



How to Setup NDMP on Sun VTL to Use NetBackup Third Party Copy

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Overview

This document provides a step-by-step guide for configuring the Sun VTL with Symantec's Netbackup (NBU) NDMP 4.0 Third Party Copy feature.

Although there are several ways of configuring the Sun VTL with NDMP, the focus of this paper is to present the architecture with NDMP running on one media server per VTL node. This allows image duplication from the VTL to physical tape without using Netbackup's Shared Storage Option (SSO). Another solution may be to run the NBU NDMP software only on the master server. In yet another solution, NDMP may run on all media servers. This last solution eliminates the need for using an Alternate Read Server described later in the paper.

Figure 1 illustrates the environment described in this paper, where v215J is the master server, v215K is the NDMP media server on Node A (x4600T) and v215L is the NDMP media server on Node B (x4600U). All master and media servers use Solaris 10 as the operating system.

This environment allows use of one virtual library by multiple NBU media servers without employing a NBU SSO license or an instance of NDMP running on all media servers. This is accomplished by creating one virtual library with as many virtual drives as necessary for each media server to perform the required backup work load. In this environment, one media server manages all of the NDMP duplication jobs automatically with the use of Storage Life Cycle policies.

One limitation in this scenario involves fail over of the VTLs. The backend physical tape drives can be zoned only to one of the VTL nodes. Therefore in a fail over situation, the physical drives zoned to the failed node will not be available unless several additional configuration steps are performed (which are not covered in this document).

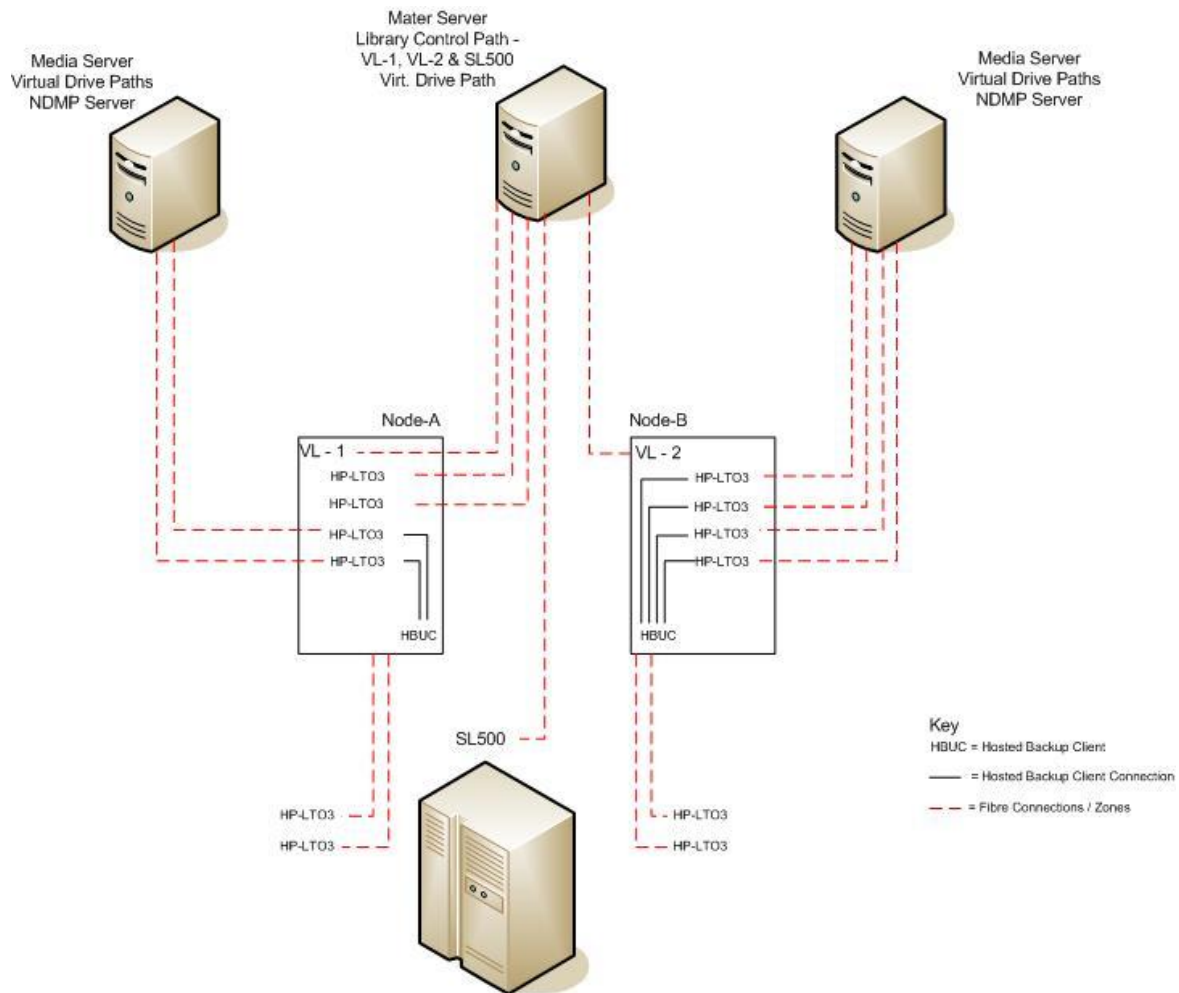


Figure 1 - Test Environment

Definitions

- HA – High Availability
- HBUC – Hosted Backup Client
- NBU – Netbackup
- NDMP – Network Data Management Protocol
- SLP – Storage Lifecycle Policy
- SSO – Shared Storage Option
- VTL – Virtual Tape Library

Assumptions:

The VTL has a user account that will be used to manage NDMP.

All fabric zoning has been implemented. This includes physical tape drives attached to the VTL and physical and virtual library paths to the NBU master server.

NBU Policies have been created.

NBU base software is installed.

The NDMP administrator has experience with VTL and Netbackup.

A minimum version of NBU 6.5.

A minimum of Sun VTL Plus 2.0 Update2 Patch 13.

VTL Configuration

This section outlines the steps necessary to configure the VTL to use NDMP.

Step 1 Enable NDMP

Use the VTL console to enable the NDMP services. NDMP is a licensed option of VTL and must be purchased before this feature is enabled. Figure 2 shows the menu steps used to enable NDMP on the VTL.

Right-click on the VTL name → Options → Enable NDMP.

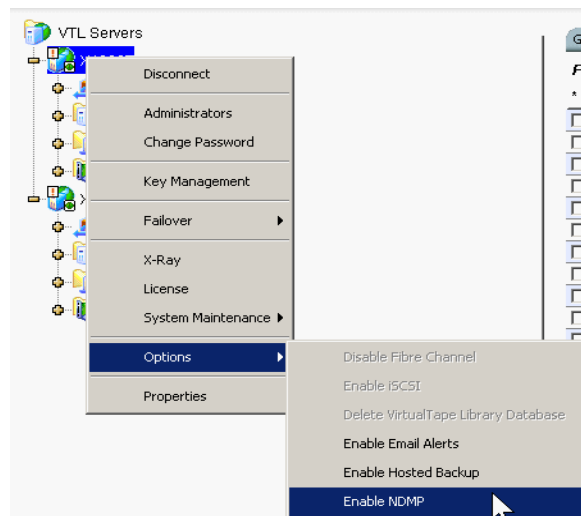


Figure 2 - Enable NDMP on the VTL

When prompted, provide the user name and password of the user that will have NDMP access. Figure 3 shows the NDMP user info window. This information will be used later when setting up NDMP on NBU. When setting up the credentials in NBU, the user name and password set on the VTL will be used to authenticate NBU with the VTL's NDMP agent.

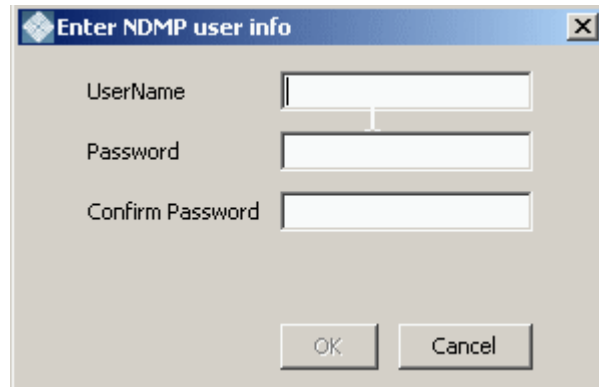


Figure 3 - Enter NDMP Credentials

Note:

There should be a user name already created on the VTL named *vtl*. This would be an appropriate user name to use for the NDMP agent.

To authenticate the NDMP agent on a HA VTL system, ensure that both nodes are logged into the VTL console and NDMP is enabled on both VTL nodes before proceeding to the NBU setup.

Step 2 Assign Drives to the SAN Client for Each Media Server.

The drives that will be used for backups and restores on each media server need to be assigned to the SAN clients. The library path also needs to be assigned to the master server. Ensure that none of the drives overlap in assignment between media servers. In others words, do not share the drives between media servers. Shared Storage Option licenses will be required if drives are shared between media servers.

Note:

Once the drives are assigned to the hosted backup client, they are not available for assigning to SAN clients; therefore the drives must assigned the SAN clients prior to assigning the hosted backup client.

Step 3 Assign Drives to the Hosted Backup Client

During NDMP enabling, a folder called HostedBackupClient (HBUC) is created under the SAN Clients section in the VTL console. The HBUC can be enabled without enabling NDMP but avoid this. The VTL uses drives assigned to the HBUC for data transfer between the disk cache and physical tape drives. See the VTL Users Guide for more information on the HBUC.

Assign the drives to the HostedBackupClient. The VTL will use these drives to move data to and from the physical tape drives. This includes all drives assigned to the NDMP media server. The number of virtual tape drives should be equal to or greater than the number of physical tape

drives. This ensures that the NDMP media server has access to all of the physical tape drives. Job queues will be created if more virtual drives than physical drives are used.

Figure 4 shows the virtual drive identification numbers on the virtual library and the drives

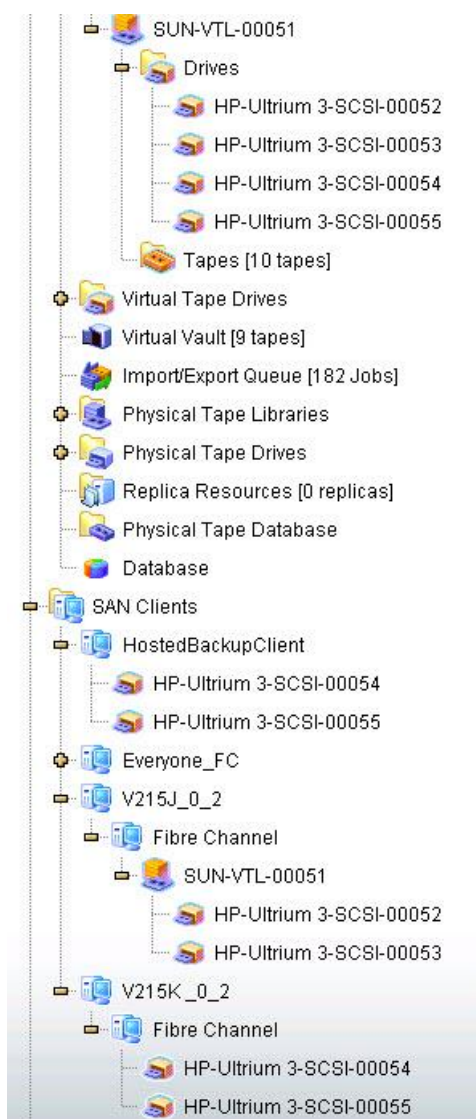


Figure 4 - Drives Assigned to the HBUC

assigned to the SAN clients and the HBUC. Note the drives assigned to the HBUC. In this figure, drives with virtual IDs 52 and 53 are assigned to the master server. Drives 54 and 55 are assigned to both the media server running NDMP and the HBUC.

The drives used by the VTL to read data from the VTL must be added to the HBUC. A NBU image duplication would be an example of this type of data movement. In this case, you add the drives assigned to the NBU NDMP server to the HBUC. This allows the NBU NDMP server to load the drives with the proper media. This, in turn, allows the VTL to read the data on the loaded tape and write it to the physical tape drive, which the VTL also can access.

The drives assigned to the HBUC can be thought of as “read” drives (in a backup or duplication operation) because the VTL uses these drives to read data from the VTL disk cache and write it

to physical tape. The virtual drives must be assigned to the NBU NDMP server so NBU can manage the media movement to and from those drives.

Note:

If there are more drives assigned to the media server (SAN client) than are assigned to the HBUC, NBU may load one of these extra drives in a NDMP operation. Therefore data transfer will take place through the NBU media server to physical tape.

Step 4 Ensure the Physical Tape Drives are Seen by the VTL

Under the physical resources section of the VTL console, ensure that the correct number and types of drives are present in the VTL. If the drives are not present, you may need to rescan the VTL's physical resources. Alternatively, the absence of drives may indicate a zoning issue.

For NDMP Third Party Copy to work with physical tape drives, ensure that a physical tape library is NOT created in the VTL. As long as the physical drives are zoned to the VTL and are present in the *Physical Resources* section, as shown in Figure 5 below, the VTL will be able to move data to and from them. The physical library path however must be controlled through NBU.

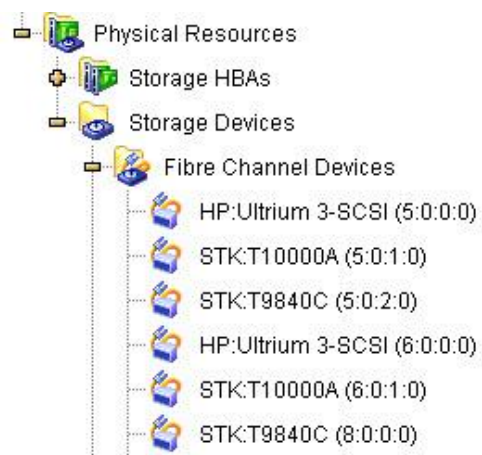


Figure 5 - Physical Drives Zoned to the VTL

Note:

If the window shown in Figure 6 appears when trying to assign drives to the HBUC (in a HA VTL system), make sure the VTL processes are running on the partner node. In addition, ensure that both nodes are logged into the console.

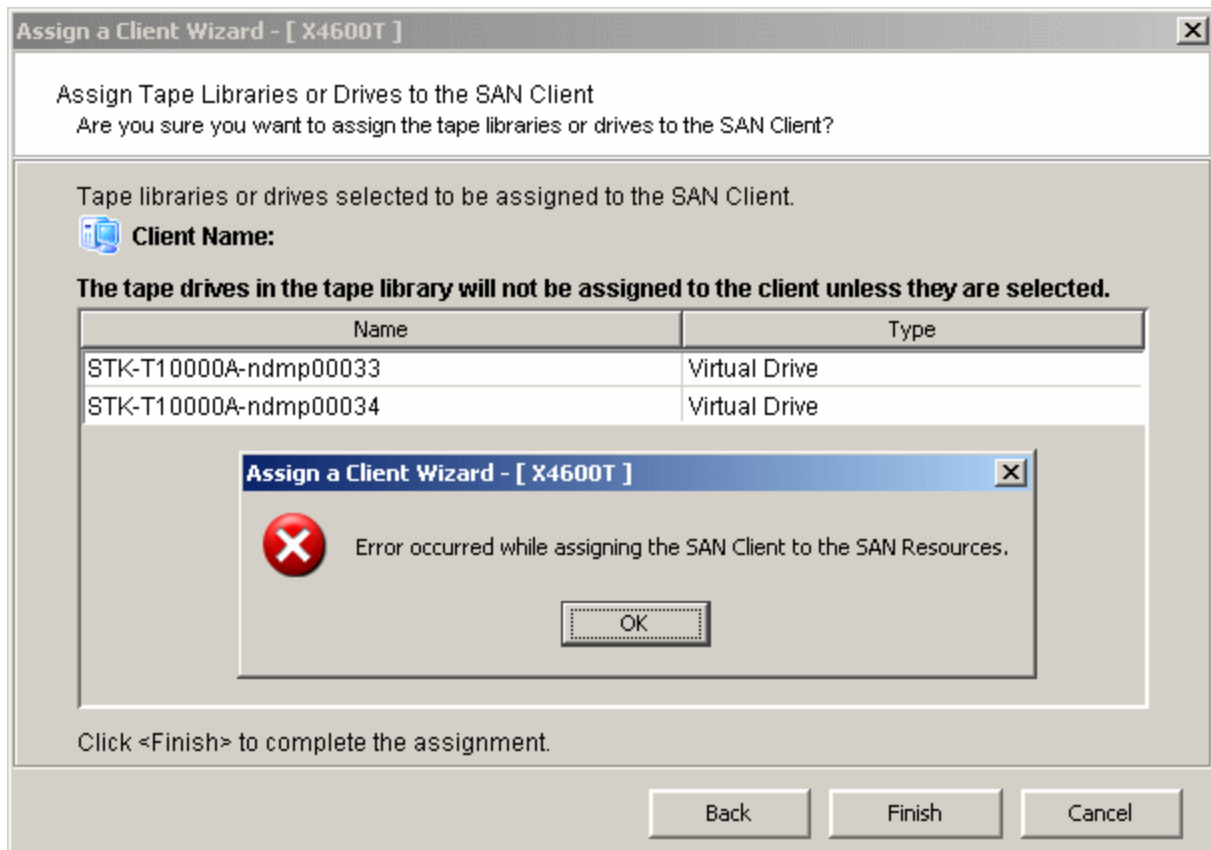


Figure 6 - Error Assigning SAN Client

Netbackup Configuration

These steps help you to install the NDMP package and configure Netbackup.

Step 1 Install the NBU NDMP package

The Netbackup NDMP package needs to be installed on the media server that will use the NDMP functionality. Refer to the “Netbackup for NDMP Administrator’s Guide” and “Best Practice for NDMP Backup Veritas NetBackup™” for more information.

Refer to the following figures to perform the package installation and upgrade. Note that your base directories may be different. You need to first install the base NDMP (SYMCnbdmp) package. Then, install the 6.5.3 upgrade package.

```
V215K# pwd
/mnt/veritas/netbackup_server_and_enterprise_server_6_5/misc/vADD
V215K# ls
i386          NBEncryption  NBVAULT       SYMCnbdmp
install       NBLUAgent    sparc         SYMCnbenc
NBBMR         NBNDMP       SYMCnbbbs    SYMCnblua
NBBMR_boot   NBSNAP_CLNT  SYMCnbbmr    SYMCnbsnc
V215K# ./install
```

Figure 7 - Install SYMCnbdmp

Run the *install* script to install the SYMCnbdmp package as shown in Figure 7.

```
*****

      NetBackup Add-On Product Installation

Choose the Add-On Products you wish to install
one at a time or select Install All Add-On Products.

      1) NetBackup Bare Metal Restore
      2) NetBackup Bare Metal Restore Boot Server
      3) NetBackup Encryption
      4) NetBackup LiveUpdate Agent
      5) NetBackup for NDMP
      6) NetBackup Snapshot Client
      7) NetBackup Vault

      8) Install All Add-On Products

      q) Done Selecting Products
      x) Exit from this Script

Choose an option: 5
```

Figure 8 - Select NDMP

Chose the option “Netbackup for NDMP” as shown in Figure 8.

```

Installation of <SYMCnbdmp> was successful.

NetBackup for NDMP installation completed.

*****

Execution of ./install is complete.

File /usr/opensv/tmp/install_options_trace.20022 contains a trace of this install.

```

Figure 9 - Install Complete

The install process will complete as shown in Figure 9.

Before installing the NBU 6.5 NDMP upgrade (6.5.3 of the SYMCnbdmp), all the NBU processes on the media server need to be stopped.

To do this, run the command:

```
/usr/opensv/netbackup/bin/goodies/netbackup stop
```

To make sure all the processes have been stopped run the command:

```
bpps -a
```

If the processes have not stopped, run the command:

```
/usr/opensv/netbackup/bin/bp.kill_all.
```

```

NB_update.install          VrtsNB_DMP_6.5.3.linuxR_x86.tar.Z
VrtsNB_DMP_6.5.3.README    VrtsNB_DMP_6.5.3.linuxS_x86.tar.Z
VrtsNB_DMP_6.5.3.hp_ux.tar.Z VrtsNB_DMP_6.5.3.rs6000.tar.Z
VrtsNB_DMP_6.5.3.hpia64.tar.Z VrtsNB_DMP_6.5.3.solaris.tar.Z
VrtsNB_DMP_6.5.3.linux.tar.Z VrtsNB_DMP_6.5.3.solaris_x86.tar.Z
T2000M# ./NB_update.install

There is 1 pack available in /mnt/veritas/netbackup_server_and_enterprise_server_6_5_3/ndmp:
(* denotes installed pack)

    NB_DMP_6.5.3

Enter pack name (or q) [q]: NB_DMP_6.5.3

```

Figure 10 - Package Upgrade

After the processes stop, proceed to the upgrade installation. See Figure 10.

Once the package installation and upgrade are complete, issue the following command:

```
/usr/opensv/netbackup/bin/goodies/netbackup start or /usr/opensv/netbackup/bin/bp.start_all.
```

Run *bpps -a* to make sure all the processes have started.

To check if the NDMP package is installed, run:

```
pkginfo |grep nbdmp
```

Step 2 Set the NDMP Credentials

Setting the NDMP credentials in NBU allows the NDMP agent on the media server to communicate with the NDMP agent running on the VTL. The user name and password must match what was set on the VTL in step 1 of the VTL Configuration section.

From the NBU console, open the Credentials drop down and right-click on NDMP hosts and select “New NDMP Host”.

Enter the hostname of the VTL. See Figure 11.

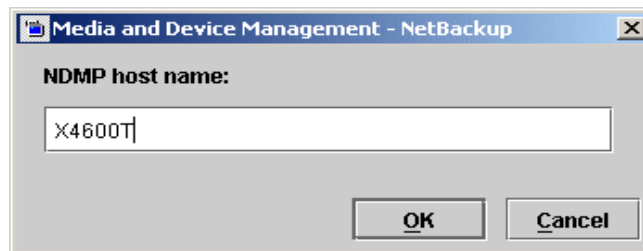


Figure 11 - Supply VTL Hostname

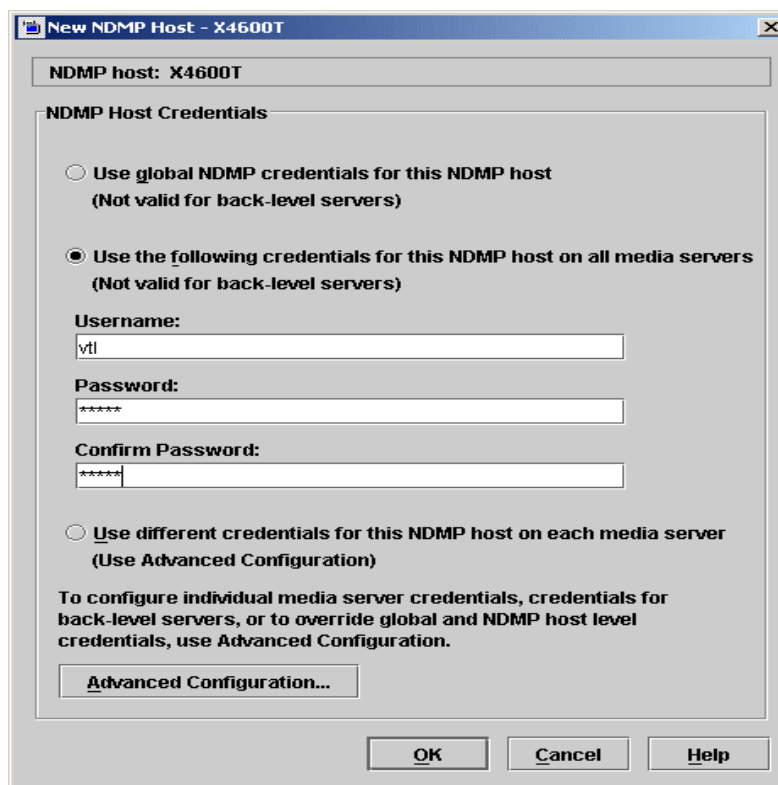


Figure 12 - Establish Credentials

Enter the user name and password that were set on the VTL when enabling NDMP. See Figure 12. Refer to the Veritas NetBackup™ for NDMP Administrator's Guide for the differences between the three choices for setting credentials.

Step 3 Configure Devices

From the NBU console, run the Device Configuration Wizard. See Figure 13. Select the media servers in the environment that are running NDMP, highlight the server name(s) and click *Change*.

This will display another dialog box where the NDMP option needs to be selected. This tells NBU to also scan the NDMP host (the VTL in this case) for additional devices.

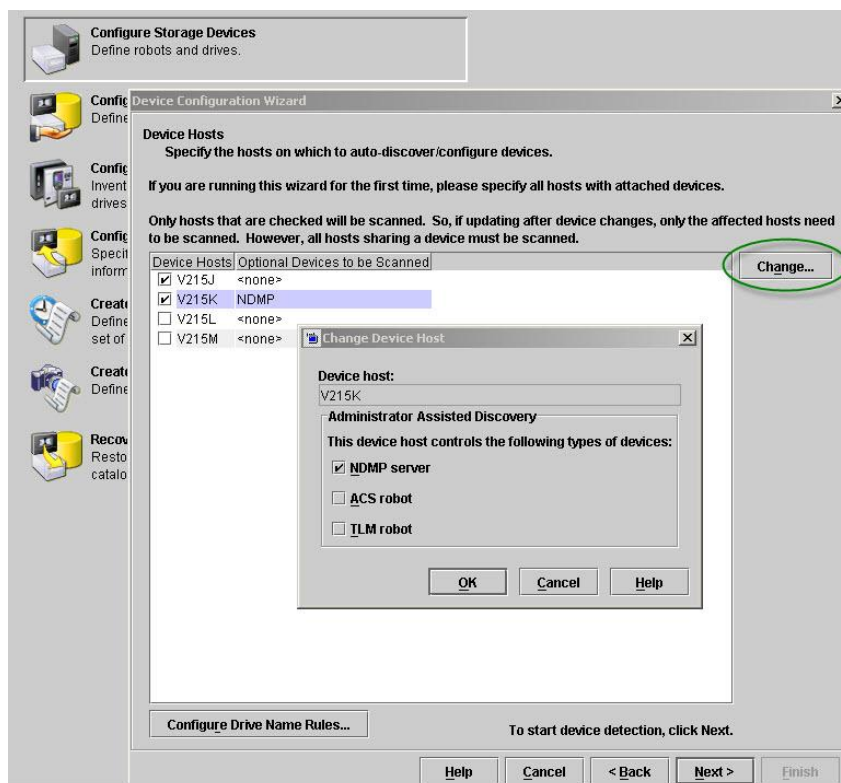


Figure 13 - Device Configuration

In the NDMP Hosts Configuration Wizard, ensure the hostname of the VTL is displayed and is checked, as shown in Figure 14. If not, refer to step 2.

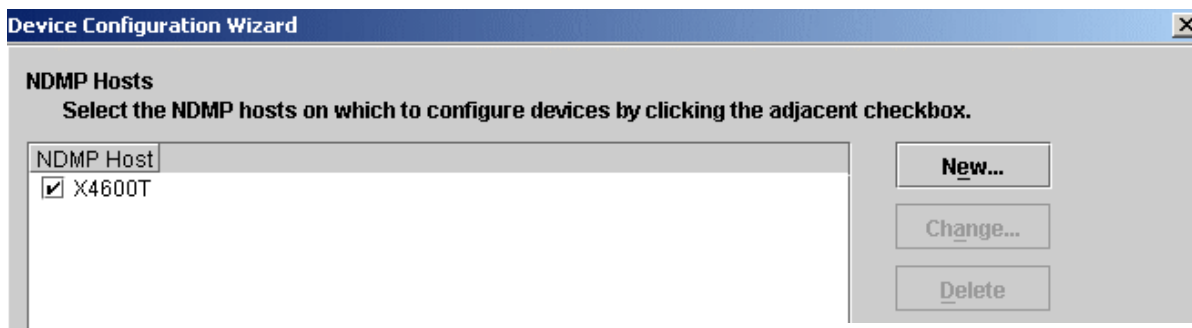


Figure 14 - Select NDMP Host

In this step, you scan the media server(s) and the VTL for devices. After scanning, NBU shows, for the NDMP media server(s), the total number of devices assigned to the SAN client, the devices assigned to the HBUC and the physical drives attached to the VTL.

Refer to Figure 15. After scanning NBU, V215K accounts for the two drives assigned through the SAN client, the two drives assigned in the HBUC, and the eight physical drives attached to the VTL, for a total of 12 drives. The robot paths are displayed as part of the scan process on V215J (the master server). In this example, there are two robot paths, the one assigned through the SAN Client and the physical robot, which is zoned directly to V215J.

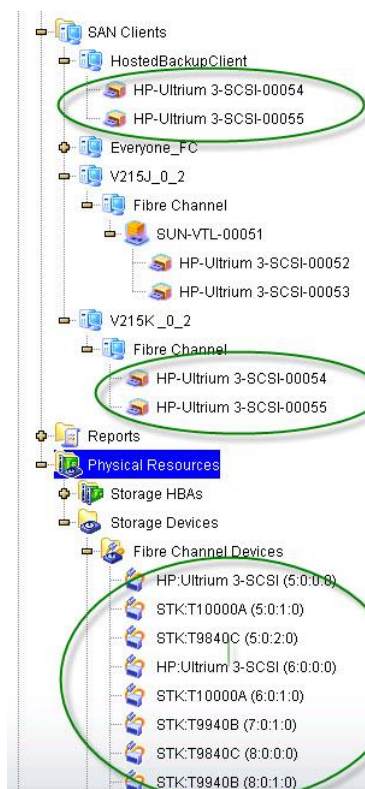


Figure 15 - Assigned Drives

Note:

The number of devices for the NDMP media server should be equal to the number of devices assigned to the SAN client + total number of physical tape drives + number of devices assigned to the Hosted Backup Client + number of devices directly zoned to the media server. For other media servers, the number of devices should be equal to the number of devices assigned to the SAN client.

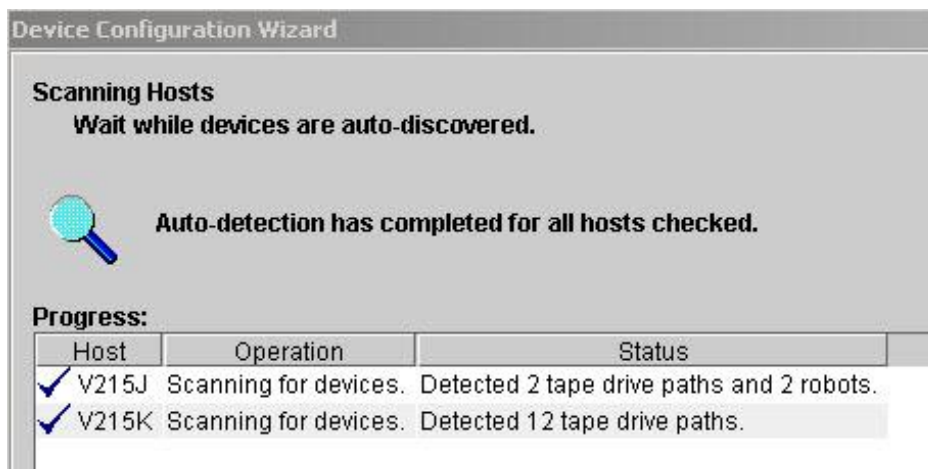


Figure 16 - Number of Scanned Devices

Figure 16 shows the results of scanning. The numbers of tape drive paths and robots displayed in this screen should reflect the formula in the note on page 17.

Ensure that NBU correctly discovers and displays the devices. The drives assigned to the NDMP media server should have two paths as shown in Figure 17. Drives with the `/dev/rmt` path are seen through the SAN client. Devices with the `/dev/scsi/sequential` path are controlled by NDMP. If any of the paths for the NDMP devices appear as a long path or do not look like `/dev/scsi/sequential/cXtXdX`, then run the command `devfsadm -C` on the VTL.

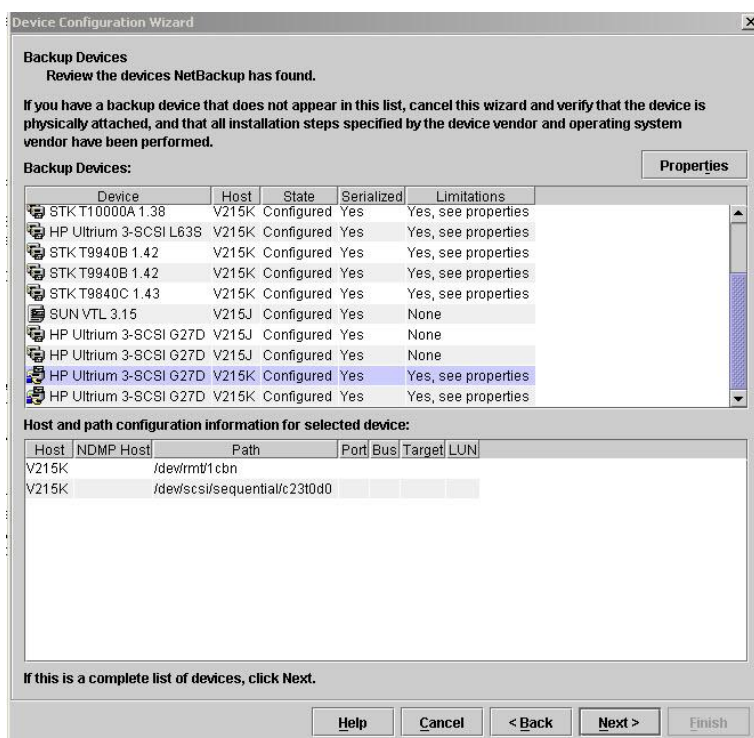


Figure 17 - Device Paths

12 Drives (6 selected)										
Drive Name	Device Host	Drive Type	Control	Shared	Ready	Write Enabl...	Assigned Host	External Me...	Reco	
HP.ULTRIUM3-SCSI.000	V215K	HCART3	TLD	No	No	No				
HP.ULTRIUM3-SCSI.001	V215K	HCART3	TLD	No	No	No				
HP.ULTRIUM3-SCSI.002	V215K	HCART3	TLD	No	No	No				
HP.ULTRIUM3-SCSI.003	V215K	HCART3	TLD	No	No	No				
HP.ULTRIUM3-SCSI.004	V215J	HCART3	TLD	No	No	No				
HP.ULTRIUM3-SCSI.005	V215J	HCART3	TLD	No	No	No				
STK.T10000A.000	V215K	HCART3	TLD	No	No	No				
STK.T10000A.001	V215K	HCART3	TLD	No	No	No				
STK.T9840C.000	V215K	HCART3	TLD	No	No	No				
STK.T9840C.001	V215K	HCART3	TLD	No	No	No				
STK.T9940B.000	V215K	HCART2	TLD	No	No	No				
STK.T9940B.001	V215K	HCART2	TLD	No	No	No				

8 Paths for selected drives (1 selected)										
Drive Name	Device Host	Control	Drive Path	Port	Bus	Target	LUN	NDMP Host	Drive Index	
HP.ULTRIUM3-SCSI.000	V215K	TLD	/dev/rmt/1cbn						0	
HP.ULTRIUM3-SCSI.000	V215K	TLD	/dev/scsi/sequential/c23t0d0				X4600T		0	
HP.ULTRIUM3-SCSI.001	V215K	TLD	/dev/rmt/0cbn						1	
HP.ULTRIUM3-SCSI.001	V215K	TLD	/dev/scsi/sequential/c23t1d0				X4600T		1	
HP.ULTRIUM3-SCSI.002	V215K	TLD	/dev/scsi/sequential/c19t0d0				X4600T		4	
HP.ULTRIUM3-SCSI.003	V215K	TLD	/dev/scsi/sequential/c20t0d0				X4600T		6	
HP.ULTRIUM3-SCSI.004	V215J	TLD	/dev/rmt/1cbn						0	
HP.ULTRIUM3-SCSI.005	V215J	TLD	/dev/rmt/0cbn						1	

Figure 18 - Device Sharing

After device discovery and creation of storage units, click on device monitor in the NBU console and verify SSO is not being used. To do this, check that the column titled “Shared” displays the value “No”. See Figure 18.

Step 4 Test the Configuration

After configuring devices, test each of the storage units individually. This can be accomplished by using the storage unit that writes to the VTL drives to create a backup image. Then create a duplicate of that image using the storage unit associated with the physical tape drives.

Before any backup jobs can be completed, each robot must be inventoried, including the physical library.

After creating a backup image, perform a manual duplication of the backup image. In the NBU console under NetBackup Management, click on Catalog. See Figure 19.

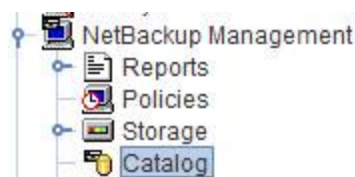


Figure 19 - Catalog Selection



Figure 20 - Duplicate Action

Under Action in the upper left of the pane, select Duplicate. See Figure 20.

Select the appropriate Date Range and click on Search Now. This displays a list of images. Right-click on the image to be duplicated and select Duplicate. Select the Storage unit for the destination of the image as well as the Volume pool.

Note:

If an Alternate Read server is used, this cannot be manually tested from the NBU GUI. See the NBU documentation for information on the *bpduplicate* command.

Step 5 Storage Life Cycle Policy Configuration

The storage units created during the device discovery can be used in the creation of a Storage Life Cycle Policy (SLP) or in standard policies. The use of this feature will vary depending on the particular NBU environment. To create a Life Cycle Policy open the New Lifecycle Policy window. See Figure 21.

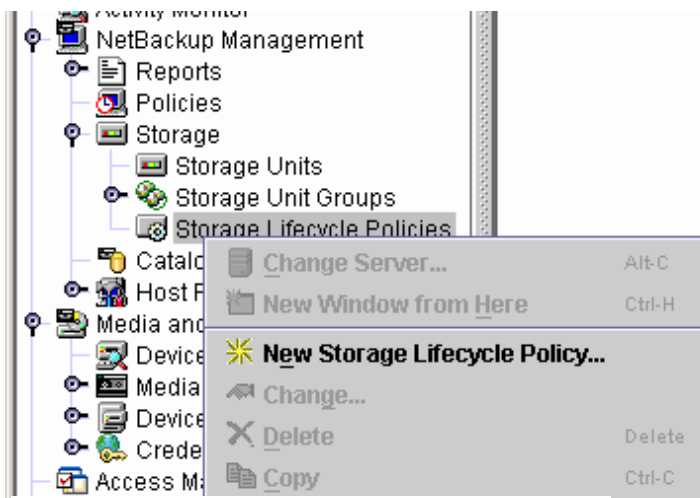


Figure 21 - Create Storage Lifecycle Policy

Enter a policy name and click Add. This will allow a new backup policy to be created within the Life Cycle Policy. Select the proper storage unit, volume pool, and any other settings as appropriate. After specifying all selections in the “New Destination” screen, click OK.

Next select Add again and select Duplication. Figure 22 shows the Backup policy in existence and the creation of the Duplication part of the lifecycle policy. Select the destination storage unit that is associated with the physical tape drives. For the media server that does not run NDMP, select the Alternate Read Server and select the NBU NDMP server. This allows NBU to use that server and its drives to load the tape with the image that is being duplicated.

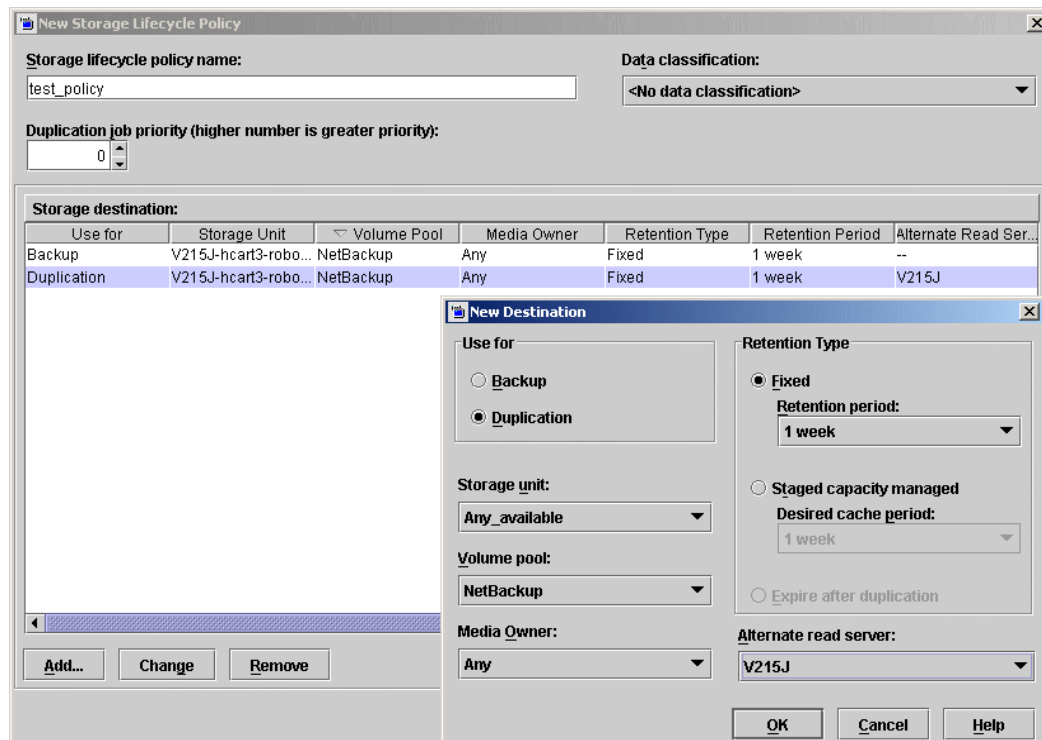


Figure 22 - Duplication as Part of SLP

Under NetBackup Management → Policies, select a policy that will run the SLP. Make the change by selecting the SLP under the Policy storage drop-down and change the Storage Unit used to the new SLP. Run the policy as normal. The backup takes place followed by the duplication job. The SLP can now be scheduled or scripted to run per the administrators needs.

Note:

There is a known issue with saving Life Cycle Policies through the windows Java console. To avoid this issue, the life cycle policies should be created through a console running on one of the media servers.

Note:

When running a duplicate job, there might be a short delay from the time the job starts to the time the data is written to the physical tape drive.

Conclusion

After the VTL NDMP and Netbackup setup steps are complete the environment is able to utilize the NDMP feature of both the Sun VTL and NBU to make duplicate images.

Appendix A: Related Publications

There are several documents available describing the benefits and use of the NDMP third party copy feature of Netbackup in general and in conjunction with the Sun VTL. See the following list of documents for reference.

Update1 White Paper (Internal Only)

VTL Users Guide

Best Practice for NDMP Backup Veritas NetBackup™

NetBackup™ Installation Guide

Veritas NetBackup™ for NDMP Administrator's Guide

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