# DXi-Series Backup Application Specific Path To Tape Configuration Guide

This document contains the following topics:

# About Backup Application Specific Path to Tape

Backup Application Specific Path to Tape is a licensable feature for the DXi4700 Multi-Protocol, DXi6700, DXi6800, DXi6900 (DXi-Series), and DXi8500(DXi-Series) enhanced data protection systems platforms. When configured on a DXi system, the Path Tape (PTT) feature allows the export of data to an attached physical tape library (PTL).

You can configure any PTL attached to the same storage network as the DXi for the PTT feature. After the feature is configured, copy or duplicate virtual images backed-up on the DXi to the PTL. These images are written to tape cartridges on the PTL, which then can be exported out of the PTL and stored off site as part of a backup and recovery plan.

## DXi Virtual Interfaces

The DXi employs two virtual interfaces with the PTT feature.

**Virtual Tape Library**

When data is transported through a Fibre Channel connection, the DXi acts as a virtual tape library (VTL). A VTL creates images from backed-up data, and stores these images on virtual tape.

**Virtual Media Changer**

When data is transported through a TCP/IP connection, the DXi virtual meda changer works as a Network Data Management Protocol (NDMP) host. The NDMP host interface duplicates the virtual tape images to a physical tape on a PTL.

# Backup Applications

The following backup applications support the Quantum DXi-Series Backup Application Specific Path to Tape (PTT) feature.

## Symantec NetBackup and Backup Exec

You can use the following Symantec products to support the PTT feature:

- Symantec's Open Storage API
- Symantec NetBackup 7.x Direct to Tape
- Symantec Backup Exec 2010 (or later) DirectCopy to Tape features

## Features

The DXi easily integrates with either NetBackup or Backup Exec to enable duplication of images to a physical tape library (PLT). With NetBackup or Backup Exec support:

- The DXi can duplicate images directly to tape without going through a media server. This process allows for better performance with less media server and network bandwidth required.

- The duplication process is controlled by NetBackup or Backup Exec so the images on the physical tape are cataloged by NetBackup or Backup Exec.

## Workflow

The following workflow depicts how the NetBackup or Backup Exec duplicates images from a DXi to a PTL.

1. NetBackup or Backup Exec prepares the DXi to copy images from a virtual tape cartridge to a physical tape cartridge.

2. NetBackup or Backup Exec mounts the required tape cartridges (physical and virtual). NetBackup or Backup Exec can perform this operation by interacting directly with the physical and virtual media changer or through the DXi.

3. NetBackup or Backup Exec selects the DXi that can provide access to the virtual drive and establishes a session with it for the purpose of duplicating images between the drives.

4. The DXi copies the image from the virtual tape cartridge to the designated physical tape cartridge under the direction of NetBackup or Backup Exec.

5. A copy of the image on the virtual tape cartridge is now on physical tape.

**Note:** Backup data flows through a Fibre Channel connection in all cases.

**Figure 1:** NetBackup Direct to Tape and Backup Exec DirectCopy Support
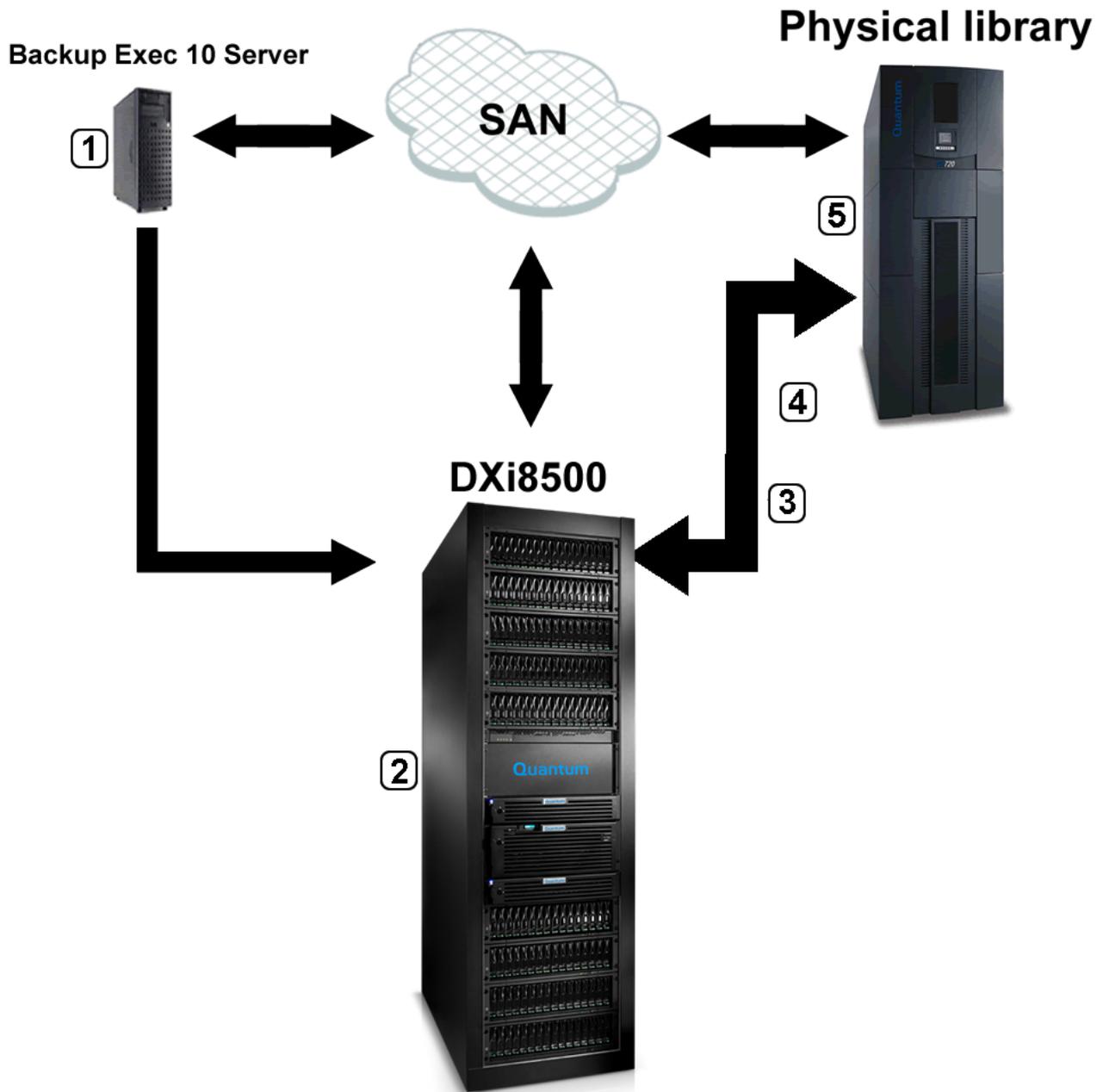
# EMC NetWorker

You can use EMC NetWorker with the PTT feature for cloning operations. With EMC NetWorker, the DXi can move data directly between its VTL and the PTL.

## Requirements

The following requirements must be met to support EMC Networker PTT cloning operations:

- The DXi is integrated with EMC NetWorker.
- The PTT feature is enabled on the DXi.
- The PTL and drives are attached to the DXi.

**Note:** EMC NetWorker 8.1 and later are not supported for Backup Application Specific Path to Tape.

# Oracle Secure Backup

You can use Oracle Secure Backup (OSB) to support the PTT feature.

OSB delivers unified data protection for heterogeneous environments. Highly scalable, OSB domains (environments) are centrally managed using a single console and common management interface across a spectrum of servers and Network Attached Storage (NAS) devices.

## Features

OSB offers the following features.

**Centralized Tape Backup Management**

OSB delivers centralized tape backup management for the entire IT environment:

- Oracle database integration with Recovery Manager (RMAN) supporting versions Oracle9i to Oracle Database 11g
- Media management interface for Oracle database backups to tape utilizing RMAN
- File system data protection for UNIX / Windows / Linux servers
- NAS protection leveraging the Network Data Management Protocol (NDMP).

**Local and Remote Data Protection**

With a highly scalable client/server architecture, OSB provides local and remote data protection leveraging Secure Socket Layer (SSL) technology for secure intra-domain communication and two-way server authentication. Addressing the complexity of enterprise data protection, OSB provides advanced media and device management such as:

- Backup encryption and key management

- Automated tape vaulting and duplication

- Dynamic drive sharing in Storage Area Network (SAN) environments

- Server-less tape duplication using NDMP direct copy functionality as supported by Virtual Tape Libraries (VTLs)

---

ⓘ **Note:** For more detailed information regarding installation, configuration, and management of OSB, please refer to the OSB web site on Oracle Technical Network (OTN) for white papers, presentations, data sheet, support matrixes, and tutorials: http://www.oracle.com/technology/products/secure-backup/index.htm.

## ASG-Time Navigator

ASG-Time Navigator supports the PTT feature by controlling the duplication process, as well as by cataloging the images on the PTL. With ASG-Time Navigator, the DXi can duplicate images directly to tape without going through a media server. This process allows for better performance with less media server and network bandwidth required.

---

# Virtual Tape to Physical Tape Transfer Techniques

DXi contain partitions — or virtual tape libraries (VTLs) — that present the virtual media changer and virtual tape drives to the host exactly as they would to a physical tape library (PTL). This presentation allows the same drivers to be used for both VTLs and PTLs. Existing backup processes are identical, and creating a backup image on a virtual tape is no different from creating a backup image on a physical tape. The backup functionality and data path are unchanged.

**Figure 2:** VTL Backup Scenario
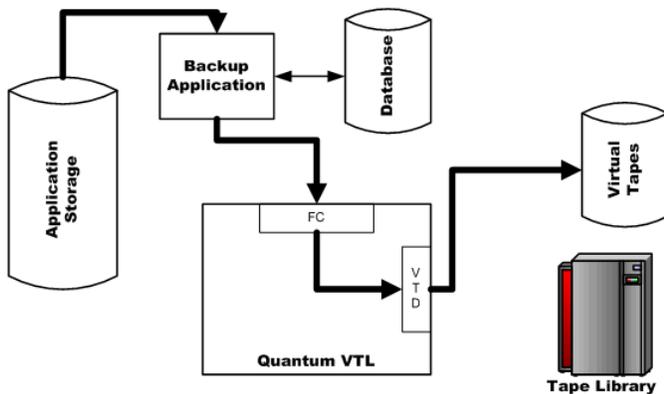


After the normal DXi backup process has completed, each backup application implements its own technique to transfer stored data from virtual tape to physical tape.

# Symantec NetBackup, Symantec Backup Exec, and ASG-Time Navigator

These backup applications can perform a copy operation using Network Data Management Protocol (NDMP) to transfer data directly from the virtual tape library (VTL) to the physical tape library (PTL) over a Fibre Channel connection.

The backup application server controls the copy process, but it does not read or write the data, which in turn frees it to do other tasks. Because this data transfer is a normal duplication job, the physical tape copy is cataloged in the backup application's database. You can restore data directly from either virtual or physical copy because both the VTL and the PTL are visible to the backup application.

## Workflow

To duplicate the virtual tape image, the backup application performs the following steps:

1. Selects an NDMP device path to the VTL.

2. Creates an NDMP control session for this device.

3. Selects a tape volume from the PTL.

4. Selects an NDMP device path from this library.

5. Creates a second NDMP control session for this device.

6. Sends NDMP messages via the control sessions both to move data and to monitor the data transfer.

7. Writes headers and handles tape spanning and errors, as needed.

**Figure 3:** Duplicating Virtual Tape Image
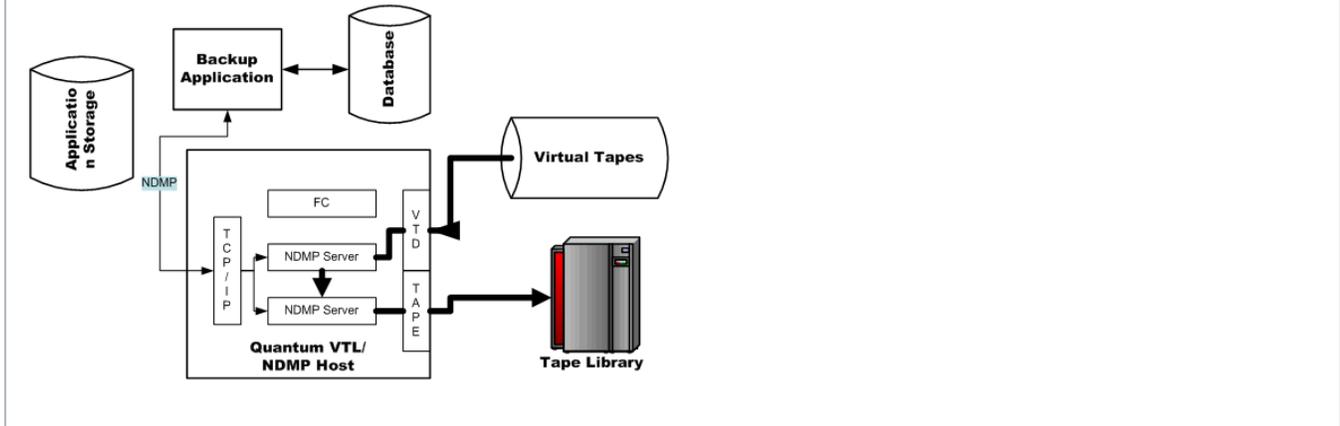
# EMC Networker

With EMC NetWorker, the DXi can move cloned data directly between its VTL and the PTL. The NetWorker storage node manages the cloning process, while the DXi manages the actual data transfer.

For data transer, the VTL presentation layer supports Fibre Channel connections. A second path, accessible via NDMP via Fibre Channel, supports the enhanced VTL to PTL clone operations with NetWorker.

The PTT feature allows both the VTL and the PTL to be visible to NetWorker, enabling you to restore data directly from either virtual or physical copy. NetWorker automatically catalogs the physical tape barcode in its database.

## Workflow

To clone data directly from the VTL to the PTL, NetWorker performs the following steps:

1. Through the DXi, selects the NDMP device paths (via Fibre Channle) to the VTL and PTL.

2. Through NDMP, identifies a source and destination for the data movement within the DXi.

3. Creates another NDMP control session for this device.

4. Sends NDMP messages via the control session to manage the overall process, as well as to monitor the data transfer taking place at the back end of the DXi appliance.

5. Updates the headers on the physical tape to manage the new barcodes.

**Figure 4:** Duplicating Virtual Tape Image
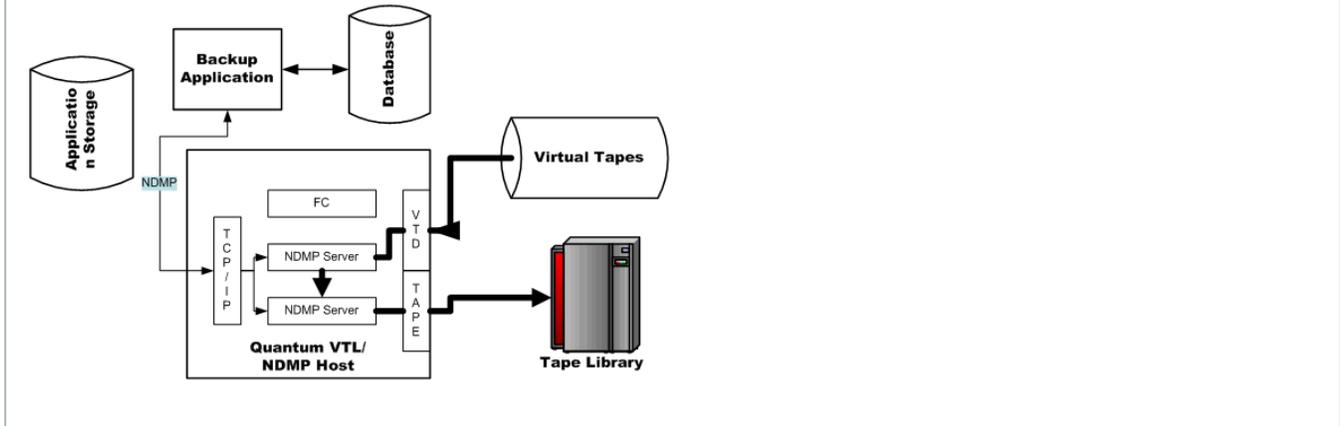
## Oracle Secure Backup

Oracle Secure Backup (OSB) can duplicate or migrate virtual tapes to physical tapes on a one-off basis or per user-defined policy.

**Duplication**

Creates a tape copy with identical backup data but a unique tape ID for tracking purposes. After a duplication operation completes, two copies of the backup data exist.

**Migration**

Creates an identical tape copy with a unique tape ID, and then deletes the original tape thereby freeing up space on the VTL. After a migration operation completes, one copy of the backup data exists on tape.

Configuring tape duplication or migration can be accomplished using the OSB Web Tool, command line (obtool), or Oracle Enterprise Manager (EM) Grid Control 10.2.0.5.

## Workflow

Perform a one-off duplication or migration from the OSB Web Tool:

1.  Open the **OSB Web Tool Volumes** page.

    **Figure 5:** OSB Web Tool Volumes Page
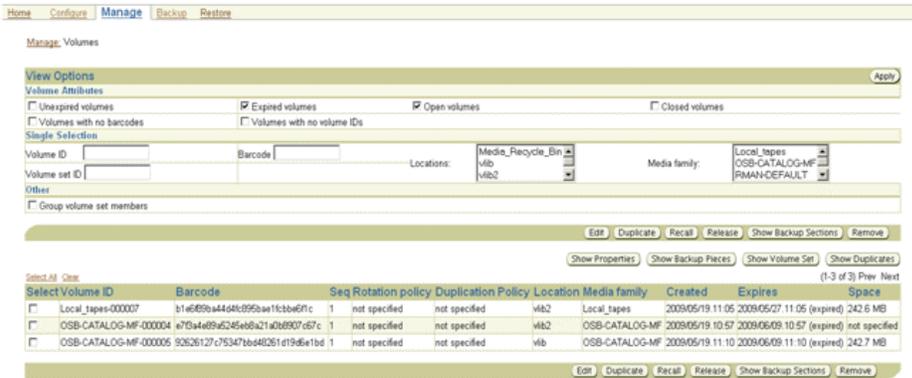
    

2.  Select the desired volumes to duplicate or migrate.

3.  Click the **Duplicate** button to display options for duplicating or migrating the volumes.

4.  Select the appropriate option.

# Device Path Requirements

You must use specific device paths for the different backup applications. Review the following requirements.

## Symantec NetBackup and Backup Exec, ASG-Time Navigator, and Oracle Secure Backup

The following device paths must be visible to these backup applications.

| Device Path | Description |
| --- | --- |
| Fibre Channel (emulating tape) to virtual tape library (VTL) | Required for duplicating backed-up data from the primary storage device. |
| NDMP (emulating tape) to VTL | Required for the following two scenarios:<br><br>• Duplicating data from a VTL to a physical tape library (PTL)<br><br>• Duplicating data from a PTL to a VTL<br><br>ⓘ **Note:** The DXi virtual medium changer must be viewed through TCP/IP, and will appear as an NDMP host. |

| Device Path | Description |
|---|---|
| NDMP to attached PTL | Required to read or restore data directly from a PTL. <br> ℹ **Note:** The backup application controls the VTL backups and NDMP duplication from VTL to PTL. |

## EMC NetWorker

The following device paths must be visible to the EMC NetWorker.

| Device Path | Description |
|---|---|
| Fibre Channel or SAN (emulating tape) to VTL | Required for duplicating backed-up data from the primary storage device. |
| Fibre Channel or SAN to the VTL from the DXi | Required for data backups. |
| Fibre Channel or SAN to the VTL from the backup host | Required for data restores. |
| NDMP (emulating tape) to VTL | Required for the following two scenarios: <br><br> • Duplicating data from a VTL to a PTL <br><br> • Duplicating data from a PTL to a VTL <br> ℹ **Note:** The DXi virtual medium changer must be viewed through TCP/IP, and will appear as an NDMP host. |
| NDMP to attached PTL | Required to read or restore data directly from a PTL. <br> ℹ **Note:** Restoring data from a PTL may take longer to complete than restoring data from a VTl. <br> ℹ **Note:** NetWorker controls the VTL backups and NDMP duplication from VTL to PTL. |

# DXi PTT Configuration

To use the DXi Path to Tape (PTT) feature, you must configure both the DXi and the backup application. In addition, for all backup applications, configure a physical tape library (PTL) that is connected to the same network as the DXi.

# Supported Tape Libraries and Tape Drives

The following tables list tape libraries and tape drives that are supported by the DXi PTT feature. Refer to the appropriate vendor's documentation for a complete list of supported PTLs for your backup application.

**Tape Libraries**

| Vendor | Tape Library |
|---|---|
| Quantum | <ul><li>Scalar i3</li><li>Scalar i6</li><li>Scalar i500</li><li>Scalar i2000 and i6000</li><li>Scalar 24</li><li>Scalar 50 (PX502)</li><li>Scalar i40 and i80</li><li>PX500</li><li>PX720</li></ul> |
| Dell | <ul><li>PV132T</li><li>PVT136T</li><li>ML6000</li></ul> |
| HP | <ul><li>ESL E Series</li><li>EML Series</li></ul> |
| IBM | TS3500 |
| Sun/STK | L180 (FC only)<br>L700 (FC only)<br>SL500 (FC only)<br>SL3000 (FC only) |

**Tape Drives**

| Vendor | Tape Drive |
|---|---|
| Quantum | • SDLT320<br>• SDLT600<br>• DLT-S4<br>• LTO-2<br>• LTO-3<br>   ⓘ **Note:** In addition to the previously listed drives, Oracle Secure Backup (OSB) also supports VS80, VS160, SDLT220, and LTO. |
| HP | • LTO-2<br>• LTO-3<br>• LTO-4<br>• LTO-5<br>• LTO-6<br>• LTO-7<br>• LTO-8 |
| IBM | • LTO-2<br>• LTO-3<br>• LTO-4<br>• LTO-5<br>• LTO-6<br>• LTO-7<br>• LTO-8 |

# Configuring the DXi For Path to Tape

Do the following to configure the DXi for the Path To Tape (PTT) feature.

## Prerequisite

Do the following before configuring the DXi for PTT.

- Make sure the PTL is properly cabled, zoned, and mapped to the DXi node. To detect the PTL, you may need to reboot the DXi node.

- Install the Backup Application Specific Path to Tape license on the DXi. See your *DXi User's Guide*.

  A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

## Configure the DXi for PTT

1. From the DXi remote management console, select **Configuration > PTT > Backup Application Specific** to display the **Manage Backup Users** page.

   **Figure 6:** Manage Backup Users Page
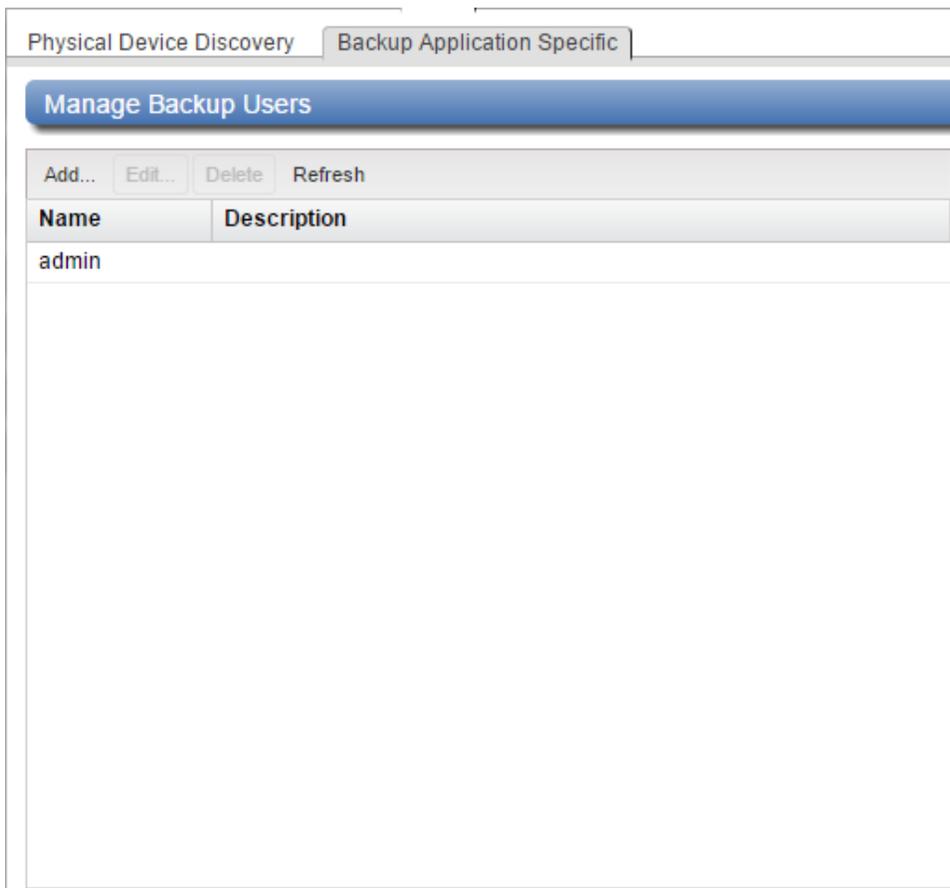
2. Click **Add** to display the **Add User Credential** dialog box.

**Figure 7:** Add User Credential Dialog Box
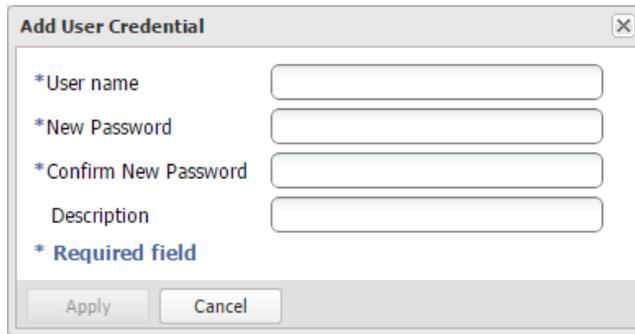


3. In the **User Name**, **New Password**, and **Confirm New Password** fields, enter the same user credentials that are used by the backup application.

4. Click **Apply** to create the user credentials.

5. Click the **Physical Device Discovery** tab to display the **Discover/Configure Physical Libraries and Tape Drives** page.

**Figure 8:** Discover/Configure Physical Libraries and Tape Drives Page



6. Click the **Scan** button to discover all attached PTLs.

7. After the DXi completes its scan, make sure that the changer and all of its drives are enabled.

   If you need to enable a changer or drive, select the component and click **Enable**.

8. Complete the configuration process by configuring the appropriate backup application for the DXi:

   - Symantec NetBackup

   - Symantec Backup Exec

   - EMC NetWorker

   - Oracle Secure Backup

   - ASG-Time Navigator

# Configuring Symantec NetBackup for PTT

To use Symantec NetBackup with the DXi Backup Application Specific Path to Tape (PTT) feature, you must configure the backup application as follows:

- Define the DXi as the NDMP host below

- Configure NetBackup for PTT on the next page

## Prerequisites

Do the following before configuring Symantec NetBackup for PTT.

- Install and configure the DXi for Backup Application Specific Path to Tape. See Configuring the DXi For Path to Tape on page 13.

- Configure Fibre Channel connectivity.

- Dedicate a partition within the DXi to NetBackup. The partition cannot be shared with another backup application.

- Install the Backup Application Specific Path to Tape license on the DXi. See your *DXi User's Guide*.

  A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

ℹ **Note:** To support large numbers of tape drives in a VTL, you must have NetBackup 7.x.

## Define the DXi as the NDMP host

1. On the NetBackup Server, open the NetBackup Administration Console.

2. Navigate to **NDMP Credentials** to create a new Network Data Management Protocol (NDMP) host.

3. For the NDMP host name, enter the DXi IP address.

4. For the NDMP host user name and password, enter the same credentials used for the backup application on the DXi. See Configuring the DXi For Path to Tape on page 13.

## Configure NetBackup for PTT

1. Display the the NetBackup **Device Configuration Wizard**.

**Figure 9:** Device Configuration Wizard
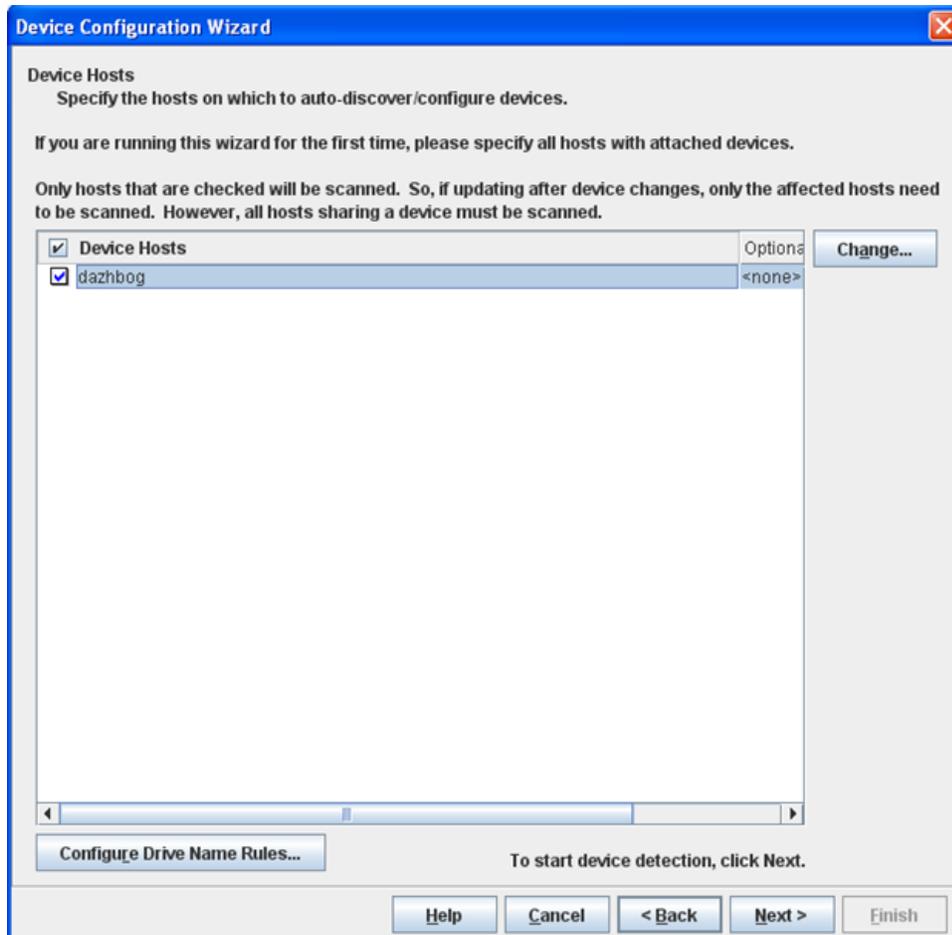
2. Select your Master server and click the **Change** button to display the **Change Device Host** dialog box.

   **Figure 10:** Change Device Host Dialog Box
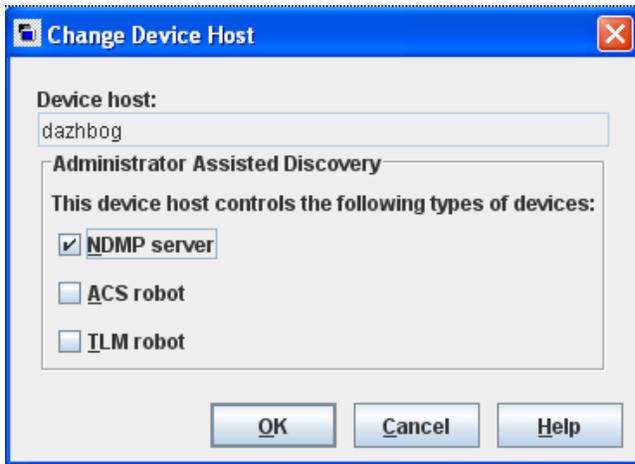
   

3. Select **NDMP Server** and click **OK** and **Next** to display the **NDMP Hosts** page.

4. Click **New** to display the **Media and Device Management - NetBackup** dialog box.

   **Figure 11:** NDMP Hosts Page and Media and Device Management - NetBackup Dialog Box
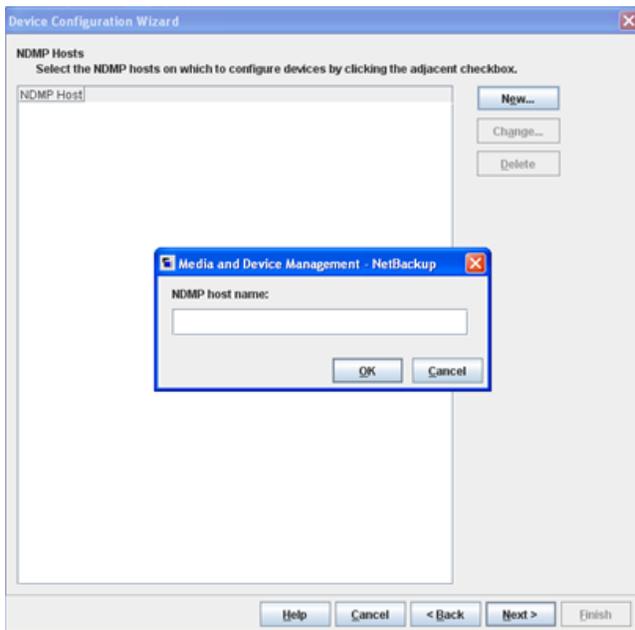
   

5. In the **NDMP host name** field, enter the hostname or IP address of the DXi.

   ⓘ **Note:** For segmented network configurations, enter the data IP address.

6. Click **OK** and **Next** to display the **New NDMP Host** page.

**Figure 12:** New NDMP Host Page
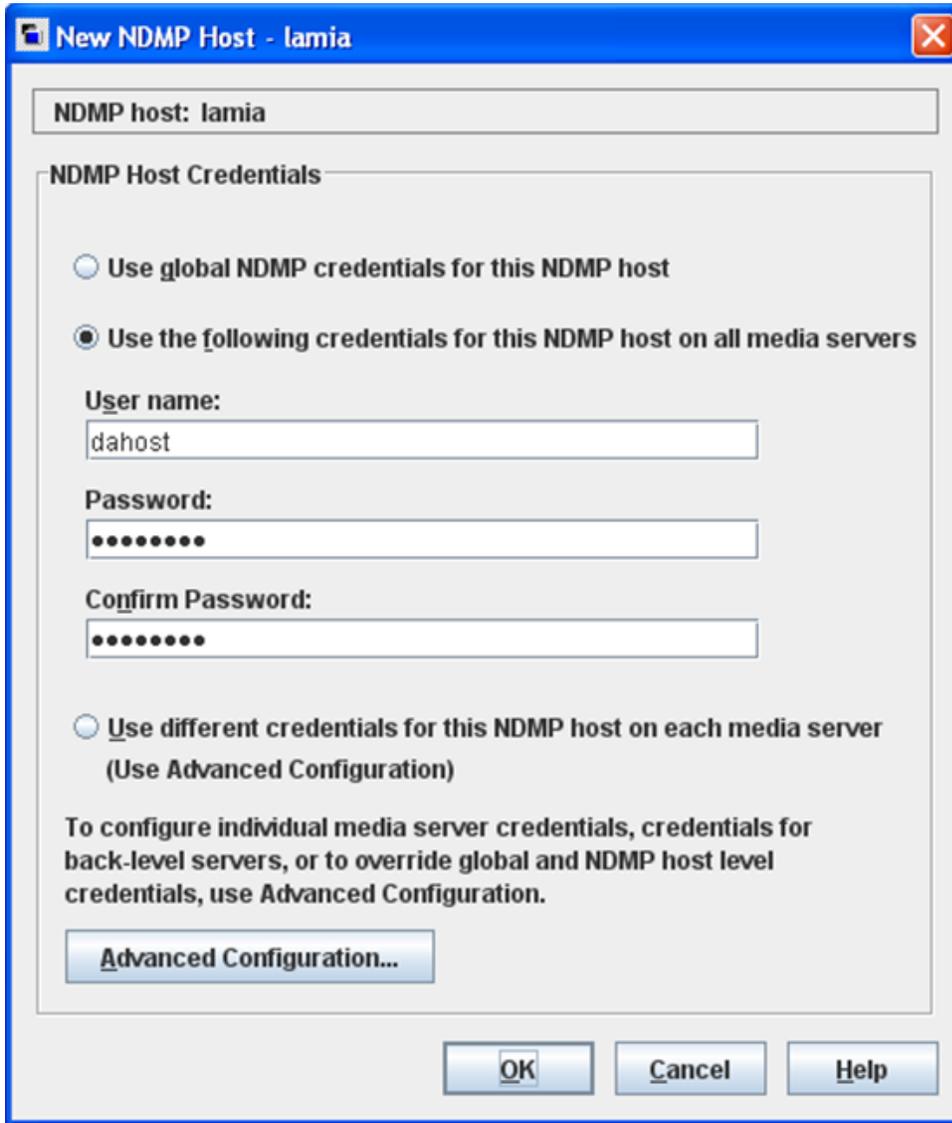


7. Select the appropriate NDMP Host Credentials method, and populate the fields, as needed.

8. Click **OK** to return to the **NDMP Host** screen with the DXi now displaying as an NDMP host.

9. Select the DXi and click **Next**.

10. After NetBackup scans the DXi NDMP host and discovers its associated virtual tape libraries (VTLs) and tape drives, click **Next**.

> **ⓘ Note:** If NetBackup does not discover the DXi or associated VTLs, make sure that the NetBackup host has network access to your DXi and recognizes the network name or IP address.

11. Select both the source VTL, target physical tape library (PTL), and all tape drives, as needed.

12. Click **Next** and **Yes** to save these settings.

13. Click **Next** twice and then click **Finish** to save these settings.

## Initiating Symantec NetBackup PTT

Symantec NetBackup uses Network Data Management Protocol (NDMP) direct copy to duplicate backed-up images. To run a duplication, you can use any of the following methods:

- The **Duplicate** option in the **Catalog** node of the **NetBackup Administration Console**

- The NetBackup Vault (See the *NetBackup Vault Administrators Guide*.)

- The **bpduplicate** command (See the *NetBackup Commands Guide*.)

- A Netbackup Storage Life-cycle Policy

---

### Requirements

The following requirements must be met for NetBackup to use NDMP direct copy in duplicating backed-up images.

- Designate an NDMP storage unit in the DXi to use as the destination for the duplicated image.

- Ensure that an NDMP tape drive is available to mount the source image. The NDMP tape drive can be one that was defined in the DXi or it can be a physical tape drive in a tape library.

When these requirements are met, NetBackup copies the image directly to the designated storage unit without using media server I/O or network bandwidth.

---

## Initiate an NDMP PTT

1. From the **NetBackup Administration Console**, expand the **NetBackup Management Catalog**.

2. Set up the search criteria for the image to duplicate.

3. Click **Search Now** to locate the backed-up images.

4. Right-click the image(s) to duplicate and select **Duplicate** from the displayed menu. NetBackup begins the duplication of the selected images.

> **ⓘ Note:** For more information, refer to the *NetBackup Administrator's Guide.*

# Configuring Symantec Backup Exec for PTT

To use Symantec Backup Exec with the DXi Backup Application Specific Path to Tape (PTT) feature, you must configure the backup application as follows:

- Add a Backup Application Specific Library
- Share Devices on an NDMP Server
- Test the Configuration

---

## Prerequisites

Do the following before configuring Symantec Backup Exec for PTT.

- Install and configure the DXi for Backup Application Specific Path to Tape. See Configuring the DXi For Path to Tape .
- Dedicate a partition within the DXi to Backup Exec. The partition cannot be shared with another backup application.
- Install the Network Data Management Protocol (NDMP) Option locally on the media server as a separate add-on component of Backup Exec. Files are not copied to the NDMP server.

  For more information, see *Installing Additional Backup Exec Options* in the *Backup Exec Installation Guide*.

- Install the Backup Application Specific Path to Tape license on the DXi. See your *DXi User's Guide*.

  A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

---

## Add a Backup Application Specific Library

1. From the Symantec Backup Exec console, select **Tools > Configure Devices> Add NDMP Storage** to display the **Add NDMP Server** dialog box.

   **Figure 13:** Add NDMP Server Dialog Box
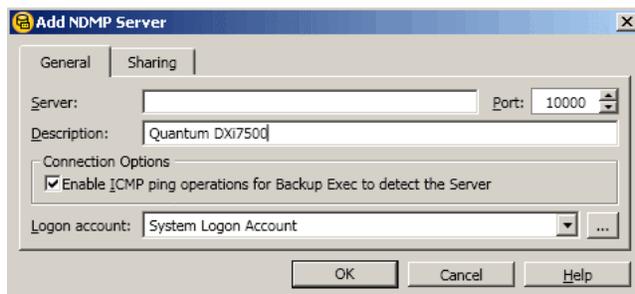
2.  In the **Description** field, enter the name or IP Address of the DXi system that is attached to the physical tape library (PTL).

3.  Select the **Enable ICMP ping operations for Backup Exec to detect the Server** check box.

4.  In the **Logon account** field, select the account that has been configured for NDMP authentication with the DXi.

5.  Click the **Sharing** tab, and select the media servers to be used with this device.

**Figure 14:** Add NDMP Server Dialog Box – Sharing Tab
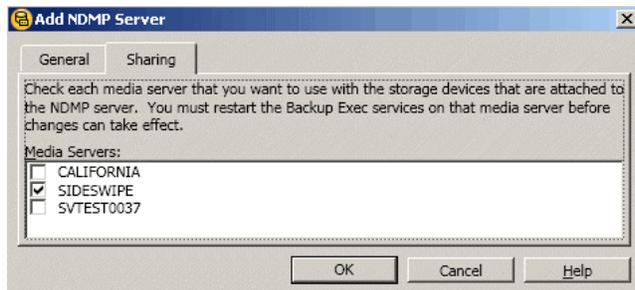


6.  For each selected media server, restart Backup Exec.

7.  From the Symantec Backup Exec console, click **Devices** to display a list of available media servers in the left pane.

8.  Right-click the media server to use in managing the device, and select **Label Media** from the displayed menu.

9.  Label the media server, as appropriate, to complete the addition of a backup application specific library to Backup Exec.

# Share Devices on an NDMP Server

If you use the **Backup Exec Central Admin Server Option** or the **SAN Shared Storage Option**, you can share the devices attached to an NDMP server between multiple media servers. The media server used to add the NDMP server is automatically selected for sharing.

ℹ️ **Note:** If you upgraded from an earlier version of Backup Exec, your existing configuration is preserved and you do not need to set up sharing for existing configurations.

**Share the devices on an NDMP server between multiple media servers**

1.  From the Symantec Backup Exec console, click **Devices** to display a list of devices.

2.  In the right pane, right-click the NDMP server with the attached devices to share.

3.  From the displayed menu, select **Manage Sharing**.

ℹ️ **Note:** The **Manage Sharing** option only appears when **Backup Exec Central Admin Server** or **SAN Shared Storage** is installed. In addition, you must have more than one media server.

4. Select the NDMP server with the attached devices to share.

5. Under **Media Servers**, select the media servers between which to share the NDMP server's attached devices.

6. Click **OK**.

7. For each selected media server, restart Backup Exec.

## Test the Configuration

1. From the Symantec Backup Exec console, select the **Job Setup** tab and create a new duplication job.

**Figure 15:** New Job to Duplicate Backup Sets Dialog Box
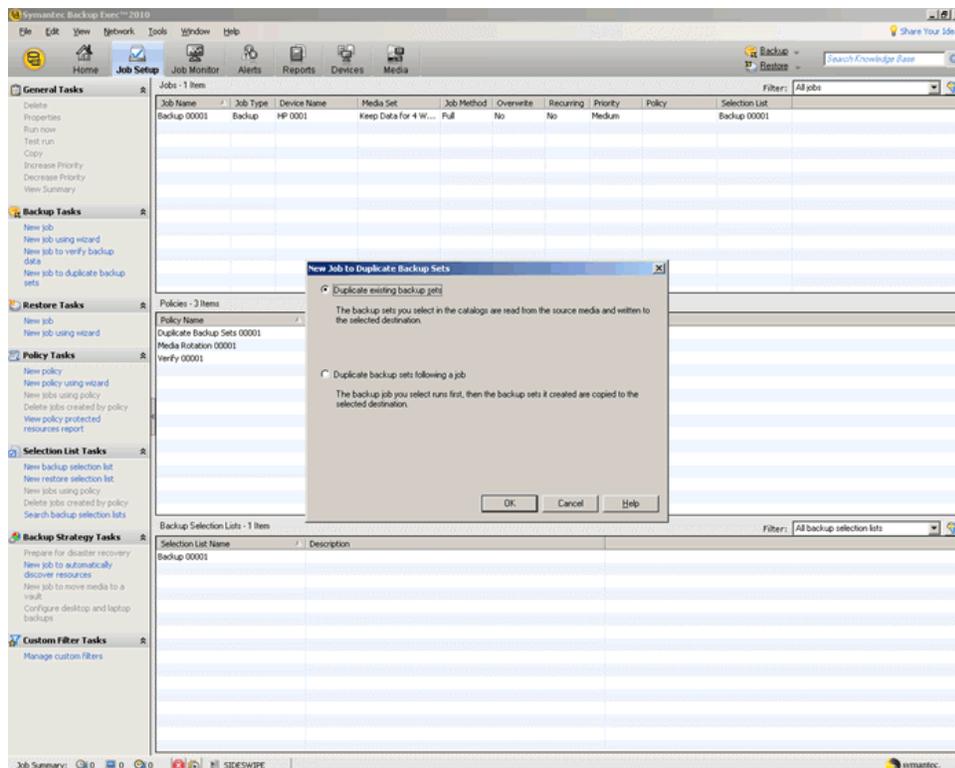


2. On the **New Job to Duplicate Backup Sets** dialog box, select the appropriate job type and click **OK** to display the **New Duplicate Backup Set Job** window.

3. Select the **Source > Selections** menu, and select a resource to back up.

**Figure 16:** New Duplicate Backup Set Job Window – Source > Selections Menu
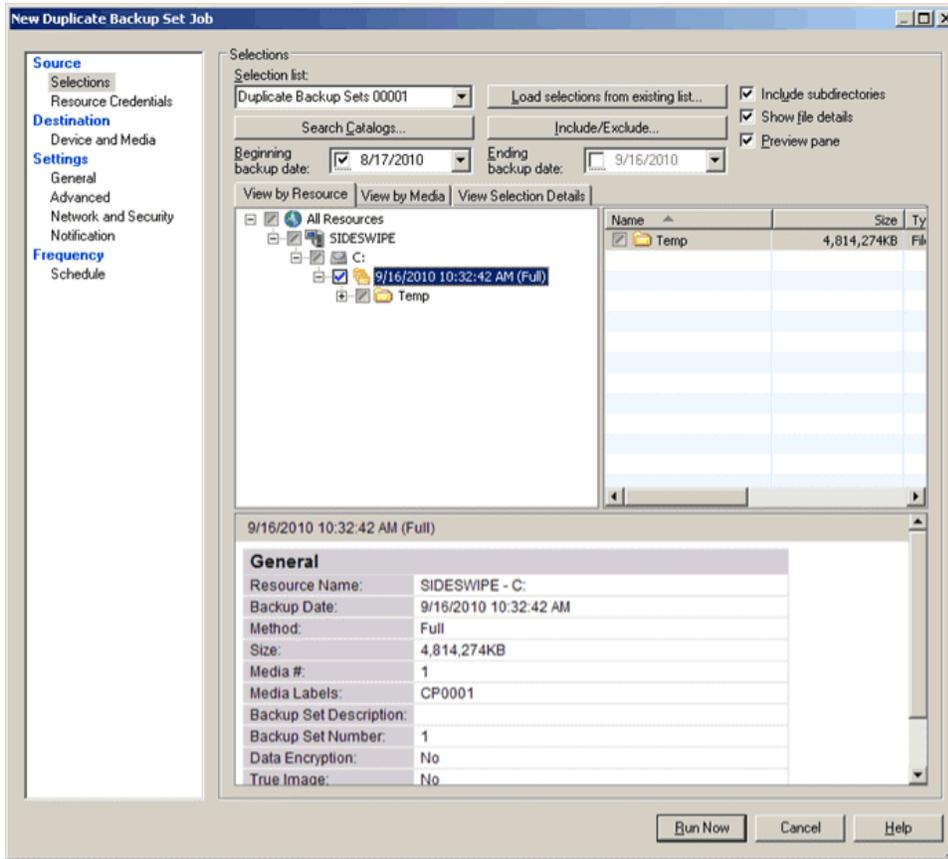
4. Select the **Destination > Device and Media** menu, and select the PTL to use as the destination.

**Figure 17:** New Duplicate Backup Set Job Window – Destination > Device and Media menu
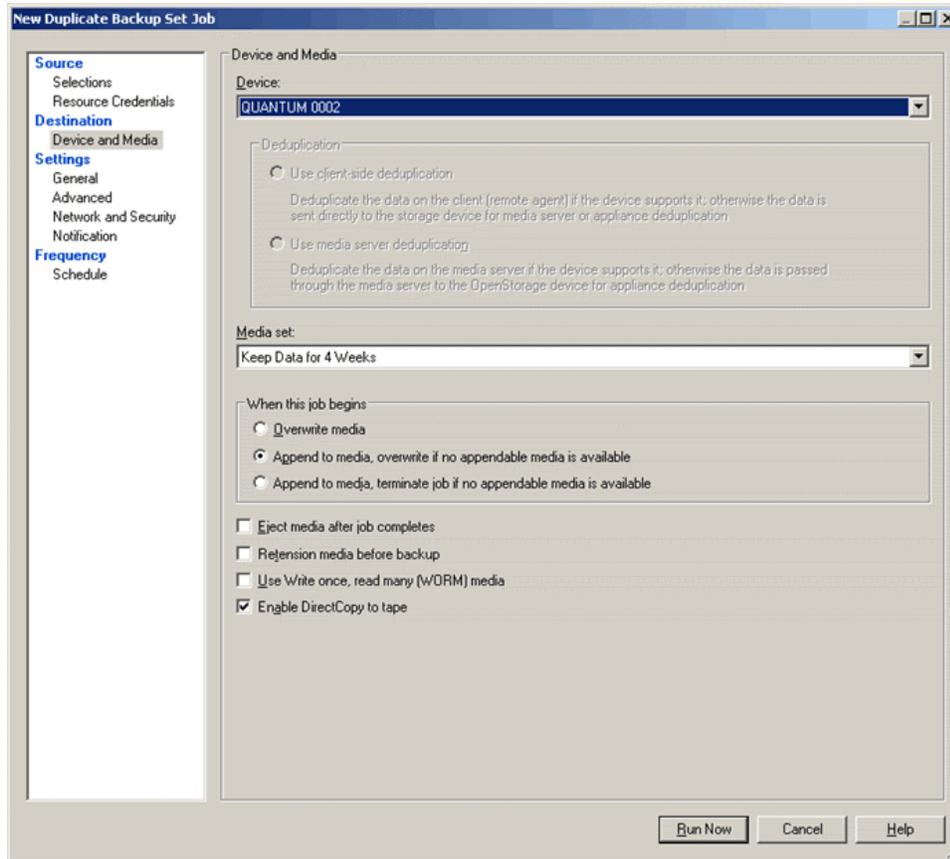


ℹ️ **Note:** Verify that the **Enable DirectCopy to Tape** feature is selected.

5. From the Symantec Backup Exec console, select the **Job Monitor** tab to monitor the duplication job's progress.

**Figure 18:** Job Monitor Tab
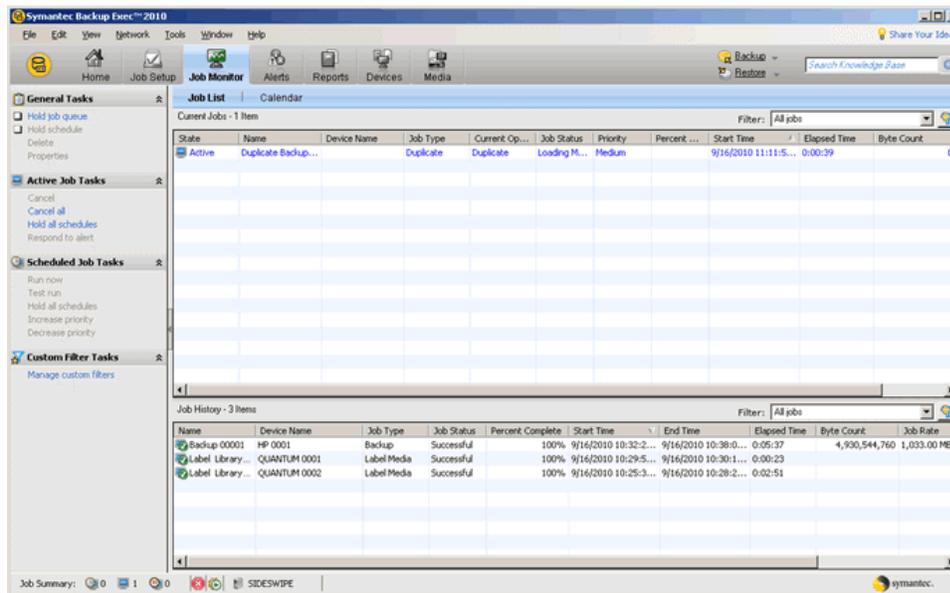


In the above illustration, **QUANTUM 0001** is the VTL and **QUANTUM 0002** is the PTL. A Scalar i40 is used as the physical tape library.

# Configuring EMC NetWorker for PTT

To use EMC NetWorker with the DXi Backup Application Specific Path to Tape (PTT) feature, you must configure the backup application, as follows:

- Configure SCSI Storage Node Paths
- Configure NDMP Storage

**Note:** EMC NetWorker 8.1 and later are not supported for Backup Application Specific Path to Tape.

## Prerequisites

Do the following before configuring EMC NetWorker for PTT

- Install and configure the DXi for Backup Application Specific Path to Tape. See Configuring the DXi For Path to Tape .
- Ensure that you have the required licenses.

  **Required Licenses**

  ◦ Backup Application Specific Path to Tape license on the DXi

A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

○ Autochanger license for the physical tape library (PTL) based on the number of cartridge slots

○ One license for each logical shared drive in the DXi

**Example**

A PTL with two physical drives requires the following:

a. Two digital data storage (DDS) licenses to share the two physical Network Data Management Protocol (NDMP) drives.

b. Two DDS licenses to share the two virtual tape library (VTL) NDMP drives.

○ Storage Node License

○ EMC's license to perform basic backups to the DXi in VTL mode

Contact EMC for license specific license information.

## Configure SCSI Storage Node Paths

Before configuring the NDMP storage node, you must configure the SCSI storage node paths to both the VTL and the PTL.

**Configure SCSI storage node paths to libraries and drives**

1. From the NetWorker Administration console, right-click on the SCSI storage node and select **Scan for Devices** to display the **Scan for Devices** dialog box.

2. In the device list, make sure that the device is the VTL and PTL are selected.

3. For the **Device Scan Type** option, select **scsi**.

4. Click the **Start Scan** button to scan the VTL and PTL.

5. After the scan completes, right-click the displayed VTL and select **Configure Library** to display the **Re-configure Library** dialog box.

**Figure 19:** Re-configure Library Dialog Box
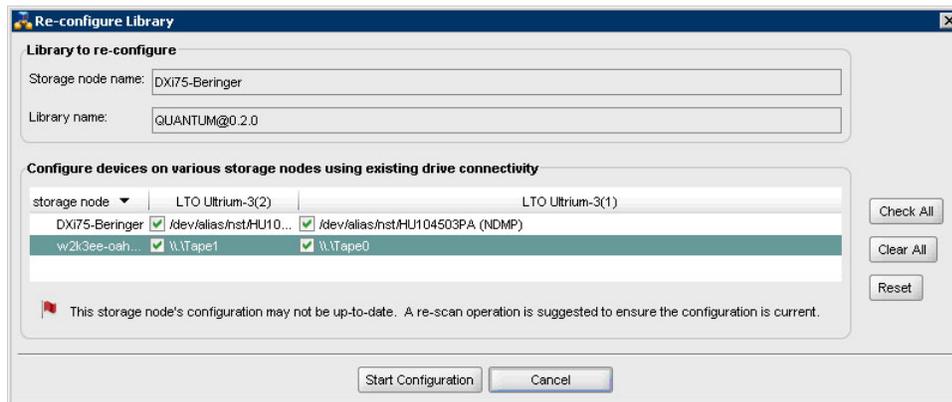


6. Select each remaining SCSI path to the VTL's tape drives.

7. Click **Start Configuration**.

8. Repeat steps 5-7 for the connected PTL.

# Configure NDMP Storage

After configuring SCSI paths, you must configure an NDMP storage node for the DXi. This configuration requires the following tasks.

**Configure the NDMP storage node for the DXi**

1. From the Networker Administration console's left pane, right-click **Storage Nodes** and select **New** to display the **Create Storage Node** dialog box.

**Figure 20:** Create Storage Node



2. In the **Name** field, enter the fully qualified device name for the DXi.

3. For the **Type of storage node** option, select **ndmp**.

4. In the **Remote Host** area, enter the remote user name and password for the NDMP user account. See Configuring the DXi For Path to Tape on page 13.

5. Click **OK** to create the NDMP storage node for the DXi.

**Configure NDMP storage node paths**

1. From the NetWorker Administration console, right-click on the NDMP storage node and select **Scan for Devices** to display the **Scan for Devices** dialog box.

**Figure 21:** Scan for Devices Dialog Box
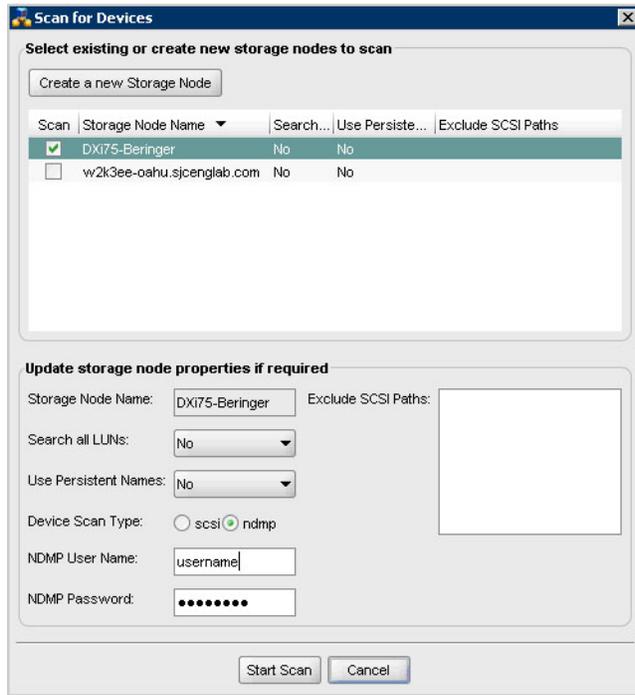


2. In the device list, make sure that the NDMP storage node is selected.

3. For the **Device Scan Type** option, select **ndmp**.

4. Click the **Start Scan** button to scan the DXi.

5. After the scan completes and the NDMP paths are visible for the VTL and PTL on the SCSI storage node, right-click the displayed VTL and select **Configure Library** to display the **Re-configure Library** dialog box.

**Figure 22:** Re-configure Library Dialog Box
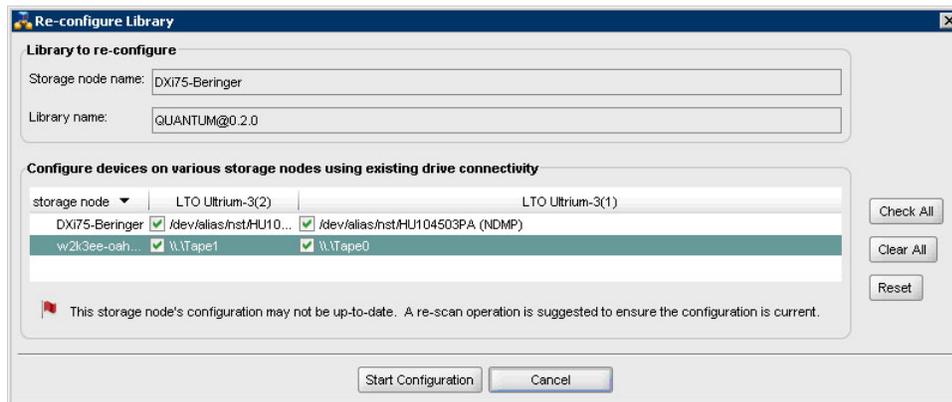


6. Select each remaining NDMP path to the VTL's tape drives.

7. Click **Start Configuration**.

8. Repeat steps 5-7 for the connected PTL.

**Configure the clone storage node**

1. From the NetWorker Administration console, click the **Configuration** tab.

2. In the left pane, select **Clients**.

3. Right-click the client to clone, and select **Properties** to display the **Properties** dialog box.

4. Click the **Globals (2 of 2)** tab.

**Figure 23:** Client Properties Dialog Box – Globals (2 of 2) Tab
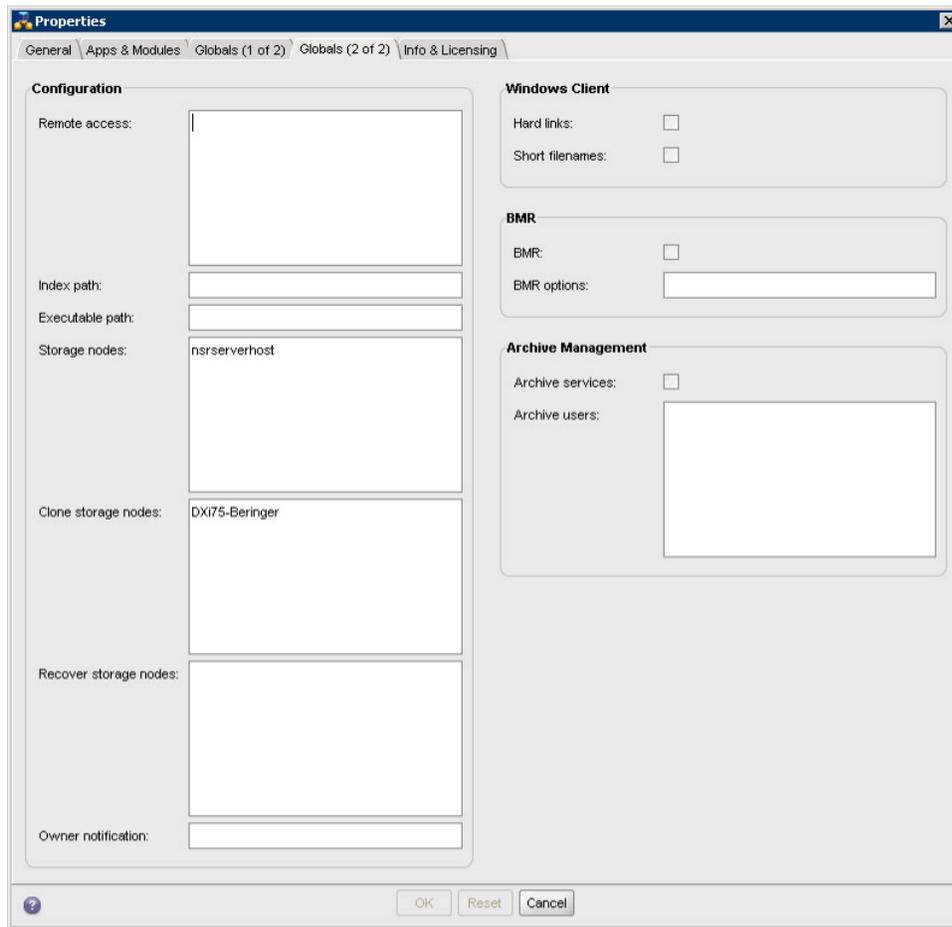


5. In the **Clone storage nodes** box, enter the hostname of the NDMP storage node on the DXi.

6. In the **Recover storage nodes** box, enter the hostname of both the SCSI storage node and the NDMP storage node.

7. Click **OK** to complete the configuration of the clone storage node.

# NDMP Cloning Operation Commands

You must initiate Network Data Management Protocol (NDMP) cloning operations using a command line interface (CLI).

Cloning to bad physical media causes EMC NetWorker to report the following:

```
Waiting for 1 writable volume(s) to backup pool
```

Workaround this issue by issuing a `CTRL-Z` command from the CLI. This command cancels the clone operation, removes the known bad physical media, and restarts the clone operation.

<div style="border:1px solid">

## Prerequisites

Prior to starting a clone operation, do the following:

- Perform backups as usual with scheduled groups or manually.
- Determine whether to clone an entire tape volume or a single save set.
- Label tapes into the Default Clone pool.

</div>

## NDMP Cloning Operation Commands

Use the following CLI commands to perform NDMP cloning operations.

**Clone a save set**

```
nsrndmp_clone -v -p -J <DXi_Hostname> -S <SSID_number>
```

**Clone an entire volume**

```
clone -v -p -J <DXi_Hostname> <volume_name>
```

**Restore data from physical tape**

NetWorker recover command specifying **saveset/cloneid**

---

**ℹ Note:** Refer to the EMC NetWorker documentation for more **nsrndmp_clone** command options.

---

# Configuring Oracle Secure Backup for PTT

To use Oracle Secure Backup (OSB) with the DXi Backup Application Specific Path to Tape (PTT) feature, you must configure the backup application, as follows:

- Assign OSB host roles on page 35
- Configure the physical tape library (PTL) in obtool on page 35
- Configure the virtual tape library (VTL) in obtool on page 36

---

**ℹ Note:** To configure devices on OSB, you must have OSB Administrator privileges.

---

<div style="border:1px solid">

## Prerequisites

</div>

Do the following before configuring OSB for PTT.

**Set up the DXi**

- Install and configure the DXi for Backup Application Specific Path to Tape. See Configuring the DXi For Path to Tape on page 13.

- Configure Fibre Channel connectivity.

- Dedicate a partition within the DXi to OSB. The partition cannot be shared with another backup application.

- Install the Backup Application Specific Path to Tape license on the DXi. See your *DXi User's Guide*.

  A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

**Attach Points**

If you are using SCSI devices, you must have the following SCSI tape device parameters. These parameters are required to create attach points from the media server to your devices.

**ⓘ Note:** For hosts with an NDMP interface, OSB can discover device attachments, and so this step is not required.

- SCSI addresses

  - For Windows, the SCSI addresses are provided during installation.

  - For Linux and UNIX environments, you must query the host to determine these parameters. Refer to the OSB documentation.

- Host bus adapter number for the SCSI adapter

- SCSI bus address for Windows or SCSI channel for Linux

- SCSI target ID

- SCSI logical unit numbers (LUNs)

**OSB LUNs**

Each tape drive and tape library needs an OSB LUN for identification. OSB uses the LUN to generate device special file names.

- For Windows media servers. OSB automatically assigns LUNs to devices.

- For UNIX or Linux media server, you must assign OSB LUNs for each device as part of planning your administrative domain.

Typically OSB LUNs are assigned sequentially, starting at 0, to each tape library and tape drive. The maximum value for an OSB LUN is 31.

> **Example**
>
> The following LUN assignments are given:
>
> - Tape libraries: **0, 1, 2...**
> - Tape drives: **0, 1, 2...** .
>
> The resulting unique device special file names are generated:
>
> - Linux or UNIX Servers:
>   - Tape libraries: **/dev/obl0, /dev/obl1, /dev/obl2...**
>   - Tape drives: **/dev/ obt0, /dev/obt1, /dev/obt2...**
> - Windows Servers:
>   - Tape libraries: **//./obl0, //./obl1, //./obl2...**
>   - Tape drives: **//./obt0, //./obt1, //./obt2...**

# Assign OSB host roles

1. Install OSB software on the hosts requiring protection.
2. From the OSB console, assign the appropriate host role.

   **Administratrive Server**

   The administrative server houses the OSB catalog and scheduling information. There can be only one administrative server per backup domain.

   > **ⓘ Note:** You can also assign the media server role to the Administrative Server, as needed.

   **Media Server**

   The media server attaches directly to the tape devices.

   **Client**

   The client contains the data to back up.

   > **ⓘ Note:** All hosts have a minimum of client role.

# Configure the physical tape library (PTL) in obtool

1. From the obtool command line interface (CLI), create an OSB device object for each PTL and assign it a user-defined name.

2. Attach each PTL to the device special file using the following command:

   **`ob> <device_object> --type library --attach <device_special_file>`**

3. For each tape drive attached to the PTLs, create an OSB device object and assign in a user-defined name.

4. Attach each drive on the PTL to the device special file using the following command, as needed:

   **`ob> <PTL_device_object> --type tape --library <type> --<drive_device_object> -- attach <device_special_file>`**

5. Verify the configuration using the following command:

   **`ob> lsdev`**

---

**Example**

You attach the following PTL drives to device special files:

**`ob> mkdev --type tape --library i500 --dte 1 --attach svtest0030:/dev/obt0 IBMLTO3A`**

**`ob> mkdev --type tape --library i500 --dte 2 --attach svtest0030:/dev/obt1 IBMLTO3B`**

**`ob> mkdev --type tape --library i500 --dte 3 --attach svtest0030:/dev/obt2 IBMLTO3C`**

You run the following command to verify the configuration:

**`ob> lsdev`**

OSB displays the following output:

```
library i500 in service
   drive 1 IBMLTO3Ain service
   drive 2 IBMLTO3B in service
   drive 3 IBMLTO3C in service
```

---

## Configure the virtual tape library (VTL) in obtool

An NDMP copy-enabled VTL, such as a Quantum DXi, has an embedded NDMP server and multiple access paths. This format offloads the volume duplication I/O from the application running on the media server to the VTL.

You must configure the NDMP copy-enabled VTL as a group of tape devices with multiple attach specifications. This representation ensures that the inventory data coming through the multiple access paths is identical.

---

ℹ️ **Note:** The following task provides basic configuration steps. For detailed instructions, see *Oracle Secure Backup Administrator's Guide*.

**Configure an NDMP copy-enabled VTL**

1. In the obtool CLI, create two OSB host objects to represent the VTL.

   a. Associate the first object with the media server to which the VTL is attached.

   b. Associate the second object with the VTL's embedded NDMP server.

2. Assign the media server role to both of these host objects.

3. Create one OSB library device object with two attach specifications for the VTL.

   a. Assign the first access path through the media server to which the VTL is attached.

   b. Assign the second access path through the embedded NDMP server.

4. Create an OSB tape device object with two access paths for each drive contained within the VTL.

   a. Assign the first access path through the media server.

   b. Assign the second access path through the embedded NDMP server.

5. Create one OSB library device object with a single attach specification for the PTL.

   Assign the access path through the VTL's embedded NDMP server.

6. Create an OSB tape device object with a single attach specification for each drive contained within the PTL.

   Assign the access path through the VTL's embedded NDMP server.

> ⓘ **Note:** Multiple media servers can access the PTL and its drives if the PTL is connected to a shared storage area network. In this case, create the OSB device objects for the PTL and its drives with multiple attach points.

**Example**

Following is an example of the **obtool** commands used to configure an NDMP copy-enabled VTL. Many of the options specified in a real environment have been omitted for clarity. The device names shown are simply placeholders that may differ from the actual names in a real environment.

1. Create the OSB host object associated with the media server to which the VTL is attached.

   ```
   mkhost --access ob --ip ipname osb_media_server
   ```

2. Create the OSB host object associated with the embedded NDMP server contained within the VTL.

   ```
   mkhost --access ndmp --ip ipname ndmp_server
   ```

3. Configure an OSB device object that is associated with the VTL **vlib**.

   ```
   mkdev --type library --class vtl

   -attach osb_media_server:/dev/obl0,ndmp_media_server:/dev/sg0 vlib
   ```

> **ℹ Note:** Access to this library and its drives is through the OSB media server and the embedded NDMP server.

4. Configure an OSB device object for drive **vdrive1**, which is contained in the VTL **vlib**.

   ```
   mkdev --type tape --library vlib --dte 1

   -attach osb_media_server:/dev/obt0,ndmp_media_server:/dev/nst0 vdrive1
   ```

5. Repeat this command for each tape drive in the VTL.

   ```
   mkdev --type tape --library vlib --dte 2

   -attach osb_media_server:/dev/obt1,ndmp_media_server:/dev/nst1 vdrive2

   mkdev --type tape --library vlib --dte 3

   -attach osb_media_server:/dev/obt2,ndmp_media_server:/dev/nst2 vdrive3
   ```

6. After configuring your devices, review the attached configured devices on the **Configure Devices** tab.

# Configuring ASG-Time Navigator for PTT

To use ASG-Time Navigatorwith the DXi Backup Application Specific Path to Tape (PTT) feature, you must configure the backup application as follows:

- Configure the VTL in ASG-Time Navigator
- Configure the PTL in ASG-TIme Navigator

## Prerequisites

Do the following before configuring ASG-Time Navigator for PTT.

- Install and configure the DXi for Backup Application Specific Path to Tape. See Configuring the DXi For Path to Tape .
- Configure Fibre Channel connectivity.
- Dedicate a partition within the DXi to ASG-Time Navigator. The partition cannot be shared with another backup application.
- Install the Backup Application Specific Path to Tape license on the DXi. See your *DXi User's Guide*.

  A separate license is required on DXi systems to support Backup Application Specific Path to Tape. The Backup Application Specific license is pre-installed on all DXi6700, DXi6800, and DXi8500 systems.

# Configure the VTL in ASG-Time Navigator

Perform the following tasks to configure a virtual tape library (VTL) in ASG-TIme Navigator.

> **ⓘ Note:** You will configure the NDMP application for the VTL **AFTER** configuring the physical tape library (PTL).

**Add the VTL**

1. On the ASG-Time Navigator console, click **Advanced Device Manager > Host Platform > Network** to display the **New Network** dialog box.

   **Figure 24:** New Network Dialog Box
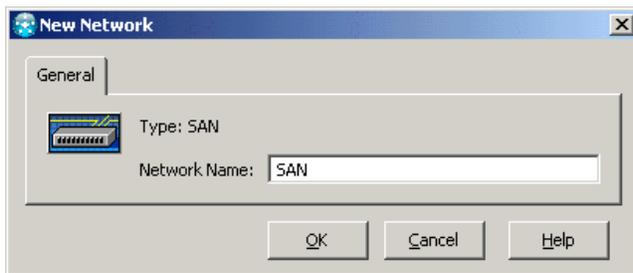
   

2. In the **Network Name** field, enter the name for the new host platform and click **OK**.

3. Click **Advanced Device Manager > Host Platform** to display the **Device List** dialog box.

   **Figure 25:** Device List Dialog Box
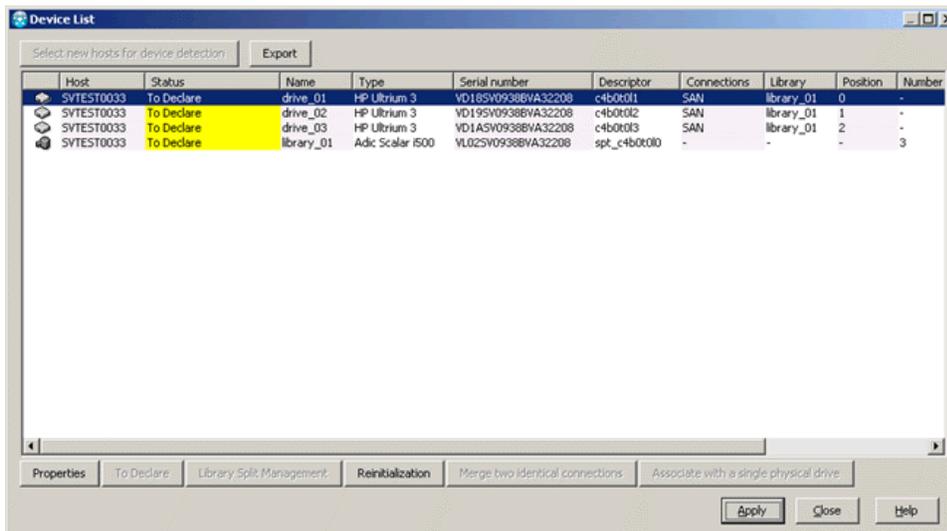
   

4. Select the VTL and drive(s) with which to associate the host platform.

5. Under **Properties**, select **SAN Connection**.

6. Click **Apply**.

## Configure the NDMP host in ASG-Time Navigator

1. On the ASG-Time Navigator console, display the **New Host** dialog box.

**Figure 26:** New Host Dialog Box – General Tab
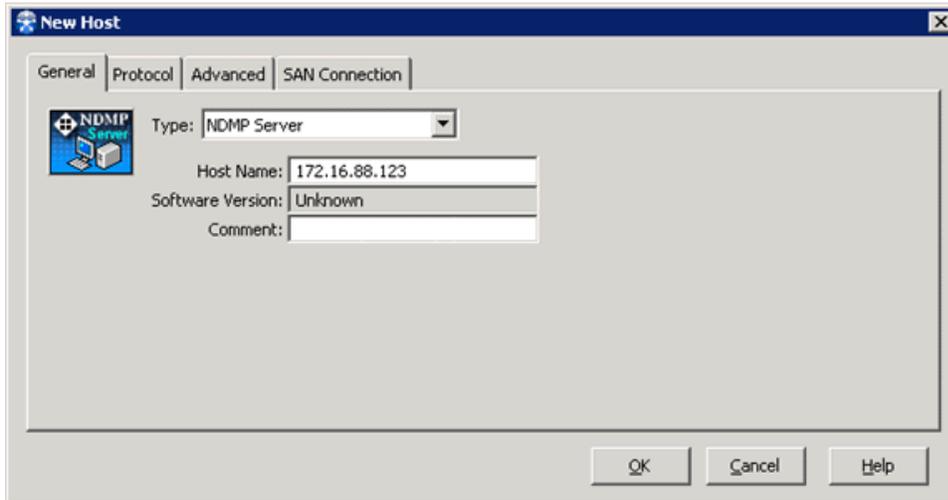


2. Populate the **General** tab with the following information:

| Field | Entry |
|---|---|
| **Type** | Enter **NDMP Server**. |
| **Host Name** | Enter the DXi's IP address or hostname. |
| **Comment** | Enter a comment to further define the host, as needed. |

3. Click the **Protocol** tab.

**Figure 27:** New Host Dialog Box – Protocol Tab
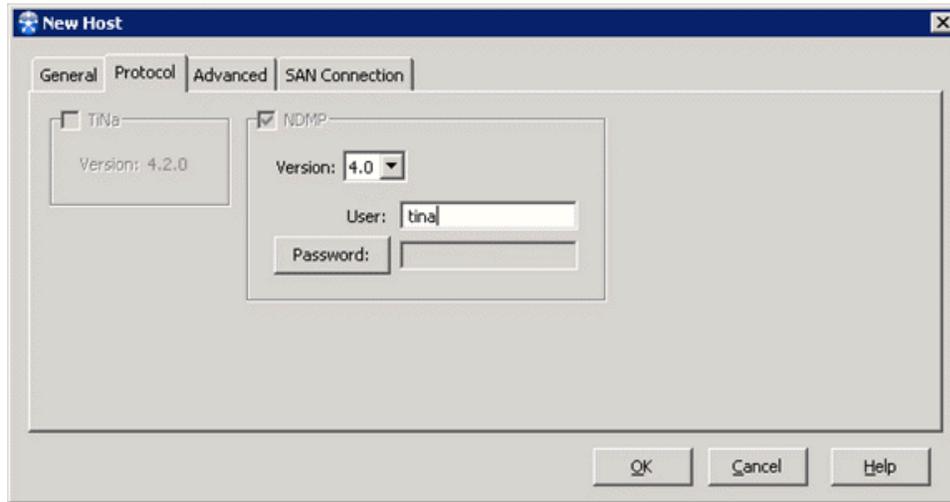


4. Populate the **Protocol** tab with the following information:

| Field | Entry |
|---|---|
| **Version** | Select **4.0**. |
| **User** | Enter the NDMP user name configured on the DXi. See Configuring the DXi For Path to Tape on page 13. |
| **Password** | Enter the NDMP password configured on the DXi. See Configuring the DXi For Path to Tape on page 13. |

5. Click **OK** to create the NDMP host.

**Configure the NDMP application for the VTL**

ⓘ **Note:** Perform this task after AFTER configuring the PTL.

1. On the ASG-TIme Navigator console, click **Advanced Device Manager > Host Platform** to add a new host platform.

2. Display the **Supported Applications** dialog box, and select the **Application > NDMP** type to create an NDMP application.

**Figure 28:** Supported Applications
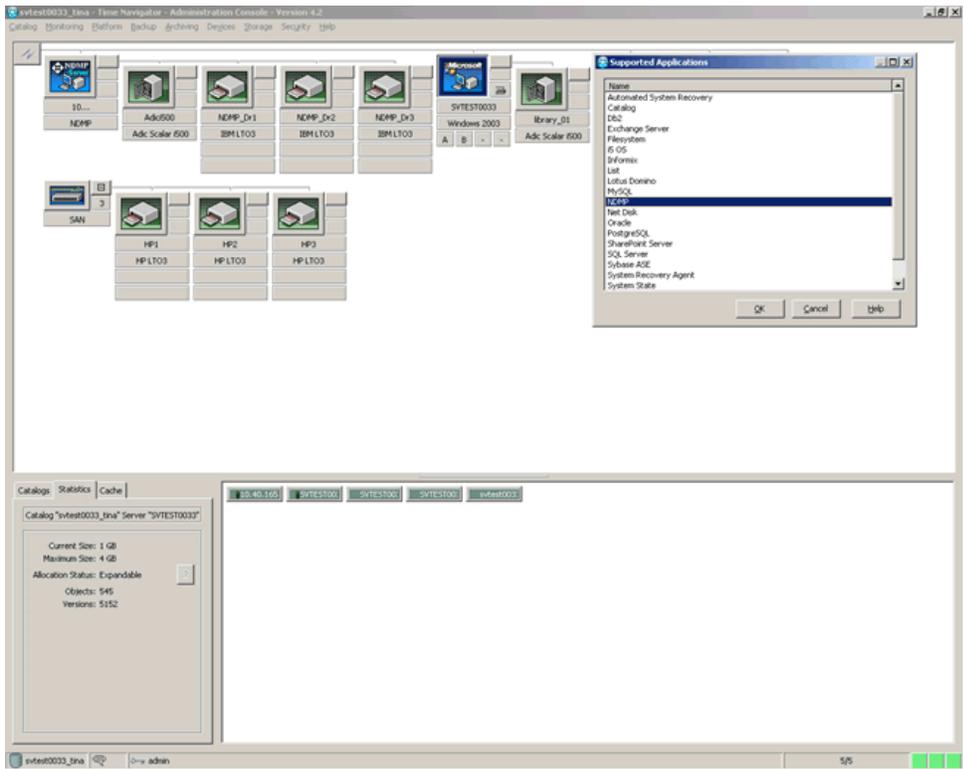
3. Display the **Application Properties** dialog box.

**Figure 29:** Application Properties Dialog Box
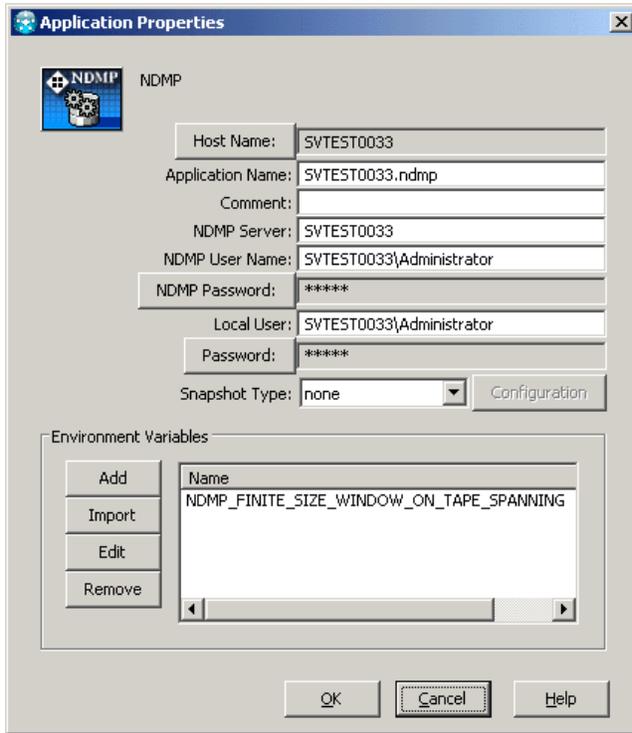


4. Configure in the login credentials for the NDMP application by populating the following fields:

| Field | Entry |
|-------|-------|
| **Local User** | Enter the NDMP user name configured on the DXi. See Configuring the DXi For Path to Tape on page 13. |
| **Password** | Enter the NDMP password configured on the DXi. See Configuring the DXi For Path to Tape on page 13. |

5. In the **Environment Variables** area, click **Add** to display the **Edit Environment Variable** dialog box.

**Figure 30:** Edit Environment Variable Dialog Box
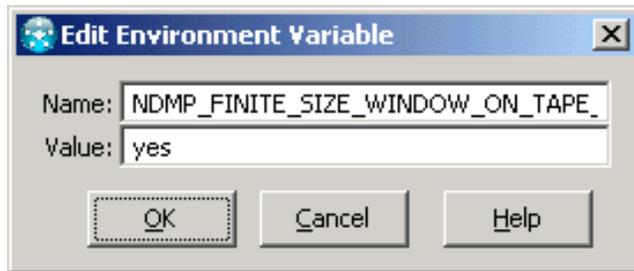


6. Populate the following fields:

| Field | Entry |
| --- | --- |
| **Name** | Enter **NDMP_FINITE_SIZE_WINDOW_ON_TAPE_SPANNING**. |
| **Value** | Enter **yes**. |

7. Click **OK** to add the environmental variable to the NDMP application.

8. Verify the configuration by running a full inventory on the VTL for which you created the NDMP application. Follow the steps outlined in the Verify connections to the PTL and its drives on page 48 task, applying them to the VTL.

9. Under **Media Management**, display the **Drive Properties** dialog box.

   **Figure 31:** Drive Properties Dialog Box
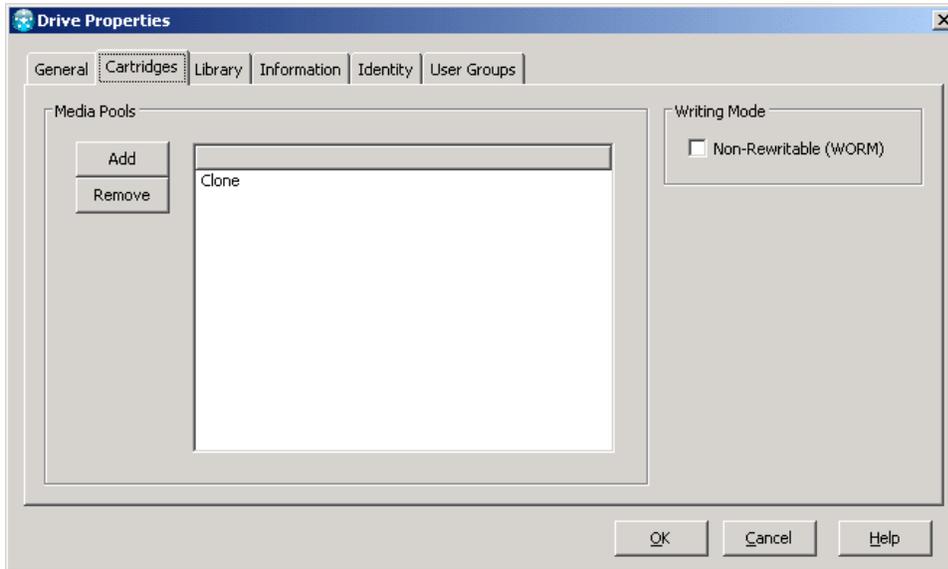


10. Select the **Cartridges** tab, and associate the VTL's drives with the **Clone** media pool.

11. Label the media in the VTL.

# Configure the PTL in ASG-TIme Navigator

Perform the following tasks to configure a PTL in ASG-TIme Navigator.

**Add the PTL to the NDMP host**

1. On the ASG-Time Navigator console, display the **New Library** dialog box.

**Figure 32:** New Library Dialog Box
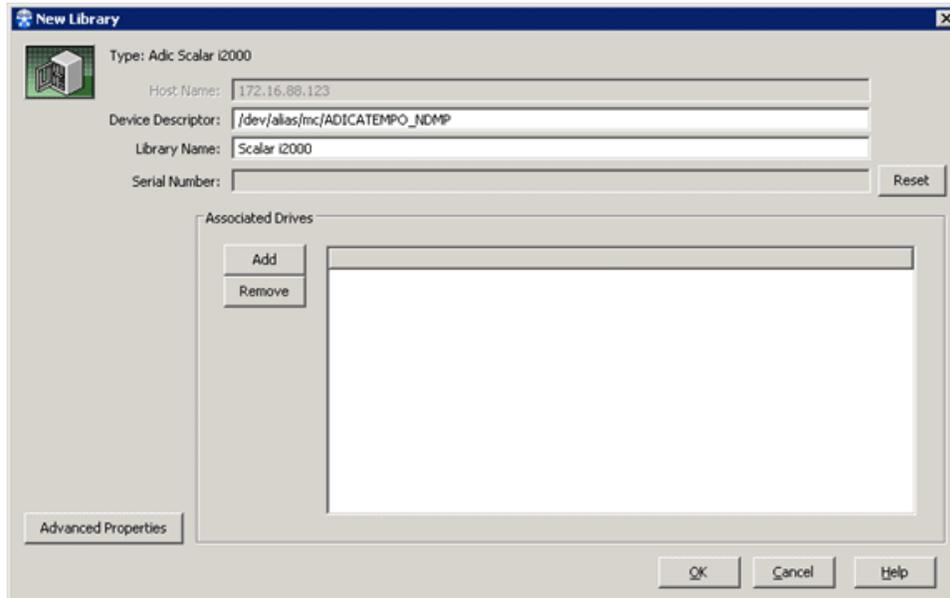


2. In the **Device Descriptor** field, enter the descriptor for the PTL.

> **Device Descriptor Format**
>
> The device descriptor is made up of the device's network path and serial number.
> **Example**
>
> **/dev/alias/mc/ADICATEMPO_NDMP**
>
> - For a medium changer, the path is **/dev/alias/mc/**.
>
> - For a tape device, the path is **/dev/alias/nst/**.
>
> - The last part of the descriptor is the device's serial number – **ADICATEMPO_NDMP** in this example.

> **Note:** After the NDMP library is configured, you can find the device descriptor on the DXi's Remote Management console from the **Configuration > PTT** page.

3. In the **Library Name** field, enter the name of the PTL.

4. Click **OK**.

**Add drives to the PTL**

1. On the ASG-Time Navigator console, display the **New Drive** dialog box.

**Figure 33:** New Drive Dialog Box – General Tab
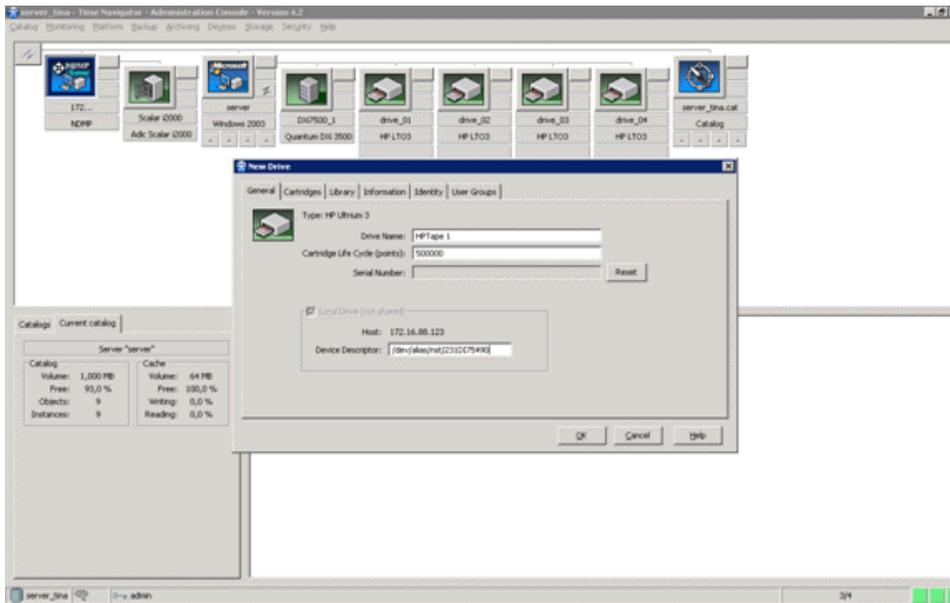


2. Populate the **General** tab with the following information:

| Field | Entry |
| --- | --- |
| **Drive Name** | Enter the drive's name. |
| **Cartridge Life Cycle** | Enter **500000**. |
| **Device Descriptor** | Enter the descriptor for the drive. See Device Descriptor Format on the previous page. |

3. On the **Library** tab, click the **Library** button to display the Library Selection Dialog Box.

**Figure 34:** Library Selection Dialog Box
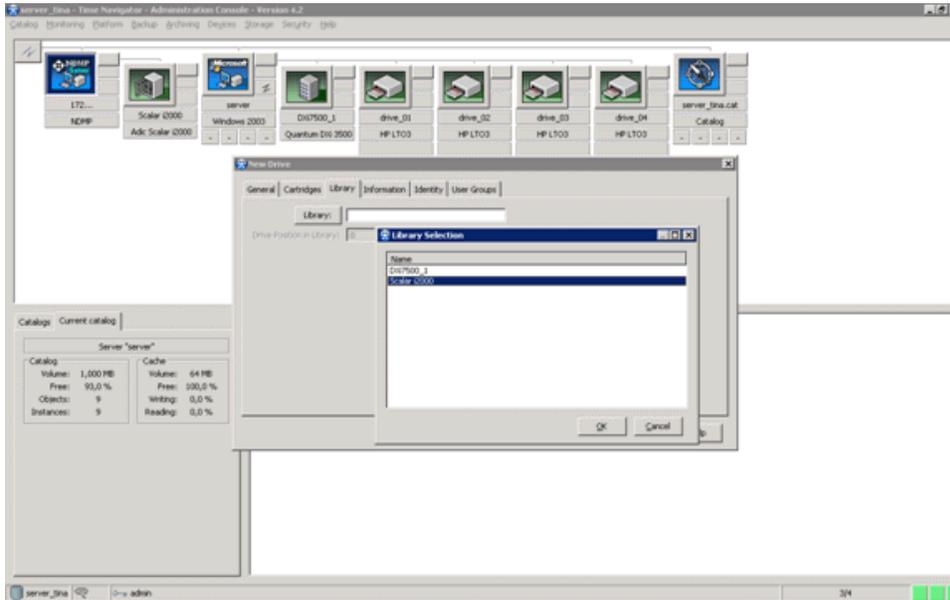


4. Select the PTL to which you are adding the drive.

5. Repeat this task for each drive to add to the PTL.

**Verify connections to the PTL and its drives**

1. On the ASG-Time Navigator console, right-click on the PTL and select **Operation** to display the **Library Manager** dialog box.

2. From the **Library** menu, select **Reinitialization > Full > Full Inventory** to run a full inventory of the PTL.

**Figure 35:** Library Manager – Full Inventory Run
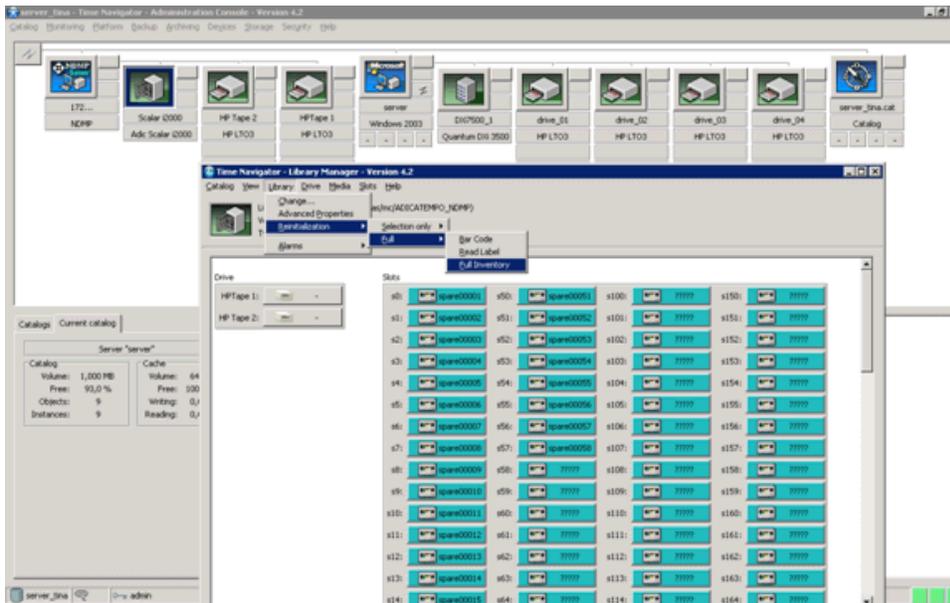


3.  After the inventory completes, verify that all media for the PTL has been identified, which in turn indicates that the system connection is working correctly.

**Configure advanced settings for the PTL**

1.  On the ASG-Time Navigator console, display the **Library Properties** dialog box.

2. Click the Advanced Properties button to display the **Advanced Properties** dialog box.

**Figure 36:** Advanced Properties Dialog Box
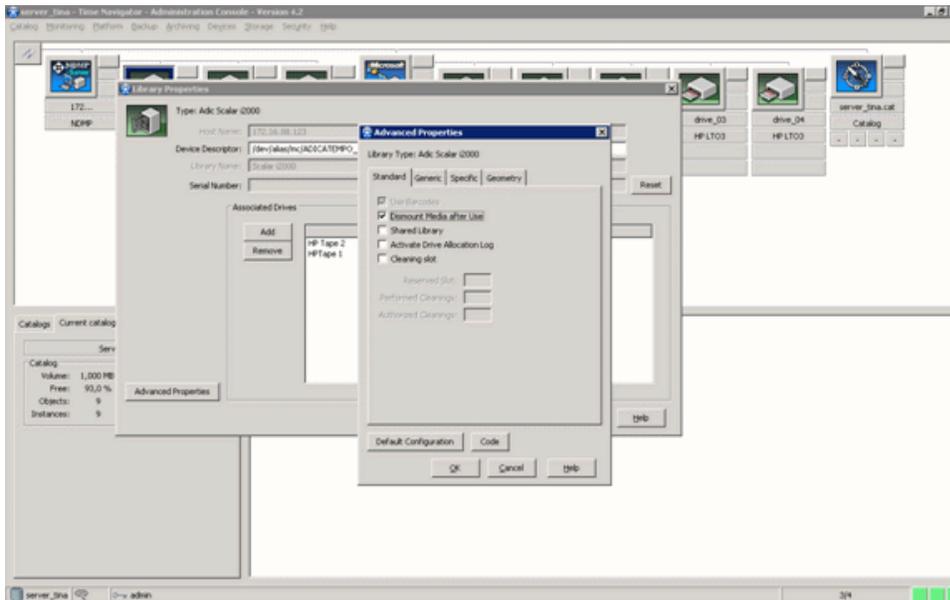


3. Select the **Dismount Media After Use** option.

4. Deselect the **Cleaning slot** option.

5. Click **Ok** to apply the advanced settings.

## Cloning Media with ASG-Time Navigator

To clone media with the ASG-Time Navigator backup application, perform the following tasks

## Back up data to the VTL

1. In the ASG-TIme Navigator console, launch the **Backup Wizard**.

2. Click **Next**.

3. Select the files on the DXi to back up to the virtual tape library (VTL).

4. Complete the remaining tasks in the **Backup Wizard**.

5. Click **Finish** to run the backup operation.

## Clone media from the VTL to the PTL

1. In the ASG-TIme Navigator console, display the **Media Management** dialog box.

2. Select the media pool from which you manage the DXi media.

3. Select the tape to clone, and click the **Duplicate** button.

4. Click **Start** to clone the media.