

Application Note

November 2013

Configuring a NEO Tape Library with Symantec Backup Exec and NetApp NDMP Environment



Summary

This application note describes how to configure a NEO tape library on a NetApp filer with ONTAP 7.3.7. The backup server is Windows Server 2008R2 with Backup Exec 2010R2. Upon successful completion of these procedures, the reader will have a general understanding on how to configure a NEO tape library on NetApps and how to create a backup and restore job with Backup Exec 2010R2.

Prerequisites

Prior to performing this procedure, ensure that you have the following:

- This document assumes the reader is familiar with the NetApps filers and Symantec Backup Exec 2010R3 environment. Any and all additional information can be attained through *Symantec Backup Exec Backup Exec Admin Guide* and NetApp Administration documentation. The Backup Exec NDMP option must be licensed and installed. NetApp must have version 4 of the Network Data Management Protocol enabled.
- This document also assumes the NEO tape library has already been installed and configured. For more information about basic configuration of the tape library, please reference the User Guide that came with it.
- In order to properly configure LTO tape drives in a NetApp NDMP environment, the required tape device configuration files (TCF files) or the minimum ONTAP version is required to support new generation of tape drives such as the IBM LTO-6 genera. The following link allows the reader to download the supporting tape device files. Please review the section “*Download NetApp Tape Device Configuration Files*” in this document.

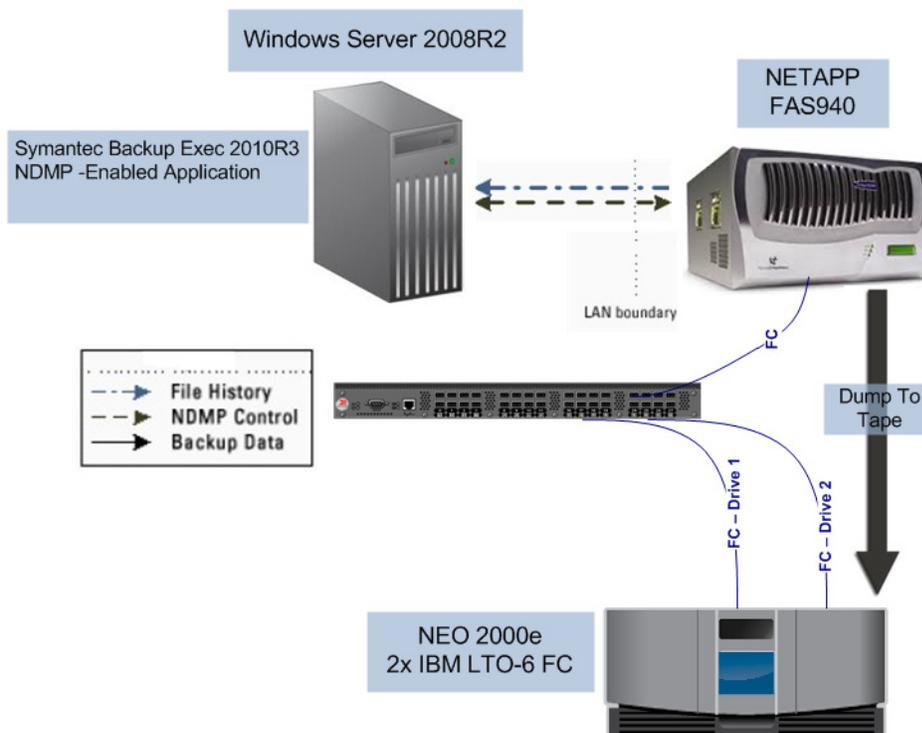
http://support.netapp.com/NOW/download/tools/tape_config/

Additional Information

The Symantec Backup Exec NDMP Option uses Network Data Management Protocol (NDMP) to backup and restore Network Attached Storage (NAS) devices. The following diagram depicts the Backup Exec 2010R3 NDMP environment. The Windows 2008 server has Backup Exec 2010R3 installed with the NDMP option licensed and enabled. The NetApp FAS 940 acts as a host backup node has a fibre connection to the switch. The NEO 2000e has two fibre connections from each tape drive also attached to the fibre switch. Although the topology depicts a SAN environment, the following NDMP topology can be referenced as a NDMP-enabled NAS Direct Attached Environment.

The backup server uses NDMP over the LAN to instruct the Filer to start the backup. The Filer then sends the data contained in the backup to a tape device (*Dump to Tape*) attached directly to the Filer or SAN. During the backup, information about files and directories written to tape is transferred via NDMP over the LAN to the backup server where it is maintained in the Backup Exec index. A restore operation uses the same concepts as the backup routine.

The steps provided in this guide reference an Overland Storage fibre channel NEO E-series library (NEO 2000e few 2.1.008) with two IBM LTO-6 tape drives. Note, we have also provided some examples of a NEO 400s with IBM LTO-6 tape drives. This document can be used as a reference to all NEO Series libraries with HP or IBM tape drives implementation in a Symantec Backup Exec 2010R3 and NetApp environment.



Versions

The test environments used for illustration in this document are as follows:

- NEO 2000E (FC) fw 2.01.026 / IBM LTO-6 fw D2DE
- Symantec Backup Exec 2010R2 for Windows
- Windows Server 2008R2SP1 x64
- NetApps FAS 940 ONTAP 7.3.7

Download NetApp Tape Device Configuration Files

Use the following link to download the tape device configuration files. Use the following procedures in order to download, copy and verify the configuration files are used on the NetApps filer.

NOTE: In order to configure and use the tape drive configuration file, the minimum ONTAP version is required.

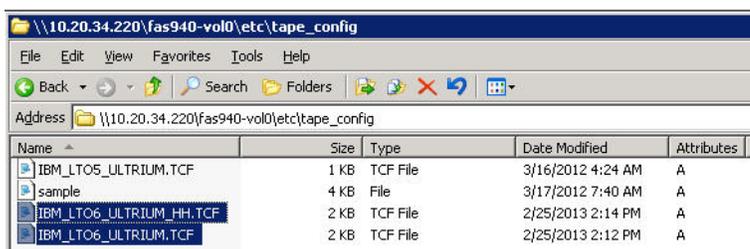
The example here shows that ONTAP 7.3.7 with the tape device configuration files is required for Fibre Channel IBM LTO-6 tape drives. In order to support IBM LTO-6 SAS tape drives, the minimum requirement is ONTAP 8.1.3. During the time of writing this document, the IBM LTO-6 tape device configuration file is not available from the public link. A NetApp login is required.

http://support.netapp.com/NOW/download/tools/tape_config/

1. Download the required **tape drive configuration files** from NetApps.

IBM ULTRIUM-TD4 (LTO 4)	FC/SAS, FH	7.0; 8.1.0(SAS)	IBM_LTO4_ULTRIUM.TCF
IBM ULTRIUM-HH4 (LTO 4)	FC/SAS, HH	7.3.2(FC); 8.1.2(SAS)	IBM_LTO4_ULTRIUM_HH.TCF
IBM ULTRIUM-TD5 (LTO 5)	FC/SAS, FH	7.3.2(FC); 8.1.0(SAS)	IBM_LTO5_ULTRIUM.TCF
IBM ULTRIUM-HH5 (LTO 5)	FC/SAS, HH	7.3.2(FC); 8.1.0(SAS)	IBM_LTO5_ULTRIUM_HH.TCF
IBM ULTRIUM-TD6 (LTO-6)	FC/SAS, FH	7.3.7 (FC); 8.1.3 (SAS)	IBM_LTO6_ULTRIUM.TCF
IBM ULTRIUM-HH6 (LTO-6)	FC/SAS, HH	7.3.7 (FC); 8.1.3 (SAS)	IBM_LTO6_ULTRIUM_HH.TCF
Quantum DLT-S4	SCSI, HH/FH	6.5	QUANTUM_DLTS4.TCF
Quantum DLT-V4	SCSI, HH/FH	6.5	QUANTUM_DLTV4.TCF
Quantum SDLT600	SCSI, HH/FH	6.5	QUANTUM_SDLT600.TCF
Quantum Ultrium-3 (LTO3)	SCSIFC/SAS, HH/FH	7.0(SCSIFC); 8.1.0(SAS)	QUANTUM_LTO3_ULTRIUM.TCF

2. Copy the tape device config files to the NetApps `\etc\tape_config` directory.



3. Use the following NetApps command to verify the configuration can be read.

storage show tape supported -v

```
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220> storage show tape supported -v
```

The results of the command shows the correct device strings displayed for the IBM LTO-6 tape drive:

```
IBM LTO-6 ULTRIUM - Dynamically Qualified
Density Compression
Setting      Setting
-----
0x00        0x00      LTO-4/5 Native Density
0x00        0x01      LTO-4/5 Compressed
0x5A        0x00      LTO-6 2.5TB
0x5A        0x01      LTO-6 6.25TB Compressed

IBM LTO-6 ULTRIUM - Dynamically Qualified
Density Compression
Setting      Setting
-----
0x00        0x00      LTO-4/5 Native Density
0x00        0x01      LTO-4/5 Compressed
0x5A        0x00      LTO-6 2.5TB
0x5A        0x01      LTO-6 6.25TB Compressed
```

NetApp Device Discovery

Use the following steps to verify the Overland NEO tape library discovered on NetApps. Telnet or SSH into the NetApp Filer console and run the command line interface (CLI) commands to determine whether the devices have been discovered.

NOTE: If the devices are not found using the following commands, either the tape device files are missing, the version of ONTAP is unsupported, or there is a communication problem on the SAN.

The following depicts outputs of both the NEO 2000e and NEO 400s products.

1. Use the following command to display the **NEO robot arm**.

```
storage show mc
```

This example is a NEO 2000e:

```
s-fas940-220> storage show mc
Medium Changer:      10a.111L1
Description:         OVERLAND NEO Series
Serial Number:       2B92100067
World Wide Name:    WWN15:005:076312:0c3a6c1L1
Alias Name(s):       mc0
Device State:        available
```

This example is a NEO 400s:

```
apps-fas940-220> storage show mc
Medium Changer:      10a.4L1
Description:         IBM      3573-TL
Serial Number:       00L4U78P7792_LL0
World Wide Name:    WWN12:001:000e11:148c601L1
Alias Name(s):       mc0
Device State:        available
```

2. Use the following command to display the **tape drives**.

```
storage show tape
```

This example is a NEO 2000e with LTO-6 full-height tape drives:

```
apps-fas940-220> storage show tape
Tape Drive:          10a.111
Description:         IBM      ULTRIUM-TD6
Serial Number:       1068000328
World Wide Name:    WWN15:005:076312:0c3a6c1
Alias Name(s):       st0
Device State:        available

Tape Drive:          10b.111
Description:         IBM      ULTRIUM-TD6
Serial Number:       1068000353
World Wide Name:    WWN15:005:076312:0c3b2f1
Alias Name(s):       st1
Device State:        available
```

This example is a NEO 400s with LTO-6 half-height tape drives:

```
apps-fas940-220> storage show tape
Tape Drive:          10a.4
Description:         IBM      ULTRIUM-HH6
Serial Number:       1068000318
World Wide Name:    WWN12:001:000e11:148c601
Alias Name(s):       st0
Device State:        available

Tape Drive:          10b.5
Description:         IBM      ULTRIUM-HH6
Serial Number:       1068000316
World Wide Name:    WWN12:004:000e11:148c601
Alias Name(s):       st1
Device State:        available
```

3. Use the following command to list the **different densities** of the LTO-6 tape drive.

```
sysconfig -t
```

This example is a NEO 2000e with LTO-6 full-height tape drives:

```

apps-fas940-220> sysconfig -t
Tape drive (10a.111) IBM      ULTRIUM-TD6
rst01 - rewind device,      format is: LTO-4/5 Native Density
nrst01 - no rewind device,  format is: LTO-4/5 Native Density
urst01 - unload/reload device, format is: LTO-4/5 Native Density
rst0m - rewind device,      format is: LTO-4/5 Compressed
nrst0m - no rewind device,  format is: LTO-4/5 Compressed
urst0m - unload/reload device, format is: LTO-4/5 Compressed
rst0h - rewind device,      format is: LTO-6 2.5TB
nrst0h - no rewind device,  format is: LTO-6 2.5TB
urst0h - unload/reload device, format is: LTO-6 2.5TB
rst0a - rewind device,      format is: LTO-6 6.25TB Compressed
nrst0a - no rewind device,  format is: LTO-6 6.25TB Compressed
urst0a - unload/reload device, format is: LTO-6 6.25TB Compressed

Tape drive (10b.111) IBM      ULTRIUM-TD6
rst1l - rewind device,      format is: LTO-4/5 Native Density
nrst1l - no rewind device,  format is: LTO-4/5 Native Density
urst1l - unload/reload device, format is: LTO-4/5 Native Density
rst1m - rewind device,      format is: LTO-4/5 Compressed
nrst1m - no rewind device,  format is: LTO-4/5 Compressed
urst1m - unload/reload device, format is: LTO-4/5 Compressed
rst1h - rewind device,      format is: LTO-6 2.5TB
nrst1h - no rewind device,  format is: LTO-6 2.5TB
urst1h - unload/reload device, format is: LTO-6 2.5TB
rst1a - rewind device,      format is: LTO-6 6.25TB Compressed
nrst1a - no rewind device,  format is: LTO-6 6.25TB Compressed
urst1a - unload/reload device, format is: LTO-6 6.25TB Compressed

```

This example is a NEO 400s with LTO-6 half-height tape drives:

```

apps-fas940-220> sysconfig -t
Tape drive (10a.4) IBM      ULTRIUM-HH6
rst01 - rewind device,      format is: LTO-4/5 Native Density
nrst01 - no rewind device,  format is: LTO-4/5 Native Density
urst01 - unload/reload device, format is: LTO-4/5 Native Density
rst0m - rewind device,      format is: LTO-4/5 Compressed
nrst0m - no rewind device,  format is: LTO-4/5 Compressed
urst0m - unload/reload device, format is: LTO-4/5 Compressed
rst0h - rewind device,      format is: LTO-6 2.5TB
nrst0h - no rewind device,  format is: LTO-6 2.5TB
urst0h - unload/reload device, format is: LTO-6 2.5TB
rst0a - rewind device,      format is: LTO-6 6.25TB Compressed
nrst0a - no rewind device,  format is: LTO-6 6.25TB Compressed
urst0a - unload/reload device, format is: LTO-6 6.25TB Compressed

Tape drive (10b.5) IBM      ULTRIUM-HH6
rst1l - rewind device,      format is: LTO-4/5 Native Density
nrst1l - no rewind device,  format is: LTO-4/5 Native Density
urst1l - unload/reload device, format is: LTO-4/5 Native Density
rst1m - rewind device,      format is: LTO-4/5 Compressed
nrst1m - no rewind device,  format is: LTO-4/5 Compressed
urst1m - unload/reload device, format is: LTO-4/5 Compressed
rst1h - rewind device,      format is: LTO-6 2.5TB
nrst1h - no rewind device,  format is: LTO-6 2.5TB
urst1h - unload/reload device, format is: LTO-6 2.5TB
rst1a - rewind device,      format is: LTO-6 6.25TB Compressed
nrst1a - no rewind device,  format is: LTO-6 6.25TB Compressed
urst1a - unload/reload device, format is: LTO-6 6.25TB Compressed

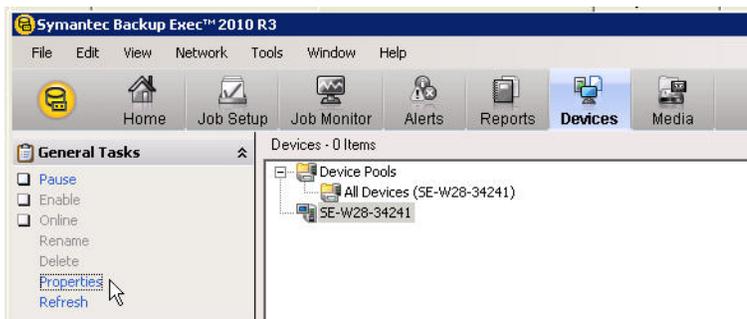
```

Configuring Backup Exec NDMP Devices

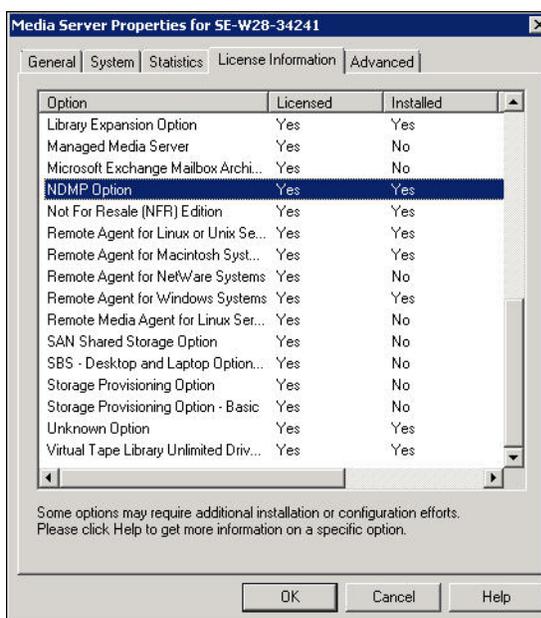
Use the following steps to configure the NEO library within Backup Exec. The steps show how to verify whether the Backup Exec NDMP option is installed and enabled, and how to add a NetApp Filer and its devices to the Backup Exec Server.

1. In the Backup Exec console, click **Devices**.

- Under the General Tasks, click **Properties**.



- Click License Information tab and search for **NDMP Option** and confirm that the Licensed and Installed columns both are **Yes**.

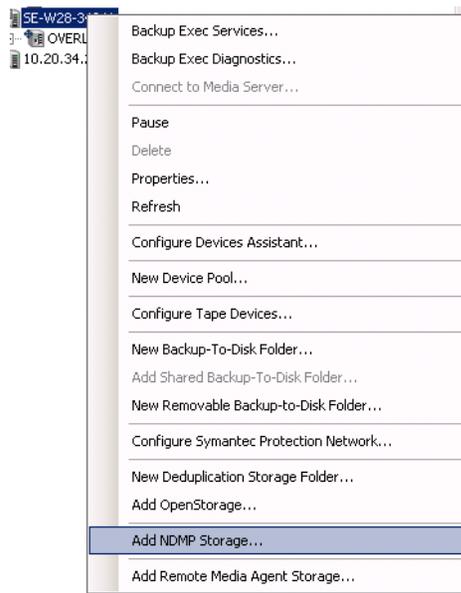


- Type the following **two commands** from the NetApps CLI console:

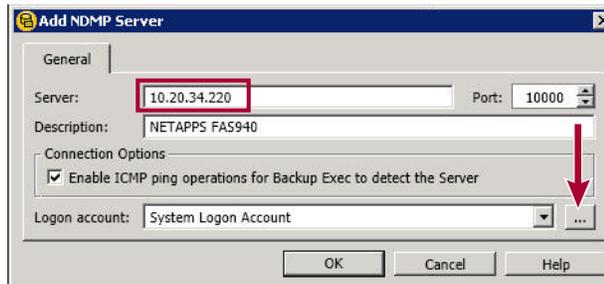
```
ndmpd version
options ndmpd.authtype challenge
```

```
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
apps-fas940-220> ndmpd version
ndmpd highest version set to: 4
apps-fas940-220>
apps-fas940-220> options ndmpd.authtype challenge
apps-fas940-220>
apps-fas940-220>
apps-fas940-220>
```

- From the Backup Exec console and **Devices**, right-click the Backup Exec Server and select **Add NDMP Storage**.



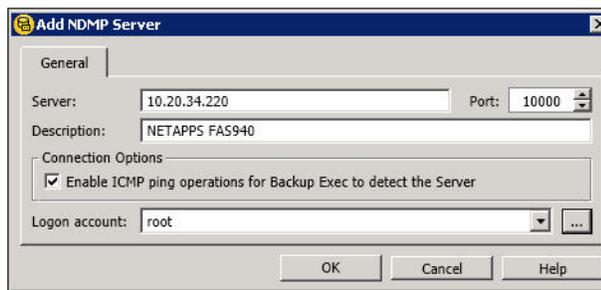
- In the **Server** field, enter the **IP address** of the NetApp Filer, and then click the browse button (...) to the right of the **Logon Account** field.



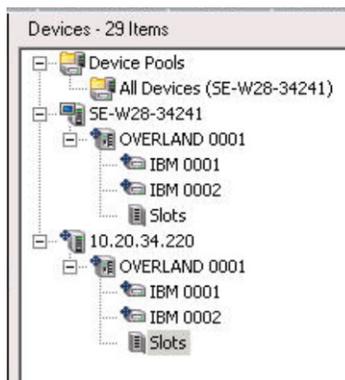
- Enter the NetApp Filer **credentials** and click **OK**.



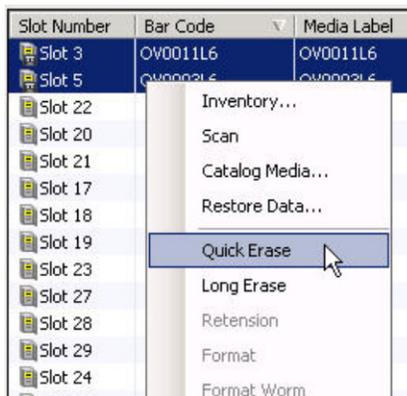
- Verify the account and click **OK**.



The Overland NEO now appears in two areas, under the Backup Exec server and under the new NDMP Filer.



- Right-click all the Medias and select **Quick Erase**.

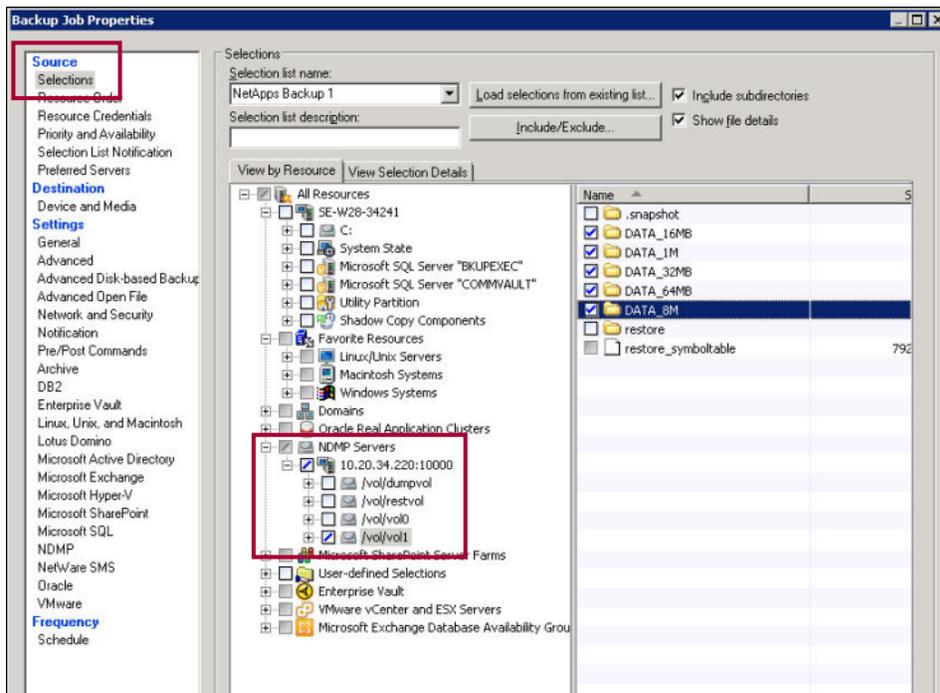


Creating a Backup Job

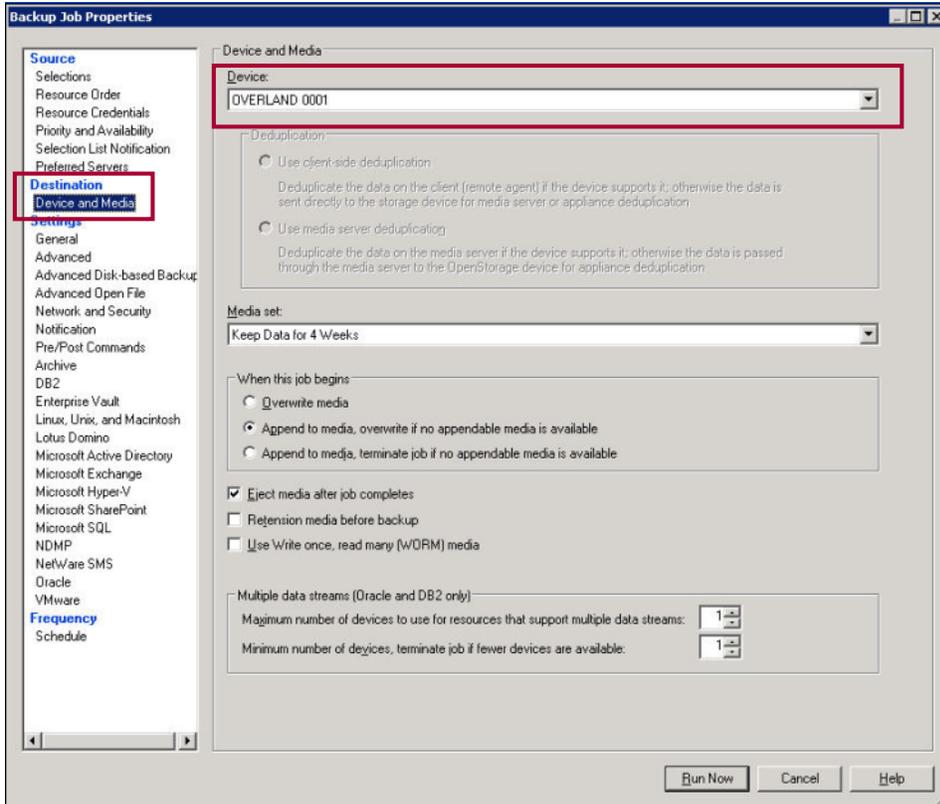
The following steps detail how to create a backup job:

- To create a new backup job, click **Source: Selections > NDMP Servers**.

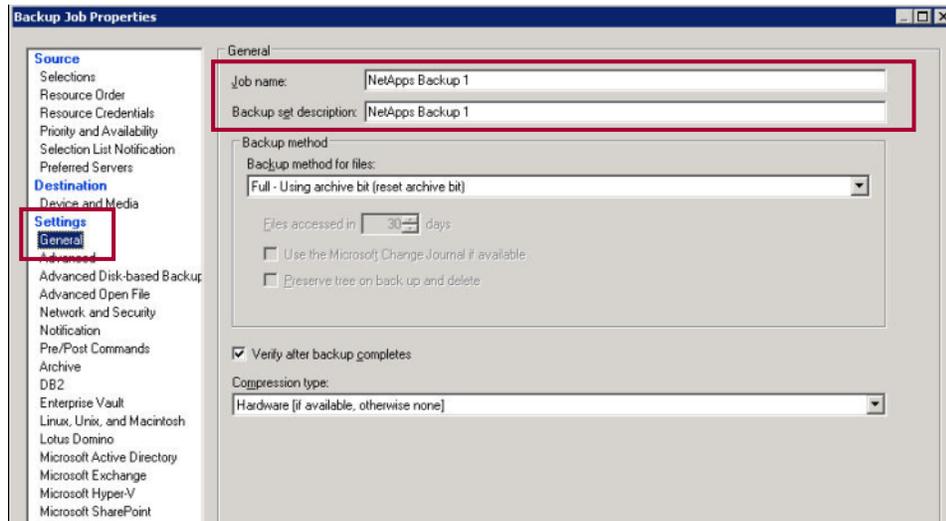
2. Expand NDMP Servers and select the source.



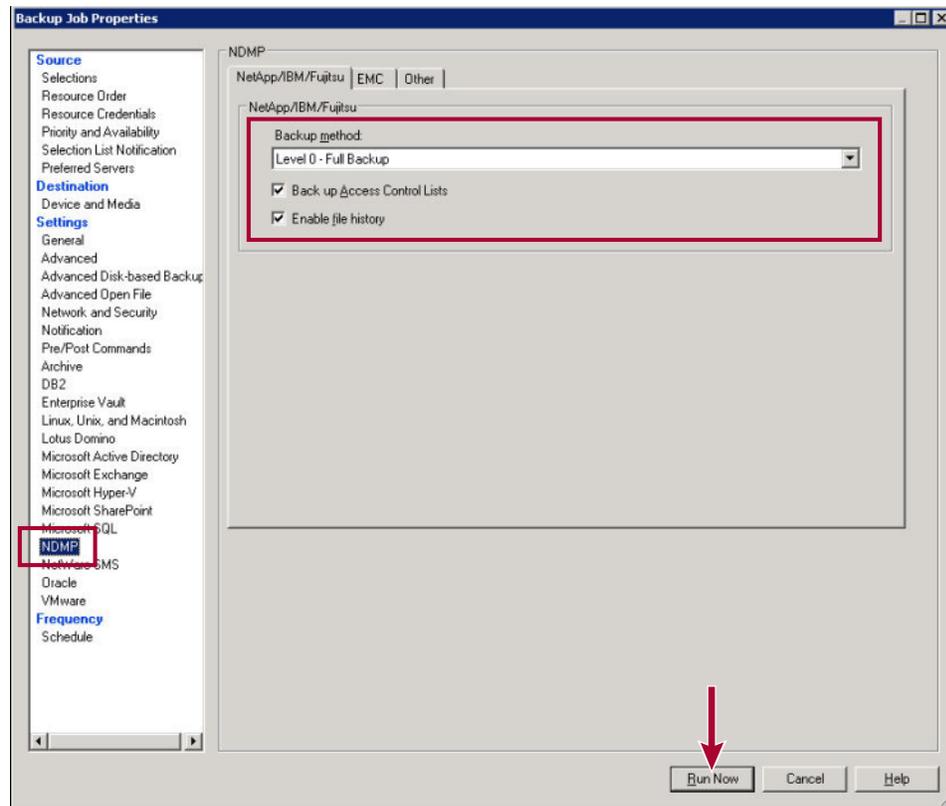
3. Click Destination: Device and Media and, using the Device drop-down list, select the NEO library.



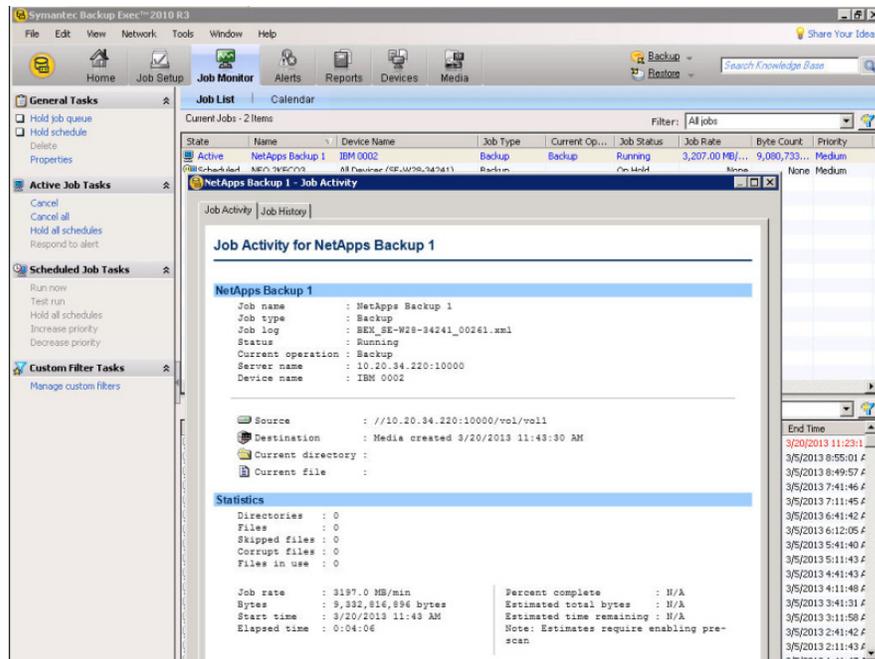
4. Click **Settings: General** and provide the **Job name** and **Backup set description**.



5. Click **Settings: NDMP**, provide the **level** of backup, and click **Run Now**.



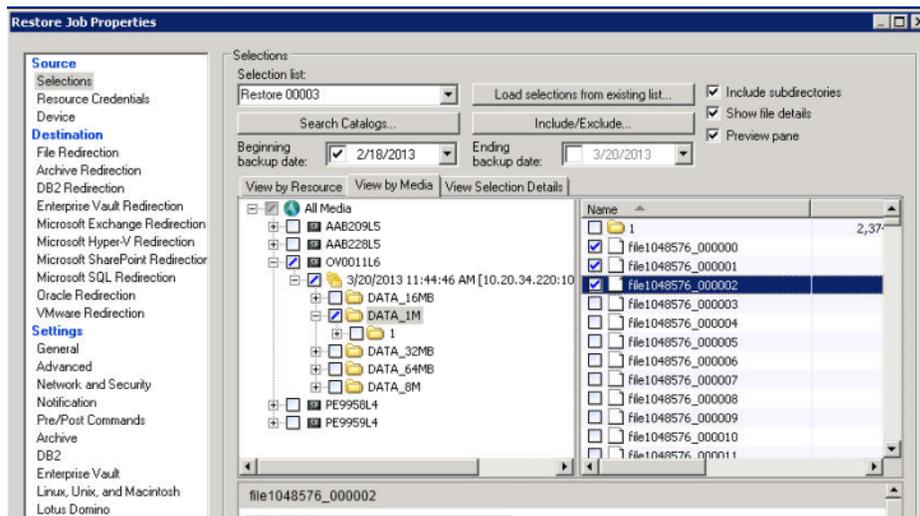
The active backup job can be displayed in the Backup Exec Job Monitor.



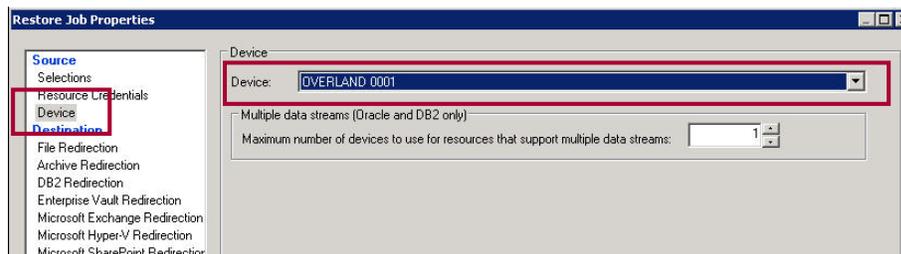
Creating a Restore Job

The following steps detail how to create a restore job:

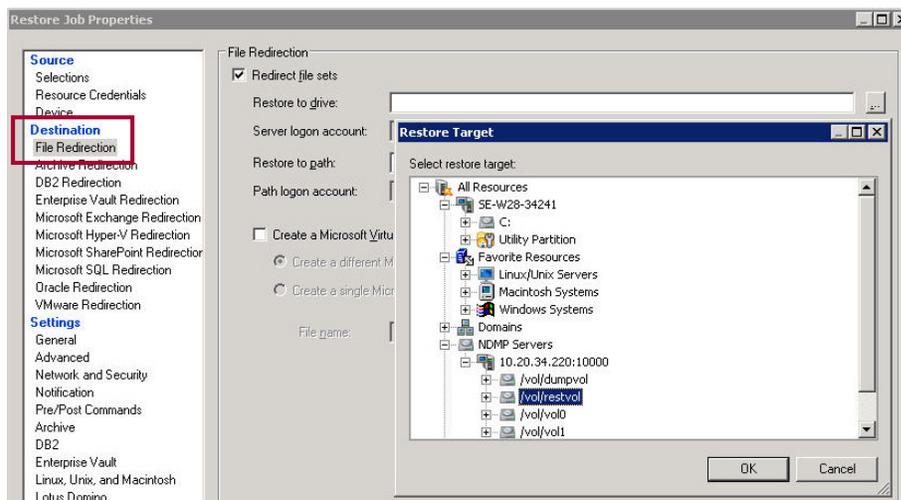
1. To create a new restore job, click **Source: Selections** and select the **source file** for the recovery.



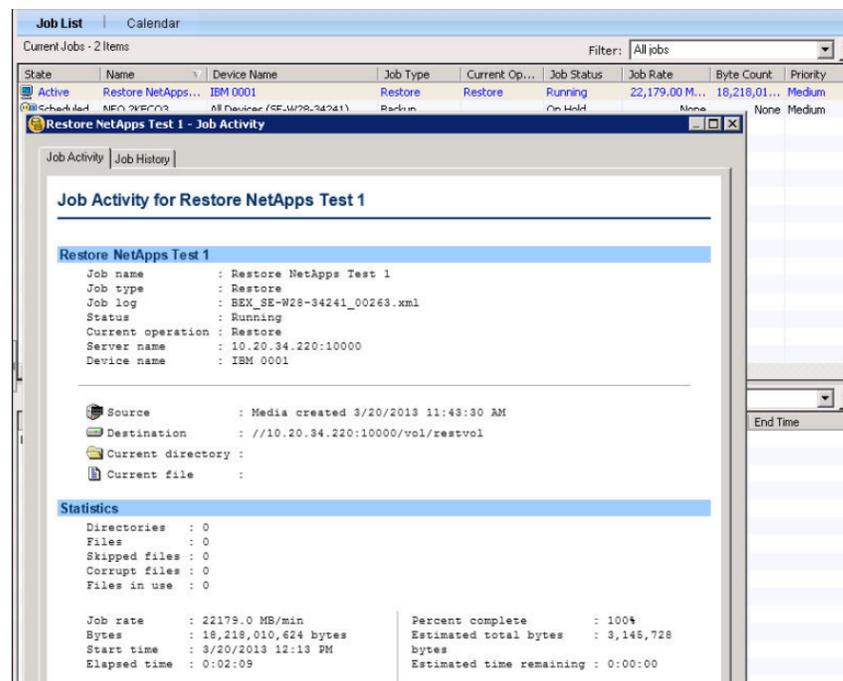
2. Click **Source: Device** and, using the drop-down list, select the **OVERLAND** device.



3. Select **Destination: File Redirection** and browse the **explicit path** for the destination.



4. When ready, click **Run Now** at the bottom of the page.
The active restore job can be displayed in the Backup Exec Job Monitor.



Additional NetApp CLI Commands

The following lists the NDMPD settings on the NetApps Filer.:

options ndmpd

Output:> *options ndmpd*

ndmpd.access	all
ndmpd.authtype	challenge
ndmpd.connectlog.enabled	off
ndmpd.enable	on
ndmpd.ignore_ctime.enabled	off
ndmpd.offset_map.enable	on
ndmpd.password_length	16
ndmpd.preferred_interface	disable*

* Value might be overwritten in takeover.

The following command stops and starts NDMPD daemon:

ndmpd on or off

The following command provides the version of NDMP:

version

The following command shows any running NDMPD processes (active backup/restore):

ndmpd status

The following command resets all device files known to the NetApps Filer (used for general house keeping with old device file remnants):

storage unalias -a

The following command sets the NDMPD daemon to version 4:

ndmpd version 4

The following command lists all host bus adapters known to the NetApps Filer:

storage show adapter -a

The following command displays detail information about the host bus adapter:

storage show adapter 1

The following command disables or enables the use of a host bus adapter:

storage enable or disable adapter 1

The following command and output shows a backup using the dump command to a specific tape drive:

dump 0f nrst6a /vol/vol0

This command is used to help isolate issues between the backup server, NetApps Filer, and the tape drive. The command states to dump or backup the data located in /vol/vol0 to a non-rewinding tape drive 6.

```
DUMP: creating "/vol/vol0/./snapshot_for_backup.0" snapshot.  
DUMP: Using subtree dump  
DUMP: Date of this level 0 dump: Tue Aug 29 10:45:32 2000.  
DUMP: Date of last level 0 dump: the epoch.  
DUMP: Dumping /vol/vol0/etc to nrst6a  
DUMP: mapping (Pass I)[regular files]  
DUMP: mapping (Pass II)[directories]  
DUMP: estimated 23370 KB.  
DUMP: dumping (Pass III) [directories]  
DUMP: dumping (Pass IV) [regular files]  
DUMP: dumping (Pass V) [ACLs]  
DUMP: 24352 KB  
DUMP: DUMP IS DONE  
DUMP: Deleting "/vol/vol0/./snapshot_for_backup.0" snapshot.
```

Additional NetApp and Backup Exec References

- Always verify that the current firmware is installed on your device. All Overland Storage firmware can be found at ftp.overlandstorage.com.
- NetApp Tape Device Configuration File download:
http://support.netapp.com/NOW/download/tools/tape_config/
- Symantec Backup Exec 2010 Hardware (HCL):
http://www.symantec.com/business/support/index?page=content&id=TECH137050&actp=search&viewlocale=en_US&searchid=1330362297253
- Symantec Backup Exec NDMP best practices:
<http://www.symantec.com/business/support/index?page=content&id=HOWTO21783>