



NetVault[®]: Backup

version 8.5

Administrator's Guide

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NetVault: Backup Administrator's Guide

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Chapter 1:

INTRODUCTION

This chapter gives an overview of NetVault: Backup and describes the features and benefits of the product. The information in this chapter is organized into the following topics:

- [NetVault: Backup – At a Glance](#)
- [Key Benefits](#)
- [Feature Summary](#)
- [About this Document](#)
- [Target Audience](#)
- [Recommended Additional Reading](#)
- [Technical Support](#)
- [Documentation Updates](#)

1.1.0 NetVault: Backup – At a Glance

With NetVault: Backup (NVBU), you can take advantage of the power of simplicity because having less time wrapped up in backup and recovery processes creates more time for more interesting and strategic initiatives. For example, with the NetVault: Backup Application Plugin Modules (APMs) you are not required to script backup and recovery jobs, so you do not need to understand storage, database or email internals. You select the backup strategy that best fits your database or email environment, and then just point and click. The same holds true for virtualization protection – no scripting required. NVBU protects data and applications from a common, user friendly console. Plus, its ease of use makes it simpler for a new person step in to assume data protection responsibilities. NVBU is enterprise level software that does not require you to be an expert because it installs out of the box, but has the flexibility to tune it as you want.

Every organization changes all the time, so BakBone engineered NVBU to keep up with those changes and let you make choices that are best for your company. For example, if an organizational merger takes place or a key department acquires a major application that requires a different platform, that is no problem with NVBU's heterogeneous server and extensive application support. The freedom of choice continues with BakBone's disk-based data protection product, NetVault: SmartDisk (NVSD) and its deduplication option which provides seamless integration with NVBU to allow you to be in control of which data should be deduplicated and which should not without restricting you to specific types of storage drives and appliances. Additionally, administrators have increased choice

including the ability to copy or move data between NVSD Instances, to Virtual Tape Library (VTL) or tape based devices in order to place redundant backups at offsite locations for failover and disaster recovery purposes. You can select your backup device of choice from a very large list of supported Network Attached Storage (NAS), VTL and tape systems. You decide when and where to encrypt to reduce backup windows while still meeting regulatory requirements. You can deploy and protect physical or virtual machines. With the APMs, you easily select the best backup method to protect all the popular operating systems, messaging and database applications. NVBU SmartClient gives you the freedom to attach virtual and physical tape devices where you want to.

Budgets are not unlimited and are shrinking in many cases, so NVBU was architected to protect and leverage existing investments in data protection while making necessary changes and upgrades to support the growth and health of your organization. NVBU's ability to efficiently scale from small installations to very large global companies means you would not be penalized by being forced to rip and replace your data protection infrastructure just because your organization is successful and growing. The NVSD product integrates with NVBU to shrink backup windows and reduce storage costs with its post-process deduplication option which can be scheduled outside the backup window. Your investment in storage systems is protected through automated access to hundreds of different storage devices. You avoid vendor lock-in by taking advantage of NVBU's heterogeneous server support as well as powerful messaging, database and virtualization protection options. With NVBU, you protect your vital IT assets because you can still recover your data even in a worst case scenario in which you only have your backup media, but no NVBU database. Plus, you can redeploy into a different operating system for an emergency recovery.

1.2.0 Key Benefits

- ***Power of Simplicity***

It is critical to an organization's success that all employees work together to meet its strategic initiatives. To ensure success, all employees must have time to work on these strategic initiatives. NVBU's power of simplicity frees your time by enabling you to protect your data without requiring you to understand the inner workings of storage, databases and e-mail applications. NVBU provides enterprise-level functionality in an easy-to-use-and-deploy solution. You can protect platforms, applications and technologies with the same solution, to save you valuable time and resources.

- ***Enhanced Administrator Productivity***

Your organization's world changes all the time, so we engineered NVBU to work within your environment and not force you to modify your platform, application, or storage to fit NVBU. We give you the widest range of

supported storage devices with the flexibility to adjust to ever-changing conditions.

■ **Safeguards Your Investment**

NVBU protection easily scales from a single server to Fortune 500 environments without having to rip and replace your data protection solution as your organization grows. You also will not have to rip and replace NVBU if you change strategic directions with regards to platforms, databases, applications, or storage devices. NVBU's seamless integration with NVSD protects your storage investment with a powerful deduplication option that does not require you to buy specific drives or appliances. NVBU also provides very flexible disaster recovery options to protect your entire datacenter for business continuity.

1.3.0 Feature Summary

- Heterogeneous Server Support
- Application Protection for Most Popular Database and Messaging Systems
- Virtualization Protection for VMware and Hyper-V
- Physical and Virtual Protection from Single Console
- Disk-based Data Protection
- Hardware Agnostic, Byte-Level Variable Block-Based Software Deduplication
- Job-level Deduplication
- Job-level Encryption
- Workstation Protection
- Easy-to-Navigate Console
- Network Attached Storage Integration
- Extensive Storage Device Coverage
- Automated Device Discovery and Configuration
- Reporting
- Scalability
- Extensive Event Notification
- Dynamically Shared Devices
- SmartClient
- User Level Access
- Policy Management
- Job Management

1.4.0 About this Document

This guide describes how to use NetVault: Backup and provides comprehensive information on all NetVault: Backup features and functionality.

1.5.0 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 under which the NetVault: Backup Server and Clients are running is assumed.

1.6.0 Recommended Additional Reading

- *NetVault: Backup Installation Guide* – This guide provides complete details on installing the NetVault: Backup Server and Client software.
- *NetVault: Backup Configuration Guide* – This guide explains how to change the preferences and default settings for NetVault: Backup.
- *NetVault: Backup Command Line Interface Reference Guide* – This guide provides detailed description of the command line utilities.
- *NetVault: Backup Workstation Client Administrator's Guide* – This guide provides complete information on administering the NetVault: Backup Workstation Client software.
- *NetVault: Backup Workstation Client User's Guide* – This guide provides complete information on using the NetVault: Backup Workstation Client software.
- *NetVault: SmartDisk Installation Guide* – This guide provides complete details on installing the NetVault: Backup SmartDisk software.
- *NetVault: SmartDisk Administrator's Guide* – This guide provides complete information on administering a NetVault: SmartDisk instance.

You can download these guides from the BakBone website at the following address:

<http://www.bakbone.com/documentation>

1.7.0 Technical Support

BakBone Software is dedicated to providing friendly, expert advice to NetVault customers. Our highly trained professionals are available to answer your questions, offer solutions to your problems and generally help you make the most of your NetVault purchase. Log on to our web site for more information:

<http://support.bakbone.com>

1.8.0 Documentation Updates

For the latest documentation updates, refer to the BakBone Software Knowledge Base. BakBone's Knowledge Base article for NetVault: Backup v8.5 can be found at the following link:

<http://kb.bakbone.com/5205>



Chapter 2:

NVBU CONSOLE

This chapter provides an overview of the NVBU Console. The information in this chapter is organized into the following topics:

- [Starting and Stopping the NVBU Service](#)
- [Starting NVBU Console](#)
 - ❖ [Starting NVBU Console on Linux/UNIX](#)
 - ❖ [Starting NVBU Console on Windows](#)
- [Logging on to NVBU](#)
 - ❖ [Logging on as a Different User](#)
- [NVBU Console Basics](#)
- [Using the Shortcut Keys](#)

2.1.0 Starting and Stopping the NVBU Service

The NVBU Service will start automatically when the software installation completes on the Server and Client machines. In situations when you want to manually stop or start the NVBU Server, perform the following steps:

1. Start NVBU Configurator as described below:
 - a. **Linux/UNIX**
 1. Log on to the system with root user privileges.
 2. Start a terminal session and issue the following command:

```
nvconfigurator
```

Alternatively, add ampersand (&) for an open prompt:

```
nvconfigurator &
```

You can issue this command from any directory.
 - b. **Windows**
 1. Log on to the system with administrator privileges.
 2. Click **Start** on the taskbar.
 3. Point to **Programs**, point to **BakBone Software**, point to **NetVault Backup**, and then click **NVBU Configurator**.
2. Click the **Service** tab.
3. To stop the Service, click **Stop Service**.
4. To start the Service, click **Start Service**.

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

2.2.0 Starting NVBU Console

The following sections describe how to start the NVBU Console on Windows and Linux/UNIX platforms.

Note: The NVBU Server and the Clients must be set to the same locale to display the Console correctly.

2.2.1 Starting NVBU Console on Linux/UNIX

To start the NVBU Console on Linux/UNIX platforms, perform the following steps:

Note: Before you proceed, ensure that the path variable contains all the font paths.

1. Log on to the system with root user privileges.
2. Start a terminal session and issue the following command from any directory:

```
nvgui
```

Alternatively, add ampersand (&) if you want an open prompt:

```
nvgui &
```

Note: On Linux Itanium platforms, the kernel logs several **Unaligned Access To** messages when you start the NVBU Console. These messages are informative and do not require any attention. To stop these messages run the command **dmesg -n4** after every reboot. For more information on the **Unaligned Access To** messages, refer to the following article:

<http://kbase.redhat.com/faq/docs/DOC-6022>

2.2.2 Starting NVBU Console on Windows

To start the NVBU Console on Windows, perform the following steps:

1. Log on to the system with administrator privileges.
2. Click **Start** on the taskbar.
3. Point to **Programs**, point to **BakBone Software**, point to **NetVault Backup**, and then click **NVBU Console**.

2.3.0 Logging on to NVBU

By default, no login prompt is displayed when you start the NVBU Console. NVBU automatically logs on as the **default** user when no password is configured for this user account. You will see a login prompt if the administrator has set a password for the **default** user account. In this situation, perform the following steps to log on to the NVBU Console:

Figure 2-1:
NVBU Logon
window



1. In the **Welcome To** list, the NVBU Server that controls the Domain is selected by default. Do not change it unless you want to log on to a different NVBU Domain. To log on to a different Domain, select the NVBU Server for that Domain in the list.
2. In the **User** box, enter your user name.
3. In the **Password** box, enter the password for your user account.
4. Select the **Use this Login from Now On** check box to save the user name.
5. Click **OK**.

Note: To change your password at logon, select the **Change Password** check box. In the **Set User Password** window, set the new password. For details on changing password refer to [Setting User Account Password on page 200](#).

2.3.1 Logging on as a Different User

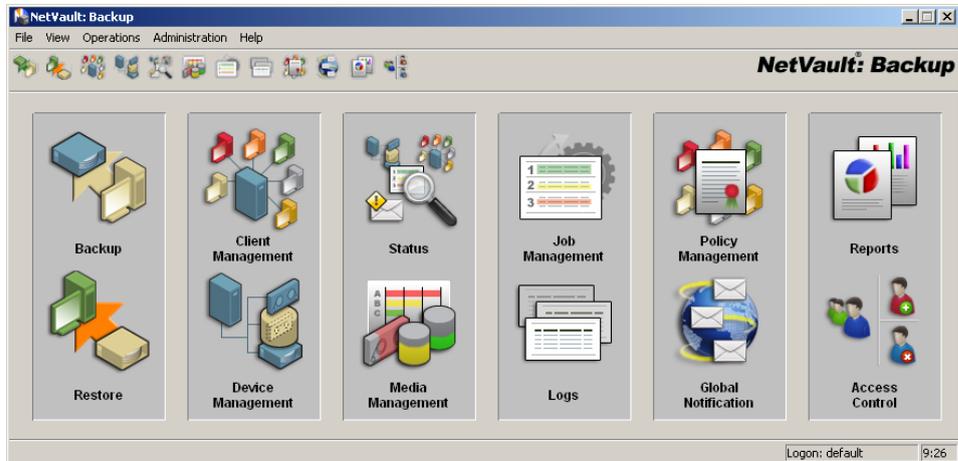
To change the user when NVBU has automatically logged on **default**, perform the following steps:

1. On the NVBU home screen, click **Log Off** on the **File** menu to log out default.
2. In the NVBU Logon window, provide the login information. For details, refer to [Logging on to NVBU on page 21](#).

2.4.0 NVBU Console Basics

The NVBU window consists of the menu bar, the toolbar, the **Large Buttons** panel and the status bar.

Figure 2-2:
NVBU Home
Screen



■ **Menu Bar**

The menu bar displays the menus, which contain commands to perform various tasks in NVBU. The main tasks are organized under the **Operations** and **Administration** menu as follows:

❖ **Operations Menu** – This menu contains the following commands:

- ❖ **Backup**
- ❖ **Restore**
- ❖ **Status**
- ❖ **Media Management**
- ❖ **Job Management**
- ❖ **Reports**
- ❖ **Logs**

❖ **Administration Menu** – This menu contains the following commands:

- ❖ **Client Management**
- ❖ **Domain Management**
- ❖ **Device Management**
- ❖ **Policy Management**
- ❖ **Access Control**
- ❖ **Global Notification**

To perform a task, open the corresponding task window. For example, to administer NVBU Clients, open the **NVBU Client Management** window as described below:

On the **Administration** menu, click **Client Management**.

The commands on the menu bar vary depending on the active window. For example, the menu items for the **Client Management** window are different from the NVBU home screen.

■ **Toolbar and the Large Buttons Panel**

For the frequently accessed functions, NVBU provides toolbar buttons on the standard toolbar and the **Large Buttons** panel. You can use these buttons to open a window with a single click. For example, to open the **NVBU Client Management** window, click **Client Management** on the toolbar or **Large Buttons** panel.

To hide or show the toolbar and/or Large Buttons panel, perform the following steps:

- To hide the standard toolbar, clear the check mark for **Tool Bar** on the **View** menu. To hide the Large Buttons panel, clear the check mark for **Large Buttons** on the **View** menu.
- To display them again, select **Tool Bar** and/or **Large Buttons** on the **View** menu.

■ **Status Bar**

The status bar displays the user name and current BakBone Time on the NVBU Server. For details on BakBone Time, refer to the *NetVault: Backup Configuration Guide*.

2.5.0 Using the Shortcut Keys

You can also use the following shortcut keys to open a task window from the NVBU home screen:

Shortcut Key	To do this
A	Open the About window
B	Open the NVBU Backup window
C	Open the NVBU Client Management window
D	Open the NVBU Device Management window
H	Show/hide the Large Buttons panel
J	Open the NVBU Jobs window
L	Open the NVBU Logs window

Shortcut Key	To do this
M	Open the NVBU Media Management window
N	Open the NVBU Global Notification window
P	Open the NVU Policy Management window
R	Open the NVBU Restore window
S	Open the NVBU Status window
T	Show/hide the standard toolbar
U	Open the NVBU Access Control window
F1	Open the Help window
F2	Open the NVBU Report Component Editor window
F3	Open the NVBU Report Job Editor window
F4	Open the NVBU Historic Reports window
F5	Open the NVBU Reports window
F6	Open the NVBU Domain Management window
F7	Open the NVBU Access Control window
F8	Open the NVBU Global Notification window

Chapter 3:

NVBU CLIENT MANAGEMENT

This chapter describes how to add and manage the NVBU Clients. The information in this chapter is organized into the following topics:

- [NVBU Clients – An Overview](#)
- [Adding Heterogeneous Clients](#)
 - ❖ [Locating a Client](#)
 - ❖ [Adding NVBU Server as a Heterogeneous Client](#)
- [Client Status Indicators](#)
- [Administering Added Clients](#)
 - ❖ [Viewing NVBU Client Properties](#)
 - ❖ [Checking Client Access](#)
 - ❖ [Establishing the Firewall Relationship](#)
 - ❖ [Setting Client Description](#)
 - ❖ [Removing a Client from the NVBU Domain](#)
- [Working with Client Groups](#)
 - ❖ [Client Groups – An Overview](#)
 - ❖ [Creating Client Groups](#)
 - ❖ [Modifying a Client Group](#)
 - ❖ [Removing a Client Group](#)

3.1.0 NVBU Clients – An Overview

NVBU is designed to work in an environment in which one machine is configured as NVBU Server and various other machines throughout the network act as NVBU Clients assigned to it. A single NVBU Server and its Clients form an NVBU Domain. The Server acts as the Domain Controller for the NVBU Domain. NVBU Clients are machines which act as backup or restore targets. The NVBU Clients are classified as Heterogeneous Clients or Workstation Clients.

Note: To understand the difference between Heterogeneous Clients and Workstation Clients, refer to the *NetVault: Backup Installation Guide*.

NVBU Clients require at least the Client version of the NVBU software and TCP/IP connectivity to the NVBU Server. The NVBU Server and Clients can reside on separate networks. A Heterogeneous Client can be a member of more than one NVBU Domain. An NVBU Server acts as a Heterogeneous Client to itself and can

also be added as a Heterogeneous Client to another NVBU Server. Clients which have locally-attached backup devices are called **SmartClients**. Such clients require additional SmartClient licenses.

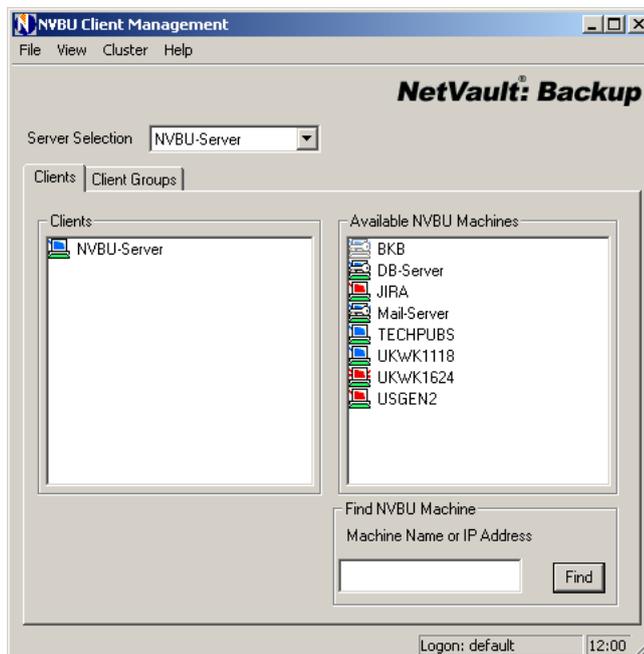
3.2.0 Adding Heterogeneous Clients

In order to target a Heterogeneous Client for a backup or restore operation, you must first add the Client to the NVBU Server. The NVBU Client software version cannot be higher than the NVBU Server software version. To add a Heterogeneous Client, perform the following steps:

Note: For details on adding Workstation Clients to the NVBU Server, refer to the *NetVault: Backup Workstation Administrator's Guide*.

1. Click **Client Management** on the toolbar or **Large Buttons** panel to open the **NVBU Client Management** window. Alternatively, on the **Administration** menu, click **Client Management**.
2. NVBU provides a list of eligible NVBU Clients under **Available NVBU Machines**. These are machines on which you have installed either the NVBU Server or the Client software. The icon to the left indicates the current status of the Client:

Figure 3-1:
NVBU Client
Management
window





A **Blue or Dimmed Blue** icon represents a Client that is up and running. It can be added without any additional requirement.



A **Blue/Dimmed Blue Icon with a Key** represents a Client that is currently available. However, this Client is password-protected. To add it, you will require the NVBU password for the machine.



A **Red Icon** represents a Client that is currently not available. Try adding it later when it becomes online.

3. To add an online Client, double-click the Client in the **Available NVBU Machines** list. Alternatively, right-click the Client and select **Add as Client**.
4. Ignore this step if you have not created any user-defined Client Groups. For details on NVBU Client Groups, refer to [Working with Client Groups on page 32](#). NVBU automatically adds a Client to the **default** group if no user-defined Client Groups have been created on the Server.

On an NVBU Server with one or more user-defined Client Groups, the **Add Client to Groups** window will appear next.

Figure 3-2:
Add Client to
Groups
window

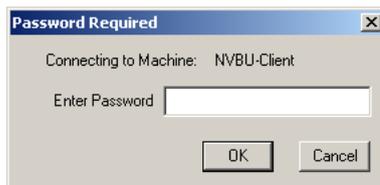


In the **Select Group(s)** list, select the Client Group(s) to which you want to add the Client. Use the Shift+Click or Ctrl+Click keys to add the Clients to multiple consecutive and non-consecutive groups, respectively.

Note: You can also change the group membership later by modifying a Client Group. For details, refer to [Modifying a Client Group on page 33](#).

5. Ignore this step for Clients which do not have an NVBU password. Such Clients are added to the Server without any further action.
For password-protected Clients, a **Password Required** window will appear next.

Figure 3-3:
Password
Required
window



In the **Enter Password** box, enter the NVBU password for the Client and click **OK**. Upon password verification, the Client will be added to the NVBU Server and listed under **Clients**.

3.2.1 Locating a Client

To locate a Client that is not listed under **Available NVBU Machines**, perform the following steps:

1. In the **Machine Name or IP Address** box under **Find NVBU Machine**, enter the NVBU name for the client or its IP address.
2. Click **Find**. NVBU rescans the network to locate the client. If found, the client is listed under **Available NVBU Machines** in alphabetical order.

Note that a search may fail for a number of reasons, including the following:

- The DNS lookup table or the machine's host table cannot be contacted.
- The NVBU Service is not running on the machine.
- NVBU software is removed from the machine.

3.2.2 Adding NVBU Server as a Heterogeneous Client

To add an NVBU Server as a Heterogeneous Client to another NVBU Server, perform the following steps:

1. Start the Configurator.
2. On the **Security** tab, select **This Machine May be Added as a Client to a Server** to change the default security settings.
3. To add the Server as a member client, refer to [Adding Heterogeneous Clients on page 26](#).

Note: An NVBU Server cannot simultaneously act as a Workstation Client and an NVBU Server. An NVBU Server cannot be added as a Workstation Client to another NVBU Server.

3.3.0 Client Status Indicators

The NVBU Clients that are added to a Server are listed under **Clients** on the **NVBU Client Management** window. The current status of these Clients is indicated using one of the following status indicators:



A **Blue or Dimmed Blue** icon indicates that the Client is up and running. A dimmed icon represents a machine running a version prior to v8.0.



A **Blue/Dimmed Blue Icon with a Key** indicates one of the following:

- The Client is in the process of being added.
- The NVBU password has changed since the Client was added.

A dimmed icon represents a machine running a version prior to v8.0.



A **Red** icon indicates that the Client is currently unavailable. Either the machine is offline or the NVBU Service is not running.



A **Yellow** icon represents a **Virtual Client** which consists of a cluster of Clients. For details on Virtual Clients, refer to [NVBU Client Clusters on page 237](#).



A **Green Laptop** indicates that the Workstation Client is online. It is powered on and has network connectivity to the NVBU Server.



A **Red Laptop** indicates that the Workstation Client is offline. It is powered off or does not have any network connectivity to the NVBU Server.

The **NVBU Server Status** window provides a consolidated view of the Clients, Devices and Jobs. To open the **NVBU Server Status** window, click **Status** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Status**.

3.4.0 Administering Added Clients

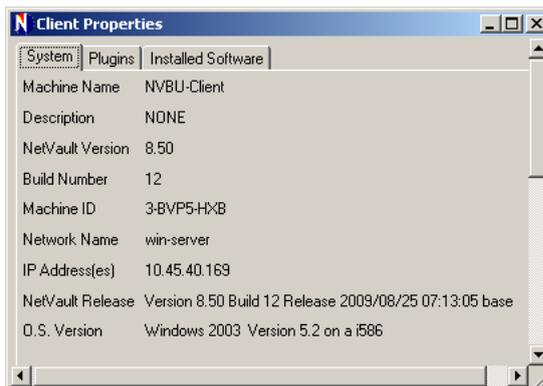
This section describes the various NVBU Client administration procedures.

3.4.1 Viewing NVBU Client Properties

To view properties of a Client, perform the following steps:

1. Under **Clients**, right-click the Client and select **Properties**.
2. The **Client Properties** window contains three tabs – **System**, **Plugins** and **Installed Software**. Click the corresponding tab to view the following information:

Figure 3-4:
Client
Properties
window



- The **System** tab displays the machine name and description, NVBU version and build number, machine ID, network name for the machine, IP address, release information and operating system version number.
- The **Plugins** tab lists the NVBU plugins installed on the Client. The details include the plugin name, version number, plugin ID, and installation date and time.
- The **Installed Software** tab lists all the NVBU plugins installed on the Client. The details include the plugin name and the installation date.

3. Click **OK** to close the window.

3.4.2 Checking Client Access

To check access between the NVBU Server and a Client, perform the following steps:

1. Under **Clients**, right-click the machine and select **Check Access**.
2. NVBU attempts to connect to the Client and displays the status message corresponding to the Client accessibility.
3. Click **OK** to close the dialog.

3.4.3 Establishing the Firewall Relationship

For NVBU Clients that are located outside the firewall, you must configure the firewall relationship as **Outside Firewall** in order to adhere to port restrictions while establishing data transfer channels, message channels and broadcast channels through the firewall. Before configuring this option for a Client, consider the following:

- If the Client and the Server are on the same side of the firewall, or if no firewall exists between the two networks, do not change the default configuration which is set as **Inside Firewall**.

- The firewall relationship cannot be established for Clients running a version prior to v8.0. Such Clients are represented with a dimmed blue icon on the **NVBU Client Management** window. The communication with such Clients is always treated as an **Outside Firewall** operation and the Server adheres to the port restrictions set from the **Firewall** tab on the Configurator. Therefore, you must open more ports to enable concurrent data transfers with multiple Clients that are outside the firewall.
- This feature is not intended for firewalls using NAT (Network Address Translation) or IP Masquerading
- This feature is not intended for configuring the firewall settings between two Clients. Client to Client communication is always treated as an **Outside Firewall** operation and adheres to the port restrictions configured from the NVBU Configurator.

To establish the firewall relationship between the NVBU Server and Client networks, perform the following steps:

1. Under **Clients**, right-click the Client and select **Outside Firewall**.
2. Once you select the **Outside Firewall** option, this command is replaced with **Inside Firewall** option, which can be used to update the firewall settings if there are any changes later.

Note: To enable communication with Clients that are outside the firewall, you must configure valid ports for data transfer channels, message channels and broadcast channels on the **Firewall** tab of the Configurator. For details on configuring the firewall settings for NVBU, refer to the *NetVault: Backup Configuration Guide*.

3.4.4 Setting Client Description

To set a description for a Client, perform the following steps:

1. Under **Clients**, right-click the Client and select **Set Description**.
2. In the **Enter Client Description** box, enter a detailed description for the Client.
3. Click **OK**.

3.4.5 Removing a Client from the NVBU Domain

To remove a Client from the NVBU Domain, perform the following steps:

1. Under **Clients**, right-click the Client and select **Remove**. For Clients with a red icon, select **Force Remove**.
2. In the confirmation window, click **Yes**.

The Client is removed and listed again under **Available NVBU Machines**.

3.5.0 Working with Client Groups

This section provides an overview of Client Groups, and describes the procedures for creating and managing the user-defined Client Groups.

3.5.1 Client Groups – An Overview

Client Groups allow you to target multiple clients without individually selecting each one for creating policy-based backups or granting user access to Clients. A Client Group named **default** is automatically created on the NVBU Server during installation. A Client is automatically added to this group if you have not created any user-defined Client Groups on the Server. On an NVBU Server with one or more user-defined Client Groups, you can select the Client Group in the **Add Client to Groups** window which appears during Client Addition. Alternatively, you can select the group members while creating a Client Group. A Client can be a member of more than one Client Group. The group membership can be changed any time by modifying the Client Group properties.

3.5.2 Creating Client Groups

To create a Client Group, perform the following steps:

1. Open the **NVBU Client Management** window.
2. Click the **Client Groups** tab.
3. Click **Add Client Group** to create a new Client Group. It is named **New Client Group**, by default.
4. To rename the group, perform the following steps:

Figure 3-5:
Rename Client
Group window



- a. Right-click the group and select **Rename Group**.
 - b. In the **New Name for the Group** box, enter the group name.
 - c. Click **OK**.
5. To set a detailed description for the group, perform the following steps:
 - a. Right-click the group and select **Set Description**.
 - b. In the **Group Description** box, enter the details.
 - c. Click **OK**.
 6. To add the group members, perform the following steps:
 - a. Right-click the group and select **Add Member Clients**.

Figure 3-6:
Add Clients to
Group window



- b. In the **Select Clients to Add** list, select the Clients. Use Shift+Click to select consecutive Clients, or Ctrl+Click to select non-consecutive Clients. Alternatively, you can select the **Group Includes ALL Clients** check box to add all the existing Clients to the group.
- c. Click **OK**.

3.5.3 Modifying a Client Group

To modify a Client Group, perform the following steps:

1. Open the **NVBU Client Management** window.
2. Click the **Client Groups** tab and locate the Client Group.
3. To add new members, perform the following steps:
 - a. Right-click the group and select **Add Member Clients**.
 - b. In the **Select Clients to Add** list, select the Clients. Use Shift+Click to select consecutive Clients or Ctrl+Click to select non-consecutive Clients. Alternatively, you can select the **Group Includes ALL Clients** check box to add all the existing Clients to the group.
 - c. Click **OK**.
4. To remove group members, perform the following steps:
 - a. Right-click the group and select **Remove Member Clients**.
 - b. In the **Remove Clients from Group** list, select the Clients. Use Shift+Click to select consecutive Clients, or Ctrl+Click to select non-consecutive Clients.
 - c. Click **OK**.
5. To rename a group, perform the following steps.
 - a. Right-click the group and select **Rename Group**.
 - b. In the **New Name for the Group** box, enter the group name.
 - c. Click **OK**.
6. To set or change the group description, perform the following steps:

- a. Right-click the group and select **Set Description**.
- b. In the **Group Description** box, enter the details.
- c. Click **OK**.

3.5.4 Removing a Client Group

To remove a client group that is no longer in use, perform the following steps:

1. Open the **NVBU Client Management** window.
2. Click the **Client Groups** tab and locate the Client Group.
3. Right-click the group and select **Remove Group**.
4. In the confirmation window, click **Yes**. This will remove the Client Group. However, the individual member clients remain part of the NVBU Domain.

Chapter 4:

BACKUP DEVICE MANAGEMENT

This chapter describes how to add and manage the backup devices. The information in this chapter is organized into the following topics:

- **Backup Devices – An Overview**
 - ❖ General Considerations
 - ❖ SAN Considerations
- **NetVault: SmartDisk Devices**
 - ❖ NVSD Devices – An Overview
 - ❖ Adding NVSD Devices
 - ❖ Administering NVSD Devices
 - ❖ Viewing NVSD Device Statistics
 - ❖ Configuring NVSD Device Group Label
 - ❖ Verifying NVSD Device Status
 - ❖ Removing an NVSD Device
 - ❖ Scanning an NVSD Device
- **NVBU Virtual Tape Libraries**
 - ❖ NVBU VTL – An Overview
 - ❖ Creating and Adding NVBU VTLs
 - ❖ Configuring Software Compression Parameters
 - ❖ Software Compression and NVDB Restores
 - ❖ Removing an NVBU VTL
- **Virtual Standalone Drives**
 - ❖ Creating and Adding Virtual Standalone Drives
- **NVBU Shared Virtual Tape Libraries**
 - ❖ NVBU SVTL – An Overview
 - ❖ Planning for NVBU SVTLs
 - ❖ NVBU SVTL Prerequisites
 - ❖ General Prerequisites
 - ❖ Setting up Raw I/O on Linux
 - ❖ Setting up Raw I/O on RedHat Linux
 - ❖ Setting up Raw I/O on RedHat Enterprise Linux 5
 - ❖ Setting up Raw I/O on SUSE Linux

- ❖ Adding a Library to SVTL Controller
- ❖ Distributing SVTL Drives
- ❖ Sharing SVTL Drives
- Adding Tape-based Devices
 - ❖ Adding Devices Using the Automatic Device Configuration Wizard
 - ❖ Manually Starting the Device Configuration Wizard
 - ❖ Adding the Libraries Manually
 - ❖ Adding Standalone Drives Manually
- Configuring Physical Tape Libraries
- Configuring Physical Tape Drives
 - ❖ Configuring General Parameters
 - ❖ Configuring NDMP Parameters
 - ❖ Tuning Drive Performance
 - ❖ Collecting Drive Performance Statistics
 - ❖ Configuring Timeout for SCSI Commands
- Configuring Drive Cleaning Parameters for Physical Tape Drives
 - ❖ Configuring Slots and Barcodes for Cleaning Media
 - ❖ Configuring Generic Cleaning Properties
 - ❖ Configuring the Life of Cleaning Media
 - ❖ Establishing Automatic Cleaning Routine
 - ❖ Cleaning a Drive Manually
 - ❖ Viewing the Drive Cleaning Status
- Adding Shared Devices in an NVBU Domain
 - ❖ Adding Shared Devices Automatically
 - ❖ Adding Shared Devices Using the Semi-Automatic Method
 - ❖ Adding Shared Devices Manually
 - ❖ Modifying Existing Libraries
 - ❖ Adding Shared Drives to Non-Shared Library Using the Semi-Automatic Method
 - ❖ Adding Shared Drives to Non-Shared Library Manually
 - ❖ Sharing Standalone Drives
- Using Mixed Media Libraries
 - ❖ Organizing Media in a Mixed Media Library
 - ❖ Adding and Configuring a Mixed Media Library
 - ❖ Adding Media to a Library with Entry/Exit Ports

- ❖ Adding Media to a Library without Entry/Exit Ports
- Administering Physical Tape Libraries
 - ❖ Viewing Device Details
 - ❖ Modifying a Library
 - ❖ Changing the Device View
 - ❖ Opening and Closing a Library Door
 - ❖ Opening and Closing Entry/Exit Ports
 - ❖ Checking an Offline Drive
 - ❖ Taking a Drive Offline in NVBU
 - ❖ Loading and Unloading Media
 - ❖ Exporting Media to Entry/Exit Port
 - ❖ Restarting ACSLS or NDMP Libraries
- Importing NetApp VTL's Shadow Tape
- Removing a Physical Tape Library
- Device Status Indicators

4.1.0 Backup Devices – An Overview

NVBU supports a wide range of backup devices which are targeted for storing backups, including different types of disk-based devices such as BakBone's NetVault: SmartDisk (NVSD) Devices with optional deduplication, NVBU's Virtual Tape Libraries (VTLs) and Shared Virtual Tape Libraries (SVTLs), and third-party virtual and physical tape libraries, appliances, autoloaders, and tape drives.

Physical backup devices can be configured for single or shared use, and connected via SCSI, iSCSI, IP, SAS or Fibre Channel SAN interfaces and can be connected to the NVBU Server, SmartClients or NAS Filers within an NVBU Backup Domain. NVBU VTLs and SVTLs can be attached to the NVBU Server and/or SmartClients while NetVault: SmartDisk Devices are added to the NVBU Server.

To target a backup device for backup and restores, you must first add the device to the NVBU Domain. A SmartClient attached device is recognized only after you add the SmartClient to the NVBU Server. Similarly, a Filer attached device is recognized only after you add the Filer to the NVBU Server using the NDMP Plugin.

4.1.1 General Considerations

Consider the following before adding a device to the NVBU Server:

- On Windows, you must disable the **Removable Storage Service** before adding a device to the NVBU Server. For instructions on disabling this service, refer to the *NetVault: Backup Installation Guide*.
- NVBU Server may not recognize a standalone tape device locally attached to an RHEL4 U1 Client. This happens because on RHEL4 U1, the SG driver that supports the standalone devices is not loaded automatically. You must manually load this driver and restart the NVBU Service. This issue only occurs when the RHEL4 U1 Client does not have any other locally attached library or changer. For details on obtaining and loading the SG driver, refer to the relevant RHEL4 U1 documentation.

4.1.2 SAN Considerations

BakBone recommends the following while configuring tape libraries within a SAN environment:

- In a SAN environment, BakBone recommends that you use persistent binding (also known as SCSI mapping/persistent reservation/ persistent naming). NVBU cannot communicate with a library if its logical address changes as a result of changes within the SAN. Persistent binding assigns a fixed logical address to the device which does not change as devices are added or removed within the SAN. For the Fibre Channel Host Bus Adapters (HBAs), you can map the Fibre Channel device address (World Wide Name(WWN) or World Wide Identifier (WWID)) or a Loop ID to the logical SCSI address. This ensures that changes within the SAN have no impact on NVBU operations.
- You must also use persistent binding when the Server and the fibre devices are attached to separate switches, or when zoning is implemented. NVBU does not support multipathing to a tape library/device, so only one channel must be logically or physically configured for use to ensure consistent communication path. BakBone also recommends that you do not use the tape libraries/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. BakBone recommends that you use separate HBAs for these devices.
- Apple supports multipathing in the FC Host Adapter and XserveRAID, and often this is the default setting after installation. However, multipathing is not supported in NVBU. Therefore, the connections must be logically or physically separated to ensure a consistent communication path.

4.2.0 NetVault: SmartDisk Devices

4.2.1 NVSD Devices – An Overview

NVBU provides seamless integration with NVSD, BakBone's next generation disk-based backup and deduplication product. While NetVault: Backup provides seamless integration with NVSD to provide disk-based backup and optional deduplication, NVSD is a separate product which is installed and licensed separately from NVBU.

An NVSD Device connects to an NVSD Instance which is comprised of one (1) or multiple Storage Pools and a set of processes which perform disk-based backups and byte-level variable block software deduplication. A single NVSD Instance can be deployed on a dedicated server, the NVBU Server or an NVBU Client and can accept data streams from heterogeneous platforms. An NVSD Storage Pool is comprised of one or more file system volumes and can be easily extended by adding additional file system paths.

For more information on NetVault: SmartDisk refer to the *NetVault: SmartDisk Installation Guide* and *NetVault: SmartDisk Administrator's Guide*.

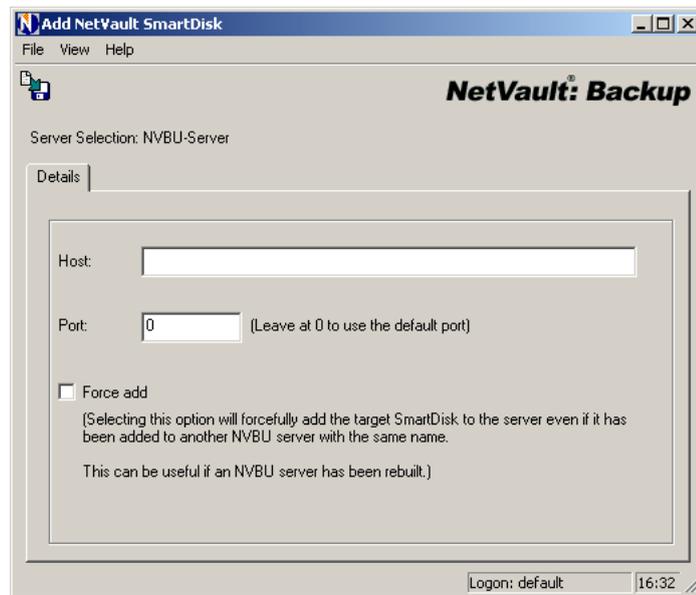
4.2.2 Adding NVSD Devices

NVSD Devices must be added to the NVBU Server before they can be used for backups and restores in an NVBU Domain. To add an NVSD Device, perform the following steps:

Note: For instructions on installing and configuring an NVSD, refer to the *NetVault: SmartDisk Installation Guide* and *NetVault: SmartDisk Administration Guide*.

1. Open the **NVBU Device Management** window.
2. On the **Add** menu, click **Add NetVault SmartDisk**.
3. In the **Add NetVault SmartDisk** window, configure the following parameters:

Figure 4-1:
Add NetVault
SmartDisk
window



- **Host** – Enter the DNS name or IP address of the host on which the NVSD Device is installed. The NVBU Server must be able to resolve the configured host name or the device will not be added. This parameter must be configured even if the device is deployed on the NVBU Server.
 - **Port** – Do not change this parameter for a device that is listening on the default port. For a device that is not using the default port, enter the port number the device is configured to listen on.
 - **Force Add** – This option is useful if you have performed a disaster recovery to rebuild a Server. Select the **Force** check box to forcefully add NVSD Device to a Server when it is already added to another NVBU Server with the same name.
4. Click **Save Details** on the toolbar. The device is added and listed on the **Devices** tab. The status changes to online after device initialization.

4.2.3 Administering NVSD Devices

This section provides information on managing the NVSD Devices added to the NVBU Server. These tasks are performed from the **NVBU Device Management** window. The information in this section is organized into the following topics:

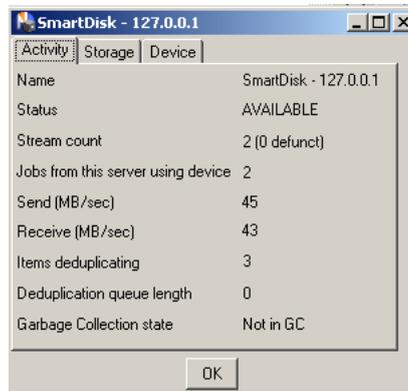
- [Viewing NVSD Device Statistics](#)
- [Configuring NVSD Device Group Label](#)
- [Verifying NVSD Device Status](#)
- [Removing an NVSD Device](#)
- [Scanning an NVSD Device](#)

4.2.3.a Viewing NVSD Device Statistics

To view the device statistics, perform the following steps:

1. On the **Devices** tab right-click the target NVSD Device, and select **Status**.
2. The status window is organized as follows:
 - **Activity** – The **Activity** tab displays the following details:

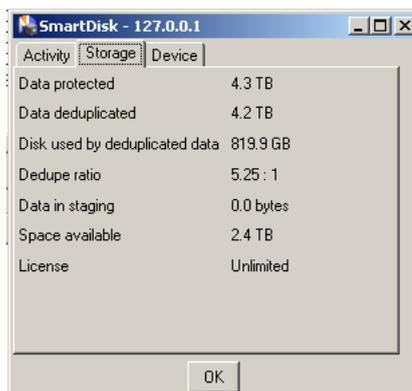
Figure 4-2:
NVSD Device
activity
statistics



- ❖ **Name** – Name of the NVSD Device which is automatically derived from the host name and IP address.
- ❖ **Status** – Status of the NVSD 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,
- ❖ **Stream Count** – Current number of elements or NVBU segments that are being streamed to the NVSD Device.
- ❖ **Jobs from this Server Using Device** – Number of NVBU jobs which are currently using the NVSD Device.

- ❖ **Send (MB/sec)** – Total megabytes per second (MBps) across all streams being sent out from NVSD to NVBU (that is, when an NVBU restore job is being performed).
- ❖ **Receive (MB/sec)** – Total MBps across all streams being sent to NVSD (that is, when an NVBU backup job is targeted to an NVSD Device).
- ❖ **Items Deduplicating** – Current number of elements or NVBU segments that are being deduplicated.
- ❖ **Deduplication Queue Length** – Current number of elements or NVBU segments that are waiting to be deduplicated.
- ❖ **Garbage Collection State** – Phase of Garbage Collection that is currently occurring.
- **Storage** – Click the **Storage** tab to view the following details:

Figure 4-3:
NVSD Device
storage
statistics



- ❖ **Data Protected** – The total amount of data that is currently being protected by the NVSD Device.
- ❖ **Data Deduplicated** – The total amount of data that has been submitted for deduplication.
- ❖ **Disk Used by Deduplicated Data** – The amount of disk space used by deduplicated data. It includes the space consumed by the **Chunk Store**, **Chunk Index**, and **Manifests**.
- ❖ **Dedupe Ratio** – The Deduplication Ratio of the data that has been deduplicated by the NVSD Device. The Deduplication Ratio is calculated as follows:

$$\text{Data Deduplicated} / \text{Disk Used by Deduplicated Data} = \text{Deduplication Ratio}$$
- ❖ **Data in Staging** – The amount of data this is currently stored in the **Staging Store**.

Figure 4-4:
NVSD Device
details

- ❖ **Space Available** – The amount of disk space that is available in the volumes that comprise the NVSD Device's **Storage Pools**. This represents the amount of space that NVSD can consume on the volumes.
- ❖ **License** – The amount of protected capacity that is currently licensed by the NVSD Device.
- **Device** – Click Device tab to view the following details:



- ❖ **Name** – Name of the NVSD Device which is automatically derived from the host name and IP address.
- ❖ **Machine ID** – Machine ID for the NVSD Instance that is required for obtaining a permanent NVSD license key. For more information on licensing NVSD, refer to the *NetVault: SmartDisk Installation Guide*.

3. Click **OK** to exit.

4.2.3.b Configuring NVSD Device Group Label

To set the properties for an NVSD Device, perform the following steps:

1. On the **Devices** tab right-click the NVSD Device, and select **Properties**.
2. In the **Storage Properties** window, configure the following parameter:

Figure 4-5:
Storage
Properties
window



- **Group Label** – In the **Group Label** box, enter the string.
3. Click **OK**.

4.2.3.c Verifying NVSD Device Status

To verify the status of an offline device, perform the following steps:

1. On the **Devices** tab right-click the NVSD Device, and select **Check** to check the NVSD Device status on the host.
2. If the NVSD Device is running on the host, the device status changes to AVAILABLE.

4.2.3.d Removing an NVSD Device

Removing an NVSD Device does not delete the backups on it. You can re-add the NVSD Device to an NVBU Server with the same NVBU Machine Name as the NVBU Server from which it was removed. To remove an NVSD Device, perform the following steps:

1. On the **Devices** tab right-click the NVSD Device, and select **Remove**.
2. In the confirmation window, click **OK**.
3. If the device fails to remove, select the **Force Removal** check box in the confirmation window and click **OK**.

Note: Selecting **Force Removal** will force the removal of an NVSD Device that is currently not in use. However, the NVSD Device may still try to communicate with the NVBU Server.

4.2.3.e Scanning an NVSD Device

Scanning an NVSD Device queries all the backups stored on the NVSD Device. Backups which are not currently indexed in this NVBU Server's NVDB will be imported and made available for restores. An NVSD Device can only be scanned into a NVBU Server that has the identical NVBU Machine Name as the original NVBU Server which performed the backups. Scanning an NVSD Device may take an extended period of time depending upon the number of backups that must be imported and the size of the backup indexes. To scan an NVSD Device, perform the following steps:

1. On the **Devices** tab right-click the NVSD Device, and select **Scan**.
2. In the confirmation window, click **OK**.

4.3.0 NVBU Virtual Tape Libraries

4.3.1 NVBU VTL – An Overview

Virtual Tape Libraries (VTLs) are an emulation of tape libraries on disk, which enable disk-to-disk backups. With VTLs, you have the flexibility to perform quick backups to disks, and during off-peak hours migrate or duplicate the backup to physical systems for off-site storage. The media manager does not distinguish between a virtual and a physical tape, which simplifies the process of setting up backup policies, including retention period and rotation schemes.

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

A VTL can handle any number of concurrent NVBU 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 must be the same as or more than the number of drives configured. Different operating systems may impose limits on the maximum file size, which can affect the maximum VTL media size.

Important: VTLs are independent of file systems (e.g., NTFS, UFS, ext3, etc.) and disk systems (e.g., IDE, SCSI, iSCSI, etc.). However, file systems residing on removable drives are not supported.

4.3.2 Creating and Adding NVBU VTLs

Before starting this procedure, consider the following points:

- Before creating a VTL, NVBU performs a disk space check to make sure 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. However, when creating an NVBU VTL on a third-party deduplication appliance or compressed file system, BakBone recommends that you disable this feature. To disable disk space checks before VTL creation, refer to the *NetVault: Backup Configuration Guide*.
- During disk space checks the free space required on the disk is calculated as follows:

Number of Slots * Media Capacity + <x>

<x> is the margin considered for the following:

- ❖ Disk space required to create the directory structure for the VTL. It varies for different file systems.

- ❖ Disk space required by other applications running on the system.

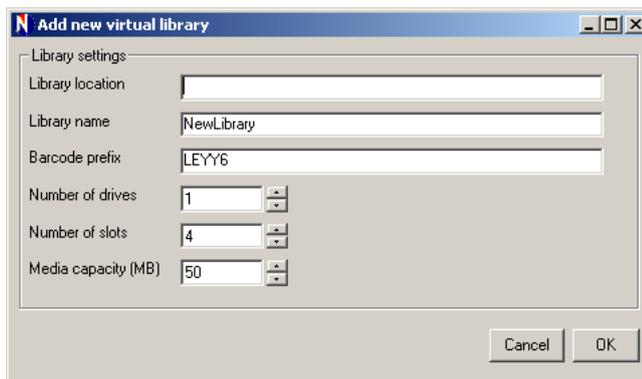
The margin is set to 20MB by default. To change this setting, refer to the *NetVault: Backup Configuration Guide*.

- If the target disk does not have sufficient space, NVBU terminates the device emulation process with an error.

To create a VTL, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library** on the **Library Selection** tab, right-click the target machine and select **Create Virtual Library**.
4. In the **Add New Virtual Library** window, configure the following parameters:
 - **Library Location** – Enter the path for the VTL. This should be an existing path. NVBU will not create any non-existing directories. For example, enter **C:\VirtualLibraries** to create a VTL in the **VirtualLibraries** folder on C drive.
 - **Library Name** – Enter a unique name for the VTL. NVBU assigns the name **NewLibrary** by default.

Figure 4-6:
Add New
Virtual Library
window



- **Barcode Prefix** – For each VTL, NVBU generates a barcode prefix that is used for identification and assigned to the media used by the VTL. It can be changed, if required. However, ensure that a unique code is assigned to each VTL.

- **Number of Drives** – Enter or select the number of drives for the VTL.

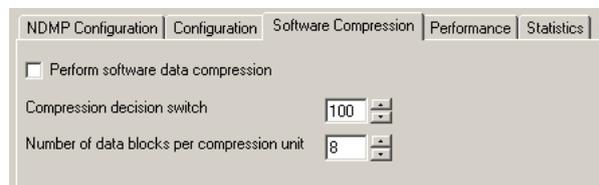
- **Number of Slots** – Enter or select the total number of slots that will hold the media.
 - **Media Capacity** – Enter or select the size of the virtual tape. The media size is specified in MB. The maximum size for a piece of media can be 800GB (i.e., 819,200MB). Each slot will contain a piece media of the given size.
5. Select **OK** to initiate the creation of VTL. Depending upon the platform, the number of slots and media size, this process will take some time to complete. The entire VTL must be created before it can be targeted for backups. Large VTLs can take considerable amounts of time to create. The NVSD Device does not have the limitation that the entire disk-based capacity must be provisioned before it can be used and should be considered as an alternative to large VTLs when creation time is an issue.
- Click **OK** to close the dialog.
6. The VTL is added to the NVBU Server in the same manner as a physical library. To add the VTL, refer to [Adding Devices Using the Automatic Device Configuration Wizard on page 58](#) or [Adding the Libraries Manually on page 60](#).

4.3.3 Configuring Software Compression Parameters

To configure software data compression parameters for NVBU VTL Drives, perform the following steps:

1. Open the **Configure Device** window as described in the following steps:
 - a. **New Drive**
Click the **Configure** tab on the **Add Library/Standalone Drive** window. Double-click the target drive.
 - b. **Existing Drive**
On the **Devices** tab, right-click the drive and select **Configure**.
2. Click the **Software Compression** tab.
3. Configure the following parameters:

Figure 4-7:
Software
Compression
tab



- **Perform Software Data Compression** – Select this check box to enable compression. The data will be compressed when it is transferred to this device during backup.

- **Compression Decision Switch** – The value set for this parameter determines the minimum level of compression which must be achieved when data is compressed during a backup. For example, if you set the value to 80%, NVBU will attempt to compress the data during backup and perform one of the following:
 - ❖ If the end result of the compression produces data less than 80% of the original data size, the data will be written to virtual media compressed.
 - ❖ If the end result of the compression produces data more than 80% of the original data size, NVBU will not compress the data and complete a normal backup with the actual file size.

If you enter 80%, then a file size of a 100MB must be \leq 80MB after compression. If not, NVBU will backup the file uncompressed. The extent that data can be compressed is dependant on the data contents. Encrypted data will typically not compress. 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** – Enter the number of data blocks per compression unit. The default block size is 32KB which can be changed via the Configuration tab. For details, refer to [Configuring General Parameters on page 66](#).

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

4.3.3.a Software Compression and NVDB Restores

When an NVDB backup is restored, the remaining space on virtual tapes that contain compressed savesets is not reported correctly. As a work-around, you can perform either of the following:

- Clear the **Software Compression** check box and re-launch the job to scan the media again.
- Manually scan the target media. If the media is not displayed, perform the following steps:
 - a. Click the **Media Request** tab.
 - b. Right-click the corresponding entry in this window and select **Hold**.
 - c. On the **Devices** tab, right-click the VTL and select **Scan**. The media will be returned to the drive.
 - d. On the **Media Request** tab, right-click the entry and select **Off Hold**.

4.3.4 Removing an NVBU VTL

When you remove an NVBU VTL, the used media information is still stored in the NVDB. To remove an NVBU VTL completely, perform the following steps:

1. On the **Devices** tab right-click the VTL, and select **Bulk Blank**. This removes all the job indexes associated with the data stored on the VTL.
2. Right-click the VTL and select **Remove**.
3. Stop the NVBU Service.
4. Open `.../config/diskdevices.cfg` file in a text editor (where ... represents the NVBU installation directory)
5. Under the **[libraries]** and **[drives]** sections, delete all entries for the deleted VTL.
6. Save and close the file.
7. Then, go to the VTL location on the hard disk, and delete the directory that represents the removed VTL.
8. Start the NVBU Service.

4.4.0 Virtual Standalone Drives

4.4.1 Creating and Adding Virtual Standalone Drives

To create a virtual standalone drive, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Standalone Drive** to open the **Add Standalone Drive** window.
3. Under **Choose Drives** on the **Drive Selection** tab, right-click the target machine and select **Create Virtual Drive**.
4. In the **Add New Virtual Drive** window, configure the following parameters:

Figure 4-8:
Add New
Virtual Drive
window

The screenshot shows a dialog box titled "Add new virtual drive". It contains the following fields and values:

Field	Value
Drive location	
Drive name	NewDrive
Barcode prefix	MTPWQ
Media capacity (MB)	50

Buttons: Cancel, OK

- **Drive Location** – Enter the path for the drive. This should be an existing path. NVBU will not create any non-existing directories.
 - **Drive Name** – Enter a unique name for the standalone drive. NVBU assigns the name **NewDrive** by default.
 - **Barcode Prefix** – For each standalone drive, NVBU generates a barcode prefix that is used for identification and assigned to the media used by the drive. It can be changed, if required. However, ensure that a unique code is assigned to each drive.
 - **Media Capacity** – Enter or select the media size in MB. Ensure that sufficient space is available on the disk to create the virtual media.
5. Select **OK** to initiate the creation of the standalone drive. Depending on the media size, this process may take a few minutes to complete. A message is displayed when the process completes. Click **OK** to close the dialog.
 6. The virtual standalone drive is added to the NVBU Server in the same manner as a physical drive. For details on adding the drive, refer to [Adding Devices Using the Automatic Device Configuration Wizard on page 58](#) or [Adding Standalone Drives Manually on page 63](#).

4.5.0 NVBU Shared Virtual Tape Libraries

4.5.1 NVBU SVTL – An Overview

NVBU SVTLs extend the VTL implementation and lets you share a VTL with multiple NVBU machines for LAN-free backups. The interface can be Fibre Channel, iSCSI or SCSI. On Linux and Solaris platforms, SCSI_FCP protocol is also supported. The SVTLs are supported on the following platforms:

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

The disks can be of any size. However, operating system imposed limitations do apply. The SVTL size can be changed on the fly using CLI utilities.

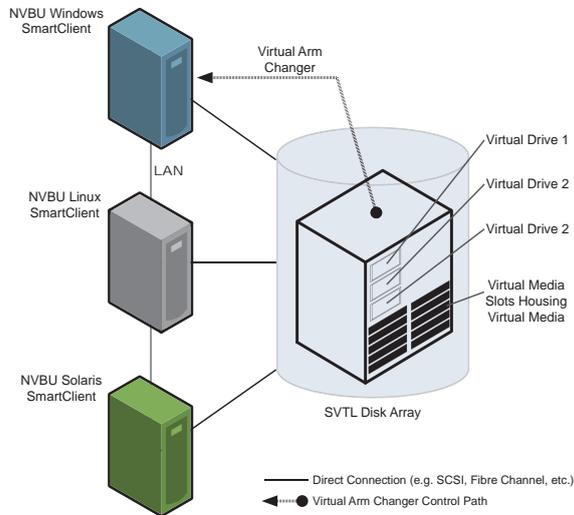
4.5.2 Planning for NVBU SVTLs

Before setting up an SVTL, consider the following:

- The SVTL size will depend on your disk size. Therefore, select a disk that meets your SVTL size requirements.
- The disk must be physically connected to all Clients that will access the SVTL. The number of virtual drives for the SVTL will depend on the number of machines that will 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.

Figure 4-9:
An illustration
depicting an
SVTL

- Select the machine that will control the virtual arm changer. Although the SVTL drives can be shared or distributed among multiple Clients, only one Client controls the virtual arm changer.



4.5.3 NVBU SVTL Prerequisites

Before creating an SVTL, refer to the following notes and complete the required tasks:

- [General Prerequisites](#)
- [Setting up Raw I/O on Linux](#)
- [Setting up Raw I/O on RedHat Linux](#)
- [Setting up Raw I/O on RedHat Enterprise Linux 5](#)
- [Setting up Raw I/O on SUSE Linux](#)

4.5.3.a General Prerequisites

- Connect the disk array to all the NVBU 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.
- Only an unformatted disk that contains no mounted partitions/volumes can be used as an SVTL. A partition on a hard disk cannot serve as an SVTL. The disk must allow multiple interfaces.
On Windows any non-ejectable disk can serve as an SVTL

NVBU does not support Multipath, Powerpath or software RAID technologies.

- On Windows delete any existing volumes on a disk or LUN before using it to create an SVTL.
- On Windows 2008, Vista and 7 a new disk drive that is added must be first placed Online within the Disk Management administrative utility. When prompted to initialize the disk, select No. If you do not perform these steps, NVBU will not be able to create an SVTL on the disk.
- Linux has a pool of raw device nodes that must be bound to a block device before raw I/O can be performed 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.
- If using a disk or RAID volume on a SAN, edit the file `/kernel/drv/sd.conf` on Solaris Clients hosting the SVTL or sharing the drives. Enter the values for SCSI ID and LUNS to scan the appropriate disks and volumes in the following format:


```
name="sd" class="scsi" target=6 lun=5;
```
- In the event that a machine running a Solaris O/S is to utilize an SVTL, the hard disk that is to house it must be partitioned into a single, large “**Backup**” partition. Utilize any relevant commands to set up the target hard disk so that it contains a single partition.
- Determine the Client that will control the virtual arm changer.

4.5.3.b Setting up Raw I/O on Linux

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

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

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

To set up raw I/O, perform the following steps:

1. At the prompt issue the following command:

```
ls /dev/rawctl
or
ls /dev/raw/raw1
```

It displays information from the `devices.txt` file that usually resides in the `/usr/src/linux/Documentation/devices.txt` directory

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

```
mkknod /dev/rawctl c 162 0
```

3. Set the permissions to the following:

```
crw-rw
```

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

4.5.3.c 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/sda5**.

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. This must be done each time the machine is rebooted. You must be logged in as root to issue this command:

```
# raw /dev/raw/raw1 /dev/sda5
```

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

```
dev/raw/raw1 /dev/sda5
```

Reboot or issue 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.

4.5.3.d 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 via udev rules. To do this correctly, add the appropriate entries to the file

/etc/udev/rules.d/60-raw.rules in the following formats:

- For Device Names:

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

- For Major/Minor Numbers:

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

Replace <device name> with the name of the device you need to bind (e.g., /dev/sda1). A and B are the major / minor numbers of the device you need 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 with 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
```

4.5.3.e Setting up Raw I/O on SUSE Linux

On SUSE Linux, the raw disk partitions are administered in the **/etc/raw** file. This is a plain text file containing comments and examples for possible configurations. Once created, bind the raw devices. You do this by starting them with the script **/etc/init.d/raw**. Use the **chkconfig(8)** utility to guarantee that the raw device binding occurs during any restart

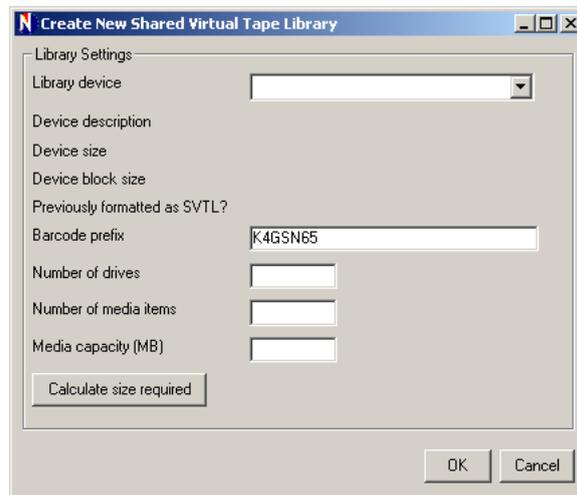
4.5.4 Creating NVBU SVTLs

To create an SVTL, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library** on the **Library Selection** tab, right-click the target machine and select **Create SVTL**.
4. In the **Create New Shared Virtual Tape Library**, configure the following parameters:
 - **Library Device** – Select the target drive in the list. Depending on the operating system, the available disks are listed as follows:

Figure 4-10:
Create New
Shared Virtual
Tape Library
window

- ❖ **Windows** – PhysicalDrive1, PhysicalDrive2, etc.
- ❖ **Linux** – /dev/raw/raw1, /dev/raw/raw2, etc.
- ❖ **Solaris** – /dev/rdisk/c0t0d0s0, /dev/rdisk/c1t1d0s0, etc.
- **Device Description** – This parameter indicates the disk type.
- **Device Size** – This parameter indicates the disk size.
- **Device Block Size** – This parameter indicates the block size.
- **Previously Formatted as SVTL?** – This parameter indicates whether the selected disk was previously formatted as an SVTL.



- **Barcode Prefix** – For each SVTL, NVBU generates a barcode prefix that is used for identification and assigned to the media used by the SVTL. It can be changed. However, ensure that a unique code is assigned to each SVTL.
- **Number of Drives** – Enter the number of drives for the SVTL. The number of drives can be more than the number of NVBU Clients currently connected to the disk. The additional drives can be used in future to connect more Clients.
- **Number of Media Items** – Enter the total number of slots that will hold the media.
- **Media Capacity** – Enter the media size in MB. When creating an SVTL, NVBU stores some information about the SVTL on the disk, which consumes a few megabytes of space. Take this into consideration when you configure the media capacity.

5. To determine the required disk size for an SVTL with the given specifications, click **Calculate Size Required**. If the required disk size is larger than the actual disk size, reduce the number of Media Items and Media Capacity.
6. Select **OK** to initiate the creation of SVTL.
7. When the process completes, a **Final Confirmation** window is displayed. Enter the following details to format the SVTL:
 - **Password** – Enter the NVBU password for the machine.
 - **Confirmation Phrase** – Enter the text **FORMAT SVTL**.Click **Format**.
8. A message is displayed when formatting completes. Click **OK** to close the dialog.

4.5.5 Adding a Library to SVTL Controller

To add the SVTL to the NVBU Client that will control the virtual arm changer, perform the following steps:

1. Open the **Device Management** window.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library**, open the SVTL Controller node (double-click the node, or right-click it and select **Open**) to list the attached libraries in the device tree.
4. Open the **SVTL Robotic Libraries** node to display the SVTL.
5. Double-click the SVTL or right-click and choose **Select**.
6. Perform the procedures described in the sections [Distributing SVTL Drives on page 56](#) or [Sharing SVTL Drives on page 57](#) to distribute or share the SVTL drives.

4.5.6 Distributing SVTL Drives

NVBU allows you to add an SVTL drive to a SmartClient for exclusive use. To distribute the SVTL drives among multiple SmartClients, perform the following steps:

1. Click the **Drive Selection** tab.
2. Open the Client to which you want to add the drive.
3. Open the **SVTL Channel** node. All the available SVTL drives are listed under this node.
4. Enter 1 in the **Select for Drive Bay** box.
5. Under **Choose Drives**, double-click drive 1 or right-click it and choose **Select**. The drive picture, type and details are displayed under **Selected Drives**.

6. Repeat steps 2–5 for the remaining shared drives that are to be added, changing the Client, drive number and bay for each drive.
7. To configure the drive parameters, refer to [Configuring Physical Tape Drives on page 65](#).

4.5.7 Sharing SVTL Drives

To share the SVTL across SmartClient drives, perform the following steps:

Note: Each drive that is to be shared by more than one SmartClient requires a Dynamically Shared Drive (DSD) licence.

1. Click the **Drive Selection** tab.
2. Open the SVTL Controller node.
3. Open the **SVTL Channel** node. All the available SVTL drives are listed under this node.
4. Perform the following steps to share the drives:
 - a. Enter 1 in the **Select for Drive Bay** box.
 - b. Under **Choose Drives**, double-click drive 1 or right-click it and select **Add Shared**. The drive picture, type and details are displayed under **Selected Drives**.
 - c. Repeat steps a and b for the remaining drives that are to be shared, changing the drive number and bay for each drive.
5. To add the shared drives to the Clients, perform the following steps:
 - a. On the **Drive Selection** tab, open the Client to which you want to add the drive.
 - b. Open the **SVTL Channel** node. All the shared SVTL drives are listed under this node.
 - c. Enter 1 in the **Select for Drive Bay** box.
 - d. Under **Choose Drives**, double-click drive 1 or right-click it and select **Add Shared**. The drive picture, type and details are displayed under **Selected Drives**.
 - e. Repeat steps a and b for the remaining shared drives that are to be added, changing the drive number and bay for each drive.
6. Perform step 5 for each Client to which you want to add the shared drives.
7. To configure the drive parameters, refer to the section [Configuring Physical Tape Drives on page 65](#).

4.6.0 Adding Tape-based Devices

4.6.1 Adding Devices Using the Automatic Device Configuration Wizard

The Automatic Device Configuration wizard helps you to quickly add and configure backup devices. This wizard can recognize devices manufactured by multiple vendors, although not all are supported. NVBU automatically starts scanning for new devices in the NVBU Domain when you start the Service.

Note: To disable automatic device scanning, refer to the *NetVault: Backup Configuration Guide*.

To automatically configure a backup device, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **NVBU Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. The **Automatic Device Configuration** wizard starts automatically when a qualified device is found. Follow the wizard as it guides you through the configuration steps.
3. Verify the device details and click **Yes** to start the configuration procedure.
4. Configure the following parameters:

Figure 4-11:
Automatic
Device
Configuration
wizard



- **Name** – NVBU assigns a default name to a backup device for identification. To change it, enter the new name for the device in the **Name** box.

- **Configure Performance Options** – To modify the default performance settings, select the **Configure Performance Options** check box.
- **Scan Client for Remote/Shared Devices** – This option is used for sharing drives among multiple Clients. For details on sharing drives, refer to [Adding Shared Devices in an NVBU Domain on page 75](#). For devices controlled by a single Client, clear the check box.

Click **Next** to proceed.

5. If the **Configure Performance Options** check box was selected in the previous step, reconfigure the following parameters to improve performance:

- **Amount of Memory to Assign to Transfer Buffers** – Enter the transfer buffer size (or the shared memory size). By default, the transfer buffer is set to 257KB. Generally, the following rule applies for the shared memory size:

```
shared memory=x*block size + 1
```

For details on configuring this parameter, refer to [Tuning Drive Performance on page 68](#).

- **Media Block Size** – Enter the media block size. The default block size is 32KB. For details on configuring this parameter, refer to [Configuring General Parameters on page 66](#).

Click **Next** to proceed.

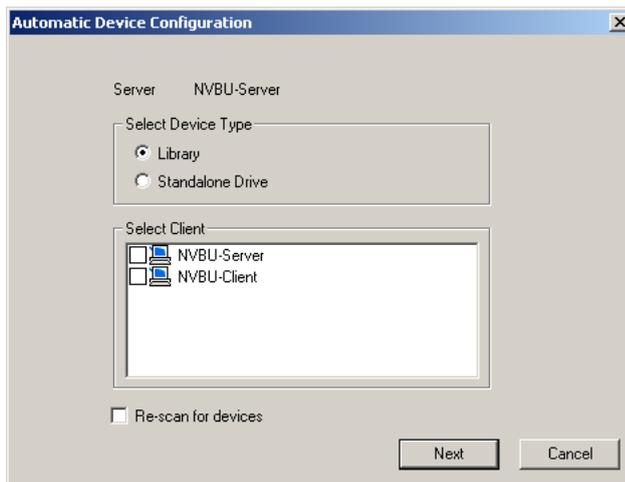
6. NVBU adds the device and displays a message. Click **Finish** to complete the procedure. The device is added and listed on the **Devices** tab.

4.6.1.a Manually Starting the Device Configuration Wizard

If a qualified device is not detected automatically, perform the following steps to start the wizard manually and complete the configuration procedure:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Auto-Configure Device**.
3. In the **Automatic Device Configuration** window, configure the following parameters to begin scanning:

Figure 4-12:
Automatic
Device
Configuration
Wizard started
manually



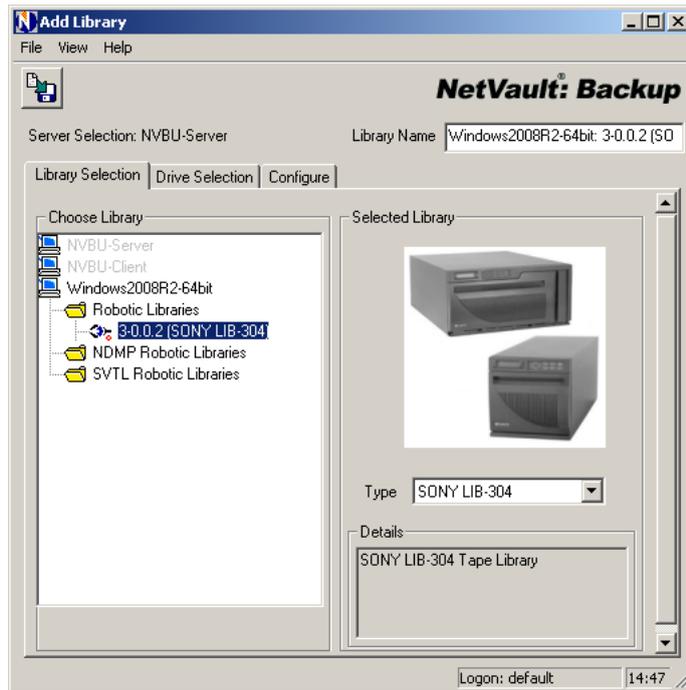
- **Select Device Type** – Under **Select Device Type**, select the appropriate option to search for Standalone Drives or Libraries.
 - **Select Clients** – Under **Select Clients**, select the check boxes corresponding to the Clients that are to be scanned.
 - **Re-scan for Devices** – To force a re-scan instead of using the cached information, select the **Re-scan for Devices** check box.
4. To scan for devices previously ignored using the **Do Not Ask Again for This Device** option, right-click the machine to which the device is physically connected, and then select **Clear List of Ignored Devices**.
 5. Click **Next** to continue.
 6. NVBU begins scanning the network for available devices and starts the **Automatic Device Configuration** wizard when a qualified device is found. To complete the configuration, continue from step 3 of [Adding Devices Using the Automatic Device Configuration Wizard on page 58](#).

4.6.2 Adding the Libraries Manually

To add a library manually, perform the following steps:

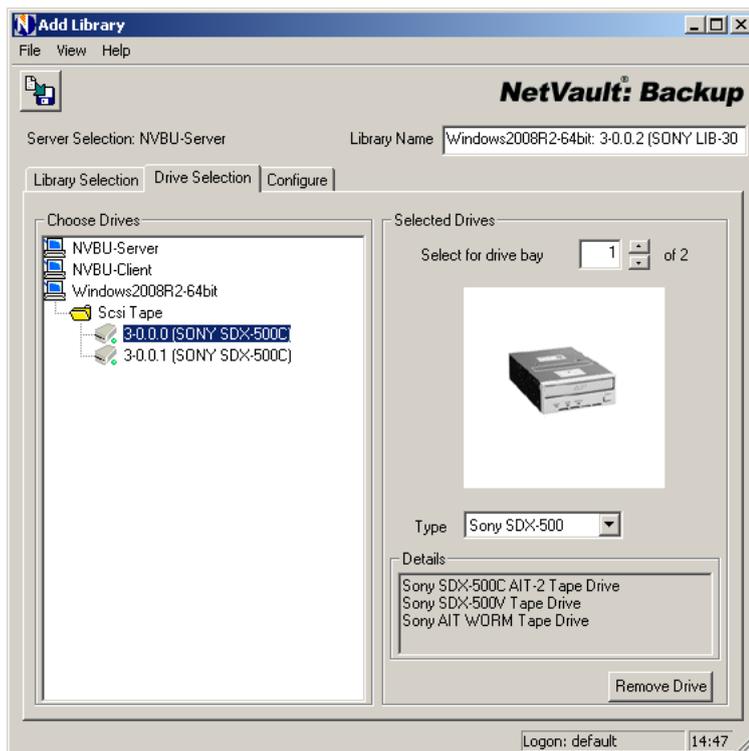
1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **NVBU Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library**, locate the NVBU Server or SmartClient to which the device is connected. Double-click the node, or right-click it and select **Open**.

Figure 4-13:
Library
Selection tab



4. Depending on the library type, open the appropriate node to display the available libraries.
5. Double-click the library, or right-click and choose **Select** to display the library picture, type and details under **Selected Library**.
6. Click the **Drive Selection** tab.

Figure 4-14:
Drive Selection
tab



7. Open the NVBU Server or SmartClient node to which the device is connected.
8. Open the appropriate drive type to display the available drives.
9. Select the drive bays as described in the following steps:
 - a. **Libraries with a Single Drive**
 1. Double-click the drive (or right-click it and choose **Select**) to display the drive picture, type and details under **Selected Drives**
 - b. **Libraries with Multiple Drives**
 1. Enter 1 in the **Select for Drive Bay** box.
 2. Under **Choose Drives**, double-click drive 1 (or right-click it and choose **Select**) to display the drive picture, type and details under **Selected Drives**.
 3. Repeat steps 1–2 for the remaining drives, changing the drive number and bay for each drive.

Note: While the drive number usually matches the bay number, depending on the library and drive configuration a different assignment of drives to bays might be necessary. If you experience failure during move or load/unload operations, consider adding your drives in a different order to their bays.

10. To configure the library and drive parameters, refer to [Configuring Physical Tape Libraries on page 64](#) and [Configuring Physical Tape Drives on page 65](#).
11. To identify a device, NVBU assigns a default name which is displayed in the **Library Name** box at the top right corner of the window. You can save a device with its default name, or assign it a new name. To change the library name, enter the string in the **Library Name** box.
12. Click **Save Details** on the toolbar. The device is added and listed on the **Devices** tab. The status changes to online after library initialization and inventory verification.

4.6.3 Adding Standalone Drives Manually

To add a standalone drive, perform the following steps:

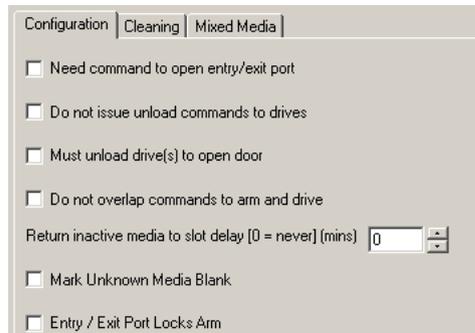
1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **NVBU Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Standalone Drive** to open the **Add Standalone Drive** window.
3. Under **Choose Drives** on the **Drive Selection** tab, open the Server or Client node to which the device is connected (double-click the node, or right-click it and select **Open**).
4. Open the **SCSI Tape** drive nodes to display the available drives under this node.
5. Double-click the drive, or right-click it and choose **Select** to display the drive picture, type and details under **Selected Drives**.
6. To configure the drive parameters, refer to [Configuring Physical Tape Drives on page 65](#).
7. To identify a device, NVBU assigns a default name which is displayed in the **Device Name** box at the top right corner of the window. You can save the device with its default name, or assign it a new name. To change the device name, enter the string in the **Device Name** box.
8. Click **Save Details** on the toolbar. The device is added and listed on the **Devices** tab. The status changes to online after device initialization.

4.7.0 Configuring Physical Tape Libraries

The default properties for a library can be set while adding a device or modified later from the **Modify Library** window. To set or change the library settings, perform the following steps:

1. Open the **Configure Device** window as described in the following steps:
 - a. **New Library**
 1. In the **Add Library** window, click the **Configure** tab.
 2. Double-click the target library, or right-click and select **Configure**
 - b. **Existing Library**
 1. On the **Devices** tab right-click the target library, and select **Modify**.
 2. In the **Modify Library** window, click the **Configure** tab.
 3. Double-click the target library, or right-click and select **Configure**
2. In the **Configure Device** window, click the **Configuration** tab.
3. Depending on the type of library you are using, the configuration settings may vary. This section only outlines the generic parameters that apply to most libraries. Contact BakBone Technical Support for any help to configure specific parameters not covered in this section. The generic parameters include the following:

Figure 4-15:
Configuration
tab for
Physical Tape
Library



Note: BakBone recommends that you do not change the default settings for the following parameters, unless otherwise advised by a Technical Support Representative.

- **Need Command to Open Entry/Exit Port**
- **Do Not Issue Unload Commands to Drives**
- **Must Unload Drive(s) to Open Door**
- **Do Not Overlap Commands to Arm and Drive**
- **Entry/Exit Port Locks Arm**

- **Return Inactive Media to Slot Delay** – Enter the timeout value for media inactivity. The media is returned back to the slot if no activity occurs within the specified interval. The default value for this parameter is zero, which implies that the media is retained in the drive indefinitely.
 - **Mark Unknown Media Blank** – When NVBU is not able to read a tape's header, it marks the media as **Unknown**. Select the **Mark Unknown Media Blank** check box to mark such media as **Blank** instead of **Unknown**. However, you must still run the **Blank** command to actually delete the data and use the media for backups.
4. To configure the drive cleaning parameters, refer to [Configuring Slots and Barcodes for Cleaning Media on page 71](#).
 5. For mixed media settings refer to [Adding and Configuring a Mixed Media Library on page 81](#).
 6. Click **OK** to save the settings.

4.8.0 Configuring Physical Tape Drives

To configure or modify the drive settings, perform the following steps:

1. Open the **Configure Device** window as described in the following steps:
 - a. **New Drive**
Click the **Configure** tab on the **Add Library/Standalone Drive** window. Double-click the target drive.
 - b. **Existing Drive**
On the **Devices** tab, right-click the drive and select **Configure**.
2. Click the corresponding tab and configure the parameters as described in the following sections:

Note: Depending on the drive type the configuration settings may vary. This section outlines only the generic parameters that apply to most drives. Contact BakBone Technical Support for any help with setting specific parameters not covered in this section.

- [Configuring General Parameters on page 66](#)
 - [Configuring NDMP Parameters on page 68](#)
 - [Tuning Drive Performance on page 68](#)
 - [Collecting Drive Performance Statistics on page 70](#)
 - [Configuring Timeout for SCSI Commands on page 70](#)
3. To configure the drive cleaning parameters, refer to [Configuring Slots and Barcodes for Cleaning Media on page 71](#).
 4. Click **OK** to save the settings.

4.8.1 Configuring General Parameters

The general parameters are provided on the **Configuration** tab, which include the following:

Note: BakBone recommends that you do not change the default settings, unless otherwise advised by a BakBone Technical Support Representative.

- **Device Serial Number** – The device serial number is displayed in this box and it cannot be changed.
- **Amount of Media Reserved at End of Tape** – Enter the remaining space in the media at which the end of media warnings are issued.
- **Cleaning Tapes Supported** – This parameter informs you whether the library has automatic cleaning tape support or not. Generally, the default value is correct, unless certain library models have a different setting.
- **Time (in seconds) to Wait for Tape to Go Ready** – Enter the timeout value for media availability. This includes the time for the drive to load and spool media, and transit from **busy** and **becoming busy** states to read a SCSI command. NVBU raises a Media Request if all these do not occur in the specified interval.

Figure 4-16:
Configuration
tab for
Physical Tape
Drive

Parameter	Value
Device Serial Number	HU10642E4U
Amount of media reserved at end of tape (MB)	2048
<input checked="" type="checkbox"/> Cleaning Tapes Supported	
Time (in seconds) to wait for tape to go ready	600
Time (in seconds) to wait for tape to stop reporting no media present	10
Time (in seconds) to wait for cleaning tape to start reporting cleaning drive	20
Time between polling empty drive [0 = never] (mins)	1
Media block size (Kb)	32
Time (in seconds) to wait for plugin to connect [0 = forever]	0
<input checked="" type="checkbox"/> Supports Short Reads	
Compression	On

- **Time (in seconds) to Wait to Stop Reporting No Media Present** – Enter the time NVBU waits for a drive to stop indicating **no media present** message and start showing **media loaded**.
- **Time (in seconds) to Wait for Cleaning Tape to Start Reporting Cleaning Drive** – Enter the time NVBU waits for the cleaning drive to load and spool cleaning tapes and send the cleaning initiation message.

- **Time Between Polling Empty Drives** – Enter the interval at which NVBU polls the standalone drives for media change.
- **Media Block Size** – Enter the block size for the data that is read and written to the media. The default media block size is 32KB and can be increased in increments of 1KB, although many devices will only accept a value in multiples of 4KB or 32KB. The maximum media block size is limited by several factors, including the operating system and SCSI adapter, the make, model and type of drives.

Large media blocks enable reading and writing of larger blocks of data, thereby reducing the overall number of times a backup needs to read data and write it to media. However, this does not always imply an overall faster backup.

On Linux/UNIX platforms, you can increase the media block size for optimum performance.

To use block sizes larger than 64KB on Windows, you might have to change the registry setting called **MaximumSGList**. Before changing this setting, ensure that you are only using tape devices on your SCSI bus. If there are other devices present, 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. To change the registry setting, perform the following steps:

- a. Open the Registry Editor (on the **Taskbar**, click **Start** and select **Run**; in the **Open** box, enter **regedit**).
- b. Open the **[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\<HBA Vendor>\Parameters** node where **<HBA Name>** is specific to your SCSI card (e.g. QL2200 for a Qlogic 2200 card).
- c. Create a **Device** key, if it is not present
- d. Under **Device** key add **DWORD** (if not present). Set the **DWORD** to **MaximumSGList**.
- e. Calculate the hexadecimal value as described below:

32-Bit Systems:

```
MaximumSGList = ((Maximum Block Size) / 4KB) + 1
```

For example, for 256KB block size, the value will be 256KB/4KB= 64. Adding 1 gives a value of 65 (decimal) or 0x41 (hexadecimal). You can configure any block size between 64KB and 1MB. The maximum value is 255 or 0xFF, for a 1MB block size

64-Bit systems:

On 64-Bit systems, the OS page size is 8KB by default. Therefore, the maximum transfer size is 2MB.

```
MaximumSGLList = ((Maximum Block Size) / 8KB) + 1
```

f. Reboot the system to apply the changes.

- **Time (in seconds) to Wait for Plugin to Connect** – Enter the timeout value for the plugin to connect to NVBU. The job is aborted if connection is not established within the specified interval.
- **Support Short Reads** – Select this check box to support short reads.
- **Compression** – Select this check box to use the tape's built-in compression functionality. Not all drives support this function and the amount of compression will vary depending on the type of data and the drive compression algorithm. Consult the hardware documentation to determine the compression rates for your drive. On some tapes, compression can be configured in the hardware, which will override this setting.

4.8.2 Configuring NDMP Parameters

The NDMP parameters are provided on the **NDMP Configuration** tab. BakBone recommends that you do not change the default settings for any parameter on this tab unless otherwise advised by a Technical Support Representative.

4.8.3 Tuning Drive Performance

The performance tuning parameters are provided on the **Performance** tab, and include the following:

Note: Any changes to the performance settings only apply to a blank media. If you are reusing media, then blank it first for these changes to take effect.

Figure 4-17:
Performance
tab

- **Amount of Memory to Assign For Transfer Buffers** – The transfer buffer or the shared memory is allocated in blocks of 32KB. The default size for this buffer is 257KB and can be increased for faster performance. The formula to calculate a valid buffer size is given below:

$$(<\text{Total number of buffers}> \times 32\text{Kb}) + 1 \text{ byte}$$

On Linux/UNIX, you require sufficient RAM and large Shared Memory segment. Before increasing the transfer buffer size, check the following parameters on these platforms:

- ❖ Maximum size of a shared memory segment (SHMMAX)

- ❖ Minimum size of shared memory segment (SHMMIN)
- ❖ Maximum number of shared memory identifiers in the system (SHMMNI)
- ❖ Maximum number of shared memory segments a user process can attach (SHMSEG)
- ❖ Maximum number of semaphore identifiers in the system (SEMMNI)
- ❖ Maximum number of semaphores in a set (SEMMSL)
- ❖ Maximum number of semaphores in the system (SEMMNS)
- ❖ Maximum number of operations per semop call (SEMOPM)
- ❖ Semaphore maximum value (SEMVMX)

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.

On Windows, you require at least 2GB RAM and large virtual memory. You might also have to change the maximum SGList parameter on the SCSI card. Some examples of the optimal values that can be specified for some of the drives are given below:

Drive Type	Optimal Transfer Buffer Value
Fast Modern Tape Drives e.g., LTO (1, 2 or 3), SDLT or SAIT	65537 (64MB + 1KB)
Medium Speed Tape Drives e.g., DLT8000, DLT7000 and AIT-3	32769 (32MB + 1KB)
Older Professional Tape Drives e.g., DLT2000, DLT4000, AIT-2, etc.	16385 (16MB + 1KB)
Older Low Capacity Low-end Drives e.g., EXB-8505, AIT-1, DAT, etc.	8193 (8MB + 1KB)

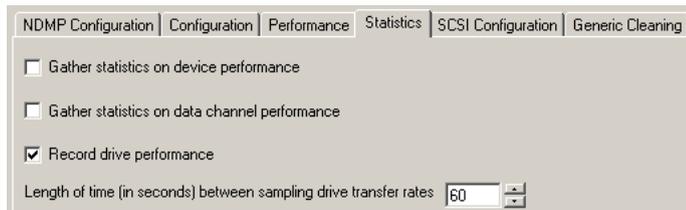
- **Number of Media Blocks to Write/Read at a Time** – BakBone recommends that you do not change the values for these two parameters. If you change the value, record them as it will be necessary to re-apply them if the drive is re-installed. Restores require the same values that were set at the time of backup and will fail if the settings do not match.
- **Lock Transfer Buffer in Memory** – This option locks the allocated transfer buffer position in memory, increasing the potential performance and preventing another process from using it when NVBU is running. BakBone recommends that you leave this selected unless otherwise advised by a Technical Support Representative.

4.8.4 Collecting Drive Performance Statistics

The drive performance parameters are provided on the **Statistics** tab, and include the following:

Note: NVBU collects statistics for complete data transfer between the Client and device during a job execution. Although it records excessive soft read and write errors for the drive, NVBU does not collect data for individual read and write actions on the device.

Figure 4-18:
Statistics tab



- **Gather Statistics on Device Performance** – Select this check box to log the statistics for drive performance. You can view this information from the **Device Logs** tab. Although this information facilitates troubleshooting, it also increases the NVDB size.
- **Gather Statistics on Data Channel Performance** – Select this check box to log the statistics for the Data Channel. You can view this information from the **Device Logs** tab. Although this information facilitates troubleshooting, it also increases the NVDB size.
- **Record Drive Performance** – Select this check box to record the drive performance details with each job that uses the given drive. You can view these logs from the **Logs** window.
- **Length of Time (in seconds) Between Sampling Drive Transfer Rates** – Enter the interval at which NVBU collects the Drive Transfer Rate statistics.

4.8.5 Configuring Timeout for SCSI Commands

On the **SCSI Configuration** tab, the default timeout value for the different types of SCSI commands is set to zero, which correspond to the following intervals:

- Fast SCSI Commands – 300 seconds
- Slow SCSI Commands – 900 seconds
- Very Slow SCSI Commands – 3 hours

An error is logged if a command execution does not complete within the specified interval. BakBone recommends that you do not change the default timeout for any of the SCSI commands unless otherwise advised by a Technical Support Representative.

4.9.0 Configuring Drive Cleaning Parameters for Physical Tape Drives

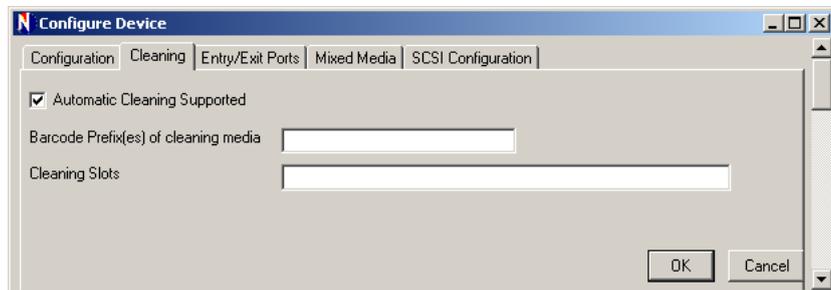
In order to establish a cleaning routine for the drives or to perform manual cleaning, you must complete the following configuration procedures.

4.9.1 Configuring Slots and Barcodes for Cleaning Media

Before loading a cleaning tape, you must configure the slots that will hold the cleaning media and specify the barcodes for the cleaning media. To accomplish this, perform the following steps:

1. On the **Devices** tab right-click the target library, and select **Modify** to open the **Modify Library** window.
2. Click the **Configure** tab.
3. Double-click the library or right-click the library, and select **Configure**.
4. Click the **Cleaning** tab.
5. Configure the following parameters:

Figure 4-19:
Cleaning tab



- **Automatic Cleaning Supported** – The **Automatic Cleaning Supported** check box is selected by default for libraries that support automatic cleaning.
- **Barcode Prefix(es) of Cleaning Media** – Enter the barcode prefixes for the cleaning media. For multiple cleaning tapes, use comma delimiter.
- **Cleaning Slots** – Enter the slot number(s) that will hold the cleaning media. For multiple slots, use comma delimiter.

Note: Both the barcode prefixes and the slot numbers must be configured for the cleaning media so that the library can recognize and place the media in the reserved slot. If the cleaning media is not placed in the designated cleaning slot, you will not be able to set the life for the cleaning media.

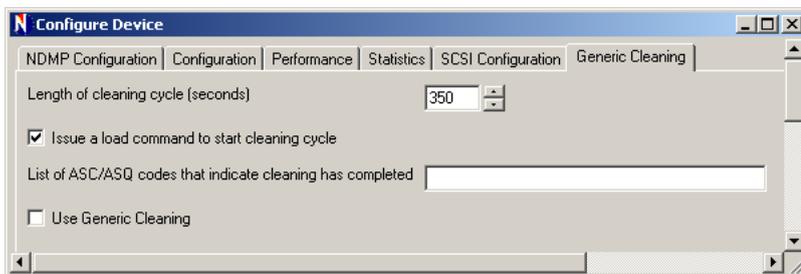
6. Click **OK**.
7. Click **Save Details** on the toolbar. Alternatively, on **File** menu click **Save**.

4.9.1.a | Configuring Generic Cleaning Properties

If the library requires generic cleaning, perform the following steps:

1. Double-click the drive in the **Modify Library** window. Alternatively, right-click it and select **Configure**.
2. Click the **Generic Cleaning** tab.
3. Configure the following parameters:

Figure 4-20:
Generic
Cleaning tab



- **Length of Cleaning Cycle** – The length of the cleaning cycle is set to 350 seconds by default. To change it, enter or select the duration in the **Length of Cleaning Cycle** box. The duration is specified in seconds.
- **Issue a Load Command to Start Cleaning Cycle** – Select this check box if the drive requires a load command to initiate a cleaning cycle.
- **List of ASC/ASQ Codes that Indicate Cleaning has Completed** – If required, enter the ASC/ASCQ SCSI codes for cleaning in this box.
- **Use Generic Cleaning** – Select the **Use Generic Cleaning** check box.

4. Click **OK**.
5. Click **Save Details** on the toolbar. Alternatively, on **File** menu click **Save**.

4.9.2 | Configuring the Life of Cleaning Media

To set up the life for a cleaning media, perform the following steps:

1. On the **Devices** tab right-click the cleaning slot, and select **Life**.
2. Configure the following parameter:

Figure 4-21:
Cleaning
Media
Properties
window



- **Lives** – In the **Lives** box, enter or select the number of times the cleaning media can be used.

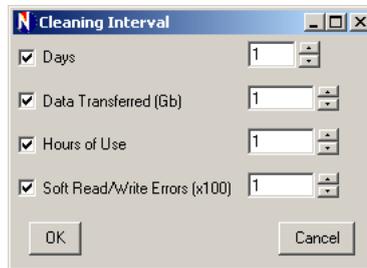
3. Click **OK** to save the property.

4.9.3 Establishing Automatic Cleaning Routine

To establish automatic cleaning routine for a drive, perform the following steps:

1. On the **Devices** tab, right-click the target drive and select **Clean Properties**.
2. In the **Cleaning Interval** window, configure the following parameters:

Figure 4-22:
Cleaning
Interval
window



- **Days** – To set the cleaning interval in number of days, select the **Days** check box. In the box to the right, enter or select the number of days between two cleaning cycles.
 - **Data Transferred** – To set the cleaning routine based on the amount for data transferred, select the **Data Transferred** check box. In the box to the right, enter or select the amount of data that can be read or written between two cleaning cycles. The data transfer amount is specified in GB.
 - **Hours of Use** – To set the cleaning interval in number of hours used, select the Hours of Use check box. In the box to the right, enter or select the number of hours between two cleaning cycles.
 - **Soft Read/Write Errors** – To set the cleaning routine based on the number of errors encountered, select the **Soft Read/Write Errors** check box. In the box to the right, enter or select the read/write errors. This value is specified in hundreds.
3. Click **OK** to establish the cleaning routine.

4.9.4 Cleaning a Drive Manually

For a drive that does not support automatic cleaning, perform the following steps in order to clean it manually:

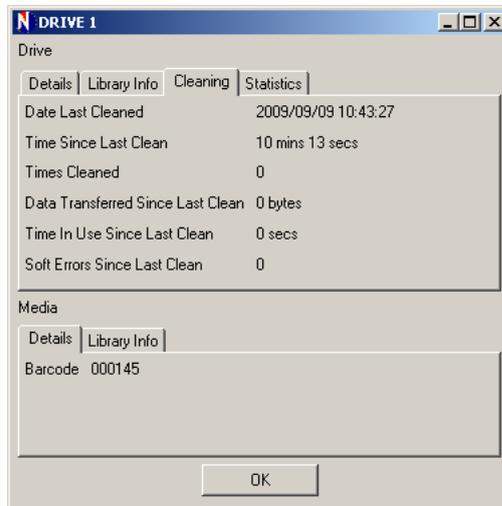
1. On the **Devices** tab right-click the target cleaning drive, and select **Clean**.
2. In the confirmation window click **Yes**. NVBU starts the cleaning routine and on completion displays a message.
3. Click **OK** to close the dialog.

4.9.5 Viewing the Drive Cleaning Status

To check the status of cleaning drives/slots, perform the following steps:

1. On the **Devices** tab right-click the target drive, and select **Status**.
2. Click the **Cleaning** tab on the **Status** window.

Figure 4-23:
Cleaning
status tab



It displays the following details for the drive:

- **Date Last Cleaned** – The date on which the drive was cleaned last.
 - **Time since Last Clean** – Time elapsed since the last automatic or manual cleaning operation.
 - **Times Cleaned** – The number of times the drive has been cleaned.
 - **Data Transferred since Last Clean** – The amount of data read or written since the last cleaning operation.
 - **Time in Use since Last Clean** – The number of times the drive has been used for read or write operations since the last cleaning operation.
 - **Soft Errors Reported since Last Clean** – The number of read or write errors reported since the last cleaning operation.
3. Click **OK** to close the window.

4.10.0 Adding Shared Devices in an NVBU Domain

Drive sharing requires an infrastructure where multiple machines can establish direct paths to the devices, e.g., in a switched Fibre Channel environment. In such environments, you can share the devices among multiple SmartClients for better resource utilization through direct access. The shared drives can be controlled by multiple machines (NVBU Server, Client or Filers), but the library arm changer remains under the control of one NVBU Client. Each device that is to be shared by more than one NVBU Client uses a Dynamically Shared Device (DSD) licence.

The following sections describe the procedure for adding shared devices in an NVBU Domain. Before you proceed, make sure all the target NVBU Clients are added to the NVBU Server.

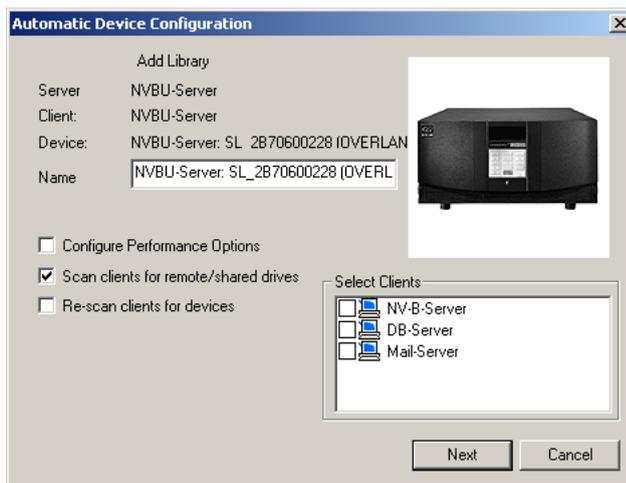
Important: BakBone recommends that you do not execute any changes for a drive while it is actively being used. All jobs that are in progress which use the drive must be inactive before any changes are made.

4.10.1 Adding Shared Devices Automatically

To add dynamically shared devices using the Automatic Device Configuration Wizard, perform the following steps:

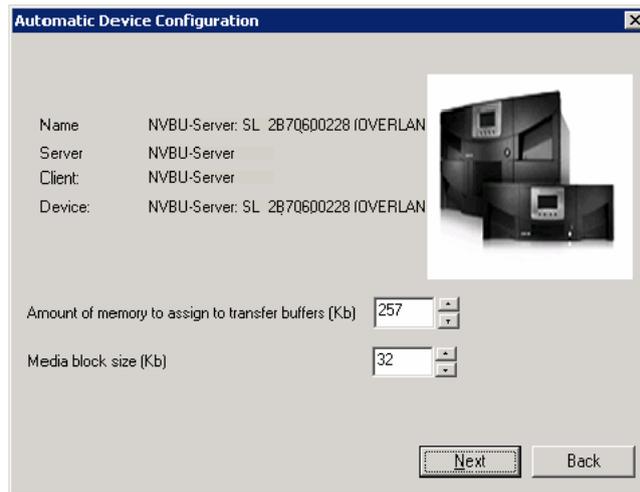
1. Open the NVBU Device Management window. The Automatic Device Configuration wizard should startup automatically when you open this window. If this fails, start the Automatic Device Configuration wizard manually. For details, refer to [Manually Starting the Device Configuration Wizard on page 59](#).
2. Click **Yes** to begin configuring the detected device and follow the wizard as it takes you through the configuration steps.
3. In the **Add Library** window configure the following parameters:

Figure 4-24:
Automatic
Device
Configuration
Wizard for
sharing drives



- **Name** – This box displays the default name for the device. You can change it and assign a new name for easy identification.
 - **Configure Performance Options** – To modify the default performance settings, select the **Configure Performance Options** check box.
 - **Scan Client for Remote/Shared Devices** – Ensure this check box is selected.
 - ❖ **Re-scan Clients for Devices** – Select this check box to force a re-scan instead of using the cached information. This is normally done if there have been changes in the I/O infrastructure that would require a re-scan, such as a Fibre Channel SAN change.
 - ❖ **Clients** – Under **Select Clients**, select the Clients that are to be scanned for shared drives. For NDMP Filer-attached devices, select the NVBU Server.
4. If the **Configure Performance Options** check box was selected in the previous step, reconfigure the following parameters to improve performance:

Figure 4-25:
Automatic
Device
Configuration
Performance
Options



- **Amount of Memory to Assign to Transfer Buffers** – Enter the transfer buffer size (or the shared memory size). By default, the transfer buffer is set to 257KB. Generally, the following rule applies for the shared memory size:

$$\text{shared memory} = x * \text{block size} + 1$$

For details on configuring this parameter, refer to [Tuning Drive Performance on page 68](#).

- **Media Block Size** – Enter the media block size. The default block size is 32KB. For details on configuring this parameter, refer to [Configuring General Parameters on page 66](#).

Click **Next** to proceed.

5. Click **Next** to proceed.
6. NVBU adds the shared drives to all the existing NVBU Clients. Click **Finish** to complete the procedure.

4.10.2 Adding Shared Devices Using the Semi-Automatic Method

The semi-automatic method involves adding the library and drives to one node exclusively, and then performing an automatic detection of the drives on all the NVBU Clients. This method will add the shared drives to all the NVBU Clients with access to these drives. To add shared devices using the semi-automatic method, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **NVBU Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.

2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library**, locate the NVBU Server or SmartClient to which the device is connected. Double-click the node, or right-click it and select **Open**.
4. Depending on the library type, open the appropriate node to display the available libraries.
5. Double-click the library, or right-click and choose **Select** to display the library picture, type and details under **Selected Library**.
6. Click the **Drive Selection** tab.
7. Open the NVBU Server or SmartClient node to which the device is connected.
8. Open the appropriate drive type to display the available drives.

Important: When selecting the drives to be shared, be sure to match the drives with the appropriate bay (data transfer element address). To obtain the proper bay number for each device, refer to the relevant *Library Operations or User's Guide*.

9. Right-click the drive to be shared, and select **Add Shared**.
10. Increase the bay number.
11. Repeat steps 9 and 10 for all drives that are to be shared.
12. Click the **Configure** tab.
13. Right-Click on the robotic arm and select **Scan for Shared Drives**.

Note: At this time NVBU will probe all NVBU Clients in the clients list for devices that match the serial numbers of those that have already been added as a result of steps 9 through 11.

14. Enter an appropriate name in the **Library Name** box.
15. Click **Save Details** on the toolbar. The library is added and listed on the **Devices** tab. When the library initialization completes, the status changes to online.

4.10.3 Adding Shared Devices Manually

The manual method of sharing devices gives more flexibility. However, this method requires you to manually share and add each drive to the required NVBU Clients. To add shared devices manually, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **NVBU Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library**, locate the NVBU Server or SmartClient to which the device is connected. Double-click the node, or right-click it and select **Open**.

4. Depending on the library type, open the appropriate node to display the available libraries.
5. Double-click the library, or right-click and choose **Select** to display the library picture, type and details under **Selected Library**.
6. Click the **Drive Selection** tab.
7. Open the NVBU Server or SmartClient node to which the device is connected.
8. Open the appropriate drive type to display the available drives.

Note: When selecting the drives to be shared, be sure to match the drives with the appropriate bay (data transfer element address). To obtain the proper bay number for each device, refer to the relevant *Library Operations or User's Guide*.

9. Right-click the drive to be shared, and select **Add Shared**.

Important: When selecting the drives to be shared, be sure to match the drives by the Serial Number. To obtain the serial number, right-click the drive to be shared, and select **Configure**. On the **Configuration** tab, the Serial Number is displayed.

10. Open the NVBU SmartClient which will share the drive.
11. Open appropriate drive type to display the available drives.
12. Right-click the corresponding drive which will be shared, and select **Add Shared**.
13. Repeat Step 7 – 12 for each drive that will be shared.
14. Enter an appropriate name in the **Library Name** box.
15. Click **Save Details** on the toolbar. The library is added and listed on the **Devices** tab. When the library initialization completes, the status changes to online.

4.10.4 Modifying Existing Libraries

This section describes the semi-automatic and manual procedures for adding shared drives to an existing non-shared library configuration.

4.10.4.a Adding Shared Drives to Non-Shared Library Using the Semi-Automatic Method

1. Right-click the library, and select **Modify**.
2. Click the **Configure** tab.
3. Right-Click on the robotic arm and select **Scan for Shared Drives**.

Note: At this time NVBU will probe all NVBU Clients in the clients list for devices that match the serial numbers of those that have already been added.

4. Click **Save Details** on the toolbar. The library is added and listed on the **Devices** tab. When the library initialization completes, the status changes to online.

4.10.4.b Adding Shared Drives to Non-Shared Library Manually

1. Right-click the library, and select **Modify**.
2. Click the **Drive Selection** tab.
3. Open the NVBU Server or SmartClient node to which the device is connected.
4. Open the appropriate drive type to display the available drives.

Note: When selecting the drives to be shared, be sure to match the drives with the appropriate bay (data transfer element address). To obtain the proper bay number for each device, refer to the relevant *Library Operations or User's Guide*.

5. Right-click the drive to be shared, and select **Add Shared**.
6. Increase or change the bay number.
7. Repeat Step 5 – 6 for each drive that will be shared.
8. Click **Save Details** on the toolbar. The library is added and listed on the **Devices** tab. When the library initialization completes, the status changes to online.

4.10.5 Sharing Standalone Drives

To add standalone drives as shared, perform the following steps:

1. On the **Add** menu, click **Add Standalone Drive** to open the **Add Standalone Drive** window.
2. Under **Choose Drives** on the **Drive Selection** tab, open the NVBU Server or SmartClient node to which the device is connected (double-click the node, or right-click it and select **Open**).
3. Open the corresponding drive type node to display the available drives.
4. Right-click the drive and select **Add Shared**. The drive picture, type and details are displayed under **Selected Drives**.
5. To configure the drive parameters, refer to [Configuring Physical Tape Drives on page 65](#).
6. Click **Save Details** on the toolbar. The drive is added and listed on the **Devices** tab. When the drive initialization completes, the status changes to online.

4.11.0 Using Mixed Media Libraries

This section provides detailed information on adding and configuring mixed media libraries.

4.11.1 Organizing Media in a Mixed Media Library

Before adding a mixed media library, you must organize the media within so that like-types are grouped together in ranges of slots in the library. For example, for two media types, group each type together and then place each group in a consistent range of slots. Note the slot locations for each type. This information will be required when configuring the library.

4.11.2 Adding and Configuring a Mixed Media Library

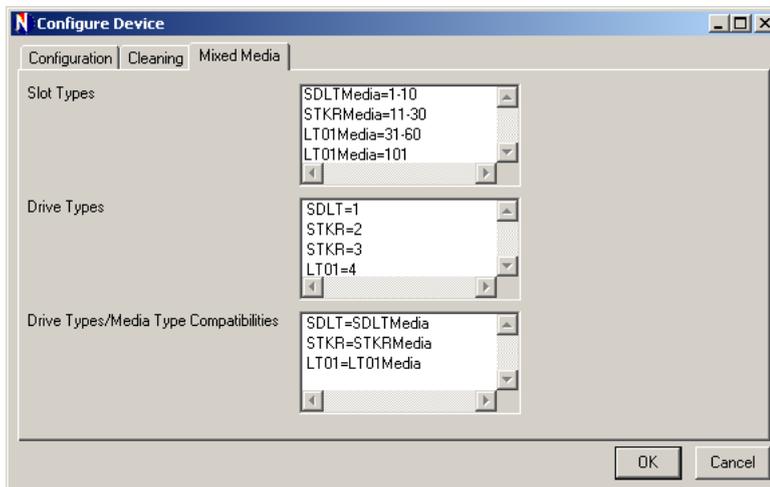
To add a mixed media library, perform the following steps:

1. Click **Device Management** on the toolbar or **Large Buttons** panel to open the **Device Management** window. Alternatively, on the **Administration** menu, click **Device Management**.
2. On the **Add** menu, click **Add Library** to open the **Add Library** window.
3. Under **Choose Library** on the **Library Selection** tab, open the Server/Client node to which the device is connected (double-click the node, or right-click it and select **Open**).
4. Depending on the library type, open the **Robotic Libraries** or **NDMP Robotic Libraries** node. The attached libraries are listed under their type.
5. Double-click the library or right-click and choose **Select**. The library picture, type and details are displayed under **Selected Library**.
6. Click the **Drive Selection** tab.
7. Open the Server or Client node to which the device is connected.
8. Open the corresponding drive type node. The available drives are listed under this node.
9. Perform the following steps to assign the correct drive bay to each drive:
 - a. Enter 1 in the **Select for Drive Bay** box.
 - b. Under **Choose Drives**, double-click drive 1 or right-click it and choose **Select**. The drive picture, type and details are displayed under **Selected Drives**.
 - c. Repeat steps a and b for the remaining drives, changing the drive number and bay for each drive.

Note: While the drive number usually matches the bay number, depending on the library and drive configuration a different assignment of drives to bays might be necessary. If you experience failure during move or load/unload operations, consider adding your drives in a different order to their bays.

10. Click the **Configure** tab, and double-click the target library in the device list.
11. In the **Configure Device** window, click the **Mixed Media** tab. Configure the following parameters:

Figure 4-26:
Mixed Media
tab



- **Slot Types** – The **Slot Types** list specifies the slot range(s) for each media type. The slot range(s) for each media type would be determined by how the media was organized in the library during initial setup (for details, refer to [Administering Physical Tape Libraries on page 84](#)). 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 this list is given below:

```
<SlotTypeIdentifier>=<SlotRange>
```

More than one slot range can be configured for a media type. However, each slot range or individual slot must be configured as 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*, ensure that it allows you to easily identify the media type contained in the slot. No spaces are allowed in the values. Some examples are given below:

```
SDLTMedia=1-10
```

```
STKRMedia=11-30
```

```
LT01Media=31-60
```

```
LTO1Media=101
```

- **Drive Types** – The **Drive Types** list 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 given below:

```
<DriveTypeIdentifier>=<DriveNumber>
```

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*, ensure that it allows you to easily identify the drive type. No spaces are allowed in the values. Some examples are given below:

```
SDLT=1
```

```
STKR=2
```

```
STKR=3
```

```
LTO1=4
```

- **Drive Types/Media Type Compatibilities** – This list specifies the supported media type for each drive type. The format for creating this list is given below:

```
<DriveTypeIdentifier>=<SlotTypeIdentifier>
```

Some examples using the above *Drive Type* and *Slot Type Identifiers* are given below:

```
SDLT=SDLTMedia
```

```
STKR=STKRMedia
```

```
LTO1=LTO1Media
```

This configuration ensures that media is only obtained from the corresponding slots when a particular type of drive is accessed.

12. Click **Save Details** on the toolbar. The library is added and listed on the **Devices** tab. When the library initialization and inventory completes, the status changes to online.

4.11.3 Adding Media to a Library with Entry/Exit Ports

To add media to a library that has an entry/exit port, perform the following steps:

1. Open the **Device Management** window.
2. On the **Devices** tab right-click the target library, and select **Open Entry/Exit Port**.
3. Insert the media in the EE port.
4. On the **Devices** tab right-click the target library, and select **Close Entry/Exit Port**.

5. A **Close Entry/Exit Port** window will appear. In the **Media Type** list, select the correct media type for the new media and click **OK**.
NVBU will automatically import the media and place it in a pre-configured slot of the same type.
6. Repeat steps 2–5 for each additional media.

Note: Ensure that the media type for the new media is assigned correctly. An incorrect media type association would result in future job failures. In addition, the library may be physically damaged as the arm changer attempts to place a wrong media into a drive.

4.11.4 Adding Media to a Library without Entry/Exit Ports

To add media to a library that has an entry/exit port, perform the following steps:

1. Open the **Device Management** window.
2. On the **Devices** tab right-click the target library, and select **Open Door**.
3. Place the media in an empty slot corresponding to the slot range assigned for the media type.
4. Repeat step 3 for each additional media.
5. On the **Devices** tab right-click the target library, and select **Open Door**.

Note: Ensure that the media is inserted into a slot that corresponds to the slot range configured for the given media type. Inserting the media into an incorrect slot would result in future job failures. In addition, the library may be physically damaged as the arm changer attempts to place a wrong media into a drive.

4.12.0 Administering Physical Tape Libraries

This section provides information on managing physical and virtual disk devices added to the NVBU Server. The information in this section is organized into the following topics:

- [Viewing Device Details](#)
- [Modifying a Library](#)
- [Changing the Device View](#)
- [Opening and Closing a Library Door](#)
- [Opening and Closing Entry/Exit Ports](#)
- [Checking an Offline Drive](#)
- [Taking a Drive Offline in NVBU](#)
- [Loading and Unloading Media](#)
- [Exporting Media to Entry/Exit Port](#)

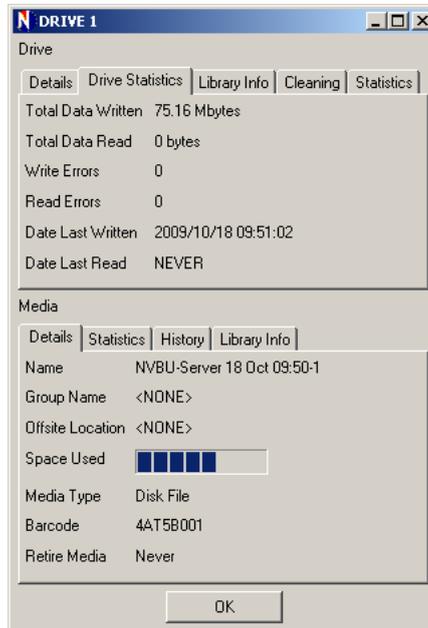
- [Restarting ACSLS or NDMP Libraries](#)

4.12.1 Viewing Device Details

To view the status and performance statistics for a device, perform the following steps:

1. On the **Devices** tab right-click the target library, drive or slot, and select **Status**.
2. The status window is organized as follows:
 - **Library Details** – The status window for a library contains the following tab:
 - ❖ **Details** – This tab displays the device name, the controlling machine name and the current status of the library.
 - **Drive Status Window** – The status window for a drive is divided into two parts – **Drive** and **Media**:
Drive

Figure 4-27:
Drive Statistics
tab



- ❖ **Details** – This tab displays the drive and media status
- ❖ **Drive Statistics** – Click this tab to view the amount of data read and written, the number of read/write errors, and the dates on which the last read and write operations were performed.

- ❖ **Library Info** – Click this tab to view the physical and logical position of the drive.
- ❖ **Cleaning** – Click this tab to view the drive cleaning statistics.
- ❖ **Statistics** – Click this tab to view the drive statistics.

Media

- ❖ **Details** – This tab displays the barcode, label, group label, media type and other details.
 - ❖ **Statistics** – Click this tab to view the amount of space used and left, total number of segments, and the dates on which the last read and write operations were performed.
 - ❖ **History** – Click this tab to view the reuse details, the amount of data read and written, and the number of read/write errors.
 - ❖ **Library Info** – Click this tab to view the slot number and the library name.
- **Slot Status Window** – The status window for a slot is divided into two parts – **Slot** and **Media**:

Slot

- ❖ **Library Info** – The **Library Info** tab under Slot displays the physical and logical position of the slot.

Media – It is similar to the Media section for the drives as detailed above.

3. Click **OK** to exit.

4.12.2 Modifying a Library

To modify the library configuration, perform the following steps:

1. On the **Devices** tab right-click the library, and select **Modify**.
2. The **Modify Library** window that appears is similar to the **Add Library** window. To change the settings, refer to [Adding the Libraries Manually on page 60](#).
3. To save the new settings, click **Save Details** on the toolbar, or on **File** menu click **Save**.

4.12.3 Changing the Device View

NVBU provides two ways to view the added devices:

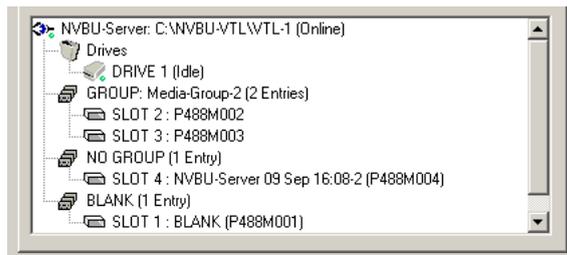
- **Physical View** – This is the default view. It displays the actual structure of the library, including all drives, slots and entry/exit ports. Media is shown at its current location in the library.

Figure 4-28:
Physical View



- **Logical View** – This view is centered around the actual media in a library. The device tree contains two folders – **Drives** and **Media**. The libraries and drives are grouped as Drives and the Media are grouped according to the Group Label.

Figure 4-29:
Logical View



To change the view type, perform the following steps:

1. On the **Devices** tab right-click the target library, and select **Change View**.
2. The view changes from Physical to Logical or vice versa and a message is displayed.
3. Click **OK** to close the dialog.

4.12.4 Opening and Closing a Library Door

Before opening the library door, you must issue the **Open Door** command from the **NVBU Device Management** window. NVBU attempts to put a software lock on the library door which prevents anyone from opening the door without issuing the **Open Door** command. Moreover, if you do not issue this command, then NVBU will not know when tapes are added, removed or rearranged, and may attempt to load non-existent media. To open a library door from the NVBU Console, perform the following steps:

1. On the **Devices** tab right-click the library, and select **Open Door**. The library goes offline when you open the door
2. To bring it back online, right-click, and select **Door Closed**.

4.12.5 Opening and Closing Entry/Exit Ports

To open or close the entry/exit ports, perform the following steps:

1. On the **Devices** tab right-click the library, and select **Open Entry/Exit**.
2. To close the port after placing the media, select **Entry/Exit Closed**. If you have placed a cleaning media in the port, select **Entry/Exit Closed with Cleaning Media**. NVBU moves the media to a cleaning slot in the library.

4.12.6 Checking an Offline Drive

To check an offline drive on which a piece of media is loaded, perform the following steps:

1. On the **Devices** tab right-click the drive, and select **Check** to run a self-test.
2. The status changes to online if a piece of media is found during the self-test.

4.12.7 Taking a Drive Offline in NVBU

To take a drive offline and make it unavailable to NVBU, perform the following steps:

1. On the **Devices** tab right-click the drive, and select **Offline**. This marks the drive as offline and it is not available for use with NVBU. For shared drives, you can either mark an individual drive or all paths as offline.
This process does not physically take the drives offline.
2. To bring a drive online and make it available to NVBU, right-click the drive and select **Online**.

Note: A standalone physical drive cannot be brought online if the device contains a piece of media. You must either restart the NVBU Service, or remove the media before selecting the **Online** option.

4.12.8 Loading and Unloading Media

To load and unload media, perform the following steps:

1. On the **Devices** tab right-click the slot, and select **Load**.
2. This loads the media on to an available drive.
3. To unload a piece of media, right-click the drive and select **Unload**. In a library the media is moved to an available slot, while in a standalone drive the media is ejected.

4.12.9 Exporting Media to Entry/Exit Port

To export a piece of media to an entry/exit port, perform the following steps:

1. On the **Devices** tab right-click the slot, and select **Export**.
2. This moves the media in the slot to an entry/exit port.

4.12.10 Restarting ACSLS or NDMP Libraries

If an ACSLS or an NDMP library encounters a network problem, use this procedure to restart the library. It stops and restarts the changer and drive processes. This has the effect of restarting the network/socket connections as the existing ones are closed and new ones are created.

1. On the **Devices** tab right-click the library, and select **Restart**.
2. This restarts the network/socket connections by removing and adding the library again.

4.13.0 Importing NetApp VTL's Shadow Tape

NVBU extends support to NetApp VTL's shadow tape feature which 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** on the filer and on the library containing the virtual tape. For more information on enabling shadow tapes, consult the relevant NetApp VTL documentation. Use the tape barcode as the label for the virtual tape media. NVBU requires this method of labelling media to be fully functional. (This can be configured by selecting the **Use Barcodes as Labels** check box on the **Media Manager** tab of the Configurator.)

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 is not listed as part of a virtual library. However, it is available for quick access if the physical tape is later imported, and is available for reading if the physical tape is stored offsite or otherwise unavailable.

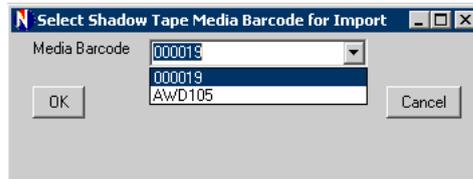
The NetApp VTL manages the space used by shadow tapes, and can delete a shadow tape if more space is required for new backup data. The administrator can set a preferred retention time for shadow tapes; if space is required, but the retention period has not expired, the NetApp VTL sends a notification before deleting the shadow tape.

To import a virtual tape, perform the following steps:

1. On the **Devices** tab, right-click the library containing the virtual tape and select **Import Media**. The **Select Shadow Tape Media Barcode for Import**

window appears, which provides a list of media barcodes for the tapes available in the shadow tape pool.

Figure 4-30:
Select Shadow
Tape Media
Barcode for
Import window



2. In the **Media Barcode** list, select the barcode for the target media. Alternatively, enter the barcode.
3. Click **OK**. The requested tape is imported into the medium changer from the shadow tape pool, if present, or from the physical library. If both the shadow tape and the physical tape are present, then the shadow tape is converted to a (read only) virtual tape and imported to the EE port. If only the physical tape is available, a virtual tape is created from the physical tape and the virtual tape is imported to the EE port.

Note the following:

- The media requests for shadow tapes can only be used for **Restore** or **Duplication** tasks because the shadow tape is converted to a virtual tape with the read-only attribute set.
- All shadow media must be exported from a library before NVBU is shutdown and restarted; otherwise the media loses its shadow media attribute and is only recognized as read-only. This happens because the NVDB does not hold a permanent record of the shadow tape media. The database holds only the details of the actual media. The shadow tape attribute is associated with the media when it is imported as shadow tape into the library. For the same reason, shadow tape media should be exported before the library door is opened.
- Error messages are displayed if you try to import media when no media is available in the shadow tape pool, or when the shadow tapes feature is not supported on the device.

4.14.0 Removing a Physical Tape Library

To remove a library, perform the following steps:

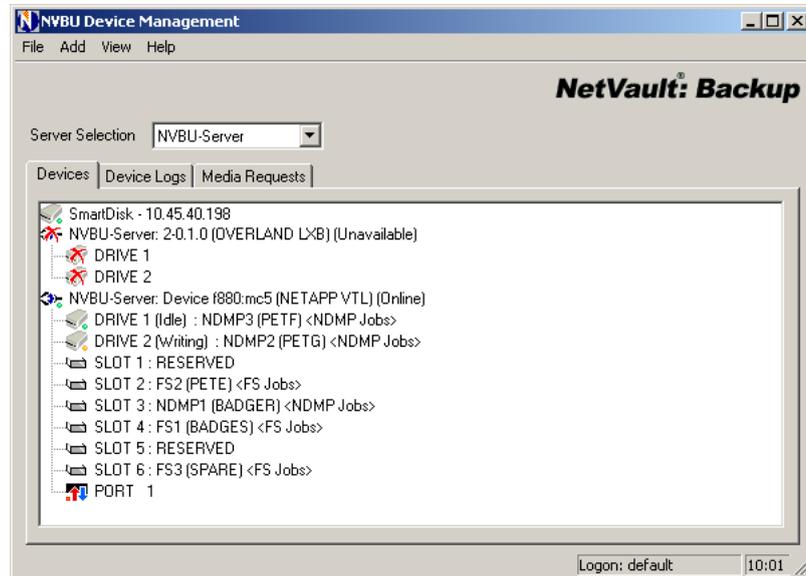
1. On the **Devices** tab right-click the library, and select **Remove**.
2. In the confirmation window, click **OK**. NVBU removes the library and deletes all the related data from the NVDB.

Note: Removing a library does not remove the media information from the NVDB. You can still use the media on any other library that supports the given media type. No scanning of media is required as long as the Controlling Server remains the same. On a different NVBU Domain, you must scan the media.

4.15.0 Device Status Indicators

The devices added to the NVBU Server are displayed on the **Devices** tab of the **NVBU Device Management** window. NVBU uses the following status indicators to indicate the availability of the devices:

Figure 4-31:
Devices tab



- **Green Light** – This icon indicates that the device is online and available for use.
- **Yellow Light** – This icon indicates that a backup or restore job is currently using this device.
- **Red Light** – This icon indicates that the device is currently offline. NVBU can detect the device but it cannot be accessed for backup or restore jobs.

- **Red Cross** – This icon indicates that the device is unavailable (e.g., the SCSI cable is disconnected, the device is removed, etc.). NVBU cannot detect the device.

For a consolidated view of Client, Device and Job status, click **Status** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Status**.

Chapter 5:

BACKUP

This chapter describes how to use NVBU to backup your data. The information in this chapter is organized into the following topics:

- Backup – An Overview
- Designing a Backup and Recovery Strategy
- Backing up Data with NVBU Plugins
- Creating a Backup Job
- Configuring Target Device and Media Options
 - ❖ Selecting Target Device
 - ❖ Configuring Backup Media Options
- Configuring Advanced Backup Options
 - ❖ Configuring the Retention Policy for a Backup
 - ❖ Enabling Job-level Encryption
 - ❖ Disabling Job-level Deduplication
 - ❖ Enabling Backup Verification
 - ❖ Enabling Network Compression
 - ❖ Creating Secondary Copies
 - ❖ Using Pre and Post Backup Scripts
 - ❖ Setting up a User-Defined Notification Event
- Viewing and Modifying a Backup Job
- Archiving Data
- Managing Backup Indexes
 - ❖ Deleting Online Indexes
 - ❖ Compressing Online Indexes

5.1.0 Backup – An Overview

A backup is a copy of data which can be used to restore and recover the original data object after a data loss event. NVBU provides a number of plugins which interface with the native APIs to backup the application-specific data. The backup methods and options provided by these plugins vary depending on the application type.

5.2.0 Designing 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 requires a well-designed backup and restore strategy that maximizes data protection and minimizes data loss, while considering your business requirements and balancing your needs with costs, resources and other factors.

The key to formulating an efficient strategy is to envision the possible failure modes, like media failure, data corruption, user error or complete loss of a data centre, match the plugin features that can be used to recover from these scenarios and then include the necessary backup methods in your plan.

Typically, your backup plan should include the backup methods you will use, the frequency of backups, the retention period for backups and the media rotation policies, and how you will store the backup media. Answering the following questions will help you choose the suitable methods and define the schedule.

- What is the amount of data to be backed up?
- Does it comprise mainly of large files or smaller ones?
- What is the frequency of updates and changes?
- Which time during the day and/or week can be considered off-peak period for full backups?
- Are some files updated more frequently than others?
- Are the changes confined to a small or large number of files?
- Are there situations that demand ad-hoc backups independent of the regular backup schedule?
- How much space is available for storing backups and what are the future expansion plans?

5.3.0 Backing up Data with NVBU Plugins

Backups are performed from the **NVBU Backup** window. You can use the Console running on the NVBU Server or any Client to define and submit the backup jobs. A backup job definition generally consists of the following components:

- Selection list
- Plugin specific backup options
- Job schedule
- Source device options which specify where the source media is located (Data Copy Plugin and Consolidate Incremental Backups Plugin)
- Target device and media options
- Advanced backup options

Each component contains a set of attributes which can be configured using the following methods:

- For each new job, you can set the attributes manually and save them in the job definition. This method is better suited for ad-hoc jobs that are seldom performed, or jobs that mainly use the default options.
- Alternatively, you can use selection sets to store the job attributes and use them to define the subsequent jobs without manually defining each job. This method is recommended for repeating jobs. With selection sets, you can easily change any one component and automatically apply them to all jobs using that set. For example, you can change the target device for all jobs by changing the device configuration in the Target set. For details on selection sets, refer to [Selection Sets on page 127](#).

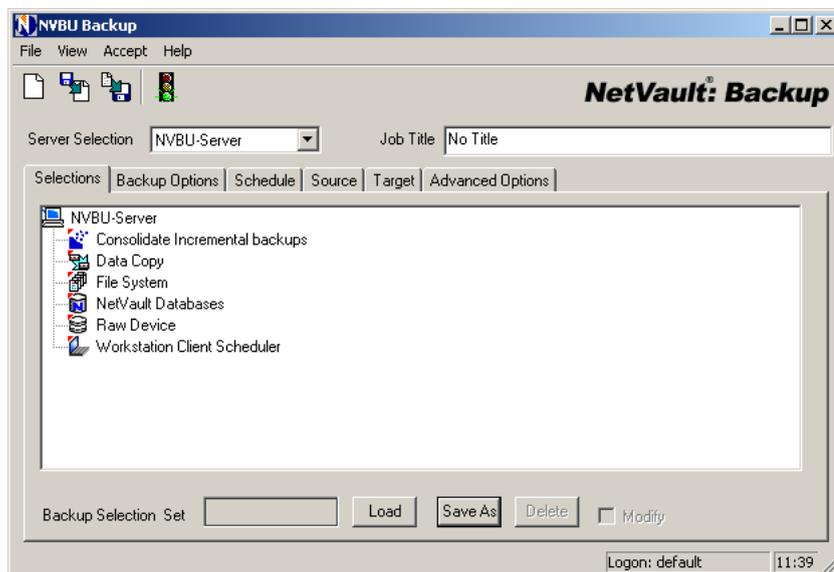
Each job has a Job ID and a title. The Job ID is a sequential number which is auto-generated. The job title is user-defined and allows you to easily identify the job when monitoring its progress, viewing the job logs or selecting the saveset to restore data. The backup data is stored in a **Saveset** on the media. For each saveset, NVBU generates an index that is written to the NVDB and the backup media. The index contains the header information which is required for restoring data. The maximum index size for a saveset can be 4GB.

5.4.0 Creating a Backup Job

To create a backup job, perform the following steps:

1. Click **Backup** on the toolbar or **Large Buttons** panel to open the **NVBU Backup** window. Alternatively, on the **Operations** menu, click **Backup**.

Figure 5-1:
NVBU Backup
window



2. On the **Selections** tab, open the target Client node. To open any node on the **Selections** tab, you can do either of the following:
 - Double-click the node
 - Right-click the node and select **Open**
3. Select the plugin you want to use.
4. Select the data you want to backup. The selection tree varies for different plugins. Refer to the relevant APM/Plugin User's Guide for more information on selecting data for a backup.
5. Click the **Backup Options** tab and configure the backup method, backup type and other plugin-specific backup options. Refer to the relevant APM/Plugin User's Guide for more information on specific backup options.
6. Click the **Schedule** tab and configure the scheduling options. You can define a daily, weekly, monthly or any other custom schedule. For details, refer to [Job Scheduling on page 113](#). You can omit this step if you want to run the job immediately, which is the default schedule for all NVBU jobs.
7. Click the **Target** tab and configure the backup device and media options. For details, refer to [Configuring Target Device and Media Options on page 97](#).

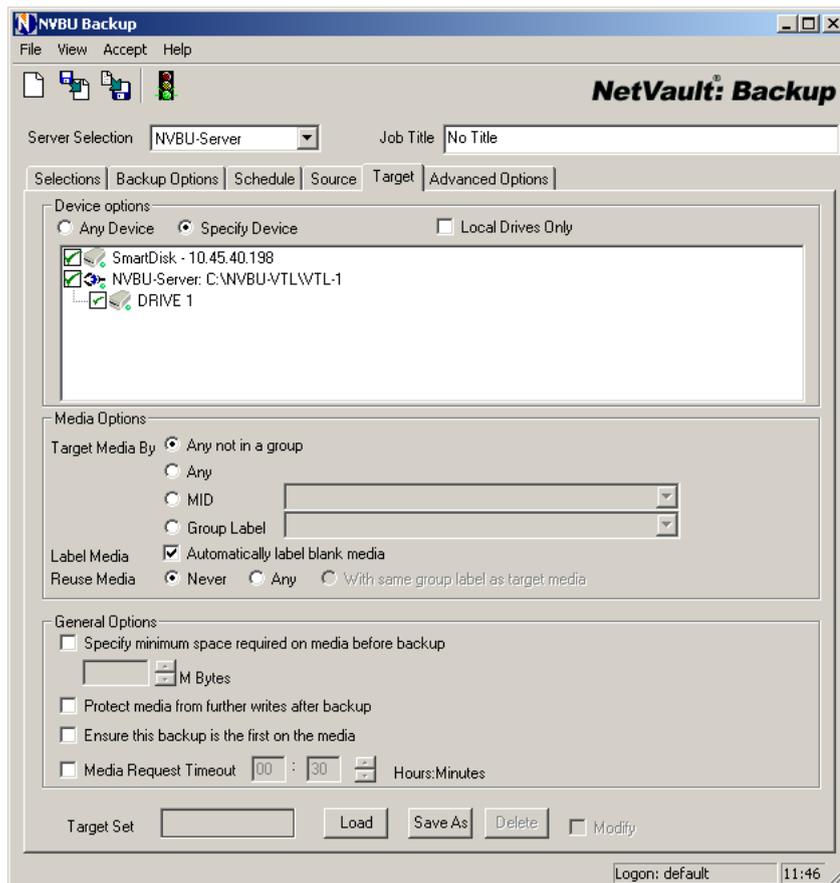
8. Click the **Advanced Options** tab and configure the advanced backup options, such as the backup retention period, deduplication, job-level encryption and secondary copy options. For details, refer to [Configuring Advanced Backup Options on page 100](#). You can omit this step if you do not want to set any advanced options for the job.
9. Enter a title for the job in the **Job Title** box at the top right corner of the **Backup** window.
10. Choose one of the following methods to save and/or schedule the job.
 - a. **Save the Definition without Scheduling the Job** – To save the job definition without scheduling it, click **Save** on the toolbar. Alternatively, on the **File** menu, click **Save**.

A saved job does not appear on the **Status** tab of the **Jobs** window and does not run unless you submit it (or use the **Triggered** scheduling option). You can load a saved job again in the **Backup** window, or open it for editing from the **Jobs** tab of the **Jobs** window. For details on editing a job definition, refer to [Viewing and Modifying a Backup Job on page 109](#).
 - b. **Schedule the Job** – To submit the job for scheduling click **Submit** on the toolbar. Alternatively, on the **Accept** menu, click **Submit Backup**.

5.5.0 Configuring Target Device and Media Options

This section describes how to configure the target device and media options for a backup job. The information in this section is organized into the following topics:

- [Selecting Target Device](#)
- [Configuring Backup Media Options](#)

Figure 5-2:
Target tab

5.5.1 Selecting Target Device

By default, NVBU uses any available device to perform backups. To override this setting, perform the following steps:

1. In the **NVBU Backup** window, click the **Target** tab.
2. To select the target device configure the following options under **Device Options**:

Important: An NVSD Device is considered a network-attached device or a non-local device.

- **Local Drives Only** – Select this check box to use only locally attached devices.
- **Any Device** – Leave this option selected if you want NVBU to handle the device selection.

- **Specify Device** – Select this option to use particular device(s). In the box below, all the devices added to the NVBU Server are listed. Since NVBU is configured to automatically select a backup device, all the devices in the list are selected by default. To exclude devices, perform the following:
 - ❖ To exclude a particular library, clear the check box for it. All the drives associated with the device are automatically removed when you remove the library.
 - ❖ To exclude a particular drive, clear the check box for it.
 - ❖ To exclude a particular NVSD Device, clear the check box for it.

5.5.2 Configuring Backup Media Options

To configure the backup media options, perform the following steps:

Note: The backups targeted to NVSD Devices are stream-oriented. For such jobs, you can configure the **Group Label** option in order to target an NVSD Device that belongs to the selected media group without specifying a particular device. The remaining Media Options described in this section do not apply to an NVSD Device, and are ignored for jobs targeting an NVSD Device.

1. In the **NVBU Backup** window, click the **Target** tab.
2. To select the target media, configure the following options under **Media Options**:
 - **Any Not in a Group** – Select this option to use media that are not associated with any group. This is the default media setting for a backup job.
 - **Any** – Select this option to use any media regardless of its group.
 - **MID** – Select this option to use a particular media. Then, select the media label in the list next to the option.
 - **Group Label** – Select this option to use media associated with a particular media group. Then, select the group label in the list next to the option.
3. To re-use media, select one of the following media re-use options:
 - **Any** – Select this option to target any media marked as re-usable.
 - **With Same Group Label as Target Media** – Select this option to target media associated with the group selected in the previous step.

Important: NVBU automatically marks media for re-use when the last saveset on the media expires. You can also manually mark media as re-usable. For details on manually marking media as re-usable, refer to [Marking Media for Re-use on page 163](#).

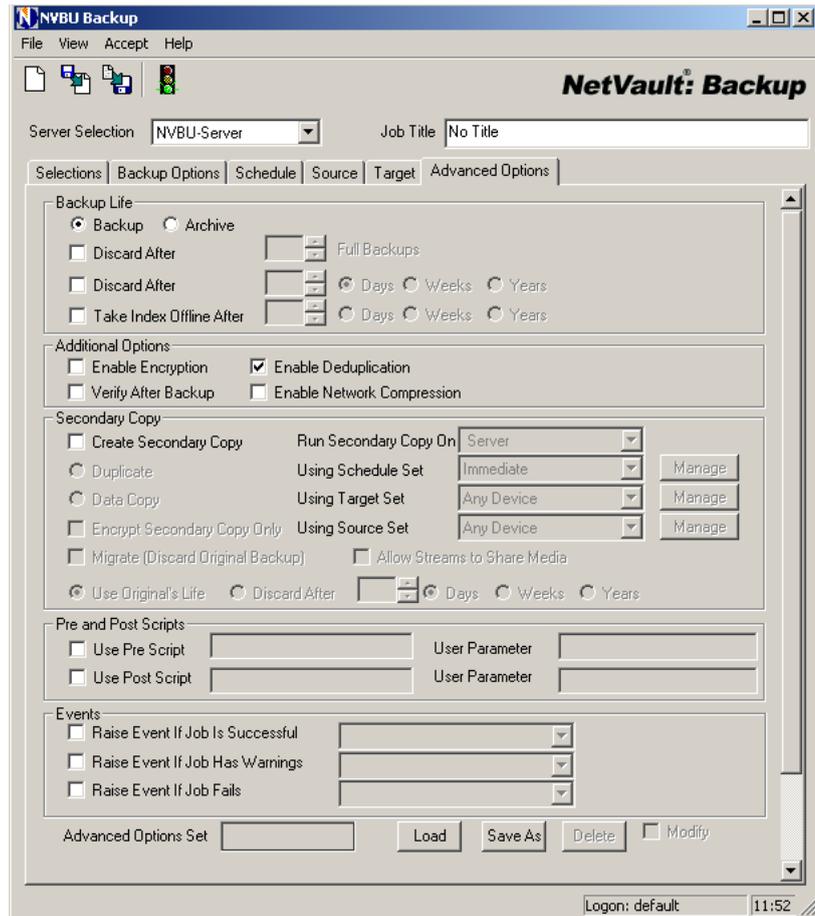
4. To label a blank media, select **Automatically Label Blank Media** under **Media Options**. The media label is generated by combining the NVBU Server Name and Date. You can also configure NVBU to generate labels using the media barcodes. To assign the media barcodes as labels, refer to the *NetVault: Backup Configuration Guide*.
5. If you want to use only those media which have at least <n> MB of free space available before backup, select **Specify Minimum Space Required on Media Before Backup** under **General Options**. In the **M Bytes** box, enter or select the minimum free space required on the media.
6. To write-protect the media after backup, select **Protect Media from Further Writes After Backup** under **General Options**. To do this anytime later, refer to [Write-protecting Media on page 161](#).
7. To store the saveset at the start for a tape, select **Ensure this Backup is the First on the Media** under **General Options**. The data can be restored quickly if the saveset is located at the start of a physical tape. The saveset is only written to new or blank media if you select this check box.
8. To set a timeout interval for the availability of a suitable backup media, select the **Media Request Timeout** check box under **General Options**. In the boxes next to this option, enter the timeout interval. The job is aborted if the backup tapes are not available within the specified interval. If you set this parameter to zero, the job will wait indefinitely for the media.

5.6.0 Configuring Advanced Backup Options

This sections describes how to configure the advanced options for a backup job. The information in this section is organized into the following topics:

- [Configuring the Retention Policy for a Backup](#)
- [Enabling Job-level Encryption](#)
- [Disabling Job-level Deduplication](#)
- [Enabling Backup Verification](#)
- [Enabling Network Compression](#)
- [Creating Secondary Copies](#)
- [Using Pre and Post Backup Scripts](#)
- [Setting up a User-Defined Notification Event](#)

Figure 5-3:
Advanced
Options tab



5.6.1 Configuring the Retention Policy for a Backup

The retention policy for a backup defines how long the information about the saveset is kept in the NVDB. The retention policy can be generation-based or time-based.

- **Generation-based Backup Retention** – In a generation-based retention policy, you specify the number of Full Backups for the same set of data you want to retain. This method can only be used for Full Backup type.
- **Time-based Backup Retention** – In a time-based retention policy, you specify the number of days, months or years you want to retain a backup. The time-based retention policy can be set for all backup types – Full, Incremental and Differential.

When the retention period elapses, NVBU retires the saveset and deletes information about the saveset from the NVDB. The information about the savesets for Incremental/Differential backups is automatically discarded when the base Full Backup retires.

To configure the retention period for a saveset, perform the following steps:

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. To set generation-based retention period, perform the following:
 - a. Under **Backup Life**, select **Discard After (x Full Backups)**.
 - b. In the box, enter the retention period in number of Full Backups to keep this saveset. For example, to retain four (4) Full Backups on an NVSD Device, enter 4.
3. To set time-based retention period, perform the following:
 - a. Under **Backup Life**, select **Discard After (x Days/Weeks/Years)**.
 - b. In the box, enter the retention period in number of days, weeks or years.
 - c. Select **Days**, **Weeks** or **Years** option next to the box.

Note: To set or change the retention period for an existing saveset, refer to [Retiring Backup Savesets on page 162](#).

5.6.2 Enabling Job-level Encryption

The NetVault: Backup Encryption Plugin (Encryption Plugin) provides CAST-128, AES-256 and CAST-256 algorithms to meet regulatory requirements without sacrificing backup windows or deduplication performance. When installed on the NVBU Server or Heterogeneous Clients, the Encryption Plugin encrypts and transfers data across the network to the backup device, where it remains encrypted until restored to the NVBU Server or the Heterogeneous Client.

Once the Encryption Plugin is installed, you can enable encryption for all backups for the NVBU Server or Heterogeneous Clients where the plugin is installed. Alternatively, you can enable encryption only for specific jobs. Encryption can also be enabled only for the primary backup or just the secondary backups. This enables users to take advantage of both encryption and deduplication by deduplicating the primary backup and encrypting the secondary copy. For details on creating secondary copies, refer to [Creating Secondary Copies on page 105](#).

Job-level encryption for primary backups is beneficial in the following situations:

- Not all the NVBU Plugins installed on the NVBU Server or Heterogeneous Client are compatible with the Encryption Plugin
- Not all backups from the same NVBU Server or Heterogeneous Client require encryption

- Primary backups do not require encryption while secondary backups for offsite protection do require encryption
- Primary backups are targeted to NVSD Devices for deduplication

For details on defining an encryption strategy, installing and configuring the Encryption Plugin, refer to the *NetVault: Backup Encryption Plugin Guide*.

To enable encryption for a primary backup, perform the following steps:

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. Under **Additional Options**, select the **Enable Encryption** check box.

Important: To ensure that a primary backup selected for encryption is not deduplicated when targeted to NVSD Devices with the Deduplication Option, the **Enable Deduplication** option will automatically be disabled when the **Enable Encryption** option is selected. You can enable encryption for secondary copies that are stored offsite for disaster recovery. For details, refer to [Creating Secondary Copies on page 105](#).

5.6.3 Disabling Job-level Deduplication

NVBU provides seamless integration with NVSD, BakBone's next generation disk-based backup and deduplication product. While NetVault: Backup provides seamless integration with NVSD to provide disk-based backup and optional deduplication, NVSD is a separate product which is installed and licensed separately from NVBU. Job-Level Deduplication is enabled by default and must be disabled for the following backup jobs:

- Encrypted primary backups targeting NVSD Devices with the Deduplication Option licensed. Encrypted backups do not deduplicate well and should not be deduplicated.
- Incremental Backups that will be consolidated with the Consolidated Incremental Backup Plugin to NVSD. This will eliminate unnecessary overhead of rehydrating the deduplicated Incremental Backups during the consolidation process but still enable the resulting Consolidated Full backup to be deduplicated.

To disable deduplication for a backup job, perform the following steps:

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. Under **Additional Options**, click to clear the check box for **Enable Deduplication**.

5.6.4 Enabling Backup Verification

NVBU includes a built-in Verify Plugin, which can be enabled to check the correctness and completeness of a backup at the end of data transfer. It verifies the stream length written to the media and makes sure that no blocks were dropped during backup. The actual backup runs as phase 1, while backup verification runs as phase 2 of the backup job. By default, the verification phase runs on the NVBU Server. To run the verification phase locally or to configure another default Client, refer to the *NetVault: Backup Configuration Guide*. An error is logged if any dropped blocks are detected and the verification fails. You must run the job again if the backup verification fails. To enable backup verification for a job, perform the following steps.

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. Under **Additional Options**, select the **Verify After Backup** check box.

Note: Backup verification does not verify the integrity of the data; only that the backup was actually written to the media.

5.6.5 Enabling Network Compression

While transferring data over the network, you can compress the data to reduce the bandwidth usage. The data is first compressed on the target NVBU Client before it is transferred over the network. On the NVBU Client to which the target device is attached, the data is decompressed before it is written to the media. Note that network compression does not work for the following types of jobs:

- Backups targeted to NVSD Devices.
- Backups to devices attached to NAS Filers.
- Jobs using the NDMP Plugin, NetWare Thin Client Plugin or NetVault: Backup Bare Metal Recovery.

To enable network compression for the supported backup jobs, perform the following steps:

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. Under **Additional Options**, select the **Enable Network Compression** check box.

5.6.6 Creating Secondary Copies

With a backup job, you can choose to run a phase 2 job to create a secondary copy of the backup. NVBU supports the following methods for creating secondary copies:

- **Duplicate** – This method creates an exact secondary copy which is linked to the original primary backup. During duplication, the copy is broken into segments and stored on the secondary backup device. During restore, segments from the primary copy and the secondary copy are interchangeable. This makes it impossible to unencrypt the primary backup and encrypt the secondary copy because it is not possible to mix unencrypted segments with encrypted segments during restore. Therefore, you cannot enable or disable encryption for a secondary copy created with the duplicate method.

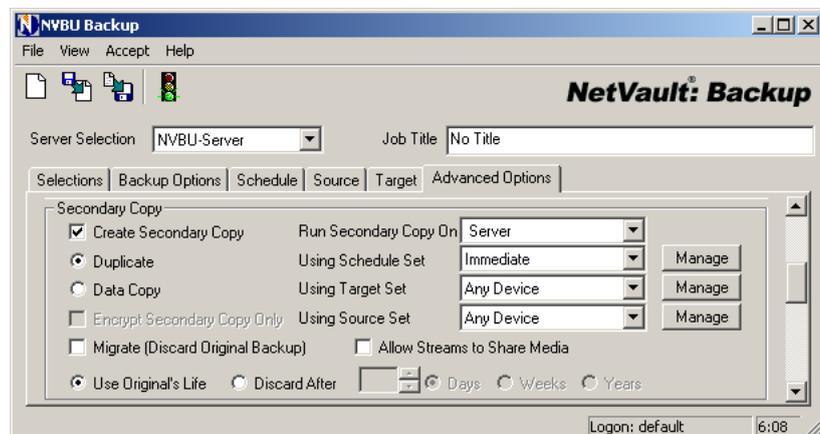
If the original saveset is encrypted, the Duplicate method will create an encrypted secondary copy. If you have not encryption for the primary backup, the secondary copy will also be unencrypted.

- **Data Copy** – This method is recommended when you want to create a secondary copy for offsite storage. The Data Copy method breaks the backup into segments and copies the segments onto the targeted backup device. During restore, NVBU only restores the primary copy or the secondary copy. Backup segments from the primary and the secondary are not interchangeable. This enables the ability to encrypt the Data Copy, or secondary copy, while the primary copy remains unencrypted such as with deduplicated primary backups.

To create a secondary copy of a backup, perform the following steps:

1. In the **Backup** window, click the **Advanced Options** tab.
2. Under **Secondary Copy**, select the **Create Secondary Copy** check box.

Figure 5-4:
Secondary
Copy options
on Advanced
Options tab



3. Select one of the following copy methods:
 - **Duplicate** – This method can be used for any backup type.
 - **Data Copy** – This method can only be used for Full Backups.
4. By default, the secondary job always runs on the NVBU Server. To run the job on a particular NVBU Client, select the Client in the **Run Secondary Copy On** list. This option can be used to perform local backups to SmartClient with a locally attached physical or virtual tape device.

Important: Ensure that the NVBU Server or Client selected to run the Secondary Copy is running NVBU v8.5 or later.

5. In the **Using Schedule Set** list, select the set that defines the scheduling options for the secondary job. Select **Immediate** if you want to run the instance immediately after the original job completes. You cannot use the **Repeating** or **Triggered** schedule types for the secondary job. If a schedule set is not available, click **Manage**. Configure the scheduling options on the **NVBU Schedule Management** window and click **Save As** to create the schedule set. For details on schedule sets, refer to [Selection Sets on page 127](#).
6. In the **Using Target Set** list, select the set that defines the target device and media options for the secondary copy. The original saveset and the copy cannot be stored in the same media. If a target set is not available, click **Manage**. Select the scheduling options in the **NVBU Backup Target Management** window and click **Save As** to create the schedule set. For details on target sets, refer to [Selection Sets on page 127](#).

Note: BakBone recommends that you designate specific drives for secondary jobs to prevent deadlocks. For example, if you have a library with 4 drives, you can select drives 1 and 2 for actual backups, whereas drives 3 and 4 for secondary copies targeted to tape devices.

7. To encrypt a secondary copy, select the **Encrypt Secondary Copy Only** check box. This option is only available for the **Data Copy** method. If the primary copy is encrypted, Data Copy will automatically create an encrypted saveset whether the **Encrypt Secondary Copy Only** check box is selected or not. Therefore, this option is only useful when you want to create an encrypted secondary copy of an unencrypted primary copy.

Important: Encrypted primary copies will not be encrypted again if the **Encrypt Secondary Copy Only** check box is selected for a copy. For restoring data from such secondary copies, you must use the primary copy's Encryption Key.

8. To migrate data, select the **Migrate** check box. After migrating the data, NVBU deletes the index for the original backup.

Note: With the File System Plugin, the **Migrate** option is only supported for Full Backups that do not have associated Incremental or Differential Backups. If the **Migrate** option is selected for a Full Backup which has an associated Incremental or Differential, the secondary copy will be created successfully. However, the index for the primary or original backup will not be deleted. An alternative would be to create a secondary copy with the Duplicate or Data Copy option, and manually retire the primary or original backup from the **NVBU Media Management** window.

9. Select the **Allow Streams to Share Media** check box to convert multiple data streams into a sequential data stream and write it to the same media. This reduces the number of media items required for the copy.
10. Configure the retention period for the copy as described below:
 - To use the original save set's retention period, select **Use Originals Life**.
 - To set a different retention period for the duplicate, select **Discard After**. In the box provided, enter the retention period in number of days, weeks or years. Select **Days**, **Weeks** or **Years** option next to the box. You can only set a time-based retention policy for the duplicate save set.

5.6.7 Using Pre and Post Backup Scripts

NVBU allows you to run your own scripts at the start and/or completion of a backup job. These scripts can be used to perform tasks, such as dismounting or shutting down a database before starting the job, or mounting/starting the database after the job completes. Consider the following points when using pre and post backup scripts:

- The script must be an executable file, for example, **.bat** on Windows, or **.sh** on Linux/UNIX.
- The scripts can contain run-time parameters. Use the NVBU environment variable **NV_USER_ARG** to access the values for these parameters in the script.
- You can also use other NVBU environment variables in the script. For a list of available environment variables, refer to [NVBU Environment Variables on page 269](#).
- After creating the script, copy it to the **...scripts** folder on the target Client. You can also create sub-folders to organize the scripts.
- If a pre script fails, the backup job fails.
- If the pre script completes successfully while the backup job fails, the post script is still executed; the job status is reported as **Backup Failed**.
- If the pre script and the backup complete successfully while the post script fails, a script error is logged; the job status is reported as completed with warnings.

- By default, NVBU provides the following two scripts that can be run as post backup scripts:
 - ❖ **psmail** – This script emails the job completion status to the addresses passed as user parameter.
 - ❖ **psmail_logs** – This script emails the job completion status and the job logs to the addresses passed as user parameter.

To run pre and post scripts for a backup job, perform the following steps:

1. In the **NVBU Backup** window, click the **Advanced Options** tab.
2. Under **Pre and Post Scripts**, select the following options:
 - a. To run a script before the job starts, select **Use Pre Script**.
 - b. To run a script after the job completes, select **Use Post Script**.
3. Enter the script file name in the box next to the selected check box. If the script resides in the **...\scripts** folder, just enter the file name. Whereas, if it resides in a sub-folder within the **...\scripts** folder, enter the relative path (e.g., if the script file **myscript.bat** resides in the folder **...\scripts\tst**, enter **\tst\myscript.bat** in the box).
4. To pass run-time parameters, enter the value in the **User Parameter** box. The value must be valid and conform to its usage in the script. NVBU does not perform any validity checks on the user parameter.

5.6.8 Setting up a User-Defined Notification Event

An event is an action or a condition that indicates an error, a problem or change in the component status. NVBU provides a set of pre-defined events for which you can set up a notification method to alert you when they occur and/or take a remedial action. For details on event types and notification methods, refer to [Event Notification on page 187](#). In addition to the default events, NVBU supports the following custom events for a backup job:

- Backup completes successfully
- Backup completes with warnings
- Backup fails

The custom events defined for a job are added to the **Jobs – User Defined** event category in the **Global Notification** window, and can be raised for any backup job within the Domain.

To raise a user-defined notification event for a backup job, perform the following steps:

1. In the **Backup** window, click the **Advanced Options** tab.
2. Under **Events**, select the following option(s):
 - a. To raise an event when the job completes successfully, select the **Raise Event if Job is Successful** check box.

- b. To raise an event when the job completes with warnings, select the **Raise Event if Job has Warnings** check box.
 - c. To raise an event when the job fails, select the **Raise Event if Job Fails** check box.
3. In the list next to the selected check box, select the custom event. If no custom events are defined, the list will be empty. To define a new event, enter the event name in the box.
4. For a new custom event, perform the following steps:
 - a. Click **Save** on toolbar. Alternatively, on the **File** menu, click **Save**.
 - b. Set up the notification method(s) for the event. For details on setting up global notification methods, refer to [Setting up a Global Notification Method on page 189](#). For details on setting up user-specific notification methods, refer to [Setting a User Notification Profile on page 200](#).
 - c. Load the job again and complete the remaining job definition steps.

5.7.0 Viewing and Modifying a Backup Job

You can use the following procedure to modify an existing job or create a new job from an existing job definition:

1. Use one of the following methods to load a backup job definition:
 - a. **Load the Job Definition from the Backup Window** – This method can be used for both saved and scheduled jobs.
 1. Open the **NVBU Backup** window.
 2. Click **Load** on toolbar. Alternatively, on the **File** menu, click **Load**.
 3. In the **Load Backup Job** window, select the job and then click **OK**.
 - b. **Load the Job Definition from the Jobs Tab of the NVBU Jobs Window** – This method can be used for both saved and scheduled jobs.
 1. Click **Job Management** on the toolbar or **Large Buttons** panel. Alternatively, click **Job Management** on the **Operations** menu.
 2. Click the **Jobs** tab.
 3. Right-click the job and select **Edit/View Job**.
 - c. **Load the Job Definition from the Status Tab of the NVBU Jobs Window** – This method can only be used for the scheduled jobs.
 1. Click **Job Management** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Job Management**.
 2. On the **Status** tab, right-click the job and select **Edit/View Job**. This loads the job definition in the **Backup** window.
2. Click the tab that contains the settings you want to change.

3. On Windows, select the **Modify** check box at the bottom. Ignore this step on Linux/UNIX.
4. Re-configure the options, as required. For information on any setting, refer to the relevant section in this guide or the APM/Plugin User's Guide. To modify or customize a selection set, refer to [Selection Sets on page 127](#).
5. Choose one of the following methods to save and/or schedule the job.
 - a. **Save the Definition without Scheduling the Job** – To save the job definition without scheduling it, click **Save** on the toolbar. Alternatively, on the **File** menu, click **Save**.
 - b. **Schedule the Job** – To submit the job for scheduling click **Submit** on the toolbar. Alternatively, on the **Accept** menu, click **Submit Backup**.

5.8.0 Archiving Data

Archiving is similar to backing up data, however, archives are standalone backups. Archives cannot be used as base for Incremental or Differential backups. You must select the Full Backup type with this option; data archived using Incremental or Differential Backup types cannot be restored. Only time-base retention period can be set for archives. You can choose the archive option when performing ad-hoc backups outside the regular backup schedule.

To archive data, perform the following steps:

1. Open the **Backup** window. Select the data and configure other options. For details, refer to [Creating a Backup Job on page 96](#).
2. Click the **Advanced Options** tab and under **Backup Life**, select **Archive**.
3. Complete the job definition and save or submit the job.

5.9.0 Managing Backup Indexes

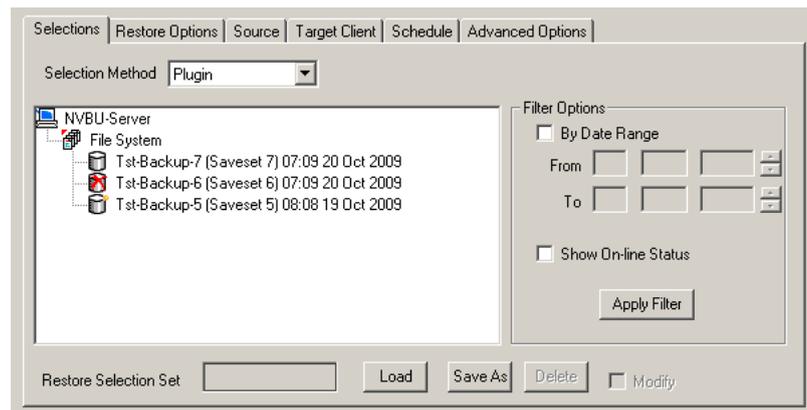
For a backup job, NVBU writes the backup index to both the media and the NVDB. The backup indexes in the NVDB are called Online Indexes. Online indexes allow you to quickly scan through the contents of a saveset without loading the media. However, these indexes increase the disk space consumed by the NVDB. In order to reduce the space used by the backup indexes, NVBU allows you to compress the online indexes or delete them.

- **Deleting Online Indexes** – While creating a backup job, you can set an expiry date for the online indexes and delete them after a certain period. The data can still be restored by loading the indexes on the backup media. The savesets for which the online indexes have been deleted are represented by cross mark icons. To browse or restore a saveset with offline indexes, you must manually load the index. For details on loading a backup index from the

backup media, refer to [Restoring from a Saveset with Offline Indexes on page 153](#)

- **Compressing Online Indexes** – The backup indexes can be compressed manually from the NVBU Restore window, or automatically using an index compression policy. For more information on automatically compressing the indexes, refer to the *NetVault: Backup Configuration Guide*. The savesets for which the indexes have been compressed are represented by an orange light icon. NVBU automatically de-compresses the index to a temporary location when you try to browse or restore such savesets. The temporary directory is deleted when the operation completes. An index can also be de-compressed manually. For details, refer to [Restoring from a Saveset with Compressed Indexes on page 153](#).

Figure 5-5:
Savesets with
offline and
compressed
indexes



The procedures for compressing and deleting online indexes are described in the following sections.

5.9.1 Deleting Online Indexes

To set an expiry date for a backup index, perform the following steps:.

Note: Deleting a backup index is not the same as setting the retention period for a saveset. When the retention period expires for a saveset, NVBU discards all information about it from the NVDB. Although you can scan the media containing an expired saveset, NVDB will load this index as a new backup index. Whereas, when you delete the online indexes, NVBU still retains some information about the saveset which allows it to quickly reload the saveset index from the backup media.

1. When defining a backup job, click the **Advanced Options** tab.
2. Under **Backup Life**, select **Offline Index After**.
3. In the box provided, enter the number of days, weeks or years you want to retain the index in NVDB.

4. Select **Days**, **Weeks** or **Years** option, next to the box.

5.9.2 Compressing Online Indexes

To manually compress the backup indexes, perform the following steps:

1. Open the **Restore** window (click **Restore** on the toolbar or **Large Buttons** panel, or click **Restore** on the **Operations** menu).
2. On the **Selections** tab, open the Client that was the backup target.
3. Locate the plugin used to backup the data and perform one of the following steps:
 - a. **Compress all Savesets Generated with the Plugin** – To compress all savesets generated with the plugin, right-click the plugin node and select **Compress**.
 - b. **Compress Individual Saveset Generated with the Plugin** – To compress particular saveset(s) generated with the plugin, open the plugin node (double-click this node, or right-click and select **Open**). Then, right-click the target saveset node and select **Compress**.

Chapter 6:

JOB SCHEDULING

This chapter describes how to set up a job schedule. The information in this chapter is organized into the following topics:

- [Job Scheduling – An Overview](#)
- [Scheduling a Job to Run Immediately](#)
- [Scheduling a Job to Run on a Specific Date](#)
- [Scheduling Repeating Jobs](#)
 - ❖ [Scheduling a Job to Run Every n Hour\(s\)](#)
 - ❖ [Scheduling a Job to Run at the Same Time Every Day](#)
 - ❖ [Scheduling a Job to Run Every n Day\(s\), Week\(s\) or Month\(s\)](#)
 - ❖ [Scheduling a Job to Run on Specific Days of Week](#)
 - ❖ [Scheduling a Job to Run on Specific Days of Month](#)
- [Scheduling Non-Repeating Jobs](#)
 - ❖ [Scheduling a Non-Repeating Job to Run on Any Day](#)
 - ❖ [Scheduling a Non-Repeating Job to Run on Specific Days of Week](#)
 - ❖ [Scheduling a Non-Repeating Job to Run on Specific Days of Month](#)
- [Triggering a Job from an External Script](#)
- [Scheduling Number of Job Retries](#)
- [Setting the Job Priority](#)

6.1.0 Job Scheduling – An Overview

A job schedule defines when and at what intervals a job runs. The job scheduling options are present on the **Schedule** tab of the **Backup**, **Restore** and **Reporting Job Editor** windows. You can use these options to accomplish the following:

- Run a job immediately
- Run a job on a specific date
- Establish a routine for repeating jobs
- Establish a routine for non-repeating jobs
- Trigger a job using an external script

The job scheduling details are stored in the Scheduler database and managed by the Schedule Manager process. For details on the Schedule Manager process, refer to the *NetVault: Backup Configuration Guide*.

6.2.0 Scheduling a Job to Run Immediately

To run a job immediately, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameter:
 - **Scheduling Type** – Select the **Immediate** scheduling type. NVBU automatically selects this option for a new job unless you change the default settings. The job will run immediately after you submit the job definition.

Note: You can also use the **Run Now** feature to run an existing job immediately. For details, refer to [Running a Job Immediately on page 174](#).

6.3.0 Scheduling a Job to Run on a Specific Date

To schedule a job to run on a particular date, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-1:
Scheduling
options for
Specific Date
scheduling
type

The screenshot shows a configuration window for job scheduling. At the top, there are four radio buttons: 'Immediate' (unselected), 'Once' (selected), 'Repeating' (unselected), and 'Triggered' (unselected). Below this is a section titled 'Schedule Options'. Under 'Schedule Options', there is a 'Run at' field with a time picker set to 16:03. Below that, there are two columns: 'Method' and 'Options'. Under 'Method', there are four radio buttons: 'Any Day' (unselected), 'Days of week' (unselected), 'Days of month' (unselected), and 'Specified Date' (selected). Under 'Options', there is a date picker set to 02 Sep 2009.

- **Scheduling Type** – Select the **Once** scheduling type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **Method** – Under **Method**, select **Specified Date**.
 - ❖ **Options** – In the **Options** box, enter or select the date on which you want to run the job.

6.4.0 Scheduling Repeating Jobs

Jobs which are performed on a regular basis at the specified date, day or time are called repeating jobs. For example, a Full or Incremental Backup scheduled to run daily at 10 P.M. You can establish a repeating job schedule for such jobs, and run them automatically at the following intervals:

- Every <n> hour(s)
- Same time every day
- Every <n> day(s), week(s) or month(s)
- Same day every week
- Specific days every week
- Specific days on specific weeks
- Same day every month
- Specific days every month

NVBU schedules the first instance when you submit the job definition. The next instance is scheduled when the current instance becomes active, and this procedure is repeated for each subsequent instance. The scheduled job instances are displayed on the **Status** tab of the **NVBU Jobs** window. By default, NVBU uses a blue background to highlight scheduled jobs.

6.4.1 Scheduling a Job to Run Every n Hour(s)

To run a job every n hour(s), perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-2:
Scheduling options for
Every n
Hour(s)
recurrence
interval

The screenshot shows the 'Schedule' tab of a configuration window. At the top, there are tabs for 'Selections', 'Backup Options', 'Schedule', 'Source', 'Target', and 'Advanced Options'. Below these, there are four radio buttons: 'Immediate', 'Once', 'Repeating' (which is selected), and 'Triggered'. Underneath is a section titled 'Schedule Options' containing a 'Run at' field with '18' and '30' in sub-fields, and a 'From' field with '01', 'Oct', and '2008' in sub-fields. Below this are two columns: 'Method' and 'Options'. In the 'Method' column, there are radio buttons for 'Every Day', 'Days of week', 'Days of month', and 'Every ...' (which is selected). In the 'Options' column, there are radio buttons for 'Hour(s)', 'Day(s)', 'Week(s)', and 'Month(s)'. Below the 'Hour(s)' radio button is an 'Every' field with the number '4' and increment/decrement arrows.

- **Scheduling Type** – Select the **Repeating** schedule type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:

- ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
- ❖ **From** – In the **From** box, enter or select the start date for the schedule.
- ❖ **Method** – Under **Method**, select **Every**.
- ❖ **Options** – In the **Every** box under **Options**, enter or select the interval. For example, to run the job every 4 hours, enter 4 in the box. Select **Hour(s)** in the frequency options.

Important:

The job will run immediately if the scheduled start time has already passed.

When you edit a job with **Every n Hour(s)** schedule, you must reconfigure the start time according to the current time. If the schedule is not updated, an instance will run immediately when you submit the job definition.

6.4.2 Scheduling a Job to Run at the Same Time Every Day

To set up a daily schedule for a job, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-3:
Scheduling
options for
Every Day
recurrence
interval

- **Scheduling Type** – Select the **Repeating** scheduling type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the **From** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Every Day**.

6.4.3 Scheduling a Job to Run Every n Day(s), Week(s) or Month(s)

To run a job at the same time every n day(s), week(s) or month(s), perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-4:
Scheduling options for
Every n
Day(s),
Week(s) or
Month(s)
recurrence
interval

The screenshot shows a window titled 'Schedule' with several tabs: 'Selections', 'Backup Options', 'Schedule', 'Source', 'Target', and 'Advanced Options'. The 'Schedule' tab is selected. At the top, there are four radio buttons: 'Immediate', 'Once', 'Repeating' (which is selected), and 'Triggered'. Below this is a section titled 'Schedule Options'. It contains a 'Run at' field with '15' and '23' in separate boxes, a 'From' field with '08', 'Sep', and '2008' in separate boxes, and a 'Method' section with radio buttons for 'Every Day', 'Days of week', 'Days of month', and 'Every ...' (which is selected). To the right of the 'Method' section is an 'Options' section with radio buttons for 'Hour(s)', 'Day(s)' (which is selected), 'Week(s)', and 'Month(s)'. Below the 'Options' section is an 'Every' box with the number '2' inside.

- **Scheduling Type** – Select the **Repeating** scheduling type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the **From** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Every**.
 - ❖ **Options** – In the **Every** box under **Options**, enter the interval. Select **Day(s)**, **Week(s)** or **Month(s)** in the frequency options.

For example,

- ❖ To run a job on alternate days, enter 2 in the **Every** box and select **Day(s)** in the frequency options.
- ❖ To run a job every week, enter 1 in the **Every** box and select **Week(s)** in the frequency options.
- ❖ To run a job once in three months, enter 3 in the **Every** box and select **Month(s)** in the frequency options.

Important: When you edit a job with **Every n Day(s), Week(s) or Month(s)** schedule, you must reconfigure the start date according to the current date. If the schedule is not updated, an instance will run immediately when you submit the job definition

6.4.4 Scheduling a Job to Run on Specific Days of Week

You can use this procedure to define the following types of schedules:

- Run a job on every Wednesday
- Run a job on every Wednesday and Friday
- Run a job on second and fourth Wednesday
- Run a job on second and fourth Wednesday and Friday

To establish a Days of Week recurrence pattern, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-5:
Scheduling options for based on the days of week recurrence pattern

The screenshot shows a 'Schedule Options' dialog box with the following settings:

- Schedule Type:** Repeating (selected)
- Run at:** 18 : 30
- From:** 01 Oct 2008
- Method:** Days of week (selected)
- Options:**
 - Wednesday (checked)
 - Friday (checked)
- Weeks in month:**
 - Selected (selected)
 - Second (checked)
 - Third (checked)
 - Fourth (checked)

- **Scheduling Type** – Select the **Repeating** scheduling type.
- **Scheduling Type** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the **From** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Days of Week**.
 - ❖ **Options** – Under **Options**, select the check boxes corresponding to the day(s) on which you want to run the job.
 - ❖ **Weeks in Month** – Under **Weeks in Month**, select **All** to run the job on any week. To run the job on n^{th} week, choose **Selected** and clear the check boxes for the weeks on which you do not want to run the job. For example,
 - ❖ To run a job on every Wednesday, select **Wednesday** under **Options** and **All** under **Weeks in Month**.
 - ❖ To run a job on every Wednesday and Friday, select **Wednesday** and **Friday** under **Options** and select **All** under **Weeks in Month**.

- ❖ To run a job on the second and fourth Wednesday, select **Wednesday** and **Friday** under **Options** and clear **First**, **Third** and **Last** check boxes.

The first instance of the job is scheduled to run on the n^{th} Wednesday or Friday, whichever occurs first after you submit the job. The subsequent instance will be scheduled when the current instance becomes active.

6.4.5 Scheduling a Job to Run on Specific Days of Month

You can use this procedure to define the following types of schedules:

- Run a job on the fifth of every month
- Run a job on the first, tenth and twentieth of every month
- Run a job on the last day of every month

To establish a Days of Month recurrence pattern, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-6:
Scheduling
options based
on days of
month
recurrence
pattern

The screenshot shows a dialog box titled 'Schedule Options'. At the top, there are four radio buttons: 'Immediate', 'Once', 'Repeating' (which is selected), and 'Triggered'. Below this, the 'Run at' field is set to '18 : 30' and the 'From' field is set to '01 Oct 2008'. Under the 'Method' section, there are four radio buttons: 'Every Day', 'Days of week', 'Days of month' (which is selected), and 'Every ...'. Under the 'Options' section, there are checkboxes for each day of the month from 1 to 31. The 'Last' checkbox is checked.

- **Scheduling Type** – Select the **Repeating** scheduling type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the **From** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Days of Month**.
 - ❖ **Options** – Under **Options**, select the check boxes corresponding to the day(s) on which you want to run the job. To run the job on the last day of every month, select the **Last** check box.

For example,

- ❖ To run a job on the fifth of every month, select 5.

- ❖ To run a job on first, tenth and twentieth of every month, select 1, 10 and 20.
- ❖ To run a job on the last day of every month, select the **Last** check box.

The first instance of the job runs on the n^{th} day of the month after the schedule becomes effective. The subsequent instance will be scheduled when the current instance becomes active.

6.5.0 Scheduling Non-Repeating Jobs

Jobs which are performed infrequently or at irregular intervals are called non-repeating jobs. Although it is difficult to establish a definite repeating schedule for these jobs, you may need to run them more than once. For the non-repeating jobs, you can either create a new job definition each time, or use one of the following types of non-repeating schedules:

- Any day
- Particular day(s) of week
- Particular day(s) of month

NVBU automatically schedules the first instance when you submit the job definition. However, the subsequent instances must be scheduled manually. This can be done by creating an instance using an existing instance or job definition. For details, refer to [Submitting a New Instance for Non-Repeating Jobs on page 174](#).

6.5.1 Scheduling a Non-Repeating Job to Run on Any Day

To schedule non-repeating jobs to run on any day, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-7:
Scheduling
options for Any
Day non-
repeating
schedule

- **Scheduling Type** – Select the **Once** scheduling type.

- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the box next to **Run At** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Any Day**.

NVBU automatically schedules the first instance when you submit the job definition. To run the job again, you must create an instance manually. For details, refer to [Submitting a New Instance for Non-Repeating Jobs on page 174](#).

6.5.2 Scheduling a Non-Repeating Job to Run on Specific Days of Week

You can use this procedure to define the following types of schedules:

- Run a job on Wednesday (any week)
- Run a job on Wednesday and/or Friday (any week)
- Run a job on second or fourth Wednesday
- Run a job on second or fourth Wednesday and/or Friday

To schedule non-repeating jobs to run on specific days of week, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-8:
Scheduling options for Days of Week non-repeating schedule

The screenshot shows a dialog box titled "Schedule Options". At the top, there are four radio buttons: "Immediate", "Once" (which is selected), "Repeating", and "Triggered". Below this is a section for "Run at" with a time field set to "10 : 02" and a date field set to "03 Sep 2009". There are three sections: "Method" with radio buttons for "Any Day", "Days of week" (selected), "Days of month", and "Specified Date"; "Options" with checkboxes for days of the week, where "Wednesday" is checked; and "Weeks in month" with radio buttons for "All" and "Selected" (selected), and a list of checkboxes for "First", "Second", "Third", "Fourth", and "Last", all of which are checked.

- **Scheduling Type** – Select the **Once** scheduling type.
- **Scheduling Type** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the box next to **Run At** box, enter or select the start date for the schedule.

- ❖ **Method** – Under **Method**, select **Days of Week**.
- ❖ **Options** – Under **Options**, select the check boxes corresponding to the day(s) on which you want to run the job.
- ❖ **Weeks in Month** – Under **Weeks in Month**, select **All** to run the job on any week. To run the job on n^{th} week, choose **Selected** and clear the check boxes for the weeks on which you do not want to run the job. For example,
 - ❖ To run a job on Wednesday (any week), select **Wednesday** under **Options** and **All** under **Weeks in Month**.
 - ❖ To run a job on a Wednesday and/or Friday (any week), select **Wednesday** and **Friday** under **Options** and select **All** under **Weeks in Month**.
 - ❖ To run a job on the second and/or fourth Wednesday, select **Wednesday** under **Options** and clear **First**, **Third** and **Last** check boxes.

NVBU automatically schedules the first instance to run on the n^{th} Wednesday or Friday after the schedule becomes effective. To run the job again, you must create an instance manually. For details, refer to [Submitting a New Instance for Non-Repeating Jobs on page 174](#).

6.5.3 Scheduling a Non-Repeating Job to Run on Specific Days of Month

You can use this procedure to define the following types of schedules:

- Run a job on the fifth
- Run a job on first, tenth and/or twentieth
- Run a job on the last day of a month

To schedule non-repeating jobs to run on specific days of month, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-9:
Scheduling
options for
Days of Month
non-repeating
schedule

The screenshot shows a dialog box for scheduling options. At the top, there are four radio buttons: 'Immediate', 'Once' (selected), 'Repeating', and 'Triggered'. Below this is a section titled 'Schedule Options' containing a 'Run at' field with a time of 10:02:03 and a date of Sep 03, 2009. Underneath, there are two columns: 'Method' and 'Options'. The 'Method' column has four radio buttons: 'Any Day', 'Days of week', 'Days of month' (selected), and 'Specified Date'. The 'Options' column has a grid of checkboxes for days 1 through 31, and a 'Last' checkbox at the bottom.

- **Scheduling Type** – Select the **Once** scheduling type.
- **Scheduling Options** – Under **Scheduling Options**, configure the following parameters:
 - ❖ **Run At** – In the **Run At** box, enter or select the start time for the job.
 - ❖ **From** – In the **From** box, enter or select the start date for the schedule.
 - ❖ **Method** – Under **Method**, select **Days of Month**.
 - ❖ **Options** – Under **Options**, select the check boxes corresponding to the day(s) on which you want to run the job. To run the job on the last day of every month, select the **Last** check box.

For example,

- ❖ To run a job on the fifth, select 5.
- ❖ To run a job on first, tenth and/or twentieth, select 1, 10 and 20.
- ❖ To run a job on the last day of a month, select the **Last** check box.

NVBU automatically schedules the first instance to run on the n^{th} day of the month after the schedule becomes effective. To run the job again, you must create an instance manually. For details, refer to [Submitting a New Instance for Non-Repeating Jobs on page 174](#)

6.6.0 Triggering a Job from an External Script

NVBU allows you to schedule a job by executing a script which defines the conditions for the task. The most common use of creating a triggered job is to be able to execute it independently of the NVBU Scheduler, such as via a 3rd-party scheduler or an automation interface. You can run the script from the command line. The job is not scheduled to run when you submit the job. Instead, it is scheduled when the **nvtrigger** command runs during the script execution. To schedule a job when the script runs, include the following line in the script:

```
nvtrigger <trigger_name>
```

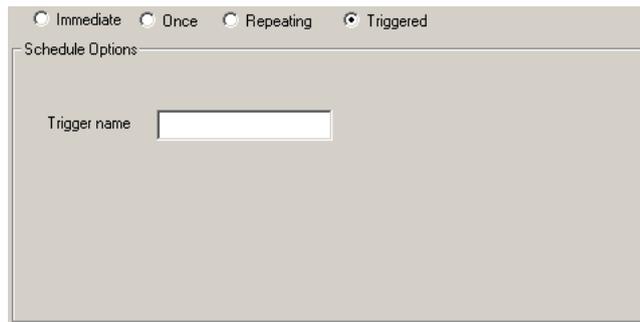
nvtrigger is a CLI command that resides in the `.../bin` directory (where ... represents the NVBU installation directory). If this path is not configured in the path variable, use the complete file path for the **nvtrigger** command, or include commands to change to the appropriate directory in the script.

Alternatively, the script can be executed using the **Pre** and **Post Scripts** options on the **Advanced Options** tab of the **NVBU Backup** window.

To trigger a job from an external script, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-10:
The option for
Triggered
scheduling
type



- **Scheduling Type** – Select the **Triggered** scheduling type.
- **Scheduling Options** – In the **Trigger Name** box under **Scheduling Options**, enter trigger name that was used with the **nvtrigger** command in the script file.

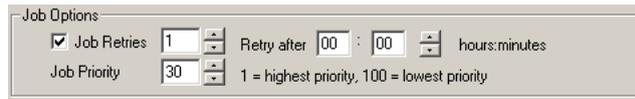
Note: If the trigger name is already in use by another job, a warning “**The Trigger Name is Already in Use. Redefine this Job if this was not Intended**” will appear when you try to save or submit the job. This is for information only and will not stop you from saving or submitting the job.

6.7.0 Scheduling Number of Job Retries

NVBU allows you to configure the retry options for a job, which specify how many attempts to make and at what intervals when an initial attempt to run the job fails. Each retry attempt runs with the original Job ID and instance number. To schedule the retry attempts for a job, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameters:

Figure 6-11:
The Job
Options on the
Schedule tab



Job Options

Job Retries 1 Retry after 00 : 00 hours:minutes

Job Priority 30 1 = highest priority, 100 = lowest priority

- **Job Retries** – Under **Job Options**, select the **Job Retries** check box.
- **Number of Retries** – In the box next to the **Job Retries** check box, enter or select the number of retries. You can set a maximum of 10 tries for a job.
- **Retry After** – In the **Retry After** boxes, enter or select the interval between two retry attempts. By default, NVBU tries to run the job again immediately after a previous attempt fails.

6.8.0 Setting the Job Priority

The Schedule Manager assigns a priority level for each job type, which is applied globally to all backup, restore and report jobs. This parameter helps prioritize resource allocation when two or more jobs are scheduled to run at the same time. The default priority level for each job type is given below:

Job Type	Priority Level
Restore	20
Backup	30
Report	50

You can globally change the priority level settings for all backup, restore or report jobs, or override these settings for an individual job. The global changes are performed using the **Schedule Manager** tab on the NVBU Configurator. For details on global priority settings, refer to the *NetVault: Backup Configuration Guide*. To override the priority settings for an individual job, perform the following steps:

1. Click the **Schedule** tab on the corresponding window.
2. Configure the following parameter:
 - **Job Priority** – In the **Job Priority** box under **Job Options**, enter or select the priority level for the job. The priority level ranges from 1 (highest priority) to 100 (lowest priority). A priority level of zero sets a job to run as a background task.

Chapter 7:

SELECTION SETS

This chapter explains how to create and use selection sets. The information in this chapter is organized into the following topics:

- [Selection Sets – An Overview](#)
 - ❖ [Types of Selection Sets](#)
- [Creating a Selection Set](#)
- [Loading a Selection Set](#)
- [Modifying a Selection Set](#)
- [Copying a Selection Set](#)
- [Deleting a Selection Set](#)

7.1.0 Selection Sets – An Overview

Selection sets provide an efficient way to create job definitions. They store the job properties which can be quickly and easily applied to multiple jobs, and changed with minimum effort. Selection sets reduce the manual steps, allowing you to create a new job or modify existing jobs in fewer steps. For example, you can save the data selections for a Full Backup in a Backup Selection Set, and use this set for creating an Incremental or a Differential Backup job. This eliminates the need to select each item manually for a new job. At the same time, it also ensures that the same set of files is backed up each time and no file is accidentally omitted. Similarly, you can change the day, date or time in a Schedule Set to automatically change the job schedule for multiple jobs, or target a new device for backups by changing the Target Set.

Note: A policy-based backup can only be created using selection sets.

7.1.1 Types of Selection Sets

NVBU supports the following types of selection sets:

Selection Set Type	Description
Backup Selection Set	Saves a backup selection list. It can be created from the Selections tab on the following windows: <ul style="list-style-type: none">■ NVBU Backup■ NVBU Policy Editor

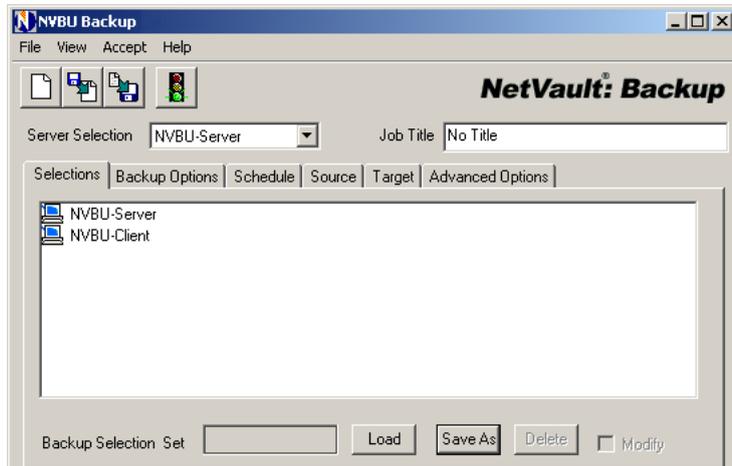
Selection Set Type	Description
Backup Options Set	Saves the backup options. It can be created from the Backup Options tab on the following windows: <ul style="list-style-type: none"> ■ NVBU Backup ■ NVBU Policy Editor
Schedule Set	Saves the scheduling options for a backup, restore or report job. It can be created from the Schedule tab on the following windows: <ul style="list-style-type: none"> ■ NVBU Backup ■ NVBU Policy Editor ■ NVBU Restore ■ NVBU Reporting Job Editor
Source Set	Saves the source drive options, which specify where the source media for a Data Copy, Consolidate Incremental Backups or Restore job is located. It can be created from the Source tab on the following windows: <ul style="list-style-type: none"> ■ NVBU Backup (Data Copy and Consolidate Incremental Backups plugins) ■ NVBU Policy Editor ■ NVBU Restore
Target Set	Saves the target drive and media options for a backup job, which specify the device and media to use to store a backup. It can be created from the Target tab on the following windows: <ul style="list-style-type: none"> ■ NVBU Backup ■ NVBU Policy Editor
Advanced Options Set	Saves the advanced options for a backup or restore job. It can be created from the Advanced Options tab on the following windows: <ul style="list-style-type: none"> ■ NVBU Backup ■ NVBU Policy Editor ■ NVBU Restore
Restore Selection Set	Save a restore selection list. It can be created from the Selections tab on the following window: <ul style="list-style-type: none"> ■ NVBU Restore

7.2.0 Creating a Selection Set

To create a selection set, perform the following steps:

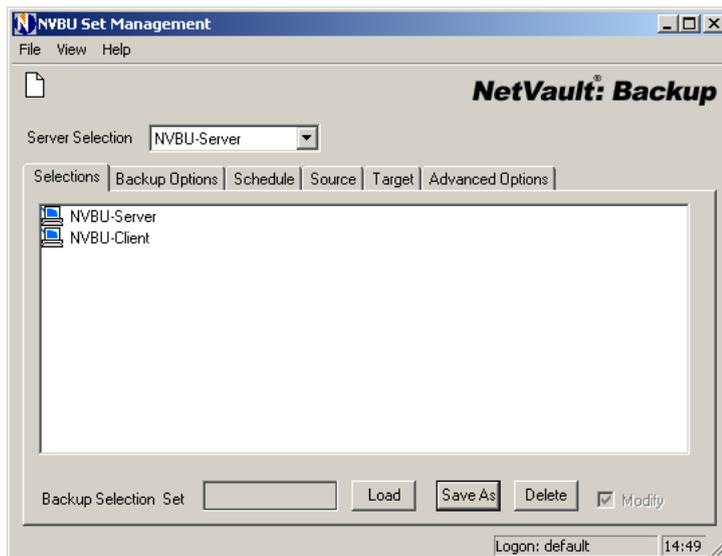
1. Depending on your task, open the corresponding NVBU window:
 - a. **Regular Backups**
 1. Click **Backup** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Backup**.

Figure 7-1:
Backup
Selection Set
options
displayed at
the bottom of
NVBU Backup
window



- b. **Policy Backups**
 1. Click **Policy Management** on the toolbar or **Large Buttons** panel to open the **NVBU Policy Management** window. Alternatively, on the **Administration** menu, click **Policy Management**.
 2. Click **New Policy** on the toolbar. Alternatively, on the **File** menu, click **New Policy**.
 3. In the **NVBU Policy Editor** window, click **Manage Sets** to open the **NVBU Set Management** window.

Figure 7-2:
NVBU Set
Management
window



c. **Restore Jobs**

1. Click **Restore** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Restore**.

d. **Report Jobs**

1. Click **Reports Management** on the toolbar or **Large Buttons** panel to open the **NVBU Reports Management** window. Alternatively, on the **Operations** menu, click **Reports**.
2. Click **Report Job** on the toolbar. Alternatively, on the **Reports** menu, click **Report Job**.

2. Click the corresponding tab.

3. Select the required data, or configure the required options. For details on data selection and job options, refer to the relevant section in this guide or the APM/Plugin User's Guide.

For example, to create a backup selection set, click the **Selections** tab on the **NVBU Backup** window, and select the data for backup. To create a schedule set, configure the scheduling options on the **Schedule** tab.

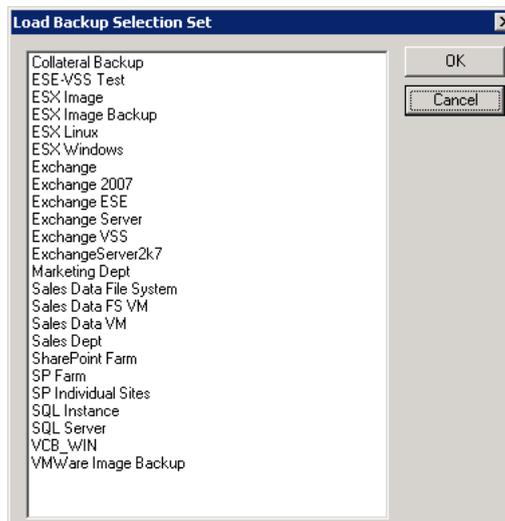
4. Click **Save As** under **<Set Type> Set** at the bottom of the tab.
5. In the **Save <Set Type> Set** window, enter a unique name for the set in the box provided.
6. Click **OK**.

7.3.0 Loading a Selection Set

To load a selection set, perform the following steps:

1. Open the **NVBU Backup**, **NVBU Restore** or **NVBU Set Management** window. For details, refer to step 1 in the section [Creating a Selection Set on page 129](#).
2. Click the corresponding tab.
3. Click **Load** under **<Set Type> Set** at the bottom of the tab.

Figure 7-3:
Load Backup
Selection Set
window



4. Select the required set in the **Load Backup Selection Set** list.
5. Click **OK** to apply the selections to the current job.

If you modify the selection set any time later, the new settings are applied automatically to all jobs that use the set.

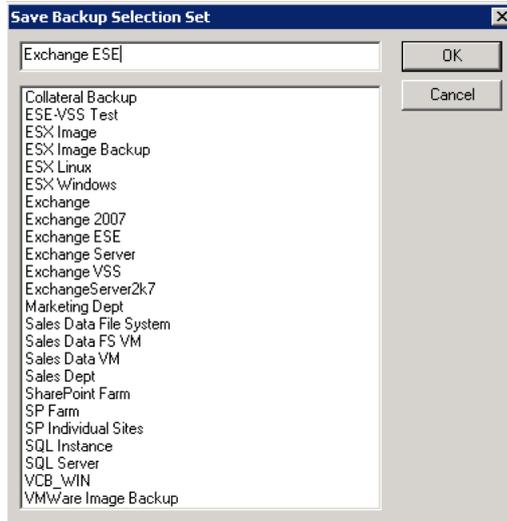
7.4.0 Modifying a Selection Set

To modify a selection set, perform the following steps:

1. Open the **NVBU Backup**, **NVBU Restore** or **NVBU Set Management** window. For details, refer to step 1 in the section [Creating a Selection Set on page 129](#).
2. Click the corresponding tab.
3. Click **Load** under **<Set Type> Set** at the bottom of the tab.
4. Select the required set in the **Load <Set Type> Set** list.
5. Click **OK**. This will load the saved settings.

6. Click **Modify** under **<Set Type> Set** at the bottom of the tab.
7. In the **NetVault Warning** window, click **Modify**.
8. Update the settings as required.
9. Click **Save As** under **<Set Type> Set** at the bottom of the tab.

Figure 7-4:
Save Backup
Selection Set
window



10. To overwrite the loaded set, click **OK** in the **Save <Set Type> Set** window. To save the selections to a new set, enter a name in the box and click **OK**.

7.5.0 Copying a Selection Set

To copy the selections to a new set, perform the following steps:

1. Open the **NVBU Backup**, **NVBU Restore** or **NVBU Set Management** window. For details, refer to step 1 in the section [Creating a Selection Set on page 129](#).
2. Click the corresponding tab.
3. Click **Load** under **<Set Type> Set** at the bottom of the tab.
4. Select the required set in the **Load <Set Type> Set** list.
5. Click **OK**. This will load the saved settings.
6. Click **Modify** under **<Set Type> Set** at the bottom of the tab.
7. In the **NetVault Warning** window, click **Copy**.
8. Change the settings, if required.
9. Click **Save As** under **<Set Type> Set** at the bottom of the tab.
10. In the **Save <Set Type> Set** window, enter a new name for the set in the box provided.

11. Click **OK**.

7.6.0 Deleting a Selection Set

To delete a selection set, perform the following steps:

1. Open the **NVBU Backup**, **NVBU Restore** or **NVBU Set Management** window. For details, refer to step 1 in the section [Creating a Selection Set on page 129](#).
2. Click the corresponding tab.
3. Click **Load** under **<Set Type> Set** at the bottom of the tab.
4. Select the required set in the **Load <Set Type> Set** list.
5. Click **OK**. This will load the saved settings.
6. Click **Modify** under **<Set Type> Set** at the bottom of the tab.
7. In the **NetVault Warning** window, click **Modify**.
8. Click **Delete** under **<Set Type> Set** at the bottom of the tab.
9. In the confirmation window, click **Yes**.

Chapter 8:

POLICY MANAGEMENT

This chapter describes how to create and manage backup policies. The information in this chapter is organized into the following topics:

- [Backup Policies – An Overview](#)
 - ❖ [Examples](#)
 - ❖ [Supported Plugins](#)
- [Creating a Backup Policy](#)
 - ❖ [Creating Selection Sets for a Policy Backup](#)
 - ❖ [Defining Jobs for a Policy Backup](#)
 - ❖ [Adding Clients or Client Groups for a Policy Backup](#)
 - ❖ [Finalizing and Submitting a Policy](#)
- [Available Policy Views](#)
 - ❖ [Changing the Policy View](#)
 - ❖ [Policy Status Indicators](#)
- [Setting up User-Defined Notification Events for a Policy Job](#)
- [Editing an Inactive Policy](#)
- [Editing an Active Policy](#)
- [Modifying Individual Policy Jobs](#)
- [Modifying Policy Client List](#)
- [Acknowledging Errors/Warnings](#)
- [Deleting a Policy](#)

8.1.0 Backup Policies – An Overview

Policies provide a convenient method for implementing backup strategies and managing backup jobs. A policy contains one or more job definitions. The job definitions are created using selection sets which specify what data is to be backed up, the target device and media, job schedule and other job attributes. You can apply these definitions to multiple Clients or Client Groups.

You can use policies in numerous scenarios, such as the following:

- Implement a Full and Incremental/Differential backup strategy
- Rotate media
- Backup multiple Clients in a single job

- Perform Incremental backups and Consolidate Incremental Backups
- Run Data Copy jobs on multiple Clients

Policies are managed from the **NVBU Policy Management** window on the Console.

8.1.1 Examples

The following examples outline the procedure for creating some basic policy backups:

Example 1 – Procedure for creating a policy to backup the C drive on multiple Windows Clients

1. Create a Client Group and add the target Clients as group members.
2. Create selection sets for Backup Selection, Backup Options, Schedule, Target and Advanced Options.
3. Create a policy and add a job using these selection sets.
4. Add the Client Group to the job.

NVBU automatically creates and schedules a job to run on each Member Client.

Example 2 – Procedure for implementing a media rotation policy for daily Incremental Backups, and weekly and monthly Full Backups:

1. Create a Backup Selection Set.
2. Create Backup Options Sets for Full and Incremental backups.
3. Create Schedule Sets for Full and Incremental backups.
4. Create Target Sets depending on your media rotation strategies.
5. Create Advanced Options Sets defining the backup retention period (and other advanced backup options).
6. Create a policy and define jobs for daily, weekly and monthly backups using these selection sets.

8.1.2 Supported Plugins

The following NVBU plugins support policy-based backups:

- File System Plugin
- Consolidate Incremental Backups Plugin
- Data Copy Plugin
- NetVault Databases Plugin

8.2.0 Creating a Backup Policy

The procedure for creating a backup policy can be broadly divided into the following steps:

- [Creating Selection Sets for a Policy Backup](#)
- [Defining Jobs for a Policy Backup](#)
- [Adding Clients or Client Groups for a Policy Backup](#)
- [Finalizing and Submitting a Policy](#)

8.2.1 Creating Selection Sets for a Policy Backup

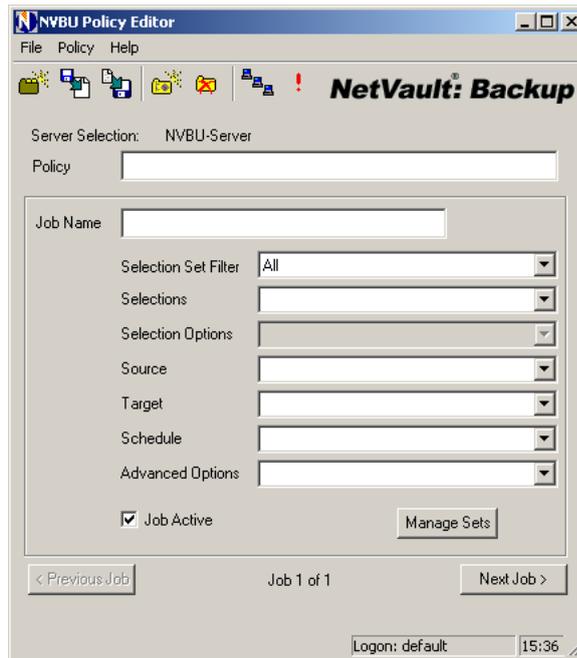
Backup Policies are created using Selection Sets. You can use the existing selection sets or create new sets from the **NVBU Set Management** window. For details on creating a new selection set, refer to [Creating a Selection Set on page 129](#).

8.2.2 Defining Jobs for a Policy Backup

A policy can contain one or more jobs. To create these job definitions, perform the following steps:

1. If the **NVBU Policy Editor** window is not open, perform the following steps:
 - a. Click **Policy Management** on the toolbar or **Large Buttons** panel to open the **NVBU Policy Management** window. Alternatively, on the **Administration** menu, click **Policy Management**.
 - b. Click **New Policy** on the toolbar. Alternatively, on the **File** menu, click **New Policy**.
2. In the **Policy** box, enter a name for the policy.
3. In the **Job Name** box, enter a title for the job.
4. To display only the selection sets created for the File System Plugin, select File System in the **Selection Set Filter**. By default, NVBU displays all selection sets.
5. In the **Selections** list, select the Backup Selections Set for the job.
6. In the **Selection Options** list, select the Backup Options Set for the job.
7. In the **Target** list, select the Target Set for the job.
8. In the **Source** list, select the Source Set for the job. A source set can only be used for Data Copy, Consolidated Incremental Backups and Restore jobs.
9. In the **Schedule** list, select the Schedule Set for the job.
10. In the **Advanced Options** list, select the Advanced Options Set for the job. If the Advanced Options set contains pre and/or post script options, copy the script files to the **.../scripts** directory on each Client included in the policy backup.

Figure 8-1:
NVBU Policy
Editor window



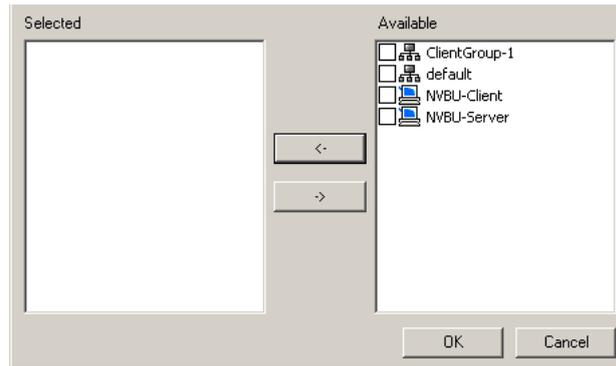
11. To schedule the job when you save the policy, leave the **Job Active** check box selected. To save the policy without scheduling the job, clear the **Job Active** check box.
12. To add another job, click **Next Job**. Otherwise, go to step 15.
13. In the **NetVault - Information** window, click **Yes**.
14. Perform steps 3–11.
15. Add the Clients and/or Client Groups as described in the following section.

8.2.3 Adding Clients or Client Groups for a Policy Backup

Before starting this step, create the necessary Client Groups in order to implement the policy on multiple Clients. For details on creating a Client Group, refer to [Creating Client Groups on page 32](#). To add Clients/Client Groups for policy backups, perform the following steps:

1. In the **NVBU Policy Editor** window, click **Add Clients** on the toolbar to open the **NVBU Policy Clients Manager** window.
Alternatively, on the **Policy** menu, click **Add/Remove Clients**.

Figure 8-2:
NVBU Policy
Clients
Manager
window



2. Under **Available**, you will find a list of NVBU Clients and Client Groups. To add a Client or Client Group, click the corresponding check box, and then click the Left Arrow. The selected Clients and Client Groups will now be listed under **Selected**.
3. To remove an added Client or Client Group, click the check box for it under **Selected**, and then click the Right Arrow.
4. Click **OK** to complete the step.

8.2.4 Finalizing and Submitting a Policy

To complete and submit the policy definition, perform the following steps:

1. To raise any events for failed jobs or jobs completed with warnings, refer to [Setting up User-Defined Notification Events for a Policy Job on page 141](#).
2. To save the policy, click **Save Policy** on the toolbar. Alternatively, click **Save Policy** on the **File** menu.

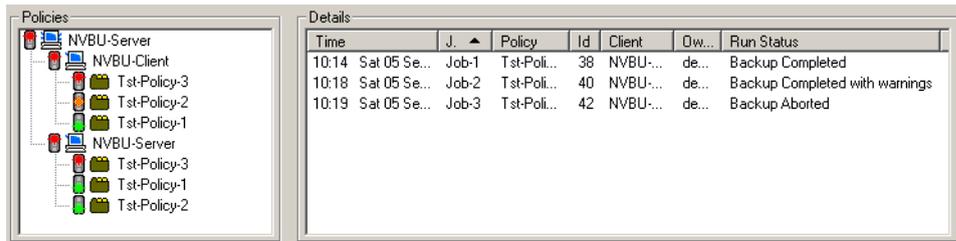
When you save a policy, all jobs that have the **Job Active** check box selected are scheduled to run on the selected Clients/Client Groups.

8.3.0 Available Policy Views

NVBU provides the following Policy Views to view policy jobs:

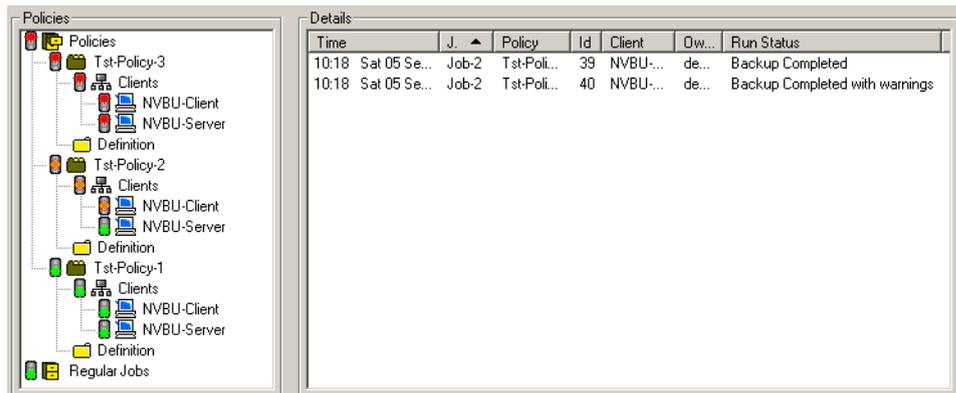
■ Domain View

This is the default view type. The Domain View organizes the policies according to the Client Groups or Individual Clients targeted by an individual policy. The Domain Controller node is displayed at the top.

Figure 8-3:
Domain View

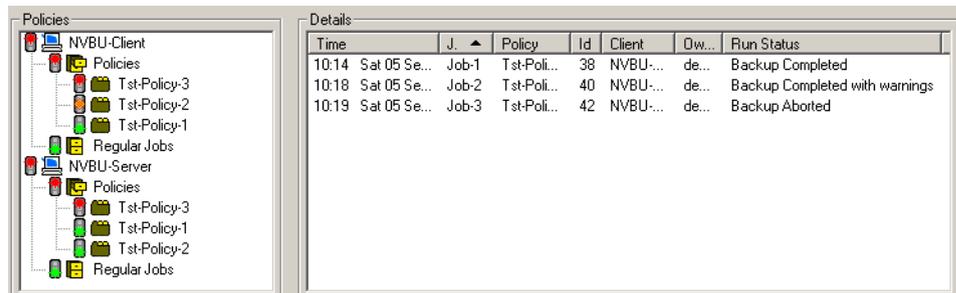
■ Policy View

The Policy View lists the target clients and the job definitions beneath the policy nodes.

Figure 8-4:
Policy View

■ Client View

The Client View displays the policies defined for individual clients.

Figure 8-5:
Client View

Each view allows you to perform similar functions. However, certain functions like deleting a schedule or quiescing a policy can only be performed from the Policy View. To view the policy details navigate through the Policy Tree under **Policies**. To open any node in this tree, double-click it, or right-click and select **Open**. To the left of each node, a status indicator displays the status of policy jobs. The nodes

with active jobs are displayed in blue text, with the parent node displaying the count for active jobs (e.g., 2 Active Jobs). The list of completed, scheduled and active jobs is displayed under **Details**.

8.3.1 Changing the Policy View

The default view type is **Domain View**. To change the view, select the view type in the **View** list.

8.3.2 Policy Status Indicators

Each node under **Policies** is accompanied by a status indicator, which displays the status of a policy, client or individual jobs. The policy tree includes the following status indicators:



A **Green** icon indicates that the corresponding job has completed successfully. For the Policy and Client nodes, it indicates that all the jobs for the policy or client have completed successfully.



An **Orange** icon indicates that the corresponding job has completed with warnings. For the Policy and Client nodes, it indicates that some of the jobs for the policy or client have completed with warnings.



A **Red** icon indicates that the corresponding job has failed. For the Policy and Client nodes, it indicates that some of the jobs for the policy or client have failed.

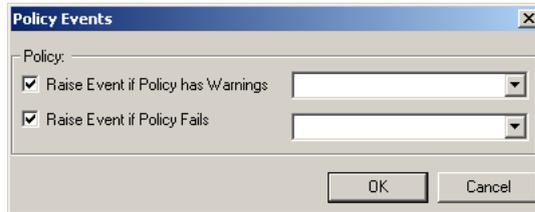
The purpose of status indicators is to help administrators identify a failed job or a job completed with warnings, and take corrective action. Therefore, a red icon accompanies the parent node to indicate a problem even if one job fails while all others complete successfully.

8.4.0 Setting up User-Defined Notification Events for a Policy Job

To raise a user-defined notification event when a policy job fails or completes with warnings, perform the following steps:

1. Open the **Policy Events** window as described in the following steps:
 - a. For a new job, click **Setup Events** on the toolbar for the **NVBU Policy Editor** window. Alternatively, click **Events** on the **Policy** menu.
 - b. For an existing policy, perform the following steps:
 1. Open the **NVBU Policy Management** window.
 2. Choose any view.
 3. Open the nodes further to display the target policy node.

Figure 8-6:
Policy Events
window



4. Right-click this node and select **Policy Events**.
2. In the Policy Events window, configure the following parameters:

- **Raise Event if Policy has Warnings** – To raise an event when a job completes with warnings, select the **Raise Event if Policy has Warnings** check box.
- **Raise Event if Policy Fails** – To raise an event when a job fails, select the **Raise Event if Policy Fails** check box.
- **Event Name** – In the list next to the selected check box, select the custom event. If no custom events are defined, the list will be empty. To define a new event, enter the event name in the box.

3. To set the notification method for a new event, first save the policy. Click **Save Policy** on toolbar, or on the **File** menu, click **Save Policy**. For details on setting a global notification method, refer to [Setting up a Global Notification Method on page 189](#), and for details on setting a user-specific notification method, refer to [Setting a User Notification Profile on page 200](#).

8.5.0 Editing an Inactive Policy

A policy for which no jobs are currently active is termed as an Inactive Policy. To edit an inactive policy, perform the following steps:

1. Load the policy definition in the **NVBU Policy Editor** window using one of the following methods:
 - a. **Method 1**
 1. Open the **Policy Management** window.
 2. On the **Edit** menu, click **Edit Policy**
 3. In the **Load Policy** window, select the target policy and click **OK**.
 - b. **Method 2**
 1. Open the **Policy Management** window.
 2. Choose any view.
 3. Open the nodes further to display the target policy node.
 4. Right-click this node and select **Edit**.

2. For details on adding a new job, refer to [Defining Jobs for a Policy Backup on page 137](#).
3. To delete a job, perform the following steps:
 - a. Load the job definition in the **NVBU Policy Editor** window. Use the **Next/Previous** buttons to navigate.
 - b. Click **Delete Job** on the toolbar. Alternatively, on **Policy** menu, click **Delete Job**.
4. To edit a job definition, perform the following steps:
 - a. Load the job definition in the **NVBU Policy Editor** window. Use the **Next/Previous** buttons to navigate.
 - b. Click **Manage Sets** on the toolbar to modify the selection set. For details on modifying a selection, refer to [Modifying a Selection Set on page 131](#).
To apply a different selection set, choose the set in the Selection Set list.
5. For details on adding or removing a Client/Client Group, refer to [Adding Clients or Client Groups for a Policy Backup on page 138](#).
6. For details on setting up user-defined notification events, refer to [Setting up User-Defined Notification Events for a Policy Job on page 141](#).
7. To commit the changes, click **Save Policy** on the toolbar. Alternatively, click **Save Policy** on the **File** menu.
To create a copy of the policy, enter a new name for the policy in the **Policy** box, and on the **File** menu, click **Save Policy As**.

8.6.0 Editing an Active Policy

A policy for which the jobs are currently running is termed as an Active Policy. To edit an active policy you must first **quiesce** the policy. A **quiesced** state is a temporary inactive/disabled state. To quiesce a policy, run the **Quiesce** command. While quiescing is in progress, NVBU performs the following tasks:

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

Although cloning is supported during this operation, the actual policy can be modified only when the operation completes and the policy is in a quiesced state. To modify an active policy, perform the following steps:

1. Open the **NVBU Policy Management** window.
2. In the **View** list, select **Policy View**.
3. Open the nodes further to display the target policy node.
4. Right-click the node and select **Quiesce**. While the operation is in progress, the text **Quiescing** is displayed beside the policy name.

5. NVBU deletes the scheduled instances, and completes the phase 1 and phase 2 for the active job(s). When these tasks complete, NVBU places the policy in a quiesced state. This state is indicated by the text **Quiesce Complete** next to the policy name. When the quiescing is completed, you can right-click the policy and select **Edit**.
6. To modify the policy, perform steps 2–7 described in the section [Editing an Inactive Policy on page 142](#).

8.7.0 Modifying Individual Policy Jobs

NVBU provides another simpler method to modify a policy job that is currently not active. To accomplish this task, perform the following steps:

1. Open the **NVBU Policy Management** window.
2. In the **View** list, select **Policy View**.
3. Open the nodes further to display the target policy node.
4. Open the policy node. Then, open the **Job Definition** node and the target job. The selection sets used to define the job are displayed under this node.
5. To edit a selection set, right-click the set name and select **Manage Sets**.
6. This opens the **NVBU Set Management** window. Make the required changes and save the set. For details on modifying a selection set, refer to [Modifying a Selection Set on page 131](#).

The scheduled instance for the job is modified when you save the set.

8.8.0 Modifying Policy Client List

To add or remove Clients/Client Groups for a policy, you can also use the following method.

1. Open the **NVBU Policy Management** window.
2. In the View list, select **Policy View**.
3. Open the nodes further to display the target policy node.
4. Right-click the node and select **Implement on Clients**. This opens the **NVBU Policy Clients Manager** window.
5. To add a Client or Client Group, click the check box for it, and then click the Left Arrow. The selected Clients and Client Groups are now listed under **Selected**.
6. To remove an added Client or Client Group, click the check box for it under **Selected**, and then click the Right Arrow.
7. To save the changes, click **OK**.

8.9.0 Acknowledging Errors/Warnings

The purpose of the status indicators is to help administrators identify a failed job or a job completed with warnings, and take corrective action. When this is accomplished you can acknowledge the error/warning to clear them. To clear the errors/warnings, perform the following steps:

1. Right-click the corresponding policy node and select **Acknowledge Errors/Acknowledge Warnings**. To acknowledge errors within multiple policies, right-click the parent node. For example, right-click the **Policies** node in the **Policy View** and select **Acknowledge Errors/Acknowledge Warnings**.
2. NVBU clears the errors/warnings and replaces the red/orange status indicator with a green status indicator.

8.10.0 Deleting a Policy

You can use the procedure in this section only if the policy has no active jobs or the policy is in a quiesced state. For details on quiescing a policy, refer [Editing an Active Policy on page 143](#). To delete a policy, perform the following steps:

1. Open the **NVBU Policy Management** window.
2. In the **View** list, select **Policy View**.
3. Open the nodes further to display the target policy node.
4. Right-click the node and select **Delete**.
5. In the confirmation window, click **Yes**.

Chapter 9:

RESTORE

This chapter describes how to use NVBU to restore and recover your data. The information in this chapter is organized into the following topics:

- [Restore – An Overview](#)
- [Restoring Data with NVBU Plugins](#)
- [Creating a Restore Job](#)
- [Configuring Source Device for Restore](#)
- [Configuring the Advanced Restore Options](#)
 - ❖ [Using Pre and Post Restore Scripts](#)
 - ❖ [Enabling Network Compression](#)
- [Restoring Data to an Alternate NVBU Client](#)
- [Restoring from a Saveset with Offline Indexes](#)
- [Restoring from a Saveset with Compressed Indexes](#)
- [Restoring an Encrypted Saveset](#)
- [Additional Features Available on the Selections Tab](#)
 - ❖ [Sorting the Savesets](#)
 - ❖ [Filtering the Savesets](#)
 - ❖ [Searching for Data Items](#)
 - ❖ [Viewing Media List for a Saveset](#)
- [Additional Considerations](#)
 - ❖ [Restores on Itanium Platforms](#)

9.1.0 Restore – An Overview

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 (e.g., a file that was accidentally deleted)
- To recover database/files which have been corrupted
- To copy or move data to another database/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/production server
- To recover from media failure, O/S corruption, loss of physical system

The NVBU plugins interface with the native APIs to restore and recover application-specific data from the backup savesets. The restore methods and options provided by these plugins vary depending on the application type. In general, NVBU offers the following restore features:

- Complete or granular restores
- Disaster recovery
- Restores to alternate location
- Restores to alternate server

9.2.0 Restoring Data with NVBU Plugins

Restores are performed from the **Restore** window. You can use the Console running on the NVBU Server or any Client to define and submit the restore job.

A restore job definition generally consists of the following components:

- Selection list
- Plugin-specific restore options
- Source device options which specify where the source media is located
- Target Client name, when restoring to an alternate server
- Job schedule
- Advanced restore options

Each component contains a set of attributes which can be configured manually or using a selection set. For details on selection sets, refer to [Selection Sets on page 127](#).

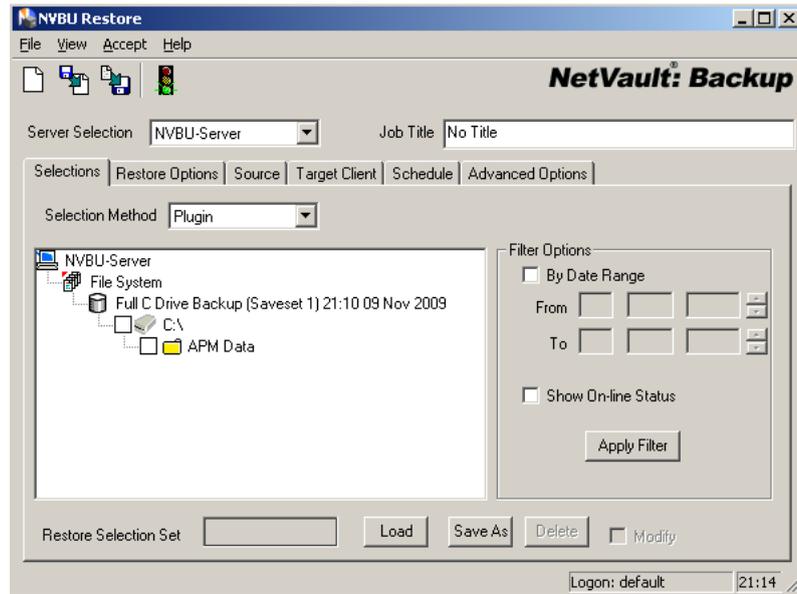
Each job has a Job ID and a title. The Job ID is a sequential number which is auto-generated. The job title is user-defined and allows you to easily identify the job when monitoring its progress or viewing the job logs.

9.3.0 Creating a Restore Job

To create a restore job, perform the following steps:

1. Click **Restore** on the toolbar or **Large Buttons** panel to open the **NVBU Restore** window. Alternatively, on the **Operations** menu, click **Restore**.
2. On the **Selections** tab, open the Client that was the source of the backup. To open any node in the **Selections** tab, you can do either of the following:
 - Double-click the node
 - Right-click the node and select **Open**

Figure 9-1:
NVBU
Restore
window



3. Select the plugin that was used to backup the data.
4. Open the target saveset and then select the data you want to restore. The selection tree varies for different plugins. Refer to the relevant APM/Plugin User's Guide for more information on selecting data for a restore.
5. Click the **Restore Options** tab and configure the run-time parameters for the job. These options are plugin-specific. Refer to the relevant APM/Plugin User's Guide for more information on specific restore options.
6. Click the **Source** tab and configure the source device options. For details, refer to [Configuring Source Device for Restore on page 150](#). You can omit this step if you want NVBU to automatically handle the device selection.
7. Click the **Schedule** tab and configure the scheduling options. For details, refer to [Job Scheduling on page 113](#). You can omit this step if you want to run the job immediately, which is the default schedule for all NVBU jobs.
8. Click the **Advanced Options** tab and configure the advanced options for the job. For details, refer to [Configuring the Advanced Restore Options on page 151](#). You can omit this step if you do not want to set any advanced options.
9. Enter a title for the job in the **Job Title** box at the top right corner of the **Restore** window.
10. Click **Submit** on the toolbar. Alternatively, on the **Accept** menu, click **Submit Restore**.

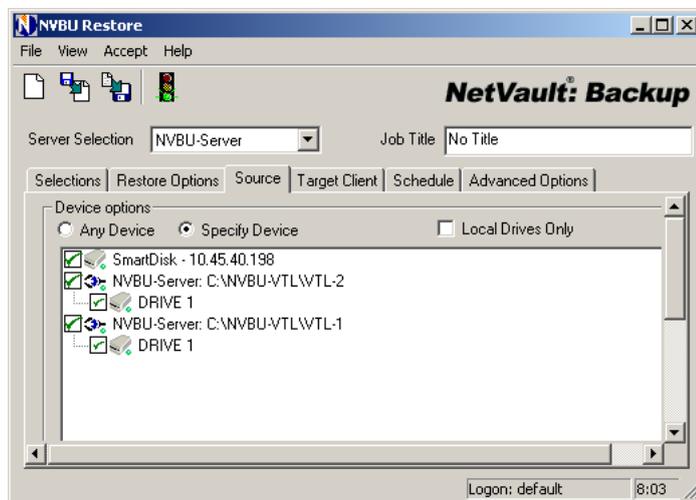
9.4.0 Configuring Source Device for Restore

NVBU allows you to select the source device where the backup is stored. You can use this option to enforce local data transfers on a SmartClient. This option is also useful if a backup was performed to an NVSD Device or a VTL, and then copied to a tape. It can be used to restore the data from the NVSD or VTL to speed up the restore or if the tape has already been moved off-site. To specify the source device for a restore, perform the following steps:

1. In the **NVBU Restore** window, click the **Source** tab.
2. To use only locally attached devices, select the **Local Drives Only** under **Device Options**.
3. To use any device added to the NVBU Server, select **Any Device** under **Device Options**.
4. To use particular device(s), select **Specify Device** under **Device Options**.

In the box below, all the devices added to the NVBU Server are listed. Since NVBU is configured to automatically select a backup device, all the devices in the list are selected by default. To exclude devices, perform the following:

Figure 9-2:
Source tab on
NVBU Restore
window



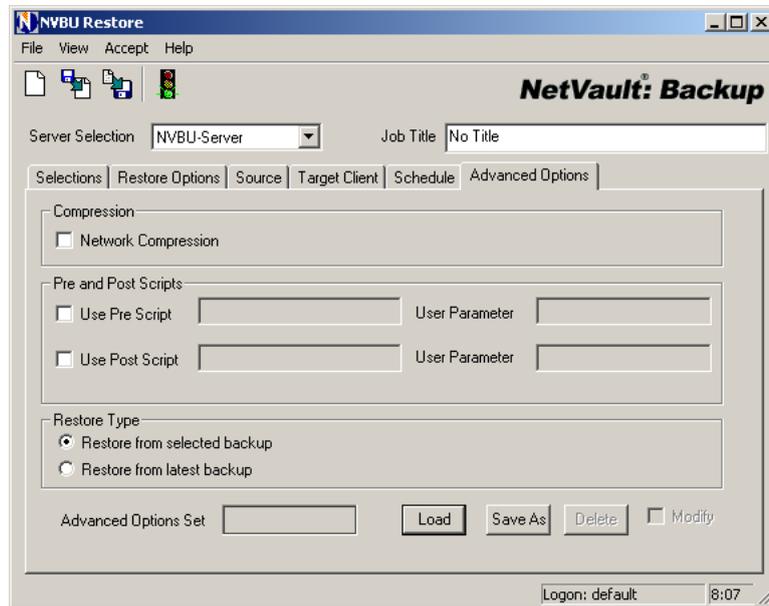
- To exclude a particular library, clear the check box for it. All the drives associated with the device are automatically removed when you remove the library.
- To exclude a particular drive, clear the check box for it.

9.5.0 Configuring the Advanced Restore Options

This section describes how to configure the advanced options for a restore job. The information in this section is organized into the following topics:

- [Enabling Network Compression](#)
- [Using Pre and Post Restore Scripts](#)

Figure 9-3:
Advanced
Options tab on
NVBU Restore



9.5.1 Enabling Network Compression

While transferring data over the network, you can compress the data to reduce the bandwidth usage. Data is first compressed on the NVBU Server or SmartClient to which the source device is attached before it is transferred over the network. On the target NVBU Client, the data is de-compressed before it is restored. Note that network compression does not work for the following types of jobs:

- Restores from NVSD Devices.
- Restores from devices attached to NAS Filers.
- Jobs using the NDMP Plugin, NetWare Thin Client Plugin or the NetVault: Backup Bare Metal Recovery.

To enable network compression for a restore job, perform the following steps:

1. In the **NVBU Restore** window, click the **Advanced Options** tab.
2. Under **Compression**, select the **Network Compression** check box.

9.5.2 Using Pre and Post Restore Scripts

NVBU provides the pre and post restore scripts feature, which allows you to run your own scripts at the start and/or completion of a restore job. These scripts can be used to perform tasks, such as shutting down a database before starting the job, or starting the database after the job completes. Consider the following points when using the pre and post restore scripts feature:

- The script must be an executable file, for example, **.bat** on Windows, or **.sh** on Linux/UNIX.
- The scripts can contain run-time parameters. Use the NVBU environment variable **NV_USER_ARG** to access the values for these parameters in the script.
- You can also use other NVBU environment variables in the script. For details on environment variables, refer to [NVBU Environment Variables on page 269](#).
- After creating the script, copy it to the **...\scripts** folder on the target Client. You can also create sub-folders to organize the scripts.
- If a pre script fails, the restore job fails.
- If the pre script completes successfully while the restore job fails, the post script is still executed; the job status is reported as **Restore Failed**.
- If the pre script and the restore complete successfully while the post script fails, a script error is logged; the job status is reported as completed with warnings.
- By default, NVBU provides the following two scripts that can be run as post restore scripts:
 - ❖ **psmail** – This script emails the job completion status to the addresses passed as user parameter.
 - ❖ **psmail_logs** – This script emails the job completion status and the job logs to the addresses passed as user parameter.

To run pre and post scripts for a restore job, perform the following steps:

1. In the **NVBU Restore** window, click the **Advanced Options** tab.
2. Under **Pre and Post Scripts**, select the following options:
 - a. To run a script before the job starts, select **Use Pre Script**.
 - b. To run a script after the job completes, select **Use Post Script**.
3. Enter the script file name in the box next to the selected check box. If the script resides in the **...\scripts** folder, just enter the file name. Whereas, if it resides in a sub-folder within the **...\NVBU\scripts** folder, enter the relative path (e.g., if the script file **myscript.bat** resides in the folder **...\scripts\tst**, enter **\tst\myscript.bat** in the box).

4. To pass run-time parameters, enter the value in the **User Parameter** box. The value must be valid and conform to its usage in the script. NVBU does not perform any validity checks on the user parameter.

9.6.0 Restoring Data to an Alternate NVBU Client

Restoration to an alternate NVBU Client is typically required in disaster recovery scenarios or when copying data to a production or test server. The target NVBU Client selection is done on the **Target Client** tab of the **NVBU Restore** window. Although all NVBU plugins support this feature, the actual implementation varies for each. Refer to the relevant APM/Plugin User's Guide for the complete procedure.

9.7.0 Restoring from a Saveset with Offline Indexes

To browse or restore from a saveset with offline indexes, you must first re-load the indexes temporarily. To accomplish this, perform the following steps:

1. Open the **NVBU Restore** window.
2. On the **Selections** tab, open the Client that was the source of the backup.
3. Open the plugin that was used to create the saveset.
4. Right-click the target saveset and select **Load Index**.
5. In the **Days to Keep Index** box, enter the number of days you want to retain the index in the NVDB.

Figure 9-4:
Days to Keep
Index window



6. Click **OK**.

9.8.0 Restoring from a Saveset with Compressed Indexes

NVBU automatically de-compresses the index when you open a saveset with compressed indexes. The index is copied to a temporary directory which is automatically deleted when the operation completes. You can also de-compress the indexes manually. To de-compress an index manually, perform the following steps:

1. Open the **NVBU Restore** window.
2. On the **Selections** tab, open the Client that was the source of the backup.

3. Open the plugin that was used to create the saveset.
4. Right-click the target saveset and select **Uncompress**.

9.9.0 Restoring an Encrypted Saveset

No additional steps are required to restore an encrypted backup. However, before you start the restore procedure, ensure that the Encryption Plugin is installed and configured on the target Client. For detail on installing and configuring the Encryption Plugin, refer to *NetVault: Backup Encryption Plugin Guide*.

9.10.0 Additional Features Available on the Selections Tab

This section provides a brief description of the additional features present on the **Selections** tab of the **NVBU Restore** window. These features are common to all NVBU plugins.

9.10.1 Sorting the Savesets

By default, the savesets on the **Selections** tab are sorted by the Plugin used to generate them. To change the sort order for the savesets, perform the following steps:

1. Click the **Selections** tab.
2. In the **Selection Method** list, select the sort criteria:
 - **Backup Set** – To sort the savesets by the Selection Set used for the backup, select **Backup Set**.
 - **Job** – To sort the savesets by the Job Title, select **Job** in the **Selection Method** list.
 - **Plugin** – To change the sort order back to Plugin, select **Plugin** in the **Selection Method** list

9.10.2 Filtering the Savesets

To filter the savesets displayed on the **NVBU Restore** tab, perform the following steps:

1. Click the **Selections** tab.
2. Under **Filter Options**, set the filter criteria as described below:
 - **By Date Range** – Select the **By Date Range** check box, and enter or select the **From** and **To** dates in the boxes provided to list the savesets generated during the specified period.
 - **Show On-line Status** – Select the **Show On-line Status** check box to list the savesets stored on the currently online media.

3. Click **Apply Filter** to set the filter.

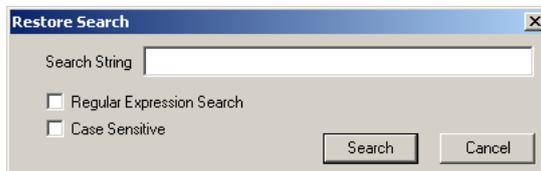
9.10.3 Searching for Data Items

The **Search** feature on the **NVBU Restore** window allows you to find a particular file or data item inside a saveset without opening it or browsing through contents. You can use either the entity name or a regular expression to find the entities. Typically, you can perform a search at the plugin level to find which saveset contains the entity, or at the saveset level to determine whether the entity is included in a particular saveset. However, NVBU allows you to use this feature at any level in the restore selections tree.

To use the **Search** feature, perform the following steps:

1. On the **Selections** tab, right-click the Client and select **Search**. If you want to perform a search at the plugin level or saveset level, open the nodes further. Right-click the plugin node or the target saveset node, and select **Search**. This opens the **Restore Search** window.

Figure 9-5:
Restore
Search
window



2. Enter the search string in the box provided.
3. To search for entities using regular expression, select the **Regular Expression Search** check box.
4. To match case during search, select **Case Sensitive** check box.
5. Click **Search** to begin the search and display the matching records.

9.10.4 Viewing Media List for a Saveset

To view the media list for a saveset, perform the following steps:

1. On the **Selections** tab, open the Client that was the source of the backup.
2. Open the plugin that was used to backup the data.
3. Right-click the target saveset and select **Media List**.
4. In the **<Job Title> (Saveset #)** window the following details are displayed: the total backup size, the list of media used to backup data, the total bytes written to the media, the media status, details of the media containing the backup index.
5. Click **OK** to close the window.

9.11.0 Additional Considerations

Refer to the following notes when restoring data with NVBU.

9.11.1 Restores on Itanium Platforms

Attempting to restore an index larger than 2GB may result in a failed restore on Itanium platforms. If a restore fails with the error message **Failed when sorting items to restore**, you will need to manually increase the stack size by using one of the following methods:

- On standard Unix platforms, this can be resolved by editing the `ulimit` (`-s` option) in the CLI Terminal to increase the stack size. Open a CLI Terminal and utilize the following commands:
 - ❖ `ulimit -a` provides all the settings for the environment
 - ❖ `ulimit -s` provides the current stack size setting
 - ❖ `ulimit -s unlimited` sets an unlimited stack size
 - ❖ `ulimit -s n` (where `n` is the desired value) sets stack size to `n`.
 - ❖ `man ulimit` provides for more details on the `ulimit` commandAfter modification, issue the `ulimit -a` command to ensure that the setting has been changed.
- On a HP-UX Itanium platform the bash command `kmtune` or `kctune` (depending on the operating system) can be used to access to the kernel stack size information. The stack vars are `maxssiz` for 32-bit applications and `maxssiz_64bit` for 64-bit applications. Open a CLI Terminal and utilize the following commands
 - ❖ `kmtune -l -q maxssiz` provides the verbose setting information for a 32-bit application
 - ❖ `kmtune -l -q maxssiz_64bit` provides the verbose setting information for a 64-bit application
 - ❖ `kmtune -u -s maxssiz=n` (where `n` is the desired value) sets the new stack size to `n` for a 32-bit application
 - ❖ `kmtune -u -s maxssiz_64bit =n` (where `n` is the desired value) sets the new stack size to `n` for a 64-bit application
 - ❖ `kmtune -u -s maxssiz+n` (where `n` is the desired value) increases the stack size by `n` for a 32-bit application
 - ❖ `kmtune -u -s maxssiz_64bit +n` (where `n` is the desired value) increases the stack size by `n` for a 64-bit application

Note that all instances of `kmtune` should be replaced by `kctune` depending on the operating system. Issue the `man` command in a CLI terminal for details.

Chapter 10:

MEDIA MANAGEMENT

This chapter describes how to perform the media administration tasks. The information in this chapter is organized into the following topics:

- [Backup Media – An Overview](#)
- [Labeling and Grouping Media](#)
- [Performing Bulk Media Labeling and Grouping](#)
- [Viewing Media Status](#)
- [Write-protecting Media](#)
- [Retiring Backup Savesets](#)
- [Marking Media for Re-use](#)
- [Scanning Foreign Media](#)
- [Tracking Offsite Location](#)
- [Marking Media as Unusable](#)
- [Removing a Backup Index from the NVDB](#)
- [Blanking Media](#)
- [Performing Bulk Media Blanking](#)

10.1.0 Backup Media – An Overview

Backup media store the backup savesets. Each piece of media, whether a tape cartridge or a VTL, must have an on-tape label for identification. NVBU supports the following types of labels for a piece of media:

- Media barcode
- A system-generated string consisting of the NVBU Server Name, Date and a Seed Number
- A user defined string

Important: Backups to NVSD Devices are stream-oriented. The media concept does not apply to an NVSD Device.

NVBU provides the following ways to label a blank piece of media:

- Automatically label a blank piece of media during backup
- Label an individual piece of media before it is used
- Label all media items in a library in bulk
- Set barcode as media labels by default

While labeling a piece of media during a backup, NVBU uses the system-generated string as the default label. You can configure NVBU to use the media barcodes as the default labels, instead. For details on this configuration procedure, refer to *NetVault: Backup Configuration Guide*. To target the same set of tapes for backup, you can create media groups. The media groups can be used in conjunction with the re-use feature to rotate the media for Full and Incremental backups according to your media rotation policy. Additionally, you can use NVBU's media management tools to write-protect media, eliminate unusable media, and track the off-site location of a piece of media.

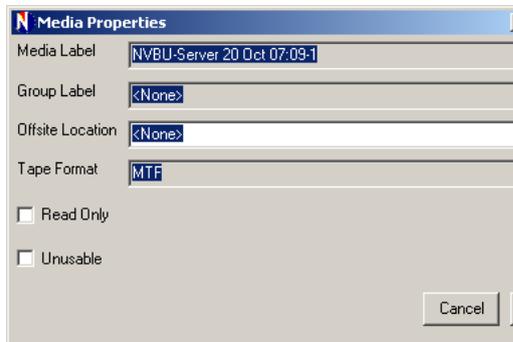
10.2.0 Labeling and Grouping Media

To label a piece of media and add it to a media group, perform the following steps:

Note: Only the **Group Label** parameter is available NVSD Devices.

1. Open the **NVBU Device Management** window.
2. On the **Devices** tab right-click the drive/slot that contains the media, and select **Properties**.
3. Configure the following parameters in the **Media Properties** window:

Figure 10-1:
Media
Properties
window



- **Media Label** – NVBU provides two default labels for media – the Media Barcode, and a system-generated string of NVBU Server Name, Date and a Seed Number. To assign one of these as the media label, select it in the **Media Label** list. To assign a user defined label, enter the string in the box
 - **Group Label** – To add the piece of media to a group, select the group label in the **Group Label** list. To create a new group and add the piece of media to it, enter the group label in the box.
 - **Tape Format** – To set a non-default tape format, select MTF (on Windows) or CPIO (on Linux/UNIX) in the **Tape Format** list.
4. Click **OK**.

10.3.0 Performing Bulk Media Labeling and Grouping

To bulk label and/or group the media items in a library, perform the following steps:

Note: Bulk media labeling and grouping does not apply to an NVSD Device.

1. Open the **NVBU Device Management** window.
2. On the **Devices** tab, right-click the target library, and select **Bulk Label** to open the **Bulk Label Media** window.

Figure 10-2:
Bulk Label
Media window

Bulk Label Media

Type of Media to Label

Blank Other NetVault 5 Reusable

Type of Label

Barcode Machine and Date User

User

Label % not allowed

Seed Empty or numeric only

Group Label

<None>

All Media in List

DRIVE 1: BLANK (KABQD004)
SLOT 1: BLANK (KABQD001)
SLOT 2: BLANK (KABQD002)
SLOT 3: BLANK (KABQD003)

Enter 'LABEL' to confirm request

Must Enter 'LABEL' above, for 'OK' button to work

Cancel OK

3. Under **Type of Media to Label**, select the media type from the following categories:
 - **Blank** – Select this check box to label any blank, non-labeled piece of media in a device that is currently accessible to the NVBU Server.
 - **Other** – Select this check box to bulk label media types that do not belong to any category listed here.
 - **NetVault 5** – Select this check box to label any piece of media that was used to backup data with NVBU v5.x.
 - **Reusable** – Select this check box to label a piece of media marked as reusable.
4. Under **Type of Label**, select one of the following:
 - **Barcode** – Select this option to use the barcode as media label.
 - **Machine and Date** – Select this option to use NVBU Server name and date as the label.

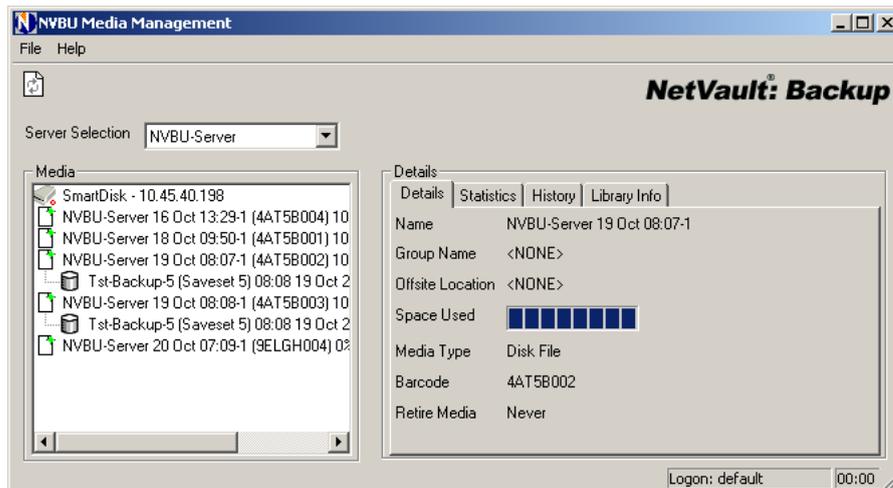
- **User** – For a user-defined label, select **User** and enter the following details:
 - ❖ **Label** – Enter the string to be used as media label. NVBU does not support a % character in the string.
 - ❖ **Seed** – In addition to the string, a sequential number is also added to the media label for unique identification. Enter the starting number for the sequence in the **Seed** box. The number will be incremented for each media. If the box is left blank, NVBU will start numbering the media from 1. The **Seed** does not apply to VTL media.
5. To add the media items to a group, select the group label in the **Group Label** list or enter the name for a new group in the box.
 6. Select the media items for labeling. Use Shift+Click/Ctrl+Click to select multiple media in the list. To label all media in the list, select the **All Media in List** check box.
 7. In the **Enter 'LABEL' to Confirm Request** box, enter LABEL (case insensitive) to confirm bulk labeling.
 8. Click **OK**.

10.4.0 Viewing Media Status

To view the media status, perform the following steps:

1. Open the **NVBU Media Management** window.
2. The currently online media are listed under **Media**. The online status for the media is indicated with a green light icon. To view the details, double-click the media, or right-click and select **Open**.

Figure 10-3:
NVBU Media
Management
window



3. Under **Details**, click the corresponding tab to view the following information:
 - The **Details** tab displays the media label, group label, off-site location for the media, space used, media type, barcode and the retirement date.
 - The **Statistics** tab displays the space left, size of the data stored, total segments, and the last read and write dates for the media.
 - The **History** tab displays the re-use statistics, read and write errors, and the total amount of data read and written. In case of any read/write errors, investigate the cause. If the media is damaged, mark it as unusable to prevent further writes.
 - The **Library** tab displays the library name, the current media location (the drive/slot number), and the original home location (drive/slot) for the media.
4. To view the details of a saveset contained in the media, double-click it, or right-click and select **Status**.
5. Under **Details**, click the corresponding tab to view the following information:
 - The **Backup** tab displays the job title, NVBU Server and Client names, plugin name, backup selection set, date, is an Incremental saveset, is an archive, and the number of generations left for the saveset expiration.
 - The **Segment n** tab displays the length of the segment, offset, segment position, block size, total time required to complete the backup, total time required to transfer the data to segment n, user ID, and the backup retirement date.
 - The **Index** tab provides the on-tape index information. The details include, the index size, the slot/drive on which the media resides, the user ID, and the retirement date.

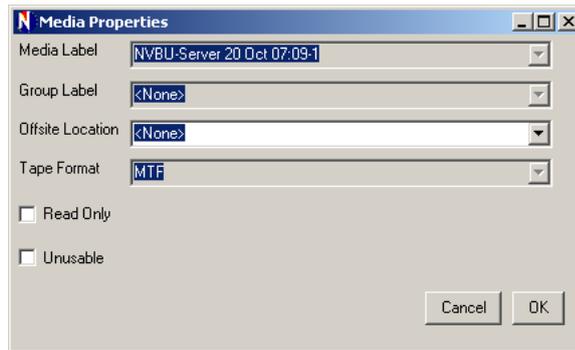
10.5.0 Write-protecting Media

To prevent further writes on a piece of media, perform the following steps:

Note: The media write-protection feature does not apply to an NVSD Device.

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the drive/slot that contains the media, and select **Properties**.
Alternatively, open the **NVBU Media Management** window. Under **Media**, right-click the target media and select **Properties**.
2. In the **Media Properties** window, select the **Read Only** check box.

Figure 10-4:
Media
Properties
window



3. Click **OK**.

You can also select the **Protect Media from Further Writes after Backup** check box on the **Target** tab on the **Backup** window when defining a backup job to write-protect the media.

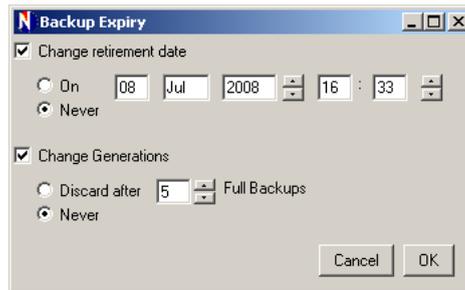
Note: NVBU may mark a piece of media as **Read Only** if a SCSI error occurs during a write operation in order to stop further writes. If this is the case, check for hardware errors. If no tape or media error is found, clear the check box for the **Read Only** property.

10.6.0 Retiring Backup Savesets

NVBU supports generation-based and time-based retirement period for a saveset, which can be set from the **Advanced Options** tab on the **NVBU Backup** window while creating a job. For existing savesets, you can set or change the retirement period from the **NVBU Media Management** window. The information about the saveset is deleted from the NVDB when the period elapses. To set or change the retirement date for existing savesets, perform the following steps:

1. Open the **NVBU Media Management** window.
2. Under **Media**, open the media that contains the target saveset (double-click the media, or right-click and select **Open**).
3. Right-click the saveset, and select **Change Expiry**. This opens the **Backup Expiry** window.

Figure 10-5:
Backup Expiry
window



4. To set a time-based retirement date, perform the following steps.
 - a. Select **Change Retirement Date**.
 - b. Select **On**.
 - c. Enter the date in the boxes provided.
Select **Never** to retain the backup indefinitely.
5. To set a generation-based retirement period, perform the following steps:
 - a. Select **Change Generations**.
 - b. Select **Discard After**.
 - c. Enter the number of generations in the **Full Backups** box.
Select **Never** to retain the backup indefinitely.
6. Click **OK**.

Note: NVBU automatically marks a piece of media for re-use for tape devices when the last saveset on the media expires.

10.7.0 Marking Media for Re-use

To manually mark a piece of media for re-use, perform the following steps. This will retain the media label and any group association.

Note: The media re-use feature is not meant for an NVSD Device. The NVSD Device uses a process known as the Garbage Collection to find chunks that are no longer used by any backup. The orphaned chunks are removed from the chunk store and the space is automatically reclaimed for newer backups.

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the drive/slot that contains the target media, and select **Re-use**.
2. In the confirmation window click **OK**.

To use this media for a backup, you must set the **Reuse Media** option on the **Backup Target** tab to either **Any** or **With Same Group Label as Target Media**. NVBU will overwrite the existing data when the media is re-used.

10.8.0 Scanning Foreign Media

NVBU cannot process data on a piece of media for which the media information is not present in the NVDB until the media, the backups and the on-tape indices stored on that media have been successfully scanned into the NVDB. Such media is marked as **Foreign**. Typically, media that is swapped between libraries, removed, or for which no job details are available are marked as Foreign. To scan a foreign media, perform the following steps:

Note: For details on scanning an NVSD Device, refer to [Scanning an NVSD Device on page 44](#).

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the library or the drive or slot that contains the target media, and select **Scan**.
2. NVBU will scan the header and add it to the NVDB. Scanning retrieves the header information from the tape and also the on-tape indices (backup saveset index files) that are then added to the NVDB. Foreign tapes then become known to NVBU. The scanning process does not read data on the tape. Instead it skips between the beginning and end of backups looking for the on-tape index for each backup saveset.

10.9.0 Tracking Offsite Location

To track the offsite location for a piece of media, perform the following steps:

Note: The offsite media location property does not apply to an NVSD Device.

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the drive/slot that contains the media, and select **Properties** to open the **Media Properties** window.
Alternatively, open the **NVBU Media Management** window. Under **Media**, right-click the target media and select **Properties**.
2. In the **Offsite Location** list, select the media location or enter the new location in the box.
3. Click **OK**.

10.10.0 Marking Media as Unusable

To mark a damaged media as unusable and prevent its further use, or to mark a piece of media unusable until a later date, perform the following steps:

Note: This feature does not apply to an NVSD Device.

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the drive/slot that contains the media, and select **Properties**.
Alternatively, open the **NVBU Media Management** window. Under **Media**, right-click the target media and select **Properties**.
2. In the **Media Properties** window, select the **Unusable** check box.
3. Click **OK**.

10.11.0 Removing a Backup Index from the NVDB

To delete a backup index from the NVDB, perform the following steps:

1. Open the **NVBU Media Management** window.
2. Under **Media**, open the media that contains the target saveset (double-click the media, or right-click and select **Open**).
3. Right-click the saveset, and select **Remove**.
4. In the confirmation window, click **OK**. The backup index will be removed from the NVDB. To use the saveset again, you must scan the media or recover a previous NVDB backup which contained the saveset information.

10.12.0 Blanking Media

In NVBU terms, blanking a piece of media removes the NVBU header information from the media. It also delete the media label and remove any group association. This makes the media available to NVBU for storing future backups. The backup data residing on the media is not deleted or erased; it can still be recovered from tape using OS tools or data recovery service. If it is desired to purposely destroy the data that is stored on the media, the media should be blanked by NVBU and have its data securely removed by tools that are designed for such purposes.

To erase all data on a piece of media, perform the following steps:

Note: Media Blanking feature does not apply to an NVSD Device.

1. Open the **NVBU Device Management** window. On the **Devices** tab, right-click the drive/slot that contains the target media, and select **Blank**.
2. In the confirmation window, click **OK**.

10.13.0 Performing Bulk Media Blanking

To erase data on all media or a set of media in a library, perform the following steps. This will also delete the media labels and remove any group association.

Note: Bulk media blanking not apply to an NVSD Device.

1. Open the **NVBU Device Management** window. On the **Devices** tab right-click the library that contains the target media, and select **Bulk Blank**. This opens the **Bulk Blank Media** window.
2. Use Shift+Click or Ctrl+Click to select multiple media in the list. To blank all media in the library, select the **All Media in List** check box.
3. In the **Password** box, enter the password for the NVBU Server.
4. In the **Enter 'BLANK' to Confirm Request** box, enter BLANK (case insensitive) to confirm bulk blanking.
5. Click **OK**.

Chapter 11:

JOB MANAGEMENT

This chapter describes how to manage NVBU Jobs from the Console. The information in this chapter is organized into the following topics:

- [NVBU Job Management – An Overview](#)
- [Viewing Job Status and Definitions](#)
- [Monitoring Job Progress](#)
- [Customizing the Column Show/Hide Settings](#)
- [Filtering Records on the Status Tab](#)
- [Filtering Records on the Jobs Tab](#)
- [Running a Job Immediately](#)
- [Submitting a New Instance for Non-Repeating Jobs](#)
- [Holding and Resuming a Job](#)
- [Aborting a Job](#)
- [Viewing Media Request Details](#)
- [Changing Media Request Priority for a Job](#)
- [Determining the Cause of “Waiting for Media” Status](#)
- [Deleting a Job Schedule](#)
- [Deleting a Job Definition](#)

11.1.1.0 NVBU Job Management – An Overview

NVBU jobs are managed by the Job Manager process, which coordinates with the the Data Plugin, Media Manager and other NVBU processes to complete the job execution. The job details are stored in the **Scheduler** database. The **NVBU Jobs** window provides an interface to access the information in the Scheduler database. This window provides a consolidated view of all NVBU jobs on the following tabs:

- **Status Tab** – The **Status** tab displays all submitted jobs, including the scheduled, running and completed jobs.
- **Jobs Tab** – The **Jobs** tab displays the job definitions of both the submitted and the saved jobs.

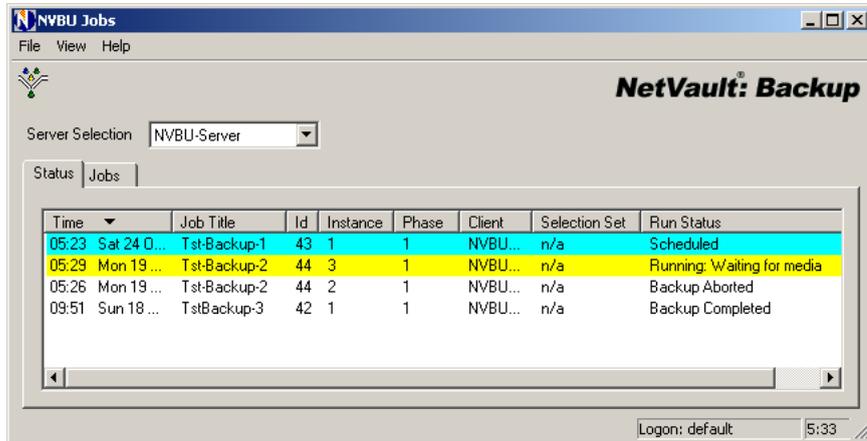
You can use the **NVBU Jobs** window to view the job status, monitor the job progress, access the job logs, start and stop jobs, and perform other job management tasks from the Console.

11.2.0 Viewing Job Status and Definitions

To view the job status and definition, perform the following steps:

1. Click **Job Management** on the toolbar or **Large Buttons** panel to open the **NVBU Jobs** window. Alternatively, on the **Operations** menu, click **Job Management**.

Figure 11-1:
Status tab on
NVBU Jobs
window



2. On the **Status** tab you can view all scheduled, running and completed jobs, which are differentiated using the following background colors:

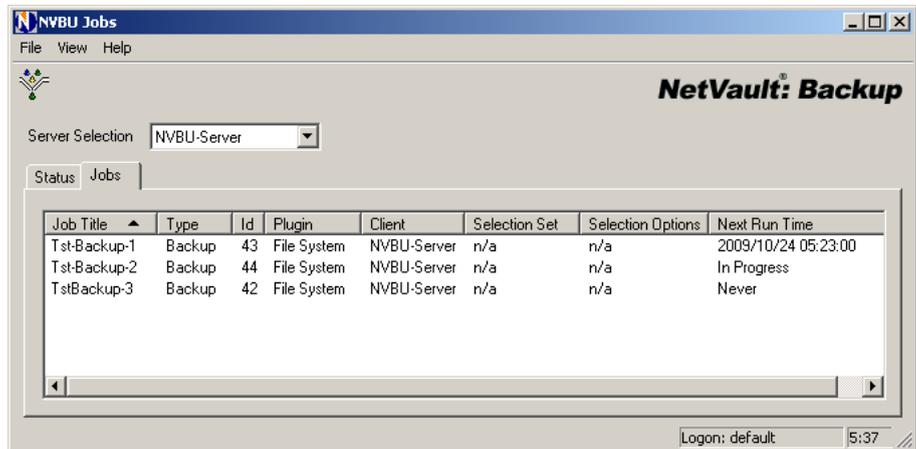
Job Status	Background Color
Running Jobs	Yellow
Scheduled Jobs	Blue
Completed Jobs	White (Normal)

These color codes are configurable and can be changed using the Configurator. For details, refer to *NetVault: Backup Configuration Guide*. The Status tab provides the following details:

- Date and Timestamp
- Job Title
- Job ID
- Instance
- Phase
- Client
- Selection Set
- Run Status

Figure 11-2:
Jobs tab on
NVBU Jobs
window

- To view the job definitions of the saved and submitted jobs, click the **Jobs** tab.



These color codes are configurable and can be changed using the Configurator. For details, refer to *NetVault: Backup Configuration Guide*. The Status tab provides the following details:

- Job Title
 - Job Type
 - Job ID
 - Plugin
 - Client
 - Selection Set
 - Selection Options
 - Next Run Time
- To view the job logs, double-click a job on the **Jobs** or **Status** tab. Alternatively, right-click the job and select **View Log**. For details on job logs, refer to [NVBU System Logs – An Overview on page 179](#).

11.3.0 Monitoring Job Progress

To monitor the job progress while a backup or restore job is running, perform the following steps:

- Open the **NVBU Jobs** window.
- On the **Status** tab, double-click an active job to open the **Job Monitor** window. Alternatively, right-click the job and select **Monitor Progress**.

Figure 11-3:
Job Monitor
window for File
System Plugin

3. The **Job Monitor** window varies for different plugins, and provides plugin-specific details in addition to the following information:



- Data Transfer Rate
 - Volume of Data Transferred
 - Elapsed Time
 - Items Completed
 - Current Object
4. Click **OK** to close the window.

11.4.0 Customizing the Column Show/Hide Settings

NVBU allows you to customize the **NVBU Jobs** window and hide the columns that you do not want to view on the **Jobs** or **Status** tabs. To show or hide columns on the **Jobs** or **Status** tabs, perform the following steps.

Note: The **Jobs** tab must contain at least one entry in order to customize the column show/hide settings.

1. Open the **NVBU Jobs** window.
2. On the **Jobs** or **Status** tab, right-click the header row.
3. To hide the columns, clear the check marks for the columns.

4. To display the columns again, right-click the header row and select the columns.

11.5.0 Filtering Records on the Status Tab

To filter the jobs displayed on the **Status** tab, perform the following steps:

1. Access the **Status** tab on the **NVBU Jobs** window.
2. Click **Set Filter** on the toolbar. Alternatively, on the **View** menu, click **Set Filter**.

Figure 11-4:
Status Filter
Options

The screenshot shows the 'Status Filter Options' dialog box. It is organized into several sections:

- Time:** Contains 'From' and 'To' sections. Each has radio buttons for 'First Job' and 'Last Job', and a 'Specify time' option with date and time pickers.
- Job Status:** Contains checkboxes for 'Scheduled Jobs', 'Running Jobs', and 'Completed Jobs'. Each has radio buttons for 'All', 'To run within', 'Completed with warnings or errors', and 'Completed with errors'.
- Filter Fields:** A grid of checkboxes and input fields for: Job Title, Type, Instance, Client, Selection Set, Schedule Set, Advanced Options, Policy, Id, Phase, Owner, Selection Options, Target Set, Run Status.
- Buttons:** 'Reset' and 'Cancel' buttons at the bottom right.

3. Set the filter(s) as described below:
 - **Date and Time Filters** – Under **From** and **To**, configure the following parameters:
 - ❖ **First Job** – Select the **First Job** option to start display from the first job definition. For a time-based filter, enter the start time in the **Specify Time** box.
 - ❖ **Last Job** – Select the **Last Job** option to view all logs from the start point until the last job definition. For a time-based filter, enter the end time in the **Specify Time** box.
 - **Job Status Filters** – Under **Job Status**, configure the following parameters:

- ❖ **Scheduled Jobs** – To view the scheduled jobs, select the **Scheduled Jobs** check box. Then, select **All** to view all scheduled jobs, or select **Run Within** to view jobs scheduled to run within next n hours/days. For the **Run Within** option, enter the number of hours or days in the box to the right and select **Hours** or **Days**.
- ❖ **Running Jobs** – To view the active jobs, select **Running Jobs**.
- ❖ **Completed Jobs** – To view jobs that have completed successfully or with warnings/errors, select **Completed Jobs**. Then, select **All**, **Completed with Warnings or Errors**, or **Completed with Errors**.
- **Job Attribute Filters** – Configure the following parameters:
 - ❖ **Job Title** – For a filter based on the job title, select this check box. Enter the job title in the box.
 - ❖ **Type** – For a filter based on the job type, select this check box. Enter Backup, Restore or Report in the box.
 - ❖ **Instance** – For a filter based on the job instance, select this check box. Enter or select the instance number in the **From** and **To** list.
 - ❖ **Client** – For a filter based on target client, select this check box. Enter the NVBU Client name in the box.
 - ❖ **Selection Set** – For a filter based on the backup selection set, select this check box. Enter the set name in the box.
 - ❖ **Schedule Set** – For a filter based on the schedule set, select this check box. Enter the set name in the box.
 - ❖ **Advanced Options** – For a filter based on the advanced options set, select this check box. Enter the set name in the box.
 - ❖ **Policy** – For a filter based on backup policies, select this check box. Enter the policy name in the box.
 - ❖ **ID** – For a filter based on the Job ID, select this check box. Enter or select the Job ID in the **From** and **To** list.
 - ❖ **Phase** – For a filter based on the job phase, select this check box. Enter or select the phase number in the **From** and **To** list.
 - ❖ **Owner** – For a filter based on the job owner, select this check box. Enter the user name in the box.
 - ❖ **Selection Options** – For a filter based on the backup or restore options set, select this check box. Enter the set name in the box.
 - ❖ **Target Set** – For a filter based on the target set, select this check box. Enter the set name in the box.
 - ❖ **Run Status** – For a filter based on job status, select this check box. Enter the status (e.g., Backup Completed) in the box.

4. By default, the filter settings are only applied to the current session. If you close the window, the settings will be discarded. Select **Set as Default Filter** to save the filter settings and use them as the default filter.
5. Click **Apply** to apply the filter condition(s). Then click **OK** to close the window.

11.6.0 Filtering Records on the Jobs Tab

To filter the jobs displayed on the **Jobs** tab, perform the following steps:

1. Access the **Jobs** tab on the **NVBU Jobs** window.
2. Click **Set Filter** on the toolbar. Alternatively, on the **View** menu, click **Set Filter**.

Figure 11-5:
Job Filter
Options

<input type="checkbox"/> Job Title	<input type="text"/>	<input type="checkbox"/> Policy	<input type="text"/>
<input type="checkbox"/> Type	<input type="text"/>	<input type="checkbox"/> Id	From: <input type="text"/> To: <input type="text"/>
<input type="checkbox"/> Plugin	<input type="text"/>	<input type="checkbox"/> Client	<input type="text"/>
<input type="checkbox"/> Owner	<input type="text"/>	<input type="checkbox"/> Selection Set	<input type="text"/>
<input type="checkbox"/> Selection Options	<input type="text"/>	<input type="checkbox"/> Schedule Set	<input type="text"/>
<input type="checkbox"/> Target Set	<input type="text"/>	<input type="checkbox"/> Advanced Options	<input type="text"/>
<input type="checkbox"/> Next Run Time	<input type="text"/>		
<input type="checkbox"/> Set as default filter			

Reset Cancel OK

3. Configure the following parameters:
 - **Job Title** – For a filter based on the job title, select this check box. Enter the job title in the box.
 - **Type** – For a filter based on the job type, select this check box. Enter Backup, Restore or Report in the box.
 - **Plugin** – For a filter based on the plugin used for the job, select this check box. Enter the plugin name in the box.
 - **Owner** – For a filter based on the job owner, select this check box. Enter the user name in the box.
 - **Selection Options** – For a filter based on the backup options set, select this check box. Enter the set name in the box.
 - **Target Set** – For a filter based on the target set, select this check box. Enter the set name in the box.
 - **Next Run Time** – For a filter based on the next run time, select this check box. Enter the date and time in the box.

- **Policy** – For a filter based on backup policies, select this check box. Enter the policy name in the box.
 - **ID** – For a filter based on the Job ID, select this check box. Enter or select the Job ID in the **From** and **To** list.
 - **Client** – For a filter based on target client, select this check box. Enter the NVBU Client name in the box.
 - **Selection Set** – For a filter based on the backup selection set, select this check box. Enter the set name in the box.
 - **Schedule Set** – For a filter based on the schedule set, select this check box. Enter the set name in the box.
 - **Advanced Options** – For a filter based on the advanced options set, select this check box. Enter the set name in the box.
4. By default, the filter settings are only applied to the current session. If you close the window, the settings will be discarded. Select **Set as Default Filter** to save the filter settings and use them as the default filter.
 5. Click **Apply** to apply the filter condition(s). Then click **OK** to close the window.

11.7.0 Running a Job Immediately

To run a job immediately, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Status** or **Jobs** tab, right-click the job and select **Run Now**. You can use the Shift+Click or Ctrl+Click methods to select multiple jobs.

Note: The **Run Now** feature cannot be used to run multiple backup jobs which include a Secondary Copy phase.

11.8.0 Submitting a New Instance for Non-Repeating Jobs

For non-repeating jobs, you can use an existing job instance or job definition to submit a new instance without re-creating the job. To submit a new instance for an existing job instance or job definition, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Status** or **Jobs** tab, right-click the backup job and select **Edit/View Job**.
3. In the **Backup** window, click **Submit** on the toolbar. Alternatively, click **Submit** on the **Accept** menu.

11.9.0 Holding and Resuming a Job

To put a job on hold, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Status** tab, right-click the job and select **Hold**.
3. To resume the job, right-click it and select **Resume**.

Note: Holding a job will disable its schedule until the job is resumed.

11.10.0 Aborting a Job

To abort a job, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Status** tab, right-click the job and select **Abort**.
3. In the confirmation window, click **Yes**.

11.11.0 Viewing Media Request Details

To view the media requests details while a backup job is in progress, perform the following steps:

1. While a backup job is in progress, open the **NVBU Media Management** window.
2. Under **Media**, double-click the media, or right-click and select **Open**.
3. Under **Details**, click the **Media Request** tab to view the following details:
 - Request ID
 - Job ID
 - Request Type
 - Job Status
 - NVBU Client on which the job is running
 - Drive on which the media resides
 - Media and group label; if no specific media is targeted, **Any** is displayed
 - Amount of space required on the media to complete the current request
 - Whether **Ensure This Backup is First on the Media** check box is selected
 - Whether **Mark Media Read-Only** is selected
 - Whether **Label Blank Media Automatically** is selected
 - Media format
 - Whether media inactivity timeout is set

- Whether **Local Drives Only** option is selected
- Whether **Network Compression** is enabled

11.12.0 Changing Media Request Priority for a Job

To change the media request priority for an active job, perform the following steps:

1. While a job is in progress, open the **NVBU Device Management** window.
2. On the **Media Requests** tab, right-click the job and select **Set Priority**.
3. In the Set Request Priority window, configure the following parameter:

Figure 11-6:
Set Request
Priority window



- **Priority** – To change the request priority, enter or select the priority level in the **Priority** box. The default priority of different request types are given below:

Request Type	Priority Level
Backup Job	30
Restore Job	20
Continuation Request	5

Note that the priority level ranges from 1 (highest priority) to 100 (lowest priority). A priority level of zero sets a request to run as a background task. A continuation request occurs when an active backup or restore job requires additional media for completion. NVBU assigns the lowest priority level to such requests so that they are not preempted by other media requests, and the active job completes without any interruption.

4. Click **OK**.

11.13.0 Determining the Cause of "Waiting for Media" Status

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

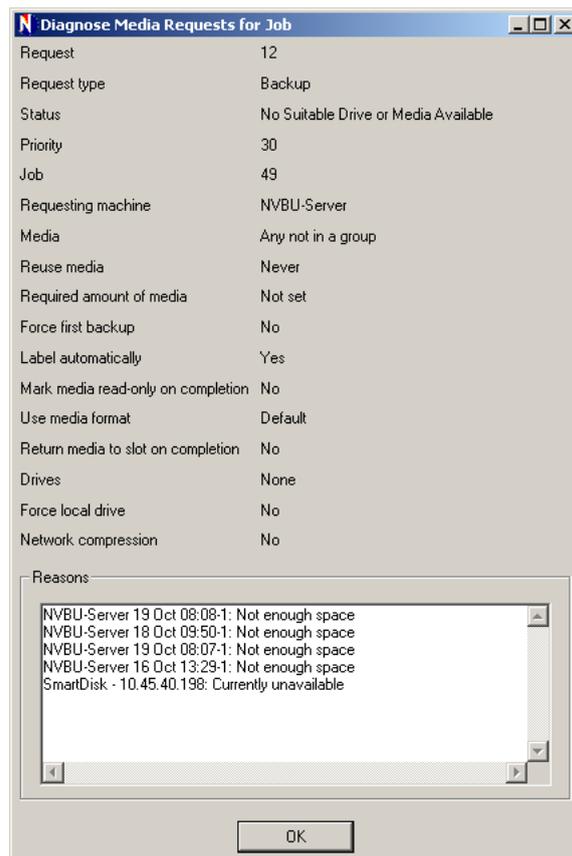
- The target media or device is in use by another job
- The target device is offline
- The target media is not loaded

- 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, perform the following steps:

1. Open the **NVBU Jobs** window.
2. Right-click the job with **Waiting for Media** status, and select **Diagnose Job**.
3. The **Diagnose Media Requests for Job** window displays the target device and media options with a list of available devices and media, and the reasons why they cannot be used.

Figure 11-7:
*Diagnose
Media
Requests for
Job window*



Important: BakBone recommends that you perform the steps above and take a binary log dump when logging a case with Technical Support.

4. Click **OK** to close the window.

11.14.0 Deleting a Job Schedule

To delete a job schedule, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Status** tab, right-click the job and select **Delete Schedule**.
3. In the confirmation window, click **Yes**.

11.15.0 Deleting a Job Definition

To delete a job definition, perform the following steps:

1. Open the **NVBU Jobs** window.
2. On the **Jobs** tab, right-click the job and select **Delete**.
3. In the confirmation window, click **Yes**.

Chapter 12:

SYSTEM LOG MANAGEMENT

This chapter describes how to view and manage the NVBU system logs. The information in this chapter is organized into the following topics:

- [NVBU System Logs – An Overview](#)
- [Viewing System Logs](#)
- [Customizing the Columns Show/Hide Settings](#)
- [Filtering Logs](#)
- [Dumping Logs to a File](#)
- [Viewing Dumped Logs](#)
- [Deleting Logs Manually](#)
- [Raising a Custom Log Event](#)
 - ❖ [Removing a Custom Log Event](#)

12.1.0 NVBU System Logs – An Overview

Various NVBU process send messages to the Server to notify about the operations taking, and report any problems or errors encountered during these operations. NVBU uses a log daemon to manage these system logs, and write them to log files. The Log Daemon starts with the NVBU Service, and runs on the NVBU Server. The system logs reside in the **...Logs** directory on the NVBU Server (where ... represents the NVBU installation directory). This directory can be relocated using the NVBU Configurator. For details, refer to the *NetVault: Backup Configuration Guide*.

The log files are stored in binary format and named log-0, log-1, log-2, etc. The Log Daemon always reserves space for logs by creating a blank file. For example, when log-0 becomes full, it creates log-2 before opening log-1 for recording events. Log-0 and log-1 are created during NVBU installation. To make sure that the system logs do not continue to accumulate and consume disk space, the Log Daemon automatically deletes them after 30 days.

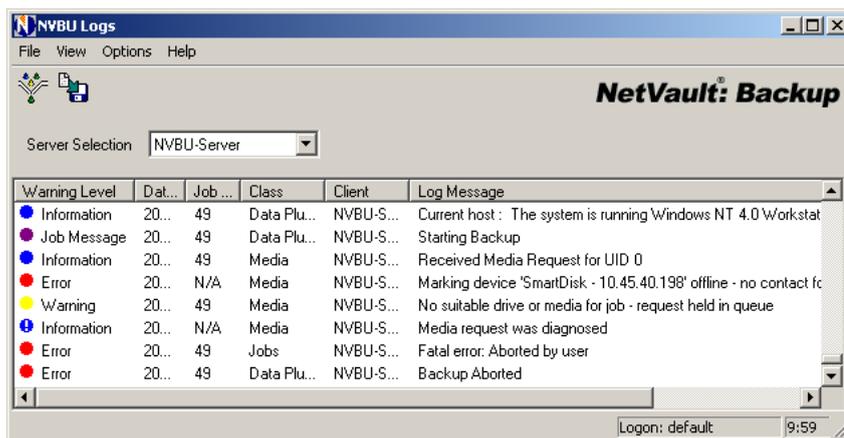
System Logs are useful for tracking activities and troubleshooting problems. You can view the system logs from the **NVBU Logs** window. The device logs and job logs can also be viewed from the **NVBU Device Management** and **NVBU Jobs** windows, respectively.

12.2.0 Viewing System Logs

To view the logs generated during an operation, perform the following steps:

1. Click **Logs** on the toolbar or **Large Buttons** panel. Alternatively, on the **Operations** menu, click **Logs**.
 - To view device specific logs, click the **Device Logs** tab on the **NVBU Device Management** window.
 - To view logs for a particular job, double-click the job in the **Status** or **Jobs** tabs on the **NVBU Jobs** window.
2. NVBU provides the following information about the log entries:

Figure 12-1:
NVBU Logs
window



- **Warning Level** – Depending on their severity, the messages are classified into different categories. Different color codes, called the Warning Level Indicators, are used to distinguish the log categories. An icon with an exclamation mark is used to represent messages that can be opened further to view the details or log contexts. The NVBU log categories include the following:
 - ❖ **Background Messages** – The general messages are classified as Background logs and represented with a green warning level indicator.
 - ❖ **Information Messages** – The messages related to media, scheduler, and system activities are classified as Information logs and represented with a blue warning level indicator.
 - ❖ **Job Message Messages** – The job activities are classified as Job Messages and represented with a purple warning level indicator. By default, only Job Messages and the higher categories are displayed.

- ❖ **Warning Messages** – Problems during process execution which do not cause a job to fail are classified as Warnings and represented with a yellow warning level indicator.
 - ❖ **Error Messages** – Problems encountered during execution which might have caused a job to fail are classified as Error Logs and represented with a red warning level indicator.
 - ❖ **Severe Error Messages** – Critical problems encountered during execution which might have caused a job to fail are classified as Severe Error Logs and represented with a red warning level indicator.
- **Date/Time** – The time stamp for the log in Year/Month/Date Hour:Minute:Second format.
 - **Job ID** – The Job ID for a backup, restore or a report job.
 - **Class** – The type of operation that generated the log. For example, media activity logs are classified as **Media**, messages sent by the plugin are classified as **Data Plugin**, and job messages are classified as **Job**.
 - **Client** – The name of the Client on which the process that generated the log is running.
 - **Log Message** – The detailed log message/description.
3. Double-click a message with an exclamation mark to open one of the following windows:
 - **Additional Information Window** – If the log contains information about data transfer or other such information, a window containing this information is displayed.
 - **View Job Context** – The log context typically contains the execution scripts or output generated by the plugin.
 4. To save a log context, click **Save to File**. In the **Save Log Context** window, enter the file name and click **OK**. The file is saved to ...**Logs** directory (where ... represents the NVBU installation directory).

12.3.0 Customizing the Columns Show/Hide Settings

NVBU allows you to customize the **Logs** window and hide the columns that you do not want to view. To hide or show the columns, perform the following steps:

Note: The **NVBU Logs** window must contain at least one entry in order to customize the column show/hide settings

1. In the **NVBU Logs** window, right-click the header row.
2. To hide the columns, clear the check marks for the column names.
3. To display the columns again, right-click the header row and select the columns.

12.4.0 Filtering Logs

To filter the logs appearing in the **NVBU Logs** window, perform the following steps:

1. Click **Set Filter** on the toolbar, or on the **View** menu, click **Set Filter**.

Figure 12-2:
Filter Options
window

2. Set filter(s) as described below:
 - **Date and Time** – For date and time filters, configure the following parameters under **From** and **To**:
 - ❖ **Start Point** – Select the **First Event** option if you want to view logs beginning with the first recorded event. For a time-based filter, enter the start time in the **Specify Time** box.
 - ❖ **End Point** – Select the **Last Event** option to view all logs from the start point until the most recent recorded event. For a time-based filter, enter the end time in the **Specify Time** box.
 - **Clients** – To hide messages related to particular NVBU Client(s), clear the corresponding check boxes under **Clients**.
 - ❖ **Select All** – To include all the listed NVBU Clients, click **Select All**.

- ❖ **Clear All** – To remove all the listed NVBU Clients, click **Remove All**. This will normally result in no logs being displayed. However if the log source is a log dump, then the **Clear All** option behaves differently because the **Clients** list may or may not contain the NVBU Clients present in the logs. Although, the **Client** list will be cleared, this will be interpreted as “**Do not Filter on NVBU Clients**” and all the logs will be displayed regardless of the **Client** list.
 - **Classes** – To hide certain classes of messages, clear the check boxes for them under **Classes**.
 - **Warning Levels** – To filter logs based on their severity, select the minimum severity level under **Warning Levels**. The warning levels are listed in the ascending order of severity. When you select a category, all logs belonging to the selected category and higher categories are displayed. For example, if you select Job Messages, then all logs classified as Job Messages, Warnings, Errors, and Severe Errors are displayed in the **NVBU Logs** window. **All** displays messages belonging to all log categories
 - **Jobs** – To view only logs for a particular job, select the **Filter on Job** check box under **Jobs** and enter the **Job ID**
 - **Text** – To set a filter string, select the **Filter on Text** check box under **Text** and enter the filter string in the box beneath
3. Click **Apply** to apply the filter condition(s). Then click **OK** to close the window.

12.5.0 Dumping Logs to a File

NVBU allows you to create a copy of the current logs and save them into a binary or text file before purging them from the NVDB. For selective dumping, first set a time-based filter criterion. For example, to dump all logs generated during last month, set a filter to display only those logs and then run this option.

To dump logs into a binary or text file, perform the following steps:

1. Open the **NVBU Logs** window.
2. Click **Dump Logs to File** on the toolbar. Alternatively, click **Dump Logs to File** on the **Options** menu.
3. In the **Dump Log Entries to File** window, configure the following options:

Figure 12-3:
Dump Log
Entries to File
window



- **Dump Log File Name** – Enter a file name for the log dump. If you do not enter the complete path, the dump file is saved to **...\\log\dumps\<text> or <binary>** folder. In this path ... represents the installation directory for NVBU and **<text>** or **<binary>** represent the name of the final folder based on the selected dump **Format**.
- **Format** – The logs can be dumped into one of following two formats:
 - ❖ **Text** – Select this option to dump the logs into a text file.
 - ❖ **Binary** – Select this option to dump the logs to a binary file (**.nlg**) which can be loaded to NVBU temporarily, if required. The binary format is required when sending the logs to BakBone Technical Support.

4. Click **OK** to save the logs.

12.6.0 Viewing Dumped Logs

To view the logs dumped as **.nlg** files, perform the following steps:

1. Open the **NVBU Logs** window.
2. Click **Select Log Source** on **Options** menu.
3. The dump files present in the **...\\logs\dumps\binary** folder are listed in the box beneath. To load a file in this folder, select it in the list.
4. To load a dump file residing in a different location, enter the complete file path in the box.
5. Click **OK** to view the dumped logs.
6. To reset the view to current logs, select the **Use Default Log** source option.

12.7.0 Deleting Logs Manually

The logs are automatically deleted after 120 days. You can change the Log Daemon properties and set a new purge period for the logs via the Configurator. For details, refer to the *NetVault: Backup Configuration Guide*. To manually delete the unnecessary logs, perform the following steps:

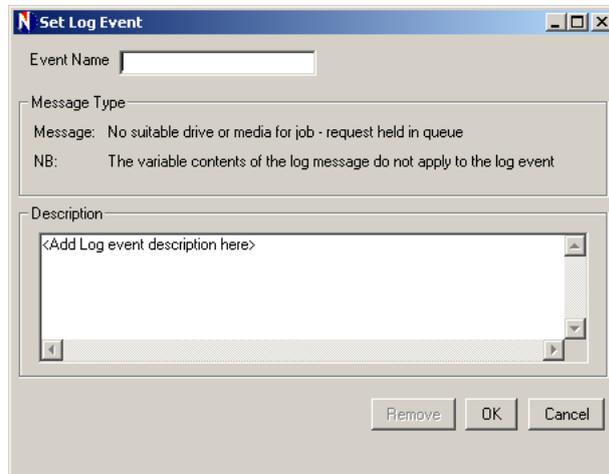
1. Open the **NVBU Logs** window.
2. Click **Purge Logs** on the **Options** menu.
3. In the **Purge Log Entries To** box, enter the date up to which you want to delete the logs.
4. Click **OK**.

12.8.0 Raising a Custom Log Event

You can raise a custom log event when a particular message is logged, and use any of the global or user-specific notification methods to alert you when this occurs. The custom log events are added to the **Log Daemon** class in the **NVBU Global Notification** window. To raise a custom log event, perform the following steps:

1. Open the **NVBU Logs** window.
2. Right-click a message and select **Set Event** to open.
3. Configure the following parameters in the **Set Event Log** window:

Figure 12-4:
Set Log Event
window



- **Event Name** – In the **Event Name** box, enter the event name
 - **Description** – In the **Description** box, enter a detailed description for the event.
4. Click **OK** to save the event definition.
 5. Set up a notification method for the event. For details on global notification methods, refer to [Setting up a Global Notification Method on page 189](#), and for details on user-specific notification methods, refer to [Setting a User Notification Profile on page 200](#).

12.8.1 Removing a Custom Log Event

To remove a custom log event, perform the following steps:

1. In the **NVBU Logs** window, right-click the message for which the event was set.
2. In the **Set Event Log** window, click **Remove**.

Chapter 13:

EVENT NOTIFICATION

This chapter describes how to set up notification methods for the NVBU events. The information in this chapter is organized into the following topics.

- [Events and Notification – An Overview](#)
 - ❖ [Methods for Setting up an Event Notification](#)
- [Events Notified By Default](#)
- [Setting up a Global Notification Method](#)
- [Viewing Operator Messages](#)
- [Removing a User-Defined Notification Event](#)

13.1.0 Events and Notification – An Overview

An event can be described as any significant occurrence within the NVBU system that you want to be notified about. It can be a user action, a system event or a state change event. The events can indicate an error or a problem, or just completion of a task.

NVBU events can be predefined or user-defined. The predefined events are organized into the following Event Classes – Audit, BakBone Time, Device, Job, Licensing, Log Daemon, Machines, Media, Media Database, Policy, Scheduler Database and Stats Collection. For details on event types in each class, refer [Predefined Events on page 249](#). The user-defined events can be created for system and job logs.

NVBU provides the following notification methods to receive a notification when a predefined or user-defined event is raised:

- **Sysop Email** – Send an email to the Sysop (Administrator) when an event is raised. This method requires the Email Server address and the Sysop email ID, which can be configured from the **Notification** tab on the Configurator. For details, refer to the *NetVault: Backup Configuration Guide*.
- **Sysop Operator Message** – Log an operator message when an event is raised. You can view these logs from the **NVBU Status** window.
- **Print Report** – Print a report when an event is raised.
- **Run a Job** – Run another job when an event is raised.

13.1.1 Methods for Setting up an Event Notification

NVBU provides three methods to generate notification:

- **Generate Notification for Predefined Events Globally** – You can set up one or more notification methods for an event in the **Global Notification** window to generate a notification whenever the event occurs within the NVBU Domain. Global notification methods can only be set for predefined events. You can choose the **Sysop E-mail**, **Sysop Operator Message** or **Print a Report** notification methods for a predefined event.
- **Generate Notification for Individual Users** – Notification methods can also be set up for individual users (e.g., NVBU Administrator). This allows a particular user to receive emails and/or Windows pop-up messages whenever the event occurs within the NVBU Domain. This is done by setting up a notification profile for the user in the **NVBU User Properties** window. For details on setting up a user notification profile, refer to [Setting a User Notification Profile on page 200](#). The notification will be generated each time the event occurs within the Domain.
- **Generate Notification for User-defined Events** – NVBU allows you to create a user-defined event for a particular instance of a system log or job log generated during NVBU operations.

To create a user-defined job or log event, refer to the following sections:

- ❖ [Setting up a User-Defined Notification Event on page 108](#)
- ❖ [Setting up User-Defined Notification Events for a Policy Job on page 141](#)
- ❖ [Setting up a User-Defined Notification Event on page 210](#)
- ❖ [Raising a Custom Log Event on page 185](#)

You can choose the **Sysop E-mail**, **Sysop Operator Message**, **Print a Report** or **Run a Report** notification methods for a user-defined event. A notification is generated only for the job log or system log for which it is configured.

13.2.0 Events Notified By Default

For certain significant events, NVBU sets up the **SysOp Operator Message** notification method by default. These include the following events:

- **Event Class: BakBone Time, Event Type: Server Time Unknown** – This event is raised when the Time Server is not able to fetch BakBone Time from the Source.
- **Event Class: Device, Event Type: No Suitable Drive** – This event is raised when NVBU is not able to find a suitable drive to run a backup or restore job.
- **Event Class: Licensing, Event Type: License Exceeded** – This event is raised when usage exceeds the available licenses.

- **Event Class: Licensing, Event Type: License Expiring** – This event is raised when the NVBU evaluation license is nearing expiry or has expired. It is raised when the validity period for an NVBU evaluation license is less than or equal to 7 days.
- **Event Class: Log Daemon, Event Type: Home Drive Becoming Full** – This event is raised when the disk space usage reaches warning or critical threshold.
- **Event Class: Media, Event Type: No Suitable Media** – This event is raised when NVBU is not able to find a suitable media to complete the backup job.

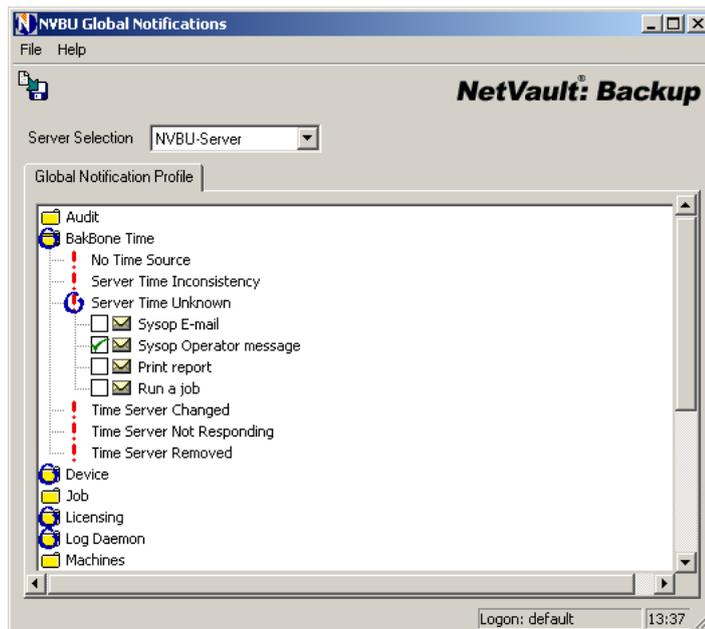
You can also set another notification method if required.

13.3.0 Setting up a Global Notification Method

To set a global notification method for a predefined or user-defined event, perform the following steps:

1. On the **Administration** menu, click **Global Notification** to open the **Global Notification** window. On the **Global Notification Profile** tab, you will find the list of event classes.
2. Double-click an event class node, or right-click it and select **Show Event Types**. The list of available event types in a class is displayed under this node.
3. Double-click an event type node, or right-click it and select **Show Notification Methods**.
4. Set up one or more notification methods as described below:
 - a. **Sysop E-mail** – Select this method to receive an email notification when the event is raised. To use this method, you must configure the email server address and the Sysop mail ID from the **Notification** tab on the Configurator. For details on these configuration procedures, refer to the *NetVault: Backup Configuration Guide*.
 - b. **Sysop Operator Message** – Select this method to log an operator message when the event is raised. These logs can be viewed from the **NVBU Status** window. For details on accessing the operator log messages, refer to [Viewing Operator Messages on page 192](#).

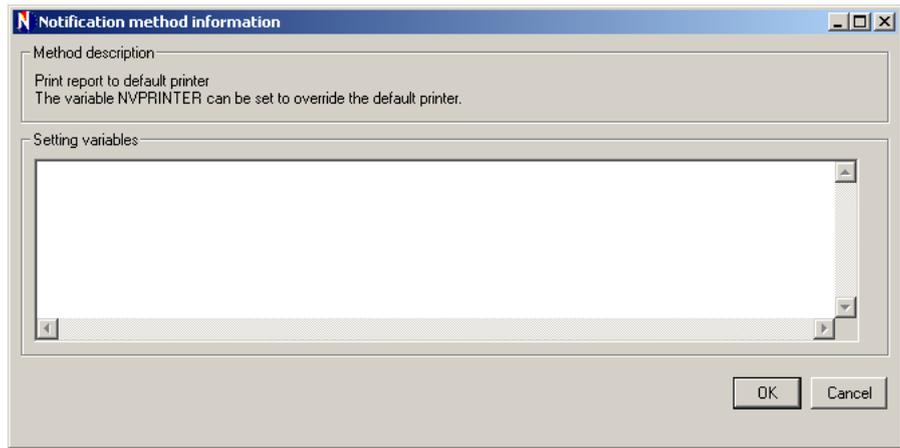
Figure 13-1:
NVBU Global
Notifications
window



- c. **Print Report** – Select this method to print a report when the event is raised. This method can only be used for **Report Job** event types. To use this method on Windows, you must either configure a default printer or set a printer for an individual event. For details on configuring a default printer for event notification, refer to the *NetVault: Backup Configuration Guide*. If a default printer is not configured or you want to use another printer for a particular event, perform the following steps:
1. Double-click **Print Report** node, or right-click it and select **About Extra Variables**.
 2. In the **Notification Method Information** window, configure the following parameter:
 - **Setting Variable** – In the **Setting Variables** box, configure the **NVPRINTER** variable:

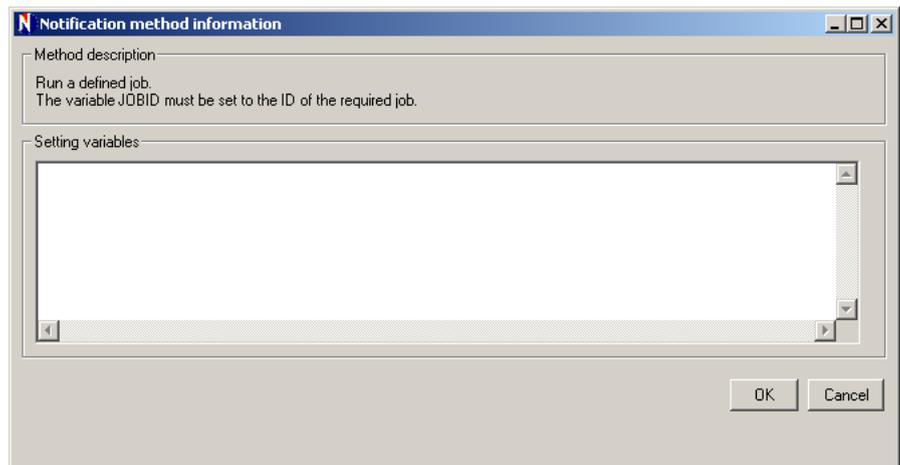

```
NVPRINTER=<Printer URL>
```

Figure 13-2:
Notification
Method
Information
window to
configure
NVPRINTER



3. Click **OK** to save the settings.
- d. **Run a Job** – Select this method to run another job when the event is raised. For example, you can use this notification method to run a report job when the backup fails to determine the cause. To use this method, first create the job you want to run when the event is raised. Then, specify the job using its Job ID as described in the following steps:
 1. Double-click **Run a Job** node, or right-click it and select **About Extra Variables**.
 2. In the **Notification Method Information** window, configure the following parameter:

Figure 13-3:
Notification
Method
Information
window to
configure
JOB ID



- **Setting Variable** – In the **Setting Variables** box, configure the **JOBID** variable:

JOBID=<Job ID for the job to run when the event is raised>

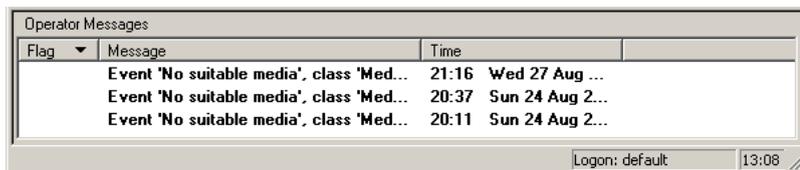
3. Click **OK** to save the settings.
5. Click **Save Global Notification Profile** on the toolbar, or on the **File** menu, click **Save**.

13.4.0 Viewing Operator Messages

To view the operator messages logged for NVBU events, perform the following steps:

1. Click **Status** on the toolbar or **Large Buttons** panel to open the **NVBU Server Status** window. Alternatively, on the **Operations** menu, click **Status**.
2. The sysop operator messages for the events are listed under **Operator Messages**.

Figure 13-4:
Operator
Messages on
NVBU Server
Status window



Flag	Message	Time
	Event 'No suitable media', class 'Med...	21:16 Wed 27 Aug ...
	Event 'No suitable media', class 'Med...	20:37 Sun 24 Aug 2...
	Event 'No suitable media', class 'Med...	20:11 Sun 24 Aug 2...

Logon: default 13:08

3. You can set the **Flag** property for a message if it requires any action. To flag a message, right-click it and select **Flag**. To clear the flag, right-click and select **Unflag**.
4. To acknowledge a message, right-click it and select **Acknowledge**.
5. To delete a particular message, right-click it and select **Delete**.
6. To clear all logs, right-click any message and select **Delete All**.

13.5.0 Removing a User-Defined Notification Event

To remove a user-defined notification event, perform the following steps:

1. Open the **NVBU Global Notifications** windows.
2. On the **Global Notification Profile** tab, locate the event class for the user-defined event.
3. Right-click the user-defined event and select **Remove Event**.
4. In the confirmation window, click **Yes**.
5. In the **Definitions Raising Event** window, click **Force Remove**.

Chapter 14:

ACCESS CONTROL

This chapter describes how to implement NVBU's access control mechanisms. This section is primarily intended for the NVBU Administrator who is responsible for managing the NVBU system. The information in this chapter is organized into the following topics:

- [Access Control – An Overview](#)
- [Creating User Accounts](#)
- [Modifying a User Profile](#)
- [Updating User Details](#)
- [Assigning Client Access Privileges](#)
- [Granting Privileges for NVBU Operations](#)
- [Assigning Media Group Memberships](#)
- [Setting Media Usage Quota](#)
- [Setting Job Quota](#)
- [Setting a User Notification Profile](#)
- [Setting User Account Password](#)
- [Setting Global Password Expiration Policy](#)
- [Deleting a User Account](#)

14.1.0 Access Control – An Overview

NVBU provides user-level access control mechanisms which can be implemented to accomplish the following:

- Prevent unauthorized access to your backup system
- Grant privileges based on the user role/functions

For example, you can create a user for the DBA role and grant privileges to perform backup and restore jobs for the database system, or you can create an account for the network administrator and grant privileges to add and remove backup devices. For the list of NVBU user privileges, refer to [User Privileges on page 265](#).

NVBU creates two user accounts during installation:

- **default** – This is a normal user account. NVBU uses this user account to automatically logon to the system when no access control mechanisms are in place. This user has full access to the NVBU system. By default, no password

is set for this account, which enables automatic logon. Although setting a password for this account will disable automatic logon, it will prevent unauthorized access to your NVBU system.

BakBone recommends that you create separate user accounts for individual users or user groups. The user accounts can be based on individual users, roles or groups/department.

- **admin** – This is the Administrator account for the NVBU system. By default, no password is set for this account. To prevent unauthorized access, you BakBone recommends that you set up a password for the admin account.

The access control mechanisms are controlled by the Auditor Daemon (nvavp), which runs on the NVBU Server. This process tracks and controls user activities. It validates each user request, and depending on the user privileges, grants or denies the request. The Auditor records these events in the audit log, which is also known as the Audit Trail. The audit log is named **audit.bin** and resides in the **.../db** directory (where ... represents the NVBU installation directory). You can view these logs via NVBU Audit Trail report. The Auditor automatically deletes the logs that are older than 31 days. You can change this property using the NVBU Configurator. For details, refer to the *NetVault: Backup Configuration Guide*.

14.2.0 Creating User Accounts

To create a new user account, perform the following steps:

1. Click **User-Level Access** on the toolbar or **Large Buttons** panel to open the **NVBU Access Control** window. Alternatively, on the **Administration** menu, click **Access Control**.
2. On the **Users** tab, click **Add User**. NVBU creates a new account and adds it to the user list. The user is named **New User** by default.
3. To rename the user account, right-click **New User** on the **Users** tab and select **User Properties**.
4. In the **NVBU User Properties** window, click the **User Details** tab.
5. In the **Account** box under **Identification**, enter the name by which the user/group account will be identified. BakBone recommends that you change the default name and assign a unique name based on the user group, role or actual name.
6. In the **Real Name** box, enter the actual name of the user/group. This information is not mandatory.

Figure 14-1:
NVBU User
Properties
window

The screenshot shows the 'NVBU User Properties' window. The title bar includes 'File', 'View', and 'Help' menus. The main window area is titled 'NetVault Backup' and displays 'Server Selection: NVBU-Server'. Below this, there are four tabs: 'User Details', 'Group Memberships', 'Privileges', and 'Notification Profile'. The 'User Details' tab is selected, showing several input fields: 'Identification' (Account: 'New User', Real Name:), 'E-mail' (E-mail 1, E-mail 2, E-mail 3), 'Contact Numbers' (Telephone, Cellular, FAX, Pager), and 'Details'. A status bar at the bottom right indicates 'Logon: default' and the time '13:29'.

7. Click the **Group Memberships** tab, and assign the access privileges to Clients. For details, refer to [Assigning Client Access Privileges on page 197](#).
8. Click the **Privileges** tab, and assign the privileges to perform NVBU operations. For details, refer to [Granting Privileges for NVBU Operations on page 197](#).
9. The remaining attributes are optional. Refer to the following sections for instructions on configuring these attributes:
 - [Updating User Details on page 196](#)
 - [Assigning Media Group Memberships on page 199](#)
 - [Setting Media Usage Quota on page 199](#)
 - [Setting Job Quota on page 199](#)
 - [Setting a User Notification Profile on page 200](#)
10. For details on setting a password for the user account, refer to [Setting User Account Password on page 200](#).
11. Click **Save User Details** on the toolbar. Alternatively, on the **File** menu, click **Save User**.

14.3.0 Modifying a User Profile

To modify a user account profile, perform the following steps:

1. Open the **NVBU Access Control** window.
2. In the user list, right-click the user, and select **User Properties**.
3. Refer to the following sections to modify the user profile:
 - [Updating User Details on page 196](#)
 - [Assigning Media Group Memberships on page 199](#)
 - [Setting Media Usage Quota on page 199](#)
 - [Setting Job Quota on page 199](#)
 - [Setting a User Notification Profile on page 200](#)
4. For details on changing user password, refer to [Setting User Account Password on page 200](#).
5. Click **Save User Details** on the toolbar. Alternatively, on the **File** menu, click **Save User**.

14.4.0 Updating User Details

To change the user name and/or update general details for an account, perform the following steps:

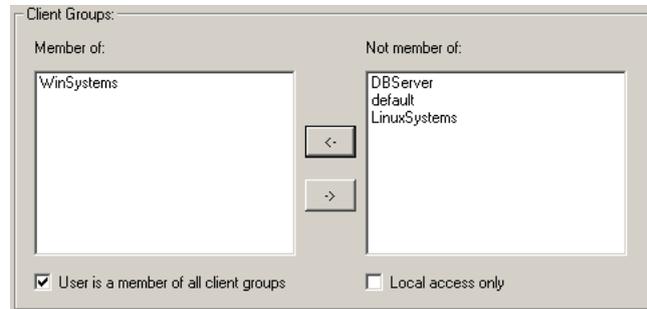
1. In the **NVBU User Properties** window, click the **User Details** tab.
2. To change the user name, enter the new name in the **Account** box under **Identification**.
3. Enter the actual name in the **Real Name** box.
4. Under **E-mail**, configure the email addresses for the user/group. Enter the address in the **E-mail 1** box if you want to set up an email notification method for pre-defined or custom events. For details on event notification, refer to [Setting a User Notification Profile on page 200](#). The other details are not required.
5. Under **Contact**, enter the phone numbers and other details in the corresponding boxes. These details are not required.
6. Under **Details**, enter the workstation name, location and the user/group description in the corresponding boxes. These details are not required.

14.5.0 Assigning Client Access Privileges

To assign client access privileges to a user, perform the following steps:

1. In the **NVBU User Properties** window, click the **Group Memberships** tab.

Figure 14-2:
Client Groups
under Group
Memberships
tab



2. To allow access to all Clients within the Domain, select the **User is a Member of All Clients Group** check box under **Client Groups**. When you select this check box, the user account is automatically granted membership to any Client/Client Group that are added in future.
Alternatively, select **default** in the **Not Member Of** list under **Client Groups**, and click the Left Arrow.
3. To grant access to selective Client Groups, select the group in the **Not Member Of** list and click the Left Arrow.
4. 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 user cannot target the Client for backups remotely from the NVBU Server or any other Client.
5. To remove a Client Group membership, select the group in the **Member Of** list and click the Right Arrow.

14.6.0 Granting Privileges for NVBU Operations

To grant privileges for NVBU operations, perform the following steps:

1. In the **NVBU User Properties** window, click the **Privileges** tab.
2. To grant full access to NVBU, select the **User is Granted All Privileges** check box under **Privilege Flags**.

Figure 14-3:
Privileges tab

3. To grant access to selective functions, select the functions in the **Denied** list. Use Shift+Click or Ctrl+Click to select the functions. Then, click the Left Arrow. These privileges are now added to the **Granted** list.
4. You can save these selections into a preset and apply the preset to another user account. This eliminates the chances of error while assigning necessary privileges to a user. To save the privileges into a set, click **Save Preset**. In the **Select Preset** window, enter a name for the set in the box provided at the bottom of the window. Then, click **OK**.
5. To apply a preset, click **Load Preset**. In the **Select Preset** list, select the set you want to apply. Then, click **OK**.
6. To revoke any granted privilege, select it in the **Granted** list and click the Right Arrow. This moves the privilege to the **Denied** list.

14.7.0 Assigning Media Group Memberships

To assign media group memberships to a user, perform the following steps:

1. In the **NVBU User Properties** window, click the **Group Memberships** tab.
2. For no media group restrictions, select the **User is a Member of All Media Groups** check box under **Media Groups**. When you select this check box, the user account is automatically granted access to any new media groups that are added.
3. To restrict the user account to target specific media groups for backups (e.g., DB-Full and DB-Inc media groups for the backups of a database), select the media group in the **Not Member Of** list and click the Left Arrow.
4. To remove a Media Group membership, select the group in the **Member Of** list and click the Right Arrow.

14.8.0 Setting Media Usage Quota

By default, NVBU users have access to unlimited media quota. No restrictions apply to the amount of media used by any user account. You can, however, override this default setting and configure a quota for a user to curtail media usage. When the usage reaches the defined quota, the jobs submitted by the user will fail. The media usage amount is calculated from the existing records in the media database. When a saveset expires, the media used by it becomes available for new jobs. To set the media usage quota for a user account, perform the following steps:

1. On the **Privileges** tab, select the option **Media Usage Up to** under **Media Quota**.
2. In the box to the right enter the media usage quota in GB.

14.9.0 Setting Job Quota

By default, NVBU users can run infinite number of jobs. No restrictions apply to the number of jobs performed by any user account. You can, however, override this default setting and configure the maximum number of jobs for a user. When the total number of existing jobs reaches the defined quota for a user, the user will not be able to submit more jobs. The number of jobs performed by a user is derived from the existing records in the scheduler database. For the deleted job definitions, the user can submit an equal number of new jobs. To set the maximum number of jobs for a user, perform the following steps:

1. On the **Privileges** tab, select the option **Job Count Up to** under **Job Quota**.
2. In the box to the right enter the maximum number of jobs for the user.

14.10.0 Setting a User Notification Profile

NVBU provides a set of pre-defined events for which you can configure global and/or user-specific notification methods. For details on pre-defined events, refer to [Predefined Events on page 249](#). You can choose to generate an email or a Windows pop-up message whenever the event is raised within the Domain. To set an event notification profile for a user account, perform the following steps:

1. Open the **NVBU Access Control** window.
2. In the user list, right-click the user, and select **User Properties**.
3. In the **NVBU User Properties** window, click the **Notification Profile** tab.
4. Double-click an event class node, or right-click it and select **Show Event Types**. The available event types are listed under this node.
5. Double-click an event type node, or right-click it and select **Show Notification Methods**.
6. The available notification methods are listed under this node. Select the required method.
 - **E-mail** – Select this method to send an email notification to the user when the event is raised. The email is sent to the mail address configured in the **E-mail-1** box on the **User Details** tab.
 - **Windows Pop-up Message** – Select this method to display pop-up messages to the user when the event is raised. This method is only supported on Windows. Note that the pop-up messages will not be displayed if firewall or other settings block such messages. The pop-up message notification method is not available on recent versions of Windows.
7. Repeat steps 4–6 to set up notification methods for other events.
8. Click **Save User Details** on the toolbar. Alternatively, on the **File** menu, click **Save User**.

14.11.0 Setting User Account Password

To set or change the password for a user account, perform the following steps;

1. Open the **NVBU Access Control** window.
2. In the user list, right-click the user, and select **Set Password**.
3. Configure the following parameters in the **Set User Password** window:
 - **Existing Password** – Enter the current password for the account. Leave it blank if no password was set.
 - **New Password** – Enter the new password for the user account. A password can contain a maximum of 100 characters. It can contain any character.

- **Confirm Password** – Re-enter the password for confirmation.
4. Click **OK**.

To set the **Password Never Expires** flag, perform the following steps:

1. In the **NVBU Access Control** window, right-click the user and select **User Properties**.
2. Click the **Privileges** tab.
3. Under **General**, select **Password Never Expires**.
4. Click **Save User Details** on the toolbar. Alternatively, on the **File** menu, click **Save User**.

This setting overrides any global password expiration policy you have set.

14.12.0 Setting Global Password Expiration Policy

To define a global password expiration policy for all NVBU user accounts, perform the following steps:

1. Open the **NVBU Access Control** window.
2. Click **Edit Password Policy**.

Figure 14-4:
Edit Password
Policy window



3. In the **Edit Password Policy** window, select the **Passwords have a Maximum Age** check box.
4. In the box next to this check box, enter the age for user password in number of days.
5. In the **Display Reminder** box, enter how many days before the expiration date you want NVBU to start displaying the reminder. The message is displayed when the user logs on to the NVBU system.

14.13.0 Deleting a User Account

To delete a user account, perform the following steps:

Important: Do not remove the **admin** user account.

1. Open the **NVBU Access Control** window.
2. In the user list, right-click the user, and select **Remove User**.
3. In the confirmation window, click **OK**.

Chapter 15:

REPORTING

This chapter describes how to use the NVBU Reporting system. The information in this chapter is organized into the following topics:

- NVBU Reports – An Overview
 - ❖ Types of Reports
 - ❖ Supported Report Formats
 - ❖ The NVBU Reports Management Window
 - ❖ The Reports Database
 - ❖ Reporting and Event Notification
- Generating a Canned Report
- Creating a Custom Report
 - ❖ Selecting the Report Components
 - ❖ Inserting Custom Headers and Footers
 - ❖ Defining Job Schedule
 - ❖ Setting up a User-Defined Notification Event
 - ❖ Finalizing and Submitting a Job
 - ❖ Retaining Excluded Data for Historic Reports
- Working with User-defined Components
 - ❖ Selecting the Base Component
 - ❖ Selecting Fields for a Component
 - ❖ Sorting the Output
 - ❖ Specifying the Output Type
 - ❖ Setting the Output Options
 - ❖ Defining Headers and Footers for the Component
 - ❖ Setting Filter Conditions
 - ❖ Creating or Modifying Filter Expressions
 - ❖ Saving a Component
- Working with Historic Reports
- Editing/Viewing a Report Template
- Viewing Logs for Report Jobs
- Deleting a Report Template

15.1.0 NVBU Reports – An Overview

NVBU's comprehensive reporting system includes a number of predefined reports, which provide you detailed and summarized information on NVBU components and operations, including the current status, utilization details and performance statistics. If these predefined reports do not meet your information needs, the advanced reporting capabilities allow you to build your own custom reports without having to understand where and how the data is stored.

15.1.1 Types of Reports

NVBU offers two types of reports:

- **Canned Reports** – Canned Reports are predefined reports that allow you to quickly and easily retrieve information on the backup and restore jobs, online and offline media, clients and devices, and other common queries. These reports are generated using built-in HTML templates. You can run and view these reports from the **NVBU Reports** window. For a list of available canned reports, refer to [Available Canned Reports on page 255](#).
- **Custom Reports** – Custom reports are reports that you create and design to meet specific information requirements. You can use this feature for a consolidated report on several components and operations, view averages and totals, or add custom headers, footers and output filter conditions. Custom reports are generated using user-defined report templates, which can be created in HTML, Text or Comma Separated Value (CSV) file formats. The custom reports can be saved for reuse, and scheduled to run at predefined time and intervals. You can create and view the custom reports from the **NVBU Reports** window.

Note: A basic version of the NetVault: Report Manager for Backup (NRMB) is included in NVBU DataCenter and Enterprise Editions. You can use this software if the NVBU Server is running on an operating system supported by NRMB. NRMB consolidates information from multiple NVBU Servers, and provides visual monitoring and alerting capabilities with additional backup reporting. The system identifies potential problems early on and graphically communicates vital data protection results to key constituents. NRMB reduces administrative time, and helps centralize operations and lowers media costs. For details on NRMB, refer to the *NetVault: Report Manager Administrator's Guide* at the following address: <http://www.bakbone.com/documentation>

15.1.2 Supported Report Formats

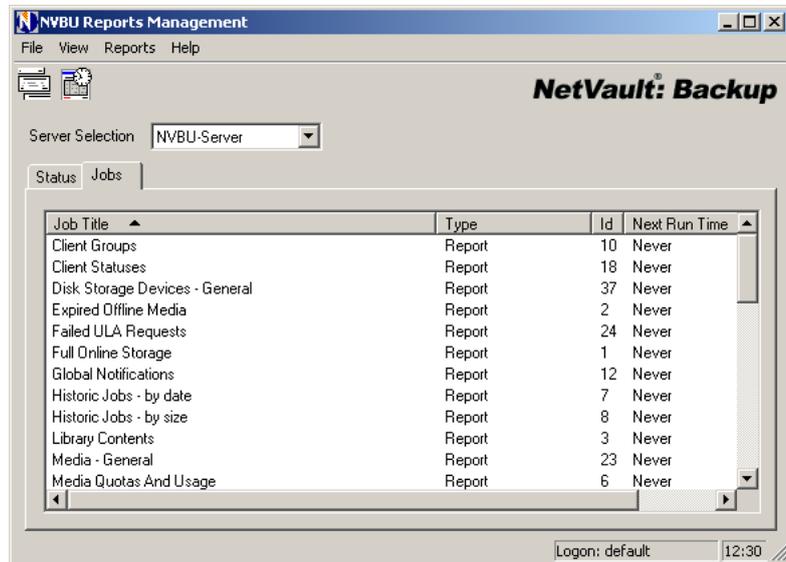
The canned and custom reports can be generated in the following formats:

- **HTML** – On Windows, you can use the built-in browser to view these reports. On Linux/UNIX, you must configure a default browser for NVBU reports using the Configurator. These options are present on the **Browser** sub-tab on the **GUI** tab. For details, refer to the *NetVault: Backup Configuration Guide*.
- **Text** – This format can be used to view the reports from the command line or using any text editor.
- **CSV** – This format can be used to generate CSV file which can be imported to your spreadsheet or database application.

15.1.3 The NVBU Reports Management Window

Both Canned and Custom reports are run from the **NVBU Reports** window. The **NVBU Reports** window contains the following tabs:

Figure 15-1:
NVBU Reports
Management
window



- **Jobs** – The **Jobs** tab provides a list of job definitions for Canned and Custom reports.
- **Status** – The **Status** tab provides a list of scheduled, active and completed report jobs. NVBU uses different background colors to display the current status of the jobs listed on the **Status** tab. The default color codes for all job types are listed in the table below:

Job Status	Background Color
Running Jobs	Yellow
Scheduled Jobs	Blue
Completed Jobs	White (Normal)

You can change the status color-coding for all jobs from the **GUI** tab on the Configurator. For details, refer to *NetVault: Backup Configuration Guide*.

15.1.4 The Reports Database

NVBU stores the report templates and components in the reports database, which resides in the **.../NVBU/reports** directory (where ... refers to the NVBU installation directory). You can relocate the database using the Configurator. For details on relocating the reports database, refer to the *NetVault: Backup Configuration Guide*.

15.1.5 Reporting and Event Notification

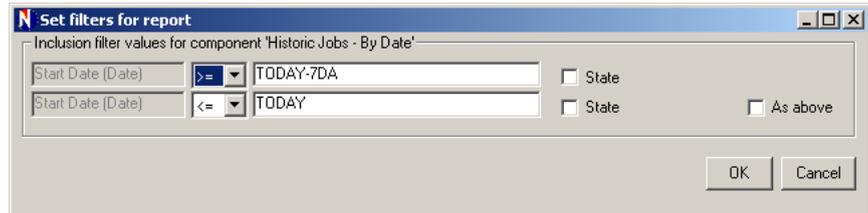
The reporting functionality is integrated with the event notification system. This allows you to set up global or user-specific notification methods, and receive notification when a job completes or fails, or when certain conditions are met. You can use this feature to send reports as email attachments to the Administrator or any other NVBU user.

15.2.0 Generating a Canned Report

To run a canned report, perform the following steps:

1. Click **Reports Management** on the toolbar or **Large Buttons** panel to open the **NVBU Reports Management** window. Alternatively, on the **Operations** menu, click **Reports**.
2. On the **Jobs** tab, locate the required canned report. Double-click the report, or right-click and select **Run and View**. Select **Run and Notify**, if you want to raise the associated events and receive a notification.
3. If any filter condition is set for the report (e.g., reports that are to be generated for a particular period or for a particular job), the **Set Filters for Report** window will be displayed. Enter the values and click **OK**.

Figure 15-2:
Set Filters
window



4. The report opens in the built-in or the configured browser.

15.3.0 Creating a Custom Report

Custom reports can include predefined as well as user-defined components. User-defined components are customized components derived from a predefined component. For details on creating a user-defined component, refer to [Working with User-defined Components on page 212](#). For a list of predefined components that can be included in a custom report, refer to [Available Report Components on page 257](#). The procedure for creating a custom report can be divided into the following steps:

- [Selecting the Report Components](#)
- [Inserting Custom Headers and Footers](#)
- [Defining Job Schedule](#)
- [Setting up a User-Defined Notification Event](#)
- [Retaining Excluded Data for Historic Reports](#)
- [Finalizing and Submitting a Job](#)

These steps are described in detail in the following sections.

15.3.1 Selecting the Report Components

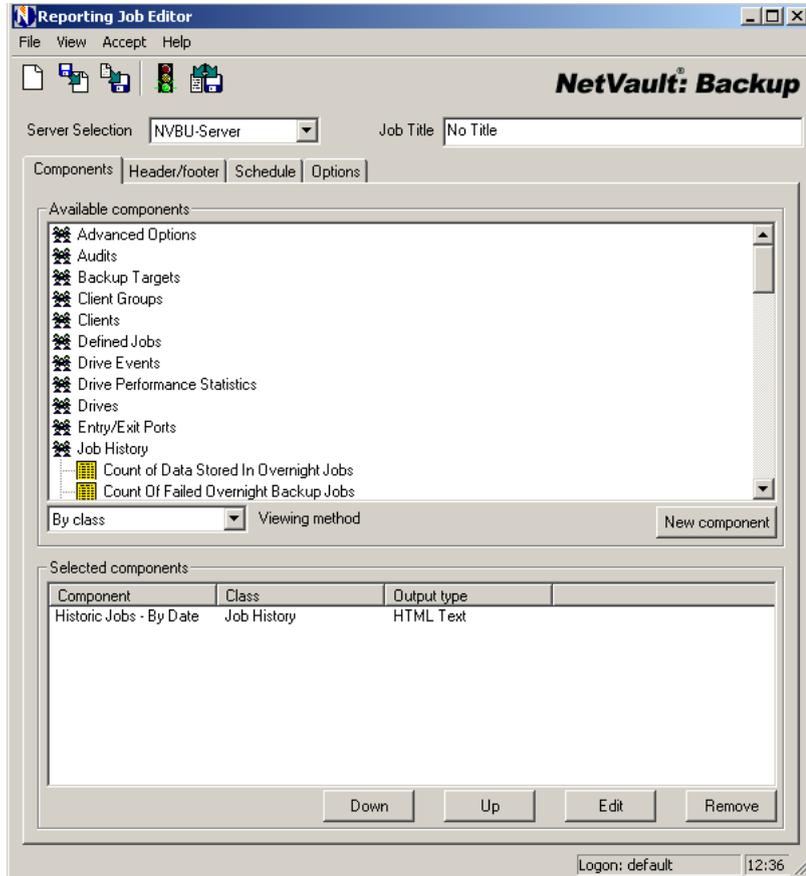
To select the components for a report job, perform the following steps:

1. Click **Reports Management** on the toolbar or **Large Buttons** panel to open the **NVBU Reports Management** window. Alternatively, on the **Operations** menu, click **Reports**.
2. Click **Report Job** on the toolbar to open the **Reporting Job Editor** window. Alternatively, on the **Reports** menu, click **Report Job**.
3. The available predefined and user-defined components are listed under **Available Components**. The default view method is **By Class**, which arranges the components under their respective classes.

You can change the view to **All** in the **Viewing Method** list for an alphabetical listing of the components. The **By Output Type** viewing method organizes the components by their output type – **Comma Separated Values**, **HTML Text** or **Plain Text**.

4. To add an available component, perform the following steps:
 - a. Open the parent class or output type. You can double-click the node, or right-click and select **Show Components**.
 - b. Double-click a component. Alternatively, right-click it and select **Add to Job**. The added component is displayed under **Selected Components**
 - c. To add other available components, repeat steps a–b.

Figure 15-3:
Reporting Job
Editor window



5. To change the order in which the components appear in the report, select the component in the **Selected Components** list, and click **Up** or **Down**.
6. To include a new user-defined component in the report, click **New Component**. For details on creating a user-defined component, refer to [Working with User-defined Components on page 212](#). After creating the component, click **Save and Add to Job** on the toolbar. Repeat this step for any other new component you want to include in the report.

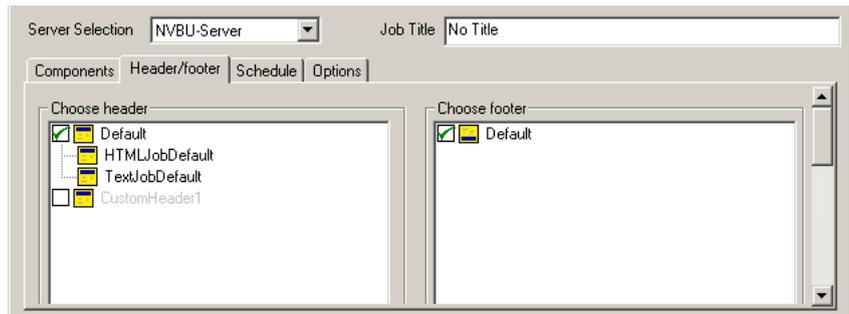
7. To modify an added component, select it in the **Selected Components** list and click **Edit**. This opens the **Report Component Editor** window. For details on modifying a report component, refer to [Working with User-defined Components on page 212](#).
8. To remove a component, select it and click **Remove**.

15.3.2 Inserting Custom Headers and Footers

Each report contains a default header and footer, which is in HTML or text format depending on the output format of the component. To replace them with your own custom header/footer, perform the following steps:

1. In the **Reporting Job Editor** window, click the **Header/Footer** tab. The available header templates are listed under **Choose Header**.

Figure 15-4:
Header/Footer
tab on
Reporting Job
Editor window



2. To insert a custom header, first clear the check box for the **Default** header.
3. If the required header is already defined, select it in the **Choose Header** list. Ignore the remaining steps in this section.
4. To define a new header, select one of the following methods.

Note: To create HTML headers, you must be familiar with the HTML tags.

- **Clone an Existing Header Template** – To create a new header from an existing template, right-click the header, and select **Clone**.
 - **Create a New Header Template** – To create a header using a blank template, click **New** at the bottom of the window.
5. In the **Edit Header** window, enter a name and make the required changes as described in the following steps:
 - a. In the **Header Name and Text** box, enter a name for the template
 - b. In the box below, enter or modify the text. You can use any HTML tag in an HTML template.
 - c. To include images (e.g., company logo) in an HTML template, use the SRC HTML tag. The image must be in .jpeg or .gif format.

- d. Click **OK**. The template is added and displayed under **Choose Header**.
6. Select the template.
7. If you have added images, copy the file to `..\reports\jobheaders\HTMLJobDefault\images` folder. Then, right-click the new custom header and select **Add Image**. In the browse window, enter the file path or select the file.

15.3.3 Defining Job Schedule

To define a schedule, click the **Schedule** tab on the **Reporting Job Editor** window. You can define a daily, weekly, monthly or any other custom schedule for the report job. For details on configuring the scheduling options, refer to [Job Scheduling on page 113](#). You can omit this step if you want to run the report job immediately.

15.3.4 Setting up a User-Defined Notification Event

NVBU supports three types of custom events for a report job:

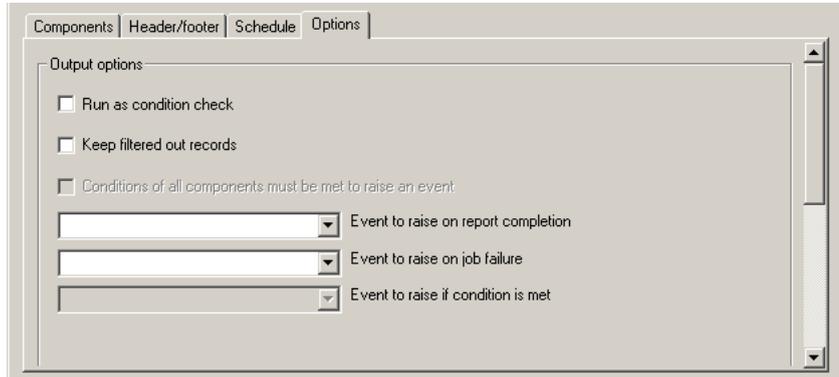
- **Conditional Event** – Raised only when the conditions are met. For details on specifying event conditions, refer to [Setting Filter Conditions on page 221](#).
- **Job Completion Event** – Raised when the job completes.
- **Job Failure Event** – Raised when the job fails.

You can set up both global and user-specific notification methods for these events. The custom report events are added to the **Report Job** class in the **Global Notification** window. You can use this feature to send reports as email attachments to the Administrator or any other user. To raise a custom report event, perform the following steps:

1. In the **Reporting Job Editor** window, click the **Options** tab.
2. Under **Output Options**, configure the following parameters:
 - **Raise an Event Conditionally** – To raise an event conditionally, configure the following parameters:
 - ❖ Select the **Run as Condition Check** check box.
 - ❖ Select or enter the event name in the **Event to Raise if Condition is Met** list.
 - ❖ To raise an event only when conditions set for all components are met, select the **Conditions of all Components must be Met to Raise an Event** check box.
 - **Raise an Event when the Job Completes** – The conditional event and job completion events are mutually exclusive. If the **Run as Condition Check** check box is selected for a report job, then this option will not be available. To raise an event when the job completes, select or enter the event name in the **Event to Raise when the Job Completes** list.

Figure 15-5:
Options tab for
custom report
events

- **Raise an Event if the Job Fails** – To raise an event if the job fails, enter or select the event name in the **Event to Raise on Job Failure** list.



3. Set up a notification method for the event. For details on global notification methods, refer to [Setting up a Global Notification Method on page 189](#), and for details on user-specific notification methods refer to [Setting a User Notification Profile on page 200](#). Note that a new event is only listed in the **Global Notification** and the **NVBU User Properties** window when you save or submit the job definition.

Note: To send the report as an email attachment to the Administrator or any user, set up the **Sysop E-mail** global notification method or the **E-mail** user notification method.

15.3.5 Retaining Excluded Data for Historic Reports

NVBU keeps a copy of the data set that was used to generate a report, allowing you to re-analyze the historic data by applying new settings and filters. By default, the data that is excluded as a result of some filter condition is not saved. Saving the excluded data allows you to conduct a reanalysis on the entire data set, and view the excluded records by modifying or removing the filter condition. The **Keep Filtered Out Records** option controls whether or not NVBU keeps a copy of the excluded data. By default, this option is not enabled. You can select it individually for each report, or globally enable it for all reports using NVBU Configurator. To globally enable the **Keep Filtered Out Records** option for all reports, refer to the *NetVault: Backup Configuration Guide*. To enable the **Keep Filtered Out Records** option for an individual report, perform the following steps:

1. In the **Reporting Job Editor** window, click the **Options** tab.
2. Select the **Keep Filtered out Records** check box. While generating the report again, you can remove the exclude condition or set a new filter to view the excluded records. Note that the filters can only be based on the fields

selected for the original report job. For details on making changes to historic reports, refer to [Working with Historic Reports on page 226](#)

15.3.6 Finalizing and Submitting a Job

Complete the following steps to finalize and submit the job.

1. Enter a title for the job in the **Job Title** box at the top right corner of the **Reporting Job Editor** window.
2. Choose one of the following methods to save, submit and/or run the report.
 - a. **Save the Definition without Scheduling the Job** – To save the job definition without scheduling it, click **Save** on the toolbar. Alternatively, on the **File** menu, click **Save**.

A saved job does not appear in the **Status** tab of the **Reports** window and does not run unless you submit it (or use the **Triggered** scheduling option). You can load a saved job again in the **Reporting Job Editor** window, or open it for editing from the **Jobs** tab of the **Reports** window. For details on editing a job definition, refer to [Editing/Viewing a Report Template on page 228](#).

- b. **Schedule the Job** – To submit the job and run it at the defined schedule, click **Submit** on the toolbar. Alternatively, on the **Accept** menu, click **Submit Backup**.
 - c. **Run the Job Immediately** – To run the job immediately and view the report, click **Save, Run and View Job** on the toolbar. Alternatively, on the **Accept** menu, click **Save, Run and View**.

15.4.0 Working with User-defined Components

NVBU allows you to customize a predefined component and derive your own custom component. This gives you the ability to choose the fields, reorder the fields, sort the records and set custom filter conditions for a component. The procedure for creating or modifying a user-defined component can be divided into the following steps:

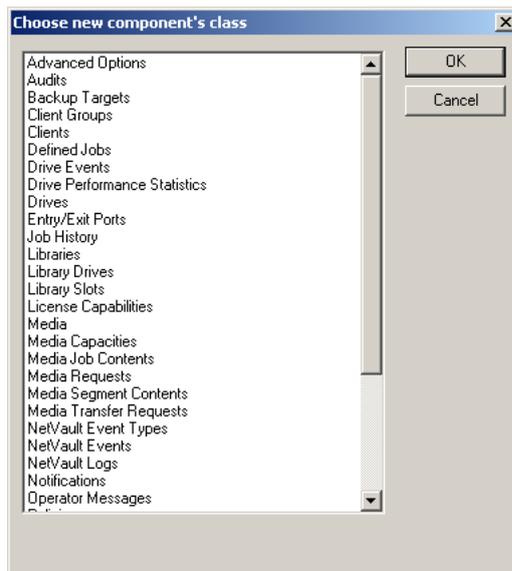
- [Selecting the Base Component](#)
- [Selecting Fields for a Component](#)
- [Sorting the Output](#)
- [Specifying the Output Type](#)
- [Setting the Output Options](#)
- [Defining Headers and Footers for the Component](#)
- [Setting Filter Conditions](#)
- [Saving a Component](#)

15.4.1 Selecting the Base Component

To select the base component, perform the following steps:

1. Select one of the following methods to choose the base component:
 - a. **Define a New Component for the Current Job** – To add a new component to the job you are defining, click **New Component** in the **Reporting Job Editor** window.
 - b. **Modify a Component for the Current Job** – To change a component added to the job you are defining, perform the following steps:
 1. In the **Reporting Job Editor** window, select the component in the **Selected Components** list.
 2. Click **Edit**.
 - c. **Create a Component for Future Use** – To create a component for future use, perform the following steps:
 1. In the **Reports** window, click **Report Component** on the **Reports** menu. This opens the **Report Component Editor** window.
 2. In the **Report Component Editor** window, click **New** on the toolbar, or on the **File** menu, click **New**.
 - d. **Modify a Component for Future Use** – To modify a component for future use, perform the following steps:
 1. Open the **Reports** window. On the Reports menu, click **Report Component**.
 2. In the **Report Component Editor** window, click **Load** on the toolbar, or on the **File** menu, click **Load**. This opens the **Choose New Component's Class** window.
 3. Double-click a class, or select it and click **OK**.
2. In the **Choose New Component's Class** window, double-click a component, or select it and click **OK**.

Figure 15-6:
Choose New
Component's
Class window

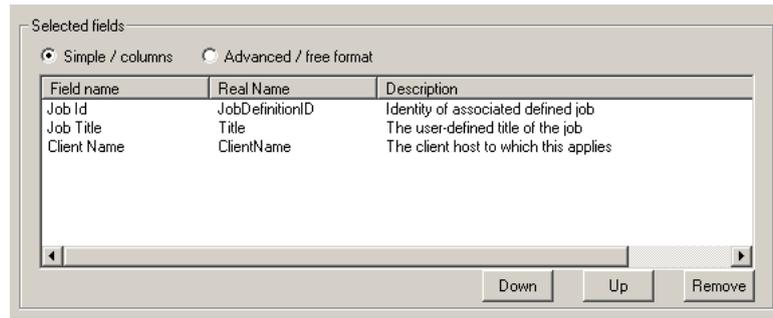


15.4.2 Selecting Fields for a Component

To select the fields for a component, perform the following steps:

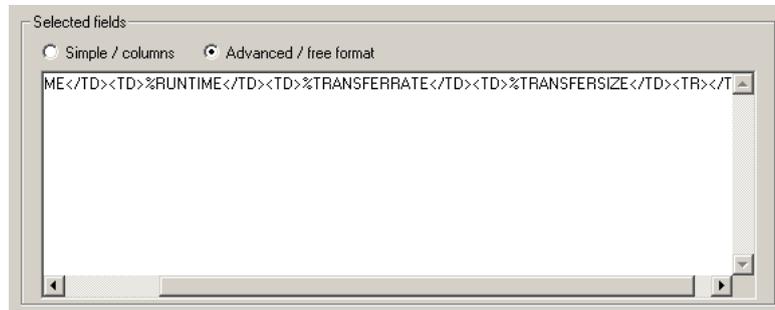
1. In the **Report Component Editor** window, click the **Field Selection** tab.
2. Under **Available Fields**, you will find the list of fields that can be included. Refer to the **Description** column in the table to find out the value stored in these fields.
3. To include a field double-click it. The added field is displayed under **Selected Fields**. Repeat this step to add the other fields.
4. Under **Selected Fields**, two views are provided – **Simple** and **Advanced/Free Format**.
 - **Simple View** – The **Simple** view lists the selected fields in a tabular format.
 - ❖ To change the order of the fields, select it in the **Selected Fields** list and click **Up** or **Down**.
 - ❖ To remove a field, select it and click **Remove**.

Figure 15-7:
Simple View
for field
selection



- Advanced/Free Format View** – The **Advanced/Free Format** view uses HTML table tags to display the order of the selected fields. If you are familiar with HTML tags, you can use this view to add, rearrange or remove fields. Use the names listed under the **Real Name** column under **Available Fields**. Prefix each field name with % to replace it with the actual field value in the report.

Figure 15-8:
Advanced
View for field
selection

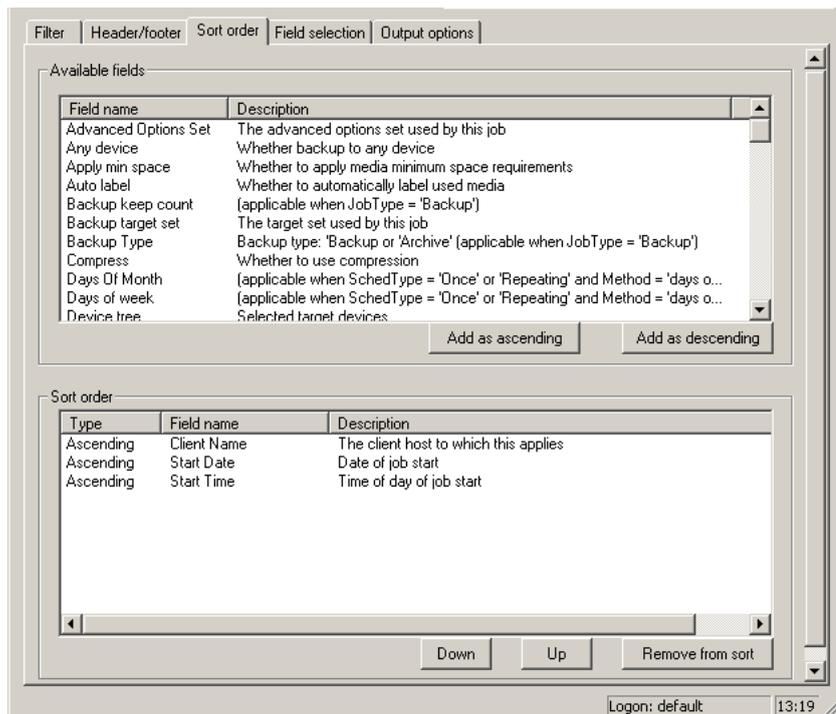


15.4.3 Sorting the Output

To sort the output on multiple fields, perform the following steps:

1. In the **Report Component Editor** window, click the **Sort Order** tab.
2. Under **Available Fields**, you will find the list of fields that can be used to specify the sort order.
3. To sort the records by a particular field, select it in the **Available Fields** list. Click **Add as Ascending** or **Add as Descending**. The added field is displayed under **Sort Order**. To add other fields, repeat this step.
4. To change the order of the fields, select it in the **Sort Order** list and click **Up** or **Down**.
5. To remove a field, select it and click **Remove**.

Figure 15-9:
Sort Order tab



15.4.4 Specifying the Output Type

To specify the type of output generated by the component, perform the following steps:

1. In the **Report Component Editor** window, click **Set Output Type** on the toolbar. Alternatively, on the **Options** menu, click **Output Type**.
2. In the **Choose Component's Output Type** list, select **Plain Text**, **HTML Text** or **Comma Separated Values** list.
3. Click **OK**.

15.4.5 Setting the Output Options

To configure the output options for a component, perform the following steps:

1. In the **Report Component Editor** window, click the **Output Options** tab.
2. Depending on the type of output generated by the component, refer to the following points:
 - a. **HTML Text** – For a component that produces HTML output, configure the following parameters:

Figure 15-10:
Output
Options for
HTML format

- **Automatically Generate Column Headers** – Leave this check box selected to include a header row for the columns. The titles are obtained from the **Field Name** column under **Available Fields** on the **Field Selection** tab.
If you have defined a custom header row in the HTML template, clear the check box.
- **Disable Main Record Output** – Select the **Disable Main Record Output** check box if you just require the total and average record counts and do not want to view the list of records.
- **Output Total Record** – Select the **Output Total Records** check box to include total record count.
- **Output Average Record** – Select the **Output Average Record** check box to include average record count.
- **Advanced Options** – NVBU uses built-in templates to format the output for HTML reports. You can customize the formatting styles and specify how the headers, total and average rows or the body cells should be displayed. The custom formatting styles can be globally applied to all HTML report templates from the **Reporting** tab on the Configurator. For details, refer to the *NetVault: Backup Configuration Guide*. To apply custom formatting to an individual report, select the

Advanced Options check box. Configure the formatting options that are displayed below. These settings must only be configured by users with a good knowledge of HTML. Improper configuration could result in incorrect output.

Use the pre-text boxes to specify the following:

- ❖ Opening HTML tags for custom formatting styles, e.g., font type, font size, bold, etc.
- ❖ Text or description for headers, total or average rows, or body cells

Use the post-text boxes to specify the following:

- ❖ Closing HTML tags for custom formatting styles

For reports with no records, you can replace the default text “Nothing to Display” with your own text in the **Default Text to Output for an HTML Report With No Records** box.

- b. **Plain Text** – For a component that produces plain text output, configure the following parameters:
- **Automatically Generate Column Headers** – Leave this check box selected to include a header row for the columns. The titles are obtained from the **Field Name** column under **Available Fields** on the **Field Selection** tab. Clear the check box if you do not require the column headers.
 - **Disable Main Record Output** – Select the **Disable Main Record Output** check box if you just require the total and average record counts and do not want to view the list of records.
 - **Variable Width Output** – The plain text format uses fixed field length for proper alignment. However, this results in truncation of the records. If you do not want to truncate the field values and display the entire contents, select the **Variable Width Output** check box. The output will not be aligned when you select this check box.
 - **Output Total Records** – Select the **Output Total Records** check box to include total record count.
 - **Output Average Record** – Select the **Output Average Record** check box to include average record count.

Figure 15-11:
Output
Options for
Text format

Option	Value
Automatically generate column headers	<input checked="" type="checkbox"/>
Disable main record output	<input type="checkbox"/>
Variable width output	<input type="checkbox"/>
Output total record	<input type="checkbox"/>
Output average record	<input type="checkbox"/>
Advanced Options	<input checked="" type="checkbox"/>
Auto-column row pre text	
Auto-column row post text	%\n%\n
Empty report text	Nothing to display%\n
Total row pre text	%\nTotal%\n
Total row post text	%\n
Total field pre text	
Total field post text	
Average row pre text	%\nAverage%\n
Average row post text	%\n

- **Advanced Options** – NVBU uses built-in templates to format the plain text reports. You can customize the formatting styles to add line breaks, tabs, separators, etc., and specify how the output should be displayed. The custom formatting can be globally applied to all plain text report templates from the **Reporting** tab on the Configurator. For details, refer to the *NetVault: Backup Configuration Guide*. To apply custom formatting to an individual report, select the **Advanced Options** check box. Configure the formatting options that are displayed below. These settings must only be configured by users familiar with the use of control characters and escape sequences in text output. Improper configuration could result in incorrect output. Use the pre-text boxes to specify the following:

- ❖ Line breaks, separators, etc.
- ❖ Text or description for headers, total or average rows, or body cells

Use the post-text boxes to specify the following:

- ❖ Line breaks, separators, etc.

For reports with no records, you can replace the default text “Nothing to Display” with your own text in the **Default Text to Output for a Plain Text Report With No Records** box.

- c. **Comma Separated Values** – For a component that produces a CSV output, configure the following parameters:

Figure 15-12:
Output
Options for
CSV format

- **Automatically Generate Column Headers** – Leave the **Automatically Generate Column Headers** check box selected to include a header row for the columns. The titles are obtained from the **Field Name** column under **Available Fields** on the **Field Selection** tab. Clear the check box if you do not require the column headers.
- **Advanced Options** – NVBU uses built-in templates to generate and format the CSV reports. You can customize the formatting styles, to define custom delimiter, add line breaks, tabs, separators, etc., and specify how the output should be displayed. The custom formatting can be globally applied to all CSV report templates from the **Reporting** tab on the Configurator. For details, refer to the *NetVault: Backup Configuration Guide*. To apply custom formatting to an individual report, select the **Advanced Options** check box. Configure the formatting options that are displayed below. These settings must only be configured by users familiar with CSV output and the use of control characters and escape sequences. Improper configuration could result in incorrect output.

Use the pre-text boxes to specify the following:

- ❖ Line breaks, tabs, separators, etc.
- ❖ Text or description for headers, total or average rows, or body cells

Use the post-text boxes to specify the following:

- ❖ Custom delimiter
- ❖ Line breaks, separators, etc.

For reports with no records, you can replace the default text “Nothing to Export” with your own text in the **Default Text to Output for a CSV Report With No Records** box.

15.4.6 Defining Headers and Footers for the Component

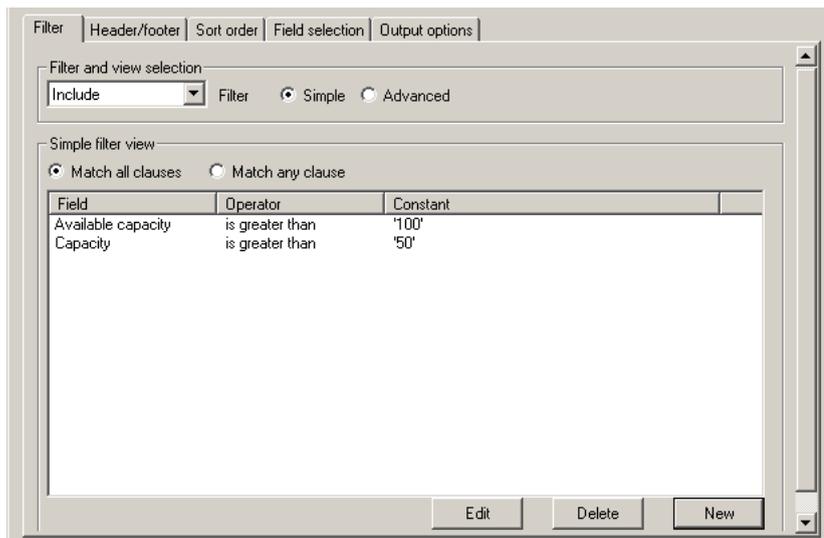
The user-defined components inherit the header and footer templates from the base component. However, you can replace them with your own custom headers or footers. To define custom headers or footers, click the **Header/Footer** tab in the **Report Component Editor** window. Perform steps 2–10 described in the section [Inserting Custom Headers and Footers on page 209](#).

15.4.7 Setting Filter Conditions

The filter conditions for a component include the include and exclude conditions, and the conditions for raising a custom event. To set the filter conditions for a component, perform the following steps:

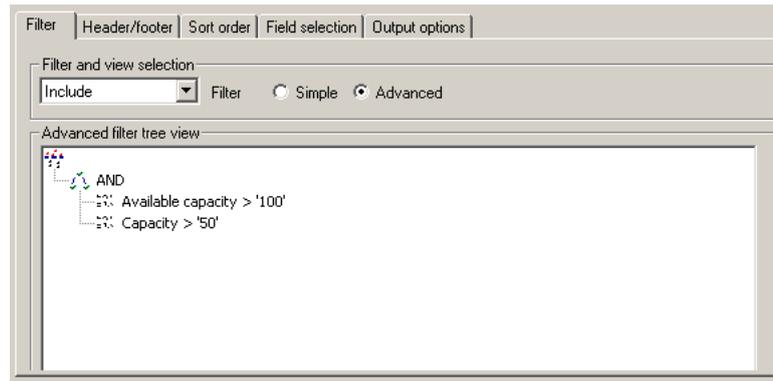
1. In the **Report Component Editor** window, click the **Filter** tab.
2. In the **Filter** list, select the filter type:
 - **Include** – Select this filter when you want to include those records that meet the condition you specify and exclude the remaining.
 - **Exclude** – Select this filter when you want to exclude those records that meet the condition you specify and include the remaining.
 - **Condition** – Select this filter when you want to include those records that meet the condition and at the same time raise an event.
3. NVBU provides two views to create and view filter expressions – **Simple** and **Advanced**.
 - a. **Simple View for Filter Expression** – The **Simple** view lists the filter expressions in a tabular format. This view is recommended for users who do not have advanced knowledge of Structured Query Language (SQL). Note that in this view you can join the multiple expressions using either **and** or **or**. You cannot combine both clauses in joins. To create a filter expression in this view, perform the following steps:

Figure 15-13:
Simple Filter
View



1. To create a filter, click **New**. To create a filter expression, refer to [Creating or Modifying Filter Expressions on page 223](#).
 2. To join another expression with **and**, select **Match All Clauses** under **Simple Filter View**. Then, click **New**. To create a filter expression, refer to [Creating or Modifying Filter Expressions on page 223](#).
 3. To join another expression with **or**, select **Match Any Clause** under **Simple Filter View**. Then, click **New**. To create a filter expression, refer to [Creating or Modifying Filter Expressions on page 223](#).
 4. To edit an expression, select it and click **Edit**. This opens the **Edit Filter Expression** window. To modify a filter expression, refer to [Creating or Modifying Filter Expressions](#).
 5. To remove an expression, select it and click **Delete**.
- b. **Advanced View for Filter Expression** – The **Advanced** view uses a tree structure to display the filter expressions. This view is intended for users with advanced knowledge of SQL. This view allows you to use both **and** and **or** to join expressions. To create a filter expression in this view, perform the following steps:

Figure 15-14:
Advanced
Filter View

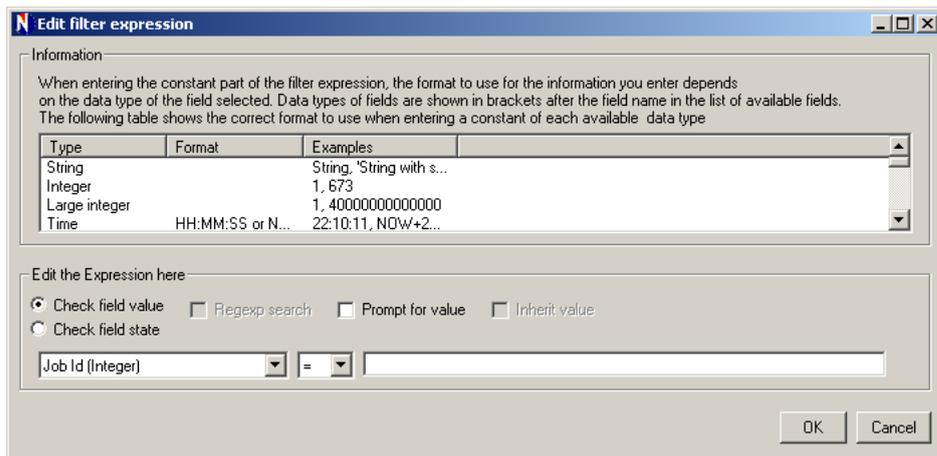


1. Under **Advanced Filter Tree View**, right-click the root and select **Add an Expression**. To create a filter expression, refer to [Creating or Modifying Filter Expressions on page 223](#).
2. To join another expression with **and**, right-click the node where you want to add the expression. Then, select **Insert Expression (AND'd)**.
3. To join another expression with **or**, right-click the node where you want to add the expression. Then, select **Insert Expression (OR'd)**.
4. To edit a particular expression, right-click that node and select **Edit Expression**. This opens the **Edit Filter Expression** window. To modify a filter expression, refer to [Creating or Modifying Filter Expressions on page 223](#).
5. To edit the whole filter, right-click the root node and select **Edit Whole Filter**. This opens the **Edit Whole Filter** window. In the **Edit the Filter Here** box at the bottom of the window, re-order, add, delete or change the clauses as required. Include only the field names that are provided in the list above.
6. Click **OK** to save the filter.

15.4.7.a Creating or Modifying Filter Expressions

NVBU supports three types of filter expressions – value comparison, regular expression comparison and field state comparison. The state comparison option is designed for advanced NVBU users who have a good understanding of the Reporting system.

Figure 15-15:
Filter
Expression
window



To create or modify a filter expression, perform the following steps:

1. Depending on the expression type, choose one of the following methods:
 - a. **Value Comparison** – To generate an expression that compares a constant, perform the following steps:
 1. Select the **Check Field Value** option.
 2. Select the field in the list. Refer to the **Available Fields** list on the **Field Selection** tab for the field description.
 3. Select the operator (=, !=, >, <, >= or <=).
 4. Enter the value for comparison in the box next to the operator list. The value you enter must match the field type. For example, enter numeric values for Integer fields, enter YES/NO/TRUE/FALSE for boolean fields, etc. Refer to the field type table under **Information** for information on the supported value type for the fields.
 - b. **Regular Expression Comparison** – To generate an expression that compares regular expressions, perform the following steps:
 1. Select the **Check Field Value** option.
 2. Select the field in the list. Refer to the **Available Fields** list on the **Field Selection** tab for the field description.
 3. Select **Regex Search**.
 4. Select the operator (=, !=, >, <, >= or <=).
 5. Enter the filter expression in the box next to the operator list.
 - c. **Field State Comparison** – You can use this method to include or exclude records based on the field state. For example, you can choose the state **Unknown** to find/exclude records that are not available in one of the

tables. To generate an expression that compares the field state, perform the following steps:

1. Select the **Check Field State** option.
 2. Select the field in the list. Refer to the **Available Fields** list on the **Field Selection** tab for the field description.
 3. Select the operator (=, !=, >, <, >= or <=).
 4. Select the field state in the list.
2. To provide a value during runtime, select **Prompt for Value**. For example, to view the details for a particular job, you can set a filter condition using the Job ID field and select the **Prompt for Value** check box. When you run the report, NVBU waits for user input, allowing you to enter the Job ID that is to be used as the filter value. This option will only work if the report is run immediately. The prompt will not appear if the job is scheduled to run later. For scheduled jobs, the filtering will be done on the basis of the value you set for the field in the **Edit Filter Expression** window.
3. In conjunction with the **Prompt for Value** check box, you can also select the **Inherit Value** check box, if you want the other report components included in the job to use the same value entered during runtime for filtering the records.
4. Click **OK** to save the expression.

15.4.8 Saving a Component

To select save the component, perform the following steps:

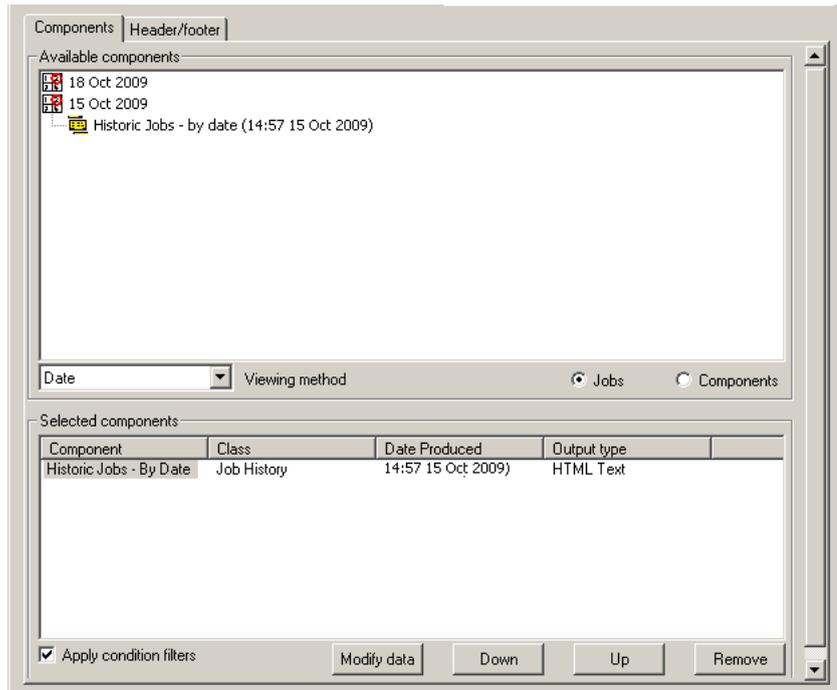
1. To create a new user-defined component, change the component title in the **Component Title** box at the top right corner of the **Reporting Component Editor** window.
2. Choose one of the following methods to save the component:
 - a. **Add the Component to a Job** – To add the component to a job that you are currently defining, click **Save** and **Add to the Job** on the toolbar. Alternatively, on the **File** menu, click **Save to Job**.
 - b. **Save the Component for Future Use** – To save a component for future use, click **Save** on the toolbar. Alternatively, on the **File** menu, click **Save**.

15.5.0 Working with Historic Reports

NVBU keeps a copy of the data set that was used to generate a report, allowing you to re-analyze the historic data by applying new settings/filters. By default, the data that is excluded as a result of some filter condition is not saved. To keep a copy of the excluded data, the **Keep Filtered out Records** check box must have been selected for the template. For details on this option, refer to [Retaining Excluded Data for Historic Reports on page 211](#). This allows you to re-apply the filters on the entire data set. To run a historic report again, perform the following steps:

1. Open the **Reports** window.
2. Click **Historic Reports** on the toolbar. Alternatively, on the **Reports** menu, click **Historic Reports**. This opens the **Historic Reports View** window.

Figure 15-16:
Historic
Reports vView



3. The historic reports are listed under **Available Components**. By default, the reports are arranged by job date in a descending order.

You can change the view to **Title** in the **Viewing Method** list for an alphabetical listing of components. To view run date with the alphabetical listing, select **All** in the **Viewing Method** list.

4. To run all the components for a historic report again, right-click the report and choose **Select All Job Components** or **Select Everything from Job**.
To add selective components, right-click the report and select **Show Components**. The components included in the report are listed under this node. Double-click a component to include it in the report.
5. To include components from multiple reports, repeat step 4 for each historic report. The added components are displayed under **Selected Components**.
6. In the **Selected Components** list, you can change the order of the components in which they appear in the report. Select the component in the list, and then click **Up** or **Down**.
7. To modify an added component, select it in the **Selected Components** list and click **Edit**. This opens the **Report Component Editor** window. For details on modifying a component, refer to [Working with User-defined Components on page 212](#).
This allows you to add, remove and modify the include, exclude and conditional filters.

Important: Any changes you make to the component are applied only to the current instance of the historic report. You cannot save the changes made to the component.

8. To remove a component, select it in the **Selected Components** and click **Remove**.
9. To modify header/footer, click the **Header/Footer** tab. For details on modifying or inserting a header, refer to [Inserting Custom Headers and Footers on page 209](#).
10. If a conditional filter has been set for the report, the **Apply Condition Filters** check box is selected by default. To disable the conditional filters, you can either delete the condition filters as described in step 7, or clear this check box.
11. To generate and view the report, click **View Report** on the toolbar.

15.6.0 Editing/Viewing a Report Template

To edit/view a report template, perform the following steps:

1. Choose one of the following methods to load the report definition:
 - a. **Load the Template from the Report Window** – This method can be used for both saved and scheduled jobs.
 1. Open the **Reports** window.
 2. Click **Report Job** on the toolbar. Alternatively, on the **Reports** menu, click **Report Job**. This opens the **Reporting Job Editor** window
 3. Click **Load** on toolbar, or on the **File** menu, click **Load**.
 4. In the **Select the Report to Load** window, select the report and then click **OK**. The template is loaded in the **Reporting Job Editor** window.
 - b. **Load the Template from the Jobs Tab of the Reports Window** – This method can be used for both saved and scheduled jobs.
 1. Open the **Reports** window.
 2. On the **Jobs** tab, right-click the job and select **Edit/View Job**. The template is loaded in the **Reporting Job Editor** window.
 - c. **Load the Template from the Status Tab of the Reports Window** – This method can only be used for scheduled jobs.
 1. Open the **Reports** window.
 2. Click the **Status** tab; right-click the job and select **Edit/View Job**. The template is loaded in the **Reporting Job Editor** window.
2. Refer to the following sections to modify the template:
 - [Selecting the Report Components](#)
 - [Inserting Custom Headers and Footers](#)
 - [Defining Job Schedule](#)
 - [Setting up a User-Defined Notification Event](#)
 - [Finalizing and Submitting a Job](#)

15.7.0 Viewing Logs for Report Jobs

To view the report job logs, perform the following steps:

1. Open the **Reports** window.
2. On the **Status** tab, right-click the report and select **View Log**. This opens the **NVBU Logs** window. Only the logs messages related to the selected report job are displayed in this window.

15.8.0 Deleting a Report Template

To delete a report template, perform the following steps:

1. Open the **Reports** window.
2. On the **Jobs** tab, right-click the report and select **Delete**.
3. In the confirmation window, click **Yes**.

Chapter 16:

DOMAIN MANAGEMENT

This chapter describes how to use an NVBU Server to manage multiple sites. The information in this chapter is organized into the following topics:

- [Domain Management – An Overview](#)
- [Adding an NVBU Server](#)
 - ❖ [Locating an NVBU Server](#)
- [Controlled Server Status Summary](#)
- [Logging on to a Controlled Server](#)
- [Changing the Default NVBU Server](#)
- [Viewing Properties of a Controlled Server](#)
- [Checking Access to a Remote NVBU Server](#)
- [Removing a Controlled Server](#)

16.1.0 Domain Management – An Overview

NVBU is designed to work in an environment in which one machine is configured as an NVBU Server and various other machines throughout the network act as NVBU Clients assigned to it. A single Server and its Clients make up a **NVBU Domain**. NVBU allows you to administer a Domain either locally from the machine acting as the NVBU Server, or remotely from another NVBU Server outside the Domain. This enables centralized administration of multiple sites from a single location.

An NVBU Server that is accessed remotely is referred to as a **Controlled Server**. To control an NVBU Domain remotely, the first step is to grant access to the Domain by adding the remote NVBU Server to a **Controlling Server**. This is done from the **NVBU Domain Management** window.

To perform a remote operation, just open the corresponding window and select the Server in the **Server Selection** list under the menu bar. For example, to add a Member Client to a remote NVBU Server, open the **NVBU Client Management** window. In the **Server Selection** list, select the NVBU Server for that Domain, and complete the steps for adding a Client. Similarly, to backup a Member Client of a remote NVBU Server, open the **NVBU Backup** window. In the **Server Selection** list, select the NVBU Server for that Domain, and complete the steps for submitting a backup job.

To use this feature, the Controlling and the Controlled Servers must run the same version of NVBU Server software.

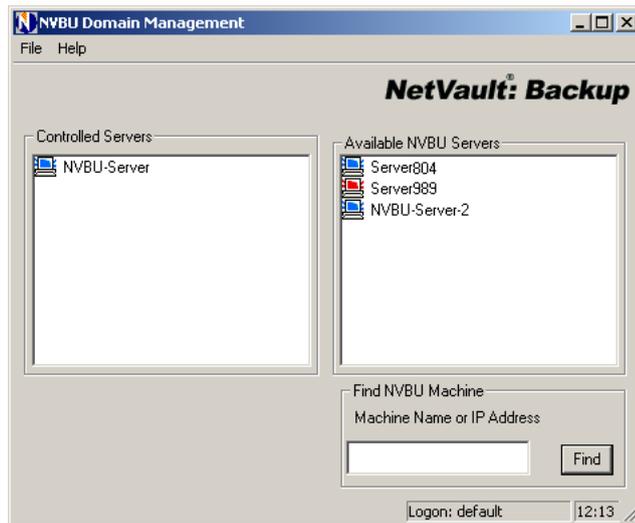
16.2 Adding an NVBU Server

To add an NVBU Server to a Controlling Server, perform the following steps:

Note: Before proceeding ensure that both the Controlling and the Controlled Servers run the same version of NVBU Server

1. On the **Administration** menu, click **Domain Management**.
2. Under **Available NVBU Servers**, you will find a list of NVBU Servers located in the network. The current status of a Server is represented with the following status indicators:

Figure 16-1:
NVBU
Domain
Management
window



- **Blue** – This icon represents an online Server.
 - **Red** – This icon represents an offline Server.
3. To add a Server that is currently available, double-click the Server in the **Available NVBU Servers** list. Alternatively, right-click the Server and select **Add as Server**.
 4. In the **Password Required**, configure the following parameters:

Figure 16-2:
Password
Required
window



- **Enter Password** – In the **Enter Password** box, enter the NVBU password for the Server.
 - **Save Password** – To save the Server password, select **Save Password**. This allows automatic logon to the Controlled Server without waiting for user input. Otherwise, you must enter the password manually each time you want to perform a remote operation.
5. Click **OK** to add the Server. The added Server is listed under **Controlled Server**.

16.2.1 Locating an NVBU Server

To locate a Server that is not listed under **Available NVBU Servers**, perform the following steps:

1. Under **Find NVBU Machine** at the bottom right, enter the NVBU name for the Server or its IP address.
 2. Click **Find**. NVBU rescans the network to locate the Server. If found, the Server is listed under **Available NVBU Servers** in alphabetical order
- Note that a search can also fail for a number of reasons, including the following:
- The DNS lookup table or the machine's host table cannot be contacted.
 - The NVBU Service is not running on the machine.
 - NVBU is removed from the machine.

16.3 Controlled Server Status Summary

The Controlled Servers are listed under **Controlled Servers** on the **NVBU Domain Management** window. Each Server is accompanied by one of the following status indicators:



A **Blue** icon indicates that the Server is up and running. It can be accessed to perform any operation remotely.



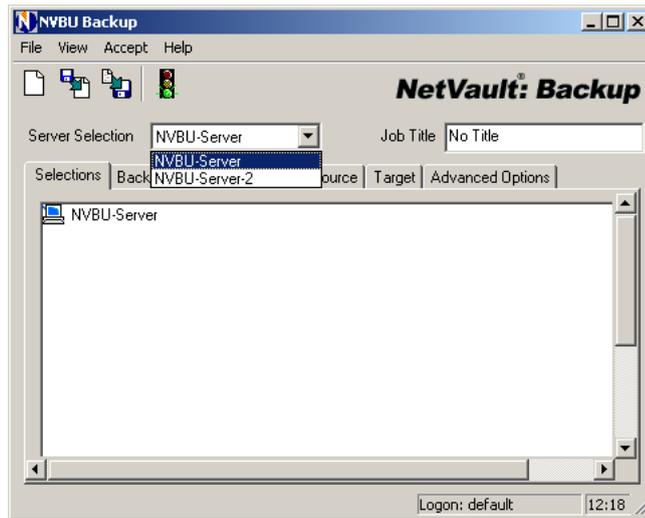
A **Red** icon indicates that the Server is currently unavailable. Either the machine is offline or the NVBU Service is not running.

16.4 Logging on to a Controlled Server

To log on to a Controlled Server in order to manage it remotely, perform the following steps:

1. Open the corresponding window. For example, to backup a Client added to a remote NVBU Server, open the **Backup** window.
2. In the **Server Selection** list, select the Server for the remote NVBU Domain.

Figure 16-3:
Controlled
Servers listed
in Sever
Selection list



3. When you log on to the Remote Server, the Console will switch to that of the Controlled Server. For example, when you change the Server in the **Backup** window, the **Selections** tab will display the Clients added to the selected Server.
4. If you saved the Server password while adding it, no action is required in this step. If the password was not saved, perform the following steps:
 - a. In the **Password Required** window, enter the valid password for the Server.
 - b. Select **Save Password** to enable auto logon for future operations.
 - c. Click **OK**.
5. Perform the steps to complete the task. Refer to the relevant section of the guide for instructions.

16.5 Changing the Default NVBU Server

To make remote management easier, NVBU allows you to designate a remote NVBU Server as the Default Server. This eliminates the need to select the Server in the Server Selection list before performing each operation. Until you change the default Server again, all the operations are performed on the selected NVBU Server. To designate a remote NVBU Server as the Default Server, right-click the target Server under **Controlled Servers** and select **Make Default**. You can reset the default Server or designate another Controlled Server as the default Server by performing the same step.

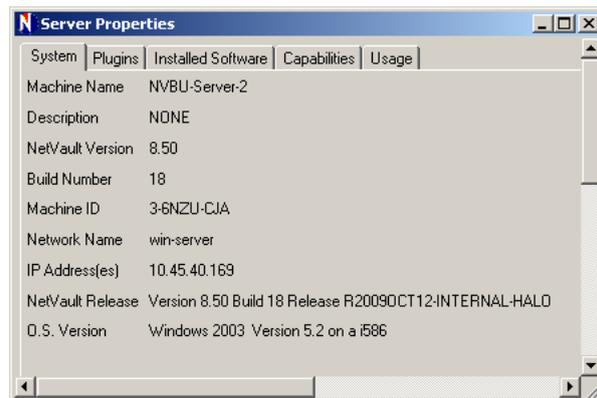
16.6 Viewing Properties of a Controlled Server

To view the properties of a Controlled Server, perform the following steps:

Note: This procedure can only be used if you are logged on to the Controlled Server. For details, refer to [Logging on to a Controlled Server on page 233](#).

1. Under **Controlled Servers**, right-click the Server and select **Properties**.
2. The **Server Properties** window contains five tabs – **System**, **Plugins**, **Installed Software**, **Capabilities** and **Usage**. Click the corresponding tab to view the following information:

Figure 16-4:
Server
Properties
window



- The **System** tab displays the Machine Name and Description, NVBU Version and Build Number, Machine ID, Network Name of the machine, IP Address, Release Information and OS Version.
 - The **Plugins** tab lists the NVBU Plugins installed on the Server. The details include the Plugin Name, Version, Plugin ID, and Installation Date and Time.
 - The **Installed Software** tab lists all the NVBU Plugins installed on the Server. The details include the plugin name and the installation date.
 - The **Capabilities** tab provides the license information for the built-in plugins.
 - The **Usage** tab provides the license usage information for the built-in plugins.
3. Click **OK** to close the window.

16.7 Checking Access to a Remote NVBU Server

To check access between the Controlled and the Controlling Servers, perform the following steps:

1. Under **Controlled Servers**, right-click the machine and select **Check Access**.
2. NVBU attempts to connect to the Controlled Server and displays the status message corresponding to the machine accessibility.
3. Click **OK** to close the dialog.

16.8 Removing a Controlled Server

To remove a Controlled Server, perform the following steps:

1. Under **Controlled Servers**, right-click the Server and select **Remove**.
2. In the confirmation window, click **Yes**.
The Server is removed and listed again under **Available NVBU Servers**.

Chapter 17:

NVBU CLIENT CLUSTERS

This chapter provides guidelines and information that will help you set up and use NVBU in a cluster environment. The information in this chapter is organized into the following topics:

- [NVBU Client Cluster Support – An Overview](#)
- [Virtual Clients – An Overview](#)
- [Installing a Cluster-aware Plugin](#)
 - ❖ [Prerequisites](#)
 - ❖ [Installation Procedure](#)
- [Configuring a Cluster-aware Plugin](#)
 - ❖ [Configuring Preferred Network Address](#)
 - ❖ [Configuring Default Parameters](#)
- [Configuring Tape Devices in a Cluster Environment](#)
- [Managing Virtual Clients](#)
 - ❖ [Modifying a Virtual Client](#)
 - ❖ [Checking Access to a Virtual Client](#)
 - ❖ [Finding the Real Client](#)
 - ❖ [Granting User Access to a Virtual Client](#)
 - ❖ [Removing a Virtual Client](#)
 - ❖ [Upgrading a Cluster-aware Plugin](#)
- [Backing up Data Using a Cluster-aware Plugin](#)
 - ❖ [Cluster Failover During Backups](#)
- [Restoring Data Using a Cluster-aware Plugin](#)
- [Viewing Logs and Job Status](#)

17.1.0 NVBU Client Cluster Support – An Overview

NVBU provides several cluster-aware plugins, which require Cluster Support License Keys. The cluster nodes are grouped together into a **Virtual Client** on which the cluster-aware plugin is installed. The cluster backups and restores are performed using the Virtual Client. The NVBU plugins which can be deployed in a cluster setup include the following:

- **File System Plugin** – This plugin is shipped with the NVBU software and can be used to backup the shared file system data on the following platforms:
 - ❖ Windows Server Clusters
 - ❖ Linux Clusters
 - ❖ Sun Clusters (Solaris SPARC)

For details on the supported cluster software versions, refer to the *NetVault: Backup Supported Platforms Matrix* at www.bakbone.com/compatibility. A default installation of NVBU does not require licensing of its native File System Plugin. However, to use this plugin in a cluster setup, a File System Cluster Support license key is required.

- **NVBU APM for SQL Server (SQL Server APM)** – This APM can be used in an SQL Server Failover Cluster setup to backup the database. For details, refer to the *NetVault: Backup APM for SQL Server User's Guide*.
- **NVBU APM for Exchange Server (Exchange Server APM)** – This APM can be deployed in an Exchange Server Single Copy Cluster (SCC)/Failover Cluster or Cluster Continuous Replication (CCR) setup to backup the Exchange Server. For details, refer to the *NetVault: Backup APM for Exchange Server User's Guide*.

17.2.0 Virtual Clients – An Overview

In NVBU, the cluster nodes are grouped together into a single entity called the **Virtual Client**. This entity is created when you install a cluster-aware plugin.

A Virtual Client is managed just like any other standard NVBU Heterogeneous Client. You can browse this Client in the same manner as any other Heterogeneous Client in NVBU, add it to Client Groups and Policies, grant or deny user access to it, and generate reports for it. A Virtual Client is represented with a yellow icon (instead of blue).

Although the NVBU Server administers the creation and configuration of a Virtual Client, the plugin runs locally on the Member Client and the data is processed locally. Therefore, a SmartClient configured within a cluster will send data directly to the attached physical or virtual tape library.

17.3.0 Installing a Cluster-aware Plugin

This section explains how to install a cluster-aware plugin.

17.3.1 Prerequisites

Before starting the plugin installation, refer to the following notes and complete the required tasks:

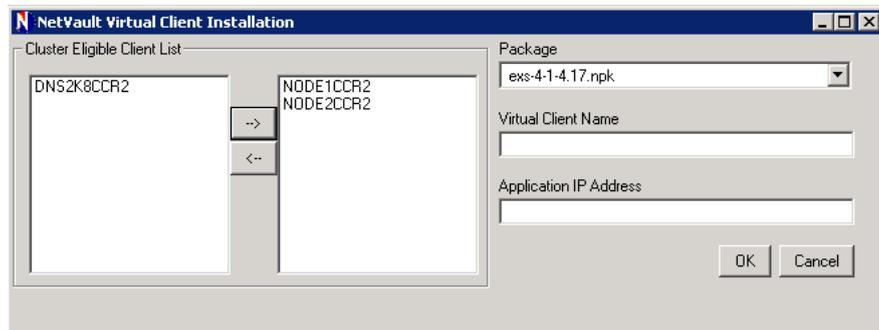
- Install the NVBU Server software on the designated machine. The Server must be a separate machine outside the cluster setup. For instructions on installing the software, refer to the *NetVault: Backup Installation Guide*.
- Install the NVBU Client software on the cluster nodes. For instructions on installing the software, refer to the *NetVault: Backup Installation Guide*.
- Add NVBU Clients to the NVBU Server. For details on adding a Heterogeneous Client, refer to [NVBU Client Management on page 25](#).
- Copy the installation file (**.npk**) for the cluster-aware plugin to **...packages** folder on the NVBU Server (where ... represents the NVBU installation directory). The File System Plugin (for the Server operating system) is already available in this folder. You can also copy the installation files to sub-folders within.

17.3.2 Installation Procedure

To install a cluster-aware plugin, perform the following steps:

1. Open the **Client Management** window (click **Client Management** on the toolbar or **Large Buttons** panel, or on the **Administration** menu, click **Client Management**).
2. On the **Cluster** menu, click **Create Virtual Client** to open the **NetVault Virtual Client Installation** window.

Figure 17-1:
NetVault
Virtual Client
Installation
window



3. Under **Cluster Eligible Client List**, the available NVBU Clients are listed in the box to the left. Use Shift+Click to select consecutive Member Clients and

Ctrl+Click to select non-consecutive Member Clients, and then click the right arrow. The selected Clients are moved to the box to the right and grouped as a Virtual Client.

Note: Although NVBU Server is listed as an eligible Client, it must not be included.

To remove any Client from the group, select the Client in the box to the right and click the left arrow.

- In the **Package** list, select the installation file for the plugin. This list contains all the cluster-aware .npk files copied to the **packages** directory and its sub-directories. The files are named as follows (where x-x-x-x refers to the build and version numbers):

Plugin Name	Binary File Name
File System Plugin for Windows	win-x-x-x-x.npk
File System Plugin for Linux	nvf-x-x-x-x.npk
File System Plugin for Solaris (SPARC)	nvf-x-x-x-x.npk
SQL Server APM	sql-x-x-x-x.npk
Exchange Server APM	exs-x-x-x-x.npk

- In the **Virtual Client Name** box, enter a unique name for the Virtual Client. The name cannot be changed. Spaces are not recognized in a Virtual Client name and will be replaced with underscores (“_”).
- In the **Application IP Address** box, enter the cluster application’s IP address.
- Click **OK**. The NVBU Server begins installing the plugin on all the Member Clients. This process overwrites any standard version of the same plugin installed on the members. However, you can use the cluster-aware version to make backups of the local/non-shared data.

Once the installation is complete, the Virtual Client is displayed under **Clients** in the **NVBU Client Management** window, represented by a yellow icon.

17.4.0 Configuring a Cluster-aware Plugin

This section explains how to configure a cluster-aware plugin.

17.4.1 Configuring Preferred Network Address

To access the cluster nodes via their public IP addresses, perform the following steps:

- Determine the IP address for the cluster node. (You can use the **ifconfig** method on Linux/UNIX platform, or the **ipconfig** command on Windows.)

2. Start the NVBU Configurator.
3. Click the **Network Manager** tab and then click the **Connections** tab.
4. In the **Preferred Network Address** box, enter the machine's public IP address.
5. Click **Apply** to save the setting, followed by **OK** to close the window.
6. Repeat steps 1-4 for each Member Client.

17.4.2 Configuring Default Parameters

To configure the default attributes for cluster backups and restores, perform the following steps. These values can be changed on a per-job basis from the **NVBU Backup** window. To configure these parameters for backups of local data, refer to the relevant APM/Plugin User's Guide.

1. Open the **NVBU Backup** window on the NVBU Server (click **Backup** on the toolbar or **Large Buttons** panel, or on the **Operations** menu, click **Backup**).

Note: The default attributes for cluster backups and restores can be set only via the **Backup Selections** tab. Setting these attributes via the Configurator or Remote Configurator is not supported for the cluster backups and restores.

2. On the **Selections** tab, locate the Virtual Client. Double-click this node, or right-click and select **Open**.
3. Right-click the cluster-aware plugin and select **Configure** to open the **Configure** window. The configuration settings for the cluster-aware version are the same as the standard version. Refer to the relevant APM/Plugin User's Guide to configure these settings.
4. Click **OK** to save the settings. These settings are stored on the NVBU Server in a configuration file specific to the Virtual Client and applied during cluster backups and restores. These settings only apply to backups and restores of shared data performed via Virtual Client.

17.5.0 Configuring Tape Devices in a 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 NVBU Server or SmartClient** – The pros and cons of this configuration are described below:
 - ❖ 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 NVBU Server, thus, giving it the control of robotic arm, and sharing the drive with the cluster nodes. This allows the control of robotic arm and at the same time enables local data transfers. The pros and cons of this configuration are described below:
 - ❖ This configuration offers high drive availability. With all Member Clients sharing the control of drives, the drives are always available.
 - ❖ However, the member Client that currently controls the drive need not be the node that currently controls the cluster.
- **Connecting a Device to a Cluster Node** – The pros and cons of this configuration are described below:
 - ❖ 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.

17.6.0 Managing Virtual Clients

This section describes the various Virtual Client administration procedures.

17.6.1 Modifying a Virtual Client

To add or remove Member Clients, or to change the application IP address, perform the following steps. For details on upgrading the cluster-aware version of the plugin, refer to [Upgrading a Cluster-aware Plugin on page 244](#).

1. Open the **NVBU Client Management** window.
2. Under **Clients**, right-click the Virtual Client and select **Edit Virtual Client Configuration**.
3. In the **NetVault Virtual Client Installation** window, configure the required parameters:
 - **Cluster Eligible Client List** – To add Member Clients, select the Clients in the box to the left under **Cluster Eligible Client List**. Use Shift+Click to select consecutive Member Clients and Ctrl+Click to select non-consecutive Member Clients, and then click the right arrow. The selected Clients are moved to the box to the right and added to the Virtual Client. Although NVBU Server is listed as an eligible Client, it must not be included.

To remove any Client from the group, select the Client in the box to the right and click the left arrow.

- **Application IP Address** – To change the IP address for the application, enter the new IP in the **Application IP Address** box.
- 4. Click **OK** to save the updated settings. NVBU Service must be stopped and restarted if you have changed the Application IP address.

17.6.2 Checking Access to a Virtual Client

At least one of the Member Clients must be online and active for a backup/restore job to succeed. In order to check accessibility to a Virtual Client, perform the following steps:

1. Open the **NVBU Client Management** window.
2. Under **Clients**, right-click the Virtual Client and select **Check Access**.
3. NVBU will check access between the Server and each machine within the cluster and return a message with the current status.

17.6.3 Finding the Real Client

To determine which machine within the cluster is currently in control of the cluster application, perform the following steps:

1. Open the **NVBU Client Management** window.
2. Under **Clients**, right-click the Virtual Client and select **Current Real Client**.
3. The NVBU name of the controlling cluster node is displayed in a dialog box.

17.6.4 Granting User Access to a Virtual Client

To grant access to a Virtual Client while denying access to individual Member Clients, perform the following steps:

1. Click the **Client Groups** tab in the **NVBU Client Management** window and create a Client Group with only the Virtual Client as the member. For details on creating a Client Group, refer to [Creating Client Groups on page 32](#).
2. On the **Administration** menu, click **Access Control**.
3. Right-click a User and select **User Properties**.
4. Click the **Group Memberships** tab
5. Select the Client Group in the **Not Member Of** box and click the left arrow. Do not select the **User is a Member of All Clients Group** and **Local Access Only** check boxes.
6. Click **Save User Details**.

Note: To add and/or remove Virtual Clients, a user must have the **Add/Remove Virtual Client** and **Manage Software** privileges. Additionally, the user requires privileges to perform backups and restores, and to manage devices. For details on

granting these privileges, refer to [Granting Privileges for NVBU Operations on page 197](#).

17.6.5 Removing a Virtual Client

If you do not want to use the plugin in a cluster setup, perform the following steps to remove the Virtual Client:

1. Open the **NVBU Client Management** window on the NVBU Server.
2. Under **Clients**, right-click the Virtual Client and select **Remove**. The Virtual Client is removed but the Member Clients are displayed as standard NVBU Clients under **Clients**.

This removes the ability of the plugin to backup cluster nodes.

17.6.6 Upgrading a Cluster-aware Plugin

To upgrade to a newer version of the cluster-aware plugin, perform the following steps:

1. First, remove the Virtual Client that was created during plugin installation. For details on removing a Virtual Client, refer to [Removing a Virtual Client on page 244](#).
2. Then, create a new Virtual Client using the upgraded version of the cluster-aware plugin. For details on installing the plugin, refer to [Installation Procedure on page 239](#). Assign the same name to the Virtual Client. If a different name is assigned, the jobs defined for the previous Virtual Client cannot be run again.

17.7.0 Backing up Data Using a Cluster-aware Plugin

The procedure for backing up data is similar for both the Standard Clients and the Virtual Clients for the File System Plugin. The File System Plugin is used in the same manner as the standard version and all the options that can be set for the standard version are also available with the cluster-aware version. The only difference is that when you open the Virtual Client node, just the cluster-aware plugin that was installed during the creation of the Virtual Client is displayed.

The File System Plugin displays both the shared and local drives/mount points on the **Selections** tab and does not differentiate between the two. You must make a note of the drive letter/mount point for the shared resource and make data selections accordingly.

For detailed instructions on backing up data in a SQL Server Failover Cluster or Exchange Server Clustered environment, refer to the relevant APM/Plugin User's Guide.

17.7.1 Cluster Failover During Backups

Typically, if a failover occurs when a backup job is running, the job aborts and returns **Job Failed** status. You can use the Job Retry feature to run the job again when the failover is complete. For details on scheduling job retries, refer to [Scheduling Number of Job Retries on page 124](#).

With the File System Plugin, when a failover occurs in Windows, the reason for the failover has a direct bearing upon the status of the aborted job. Accordingly, perform one of the following:

- If the machine in control of the cluster resources goes offline during backup, the job is aborted and returns the status **Job Failed**. 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, then the job is aborted and returns the **Backup Completed with Warnings** status. 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 backup all data.

17.8.0 Restoring Data Using a Cluster-aware Plugin

The procedure for restoring data using the File System Plugin is similar for both the Standard Clients and the Virtual Clients. The only difference is that the backups are restored from the Virtual Client node and not the actual Client node. When a restore job is initiated, NVBU communicates with the cluster service to determine the controlling node and targets this machine for the restore.

For detailed instructions on restoring data in a SQL Server Failover Cluster or Exchange Server Clustered environment, refer to the relevant APM/Plugin User's Guide.

17.9.0 Viewing Logs and Job Status

When you backup a Virtual Client, the data is essentially backed up from a single client and it is accessed from the controlling node. NVBU displays the Virtual Client name in the **NVBU Jobs** and **NVBU Server Status** windows for Virtual Client backups and restores. The **NVBU Logs** window, however, displays the actual NVBU Client name to facilitate quick troubleshooting.

Appendix



Appendix A:

PREDEFINED EVENTS

This appendix provides a brief description of the predefined event classes and events. The information in this appendix is organized into the following topics:

- [Predefined Event Description](#)

A.1.0 Predefined Event Description

NVBU includes the following predefined events:

- **Event Class – Audit**
 - ❖ **Failed to Update Audit File** – Raised when NVBU is not able to update the audit trail.
 - ❖ **Update Session Map Failed** – Raised when NVBU is not able to update the session owner mapping file.
- **Event Class – BakBone Time**
 - ❖ **No Time Source** – Raised when the BakBone Time Server is not configured for the Domain.
 - ❖ **Server Time Inconsistency** – Raised when the BakBone Time on the two (2) NVBU Servers controlling the NVBU Client do not match.
 - ❖ **Server Time Unknown** – Raised when the Time Server is not able to fetch BakBone Time from the Source. By default, a **Sysop Operator Message** method is set for this event.
 - ❖ **Time Server Changed** – Raised when the Time Server changes for an NVBU Domain.
 - ❖ **Time Server Not Responding** – Raised when the Time Server does not respond to a time request.
 - ❖ **Time Server Removed** – Raised when the Time Server is removed from the NVBU Domain.
- **Event Class – Device**
 - ❖ **Check** – Raised for a request to check a device.
 - ❖ **Close Door** – Raised for a request to close a library door.
 - ❖ **Close EEPort** – Raised for a request to close an Entry/Exit port.
 - ❖ **Close EEPort Clean** – Raised for a request to close an Entry/Exit port containing cleaning media.
 - ❖ **Device Forced Offline** – Raised when any device controlled by the NVBU Server is forced to become offline.

- ❖ **Device Gone Offline** – Raised when any device controlled by the NVBU Server becomes offline.
- ❖ **Drive Unavailable** – Raised when any drive controlled by the Server goes offline.
- ❖ **Library Gone Offline** – Raised when any library controlled by the Server goes offline.
- ❖ **Library Scan Completed** – Raised when a media scan request completes.
- ❖ **Map** – Raised when an ACSLS drive is mapped.
- ❖ **No Suitable Drive** – Raised when NVBU is not able to find a suitable drive to run a backup or restore job. By default, a **Sysop Operator Message** method is set for this event.
- ❖ **Open Door** – Raised for a request to open a library door.
- ❖ **Open EEPort** – Raised for a request to close an Entry/Exit port.
- ❖ **Reconfigure Device** – Raised when the device properties are modified for an added device.
- ❖ **Remove** – Raised when a device is removed.
- ❖ **Restart Library** – Raised when a library is restarted.
- ❖ **Unmap** – Raised when an ACSLS drive is un-mapped.
- **Event Class – Job**
 - ❖ **All Job Retries Failed** – Raised when all retry attempts for a job have failed.
 - ❖ **Job Aborted** – Raised when a job is aborted.
 - ❖ **Job Completed Successfully** – Raised when a job completes successfully.
 - ❖ **Job Completed with Warnings** – Raised when a job completes with warnings.
 - ❖ **Job Created** – Raised when a new job is created.
 - ❖ **Job Deleted** – Raised when a job is deleted.
 - ❖ **Job Died** – Raised when a job dies unexpectedly.
 - ❖ **Job Failed** – Raised when a job fails.
 - ❖ **Job Finished** – Raised when a job execution completes.
 - ❖ **Job Hold** – Raised when a running job is put on hold.
 - ❖ **Job Modified** – Raised when a job is modified.
 - ❖ **Job Phase Starting** – Raised when any phase of a job starts.
 - ❖ **Job Resume** – Raised when a job on hold is resumed again.

- ❖ **Job Retry Scheduled** – Raised when NVBU schedules retry attempt for a failed job.
- ❖ **Job Run Now** – Raised when a job is submitted to run immediately.
- ❖ **Job Scheduled** – Raised when a job is submitted.
- ❖ **Job Stopped** – Raised when a running job is halted.
- ❖ **Scheduled Phase Deleted** – Raised when any scheduled phase for a job is deleted.
- ❖ **Set Created** – Raised when a new selection set is created.
- ❖ **Set Deleted** – Raised when a selection set is deleted.
- ❖ **Set Modified** – Raised when a selection set is modified.
- **Event Class – Licensing**
 - ❖ **License Exceeded** – Raised when usage exceeds the available licenses. By default, a **Sysop Operator Message** method is set for this event.
 - ❖ **License Expiring** – Raised when the NVBU evaluation license is nearing expiry or has expired. It is raised when the validity period for an NVBU evaluation license is less than or equal to 7 days. By default, a **Sysop Operator Message** method is set for this event.
- **Event Class – Log Daemon**
 - ❖ **Home Drive Becoming Full** – Raised when the disk space usage reaches warning or critical threshold. By default, a **Sysop Operator Message** method is set for this event.
- **Event Class – Machines**
 - ❖ **Client Added** – Raised when a new NVBU Client is added to the Domain.
 - ❖ **Client Down** – Raised when an NVBU Client becomes offline or unavailable.
 - ❖ **Client Group Created** – Raised when a Client Group is created.
 - ❖ **Client Group Deleted** – Raised when a Client Group is deleted.
 - ❖ **Client Group Modified** – Raised when a Client Group is modified.
 - ❖ **Client Group Renamed** – Raised when a Client Group is renamed.
 - ❖ **Client Removed** – Raised when a Client is removed from the Domain.
 - ❖ **Virtual Client Added** – Raised when a cluster-aware plugin is installed on the Server.
 - ❖ **Virtual Client Removed** – Raised when a cluster-aware plugin is removed.
- **Event Class – Media**
 - ❖ **Blank** – Raised for a request to blank a piece of media.
 - ❖ **Delete Group** – Raised when a media group is deleted.

- ❖ **Delete Job Instance** – Raised when a job instance is deleted.
- ❖ **Export** – Raised when a piece of media is exported to an Entry/Exit port.
- ❖ **Import** – Raised when a NetApp VTL's shadow tape is imported to an Entry/Exit port.
- ❖ **Import Clean** – Raised when a cleaning tape is loaded on a drive.
- ❖ **Label** – Raised when a media label is assigned.
- ❖ **Load** – Raised when a piece of media is loaded on a drive.
- ❖ **Media Blanked** – Raised when a piece of media is blanked.
- ❖ **Media Deleted** – Raised when a piece of media is removed from the NVDB.
- ❖ **Medial Full** – Raised when a piece of media becomes full.
- ❖ **Media Labelled** – Raised when a media label request completes.
- ❖ **Medial Loaded** – Raised when a media load request completes.
- ❖ **Media Marked Bad** – Raised when a piece of media is marked bad.
- ❖ **Media Request Change Priority** – Raised when the media request priority is changed.
- ❖ **Media Request Timeout Expired** – Raised when media request has timed out for a backup job; NVBU could not find suitable media within the specified timeout interval.
- ❖ **Media Suspect** – Raised when a piece of media is marked suspect.
- ❖ **Media Unloaded** – Raised when a piece of media is unloaded.
- ❖ **Media Unusable** – Raised when a piece of media is rejected by a drive.
- ❖ **No Suitable Media** – Raised when NVBU is not able to find a suitable media to complete the backup job. By default, a **Sysop Operator Message** method is set for this event.
- ❖ **Request Off Hold** – Raised when a media request is taken off hold.
- ❖ **Request On Hold** – Raised when a media request is put on hold.
- ❖ **Reuse** – Raised when a piece of media is marked for re-use.
- ❖ **Scan Request** – Raised for a request to scan a foreign media.
- ❖ **Unload** – Raised when a piece of media is unloaded.
- ❖ **Update Properties** – Raised when media properties are modified.
- **Event Class – Media Database**
 - ❖ **Backup Retired** – Raised when a saveset is retired and its information is deleted from the NVDB.
 - ❖ **Index Compressed** – Raised when a backup index is compressed.
 - ❖ **Index Decompression Failure** – Raised when index de-compression fails due to insufficient disk space.

- ❖ **Index Loaded** – Raised when an offline index is temporarily loaded.
- ❖ **Index Offlined** – Raised when the backup index for a saveset is deleted from the NVDB.
- ❖ **Index Read Failure** – Raised when NVBU cannot read the index for a saveset.
- ❖ **Index Uncompressed** – Raised when a backup index is de-compressed.
- ❖ **Media Database Check Failed** – Raised when database integrity or reference check fails for the media database during NVDB backup.
- ❖ **Media Database Check Passed** – Raised when the media database check completes successfully during NVDB backup.
- ❖ **Media Database Check Passed with Warnings** – Raised when the media database check generates warnings during NVDB backup.
- ❖ **Media Database Compacted** – Raised when the media database compaction completes successfully during NVDB backup.
- ❖ **Media Database Compaction Failed** – Raised when the media database compaction fails during NVDB backup.
- ❖ **Modify Backup Expiry** – Raised when the retention period is modified for an existing saveset.
- **Event Class – Policy**
 - ❖ **Policy Branch Errors Acknowledged** – Raised when errors/warnings are acknowledged at a policy level.
 - ❖ **Policy Created** – Raised when a policy is created.
 - ❖ **Policy Deleted** – Raised when a policy is deleted.
 - ❖ **Policy Errors Acknowledged** – Raised when errors/warnings are acknowledged for a particular policy job.
 - ❖ **Policy Modified** – Raised when a policy is modified.
 - ❖ **Policy Quiesce** – Raised when a **quiesce** request is raised for a policy.
 - ❖ **Policy Quiesced** – Raised when a policy placed in a **quiesced** state.
- **Event Class – Scheduled Database**
 - ❖ **Scheduler Database Check Failed** – Raised when database integrity or reference check fails for the scheduler database during NVDB backup.
 - ❖ **Scheduler Database Check Passed** – Raised when the scheduler database check completes successfully during NVDB backup.
 - ❖ **Scheduler Database Check Passed with Warnings** – Raised when the scheduler database check generates warnings during NVDB backup.
 - ❖ **Scheduler Database Compacted** – Raised when the scheduler database compaction completes successfully during NVDB backup.

- ❖ **Scheduler Database Compaction Failed** – Raised when the scheduler database compaction fails during NVDB backup.
- **Event Class – Stats Collection**
 - ❖ **Cache Too Small** – Raised when cache memory for the Statistics Manager process is running low; this would result in the process running slowly.
 - ❖ **Cannot Accept Records** – Raised when the Statistics Manager process refuses to accept data from other processes.
 - ❖ **Lost Server** – Raised when the Statistics Manager discards the I/O data collected for a Server on polling timeout.
 - ❖ **Stats Manager Ready** – Raised when the Statistics Manager process starts.

Appendix B:

PREDEFINED REPORTS AND COMPONENTS

This appendix provides a brief description of the predefined NVBU reports and components. The information in this appendix is organized into the following topics:

- [Available Canned Reports](#)
- [Available Report Components](#)

B.1.0 Available Canned Reports

NVBU includes the following canned reports:

- **Client Groups** – Provides a list of client groups.
- **Client Statuses** – Provides the current status of clients.
- **Expired Offline Media** – Provides a summary of retired offline media which can be reused.
- **Failed ULA Requests** – Provides a summary of failed user requests for a given period.
- **Full Online Media** – Provides a list of online media with no free space.
- **Global Notifications** – Provides a list of events for which any global notification method has been set.
- **Historic Jobs - By Date** – Provides a date-wise summary of jobs performed during a given period. The details include the Job ID, transfer size, run length, the job completion status, etc.
- **Historic Jobs - By Size** – Provides a size-wise summary of jobs performed during a given period. The details include the Job ID, transfer size, run length, the job completion status and other details.
- **Library Contents** – Provides a summary of currently online media. The details include the current location (the drive or slot in a library), and the used and available space on the media.
- **Media General** – Provides a summary of used media. The details include the current location, used and available space, saveset expiry date, etc.
- **Media Contents Query** – Provides a summary of media contents. The details include the job title, plugin name, saveset expiry date, etc. The output can be filtered on the basis of backup target, media label, media group, job title or plugin.

- **Media Quotas and Usage** – Provides a summary of used and assigned media quota for each user.
- **Media Segment Contents Query** – Provides a summary of media segments. The details include the plugin name, job title, target client, etc.
- **Media Utilization** – Provides a summary of used media, and the count of blank media available in each backup device.
- **NDMP Jobs** – Provides a summary of NDMP filer backups. The details include the Job ID, title, start time, run length, client name, transfer size and the job completion status.
- **NetVault Error Logs** – Provides a summary of error logs generated during a given period.
- **NetVault Events** – Provides a summary of events raised during a given period.
- **NetVault Logs** – Provides a summary of system logs generated during a given period.
- **Offline Devices** – Provides a list of currently offline devices.
- **Outstanding Operator Messages** – Provides a list of unacknowledged operator messages.
- **Overnight Job Summary** – Provides a summary of jobs scheduled to run at night. The details include 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 jobs performed during a given period. For each policy, the report displays the policy name, client and job count, policy status, list of clients, number of failed jobs and jobs completed with warnings, and the details of failed jobs.
- **Restore Summary** – Provides a summary of restore jobs. The details include the Job ID, target client, job completion status, etc.
- **Server License - Capabilities and Usage** – Provides a summary of available and used licenses for NVBU.
- **Single Job Summary** – Provides the job details, drive events, media transfer details, logs and media used for a single job.
- **Single Policy Summary** – Provides the policy status, target clients, job details, number of failed jobs, the transfer size and transfer rate for the policy for a single policy.
- **Single User's Audit Trail** – Provides a summary of audit logs generated for for a particular user. The report can be further filtered for a specific period.
- **User Details** – Provides user details.
- **User Notifications** – Provides a list predefined and user-defined events for which any user notification method has been set.

- **User Privileges** – Provides a summary of privileges granted to individual users.
- **User-defined Event Types** – Provides a list of user-defined events.
- **Workstation Client Failed Jobs** – Use this report to obtain a list of the Workstation Client backups that have failed.
- **Workstation Client Jobs - By Client** – Use this report to obtain a list of the Workstation Client backup jobs sorted alphabetical by Workstation Client name.
- **Workstation Client Jobs - By Date** – Use this report to obtain a list of Workstation Client backup jobs sorted in chronological order with the most recent jobs at the top of the report.
- **Workstation Client Successful Jobs** – Use this report to obtain a list of the Workstation Client backups that have been successfully completed.
- **Workstation Client Inactive For a Week** – Use this report to obtain a list of the Workstation Client that have not had a backup attempted for more than seven (7) days. This report is ideal to determine which Workstation Clients have not connected to the network where the NVBU Server resides long enough for a backup to occur. It helps identify the workstation data that may be at risk by not being protected for long-term retention or disaster recovery.

B.2.0 Available Report Components

NVBU includes the following predefined components:

- **Component Class – Advanced Options**
 - ❖ **Advanced Options - CLI Default Template** – Use this component to view the advanced options for a backup job in text format.
- **Component Class – Audits**
 - ❖ **Audits - CLI Default Template** – Use this component to view the auditor logs in text format.
 - ❖ **Failed ULA Requests** – Use this component to view failed user requests.
 - ❖ **Single User's Audit Trail** – Use this component to view the auditor logs for a particular user.
- **Component Class – Backup Targets**
 - ❖ **Backup Targets - CLI Default Template** – Use this component to view the target device and media details for a backup job.
- **Component Class – Client Groups**
 - ❖ **Client Groups** – Use this component for a list of client groups.
 - ❖ **Client Groups - CLI Default Template** – Use this component for a list of client groups in text format.

- **Component Class – Clients**
 - ❖ **Client Machines - CLI Default Template** – Use this component for a list of clients in text format.
 - ❖ **Client Statuses** – Use this component to view client status.
- **Component Class – Defined Jobs**
 - ❖ **Defined Jobs** – Use this component to view job details, including the Job ID, title, policy name, job type and the selection sets used to define the job.
 - ❖ **Defined Jobs - CLI Default Template** – Use this component to view the job details in text format.
- **Component Class – Drive Events**
 - ❖ **Drive Events - CLI Default Template** – Use this component to view the drive events for all jobs.
 - ❖ **Single Job’s Drive Events** – Use this component to view the drive events for a particular job.
- **Component Class – Drive Performance Statistics**
 - ❖ **Drive Performance Statistics - CLI Default Template** – Use this component to view the drive performance logs.
 - ❖ **Single Job’s Data Transfer Rate** – Use this component to view the data transfer rates for a particular job.
- **Component Class – Drives**
 - ❖ **All Drives** – Use this component to view the read/write information for drives, including the total amount of data read/written, number of read/write errors, and the cleaning details for the drive.
 - ❖ **Drives - CLI Default Template** – Use this component to view the drive read/write details in text format.
 - ❖ **Offline Devices** – Use this component for a list of currently offline devices.
- **Component Class – Entry/Exit Ports**
 - ❖ **Entry/Exit Ports - CLI Default Template** – Use this component for a list of entry/exit ports, and the label and barcode of the media residing in the entry/exit ports.
- **Component Class – Job History**
 - ❖ **Count of Data Stored in Overnight Jobs** – Use this component to view the amount of data stored by the overnight backup jobs.
 - ❖ **Count of Failed Overnight Backup Jobs** – Use this component to view the number of overnight backup jobs that failed.

- ❖ **Count of Overnight Jobs Finished with Warnings** – Use this component to view the number of overnight backup jobs that completed with warnings.
- ❖ **Count of Successful Overnight Backup Jobs** – Use this component to view the number of overnight backup jobs that completed successfully.
- ❖ **Currently Active Jobs** – Use this component for a list of active policy jobs.
- ❖ **Executed Job History** – Use this component for a summary of jobs performed during a given period. The details include the Job ID, title, client name, plugin and the completion status for the job.
- ❖ **Executed Job History - CLI Default Template** – Use this component for a summary of jobs performed during a given period in text format.
- ❖ **Failed Jobs within Single Policy** – Use this component for a summary of failed jobs for a policy.
- ❖ **Failed Overnight Backup Jobs** – Use this component for a summary of failed overnight backup jobs.
- ❖ **Failed Policy Jobs** – Use this component for a summary of failed policy jobs.
- ❖ **Historic Jobs - By Date** – Use this component for a date-wise summary of jobs performed during a given period. The details include the Job ID, transfer size, run length, the job completion status, etc.
- ❖ **Historic Jobs - By Size** – Use this component for a size-wise summary of jobs performed during a given period. The details include the Job ID, transfer size, run length, the job completion status, etc.
- ❖ **Policy Totals** – Use this component to view the total and average backup size and transfer rates for policy jobs.
- ❖ **Restore Summary** – Use this component for a summary of restore jobs. The details include the target client, run length, job completion status, etc.
- ❖ **Single Job Main Summary** – Use this component to view the job details, including the plugin name, start and end time, transfer size, transfer rate and the job completion status for a single job.
- **Component Class – Libraries**
 - ❖ **Blank Media Items in Libraries** – Use this component to view the number of blank media items available in each library.
 - ❖ **Libraries - CLI Default Template** – Use this component for a summary of added libraries in text format.
- **Component Class – Drives**
 - ❖ **Library Drives - CLI Default Template** – Use this component for a summary of added drives in text format.

- **Component Class – Slots**
 - ❖ **Library Slots - CLI Default Template** – Use this component for a summary of library slots in text format.
- **Component Class – License Capabilities**
 - ❖ **Server License Capabilities and Usage** – Use this component for a summary of available and used licenses for NVBU.
 - ❖ **Server License Flags** – Use this component to view the features available with the installed licenses.
 - ❖ **This Server’s License Capabilities and Usage - CLI Default Template** – Use this component for a summary of available and used license information in text format.
- **Component Class – Media**
 - ❖ **Expired Offline Media** – Use this component for a summary of retired offline media which can be reused.
 - ❖ **Full Online Media** – Use this component for a list of online media with no free space.
 - ❖ **Libraries’ Media Contents** – Use this component for a summary of currently online media. The details include the current location (the drive or slot in a library), the used and available space on the media.
 - ❖ **Media - CLI Default Template** – Use this component for a summary of currently online media in text format.
 - ❖ **Media - General** – Use this component for a summary of used media. The details include the current location, used and available space, saveset expiry date, etc.
 - ❖ **Media Utilization** – Use this component for a summary of used media, and the count of blank media available in each backup device.
- **Component Class – Media Capacities**
 - ❖ **Media Capacities - CLI Default Template** – Use this component to view the capacity of online media.
- **Component Class – Media Job Contents**
 - ❖ **Media Contents Query** – Use this component for a summary of media contents. The details include the job title, plugin name, saveset expiry date, etc. The output can be filtered on the basis of backup target, media label, media group, job title or plugin.
 - ❖ **Media Contents Query- Textual** – Use this component for a summary of media contents in text format.
 - ❖ **Media Used by a Single Backup** – Use this component to view the details of the media used for a particular backup job.
- **Component Class – Media Requests**

- ❖ **Media Requests - CLI Default Template** – Use this component to view the pending media requests.
- **Component Class – Media Segment Contents**
 - ❖ **Media Segment Contents Query** – Use this component for a summary of media segments. The details include the plugin name, job title, target client, etc.
 - ❖ **Media Segment Contents Query - CLI Default Template** – Use this component for a summary of media segments in text format.
- **Component Class – Media Transfer Requests**
 - ❖ **Media Transfer Requests - CLI Default Template** – Use this component for a summary of media read and write requests.
 - ❖ **Single Job's Media Transfers** – Use this component for a summary of media read/write requests for a particular job.
- **Component Class – NetVault Event Types**
 - ❖ **NetVault Event Types - CLI Default Template** – Use this component for a list of predefined event types.
 - ❖ **User-Defined Event Types** – Use this component for a list of custom events.
- **Component Class – NetVault Events**
 - ❖ **NetVault Events** – Use this component for a summary of events raised during a given period.
 - ❖ **NetVault Events - CLI Default Template** – Use this component for a summary of raised events in text format.
- **Component Class – NetVault Logs**
 - ❖ **NetVault Logs** – Use this component for a summary of system logs generated during a given period.
 - ❖ **NetVault Logs - CLI Default Template** – Use this component for a summary of system logs in text format.
 - ❖ **Recent Error Logs** – Use this component for a summary of error logs generated during a given period.
 - ❖ **Single Job's Logs** – Use this component for a summary of logs generated for a particular job.
- **Component Class – Notifications**
 - ❖ **Global Notifications** – Use this component for a list of events for which any global notification method has been set.
 - ❖ **User's Selected Notifications - CLI Default Template** – Use this component for a list of events selected for user notification in text format.

- ❖ **User's Selected Notifications** – Use this component for a list of predefined and user-defined events for which any user notification method has been set.
- **Component Class – Operator Messages**
 - ❖ **Operator Messages - CLI Default Template** – Use this component for a list of operator messages in text format.
 - ❖ **Outstanding Operator Messages** – Use this component for a list of unacknowledged operator messages.
- **Component Class – Policies**
 - ❖ **Policies - CLI Default Template** – Use this component for a summary of policy jobs performed during a given period in text format. For each policy, the report displays the policy name, client and job count, policy status, and the list of clients.
 - ❖ **Policy Basics** – Use this component for a summary of policy jobs performed during a given period. For each policy, the report displays the policy name, client and job count, policy status, list of clients, number of failed jobs and jobs completed with warnings, and the details of failed jobs.
 - ❖ **Policy Status Information** – Use this component for a summary of policy jobs performed during a given period. For each policy, the report displays the policy name, client and job count, number of failed jobs and jobs completed with warnings, and the policy status.
- **Component Class – Policy Clients**
 - ❖ **Policy Clients** – Use this component for the client list for a policy.
 - ❖ **Policy Clients - CLI Default Template** – Use this component for the client list for a policy in text format.
- **Component Class – Policy Jobs**
 - ❖ **Defined Policy Jobs** – Use this component for a summary of jobs included in a policy.
 - ❖ **Policy Jobs - CLI Default Template** – Use this component for a summary of jobs for a policy in text format.
- **Component Class – Privileges**
 - ❖ **Granted Privileges - CLI Default Template** – Use this component for a summary of individual user privileges in text format.
 - ❖ **User Privileges** – Use this component for a summary of privileges granted to individual users.
- **Component Class – Report Templates**
 - ❖ **Report Templates Installed on System** – Use this component for a list of report templates stored in the report database.

- **Component Class – Schedule Sets**
 - ❖ **Schedule Sets - CLI Default Template** – Use this component for a summary of available schedule sets.
- **Component Class – Segments**
 - ❖ **Segments - CLI Default Template** – Use this component for a summary of media contents in text format.
- **Component Class – Selection Options Sets**
 - ❖ **Selection Options Sets - CLI Default Template** – Use this component for a summary of available backup options sets.
- **Component Class – Selection Sets**
 - ❖ **Selection Sets - CLI Default Template** – Use this component to view the details of the available backup selection sets.
- **Component Class – Users**
 - ❖ **Quotas and Media Usage** – Use this component for a summary of used and assigned media quota for each user.
 - ❖ **User Details** – Use this component to view the user details.
 - ❖ **Users - CLI Default Template** – Use this component to view the user details in text format.

Appendix C:

USER PRIVILEGES

This appendix provides a brief description of the user privileges required to perform NVBU operations. The information in this appendix is organized into the following topics:

- [Privilege Description](#)

C.1.1.0 Privilege Description

- **Clients – Add/Remove Clients** – Permission to add Clients to NVBU Server, and remove them.
- **Clients – Add/Remove Virtual Clients** – Permission to add or remove Virtual Clients.
- **Clients – Administer Client Groups** – Permission to create, modify and delete Client Groups.
- **Clients – Configure Client** – Permission to access the Remote Configurator.
- **Clients – Get Client Properties** – Permission to view Client properties.
- **Clients – Set Firewall Relationship** – Permission to establish the inside/outside firewall relationship between the NVBU Server and Client.
- **Devices – Add Libraries** – Permission to add libraries to the NVBU Server.
- **Devices – Add Simple Drive** – Permission to add a standalone drive to the NVBU Server.
- **Devices – Clean Drives** – Permission to run the **Clean** command for an added drive.
- **Devices – Manage Devices** – Permission to configure device properties and perform device management tasks.
- **Devices – Open and Close Entry/Exit Ports** – Permission to issue open/close entry/exit port commands.
- **Devices – Open and Close Library Doors** – Permission to issue open/close library door commands.
- **Devices – Perform Device Checks** – Permission to run self-test on an off-line device.
- **Devices – Reconfigure Devices** – Permission to re-configure an added device.
- **Devices – Remove Devices** – Permission to remove devices from the NVBU Server.

- **Devices – Set Drive Cleaning Properties** – Permission to establish a cleaning routine for the drives.
- **Jobs – Abort Jobs** – Permission to abort the running jobs.
- **Jobs – Acknowledge Policy Errors** – Permission to acknowledge errors for a policy and remove the error flags.
- **Jobs – Administer Backup/Restore Set** – Permission to create, modify, copy and delete backup/restore selection sets.
- **Jobs – Administer Policies** – Permission to define and manage backup policies.
- **Jobs – Delete Job** – Permission to delete a job.
- **Jobs – Delete Scheduled Phase** – Permission to delete a job schedule.
- **Jobs – Hold Job** – Permission to put a job on hold.
- **Jobs – Jobs Owned by this User may Run** – Permission to submit jobs.
- **Jobs – Quiesce Policy** – Permission to quiesce an active policy.
- **Jobs – Restart Job** – Permission to resume a stopped File System Plugin job.
- **Jobs – Resume Job** – Permission to resume a job that is put on hold.
- **Jobs – Run Predefined Job Instantly** – Permission to issue the **Run Now** command for a job.
- **Jobs – Stop Job** – Permission to issue the **Stop** command for a restartable File System Plugin job.
- **Jobs – Submit/Update Backup Jobs** – Permission to submit/modify backup jobs.
- **Jobs – Submit/Update Restore Jobs** – Permission to submit/modify restore jobs.
- **Jobs – View Backup Jobs** – Permission to view the job definition for a backup job.
- **Jobs – View Policies** – Permission to view the policy definition.
- **Jobs – View Restore Jobs** – Permission to view the job definition for a restore job.
- **Media – Blank ANSI Media** – Permission to blank a piece of media.
- **Media – Blank Bad Media** – Permission to blank a piece of media that is marked as Bad.
- **Media – Blank Media** – Permission to blank a piece of media.
- **Media – Blank Non-NetVault Media** – Permission to blank a piece of media not used by NVBU.
- **Media – Export Media** – Permission to export a piece of media to entry/exit port.

- **Media – Get Media or Device Status Item** – Permission to view the status of libraries and drives.
- **Media – Import Media** – Permission to import NetApp VTL's shadow tapes.
- **Media – Load/Unload Media from Drives** – Permission to load or unload media.
- **Media – Manage Media Requests** – Permission to set the priority for media requests and/or put a media request on hold.
- **Media – Mark Media for Reuse** – Permission to manually mark a piece of media as re-usable.
- **Media – Modify Backup Expiry Data** – Permission to modify the retention period for savesets.
- **Media – Remove Media** – Permission to remove media information from the NVDB.
- **Media – Scan a Foreign Media** – Permission to scan a piece of media that is marked as Foreign.
- **Media – View and Diagnose Media Requests** – Permission to view and diagnose media requests.
- **Media – View Backup Expiry Data** – Permission to view the retention period for a saveset.
- **Media – View Media Properties** – Permission to view the 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/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 notification methods for pre-defined events.
- **System – Dump Log Entries** – Permission to dump logs in binary or text format.
- **System – Install/Remove Software Packages** – Permission to install and remove the NVBU plugins.
- **System – Install License Key** – Permission to install license keys for the NVBU products.
- **System – Manage Operator Message** – Permission to acknowledge and/or delete operator messages that are logged when an event is raised.
- **System – Permitted to Use CLI Tools** – Permission to use the NVBU CLI Utility.
- **System – Purge Log Entries** – Permission to delete logs from the NVDB.

- **System – Administer User Accounts** – Permission to create, modify and delete user accounts.
- **System – Reset Password for User** – Permission to set, change or reset password for a user.

Appendix D:

NVBU ENVIRONMENT VARIABLES

This appendix provides a brief description of the NVBU environment variables which can be used in user scripts. The information in this appendix is organized into the following topics:

- [Using Environment Variables](#)

D.1.1.0 Using Environment Variables

NVBU provides the following environment variables which can be used in user scripts.

- **NETVAULTCLIACCOUNT** – Use this variable to specify a user account name. The named account must have privileges to use the CLI utility.
`NETVAULTCLIACCOUNT=<Account Name>`
- **NETVAULTCLIPASSWORD** – Use this variable to specify the password for the CLI user account.
`NETVAULTCLIPASSWORD=<Password>`
- **NV_HOME** – Use this variable to refer to the NVBU installation directory.
- **NV_JOBCLIENT** – Use this variable to refer to the target client for the job.
`NV_JOBCLIENT=<Name for the NVBU Client>`
- **NV_JOBID** – Use this variable to refer to a particular job using its Job ID.
`NV_JOBID=<Job ID>`
- **NV_JOBTITLE** – Use this variable to refer to a particular job using its title.
`NV_JOBTITLE=<Job title>`
- **NV_JOB_WARNINGS** – This variable indicates whether a job had warnings during its previous phases. It returns TRUE or FALSE. This variable can only be used in a post script. It is currently used by mail scripts but has general applicability.
- **NV_SERVERNAME** – Use this variable to refer to an NVBU Server.
`NV_SERVERNAME=<Name of the NVBU Server>`
- **NV_SESSIONID** – Use this variable to refer to a particular job using its session ID.
`NV_SESSIONID=<Session ID>`

- **NV_STATUS** – This variable provides the exit status of the previous phase of a job. It returns either **SUCCEEDED** or **FAILED**. For example, when a backup job completes successfully, **NV_STATUS** returns **SUCCEEDED**. You can use this variable in the script to perform any conditional action based on the job exit status.

This variable can only be used in a post script. The return value for this script is not localized. It is **SUCCEEDED** or **FAILED** in English.
- **NV_USER_ARG** – Use this variable to refer to the variables passed with the pre and/or post scripts.

Appendix E:

NVBU PROCESSES

This appendix provides a brief description of the NVBU processes that run on the Server and the Clients. The information in this appendix is organized into the following topics:

- [NVBU Processes – An Overview](#)
- [Process Description](#)

E.1.0 NVBU Processes – An Overview

NVBU comprises several static and dynamic processes which run on the NVBU Server and its Clients. The static processes remain active while the NVBU Service is running and have a single digit fixed process ID. These processes generally require the same amount of system resources throughout. The dynamic processes are initiated and destroyed during process execution, and are assigned a changing ID. These processes require a varying amount of system resources.

On Linux/UNIX platforms, the following command can be used to view the NVBU processes:

```
ps -ef | grep nv
```

On Windows, these can be viewed from the Task Manager.

E.2.0 Process Description

The section briefly describes the functions of various NVBU processes.

- ***nvpmgr (Process Manager)***

nvpmgr runs on all NVBU Server and Clients. This process manages all other NVBU processes. It creates and destroys the transient NVBU 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 due to its need for 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 NVBU Server and Clients. The Communications Manager runs as a process on

UNIX/Linux, and as a thread within the `nvpmgr` process on Windows. It handles communication between the NVBU processes on local machine.

Process Type – Static

Process ID – 2

■ ***nvnmgr (Network Manager)***

`nvnmgr` supports the inter-process messaging system. It runs on all NVBU Server and Clients. The Network Manager runs as a process on UNIX/Linux, and as a thread within the `nvpmgr` process on Windows. It transmits the inter-process messages to remote clients. The Network Manager also broadcasts availability messages, which help determine the current status of NVBU Clients.

Process Type – Static

Process ID – 3

■ ***nvmedmgr (Media Manager)***

`nvmedmgr` runs on the NVBU Server. It manages the media database, which contains information about the media contents and online backup savesets. The Media Manager issues high-level instructions for loading and unloading media, which are carried out by the Device Manager processes. It controls the selection of device and media for a job based on the media requests submitted by the Job Manager process.

Process Type – Static

Process ID – 4

■ ***nvsched (Schedule Manager)***

`nvsched` runs on the NVBU Server. It manages the job schedules and queues. The Schedule Manager initiates the Job Manager process to launch a job instance, and reschedules the next instance for recurring jobs. The actual job execution is carried out by the Job Manager. The Scheduler Manager manages the Scheduler database. It updates the **NVBU Jobs** window, which provides an interface to view the Scheduler records. The Schedule Manager is also responsible for providing job scheduling data to the NVBU Reporting Tool.

Process Type – Static

Process ID – 5

■ ***nvlogdaemon (Log Daemon)***

`nvlogdaemon` runs on the NVBU Server. It manages the system logs generated by various NVBU processes and writes them to log files. System logs are useful in tracking activities and troubleshooting problems. The Log Daemon also performs periodic disk space checks, and issues alerts when the space usage reaches the defined warning or critical threshold for Home, Database, Logs and Reports directories.

Process Type – Static

Process ID – 7

■ ***nvavp (Audit Verification Manager or Auditor)***

nvavp runs on the NVBU Server. It tracks and controls user activities. The Auditor Daemon validates each user request, and depending on the user permissions, grants or denies the request.

Process Type – Static

Process ID – 8

■ ***nvstatsmgr (Statistics Manager)***

nvstatsmgr runs on all NVBU Server and Clients. It collects drive statistics, event history, media requests, server capacity and transfer information for the NVBU reporting system.

Process Type – Static

Process ID – 9

■ ***nvrepdbmgr (Report Manager)***

nvrepdbmgr runs on the NVBU Server. It manages the reports database. The Reports Database Manger polls the Statistics Manger at periodic intervals to get the collected data, and writes the data to the reports database. It provides the information in the reports database to the NVBU reporting tool and performs periodic purging of the reports database.

Process Type – Static

Process ID – 10

■ ***nvdevmgr (Device Manager)***

nvdevmgr runs on the Server and Clients which have a locally-attached device (e.g., NVBU Server and SmartClients). It performs the media reads and writes, and handles loading and unloading of media. NVBU creates an instance of the Device Manager process for each configured drive. In a SAN environment, an instance runs for each NVBU Client that shares the device.

Process Type – Dynamic

Process ID – Varies

■ ***nvndmpdevmgr (NDMP Device Manager)***

nvndmpdevmgr runs on the NVBU Server. It performs media reads and writes, and handles loading and unloading of media for NDMP Filer-attached devices. NVBU creates an 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 Server and Clients to which the robotic arm changer is connected. NVBU creates one instance for each arm changer.

Process Type – Dynamic

Process ID – Varies
- ***nvndmpchgmgr (NDMP Changer Manager)***

nvchgmgr runs on the NVBU Server. It controls the robotic arm changer for NDMP filer-attached devices. NVBU creates one instance for each arm changer.

Process Type – Dynamic

Process ID – Varies
- ***nvjobmgr (Job Manager)***

nvjobmgr runs on the NVBU Server and manages the execution of a job. It 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 reports on the job state changes and the exit status of a job. It coordinates with the Data Plugin and fetches the required information from the NVBU Server. It is also responsible for sending drive and media requests to the Media Manager process.

Process Type – Dynamic

Process ID – Varies
- ***nvgui (GUI Process)***

nvgui manages the Console for NVBU and runs on any NVBU machine on which you start the Console.

Process Type – Dynamic

Process ID – None
- ***nvguiproxy (GUI Proxy Process)***

nvguiproxy allows a Server to be controlled remotely. It runs on the Controller Server.

Process Type – Dynamic

Process ID – None
- ***nvduplicate (Duplicate Process)***

nvduplicate performs backup duplication. It runs on the selected NVBU machine when you select the Secondary Copy phase for a backup job.

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 selected NVBU Server or Client when you select the verification phase for a backup job.

Process Type – Dynamic

Process ID – None

- ***nvplgscript (Plugin 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

