes that can be simultaneously compressed, decompressed, or taken offline.<br>The default value is 200 indexes. To change the default setting, type or select a new value. |
| **Minimum Space For Index Decompression** | The compressed backup indexes are automatically decompressed when you try to browse or restore the corresponding saveset. The minimum amount of space for index decompression is set to 500MB by default. This space is reserved on the drive or partition on which the NetVault Database resides.<br>To change the minimum space for index decompression, type or select the new value. The space requirement is specified in MB.<br>A decompression request fails in the following circumstances:<br>• The available space on the target drive or partition is less than the minimum required space.<br>• The specified amount of free disk space is not available on the target drive or partition after index decompression.<br>When NetVault Database receives a decompression request, it reads the index header to determine its decompressed file size. The request is not completed if after decompression the free disk space on the target drive or partition would be less than the specified amount. |

**Table 10. General settings for Media Manager**

| Setting | Description |
|---|---|
| | If the decompression request fails, an error message is displayed. If the request was issued manually, the message is displayed on the **Create Restore Job** page. When index decompression is performed automatically, the message is displayed on the **View Logs** page. |
| **Days of inactivity before an index is offlined** | Backup indexes stored in the NetVault Database are called Online Indexes. To automatically delete online indexes after a specified period of inactivity, type or select the value. The inactivity period is specified in number of days. The default value is zero (0), which disables automatic deletion of online indexes. |
| **Hours between scans for indexes to be offlined** | This setting determines the interval at which the Media Manager scans the Media Database to identify backup indexes that can be taken offline. The default interval is 24 hours.<br>To change the default interval, type or select a new value.<br>To disable Media Manager scans for online index deletion, set this option to zero (0) |
| **Maximum characters in a media request diagnosis** | By default, NetVault Backup supports a maximum of 64,000 characters in the **Diagnose Media Requests for Job** dialog box. To change this setting, type or select a new value. The value is specified in thousands of characters.<br>Lesser number of characters may result in quicker output. However, the output may be truncated and you may not get the complete information. Therefore, you should not change the default value for this option. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring device-related settings

*To configure device-related settings*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **General Settings**, configure the following device-related settings.

**Table 11. Device settings controlled by Media Manager**

| Setting | Description |
|---|---|
| **Do not describe device activity in device window** | Select this check box to stop status updates on the **Device Activity** page. It may help reduce the load on the NetVault Backup Server when several backup devices are added to the server. |
| **Do not display drives that are available but not active** | Select this check box to hide the offline devices on the **Device Activity** page. |

**Table 11. Device settings controlled by Media Manager**

| Setting | Description |
|---|---|
| **Only check available drives and media when processing a media request** | Select this check box to only check for available drives and media when a media request is received. It can be useful in large environment to reduce the network traffic generated by the automatic checks. However, it may cause a delay in job startup when several jobs are started at the same time. |
| **Only check available drives when processing a media request** | Select this check box to only check for available drives when a media request is received. |
| **Only check available media when processing a media request** | Select this check box to only check for available media when a media request is received. |
| **Do not issue Prevent/Allow Media Remove commands to drives** | During backup and restore operations, the Media Manager issues PREVENT/ALLOW MEDIUM REMOVAL SCSI commands to move a tape to or from a drive. If your library software can handle tape removal or ejection by itself and does not require any explicit commands to be sent to the drive, you can select this check box. When this check box is selected, the Media Manager skips the PREVENT/ALLOW MEDIUM REMOVAL SCSI commands during device operations. |
| **Do not open a device if the serial number has changed** | Select this check box to stop issuing commands to a device whose serial number has changed since its last configuration for NetVault Backup. |
| **Unavailable device retry interval** | Type or select the interval at which NetVault Backup tries to locate unavailable devices. The retry interval is specified in minutes. The default value is 30 minutes. |
| **Allow library modification when jobs are running** | Select this check box to allow a user to modify the library settings while it is in use. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring additional settings for Media Manager

*To configure general settings for Media Manager*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **General Settings**, configure the following additional settings.

**Table 12. Additional Media Manager settings**

| Setting | Description |
|---|---|
| **Use Target media request timeout for Source media request** | This option can be used to set timeout interval for source media requests. It applies to Plug-in for Consolidation, Plug-in for Data Copy, and Secondary Copy jobs.<br>When you select this check box, the timeout setting for the source media is automatically obtained from the Target Set defined for the job. If the required piece of media is not available within the specified interval, the job is aborted. |

**Table 12. Additional Media Manager settings**

| Setting | Description |
|---|---|
| **Do Not Scan Unknown Media** | When you add tapes to a library, and close the door (or restart the library), NetVault Backup takes inventory by reading the media barcodes. If NetVault Backup cannot find the barcode for a piece of media, it marks that tape as "UNKNOWN." NetVault Backup loads each unknown tape into one of the drives to scan for backups and on-tape indices. On large systems, this process can increase the burden on the drive resources. If you do not want to scan unknown tapes and leave them as "UNKNOWN," select this check box.<br>This option applies to all new libraries that are added to the Netvault Backup Server. It does not change the setting for existing libraries. To apply this setting to an existing library, you must remove the library and re-add it. |
| **Force Process Media Request Queue Throttling** | This setting allows NetVault Backup to interrupt the continuous processing of media request queues in very busy systems to allow other processing to occur. It determines the minimum response time between two media requests. The default value is 5 seconds. The value must be specified in number of seconds.<br>**NOTE:** This setting should only be changed under the direction of Dell Software Technical Support. |
| **Life Of Segments Table Scan Results For Duplication** | During Phase 2 Data Copy and Duplication jobs, the Media Manager stores the results of the Segments table scan so that it does not have to scan the table each time a media request is serviced. This setting determines the amount of time the cached results are retained by NetVault Backup.<br>The default value is 600 seconds. To change the default setting, type or select the new value. The value must be specified in number of seconds. The recommended period is between 300 and 1800 seconds. |
| **Life Of Index When Loaded From Offline** | The **nvrestore** CLI utility automatically imports an offline index if it is needed for a restore job.<br>This setting determines how long the indexes imported by the **nvrestore** utility are retained in the NetVault Database. The default value is one (1) day. To change the default setting, type or select the number of days you want to retain the index. This value must be specified in number of days. |
| **Recover Database Table After Failed Compaction** | Select this check box to create a copy of the NetVault Database tables before performing a database compact action during NetVault Database backups. The copy is used to recover the tables and indexes if failure or data corruption occurs during the compact action. This option applies to both the Media and Schedule Databases.<br>The copy of the tables is stored in <NetVault Backup home>\tmp on Windows and <NetVault Backup home>/tmp on Linux. The compact action does not occur for a table if there is insufficient disk space in the "tmp" directory to store a copy of the table. By default, this option is disabled because of the disk space overhead associated with it. Before enabling this option, ensure that the "tmp" directory has sufficient space to store the copy of the largest database table and index. |
| **Maximum number of sessions to retire at a time** | This setting determines the maximum number of simultaneous sessions that are used to retire backup savesets.<br>The default value is 250 savesets. To change the default setting, type or select a new value. |
| **Offline RAS device after timeout time** | The timeout value for determining that a RAS device is not responding. The default value is 7200 seconds. To change the default setting, type or select a new value. After the timeout expires, NetVault Backup sets the device status to offline. |

**Table 12. Additional Media Manager settings**

| Setting | Description |
|---|---|
| **Number of attempts (retries) for onlining a RAS device** | The number of times NetVault Backup tries to contact an offline RAS device in an attempt to bring it back online. The default value is 3. If you set this value to zero (0), no attempts are made to bring the device back online. |
| **Cancel online RAS device batch after timeout time** | The number of seconds NetVault Backup waits for a response from the RAS device before canceling the Media Manager batch that is trying to bring the device back online. The default value is 300 seconds. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring foreign RAS device settings

When you add a Data Domain system, the NetVault Backup Server creates several metadata files on the device. Each NetVault Backup Server (to which you add the Data Domain system) creates its own set of metadata files. NetVault Backup also writes the data transfer statistics to the **stats.stnz** file. The **nvstatsmngr** process uses this file and requires that it is regularly updated. However, frequent updates can have a significant performance impact on the system. By default, NetVault Backup updates the file after every 5 seconds or 10 blocks of data transfer.

*To change the transfer update frequency for Data Domain Systems*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **Foreign RAS Device Configuration**, configure the following settings:

- **Transfer Update Frequency (Blocks):** By default, NetVault Backup updates the stats.stnz file after every 10 blocks of data transfer. To change the default setting, type or select a new value.
- **Transfer Update Frequency (Seconds):** By default, NetVault Backup updates the stats.stnz file after every 5 seconds. To change the default interval, type or select a new value. The time interval is specified in number of seconds.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring DAV RAS device settings

*To change the timeout interval for NetVault SmartDisk "stream end responses"*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **DAV RAS Device Configuration**, configure the following setting:

- **Data transfer stall timeout:** This setting determines the amount of time NetVault Backup waits for a "stream end" response from a NetVault Backup SmartDisk before reporting a stall. The default value is 60 seconds. To change the default setting, type or select the new value. The stall timeout interval is specified in number of seconds.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring media request weightings

The Media Manager process uses media request weightings while assigning a media request for a backup or restore job.

**IMPORTANT:** These settings should only be changed under the direction of Dell Software Technical Support.

*To change relative priority for backup devices*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Media Manager**.

4 In the **Media Manager** dialog box, under **Media Request Weightings**, configure the following settings.

**Table 13. Media request weightings**

| Setting | Description |
|---|---|
| **Local Device Weighting** | The media request weighting for local devices is set to 32 by default. To change this setting, type or select the new value. You can assign any value between 2 and 32. |
| **RAS Device Weighting** | The media request weighting for RAS devices is set to 16 by default. To change this setting, type or select the new value. You can assign any value between 2 and 32. |
| **Non NDMP Device Weighting** | The media request weighting for non-NDMP devices is set to 8 by default. To change the default setting, type or select the new value. You can assign any value between 2 and 32. |
| **Media Loaded Weighting** | The media request weighting for media-loaded devices is set to 4 by default. To change the default setting, type or select the new value. You can assign any value between 2 and 32. |
| **Device Empty Loaded Weighting** | The media request weighting for empty loaded devices is set to 2 by default. To change the default setting, type or select the new value. You can assign any value between 2 and 32. |

By default, the Media Manager gives preference to a local device. To use any other suitable device for a job, you can set a higher media request weight for that device. For example, to ensure that the Verification phase for a job uses the same NDMP device that was used for the backup, you can set a higher value for the **Media Loaded Weighting** option. If you use the default media request weights, the Media Manager gives preference to a local device even if the required piece of media is loaded into the NDMP device.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring default interval for backup retirement scans

In a time-based retirement period, the time component (HH:MM) does not represent the actual retirement time. This component only represents the time due for backup retirement. The actual time of retirement is determined by the interval at which Media Manager scans the Media Database to identify the backups that it needs to retire. The default interval between two scans is 60 minutes. Thus, if the retirement time is set to 10:20, the backup is actually retired at 11:00.

*To configure the default interval for the backup retirement scans*

1. Open the **mediamgr.cfg** file in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.
2. Add the following lines:

   ```
   [Defaults:Retirement Check Granularity in Mins]

   Value = <Minutes>
   ```

   By default, the **mediamgr.cfg** file does not include the `[Defaults:Retirement Check Granularity in Mins]` section. To change the default interval, you must add this section and specify the interval. If you do not add the section, the default interval (60 minutes) is used.

   For example, to set the scan interval to 30 minutes, add the following lines:

   ```
   [Defaults:Retirement Check Granularity in Mins]

   Value = 30
   ```

   **NOTE:** If you set this value to 0 (zero), the savesets are retired according to the time specified in the Advanced Options set or the **Change Expiry** dialog box.
3. Save the file.

# Configuring an alternate index read block size for Dell DR Series Systems

If a backup stored on a Dell DR Series System was performed using a non-standard block size, the scan process is unable to read the index for that backup from the device. To import indexes for such backups, you can configure an alternate index read block size in the **mediamgr.cfg** file.

The alternate block size is used only when index scanning fails using the current block size. When the alternate block size is used, the following message is added to the NetVault Backup logs:

Scanned index for job '<job name>' found using alternate block size <xx>, after a failed scan using original request block size <yy>.

*To configure an alternate index read block size for Dell DR Series systems*

1. Open the file **mediamgr.cfg** in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.
2. Add the following lines to this file:

   ```
   [Defaults:Alternate Index Read Block Size]

   Type = Range

   Range = 500,2147483647

   Value = <Original non-standard block size>
   ```
3. Save the file.

# Configuring RAS transfer start timeout period

By default, the RAS transfer start timeout period is set to 30 seconds. You can change this setting in the **mediamgr.cfg** file.

*To configure the RAS transfer start timeout*

1. Open the file **mediamgr.cfg** in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.
2. Add the following lines to this file:

```
[Defaults:RAS Start Transfer Timeout]

Value = <Timeout interval>

Tab Name = General Settings

Tab Name Id = 0

Label = RAS device start transfer batch timeout time (in seconds)

Label Id = 0

Type = Range

Range = 10, 300
```

3. Save the file.

# Configuring Network Manager settings

This section includes the following topics:



## About Network Manager

The Network Manager **(nvnmgr)** and Communications Manager **(nvcmgr)** support the inter-process messaging system. Both run as processes on Linux and UNIX systems and as threads within the **nvpmgr** process on Windows. These processes perform the following functions:

- The Network Manager and Communications Manager work in tandem to transmit inter-process messages to remote clients. While the Communications Manager handles communication between the NetVault Backup processes on local machines, Network Manager transmits the inter-process messages to remote clients.
- The Network Manager broadcasts availability messages, which help determine the current status of the NetVault Backup Clients.

**NOTE:** You must restart the NetVault Backup Service to apply any changes to the Network Manager settings.

# Configuring timeout settings for Network Manager

*To configure timeout settings for Network Manager*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Network Manager**.

4 In the **Network Manager** dialog box, under **Timeouts**, configure the following settings.

**Table 14. Network Manager timeout settings**

| Setting | Description |
|---|---|
| **Time to complete a remote connection** | This setting controls how long the NetVault Backup Server tries to establish connection with a remote client. The default value is 60 seconds. To change the default timeout interval, type or select a new value. The timeout interval is specified in number of seconds. |
| **Time to wait before dropping inactive connection(s)** | This setting controls how long the NetVault Backup Server waits before ending an inactive connection. It helps to reduce the amount of resources consumed by idle connections. The default value is 600 seconds. To change the default timeout interval, type or select a new value. The timeout interval is specified in number of seconds. |
| **Keep Alive rate** | Keep-alive messages are used to verify that a connection between two NetVault Backup machines is still intact. The Keep Alive Rate controls how often the server sends keep-alive messages. The default value is 7 seconds. To change the default interval, type or select a new value. The keep-alive rate is specified in number of seconds. |
| **Time between availability broadcasts** | The NetVault Backup Clients broadcast availability messages at regular intervals that provide their current status and location on the network. These broadcasts are used to discover the new clients and update the client status on the NetVault WebUI. The default interval for availability broadcasts is 600 seconds. To change the default setting, type or select a new value. The broadcast interval is specified in number of seconds.<br>**NOTE:** If you set a very small interval, it may increase network traffic, and if you set a large interval, it may result in delayed discovery of clients and client status updates on the NetVault WebUI. |
| **Time between security broadcasts** | Security broadcasts discover the password-protection status of clients, and notify whether its password has been enabled or disabled on a client. The Client Status icons on the NetVault WebUI are updated based on these broadcasts. The default interval for security broadcasts is 600 seconds. To change the default setting, type or select a new value. The broadcast interval is specified in number of seconds. |
| **Time between availability checks** | The NetVault Backup Server performs availability checks at regular intervals to scan for changes in the network settings. If a change is detected, the server sends an interim broadcast to propagate the new settings. The broadcast system is then reset to regular pulse, reducing network traffic. The default interval for availability checks is 10 seconds. To change the default setting, type or select a new value. You can reduce the interval between two checks to quickly detect and transmit changes. If you do not want to apply the changes immediately, use the default value or set it equal to the interval for Availability Broadcasts. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring connection settings for Network Manager

*To configure connection settings for Network Manager*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Network Manager**.

4 In the **Network Manager** dialog box, under **Connections**, configure the following settings.

**Table 15. Network Manager connection settings**

| Setting | Description |
|---|---|
| **Broadcast details to machines on local networks** | This check box is selected by default. Although this option can be disabled, it is not recommended. Availability broadcasts are needed for automatic discovery of clients and status updates. Without these broadcasts, you need to manually locate new clients using the **Find Machine** command to add them. For more information about this command, see Locating a client. |
| **Preferred network address**<br><br>**Comma separated list of barred address(es)**<br><br>**Comma separated list of fallback address(es)** | For multihomed systems, you can configure the following settings:<br>• **Preferred network address**: Specify the primary IP address for network connection. You can specify only a single IP address.<br>• **Comma separated list of barred address(es):** Specify the barred or blocked addresses that you do not want to use for NetVault Backup connections. To specify multiple addresses, use a comma as delimiter.<br>You must restart the NetVault Backup Service to apply any changes to the barred addresses setting.<br>• **Comma separated list of fallback address(es)**: Specify the fallback addresses to use when the preferred network address is not available. For multiple addresses, use a comma as delimiter.<br>**Important notes:**<br>• The preferred, barred, and fallback addresses should not conflict with each other.<br>• These settings should only be used when the local machine is connected to multiple networks, either through multiple Network Interface Cards or through virtual IP addressing.<br>When a connection is initiated, the addresses are attempted in the following order:<br>• Preferred network address<br>• Fallback addresses<br>• Any other addresses in the order defined by the binding order of the host machine<br>If the preferred address is unavailable and the NetVault Backup Server starts using a fallback address, it does not automatically revert to the preferred address when the IP becomes available. |

**Table 15. Network Manager connection settings**

| Setting | Description |
|---|---|
| | To force the NetVault Backup Server to use the preferred address, do one of the following:<br>• Remove the client and add it again.<br>When you remove the client, the message "Machine <NetVault Backup Machine Name> Has Gone Down" (Warning Level: Background) is displayed on the **View Logs** page. Wait until the timeout for remote connection expires. The timeout interval is determined by the **Time to complete remote connection** setting (set to 60 seconds by default).<br>When the client is up and detected on the network, the message "Machine <NetVault Backup Machine Name> Has Come Up" (Warning Level: Background) is displayed on the **View Logs** page. To add the client, use the **Find Machine** command, and specify its preferred network address in the box.<br>• Alternatively, disable or disconnect the network interface currently in use until the timeout for remote connection expires. The value configured for the **Time to complete remote connection** setting determines the duration for which the network interface needs to be disabled or disconnected. Restart the NetVault Backup Service when the client is reported as unavailable. The NetVault Backup Server uses the preferred address when the next connection attempt is made after you restart the service on the client. |
| **Comma separated list of networks and addresses not to resolve** | When the NetVault Backup Service starts, it attempts to resolve all client IP addresses listed in the **machines.dat** file. (You can find this file in <NetVault Backup home>\etc on Windows and <NetVault Backup home>/etc on Linux.) Resolving all client addresses can cause a significant delay in the service startup and the machine can appear unresponsive during this time. You can use this setting to reduce or avoid the startup delay by specifying the addresses that are not to be resolved during startup.<br>You can specify a single address or a range, for example, 192.168.1.2 or 192.168.x.x. If you want to configure multiple addresses or networks, use a comma as delimiter.<br>To get the list of networks from the **machines.dat** file, issue the following command on Windows:<br>`findstr Network <NetVault Backup home>\etc\machines.dat`<br>The following is an example output:<br>`C:\NetVault Backup\etc>findstr Network machines.dat`<br>`Networks=192.168.203.1,192.168.65.1,172.16.245.1`<br>`Networks=10.1.40.81,172.16.211.1,172.16.62.1`<br>`Networks=10.1.2.37,172.16.22.1,172.16.128.1`<br>`Networks=10.1.240.222,172.16.4.1`<br>`Networks=192.168.122.1,10.1.240.52`<br>`Networks=10.1.80.83,10.1.2.68,172.16.116.1`<br>`Networks=192.168.172.1,10.1.40.98,192.168.147.1`<br>`Networks=192.168.174.1,10.1.8.71,192.168.120.1`<br>`Networks=192.168.122.1,10.1.8.79`<br>`Networks=10.1.8.132,192.168.91.1,192.168.106.1`<br>`Networks=10.1.8.163,192.168.233.1,192.168.207.1`<br>`Networks=10.1.8.16,200.0.0.1`<br>`...` |

**Table 15. Network Manager connection settings**

| Setting | Description |
|---|---|
| | Based on this output, you can configure the following values in the **Comma separated list of networks and addresses not to resolve** box:<br>`10.0.0.0, 172.0.0.0, 192.0.0.0, 200.0.0.0`<br>Some networks may have name instead of the IP address. To find the IP addresses for such clients, you can use the **nslookup** tool.<br>To prevent the NetVault Backup Service from resolving all networks, specify the first octet of a network address (that is, 192.0.0.0, 10.0.0.0).<br>**NOTE:** Using 0.0.0.0 does not prevent the service from resolving the networks.<br>The clients that are offline and listed on the **Manage Clients** page can also cause the startup delay. To speed up the process, you can remove the clients that are offline or no longer in use.<br>In a domain managed by a Windows-based NetVault Backup Server, you may experience a long delay as the service attempts to resolve all client IP addresses using the NBNS (NetBIOS Name Service) protocol. In this environment, you can use the **Comma separated list of networks and addresses not to resolve** setting to reduce the startup delay. You can also use this setting in an NetVault Backup Client Cluster setup to prevent the service from resolving the private cluster IP addresses. |

5 Click **Apply** to apply the new settings and close the dialog box

# Configuring default port for Network Manager

The Network Manager is configured to use port 20031 to open TCP and UDP sockets on a client. If this port is in use by any other application, the NetVault Backup Service fails immediately after startup. When this error occurs, you must change the default port for Network Manager.

### *To change the default port for Network Manager*

1 Open the file **nvnmgr.cfg** in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.

2 Add the following lines to this file:

```
[network]

UdpPort=<port number>

TcpPort=<port number>
```

Set the same port number for both the TCP and UDP sockets. Ensure that the port is not in use by any other application. In a firewall-protected environment, ensure that the port is open and specified in the firewall settings for the client. For more information, see Configuring firewall settings.

3 Save the file.

4 Restart the NetVault Backup Service to apply the new settings.

5 Repeat steps 1–3 on the NetVault Backup Server and all clients.

# Configuring default port for Communications Manager

The Communications Manager is configured to use port 20032 to open TCP sockets on a client. If this port is in use by any other application, the NetVault Backup Service fails immediately after startup. When this error occurs, you must change the default port for Communications Manager.

*To change the default port for Communications Manager*

1. Open the file **configure.cfg** in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.
2. In the `[machine]` section, append the following line:

   ```
   [machine]

   Comms TcpPort=<port number>
   ```

   Ensure that the port is not in use by any other application. In a firewall-protected environment, ensure that the port is open and specified in the firewall settings for the client. For more information, see Configuring firewall settings.
3. Save the file.
4. Restart the NetVault Backup Service to apply the new settings.
5. Repeat steps 1–3 on the NetVault Backup Server and all clients.

# Configuring Process Manager settings

This section includes the following topics:



# About Process Manager

The Process Manager (**nvpmgr**) runs on all NetVault Backup machines and manages all other NetVault Backup processes. It creates and destroys the transient processes. The Process Manager also manages the allocation of the shared memory area for the process table, trace buffers, and progress buffers.

**NOTE:** You must restart the NetVault Backup Service to apply any changes to the Process Manager settings.

# Configuring shared memory settings

*To configure the shared memory settings for Process Manager*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Process Manager**.

4 In the **Process Manager** dialog box, configure the following settings.

**Table 16. Shared memory settings for Process Manager**

| Setting | Description |
|---|---|
| **Shared Memory Allocated to the Trace Buffer of Each Process** | This setting controls the amount of shared memory allocated to the individual trace buffers of each NetVault Backup process. The default value is 7KB on all platforms. To increase the shared memory for individual trace buffers, type or select a new value. The shared memory is allocated in KB.<br>**NOTE:** Increasing the value of this setting could affect the performance and scalability of NetVault Backup. For example, it could reduce the maximum number of concurrent data transfers. |
| **Shared Memory Allocated to a Progress Buffer** | This setting controls the amount of shared memory allocated to the individual progress buffers of the data plug-ins. The progress buffers are used to share job progress data displayed on the NetVault WebUI. The default value is 1KB on all platforms. To increase the shared memory for progress buffers, type or select a new value. The shared memory is allocated in KB. |
| **Number of Progress Buffers Available to Plugins** | This setting controls the total number of progress buffers available to the plug-ins running on the NetVault Backup Clients. The progress buffers are used to share job progress data displayed on the NetVault WebUI. The default value is 200 on all platforms. To increase the shared memory for progress buffers, type or select the new value. |
| **Shared Memory Used for Process Table** | This setting controls the amount of shared memory allocated to the Process Table that maintains the details of all current NetVault Backup processes. The default value for this option is 16384KB on Windows and 500KB on Linux and UNIX.<br>On NetVault Backup machines running a number for concurrent processes, you can increase the amount of shared memory for the Process Table to get optimum performance. To increase the shared memory, type or select a new value. The shared memory is allocated in KB.<br>**NOTE:** On Windows, the shared memory is allocated dynamically. On Linux and UNIX, the shared memory for process table is allocated from the shared memory pool. To increase the shared memory for process table on these platforms, you must first increase the overall shared memory pool. You can increase the shared memory by configuring the **shmmax** variable in the system configuration file. For more information about increasing the shared memory pool, consult the relevant O/S documentation. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring Schedule Manager settings

This section includes the following topics:

- About Schedule Manager
- Configuring default settings for Schedule Manager

# About Schedule Manager

The Schedule Manager (**nvsched**) runs on the NetVault Backup Server and performs the following functions:

- It manages the job schedules and queues. The Schedule Manager initiates the Job Manager to start a job instance, and schedules the next instance for recurring jobs; the Job Manager runs the job.
- It manages the Scheduler database. The Schedule Manager updates the **Job Status** page and provides job scheduling data to the Reporting utility.

# Configuring default settings for Schedule Manager

*To configure the default settings for Schedule Manager*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **Services**, click **Schedule Manager**.
4. In the **Schedule Manager** dialog box, configure the following settings.

**Table 17. Schedule Manager settings**

| Setting | Description |
|---|---|
| **Number of days to keep job status** | Type or select the display period for status records. The display period is specified in number of days. The default value for this setting is seven days.<br>**NOTE:** This setting just hides the display of job status records on the NetVault WebUI. It does not delete the records from the Scheduler database. |
| **Number of days to keep report job histories in the database** | By default, the Schedule Manager deletes the report job history from the database after 90 days. To change the retention period, type or select a new value. The value is specified in number of days. |
| **Number of days to keep other job histories in the database** | By default, the Schedule Manager deletes the backup and restore job history from the database after 90 days. To change the retention period, type or select a new value. The value is specified in number of days. |
| **Number of days to keep non-scheduled jobs in the database** | Type or select the retention period for non-repeating jobs. The retention period is specified in number of days. The default value for this setting is 0 (zero). With the default setting, the job definitions of non-repeating jobs are retained indefinitely. |
| **Maximum simultaneously active jobs** | By default, the Schedule Manager supports a maximum of 200 simultaneous jobs, including backup, restore and report jobs. To change the default setting, type or select a new value.<br>**NOTE:** Each active job requires some amount of shared memory. An increase in the number of active jobs might have an impact on the overall performance of NetVault Backup. |
| **Exclude reports jobs from jobs management views** | To display the report jobs on the **Job Status** page, clear this check box. These jobs are excluded by default. |
| **Exclude reports jobs from policy management views** | To display the report jobs on the **Manage Policy** page, clear this check box. These jobs are excluded by default. |
| **Exclude restore jobs from policy management views** | To display the restore jobs on the **Manage Policy** page, clear this check box. These jobs are excluded by default. |

**Table 17. Schedule Manager settings**

| Setting | Description |
|---|---|
| **Default backup job priority**<br><br>**Default restore job priority**<br><br>**Default report job priority** | The Schedule Manager assigns a priority level for each job type. This setting is applied globally to all backup, restore, and report jobs. It is used to prioritize resource allocation when two or more jobs are scheduled to run at the same time.<br>The default priority levels are:<br>• Backup job: 30<br>• Restore job: 20<br>• Report job: 50<br>To change the priority level settings globally for all jobs, configure the following options:<br>• **Default backup job priority**<br>• **Default restore job priority**<br>• **Default report job priority**<br>Type or select a value from 1 through 100. 1 denotes highest priority, while 100 denotes lowest priority. A job with a priority level of zero (0) runs as a background task.<br>To override the priority setting for an individual job, configure the **Job Priority** option in the Schedule Set. For more information, see Creating a Schedule Set, Job retry and priority settings for Schedule Set. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring Web Service settings

You can access the NetVault WebUI through HTTP or HTTPS. The Web Service settings specify the protocol and port for accessing the WebUI. For the initial configuration, you can use the NetVault Configurator. For more information, see Configuring Web Service settings.

*To configure Web Service settings*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click **Server Settings**.

3 On the **NetVault Server Settings**, under **Services**, click **Web Service**

4 In the **Web Service** dialog box, configure the applicable settings. For more information about these settings, see Configuring Web Service settings.

5 Click **Apply** to apply the new settings and close the dialog box.

**NOTE:** For the initial configuration, you can use the NetVault Configurator. For more information, see Configuring Web Service settings.

# Configuring timeout period for saveset removal request

By default, the timeout period for saveset removal request is set to 600 seconds. When the Web Service Worker Process (**nvwsworker**) sends the delete request to Media Manager, it waits for 600 seconds. If the Media Manager is unable delete all the savesets within this period, the Web Service Worker Process times out and reports an error (“Failed to receive reply from Media Manager”). If you receive this error, change the **SavesetRemoveTimeout** setting in the **webservice.cfg** file.

*To configure the timeout period for saveset removal request*

1. Open the file **webservice.cfg** in a text editor. You can find this file in <NetVault Backup home>\config on Windows and <NetVault Backup home>/config on Linux.
2. In the `[WebService]` section, configure the value for the **SavesetRemoveTimeout** setting:

   ```
   [WebService]

   SavesetRemoveTimeout=<Value>
   ```

   The default value for this setting is 600 seconds.
3. Save the file.

# Configuring Auditor Daemon settings

This section includes the following topics:

- About Auditor Daemon
- Configuring default settings for Auditor Daemon

# About Auditor Daemon

The Auditor Daemon (**nvavp**) runs on the NetVault Backup Server. This process tracks and controls user activities. It validates each user request, and depending on the assigned privileges, allows or denies a request. The audit log messages are stored in the NetVault Database.

By default, the Auditor Daemon logs every user activity regardless of whether the request is granted or denied. It automatically deletes the log messages that are older than 31 days. You can customize the Auditor Daemon to log only failed user requests or create a user-defined policy to delete the log messages.

# Configuring default settings for Auditor Daemon

*To configure the default settings for Auditor Daemon*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **Auditing**.
4. In the **Auditing** dialog box, configure the following settings.

**Table 18. Auditor Daemon settings**

| Setting | Description |
|---|---|
| **Only record failed requests in the audit trail** | By default, the Auditor Daemon logs every user request, regardless of whether the request is granted or denied. To override this behavior and log only failed user requests, select this check box.<br>**NOTE:** You must restart the NetVault Backup Service to apply any changes to this setting. |

**Table 18. Auditor Daemon settings**

| Setting | Description |
|---|---|
| **Purge entries by age** | To purge log entries that are older than the maximum age set for the log messages, leave this check box selected. The maximum log age is specified in the **Purge entries that are older than** box.<br>**NOTE:** The audit logs can consume a considerable amount of disk space. Therefore, you must periodically purge the log files. |
| **Purge entries that are older than** | Type or select the maximum age for the log messages. The log age is specified in number of days. The default value is 31 days. |
| **Time interval between purges** | Type or select the interval between two purge events for audit logs. The time interval is specified in number of hours. The default interval is 24 hours. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring firewall settings

Firewall settings are required to communicate with the NetVault Backup Clients located outside the firewall. You can use these settings to specify the TCP/IP ports that are used to establish data transfer channels, message channels, and broadcast channels through the firewall.

*To configure firewall settings for a client*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **Firewall**.

4 In the **Firewall** dialog box, configure the applicable settings. For more information about these settings, see Configuring firewall settings.

When creating firewall rules on the server and client machines, verify that you open the configured ports. For more information, see Firewall rules.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring general settings

This section includes the following topics:

- Relocating default directories
- Configuring TCP/IP buffer sizes
- Changing language and locale settings
- Changing locale settings for legacy clients
- Disabling pre-installation package compatibility check
- Configuring license expiration warning period

# Relocating default directories

You can relocate database, trace, logs, reports, stats, and temporary directories to a different drive or volume to alleviate low disk space issues.

**NOTE:** You must restart the NetVault Backup Service to apply any changes to these settings.

*To relocate the default directories*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following settings.

**Table 19. Default directory paths**

| Setting | Description |
|---|---|
| **Database Directory** | This directory stores the module list, license keys, and NetVault Database. The default path for the database directory is <NetVault Backup Home>\db on Windows and <NetVault Backup Home>/db on Linux.<br>To relocate the directory, type the full path. The specified path must exist on the target drive or volume. If the NetVault Backup Server is unable to find the path, it fails to relocate the directory. |
| **Trace Directory** | This directory stores the NetVault Backup trace logs. The default path for the trace directory is <NetVault Backup Home>\trace on Windows and <NetVault Backup Home>/trace on Linux.<br>To relocate the directory, type the full path. The specified path must exist on the target drive or volume. If the NetVault Backup Server is unable to find the path, it fails to relocate the directory.<br>**NOTE:** The trace logs contain large volume of data. Therefore, this directory should not be relocated to a network share. |
| **Log Directory** | This directory stores the NetVault Backup log files. The default path for the logs directory is <NetVault Backup Home>\logs on Windows and <NetVault Backup Home>/logs on Linux.<br>To relocate the directory, type the full path. The specified path must exist on the target drive or volume. If the NetVault Backup Server is unable to find the path, it fails to relocate the directory. |
| **Temporary Directory** | This directory stores the temporary files generated during various NetVault Backup operations. The default path for the temporary directory is <NetVault Backup Home>\tmp on Windows and <NetVault Backup Home>/tmp on Linux.<br>To relocate the directory, type the full path. The specified path must exist on the target drive or volume. If the NetVault Backup Server is unable to find the path, it fails to relocate the directory.<br>**NOTE:** The temporary directory holds the Backup Saveset Index. The free disk space on this directory should be at least three times the size of the index file to perform backups and restores properly. For example, if the backup index file is 3GiB in size, the temporary directory should have at least 9GiB of free disk space. If the temporary directory does not have sufficient space, warnings and logs are generated. |

**Table 19. Default directory paths**

| Setting | Description |
|---|---|
| **Reports Directory** | This directory stores the report templates. The default path for the reports directory is <NetVault Backup Home>\reports on Windows and <NetVault Backup Home>/reports on Linux.<br>To relocate the directory, type the full path.<br>Before configuring a new path, you must copy the directory contents to the new path. If a new path is configured without relocating the directory contents, an error message appears ("Provider 'NVBUPhysicalClient' failed"), and the NetVault Backup Service fails to restart. |
| **Statistics Directory** | This directory stores data collected by the **nvstatsmngr** process. The default path for the statistics directory is <NetVault Backup Home>\stats on Windows and <NetVault Backup Home>/stats on Linux.<br>To relocate the directory, type the full path. The specified path must exist on the target drive or volume. If the NetVault Backup Server is unable to find the path, it fails to relocate the directory. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring TCP/IP buffer sizes

In most cases, the default buffer sizes for the TCP/IP sockets are adequate, and should not be changed. For guidance on optimal buffer sizes and TCP/IP tuning, see your OS documentation.

### *To change the default buffer sizes for the TCP/IP sockets*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following settings.

**Table 20. TCP/IP send and receive buffer sizes**

| Setting | Description |
|---|---|
| **Minimum network send buffer size** | This setting determines the minimum send buffer size for a TCP/IP socket. The default value is 1KB. To adjust the buffer size, type or select the new value. The buffer size must be set in KB. |
| **Maximum network send buffer size** | This setting determines the maximum send buffer size for a TCP/IP socket. The default value is 16384KB. To adjust the buffer size, type or select the new value. The buffer size must be set in KB. |
| **Minimum network receive buffer size** | This setting determines the minimum receive buffer size for a TCP/IP socket. The default value is 1KB. To adjust the buffer size, type or select the new value. The buffer size must be set in KB. |
| **Maximum network receive buffer size** | This setting determines the maximum receive buffer size for a TCP/IP socket. The default value for this option is 16384KB. To adjust the buffer size, type or select the new value. The buffer size must be set in KB. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Changing language and locale settings

*To change the language and locale for NetVault Backup*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following settings

- **Language Selection:** Select the preferred language for NetVault Backup. The available options are:
  - Chinese (Simplified)
  - English
  - French
  - German
  - Japanese
  - Korean

5 Click **Apply** to apply the new settings and close the dialog box.

6 Close the NetVault WebUI, and open it in a new browser tab or window.

# Changing language settings for NetVault WebUI

To change the display and input language for NetVault WebUI, you must change the language settings for your web browser. The following procedures describe how to change this setting in different web browsers.

## Internet Explorer

1 On the tool bar, click **Internet Options**.

2 On the **General** tab, under **Appearance**, click **Languages**.

3 If the preferred language is not available in the **Language** list, click **Add**. In the **Add Language** dialog box, select the language that you want to use, and click **OK**.

4 In the **Language Preference** dialog box, click the applicable language, and use the **Move up** button to move the selected item to the top of the list. Click **OK**.

5 Close all Internet Explorer windows and reopen the browser window.

## Chrome

1 On the tool bar, click **Customize and control Google Chrome**.

2 Click **Settings**, and then click **Show Advance Settings**. Under **Languages**, click **Language and input settings**.

3 If the preferred language is not available in the list, click **Add**. In the **Add Language** dialog box, select the language that you want to use, and click **OK**.

4 In the **Languages** dialog box, select the applicable language, and click **Display Google Chrome in this language**. Click **Done**.

5 Close all Google Chrome windows and reopen the browser window.

### Firefox

1 Click the **Tools** menu, and select **Options**.

2 Click the **Content** tab. Under **Languages**, click **Choose**.

3 If the preferred language is not available in the list, click **Select a language to add**. Select the language that you want to use, and click **Add**.

4 In the **Languages** dialog box, click the applicable language, and use the **Move up** button to move the selected item to the top of the list. Click **OK**.

5 Close all Firefox windows and reopen the browser window.

# Changing locale settings for legacy clients

By default, the legacy clients (that is, the clients running 9.x or a previous version of NetVault Backup) assume the locale settings of the NetVault Backup Server.

**NOTE:** This setting is required only when the NetVault Backup Server and Client run on machines with different locale settings.

*To change the locale setting for a legacy client*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click **Client Settings**. In the clients table, select the applicable client, and click **Next**.

3 Under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following setting:

- **Locale to assume for legacy clients:** Select the preferred locale for the client. The available options are:
  - Default
  - Chinese (Simplified)
  - English
  - French
  - German
  - Japanese
  - JapaneseEUC
  - Korean

  Use **"Default"** to automatically use the locale settings of the NetVault Backup Server.

**NOTE:** If international characters are not displayed correctly when selecting data for a backup or restore job, verify that the **Locale to assume for legacy clients setting** is correctly configured for the client.

5 Click **Apply** to apply the new settings and close the dialog box.

# Disabling pre-installation package compatibility check

Before installing a plug-in, NetVault Backup ensures that the installation package is compatible with the client OS and bit-type. You can disable this check, if necessary.

*To disable pre-installation compatibility checks for packages*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following setting:

- **Package Install System Check:** This check box is selected by default. Before installing any plug-in, NetVault Backup ensures that installation package is compatible with the client OS and bit-type. The installer reports an error if the package is incompatible.

  To disable pre-installation package compatibility checks, clear the check box.

**NOTE:** When you disable package check, you risk installing an incompatible package.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring license expiration warning period

By default, the NetVault WebUI shows the license expiration message seven days before the product expiration date. The dialog box is displayed when you log on to the NetVault WebUI.

*To change the license expiration warning period*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **General**.

4 In the **General** dialog box, configure the following setting:

- **License expiry warning threshold:** Specify how many days in advance NetVault Backup notifies you about the license expiration. The message is displayed every time you log on to the WebUI. The default period is seven days.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring security settings

*To configure security settings for NetVault Backup Server or Client*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **Security**.

4 In the **Security** dialog box, configure the following settings.

**Table 21. Security settings**

| Setting | Description |
|---|---|
| **This machine may be added as a client to a server** | The security settings on a NetVault Backup Server prevent the server from being added as a client to a different server.<br>To allow a NetVault Backup Server to function as a client to a different server, select this check box. |
| **Disable Security** | To add a client without using its NetVault Backup password, select this check box. |
| **Master Password** | Specify a password for the NetVault Backup machine. The password can contain a maximum of 100 characters. It cannot contain the following characters:<br>**< > & # \|**<br>The NetVault Backup password is used during client addition. For more information about NetVault Backup passwords, see the *Dell NetVault Backup Installation Guide*. |
| **Confirm Password** | Type the NetVault Backup password again for confirmation. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Synchronizing BakBone Time

This section includes the following topics:

- About BakBone Time
- Configuring an alternate BakBone Time Server

## About BakBone Time

NetVault Backup designates a Time Server, called BakBone Time Server, to synchronize time on the server and all client machines in the NetVault Backup Domain. Typically, the NetVault Backup Server acts as the BakBone Time Server, and the system time on this machine is the BakBone Time. However, you can designate any other NetVault Backup machine as the BakBone Time Server. NetVault Backup ignores the local time on the clients and uses BakBone Time for all time-specific operations, such as job scheduling, reporting, and tracing.

# Configuring an alternate BakBone Time Server

*To establish an alternate NetVault Backup machine as the BakBone Time Server*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **System and Security**, click **Time Sync**.

4 In the **Time Sync** dialog box, configure the following settings.

**Table 22. Time synchronization settings**

| Setting | Description |
|---|---|
| **This machine is the BakBone time server** | This check box is selected by default on the NetVault Backup Server.<br>To configure an alternate time server, clear this check box on the NetVault Backup Server. |
| **Synchronize BakBone time with system** | Type the NetVault Backup name of the alternate time server. |
| **Number of ping-pongs to determine time difference** | Type or select the number of time packets to be exchanged while polling. The default value is 5. |
| **Number of hours between time sync updates** | Specify how often the NetVault Backup Server checks to see if it is still synchronized with the time server. The default polling interval is 24 hours. |
| **Number of milliseconds of time difference allowed between 2 servers** | Type or select the allowed time variance. By default, NetVault Backup allows 1000-millisecond variance between the NetVault Backup Server and the BakBone Time Server. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring default settings for global notification methods

This section includes the following topics:

- Configuring email server settings for notifications
- Configuring SysOp email ID for notifications
- Configuring a default printer for notifications
- Configuring network manager host settings for notifications

# Configuring email server settings for notifications

Before you can use Sysop Email method for sending notifications, you must configure the Outgoing Email Server (SMTP) settings and the SysOp email address.

*To configure the email server settings for notifications*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Notification**.

4 In the **Notification** dialog box, under **Mail Server**, configure the following options.

**Table 23. Mail server settings for notifications**

| Setting | Description |
|---|---|
| **Outgoing E-mail Server (SMTP)** | Type the machine name or IP Address of the Mail Server. |
| **Port number** | The default SMTP listener port is port number 25. If the Mail Server is configured to listen on a different port, specify the port number. |
| **NetVault's E-mail Address** | Type the sender's email address for notifications. |
| **NetVault's Real Name** | Type the sender's name for email notifications. |
| **Perform Authentication** | To perform authentication, select this check box.<br>You can use this setting only if your Mail Server supports LOGIN or PLAIN protocols. |
| **Authentication Account** | Specify a user account that can be used for SMTP authentication. This option is required only if the **Perform Authentication** check box is selected.<br>If no user account is specified, the user name from **NetVault's E-mail Address** is used for authentication. For example, if you specify "User-A@mycompany.com" in the **NetVault's E-mail Address** box, NetVault Backup uses "User-A" to perform SMTP authentication. |
| **Authentication Password** | Type the password for the SMTP authentication account. |
| **Confirmation Authentication Password** | Re-type the password for confirmation. |
| **Use hostname instead of nvsendmail** | Select this check box to use the Fully Qualified Domain Name (FQDN) instead of **nvsendmail** with the EHLO and HELO commands. NetVault Backup uses the host name in the mail server messages, so the system must be set up with an FQDN to display the host name in FQDN format. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring SysOp email ID for notifications

Before you can use Sysop Email method for sending notifications, you must configure the Outgoing Email Server (SMTP) settings and the SysOp email address.

*To configure the SysOp email ID for notifications*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Notification**.

4 In the **Notification** dialog box, under **Global Notification**, configure the following settings.

**Table 24. SysOp mail ID for notifications**

| Setting | Description |
|---|---|
| **Email Address of System Administrator** | Type the email address of the Sysop (Administrator). Use a comma (,) to separate multiple email addresses. |
| **Real Name of System Administrator** | Type the real name of the Sysop or Administrator. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring a default printer for notifications

To use the Print Report method on Windows, you can either configure a default printer or set the variable NVPRINTER while setting up a notification method.

*To configure a default printer for notifications*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Notification**.

4 In the **Notification** dialog box, under **Default Printer**, configure the following setting:

- **Default Printer Name:** To configure a default printer for the Print Report notification method, type the printer name. Specify the exact string that is used to identify the printer in the Windows OS.

  This setting is only required on Windows-based NetVault Backup Servers.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring network manager host settings for notifications

Before you can use SNMP Trap method, you must configure the network manager host settings.

*To configure the Network Manager Host settings notifications*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Notification**.

4 In the **Notification** dialog box, under **SNMP Traps**, configure the following settings.

**Table 25. Default settings for SNMP Trap notifications**

| Setting | Description |
|---|---|
| **Trap Target Host** | Type the network name or FQDN (Fully Qualified Domain Name) of the Network Manager host to which the SNMP traps are to be sent. |
| **Port Number** | The default listener port for SNMP traps is port number 162.<br>If the host is configured to listen on a different port, specify the port number. |
| **Community String** | An SNMP community string is a password that is used to authenticate messages that are sent between the Network Manager Host and the agent. The community string is included in every packet that is transmitted between the SNMP manager and the SNMP agent.<br>This Community String is set to "public," which is the default read-only community string for most network devices. We recommend that you modify this default string and set a new password for SNMP traps. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring the reporting utility

This section includes the following sections:

- About reporting utility
- Customizing HTML report templates
- Customizing plain text report templates
- Customizing CSV report templates
- Configuring default settings for Statistics Manager
- Creating a global purge policy for the Reports Database
- Creating table-specific purge policy

# About reporting utility

The NetVault Backup reporting utility provides a selection of canned reports that can be generated and viewed in HTML, text, and Comma Separated Value (CSV) formats. For more information about reports, see Using canned reports.

NetVault Backup uses the Statistics Manager (**nvstatsmngr**) and Reports Database Manager (**nvrepdbmngr**) processes to gather and transmit data for the canned reports:

- **Statistics Manager:** This process runs on the NetVault Backup Server and Client machines. The Statistics Manager collects drive statistics, event history, media requests, server capacity, and transfer information.
- **Reports Database Manager:** This process runs only on the NetVault Backup Server. The Reports Database Manager polls the Statistics Manager at regular intervals to retrieve the collected data, and writes the data to the Reports Database. It provides the information in the reports database to the reporting utility and performs periodic purging of the reports database.

You can customize the report templates and change the default settings for the Statistics Manager and Reports Database Manager from the NetVault WebUI.

# Customizing HTML report templates

NetVault Backup uses built-in templates to generate and format the output for HTML reports. You can customize these templates to apply various formatting styles. The formatting styles are applied globally to all HTML report templates. Only users having a good knowledge of HTML should configure these settings. Improper configuration can result in incorrect output.

*To customize the output format for HTML reports*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.
4. In the **Reporting** dialog box, under **HTML Text Output**, configure the following settings:
   - **Pre-text for HTML output of plain text**
   - **Post-text for HTML output of plain text**
   - **Default HTML column header pre-text**
   - **Default HTML column header post-text**
   - **Default HTML header field pre-text**
   - **Default HTML header field post-text**
   - **Default text to output for an HTML report with no records**
   - **Default HTML total row pre-text**
   - **Default HTML total row post-text**
   - **Default HTML total field pre-text**
   - **Default HTML total field post-text**
   - **Default HTML average row pre-text**
   - **Default HTML average row post-text**
   - **Default HTML average field pre-text**

- **Default HTML average field post-text**
- **Default HTML format pre-text**
- **Default HTML format post-text**
- **Default HTML format field pre-text**
- **Default HTML format field post-text**

Use the pre-text fields to specify opening HTML tags for formatting styles (for example, font type, font size, and others) or text for headers, total or average rows, or body cells.

Use the post-text fields to specify closing HTML tags for custom formatting styles.

Use the **Default text to output for an HTML report with no records** field to change the default text "Nothing to display" with any custom text.

5 Click **Apply** to apply the new settings and close the dialog box.

# Customizing plain text report templates

NetVault Backup uses built-in templates to generate and format the plain text reports. You can customize these templates and add line breaks, tabs, or separators. The formatting styles are applied globally to all plain text report templates. Only users familiar with the use of control characters and escape sequences in text output should configure these settings. Improper configuration can result in incorrect output.

### *To customize the output format for plain text reports*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **Plain Text Output**, configure the following settings:

- **Default plain text column header pre-text**
- **Default plain text column header post-text**
- **Default text to output for a plain text report with no records**
- **Default plain-text total row pre-text**
- **Default plain-text total row post-text**
- **Default plain-text total field pre-text**
- **Default plain-text total field post-text**
- **Default plain-text average row pre-text**
- **Default plain-text average row post-text**
- **Default plain-text average field pre-text**
- **Default plain-text average field post-text**
- **Default plain-text format pre-text**
- **Default plain-text format post-text**
- **Default plain-text format field pre-text**
- **Default plain-text format field post-text**

Use the pre-text fields to specify formatting styles (for example, line breaks, separators, and others) or text for headers, total or average rows, or body cells.

Use the post-text fields to specify formatting styles (for example, line breaks, separators, and others).

Use the **Default text to output for a plain text report with no records** field to change the default text "Nothing to display" with any custom text.

5 Click **Apply** to apply the new settings and close the dialog box.

# Customizing CSV report templates

NetVault Backup uses built-in templates to generate and format the output for CSV reports. You can customize these templates and define a custom delimiter, add line breaks, tabs, or separators. The formatting styles are applied globally to all CSV report templates. Only users familiar with the use of control characters and escape sequences in CSV output should configure these settings. Improper configuration can result in incorrect output.

*To customize the output format for CSV reports*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **CSV Output**, configure the following settings:

- **Default CSV column header pre-text**
- **Default CSV column header post-text**
- **Default CSV header field pre-text**
- **Default CSV header field post-text**
- **Default text to output for a CSV report with no records**
- **Default CSV format pre-text**
- **Default CSV format post-text**
- **Default CSV format field pre-text**
- **Default CSV format field post-text**

Use the pre-text fields to specify formatting styles (for example, line breaks, separators, and others) or text for headers, total or average rows, or body cells

Use the post-text fields to specify formatting styles (for example, line breaks, separators, and others) and custom delimiters.

Use the **Default text to output for a CSV report with no records** field to change the default text "Nothing to display" with any custom text.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring timeout setting for report generation

*To configure the timeout setting for report generation*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **Misc**, configure the following setting:

- **Report Generation Timeout:** By default, the timeout period is set to 120 seconds. If the report generation does not complete within this period, the job fails. To change the timeout period, type or select a new value. The valid timeout range is 60 to 600 seconds.

5 Click **Apply** to apply the new settings and close the dialog box.

# Configuring default settings for Statistics Manager

*To configure the default settings for Statistics Manager*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **Stats Collection**, configure the following settings.

**Table 26. Stats Collection settings**

| Setting | Description |
|---|---|
| **Statistics gathering window start**<br>**Statistics gathering window end** | By default, the Statistics Manager collects statistics for 24 hours, starting at 00:00:00 and continuing until 23:59:59 hours. To limit statistics collection to certain times of the day, specify the start and end time in these boxes.<br>Specify the time in HH:MM:SS format.<br>The maximum duration for a session is 24 hours. It could last a single calendar day or continue to the next day. For example, if you set 10:00:00 as the start time and 7:00:00 as the end time, the session will begin at 10:00 A.M. on the current day and lasts until 7:00 A.M. the next day. |
| **Frequency** | Type or select the polling period for Statistics Manager. The polling period is specified in number of seconds. The default value is 10 seconds. |
| **Records per Storage File** | Type or select the maximum number of records per file. The Statistics Manager will close the current file and open a new file when this limit is reached. The default value for this setting is 1000 records. |

5 In the **Reporting** dialog box, under **Stats Provision**, configure the following settings.

**Table 27. Stats Provision settings**

| Setting | Description |
|---|---|
| **Enable stats collection on this machine** | Statistics collection is enabled by default on all NetVault Backup machines. To disable this activity on a client, clear this check box.<br>If you disable statistics collection, the reports related to drive performance, event history, media requests, and other data collected by the Statistics Manager may show inaccurate information. |
| **Absent server threshold** | Type or select how long the Statistics Manager holds the collected data for the Reports Database Manager. The threshold is specified in number of hours. The default value is 72 hours. If the Reports Database Manager does not poll for data within this time, a warning is logged and the following events occur:<br>• The Statistics Manager discards all files that are not transferred to the Reports Database.<br>• The Statistics Manager does not store any files until the Reports Database Manager establishes contact with it. |
| **Transmit Block Size** | Type or select the block size for transmitting data collected by the Statistics Manager. The block size is specified in KB. The default value is 10KB. |
| **Minimum Stats Manager Cache** | Type or select the minimum cache for Statistics Manager. It is specified in number of records. The default value is 30 records. |

6 Click **Apply** to apply the new settings and close the dialog box.

# Creating a global purge policy for the Reports Database

By default, the Reports Database Manager deletes all records that are older than 31 days. You can override this behavior with an age-based or a size-based purge policy.

### *To create a global purge policy for the Reports Database*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **Tables**, configure the following settings.

**Table 28. Global purge settings for the Reports Database**

| Setting | Description |
|---|---|
| **Tables default to being part of the global purge group** | By default, the global purge policy is applied to all the tables in the Reports Database. You can override this behavior for individual tables with table-specific purge policies. The table-specific policies are only applied when you disable the global policy at the database level.<br>To apply the global purge policy to all report tables, ensure that this check box is selected. |

**Table 28. Global purge settings for the Reports Database**

| Setting | Description |
|---|---|
| **Purge check frequency** | By default, the Reports Database Manager performs purge check every 24 hours, and deletes all records that match the purge condition.<br>To change the frequency of purge checks, type or select the time interval between two purge events. The purge frequency is specified in number of hours. |
| **Global purge method** | Select one of the following options:<br>• **By date:** Select this option to delete records that are older than the specified time limit.<br>• **By space used:** Select this option to delete records when the space usage exceeds the specified size limit. |
| **Global purge space limit** | Type or select the maximum file size for the report tables. The file size is specified in MB. The default value is 50MB. |
| **Global purge time limit** | Type or select the maximum age for records stored in the Reports Database. The record age is specified in number of days. The default value is 31 days. |

5 Click **Apply** to apply the new settings and close the dialog box.

# Creating table-specific purge policy

Table-specific purge policies can be created for the following report tables: driveevents, events, mediacapacities, mediarequests, mediatransfers, driveperformance, and jobfiletallies.

### *To create a purge policy for individual report tables*

1 In the Navigation pane, click **Change Settings**.

2 On the **Configuration** page, click the applicable icon:

- **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
- **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.

3 On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Reporting**.

4 In the **Reporting** dialog box, under **Tables**, configure the following settings.

**Table 29. Table-specific purge policy**

| Setting | Description |
|---|---|
| **Tables default to being part of the global purge group** | By default, the global purge policy is applied to all the tables in the Reports Database. The table-specific policies are only applied when you disable the global policy at the database level.<br>To disable the global purge policy at the database level, clear this check box. |
| **Table <table name> purge method** | Select one of the following options:<br>• **By space used:** Select this option to delete records when the space usage exceeds the specified size limit.<br>• **By date**: Select this option to delete records that are older than the specified time limit.<br>• **Use global policy**: Select this option to apply the global purge policy to the table. |

**Table 29. Table-specific purge policy**

| Setting | Description |
|---|---|
| **Table <table name> purge space limit** | Type or select the maximum file size for the report tables. The file size is specified in MB. The default value is 10MB. |
| **Table <table name> purge time limit** | Type or select the maximum age for records stored in the Reports Database. The record age is specified in number of days. The default value is 31 days. |

5 Click **Apply** to apply the new settings and close the dialog box.

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# Using the trace utility



## About trace logs

Tracing is a logging technique that captures diagnostic information related to events and error conditions occurring in the NetVault Backup system. Trace logs are used by Dell Software Technical Support to identify and correct problems in the system.

**NOTE:** The trace utility must only be used under the direction of Dell Software Technical Support.

Tracing is disabled by default. To generate trace logs, you must set appropriate trace levels for various processes, and enable tracing. You can find the trace logs in <NetVault Backup home>\trace on Windows and <NetVault Backup home>\trace on Linux. To relocate the trace directory, see Configuring general settings.

By default, the BakBone Time is used in trace logs. BakBone Time is the system time on the BakBone Time Server that is usually the NetVault Backup Server. It is used to synchronize time on all NetVault Backup Clients in the domain. You can also configure NetVault Backup to use local client time in the trace logs. The log time is recorded in the format **hhmmss.mmmmmm** (Hours, Minutes, Seconds, and fractional component). The update interval for the fractional component depends on the OS in use**.**

By default, a single trace file is created for each process that continues to grow as new logs are added to it. The maximum file size depends on the OS and file system in use. From the **Change Settings** link, you can override this behavior and configure a circular tracing method for the trace logs.

## Trace levels

Trace levels specify what type of events and errors are traced, and what level of detail is recorded in the trace logs. The following table lists the supported trace levels.

**Table 1. Trace levels**

| Trace level | Description |
|---|---|
| DEFAULT | The DEFAULT trace level is equivalent to the LIBDEBUG trace level.<br>On pre-8.5 versions, this setting is equivalent to the LIBVERBOSE trace level. |
| ALWAYS | Traces all error conditions. |
| NORMAL | Traces high-level application execution path. |
| VERBOSE | Traces low-level application execution path. |
| LIBNORMAL | Traces high-level execution of library functions. |
| LIBVERBOSE | Traces low-level execution of library functions. |

**Table 1. Trace levels**

| Trace level | Description |
|---|---|
| DEBUG | Traces high-level debug information. |
| LIBDEBUG | Traces low-level debug information. |

# Setting trace levels

Trace levels specify what type of events and errors are traced, and what level of detail is recorded in the trace logs. By default, the trace level for each process is set to DEFAULT. The DEFAULT trace level is equivalent to the LIBDEBUG trace level.

*To change trace levels for one or more processes*

1. In the Navigation pane, click **Change Settings**.
2. On the **Configuration** page, click the applicable icon:
   - **Server Settings:** To configure the default settings for the NetVault Backup Server, click this icon.
   - **Client Settings:** To configure the default settings for a NetVault Backup Client, click this icon. In the clients table, select the applicable client, and click **Next**.
3. On the **NetVault Server Settings** or **Client Settings** page, under **User Interface**, click **Trace Level**.
4. In the **Trace Level** dialog box, the following processes are listed.

   **Table 2. Setting trace levels for various NetVault Backup processes**

   - Configurator
   - Process Manager
   - Communication Manager
   - Network Manager
   - Script Plugin
   - GUI
   - Core Plugin
   - GUI Proxy
   - Schedule Manager
   - Job Manager
   - Device Manager
   - NDMP Device Manager
   - SVTL Device Manager
   - Library Manager
   - NDMP Library Manager
   - SVTL Library Manager
   - ACSLS Library Manager
   - Media Manager
   - Logging Daemon
   - Database Browser
   - Verify Browser
   - Duplicate Browser
   - SysExec Plugin
   - Utility Plugin
   - Device Scan
   - Statistics Manager
   - Reports Database Manager
   - Auditor
   - SVTL Creator
   - CLI Proxy Gateway
   - Config Manager
   - RAS Device Scanner
   - Web Service
   - Web Service Worker
   - Notification Plugin
   - Reports Producer
   - Audit Tool Plugin
   - Consolidate Incremental backups
   - Data Copy
   - Data Copy Plugin Slave
   - Disk Device Creator
   - Raw Device
   - Verify Plugin
   - File System
   - NetVault Databases

   When you install a licensed plug-in, a new process corresponding to that plug-in is automatically added to this dialog box. The trace utility can be used to capture information about the new process without any additional requirement.
5. For each process, the trace level is set to DEFAULT. To set or change the trace level for a process, select the appropriate setting. The available options are:
   - DEFAULT
   - ALWAYS
   - NORMAL

- VERBOSE
- LIBNORMAL
- LIBVERBOSE
- DEBUG
- LIBDEBUG

6 Click **Apply** to apply the new settings and close the dialog box.

# Enabling tracing

Tracing is not enabled by default. You have to start it manually after setting the trace levels.

*To enable tracing*

1 In the Navigation pane, click **Change Settings**.

2 To configure the default settings for NetVault Backup Server, click **Server Settings**.

3 To configure the default settings for a NetVault Backup Client, click **Client Settings**. In the clients table, select the applicable client, and click **Next**.

4 Under **System and Security**, click **General**.

5 In the **General** dialog box, configure the following settings.

**Table 3. Enable tracing**

| Setting | Description |
|---|---|
| **Generate debugging files** | To enable tracing, select this check box.<br>To disable tracing, clear this check box. |
| **Use Bakbone time in debugging files** | This check box is selected by default to ensure all date and time values in the trace logs are based on BakBone Time. This setting helps in comparing and analyzing trace output from multiple clients. We recommend that you leave this check box selected. |

6 Click **Apply** to apply the new settings and close the dialog box.

# Enabling circular logging method for trace files

By default, NetVault Backup creates a single trace file for each process that continues to grow as logs are added to it. Circular tracing allows you to split the file by setting maximum lines per trace file, and overwrite the oldest file by setting the maximum number of trace files to retain. For example, if you configure 5000 lines per trace file and 5 trace files to keep per session, 5000 trace logs are written to one file, and then a new file is created. When the fifth file is filled up, the first file is overwritten.

*To enable circular logging method for trace files*

1 In the Navigation pane, click **Change Settings**.

2 To configure the default settings for NetVault Backup Server, click **Server Settings**.

3 To configure the default settings for a NetVault Backup Client, click **Client Settings**. In the clients table, select the applicable client, and click **Next**.

4 Under **System and Security**, click **General**.

5 In the **General** dialog box, configure the following settings.

**Table 4. Enable circular logging method for trace files**

| Setting | Description |
|---|---|
| **Lines per trace file** | This setting determines two properties for trace files:<br>• If circular tracing is enabled<br>• If circular tracing is enabled, the maximum number of lines for each trace file<br>The default value for this option is zero (0), which indicates that circular logging is not enabled for trace files.<br>To enable circular tracing, type or select the maximum number of trace lines that can be written to each file. It is set in multiples of 1000 and the maximum supported value is 32,000.<br>After configuring this option, you must also set the **Trace Files to Keep Per Session** option. |
| **Trace file to keep per session** | Type or select the maximum number of trace files that can be created in a session. A session is valid for an indefinite time, until the NetVault Backup Service is restarted. The maximum supported value is 1000.<br>When circular tracing is enabled, NetVault Backup begins writing trace messages to the first file. When data exceeds the defined maximum lines, the current file is closed and a new file is created. An integer is appended to the filename to indicate its sequence. When the last file gets filled, NetVault Backup overwrites the first file, and so on. |

6 Click **Apply** to apply the new settings and close the dialog box.

A

# Using the deviceconfig utility



## About deviceconfig

The **deviceconfig** utility is a console application that allows you to configure advanced device settings for all types of tape libraries and drives. This utility is automatically installed on the respective machines when you install the NetVault Backup Server and Client software.

The **deviceconfig** utility is located in the **"bin"** directory (<NetVault Backup home>\bin on Windows and <NetVault Backup home>/bin on Linux and UNIX).

To use this utility, you must be logged-in with Administrator privileges on Windows and root user privileges on Linux and UNIX.

## Configuring default settings for tape libraries

*To configure default settings for a tape library*

1 Start a terminal session or command window.

2 Go to <NetVault Backup home>\bin (Windows) or <NetVault Backup home>/bin (Linux and UNIX).

3 To start the utility, type the following command:

```
deviceconfig [-servername <FQDN> (-httpport <HTTP port> |
-httpsport <HTTPS port>)] -username <NetVault Backup user>
                    -password <user password>
-librarymachine <library machine name> -libraryname <library name>
```

These options are described in the following table.

**Table 1. Using deviceconfig to modify tape library settings**

| Option | Description |
|---|---|
| **-servername** | Connects to a remote NetVault Backup Server.<br>With this option, you must specify either the HTTP or HTTPS port to connect to the Remote Web Service.<br>If you omit this option, the deviceconfig utility connects to the Local Web Service and automatically detects the local Web Service configuration. |
| **-username** | Specifies a valid NetVault Backup user name. |
| **-password** | Specifies the password for the user account. |

**Table 1. Using deviceconfig to modify tape library settings**

| Option | Description |
|---|---|
| **-librarymachine** | Specifies the name of the NetVault Backup machine to which the library is connected to. |
| **-libraryname** | Specifies the name of the library. |

**Examples:**

- `deviceconfig -servername "Test_Server-B" -httpsport 8443 -username default -librarymachine "Test_Server-B" -libraryname "Library_1"`
- `deviceconfig -username default -librarymachine "Test_Server-A" -libraryname "Library_2"`

4 The **Changer Configuration** page is displayed when you start the utility. This page contains the following items:

- **Configuration:** To configure general settings for a tape library, press **1**. For more information about these settings, see Configuring general settings for tape libraries.
- **Cleaning**: To configure drive cleaning settings for a tape library, press **2**. For more information about these settings, see Configuring drive cleaning settings.
- **Mixed Media:** To configure mixed media settings, press **3**. For more information about these settings, see Configuring mixed media settings.

5 To save the changes and quit, press **s**.

(To quit without saving the changes, press **q**.)

# Configuring general settings for tape libraries

On the **Configuration** page, the following settings are available.

**Table 2. General settings for tape libraries**

| Option | Description |
|---|---|
| **Need command to open entry/exit port** | The default setting is **OFF**. To change it, press the option number. |
| **Do not issue unload commands to drives** | The default setting is **OFF**. To change it, press the option number. |
| **Must unload drive(s) to open door** | The default setting is **OFF**. To change it, press the option number. |
| **Do not overlap commands to arm and drive** | The default setting is **OFF**. To change it, press the option number. |
| **Return inactive media to slot delay** | Type the timeout period for media inactivity. The timeout period is specified in number of seconds. NetVault Backup returns the media i returned to the slot if no activity occurs within the specified period. The default value for this option is 30 seconds. To retain the media indefinitely in the drive, set this option to zero (0). |
| **Mark Unknown Media Blank** | The default setting is **OFF**. To change it, press the option number.<br>When it is set **ON**, NetVault Backup marks unknown tapes as BLANK without reading the tape headers. You still need to run the **Blank** command to actually delete the data and use the media for backups. |

**Table 2. General settings for tape libraries**

| Option | Description |
|---|---|
| **Do Not Scan Unknown Media** | When you add tapes to a library, and close the door (or restart the library), NetVault Backup takes an inventory by reading the media barcodes. If NetVault Backup cannot find the barcode for a piece of media in the Media Database, it marks that tape as UNKNOWN. You can use the **Mark Unknown Media Blank** option to mark such tapes as BLANK.<br>If you do not mark the unknown tapes as BLANK, NetVault Backup starts loading each unknown tape into one of the drives to scan for backups and on-tape indices. On large systems, this process can increase the burden on the drive resources.<br>If you do not want to scan the unknown tapes automatically, change the setting to **ON**. When it is set **ON**, the unknown tapes are marked as UNKNOWN.<br>To apply this parameter to an existing library, you must remove the library and re-add it. |
| **Entry / Exit Port Locks Arm** | The default setting is **OFF**. To change it, press the option number. |

# Configuring drive cleaning settings

On the **Cleaning** page, the following settings are available.

**Table 3. Drive cleaning settings**

| Option | Description |
|---|---|
| **Automatic Cleaning Supported** | The default setting is **ON** for libraries that support automatic cleaning. |
| **Barcode Prefix(es) of cleaning media** | Specify the barcode prefixes for cleaning media. To configure multiple cleaning tapes, separate the barcodes using a comma. If you do not use the barcode labels of tape media, you can omit this option. |
| **Cleaning Slots** | Specify the slot numbers that can hold the cleaning media. To configure multiple slots, use a comma. |

# Configuring mixed media settings

On the **Mixed Media** page, the following settings are available.

**Table 4. Mixed Media settings**

| Option | Description |
|---|---|
| **Slot Types** | This option specifies the slot ranges for each media type. The media organization in the library during initial setup determines how you configure this setting. To create this list, assign a unique Slot Type Identifier for each media type and specify the corresponding slot range for it. The format for creating is:<br>`<SlotTypeIdentifier>=<SlotRange>`<br>To specify more than one slot range for a media type, create a separate list item. Comma-separated values are not supported. Use the same Slot Type Identifier for configuring the additional slots or slot ranges. When assigning a Slot Type Identifier, verify that it allows you to easily identify the media type contained in the slot. No spaces are allowed in the values. |

**Table 4. Mixed Media settings**

| Option | Description |
|---|---|
| | **Example:**<br>`SDLTMedia=1-10`<br>`STKRMedia=11-30`<br>`LTO1Media=31-60`<br>`LTO1Media=101` |
| **Drive Types** | This option specifies the types of drives that are available on the library. To create this list, assign a unique Drive Type Identifier for each media type and specify the corresponding drive number for it. The format for creating this list is:<br>`<DriveTypeIdentifier>=<DriveNumber>`<br>For multiple drives of the same type, configure each individual drive as a separate list item. Comma-separated values are not supported. Use the same Drive Type Identifier for configuring multiple drives of the same type. When assigning a Drive Type Identifier, make sure that it allows you to easily identify the drive type. No spaces are allowed in the values.<br>**Example:**<br>`SDLT=1`<br>`STKR=2`<br>`STKR=3`<br>`LTO1=4` |
| **Drive Types/Media Type Compatibilities** | This option specifies the supported media type for each drive type. The format for creating this list is:<br>`<DriveTypeIdentifier>=<SlotTypeIdentifier>`<br>**Example:**<br>`SDLT=SDLTMedia`<br>`STKR=STKRMedia`<br>`LTO1=LTO1Media`<br>This configuration ensures that a piece of media is only obtained from the corresponding slots when a particular type of drive is accessed. |

# Configuring default settings for tape drives

*To configure the default settings for a tape drive*

1. Start a terminal session or command window.
2. Go to <NetVault Backup home>\bin (Windows) or <NetVault Backup home>/bin (Linux and UNIX).
3. To start the utility, type the following command:

```
deviceconfig [-servername <FQDN> (-httpport <HTTP port> |
-httpsport <HTTPS port>)] -username <NetVault Backup user>
                    -password <user password>
-drivemachine <drive machine name> -drivepath <path to drive>
```

These options are described in the following table.

**Table 5. Using deviceconfig to modify tape drive settings**

| Option | Description |
|---|---|
| **-servername** | Connects to a remote NetVault Backup Server.<br>With this option, you must specify either the HTTP or HTTPS port to connect to the Remote Web Service.<br>If you omit this option, the deviceconfig utility connects to the Local Web Service and automatically detects the local Web Service configuration. |
| **-username** | Specifies a valid NetVault Backup user name. |
| **-password** | Specifies the password for the user account. |
| **-drivemachine** | Specifies the name of the NetVault Backup machine to which the drive is connected to. |
| **-drivepath** | Specifies the name or path of the drive. |

**Examples:**

- `deviceconfig -servername "Test_Server-B" -httpsport 8443 -username default -drivemachine "Test_Server-B" -drivepath "C:\VTL\MyVTL\drives\1"`
- `deviceconfig -username default -drivemachine "Test_Server-A" -drivepath "C:\VTL\MyVTL-2\drives\1"`

4 The **Drive Configuration** page is displayed when you start the utility. This page contains the following items:

- **NDMP Configuration:** To configure NDMP Settings, press **1**. For more information about these settings, see Configuring NDMP settings.
- **Configuration:** To configure general settings for a tape drive, press **2**. For more information about these settings, see Configuring general settings for tape drives.
- **Software Compression:** To configure software compression settings, press **3**. For more information about these settings, see Configuring software compression settings.
- **Performance:** To configure drive performance settings, press **4**. For more information about these settings, see Configuring drive performance settings.
- **Statistics**: To configure statistics collection settings, press **5**. For more information about these settings, see Configuring statistics collection settings.
- **Generic Cleaning:** To configure generic cleaning settings for a tape drive, press **6**. For more information about these settings, see Configuring generic cleaning settings.

5 To save the changes and quit, press **s**.

(To quit without saving the changes, press **q**.)

# Configuring NDMP settings

On the **NDMP Configuration** page, the following settings are available.

**Table 6. NDMP settings**

| Option | Description |
|---|---|
| **Allow Mover to do Local Data Transfer if Possible** | The default setting is **OFF**. To change it, press the option number. |
| **Allow Mover to do IPC Data Transfers if Possible** | The default setting is **OFF**. To change it, press the option number. |

**Table 6. NDMP settings**

| Option | Description |
|---|---|
| **Allow Mover to do TCP Data Transfer if Possible** | The default setting is **ON**. To change it, press the option number. |
| **Allow Mover to do Direct Backup if Possible** | The default setting is **ON**. To change it, press the option number. |
| **Allow Mover to do Direct Restore if Possible** | The default setting is **ON**. To change it, press the option number. |
| **Emulate NDMP Device** | The default setting is **ON**. To change it, press the option number. |

# Configuring general settings for tape drives

On the **Configuration** page, the following settings are available.

**Table 7. General settings for tape drives**

| Option | Description |
|---|---|
| **Device Serial Number** | Displays the drive serial number. |
| **End of media warning** | This option specifies the amount of media reserved at the end of the tape at which the "end of media" warnings are issued. This value is specified in MB. The default value is 0MB. |
| **Time between polling empty drive** | This option specifies the interval at which NetVault Backup polls a standalone drive to detect a tape in the device. This value is specified in number of minutes. The default value is one (1).<br>To turn off polling, set this option to zero (0). |
| **Media block size (KiB)** | This option specifies the block size used for read and write operations. The default value is 64KiB.<br>You can change the media block size in increments of 1KiB, but many devices may only accept a value in the multiples of 4KiB or 32KiB.<br>**NOTE:** The changes to the media block size settings are only applied to blank media items. If you are reusing a media item, blank it first for these changes to take effect.<br>Increasing the block size can reduce the number of times a backup needs to read data and write it to media. However, large media block sizes do not always imply an overall faster backup. The maximum block size is limited by several factors, such as the OS, SCSI adapter, drive make, drive model, and drive type.<br>On Linux and UNIX systems, you can increase the media block size for optimum performance.<br>On Windows, you might be required to change the registry setting **MaximumSGList** to use block sizes larger than 64KB. Before changing this setting, check that the SCSI bus is only used by the tape devices. If other devices also use the SCSI bus, this registry change might prevent them from working. If you want to apply these changes only to a specific channel on the HBA, consult the hardware vendor.<br>To change the registry setting on Windows, follow these steps:<br>1 Start the Registry Editor.<br>2 Open the key `[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\<HBA Vendor>\Parameters` (where `<HBA Name>` is specific to your SCSI card — for example, QL2200 for a Qlogic 2200 card).<br>3 Create the **Parameters** key if not present.<br>4 Under **Parameters**, create the **Device** key if not present.<br>5 Under the **Device** key, add the **DWORD** registry value **MaximumSGList** if not present. |

**Table 7. General settings for tape drives**

| Option | Description |
|---|---|
| | 6 Calculate the hexadecimal value of **MaximumSGList**:<br>**On 32-bit systems:**<br>`MaximumSGList = (Maximum Block Size / 4KiB) + 1`<br>For example, if the block size is set to 256KiB, the value for this key is:<br>`(256KiB/4KiB) + 1 = 65`<br>The decimal value is 65 and the hexadecimal value is 0x41.<br>You can set the block size to any value from 64KiB through 1012KiB. The maximum value 255 is internally converted to 257 to make a block size of 1 MiB (1024 KiB).<br>**On 64-bit systems:**<br>On 64-bit systems, the default OS page size is 8KiB. The formula for calculating **MaximumSGList** is:<br>`MaximumSGList = (Maximum Block Size / 8KiB) +1`<br>Thus, the maximum value of 255 corresponds to a maximum media block size of 2MiB.<br>7 Reboot the system to apply the changes. |
| **Time to wait for plugin to connect** | This option specifies the timeout period for the plug-in to connect to NetVault Backup. The job is aborted if connection cannot be established within the specified interval. This value is specified in number of seconds. The default value is zero (0). With the default setting, the job is not timed out. |
| **Supports Short Reads** | The default setting is **ON**. To change it, press the option number. |
| **Cleaning Tapes Supported** | This option indicates whether the library supports cleaning tapes or not. The default value is usually correct, unless certain library models have a different setting. |

# Configuring software compression settings

On the **Software Compression** page, the following settings are available.

**Table 8. Software Compression settings**

| Option | Description |
|---|---|
| **Perform software data compression** | The default setting is **OFF**. To perform software compression, change the setting to **ON**. The data is compressed when it is transferred to the device during backup. |
| **Compression decision switch** | The value set for this option determines the minimum level of compression that must be achieved when data is compressed during a backup. For example, if you set the value to 80 percent, one of the following occurs:<br>• If the compressed data size is less than 80 percent of the original data size, the data is backed up in its compressed form.<br>• If the compressed data size is more than 80 percent of the original data size, the data is backed up in its uncompressed form.<br>If you specify 80 percent, a file size of a 100MB must be <= 80MB after compression. If the specified level is not achieved, NetVault Backup backs up the file in its uncompressed form. The extent that data can be compressed depends on the data contents. Encrypted data cannot be compressed. With some files, compression may actually result in a file that is larger than the original uncompressed file. |
| **Number of data blocks per compression unit** | Type the number of data blocks per compression unit. The default block size is 8KiB. |

# Configuring drive performance settings

On the **Performance** page, the following settings are available.

**Table 9. Performance settings**

| Option | Description |
|---|---|
| **Open disk media for Synchronous IO on Unix** | The default setting is **OFF**. If your RAID system can respond instantaneously to synchronous IO writes, change the setting to **ON**. The **ON** setting allows multiple streams to generate output at similar rates resulting in similar jobs ending at the same time (but at the expense of overall throughput).<br>Under most circumstances, it is best to leave this option at the default **OFF** state to achieve best overall performance. |
| **Amount of memory to assign for transfer buffers** | The transfer buffer or the shared memory is allocated in blocks of 32KiB. The default value is 8193KiB.<br>Increasing the transfer buffer size can improve backup performance. To calculate the buffer size, use the following formula:<br>`(<Total number of buffers> x 32KiB) + 1 byte`<br>On Linux and UNIX systems, you require sufficient RAM and large Shared Memory segment. Before increasing the transfer buffer size, check the following settings on these platforms:<br>• Maximum size of a shared memory segment (SHMMAX)<br>• Minimum size of shared memory segment (SHMMIN)<br>• Maximum number of shared memory identifiers in the system (SHMMNI)<br>• Maximum number of shared memory segments a user process can attach (SHMSEG)<br>• Maximum number of semaphore identifiers in the system (SEMMNI)<br>• Maximum number of semaphores in a set (SEMMSL)<br>• Maximum number of semaphores in the system (SEMMNS)<br>• Maximum number of operations per semop call (SEMOPM)<br>• Semaphore maximum value (SEMVMX)<br>The total allowed shared memory is determined by the formula `SHMMAX * SHMSEG`. These values are often limited by the **ulimit** setting, and the command `ulimit -a` can be used to view these system settings.<br>On Windows, you require at least 2GB RAM and large virtual memory. You might also have to change the **MaximumSGlist** setting on the SCSI card.<br>For examples, see the Optimal transfer buffer size. |
| **Number of media blocks to write at a time** | We recommend that you do not change the default setting for this option.<br>If you change the value, record it because it is necessary to re-apply the setting if the drive is reinstalled. Restores require the same values that are set at the time of backup and fail if the settings do not match. |
| **Number of media blocks to read at a time** | We recommend that you do not change the default setting for this option.<br>If you change the value, record it because it is necessary to re-apply the setting if the drive is reinstalled. Restores require the same values that are set at the time of backup and fail if the settings do not match. |
| **Lock transfer buffer in memory** | Use this option to lock the allocated transfer buffer position in memory, and thus increase the potential performance and prevent other processes from using it when NetVault Backup is running.<br>The default setting is **ON**. Do not change the default setting unless otherwise advised by Dell Software Technical Support. |

# Configuring statistics collection settings

On the **Statistics** page, the following settings are available.

**Table 10. Drive performance statistics**

| Option | Description |
|---|---|
| **Gather statistics on device performance** | The default setting is **OFF**. To log drive performance statistics, change the setting to **ON**. This information facilitates troubleshooting. However, it also increases the size of the NetVault Database. |
| **Gather statistics on data channel performance** | The default setting is **OFF**. To log Data Channel statistics, change the setting to **ON**. This information facilitates troubleshooting. However, it also increases the size of the NetVault Database. |
| **Record drive performance** | The default setting is **ON**. To record drive performance details with each job that uses the drive, use the default setting. |
| **Length of time between sampling drive transfer rates** | Specify the interval at which NetVault Backup records the drive transfer rates. The value is specified in number of seconds. The default value is 60 seconds. |

**NOTE:** To apply any changes to these settings, do the following:

- From the NetVault WebUI (**Tape Drive Management** page), restart the Device Manager process (nvdevmgr) associated with the device by setting the device offline, and then back online. For more information about this process, see Changing the status of a tape drive.

  — or —

- Restart the NetVault Backup Services on the relevant machine.

# Configuring generic cleaning settings

On the **Generic Cleaning** page, the following settings are available.

**Table 11. Generic Cleaning settings**

| Option | Description |
|---|---|
| **Length of cleaning cycle** | Specify the duration of the cleaning cycle. The value is specified in number of seconds. The default value is 350 seconds, |
| **Issue a load command to start cleaning cycle** | The default setting is **ON**. If the drive requires a load command to initiate a cleaning cycle, use the default setting. |
| **List of ASC/ASQ codes that indicate cleaning has completed** | Specify the ASC/ASCQ SCSI codes for cleaning, if necessary. |
| **Use Generic Cleaning** | The default setting is **OFF**. To use generic cleaning properties, change the setting to **ON**. |

B

# NetVault Backup processes



## About NetVault Backup processes

NetVault Backup includes several static and dynamic processes that run on the server and client systems.

The static processes remain active while the NetVault Backup Service is running. These processes are assigned a fixed single-digit process ID and generally use the same amount of system resources during their life.

The dynamic processes are initiated and destroyed according to the current NetVault Backup activities. These processes are assigned a changing ID and use varying amount of system resources during their life

On Windows-based systems, you can view the NetVault Backup processes from the Task Manager. On Linux- and UNIX-based platforms, you can use the following command to view these processes:

```
ps -ef | grep nv
```

## Understanding NetVault Backup processes

This section briefly describes the functions of various NetVault Backup processes.

### nvpmgr (Process Manager)

**nvpmgr** runs on all NetVault Backup Server and Client systems. This process manages all other NetVault Backup processes. It creates and destroys the transient processes. The Process Manager also manages the allocation of shared memory area for the process table, trace buffers, and progress buffers. Although the Process Manager is assigned a static process ID, it is seen as a Dynamic process because it requires varying levels of system resources.

Process Type: Dynamic

Process ID: 1

### nvcmgr (Inter-Process Communications Manager)

**nvcmgr** supports the inter-process messaging system. It runs on all NetVault Backup Server and Client systems. On UNIX and Linux OS, the Communications Manager runs as a process. On Windows, this process runs as a thread within the **nvpmgr** process. It handles communication between various NetVault Backup processes on a local machine.

Process Type: Static

Process ID: 2

# nvnmgr (Network Manager)

**nvnmgr** supports the inter-process messaging system. It runs on all NetVault Backup Server and Client systems. On UNIX and Linux OS, the Network Manager runs as a process. On Windows, this process runs as a thread within the **nvpmgr** process. This process transmits the inter-process messages to remote clients. The Network Manager also broadcasts availability messages that help determine the status of the clients.

Process Type: Static

Process ID: 3

# nvmedmgr (Media Manager)

**nvmedmgr** runs on the NetVault Backup Server. This process manages the Media Database. This database contains information about the media contents and online backup savesets. The Media Manager issues high-level instructions for loading and unloading media. The Device Manager processes carry out these instructions. The Media Manager controls the selection of device and media for a job according to the media requests submitted by the Job Manager.

Process Type: Static

Process ID: 4

# nvsched (Schedule Manager)

**nvsched** runs on the NetVault Backup Server. This process manages the job schedules and queues. The Schedule Manager initiates the Job Manager to start a job instance and schedules the next instance for recurring jobs; the Job Manager runs the job. The Scheduler Manager manages the Scheduler Database. It updates the **Job Status** page and provides job scheduling data to the Reporting utility.

Process Type: Static

Process ID: 5

# nvlogdaemon (Logging Daemon)

**nvlogdaemon** runs on the NetVault Backup Server. This process manages the messages generated by various processes and writes them to log files. Log messages are useful in tracking activities and troubleshooting problems. The Logging Daemon also performs periodic disk space checks, and issues alerts when the space usage reaches the defined warning or critical threshold for the NetVault Backup Home, Database, Logs, and Reports directories.

Process Type: Static

Process ID: 7

# nvavp (Audit Verification Manager or Auditor)

**nvavp** runs on the NetVault Backup Server. This process tracks and controls user activities. It validates each user request, and depending on the assigned privileges, allows or denies a request.

Process Type: Static

Process ID: 8

## nvstatsmngr (Statistics Manager)

**nvstatsmngr** runs on all NetVault Backup Server and Client systems. This process collects drive statistics, event history, media requests, server capacity, and transfer information for the reporting utility.

Process Type: Static

Process ID: 9

## nvrepdbmngr (Report Manager)

**nvrepdbmngr** runs on the NetVault Backup Server. This process manages the Reports Database. The Reports Database Manager polls the Statistics Manager at periodic intervals to fetch the collected data, and writes the data to the Reports Database. It transmits the information in the Reports Database to the reporting utility and performs periodic purging of the Reports Database.

Process Type: Static

Process ID: 10

## nvdevmgr (Device Manager)

**nvdevmgr** runs on the NetVault Backup Server and Clients that have locally attached devices. It performs media reads and writes, and handles loading and unloading of media. NetVault Backup creates one instance of the Device Manager process for each configured drive. In SAN environment, an instance runs for each NetVault Backup Client that shares the device.

Process Type: Dynamic

Process ID: Varies

## nvndmpdevmgr (NDMP Device Manager)

**nvndmpdevmgr** runs on the NetVault Backup Server. It performs media reads and writes, and handles loading and unloading of media for NDMP-based filers. NetVault Backup creates one instance of the NDMP Device Manager process for each configured drive.

Process Type: Dynamic

Process ID: Varies

## nvchgmgr (Changer Manager)

**nvchgmgr** controls the Robotic Arm Changer. It runs on the NetVault Backup Server and Clients to which the robotic arm changer is connected. NetVault Backup creates one instance for each arm changer.

Process Type: Dynamic

Process ID: Varies

## nvndmpchgmgr (NDMP Changer Manager)

**nvchgmgr** runs on the NetVault Backup Server. It controls the Robotic Arm Changer for devices attached to NDMP-based filers. NetVault Backup creates one instance for each arm changer.

Process Type: Dynamic

Process ID: Varies

# nvjobmgr (Job Manager)

**nvjobmgr** runs on the NetVault Backup Server and manages the execution of a job. The Schedule Manager initiates the Job Manager. A single instance of Job Manager runs for each job until the execution is completed. The Job Manager reports on the job run status and exit status. It coordinates with the Data Plug-in and fetches the required information from the NetVault Backup Server. It also sends drive and media requests to the Media Manager.

Process Type: Dynamic

Process ID: Varies

# nvduplicate (Duplicate Process)

**nvduplicate** performs backup duplication. It runs on the NetVault Backup system on which the Duplication phase is run.

Process Type: Dynamic

Process ID: None

# nvverify (Verification Process)

**nvverify** performs backup verification. It verifies the stream length written to the media and makes sure that no blocks were dropped during backup. It runs on the NetVault Backup system on which the Verification phase is run.

Process Type: Dynamic

Process ID: None

# nvplgscript (Plug-in Script Process)

**nvplgscript** executes the pre- and post-scripts for a job. It runs on the target client when you select the pre- and post-script execution options for a job.

Process Type: Dynamic

Process ID: None

# nvwsrequesthandler (Web Service Request Handler)

**nvwsrequesthandler** runs the Web Service used by the WebUI.

Process Type: Dynamic

Process ID: None

# nvwsworker (Web Service Worker Process)

**nvwsworker** is the Web Service worker process. The **nvwsrequesthandler** process starts the worker processes. Teams of these processes are used to improve performance. When a large amount of content is served to the WebUI, ten or more processes can run on the NetVault Backup Server. These processes continue running for a short time after the content is served.

Process Type: Dynamic

Process ID: None

# C

# Environment variables



## Using environment variables

The following is a list of NetVault Backup environment variables that can be used in user-defined scripts.

**Table 1. Environment variables**

| Variable | Description |
|---|---|
| NETVAULTCLIACCOUNT | Specifies the NetVault Backup user name. The specified account must have privileges to use the CLI utility.<br>`NETVAULTCLIACCOUNT=<User Account Name>`<br>The variable must be included in the script to access the CLI utility. |
| NETVAULTCLIPASSWORD | Specifies the password for the NetVault Backup user account.<br>`NETVAULTCLIPASSWORD=<Password>`<br>This variable must be included in the script to specify the password for the user account. |
| NV_HOME | Returns the NetVault Backup installation directory. |
| NV_JOBCLIENT | Specifies the target client for a job.<br>`NV_JOBCLIENT=<Name of the NetVault Backup Client>` |
| NV_JOBID | Specifies the Job ID.<br>`NV_JOBID=<Job ID>` |
| NV_JOBTITLE | Specifies the Job Title.<br>`NV_JOBTITLE=<Job title>` |
| NV_JOB_WARNINGS | Returns TRUE if a job completes with warnings, else FALSE.<br>• If a backup completes with warnings:<br>`NV_JOB_WARNINGS=TRUE`<br>• If a backup completes successfully:<br>`NV_JOB_WARNINGS=FALSE`<br>This variable can only be used in a post -script. The mail scripts use this variable, but the variable has general applicability.<br>If a backup completes with warnings, the `NV_STATUS` variable returns `SUCCEEDED`, while the `NV_JOB_WARNINGS` variable returns `TRUE`.<br>The return value is not localized; it is TRUE or FALSE in English. |
| NV_OUTPUT_FILE | Returns the user-defined output file for reports. |
| NV_SERVERNAME | Specifies the NetVault Backup Server Name.<br>`NV_SERVERNAME=<Name of the NetVault Backup Server>` |
| NV_SESSIONID | Specifies the Session ID of a job.<br>`NV_SESSIONID=<Session ID>` |

**Table 1. Environment variables**

| Variable | Description |
|---|---|
| NV_STATUS | Returns the exit status of a job. It returns either SUCCEEDED or FAILED.<br>• If a backup job completes successfully or completes with warnings:<br>`NV_STATUS=SUCCEEDED`<br>• If a backup job fails:<br>`NV_STATUS=FAILED`<br>This variable can only be used in a post-script. The return value is not localized; it is SUCCEEDED or FAILED in English. |
| NV_USER_ARG | Specifies the user-defined arguments passed with the pre- or post-scripts. |

D

# Network ports used by NetVault Backup



## Ports used or required

The following table provides a list of network ports used by NetVault Backup.

**Table 1. Ports used by NetVault Backup**

| Port | Protocol | Usage | Comments |
|---|---|---|---|
| 80 | TCP | HTTP Listen port for incoming Web Service connections. | |
| 3306 | TCP | Port used to make a TCP/IP connection to the MySQL Server. | Configured on the NetVault Backup Client on which the Plug-in for MySQL is installed.<br>The default port number is 3306. If a non-default port is configured for client connections on the MySQL Server, verify that the same port is configured on the NetVault Backup Client.<br>To run multiple instances of MySQL on the same machine, a different port is configured for each instance. |
| 5432 | TCP | Listener port for PostgreSQL Database. | Configured on the NetVault Backup Client on which the Plug-in for PostgreSQL is installed.<br>The default port number is 5432. If the PostgreSQL Database is configured to listen on a non-default port, verify that the same port is configured on the NetVault Backup Client. |
| 8443 | TCP | HTTPS Listen port for incoming Web Service connections. | |
| 10000 | TCP | Ports for sending NDMP messages (NDMP control channels). | Configured on the NetVault Backup Server on which the Plug-in for NDMP is installed.<br>The default port number is 10000, but you can change it. |
| 20031 | UDP | UDP messaging. | Required on server and clients. |
| 20031 | TCP | Port used by Network Manager (nvnmgr). | |
| User-defined listen ports for devices | TCP | Ports to listen on for device requests. | Configured on the NetVault Backup Server and SmartClients.<br>Requirement: Two ports per drive. |

**Table 1. Ports used by NetVault Backup**

| Port | Protocol | Usage | Comments |
|---|---|---|---|
| User-defined connect ports for devices | TCP | Ports to connect to remote storage devices. | Configured on clients that connect to remote storage devices.<br>Requirement: Two ports per drive |
| User-defined listen ports for message channels | TCP | Ports to receive messages during data transfers. | Configured on NetVault Backup Server and Clients.<br>Requirement: Three ports per client.<br>To run two or more plug-ins simultaneously on a client, NetVault Backup requires two ports per plug-in plus an extra port per client. For example, to run two plug-ins simultaneously, NetVault Backup requires (2 * 2) + 1 = 5 ports for a client. |
| User-defined connect ports for message channels | TCP | Ports for sending messages during data transfers. | Configured on NetVault Backup Server and Clients.<br>Requirement: Three ports per client.<br>To run two or more plug-ins simultaneously on a client, NetVault Backup requires two ports per plug-in plus an extra port per client. For example, to run two plug-ins simultaneously, NetVault Backup requires (2 * 2) + 1 = 5 ports for a client. |
| User-defined connect ports for inter-machine setup | TCP | Ports for establishing initial contact (broadcast channels) while adding a NetVault Backup Client, and later to ascertain its availability. | Requirement: Two ports per client. |
| User-defined listen ports for NDMP data channels | TCP | Ports to listen on for NetVault Backup devices operating as NDMP movers. | These ports are used for data transfers between NDMP filer and storage device. These ports are required on the NetVault Backup Server or Client to which the device is attached. |

# About Dell

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info@software.dell.com

## Technical support resources

Technical support is available to customers who have purchased Dell software with a valid maintenance contract and to customers who have trial versions. To access the Support Portal, go to https://support.software.dell.com/.

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 portal provides direct access to product support engineers through an online Service Request system.

The site 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