

# HP StoreOnce OpenStorage (OST) Plug-in for Symantec NetBackup Version 3.1.2 installation and user guide

## Abstract

This document provides instructions for using the HP OpenStorage (OST) Plug-in for Symantec NetBackup version 3.1.2. It is intended for database administrators and information technology (IT) administrators familiar with the HP StoreOnce Backup system and Symantec NetBackup.

Always check [www.hp.com/go/storage/docs](http://www.hp.com/go/storage/docs) for the most current plug-in documentation. (Select your product and then select the "Installation" Information Type.)

Refer to the *Data Agile BURA Compatibility Matrix* on [www.hp.com](http://www.hp.com) for supported client hardware.



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### Revision History

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Revision 1	October 2013
Part number EJ022-90998, release of the OST plug-in version 2.1, first edition for NetBackup that combined information for all operating systems into one document	
Revision 2	June 2014
Part number BB897-90926, release of the OST plug-in version 3.0	
Revision 3	August 2014
Part number Z7550-96076, release of the OST plug-in version 3.0.1	
Revision 4	February 2015
Part number Z7550-96079, release of the OST plug-in version 3.1	
Revision 5	July 2015
Part number Z7550-96173, release of the OST plug-in version 3.1.2	

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# 1 Overview

The OST Plug-in is a Symantec backup interface that allows intelligent storage devices like the HP StoreOnce Backup systems to work with Symantec's NetBackup software. OST provides NetBackup administrators with advanced capabilities such as optimized duplication and A.I.R.

The OST Plug-in is installed on NetBackup media servers. It uses a StoreOnce Catalyst interface to interact with the HP StoreOnce Backup systems.

**NOTE:** All OST Plug-in operations supported on version 3.1.2 for physical StoreOnce appliances are also supported on Virtual StoreOnce Appliances (VSA). VSAs hosted on VMware ESX Servers, Microsoft Hyper-V, and Linux KVM are supported. For more information, see the *HP StoreOnce VSA Backup system user guide* for software version 3.12.0 or later.

Using the OST Plug-in version 3.1.2 with NetBackup works with:

- Un-targeted and Targeted Auto Image Replication (A.I.R.)
- StoreOnce Catalyst over Fibre Channel interface
- StoreOnce Catalyst stores and Federated Catalyst stores
- Granular Recovery Technology (GRT)
- NetBackup Accelerator for File Systems and VMware
- NetBackup Instant Recovery for VMWare

## Prerequisites

This section describes media server prerequisites that should be considered before installing the OST Plug-in for Symantec NetBackup.

### Operating systems

Operating Systems Supported	Ethernet network supported?	Fibre Channel network supported?
Microsoft Windows Server 2008 R2 (x64), 2012 R2 (x64)	✓	✓
RedHat Enterprise Linux 5.x (x64), 6.x (x64), 7.x (x64)	✓	✓
SuSE Linux Enterprise Server 10.x (x64), 11.x (x64), 12.x (x64) <sup>1</sup>	✓	✓
HP-UX 11.31 (IA-64)	✓	✓
AIX 6.1 (x64), 7.1 (x64) <sup>2</sup>	✓	✓
Solaris 10 (SPARC 64), 11 (SPARC 64) <sup>3</sup>	✓	✓

<sup>1</sup> StoreOnce Catalyst over Fibre Channel is only supported on SuSE 11 SP2 and lower. SP3 supports StoreOnce Catalyst over Fibre Channel with StoreOnce software version 3.13.

<sup>2</sup> Catalyst over Fibre Channel on AIX is available by request only. If you have a requirement for Catalyst over Fibre Channel on AIX 6.1 or 7.1, contact [BURA.Solutions@hp.com](mailto:BURA.Solutions@hp.com).

<sup>3</sup> SPARC T1 and SPARC T2 are supported in high bandwidth mode only.

### Symantec NetBackup

The OST Plug-in works with the following NetBackup versions:

- 7.5
- 7.6

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**NOTE:** Be sure to observe the following:

- While installing NetBackup, be sure to take note of and appropriately resolve all warnings and errors encountered during pre-install checks. Failure to do so may impact backup operations later.
  - You must install NetBackup first, and then install the OST Plug-in.
-

## 2 HP StoreOnce Catalyst

This chapter provides a brief overview of HP StoreOnce Catalyst.

- ① **IMPORTANT:** For more information, including how to create, edit, and delete StoreOnce Catalyst and Federated Catalyst stores, see the *HP StoreOnce Backup system user guide* for your product.

### What is StoreOnce Catalyst?

HP StoreOnce Catalyst is a StoreOnce function that allows backup applications to:

- back up data to a target store on the HP StoreOnce Backup system. Deduplication may occur on the media server, backup server, or HP StoreOnce Backup system.
- copy jobs between HP StoreOnce Backup systems. Configuration occurs within the backup application, making this an attractive alternative to using the replication function on the HP StoreOnce Backup system.

StoreOnce Catalyst requires a backup application that supports it. See [www.hp.com/go/ebs](http://www.hp.com/go/ebs) for a list of supported backup applications.

### Benefits of StoreOnce Catalyst

- The backup application is in full control of data for the full lifecycle of the backup data.
- The backup application has full visibility of all items and jobs on the HP StoreOnce Backup system.
- Deduplication can occur on either the media server or HP StoreOnce Backup system which ensures efficient use of the available bandwidth.
- There is no limiting geometry (for example, cartridges for VTL libraries).
- There is no enforced limit on the number of items within a store.
- Copy jobs are instigated from the application and have none of the complexities of replication mapping.
- Space reclamation is more automated and easier to implement if HP StoreOnce Catalyst devices types are used.

### StoreOnce Catalyst Terminology

**Table 1 Terminology**

Term	Description
StoreOnce Catalyst	the name of the StoreOnce interface
StoreOnce Catalyst stores	the targets/device types in which backups are stored on the HP StoreOnce Backup system
StoreOnce Catalyst Federated stores	a group of up to eight service sets within the same cluster that share backup jobs as a federation on the HP StoreOnce Backup system
StoreOnce Catalyst items	the items stored in the StoreOnce Catalyst stores on the HP StoreOnce Backup system
StoreOnce Catalyst clients	the generic term for applications that connect using the StoreOnce Catalyst interface
Data jobs	any backup or restore job
StoreOnce Catalyst Optimized Backups	backups performed on the media server or backup server (instead of the HP StoreOnce Backup system) so only

**Table 1 Terminology** *(continued)*

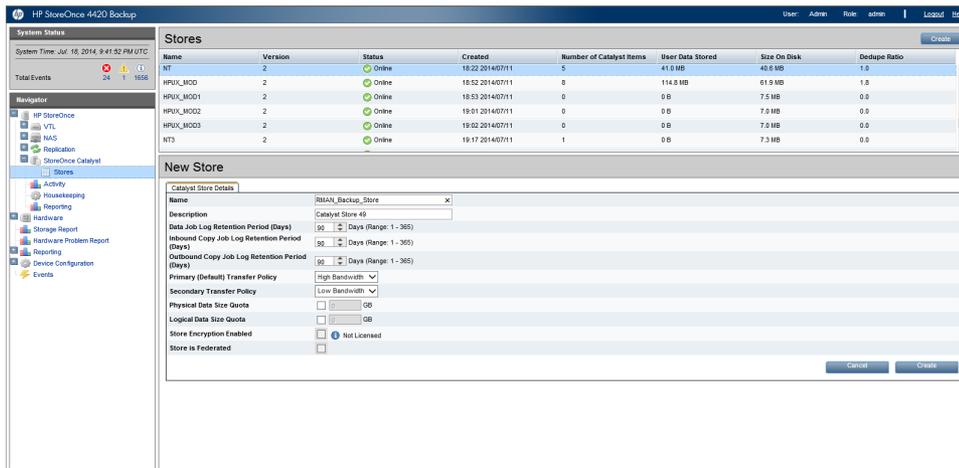
<b>Term</b>	<b>Description</b>
	unique data is sent to the HP StoreOnce Backup system and a low bandwidth network link is adequate. Actual performance varies depending upon the data and disk I/O speeds.
Copy jobs	true copies of the data (not mirror images). The backup application specifies the source store (outbound copy job) and target store (inbound copy job). Once copied, the two versions are independent of each other and either version can be deleted, moved, or added to from the backup application.
StoreOnce Catalyst Optimized Copy	the two stores negotiate so that only unique data is transferred and the copy job is completed in a bandwidth-efficient manner.

# 3 Configuring the HP StoreOnce Backup system for the OST Plug-in

## Creating StoreOnce Catalyst and Federated Catalyst stores

You must manually create a StoreOnce Catalyst or Federated Catalyst store on your StoreOnce appliance to work with the OST Plug-in.

1. Log onto the HP StoreOnce Management Console (StoreOnce GUI) with administrator privileges.
2. Navigate to **HP StoreOnce**→**StoreOnce Catalyst**→**Stores**.
3. Click **Create**.
4. If using an HP StoreOnce 6500 or B6200 Backup system, select a service set for the new store and click **OK**. To create a Federated store, select multiple service sets; these become the Federation members.
5. Change the store details as appropriate. A table describing the store details can be found in the “StoreOnce Catalyst Stores page” section of the *HP StoreOnce Backup system user guide* for your product.



6. Click **Create**. A StoreOnce Catalyst or Federated Catalyst store is created. The store will appear in the top panel. This means the HP StoreOnce Backup system is configured and ready to accept backups.

## Configuring StoreOnce Catalyst Store Access Control

In setting client access control, two modes can be set on StoreOnce Catalyst stores:

- No client credential checking – Allows all clients to have access to the StoreOnce Catalyst store.
- Client credential checking – Allows a select group of client identifiers to have access to the StoreOnce Catalyst store. To enable this mode, client access permission checking must be enabled on the **Settings** tab of the StoreOnce GUI. To access this tab, navigate to **HP StoreOnce**→**StoreOnce Catalyst**→**Settings**. Also, an individual StoreOnce Catalyst store must grant access for a client identifier within the **Permissions** tab of a StoreOnce Catalyst store.

**NOTE:** Access to StoreOnce Catalyst stores is controlled through client identifiers with optional passwords.

# Configuring StoreOnce Catalyst over Fibre Channel

**NOTE:** Fibre Channel users are advised to consult the *Data Agile BURA Compatibility Matrix* (available at [www.hp.com](http://www.hp.com)) to ensure that client HBAs, switches, Fibre Channel driver, and firmware versions are supported.

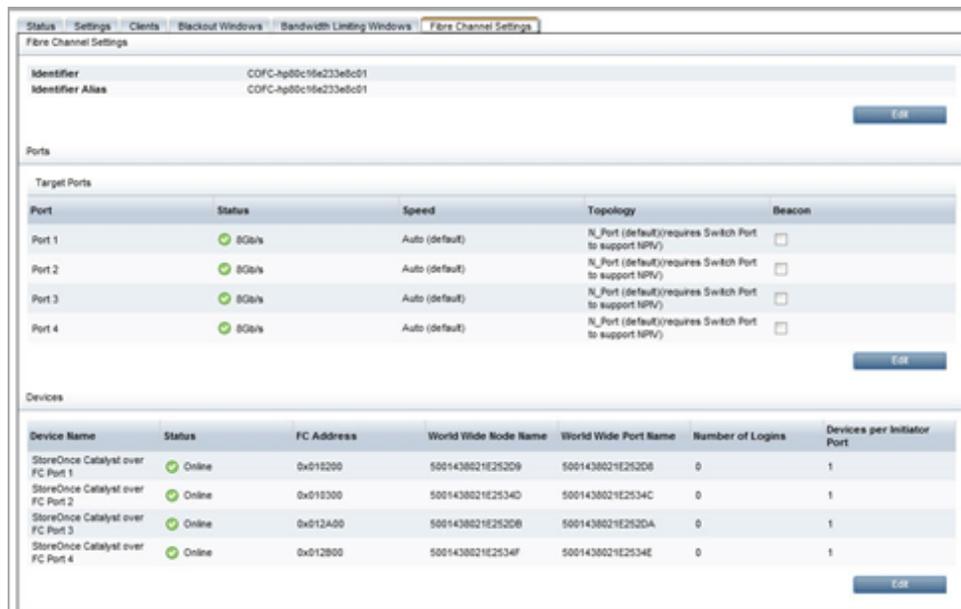
Before configuring StoreOnce Catalyst over Fibre Channel, ensure that:

- Database servers and the HP StoreOnce appliance are connected to the Fibre Channel network.
- Media servers can communicate with the HP StoreOnce appliance over a Fibre Channel network. To do so, the storage administrator must ensure that any network segregation, such as zoning, is set up to handle required connectivity between the server and appliance.

**NOTE:** When using StoreOnce Catalyst over Fibre Channel:

- Backups are supported on StoreOnce Catalyst over Fibre Channel interface, as well as over Ethernet networks. Optimized copies continue to run over an Ethernet interface.
- Appliance-to-appliance connectivity should be through an Ethernet network. Doing so enables data recovery copies to be made through the HP StoreOnce Catalyst copy function.
- Administrator privileges are required to run StoreOnce Catalyst over Fibre Channel because it accesses OS-specific device files associated with StoreOnce Catalyst over Fibre Channel devices.

StoreOnce Catalyst over Fibre Channel functions the same way as standard StoreOnce Catalyst (over Ethernet); the backup application will not perceive a difference. However, some configuration is required to set up the backup and restore connections between the ports on the HP StoreOnce Backup system and the ports on the client servers. This is done using the Fibre Channel Settings tab which is available within the StoreOnce GUI only if StoreOnce Catalyst over Fibre Channel is enabled.



## Initial configuration

1. Locate the Identifier at the top of the screen. This is the Fibre Channel address of the StoreOnce Backup system and is used to identify the StoreOnce Backup system in the backup application. It is in the format `COFC-<device-id>`; you may provide an Identifier Alias to make it easier to identify from the backup application. This Catalyst over Fibre Channel Identifier is provided to the backup application where an Ethernet address would otherwise be provided.

2. In the Target Ports section, HP recommends the default values. However, you can edit the speed.
3. On the Fibre Channel Settings tab, in the Devices section, locate the World Wide Port Name for each port on the StoreOnce Backup system. This is the information needed to connect the client with the StoreOnce Backup system. Use this information to zone your client Fibre Channel ports with your StoreOnce Fibre Channel ports.
4. Locate the Number of Logins and Devices per Initiator Port for each port. These values determine the number of concurrent backup and restore connections allowed on each Fibre Channel port on the HP StoreOnce Backup system.
  - Number of Logins – defines the number of client-side ports that are zoned to connect to that port on the StoreOnce Backup system and cannot be edited.
  - Devices per Initiator Port – determines the number of backup and restore connections that are allowed for each client login to that port on the StoreOnce Backup system. This value should be increased if multiple concurrent backup streams are required; the maximum allowed is 64 devices per login.

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**NOTE:** On Linux systems, it is possible that a client HBA port can open multiple concurrent StoreOnce Catalyst over Fibre Channel connections to a target StoreOnce Fibre Channel port and therefore it is sufficient to have a device count of 1. On Windows, HP-UX, Solaris and AIX, this is not possible. The number of devices per initiator port should be increased when multiple backup streams are required so that multiple LUNs are presented to the client.

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The number of paths available to a particular client is calculated as:

number of client ports zoned \* number of StoreOnce node ports zoned  
 \* devices per initiator port

**Table 2 Example relationships between Device per Initiator Port and Number of Connections on Windows and HP-UX**

Client-side	HP StoreOnce Backup system	Devices per Initiator Port	Number of concurrent backup and restore sessions (per service set)
1 port zoned to	4 ports	1	4
2 ports zoned to	4 ports	1	8
2 ports zoned to	2 ports	4	16
2 ports zoned to	4 ports	8	64

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**NOTE:** The number of StoreOnce Catalyst over Fibre Channel devices available must be at least one more than the number of streams if the backup application or plug-in can open command sessions during a backup or restore.

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Once the client has been Fibre Channel zoned with the StoreOnce appliance there are a number of considerations for each operating system.

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**NOTE:** Only backup is supported with Catalyst over Fibre Channel. All StoreOnce Catalyst copies must take place over Ethernet. When configuring a StoreOnce Catalyst copy destination, ensure that an Ethernet address is provided instead of a Catalyst over Fibre Channel address.

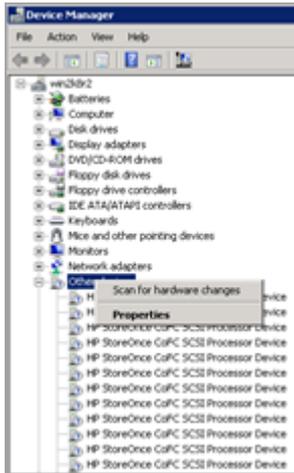
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## Client configurations

### Windows Clients

Administrator permissions are required to run Catalyst over Fibre Channel backups.

StoreOnce Catalyst over Fibre Channel presents a device type of “Processor.” In Windows Device Manager, these devices are shown as “Other Devices.” After zoning the devices or changing the Number of Devices per Initiator Port, right-click “Other Devices” and select “Scan for hardware changes” to detect the new devices.



## Linux Clients

StoreOnce Catalyst over Fibre Channel presents a device type of “Processor.” On Linux, these devices files are created in `/dev/sg*`. By default, `/dev/sg*` devices are accessible by root users only. If backups are run as a non-root user, first grant the backup user permissions to access these device files using the `chmod o+rwx /dev/sg*` command.

For finer grained permissions, determine which `/dev/sg*` device files relate to Catalyst over Fibre Channel using the `lsscsi --generic` command and then `chmod o+rwx` on the appropriate devices.

## AIX Clients

Catalyst over Fibre Channel on AIX is available by request only. If you have a requirement for Catalyst over Fibre Channel on AIX 6.1 or 7.1, contact [BURA.Solutions@hp.com](mailto:BURA.Solutions@hp.com).

## HP-UX Clients

StoreOnce Catalyst over Fibre Channel presents a device type of “Processor.” On HP-UX, these devices files are created in `/dev/pt/ptX`. After zoning the devices or changing the Number of Devices per Initiator Port, scan for device file changes. Execute the `ioscan -fnC /dev/pt` command as a root user. By default, `/dev/pt/ptX` devices are accessible by root users only. If backups are run as a non-root user, first grant the backup user permissions to access these device files using `chmod o+rwx /dev/pt/pt*`.

For finer grained permissions, determine which `/dev/pt/ptX` device files relate to Catalyst over Fibre Channel using:

```
/usr/sbin/scsimgr -p get_attr all_lun -a device_file -a dev_type -a pid
| grep StoreOnce
```

Then use `chmod o+rwx` on the appropriate devices.

## Solaris Clients

StoreOnce Catalyst over Fibre Channel presents a device type of “Processor.” On Solaris, these devices files are created in `/dev/scsi/processor/*`. After zoning the devices or changing

the Number of Devices per Initiator Port, scan for device file changes. Execute the following commands as a root user:

- `add_drv -vi scsiclass,03 sgen`
- `update_drv -vai scsiclass,03 sgen`

By default, `/dev/scsi/processor/*` devices are accessible by root users only. If backups are run as a non-root user, first grant the backup user permissions to access these device files using `chmod o+rwx /dev/scsi/processor/*`.

For finer grained permissions, determine which `/dev/scsi/processor/*` device files relate to Catalyst over Fibre Channel using:

```
for i in /dev/scsi/processor/*; do echo $i; ls $i; luxadm inq $i | egrep  
"Vendor|Product"; echo; done
```

Then use `chmod o+rwx` on the appropriate devices.

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# 4 Installing and upgrading the OST Plug-in

## Downloading the OST Plug-in

Download the OST Plug-in installer `zip` or `tar` file onto NetBackup media servers. Find the files at <http://software.hp.com> and navigate to **HP Storage**→**Storage Software**→**StoreOnce Free Software**. (Refer to your sales contact for user ID and password information.)

## Installing and upgrading the OST Plug-in with NetBackup

Before you begin the installation, make sure that Symantec NetBackup is installed. See the *NetBackup Installation Guide* for its installation instructions.

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❗ **IMPORTANT:** If you are installing the OST Plug-in version 3.1.2 on AIX, ensure that you use the appropriate `.rpm` file before completing installation instructions.

- For AIX v7.1: `gcc-c++-4.8.1-1.aix7.1.ppc.rpm`
- For AIX v6.1: `gcc-c++-4.8.1-1.aix6.1.ppc.rpm`

You must install the above AIX dependency packages before proceeding.

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**NOTE:** On Unix platforms, the OST Plug-in cannot be installed on an alternative path. You must use the paths provided.

**NOTE:** Before completing AIX installations, observe the following:

- On AIX media servers, where IPv6 is not configured, you must configure the `/etc/netsvc.conf` file as `hosts=local4,bind4`. Failure to do so causes NetBackup to mark disk volumes as down due to latencies introduced by AIX resolving storage server addresses.
- For AIX installations, typically, the page size setting is set to 512 MB. This setting must be changed to 4 GB to allow for the seamless operation of NetBackup installations. Be sure to change this setting before completing the AIX installation process. Failure to do so causes slow or unresponsive operations on the AIX server.
- On AIX media servers, when the system reports the disk volume status to the master server, delays may occur, and the system may then mark disk volumes as being down and may also mark media servers as being not active. In this case, backup operations fail, and the NetBackup Administration Console may also show poor response and, in some cases, no response. To work around this issue, execute the following steps on each of the NetBackup Media servers, and then restart NetBackup services:

```
# touch /usr/openv/netbackup/db/config/DPS_PROXYNOEXPIRE
# echo "3600" > /usr/openv/netbackup/db/config/DPS_PROXYDEFAULTSENDTMO
# echo "3600" > /usr/openv/netbackup/db/config/DPS_PROXYDEFAULTRECVTMO
```

---

1. Shut down all NetBackup services using the appropriate command.

- **Windows:**

Command: `bpdown`

Execution Path: `C:\Program Files\Veritas\NetBackup\bin`

- **Linux, HP-UX, AIX, and Solaris:**

Command: `bp.kill_all`

Execution Path: `as/usr/openv/netbackup/bin/`

2. On Windows, close any open command prompts so that environment variable changes, which occur during the OST Plug-in installation, are reflected in the command prompt.

3. Run the installer.

**Windows**

- To install the OST Plug-in version 3.1.2, extract the contents of the zip file, double-click the executable file, and follow the instructions.
- To upgrade from older versions, there is no need to uninstall the existing plug-in. Install version 3.1.2 as a new installation as stated above.

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**NOTE:** If you installed NetBackup on a path other than the default, you must use the same path when installing or upgrading the OST Plug-in.

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During the installation, files are copied to the following locations:

- OST Plug-in: `libstspihp.dll`
- Located in: `C:\Program Files\Veritas\NetBackup\bin\ost-plugins`
- Configuration files: `C:\Program Files\Hewlett-Packard\OpenStorage\3.1.2\config`
- Log files: `C:\Program Files\Hewlett-Packard\OpenStorage\3.1.2\logs`

**Linux, HP-UX, AIX, and Solaris**

- To install the OST Plug-in version 3.1.2, extract the `<gzip -d package_name and tar -xvf _tar_file>` (for Solaris, use `gunzip` instead of `gzip`) package, execute `bash install.sh`, and then follow the installation instructions.
- To upgrade from version 3.1, execute `bash install.sh` and then follow the installation instructions. To upgrade from versions earlier than 3.1, uninstall the existing plug-in and then install version 3.1.2; see the OST Plug-in user guide for version-specific uninstall instructions.

During the installation, files are copied to the following locations:

- OST Plug-in: `libstspihpq.so` and `libstspihpqMT.so`
- Located in: `/usr/opensv/lib/ost-plugins`
- Configuration files: `/usr/opensv/hp/ost/3.1.2/config`
- Log files: `/usr/opensv/hp/ost/3.1.2/logs`

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## 5 Uninstalling the OST Plug-in

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**NOTE:** Adhere to the following notes before uninstalling the OST Plug-in:

- Be sure to uninstall the OST Plug-in before uninstalling Symantec NetBackup.
  - In Windows 2012, if NetBackup is uninstalled before the OST Plug-in is uninstalled, the OST Plug-in uninstallation process fails.
- 

To uninstall the OST Plug-in, complete the following steps for the appropriate operating system.

### **Windows**

1. Shut down all NetBackup services by using the `bpdown` command.
2. Click **Start**→**Control Panel**→**Add or Remove Programs**.
3. Select **HP OST Plugin for Symantec NetBackup**.
4. Click **Uninstall**.
5. Follow the on-screen instructions. The plug-in is uninstalled, and all related files are deleted from the system; no reboot is required.

**Linux, HP-UX, AIX, and Solaris:**

1. Shut down all NetBackup services by using the `bp.kill_all` command.
2. Remove the OST Plug-in by executing `bash uninstall.sh` from the version 3.1.2 package.
3. Follow the on-screen instructions.

## 6 Configuring the OST Plug-in

The OST Plug-in comes with two configuration files.

- `hpost.conf` — Controls plug-in behavior
- `hpostlog.conf` — Controls plug-in logging

These files can be found at the following locations:

- In Windows: `%SystemRoot%\Program Files\Hewlett-Packard\OpenStorage\3.1.2\config`
- In Linux: `/usr/opensv/hp/ost/3.1.2/config`
- In HP-UX: `/usr/opensv/hp/ost/3.1.2/config`
- In AIX: `/usr/opensv/hp/ost/3.1.2/config`
- In Solaris: `/usr/opensv/hp/ost/3.1.2/config`

Refer to [Table 3 \(page 17\)](#) for a description of configuration parameters. Add comments in the `.conf` file by using `#` at the beginning of each new line. The plug-in is installed with default configurations settings.

**CAUTION:** Change the configuration only if you are familiar with the use and outcome of these parameters. Improper configuration settings can cause the system to malfunction.

[Table 3 \(page 17\)](#) lists and describes parameters that can be used with the `hpostlog.conf` configuration file.

**NOTE:** Any changes to `hpostlog.conf` become effective without restarting NetBackup services.

**Table 3 Parameters used with `hpostlog.config` configuration file**

Parameter syntax	Description
<code>LOGLEVEL:&lt;log level&gt;</code>	Specifies the level of logging for the OST Plug-in. Default: <code>ERROR</code> Valid Values: <code>VERBOSE/DEBUG/INFO/ERROR</code> Example: <code>LOGLEVEL:ERROR</code> <b>NOTE:</b> Note the following information when using valid values: <code>ERROR:</code> Logs only error messages <code>INFO:</code> Logs error and informational messages <code>DEBUG:</code> Provides adequate detail for troubleshooting issues <code>VERBOSE:</code> Provides the highest level of logging for tracing
<code>LOGFILE:&lt;filename&gt;</code>	Specifies the user-specific log file name. Default: <code>hpOstLogFile.log</code> Example: <code>LOGFILE:hpOstLogFile.log</code>
<code>ROLLUPSIZE:&lt;MB&gt;</code>	Sets the size of the log file in MBs before it is rolled over. Default: <code>10</code> Maximum: <code>50 (MB)</code> Example: <code>ROLLUPSIZE:10</code>
<code>ROLLUPFILES:&lt;count&gt;</code>	Specifies the number of rolled over log files to be kept in the filesystem. Default: <code>10</code> Maximum: <code>100</code>

**Table 3 Parameters used with hpostlog.config configuration file** *(continued)*

Parameter syntax	Description
	Example: <code>ROLLUPFILES:20</code>

## Configuring OST Plug-in using IPv6 addressing

The OST Plug-in version 3.1.2 supports addressing StoreOnce storage appliances using IPv6 addresses for all NetBackup operations that are supported with IPv4 addresses. However, an issue with NetBackup will cause the configuration to fail if an IPv6 address is used. Therefore, enter the IPv6 address as an FDQN in the NetBackup “Storage server name” field as shown below.

**Figure 1 Using an IPv6 address entered as an FDQN**

The screenshot shows the 'Storage Server Configuration Wizard' window. The title bar reads 'Storage Server Configuration Wizard'. The main heading is 'Add Storage Server' with the subtext 'Provide details to create storage server'. The 'Storage server details' section includes: 'Storage server name' (text box: OST\_server.hp.com), 'Storage server type' (dropdown menu: hp-StoreOnceCatalyst), and 'Media server' (dropdown menu: d2dblade03). Below this is a note: 'Select a media server that has the vendor's OpenStorage plug-in installed. NetBackup will query the storage server to determine its capabilities using this media server.' The 'Enter storage server credentials' section includes: 'User name' (text box: FibreConnect), 'Password' (text box: masked with asterisks), and 'Confirm password' (text box: masked with asterisks). At the bottom are buttons for '< Back', 'Next >', 'Cancel', and 'Help'.

---

# 7 Setting up Auto Image Replication (A.I.R.) with NetBackup

Topics included in this section are as follows:

- [“About A.I.R.” \(page 19\)](#)
- [“A.I.R. Prerequisites” \(page 20\)](#)
- [“Setting up Un-targeted A.I.R.” \(page 20\)](#)
- [“Setting up Targeted A.I.R.” \(page 24\)](#)

## About A.I.R.

The Auto Image Replication (A.I.R.) feature of NetBackup addresses the site-to-site replication challenge by allowing storage lifecycle policies to duplicate selected images between NetBackup Master Domains. The primary purpose of Auto Image Replication is to create off-site copies of mission critical backups to protect against site loss.

NetBackup A.I.R. relies on `tpman`, an HP proprietary tool, to create replication topologies between storage servers. The OST Plug-in uses this information to initiate automatic replication of data. `tpman` supports `m:n` NetBackup Domain replication topologies for A.I.R. operation.

A.I.R. comes in the following configurations:

- **Untargeted A.I.R.:** The OST Plug-in broadcasts the images based on the `m:n` topology and you cannot choose the replication targets.
- **Targeted A.I.R.:** Targeted A.I.R. presents the set of available targets for an A.I.R. operation. You can use the OST Plug-in to send data to selective targets rather than a broadcast.

---

**NOTE:** The `tpman` tool is still necessary to create the replication topology.

---

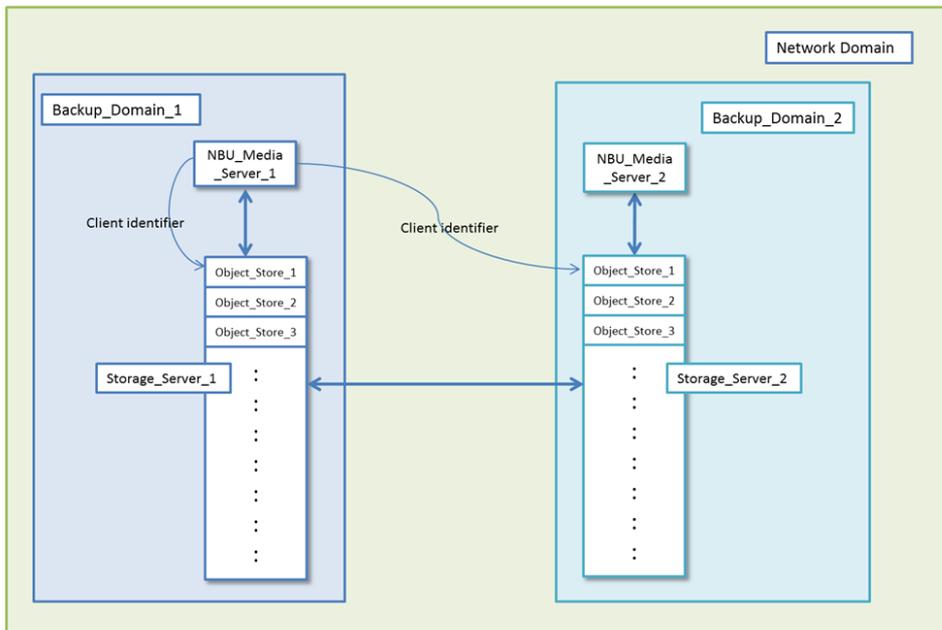
[Figure 2 \(page 20\)](#) provides an overview of how A.I.R. needs to be set up with the OST Plug-in versions 2.1 or later. It displays some of the prerequisites that need to be satisfied before setting up A.I.R. Please see the [“A.I.R. Prerequisites” \(page 20\)](#) for complete information.

---

**NOTE:** The OST Plug-in versions 2.1 through 3.0.1 only support un-targeted A.I.R. operations. Versions 3.1 and later support both un-targeted and targeted A.I.R. on NetBackup v7.6 and later.

---

Figure 2 A.I.R. setup between Object\_Store\_1 of Storage\_Server\_1 and Object\_Store\_1 of Storage\_Server\_2



## A.I.R. Prerequisites

Before setting up A.I.R., make sure that:

- NetBackup source and target master domains are accessible over the network to each other.
- Both source and target stores use the same client identifier for the A.I.R. operation (in case client access permission checking is enabled).
- NetBackup does not have any provisions for setting up replication topologies for third-party storage vendors. To set up replication topologies for the HP StoreOnce Backup System, storage administrators must use the tpman tool that shipped with the OST Plug-in.
- The source and target master domain, A.I.R. SLP names and data classification, are exactly the same (Un-targeted A.I.R. only).
- The date and time on source and target NetBackup domains should be set to their respective current time. NetBackup delays import of images at the target master if the time stamp on the replicated image is in the future.

## Setting up Un-targeted A.I.R.

To set up un-targeted A.I.R.:

1. Create stores on the source and target HP StoreOnce Backup system. (Refer to HP StoreOnce Backup system documentation at [www.hp.com/go/storage/docs](http://www.hp.com/go/storage/docs) for more information.)
2. Set up topology:
  - a. HP provides a CLI tool (tpman) to storage administrators for replication topology setup. The tool is installed automatically after the OST Plug-in is installed. The tool is located at:
    - For Windows: %SystemRoot%\Program Files\Hewlett-Packard\OpenStorage\3.1.2\bin
    - For Linux: /usr/opensv/hp/ost/3.1.2/bin
    - For HP-UX: /usr/opensv/hp/ost/3.1.2/bin
    - For AIX: /usr/opensv/hp/ost/3.1.2/bin

- b. Use the tpman tool to setup replication topology. The OST Plug-in versions 3.1 and later support replication topology setup between stores. Topology can scale in an m:n fashion.  
Tpman usage:
  - For Windows: `tpman.exe -add -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
  - `tpman.exe -remove -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
  - `tpman.exe -showtopology -store <sts:lsu> [-clientid <id>]`
- c. For all other platforms (non-Windows platforms), use tpman as follows:
  - `tpman -add -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
  - `tpman -remove -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
  - `tpman -showtopology -store <sts:lsu> [-clientid <id>]`
- d. Run the add command as shown below. In the example below, StoreOnce Catalyst Store, Air\_Demo\_62\_1, of storage server 10.11.3.62 replicates to StoreOnce Catalyst Store, Air\_Demo\_64\_1, of storage server 10.11.3.64.

**Figure 3 Running the add command example**

```

Administrator: C:\Windows\system32\cmd.exe
C:\Program Files\Hewlett-Packard\OpenStorage20\bin>tpman.exe -add -source 10.11.3.62:Air_Demo_62_1 -target 10.11.3.64:Air_Demo_64_1
Replication Topology - 10.11.3.62:Air_Demo_62_1
10.11.3.62:Air_Demo_62_1 --> 10.11.3.64:Air_Demo_64_1
C:\Program Files\Hewlett-Packard\OpenStorage20\bin>_
  
```

---

**NOTE:** Source StoreOnce Catalyst stores and target StoreOnce Catalyst stores should have same client identifiers.

---

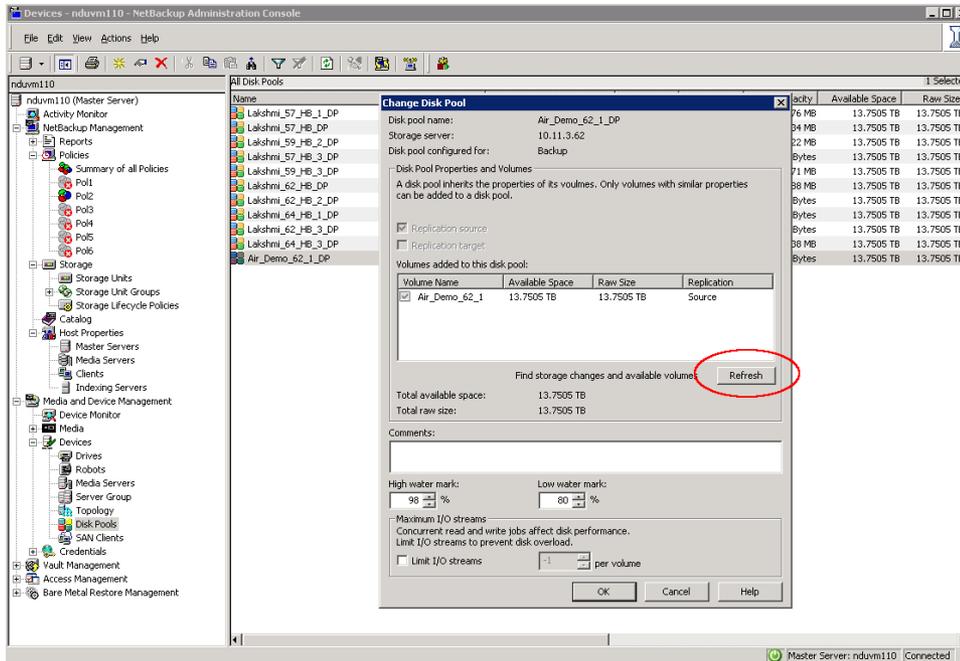
3. Create storage units and disk pools out of these replication-enabled StoreOnce Catalyst stores, for use with A.I.R., and then restart NetBackup services.

---

**NOTE:** You can change the topology of a StoreOnce Catalyst Store even after it has been added as a disk pool. If doing so, always remember to refresh the disk pool as shown below.

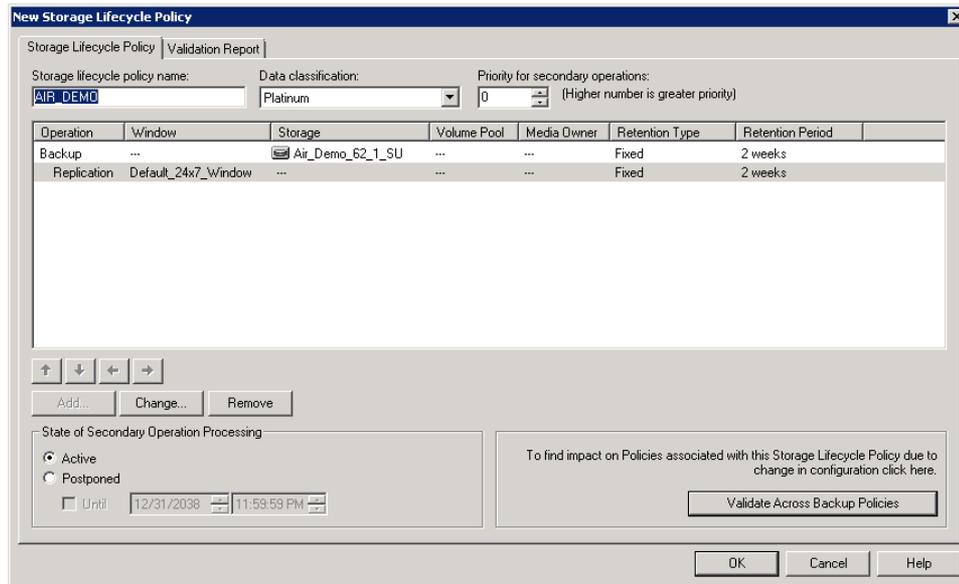
---

**Figure 4** Creating storage units and disk pools from replication-enabled StoreOnce Catalyst stores



4. Create a Storage Lifecycle Policy (SLP) on the source master server as shown below.

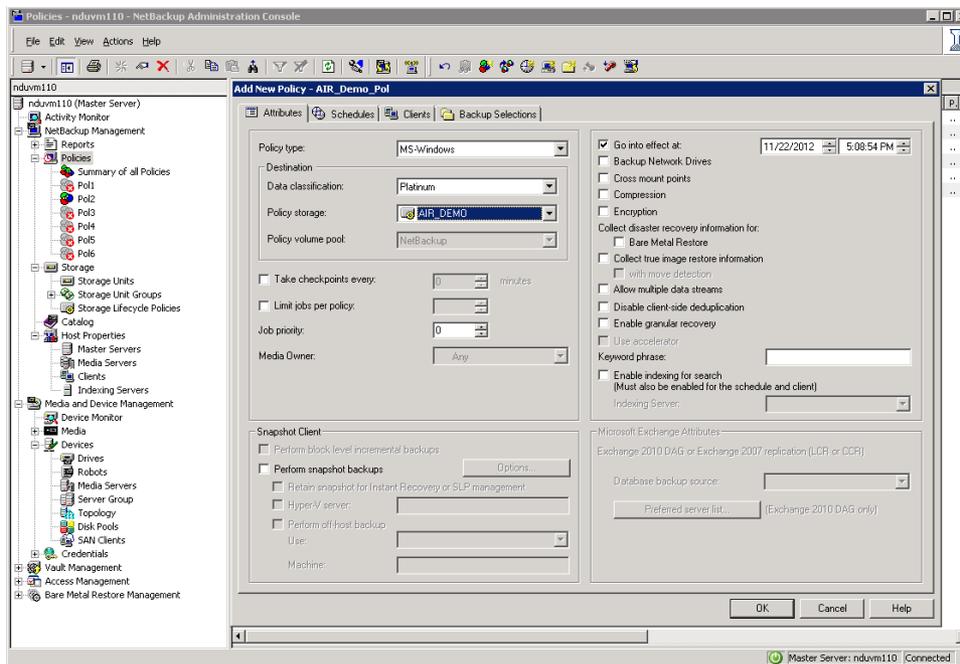
**Figure 5** Creating a Storage Lifecycle Policy on the source master server



5. Create a policy that uses this SLP.

**NOTE:** The policy should start to backup and replicate selected backup sets to the replica as set up when using tpman.

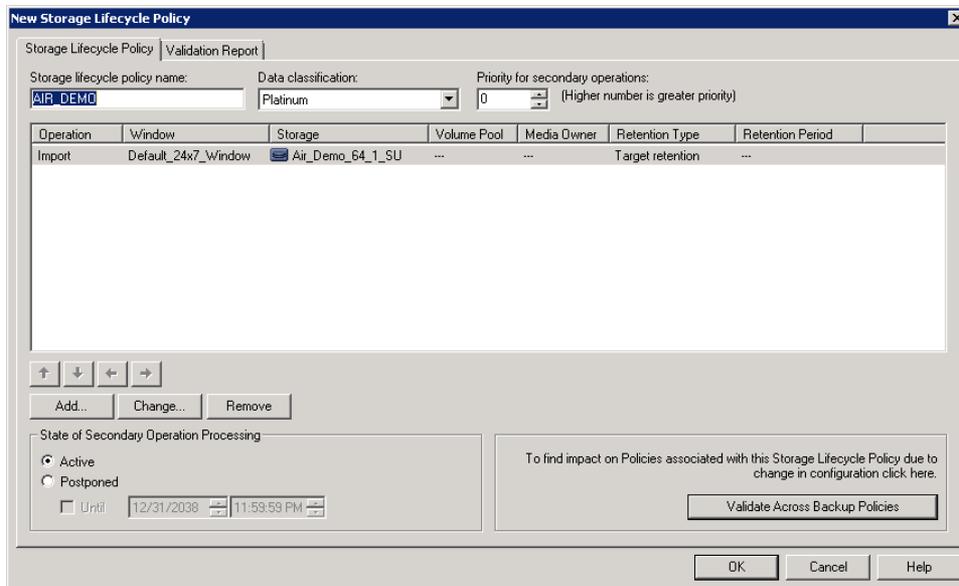
Figure 6 Creating a policy from the Storage Lifecycle Policy



6. Create an SLP on the target master server.

**NOTE:** Source SLP and target SLP names and their data classification must be exactly the same.

Figure 7 Creating a Storage Lifecycle Policy on the target master server



7. After the import operation for SLP is successfully created, note that the target starts polling for image replication events and starts to automatically import these images into the target domain.

**NOTE:** With default settings in place, it may take NetBackup up to 30 minutes until the image being imported is seen in the catalog of the other NetBackup domain. You can modify this behavior by changing configuration parameters at **host properties**→**Properties**→**SLP Parameters** in the **NetBackup Administration Console**. Please refer to the *NetBackup 7.x Administrator's Guide* for more details.

## Setting up Targeted A.I.R.

Targeted A.I.R. helps replicate backup images from the source storage servers to selective storage servers in target domains. Because a trusted relationship is established between the source and target NetBackup domains with the exchange of information, the backup administrator now has a setup that ensures the replication topology will work even before any A.I.R operations are initiated.

**NOTE:** You must apply the device mappings file from Symantec to enable the Targeted A.I.R. feature. See “[Configuring Accelerator](#)” (page 34) to set up the device mapping file.

**NOTE:** Using Targeted A.I.R. with Catalyst over Fibre Channel on the target NetBackup domain for import operations requires adding the following entry in the `/etc/hosts` file on the target master. After adding the entry, restart the NetBackup services on the target master.

---

`<Target_Storage_Server_IP_Address> <Corresponding_CoFC_Identifier>`

---

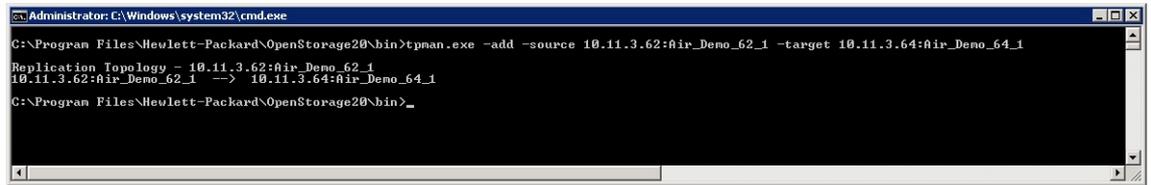
1. Create stores on the source and target HP StoreOnce Backup system. (Refer to HP StoreOnce Backup system documentation at [www.hp.com/go/storage/docs](http://www.hp.com/go/storage/docs) for more information.)
2. Set up topology:
  - a. HP provides a CLI tool (tpman) to storage administrators for replication topology setup. The tool is installed automatically after the OST Plug-in is installed. The tool is located at:
    - For Windows: `%SystemRoot%\Program Files\Hewlett-Packard\OpenStorage\3.1.2\bin`
    - For Linux: `/usr/opensv/hp/ost/3.1.2/bin`
    - For HP-UX: `/usr/opensv/hp/ost/3.1.2/bin`
    - For AIX: `/usr/opensv/hp/ost/3.1.2/bin`
  - b. Use the tpman tool to setup replication topology. The OST Plug-in versions 3.1 and later support replication topology setup between stores. Topology can scale in an m:n fashion.

Tpman usage:

    - For Windows: `tpman.exe -add -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
    - `tpman.exe -remove -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
    - `tpman.exe -showtopology -store <sts:lsu> [-clientid <id>]`
  - c. For all other platforms (non-Windows platforms), use tpman as follows:
    - `tpman -add -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
    - `tpman -remove -source <sts:lsu> -target <sts:lsu> [-clientid <id>]`
    - `tpman -showtopology -store <sts:lsu> [-clientid <id>]`

- d. Run the add command as shown below. In the example below, StoreOnce Catalyst Store, Air\_Demo\_62\_1, of storage server 10.11.3.62 replicates to StoreOnce Catalyst Store, Air\_Demo\_64\_1, of storage server 10.11.3.64.

**Figure 8 Running the add command example**

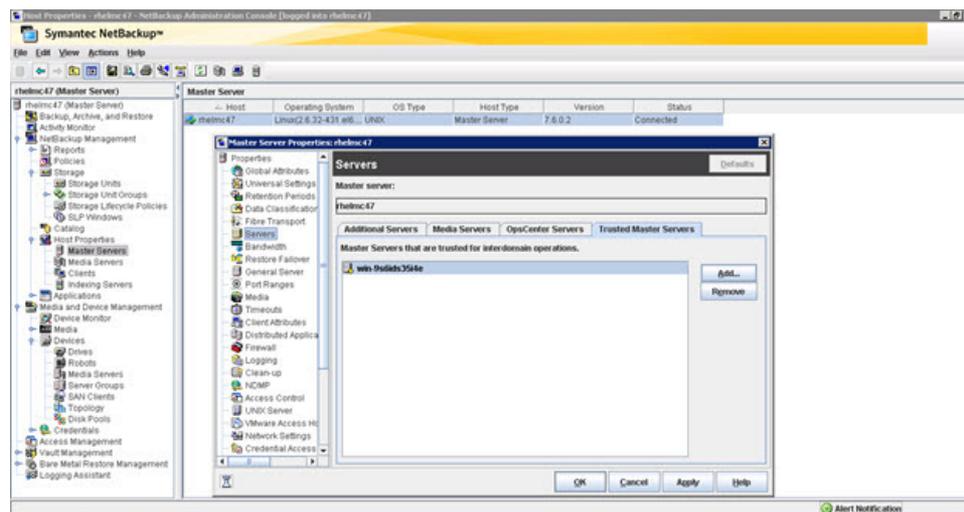


```
C:\Program Files\Hewlett-Packard\OpenStorage20\bin>tpman.exe -add -source 10.11.3.62:Air_Demo_62_1 -target 10.11.3.64:Air_Demo_64_1
Replication Topology - 10.11.3.62:Air_Demo_62_1
10.11.3.62:Air_Demo_62_1 --> 10.11.3.64:Air_Demo_64_1
C:\Program Files\Hewlett-Packard\OpenStorage20\bin>
```

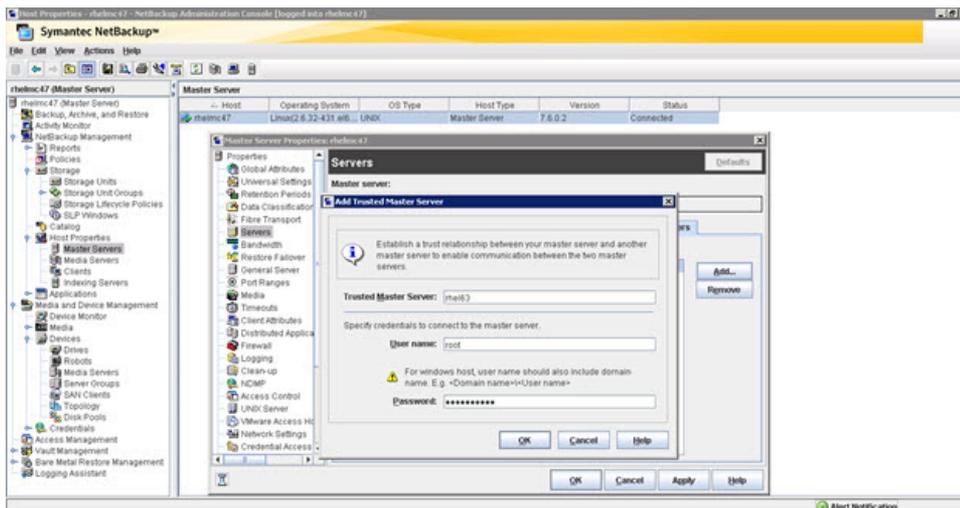
**NOTE:** Source StoreOnce Catalyst stores and target StoreOnce Catalyst stores should have same client identifiers.

3. You must establish a trusted master relationship between the source and target NetBackup domains in the order shown in the remaining steps.

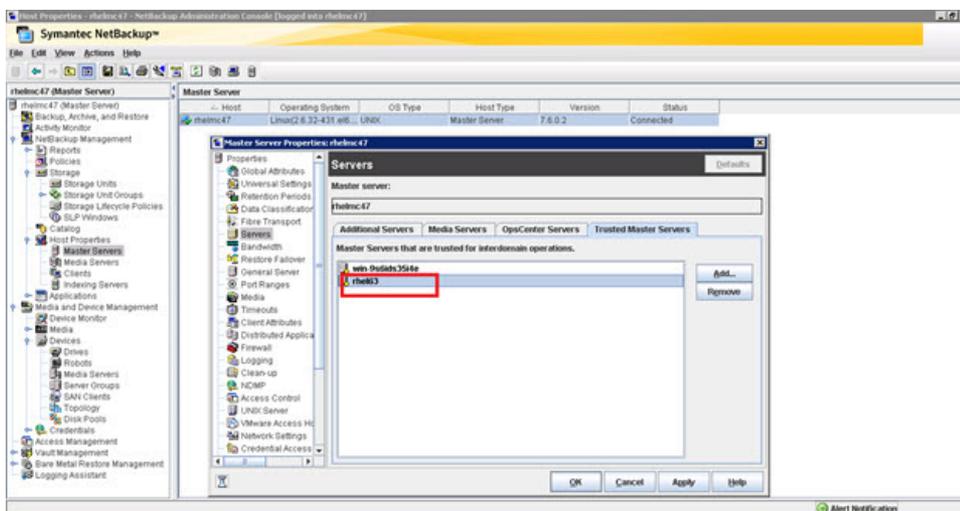
On the source NetBackup Domain (Master), navigate to **Host Properties**→**Master Servers**→**Servers**→**Trusted Master Servers**.



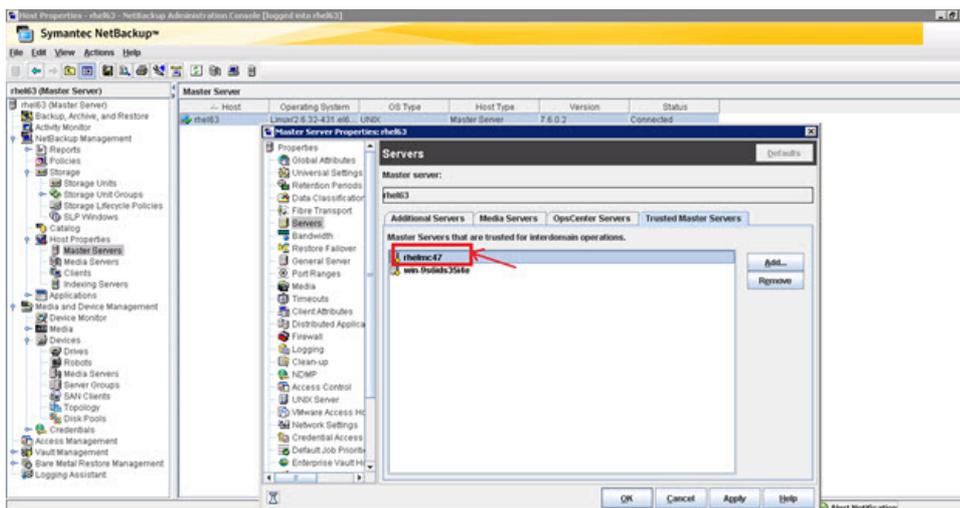
4. Click **Add**.
5. Specify the target master server and access credentials. These credentials are the same that you would use to connect to NetBackup Domain.



On successful completion of the operation the target master is listed under trusted master servers.

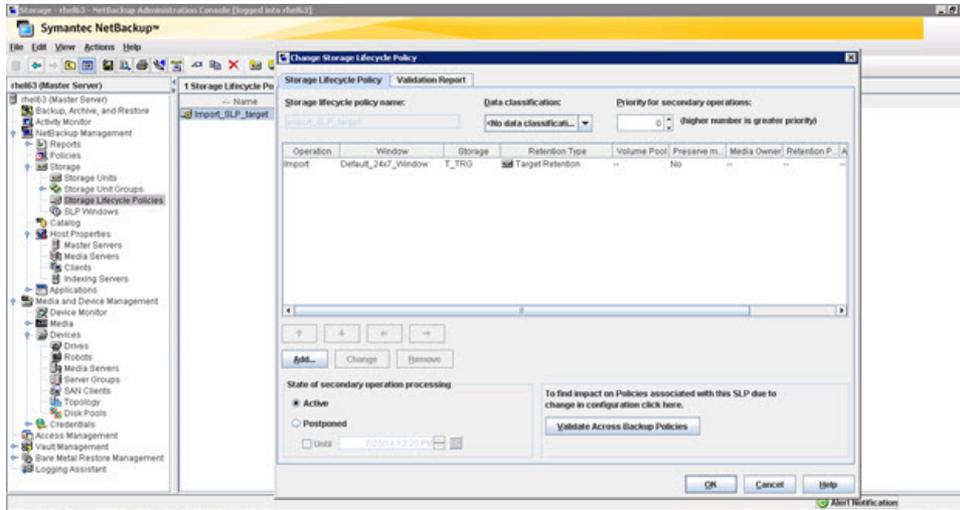


On the target master, the "trusted master servers" relationship is established automatically.

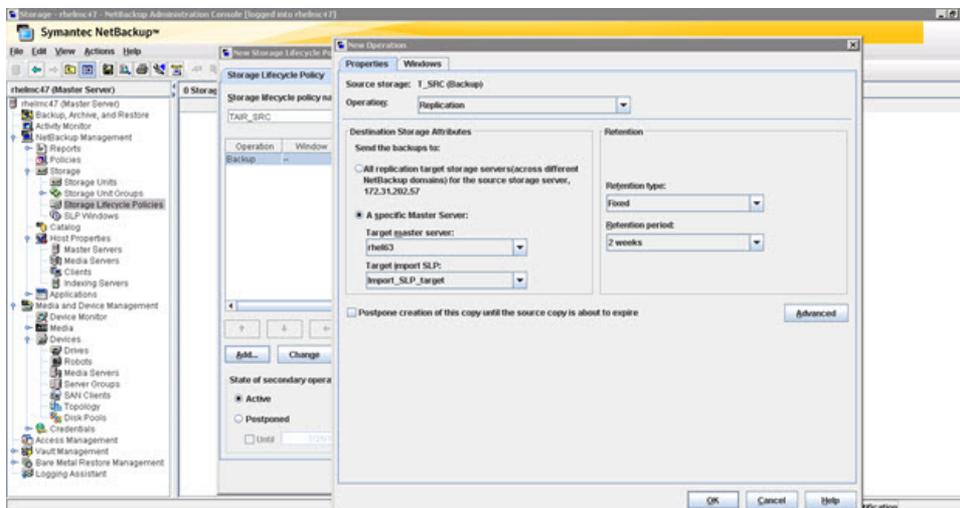
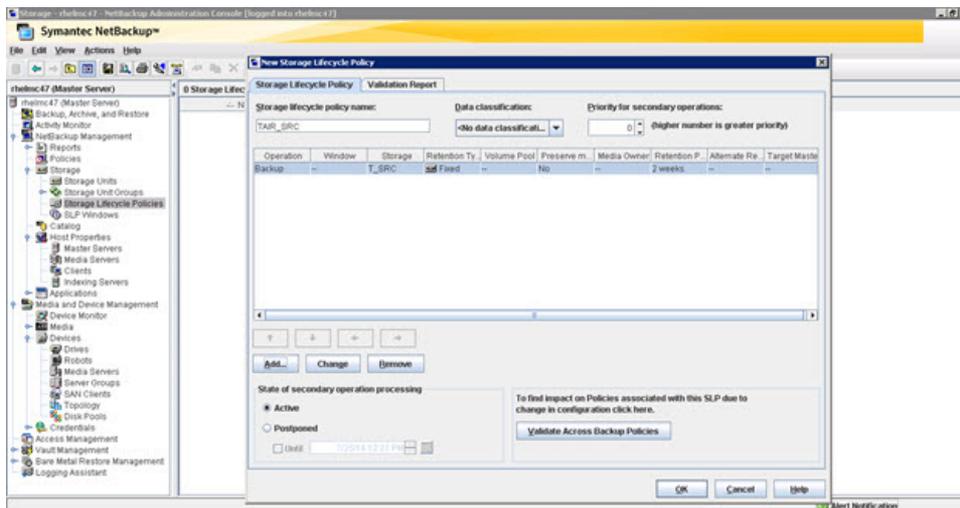


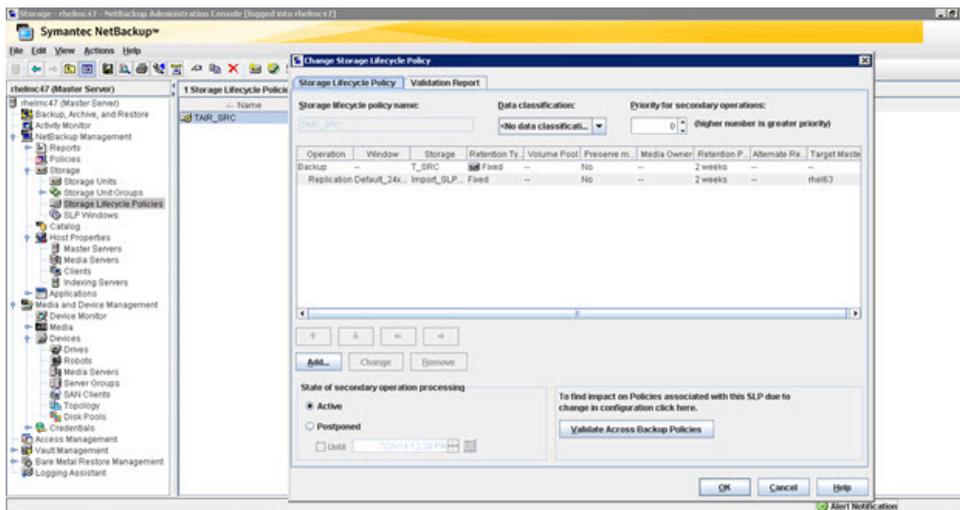
6. On the target master, create an Import Storage Lifecycle Policy.

**NOTE:** The source and target Storage Lifecycle Policies do not need to have the same name.

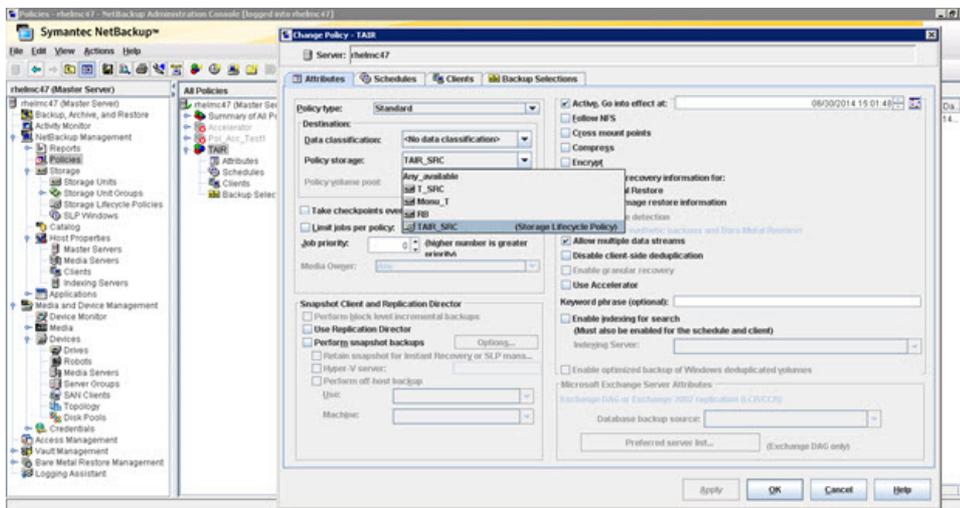


7. On the source master, create a Storage Lifecycle Policy consisting of a Backup followed by a Replication.





- On the source master, create a policy for triggering the targeted auto-image replication operation.



---

## 8 Setting up other NetBackup functions

Please refer to the applicable NetBackup v7.x administrator guide at <http://www.symantec.com/business/support/index?page=content&id=DOC5334> on the web to:

- Set up a disk storage server (server type is hp-StoreOnceCatalyst)
- Set up a disk pool

---

**NOTE:** The NetBackup LSU spanning feature is not supported or recommended.

---

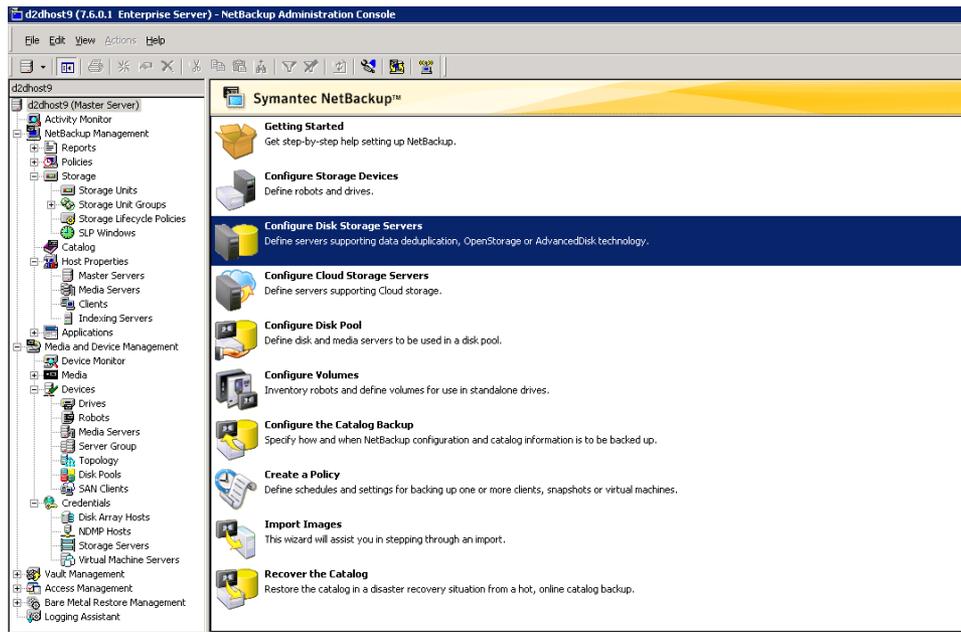
- Set up a storage unit
- Set up a backup policy
- Start a backup operation
- Restore a backup file
- Set up an optimized duplication
- Set up a Storage Lifecycle Policy (SLP)
- Set up Auto Image Replication (A.I.R.)

# 9 Configuring NetBackup for StoreOnce Catalyst over Fibre Channel Channel

To configure Symantec NetBackup to work with the StoreOnce Catalyst over Fibre Channel interface:

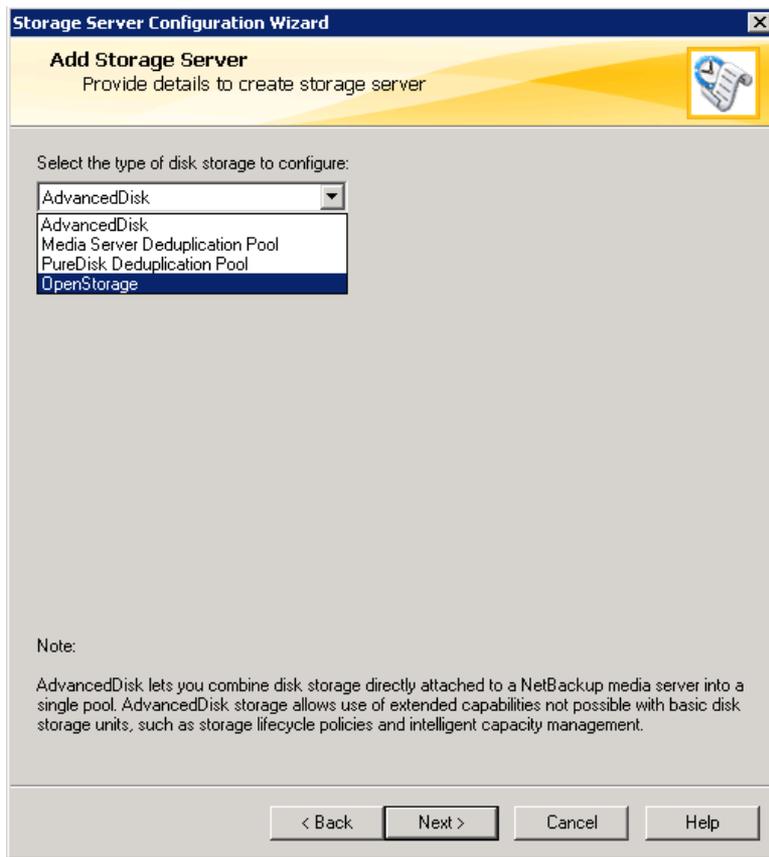
1. Launch the **Symantec NetBackup Administrative Console**.
2. Select **Configure Disk Storage Servers**.

**Figure 9** Selecting the Configure Disk Storage Servers option



3. Navigate to the **Add Storage Server** screen after entering the appropriate detail in the previous screens.

Figure 10 Selecting the disk storage type



4. Input the StoreOnce Catalyst over Fibre Channel interface identifier or alias (listed on the HP StoreOnce GUI on the Fibre Channel Settings tab, see ["Initial configuration" \(page 9\)](#)) in the Storage server name field on the Symantec NetBackup GUI. These identifiers are case sensitive.

**Figure 11** Inputting the StoreOnce Catalyst over Fibre Channel interface identifier in the Storage server name field

The screenshot shows the 'Storage Server Configuration Wizard' window, specifically the 'Add Storage Server' step. The window title is 'Storage Server Configuration Wizard'. Below the title bar, there is a yellow header with the text 'Add Storage Server' and 'Provide details to create storage server'. The main area is divided into two sections: 'Storage server details' and 'Enter storage server credentials'. In the 'Storage server details' section, the 'Storage server name' field is highlighted with a red circle and contains the text 'COFC-hp6431504d787001'. The 'Storage server type' dropdown menu is set to 'hp-StoreOnceCatalyst'. Below this, there is a note: 'Select a media server that has the vendor's OpenStorage plug-in installed. NetBackup will query the storage server to determine its capabilities using this media server.' The 'Media server' dropdown menu is set to 'd2dblade03'. In the 'Enter storage server credentials' section, the 'User name' field contains 'FibreConnect', and the 'Password' and 'Confirm password' fields are masked with 'xxxxxx'. At the bottom of the window, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

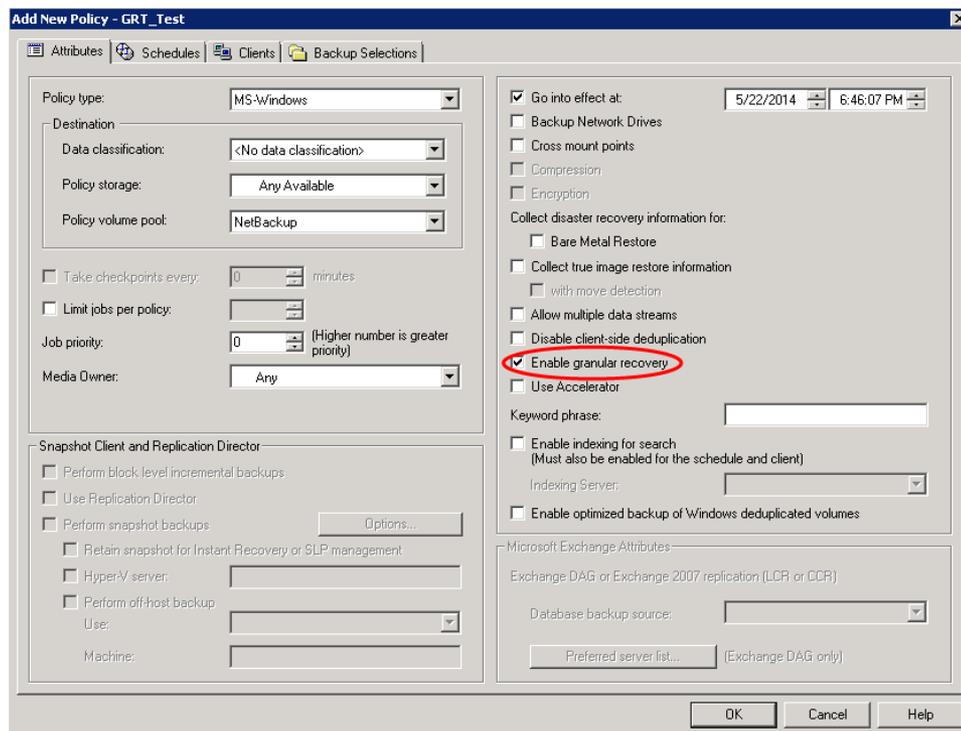
5. Continue with the rest of the setup as you would do for setting up NetBackup to work with the OST Plug-in.

# 10 Setting up NetBackup with Granular Recovery Technology (GRT)

The OST Plug-in versions 3.1 and later supports Symantec's NetBackup Granular Recovery Technology (GRT) feature, a feature that enables select items from database backups to be restored on clients. GRT has been tested with Microsoft Exchange Server, Active Directory(AD) Server, and Microsoft SharePoint solutions. For details on GRT setup information, refer to the appropriate Symantec and Microsoft documentation.

While setting up NetBackup backup policies for GRT, be sure to check **Enable Granular Recovery** for granular restores later.

**Figure 12** Setting up backup policies using the Add New Policy window



**NOTE:** During recoveries and browse sessions of GRT-enabled backups, sessions that last longer than four hours sometimes time out and the operation fails. If this occurs, please contact HP Support.

---

## 11 Setting up Symantec NetBackup Accelerator with HP StoreOnce Catalyst

Accelerator is a Symantec NetBackup feature which performs a full backup at the speed of an incremental backup. Accelerator leverages change track logging for files in a data set on the client and sends only the changed blocks of data to the storage server. Therefore, full backups can be synthesized on the disk on the fly with NetBackup by cloning the disk resident portion of the data (copied from previous backups) and the modified data sent to the storage server. The result is a full backup created on the storage server by sending the incrementals only. StoreOnce deduplication works at a much finer level of data management (chunking, hashing, and matching) and complements the bandwidth savings of NetBackup Accelerator.

The OST Plug-in implements support for cloning disk resident data extents to help Symantec NetBackup perform an Accelerator Backup on HP StoreOnce appliances. The feature is supported on HP StoreOnce appliances running software versions 3.12.0 and later.

NetBackup Accelerator backups are supported for File Systems (on NetBackup versions 7.5 and later) and VMware (on NetBackup versions 7.6 and later).

For best practices when using Accelerator, see the Symantec documentation.

---

**NOTE:** Accelerator backups are supported with OST Plug-in versions 3.1 and later with StoreOnce Catalyst using low bandwidth data transfer mode only. High bandwidth accelerated backup should not be used.

In some cases, Accelerator-forced rescan backups can run slower than non-Accelerated backups. To improve performance, run Accelerator in Emulated Clone mode by turning on the following setting in the `hpost.conf` file:

```
ACCELERATOR-CLONING-EMULATION:ENABLE
```

---

### Configuring Accelerator

Download the device mappings file from Symantec and install it on the Master/EMM server. Detailed instructions and versions of the mappings file to use are found on Symantec's HCL listing at [http://www.symantec.com/business/support/library/BUSINESS/xCL/TECH76495/nbu\\_7x\\_hcl.html#device\\_mappings\\_files](http://www.symantec.com/business/support/library/BUSINESS/xCL/TECH76495/nbu_7x_hcl.html#device_mappings_files).

### Verifying the Accelerator Configuration

To verify if Accelerator is configured on your setup, execute the following commands on the Master/EMM server:

- `nbdevquery -listdp -stype hp-StoreOnceCatalyst -U`

```

Flag
Disk Pool Name : Accelerator
Disk Pool Id : Accelerator
Disk Type : hp-StoreOnceCatalyst
Status : UP
Flag : Patchwork
Flag : Usible
Flag : OpenStorage
Flag : SingleStorageServer
Flag : CopyExtents
Flag : AdminUp
Flag : InternalUp
Flag : LifeCycle
Flag : CapacityMgmt
Flag : FragmentImages
Flag : Cpr
Flag : FT-Transfer
Flag : OptimizedImage
Raw Size (GB) : 35300.83
Usable Size (GB) : 35300.83
Num Volumes : 1
High Watermark : 98
Low Watermark : 80
Max IO Streams : -1
Comment :
Storage Server : 172.28.6.10 <UP>

```

- `nbdevquery -liststs -stype hp-StoreOnceCatalyst -U`

```

C:\Program Files\Veritas\NetBackup\bin\admincmd>nbdevquery -liststs -stype hp-StoreOnceCatalyst -U
Storage Server : 10.65.80.95
Storage Server Type : hp-StoreOnceCatalyst
Storage Type : Formatted Disk, Network Attached
State : UP
Flag : OpenStorage
Flag : CopyExtents
Flag : AdminUp
Flag : InternalUp
Flag : LifeCycle
Flag : CapacityMgmt
Flag : FragmentImages
Flag : Cpr
Flag : FT-Transfer

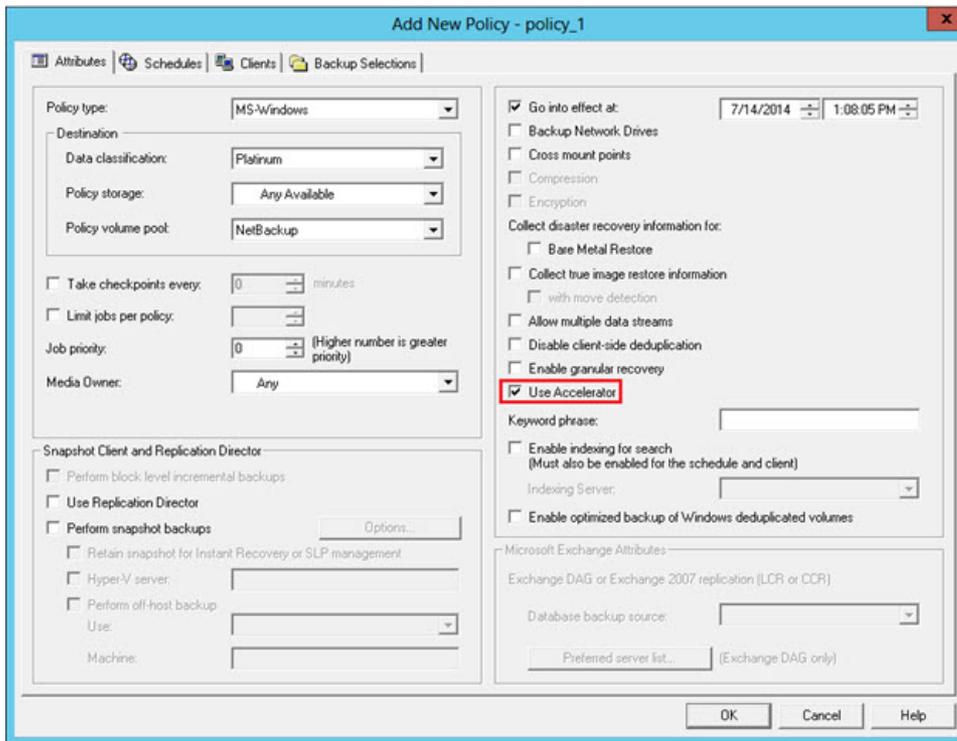
Storage Server : 172.28.6.10
Storage Server Type : hp-StoreOnceCatalyst
Storage Type : Formatted Disk, Network Attached
State : UP
Flag : OpenStorage
Flag : CopyExtents
Flag : AdminUp
Flag : InternalUp
Flag : LifeCycle
Flag : CapacityMgmt
Flag : FragmentImages
Flag : Cpr
Flag : FT-Transfer
Flag : OptimizedImage

```

## Accelerated Backups for File Systems using HP StoreOnce Open Storage Plug-in for NetBackup

Enabling NetBackup Accelerator for File Systems only requires a check box selection in the NetBackup policy editor.

Figure 13 Checking Use Accelerator



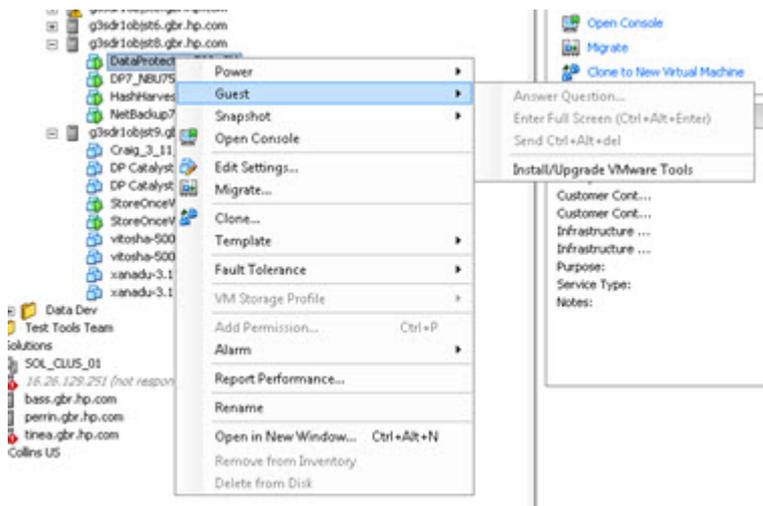
**NOTE:** The first Accelerated backup might be bit slower than a regular Backup without accelerator because NetBackup Accelerator needs to generate change track logs for the entire Dataset being written to on the storage appliance. Subsequent Accelerated backups (full and incremental) are much faster than corresponding regular Backups.

## Accelerated Backups for VMware using HP StoreOnce Open Storage Plug-in for NetBackup

NetBackup uses Change Block Tracking on VMware for Accelerated Backups on VMware. Note that VMware Accelerator Backups are supported on NetBackup 7.6 and later. To set up Accelerator Backups for VMware:

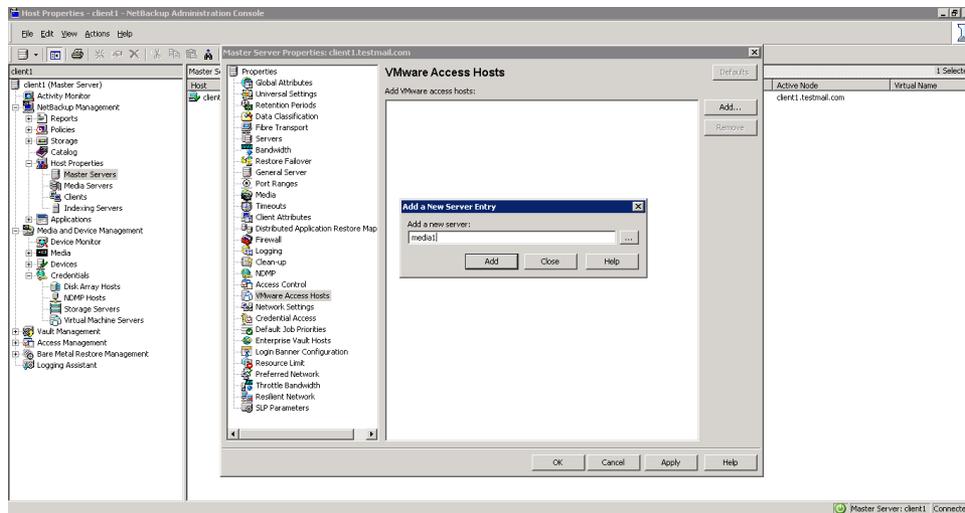
1. Install VMware Tools on the VM client you intend to backup. In ESX vSphere, right click the client and select **Install / Upgrade VMWare Tools**.

Figure 14 Installing VMware Tools



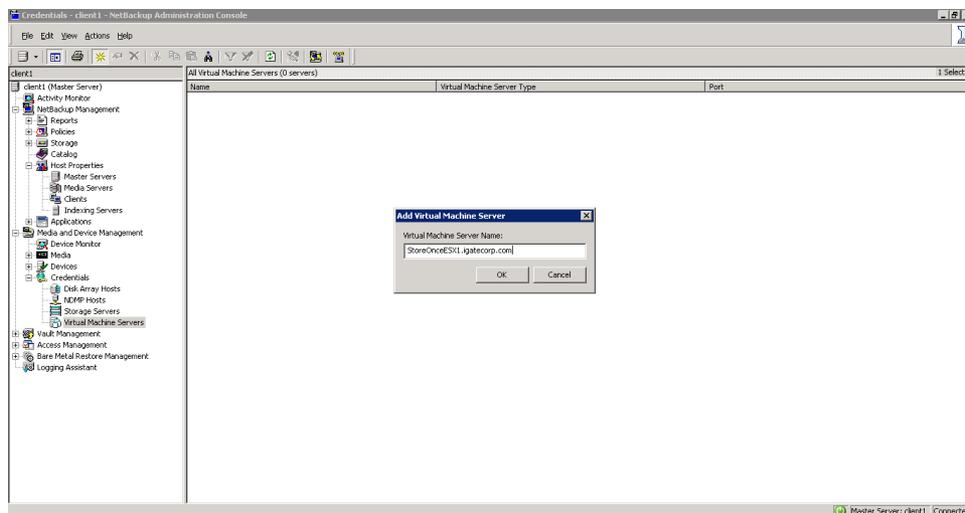
2. Log into the client and open My Computer. You will see a VMWare drive mounted. Double click the drive letter and complete the installation instructions. At the end of the process, the client will reboot.
3. On NetBackup Server, create a NetBackup Storage Server, Disk Pool, and Storage Unit.
4. Add a backup host in your Master Server settings; the backup host is the media server name.

**Figure 15 Adding the backup host**



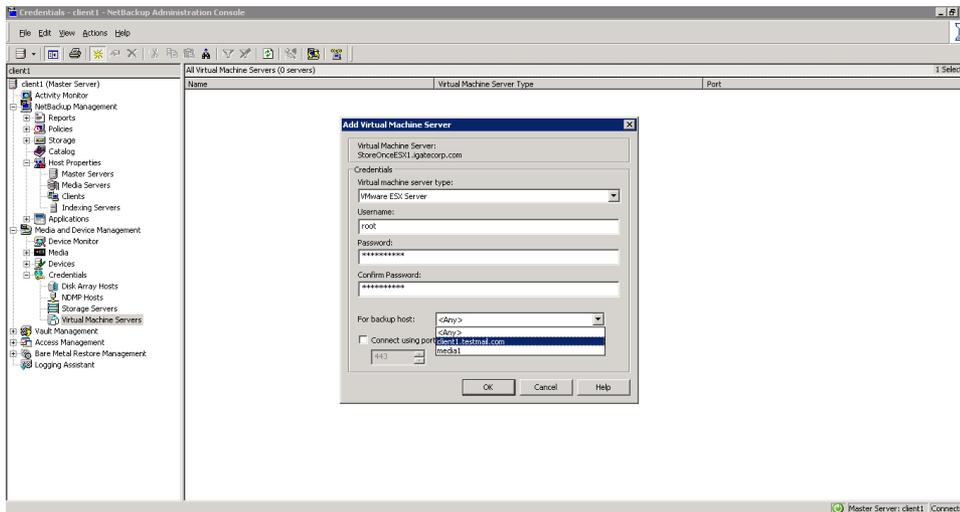
5. Add the ESX server hosting the guest OS (VM to be backed up) to the NetBackup Virtual Machine server list.

**Figure 16 Adding the virtual machine server**



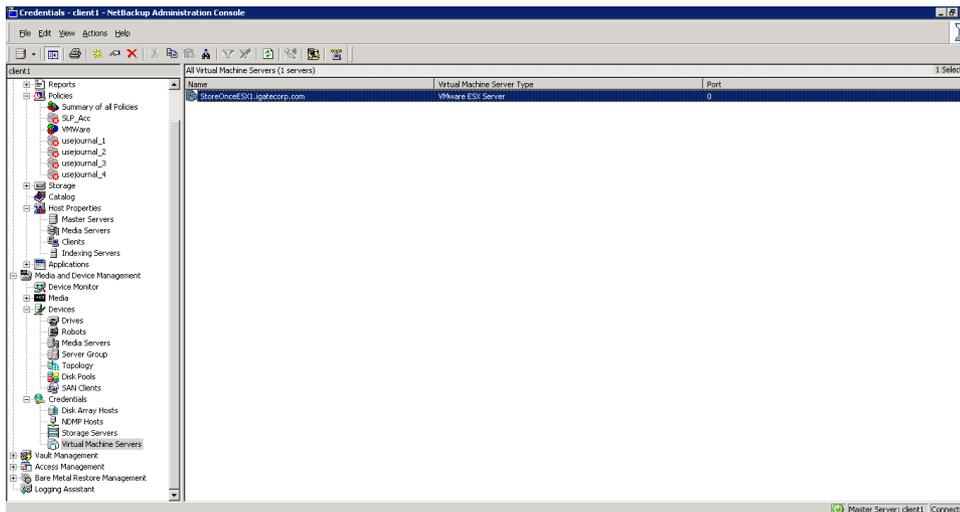
6. Authenticate the ESX server and add the backup host details (this example chose client1).

Figure 17 Adding the backup host details



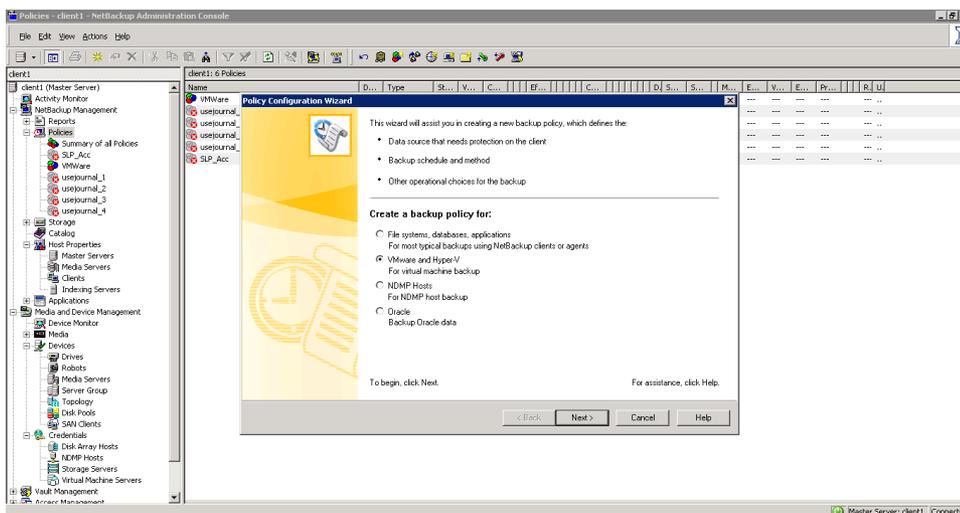
7. The ESX server will appear in the list of Virtual Machine servers.

Figure 18 The ESX server is shown



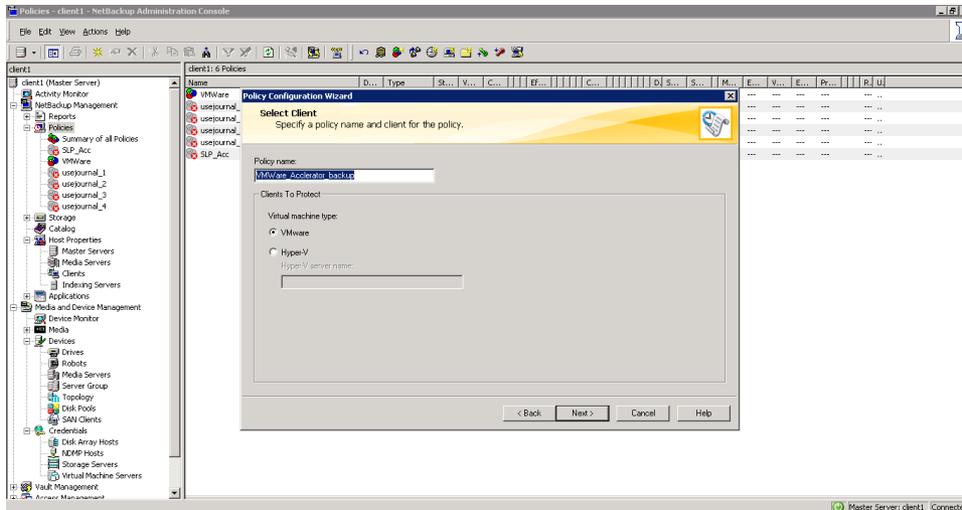
8. Create a Backup Policy of type VMware.

Figure 19 Creating the Backup Policy



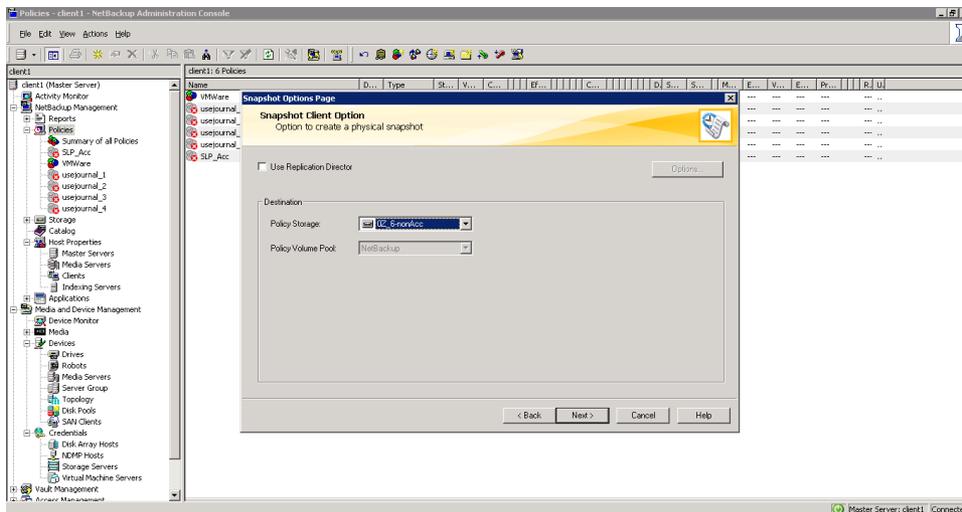
9. Choose a suitable policy name for your VMware Backups.

**Figure 20 Entering a policy name**



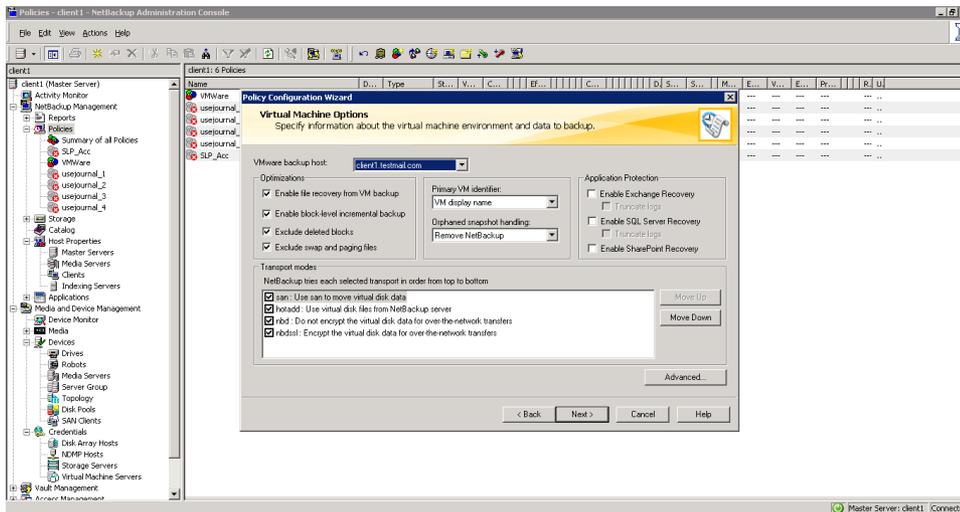
10. Add the Storage Unit details created in "step 3" (page 37).

**Figure 21 Adding the Storage Unit**



11. Add the details on the backup host selected earlier.

Figure 22 Adding the backup host details



12. Select and add the Virtual machine that you want to backup.

Figure 23 Browsing the Virtual Machines

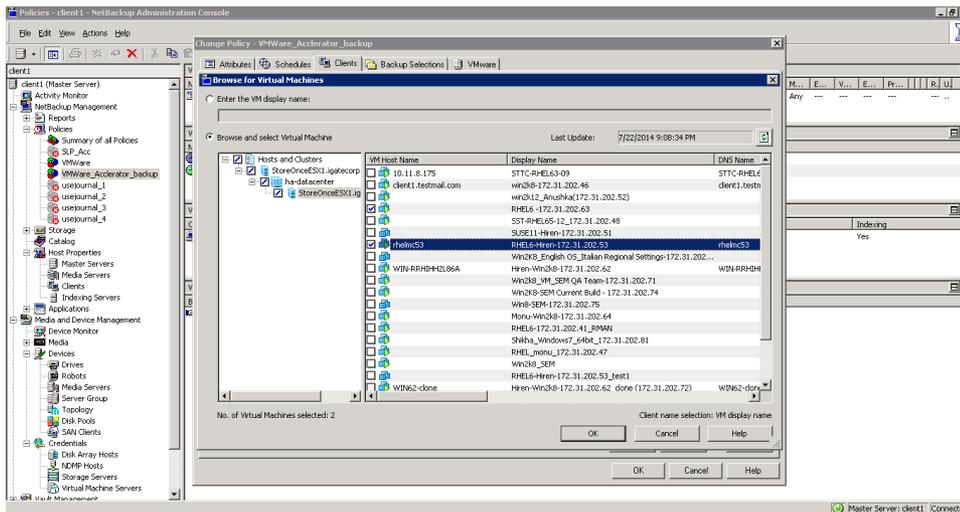
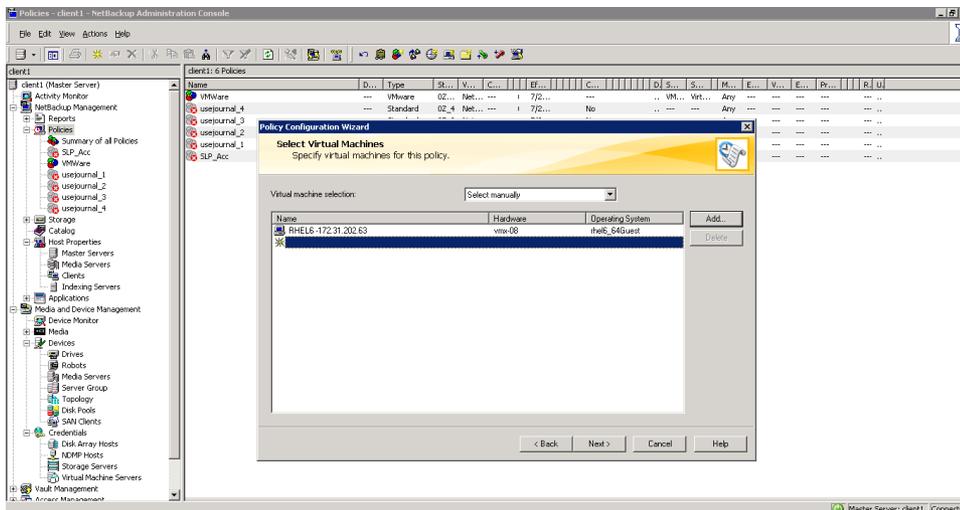
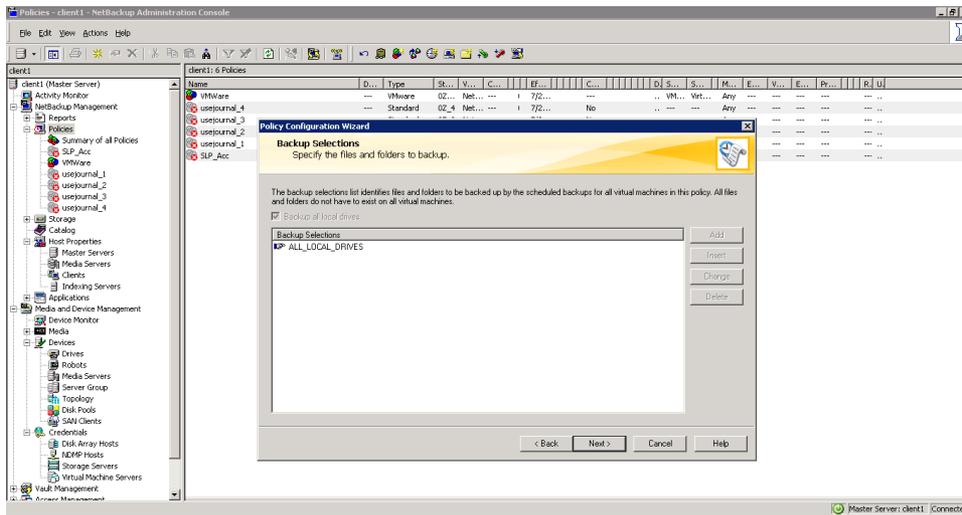


Figure 24 Adding the Virtual Machine of interest



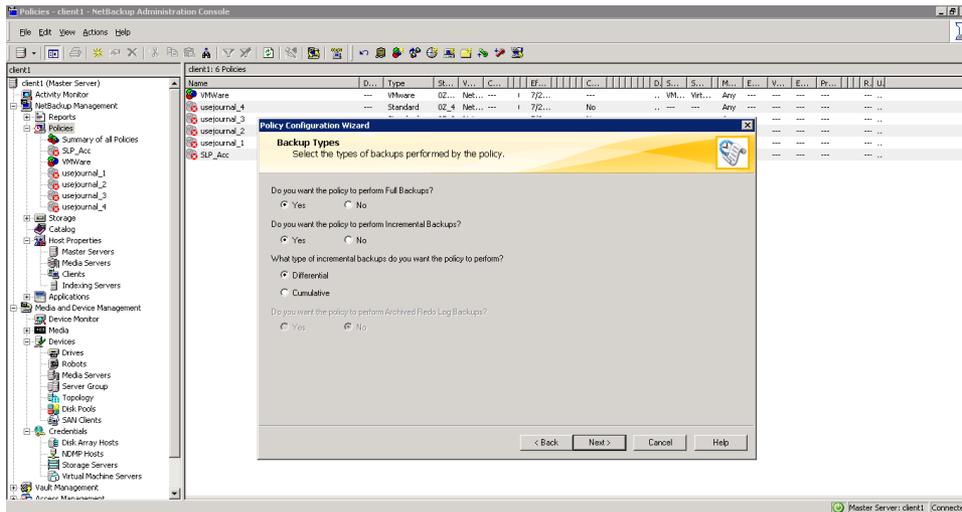
13. Select the data to be backed up on the Virtual Machine.

Figure 25 Selecting the data



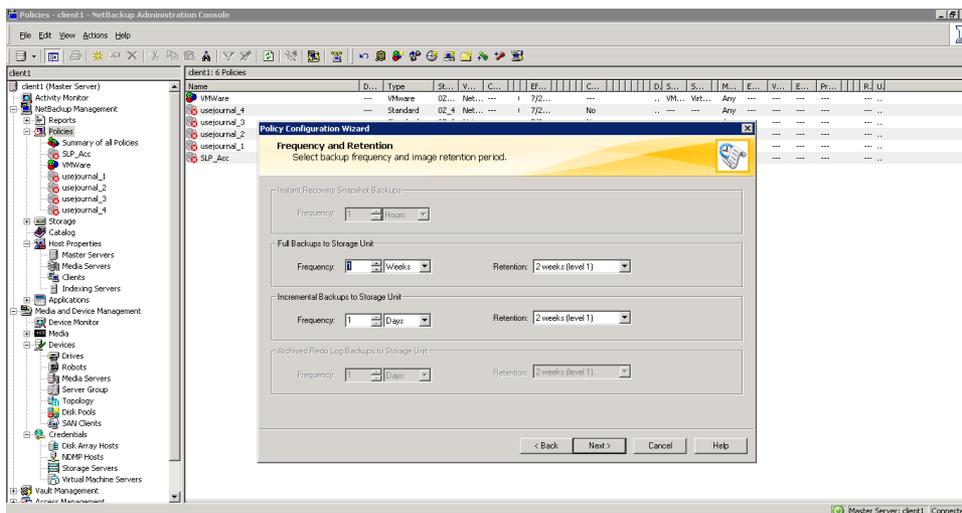
14. Choose the Backup type.

Figure 26 Choosing the Backup type



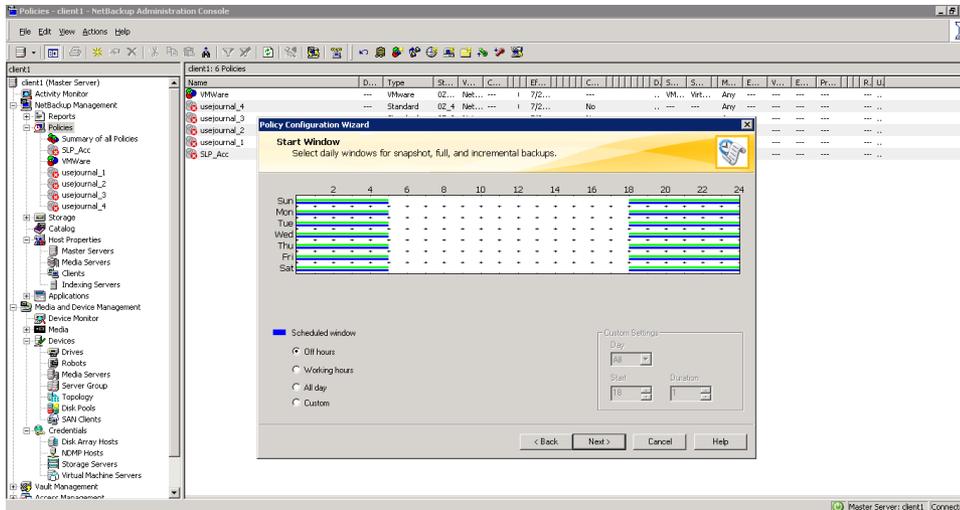
15. Set the frequency and retention for backups.

Figure 27 Setting the frequency and retention



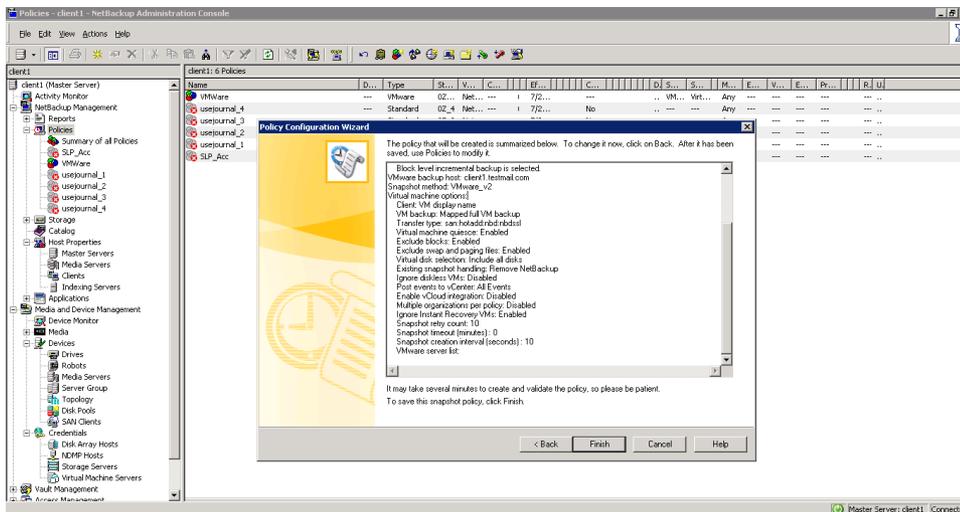
16. Define the backup window.

Figure 28 Defining the backup window



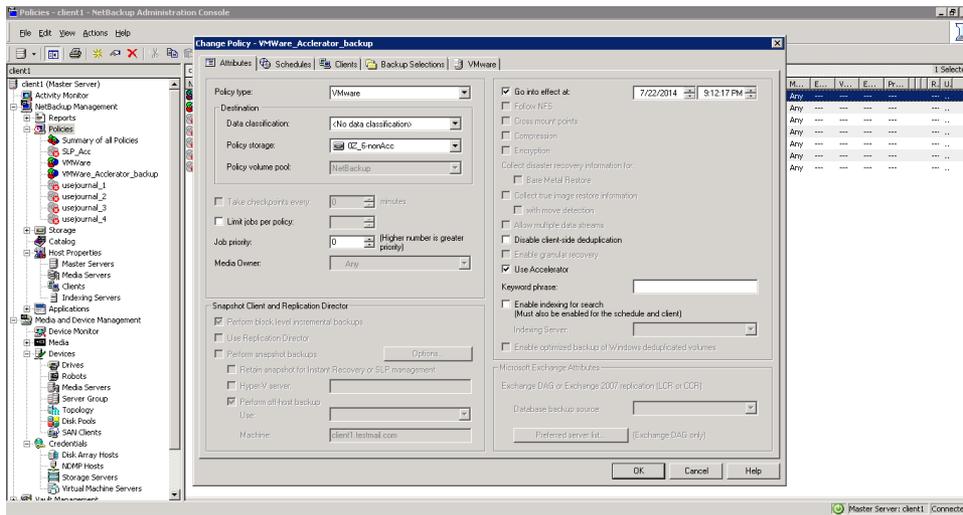
17. Complete the backup selection details under the corresponding tab.

Figure 29 Completing the backup details



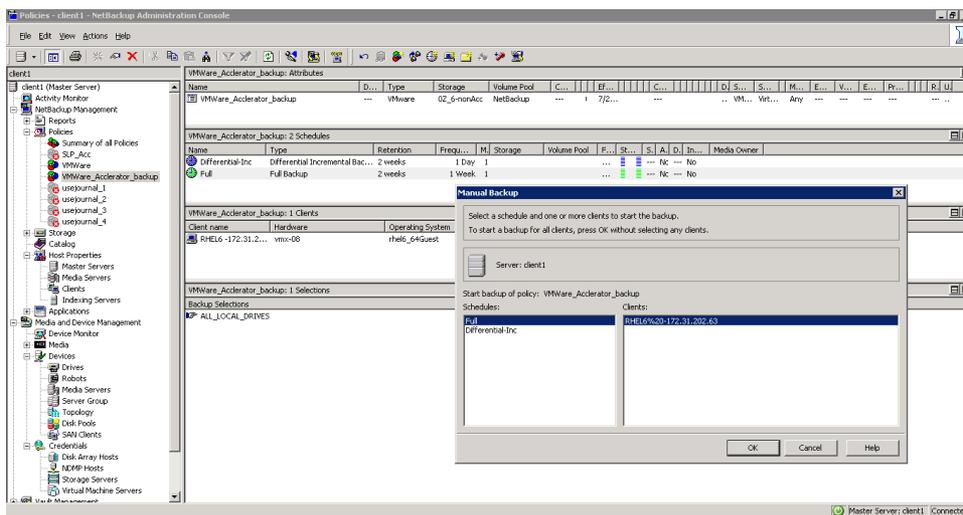
18. For VMware backups, add details under an additional VMware tab. Ensure you select the check box "Use Accelerator."

**Figure 30 Adding VMware details**



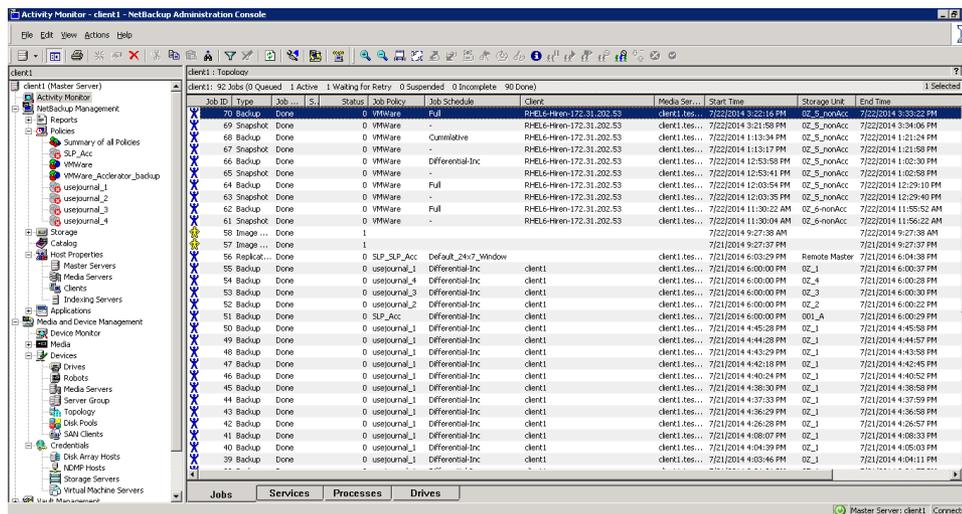
- To test your Accelerated backups, right click on the policy and trigger a manual VMware backup for the selections made in the above steps.

**Figure 31 Testing the backups**



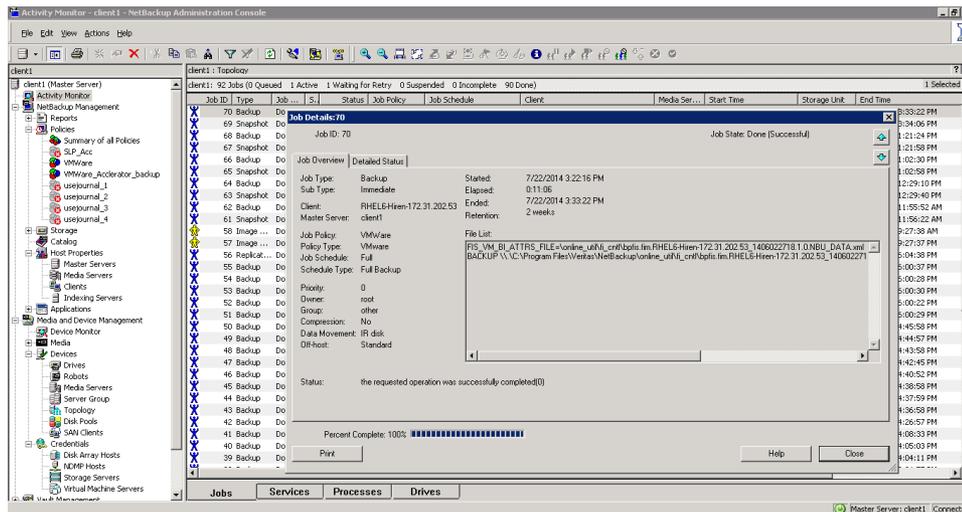
- Verify the completion status on the Activity monitor of the VMware backup triggered.

Figure 32 Verifying completion



21. Examine the job details to verify there were no errors.

Figure 33 Checking for errors

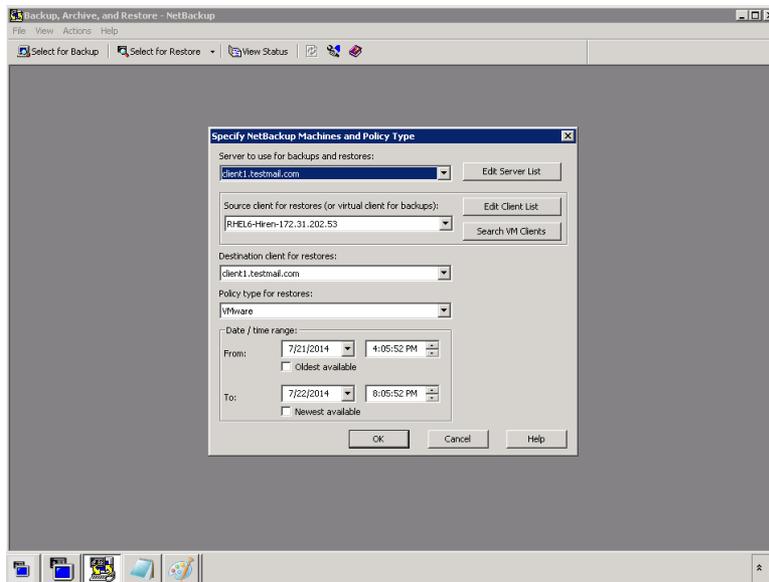


## Restoring VMware Accelerated Backups

To restore Virtual Machine backups:

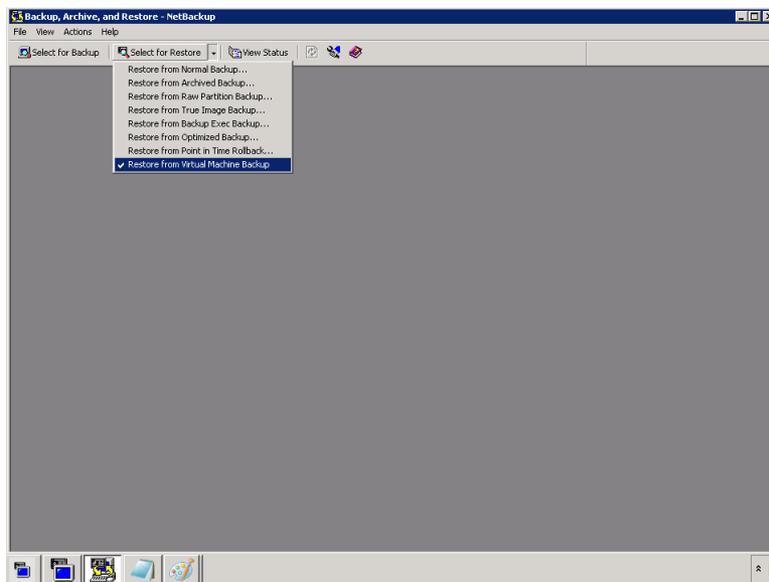
1. Launch **Backup/Archive and Restore**.
2. Select the appropriate server, client, and the policy type of VMware.

Figure 34 Selecting the restore details



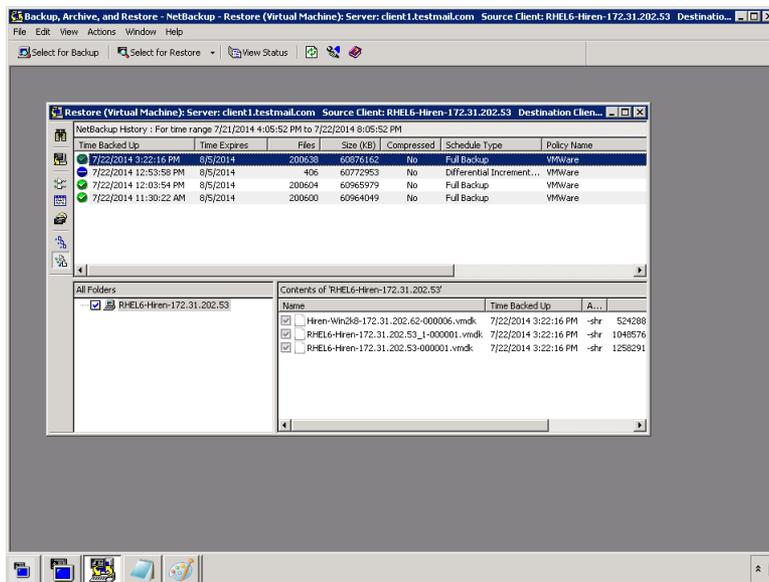
3. Select **Restore from Virtual Machine Backups.**

Figure 35 Selecting "Restore from Virtual Machine Backups"



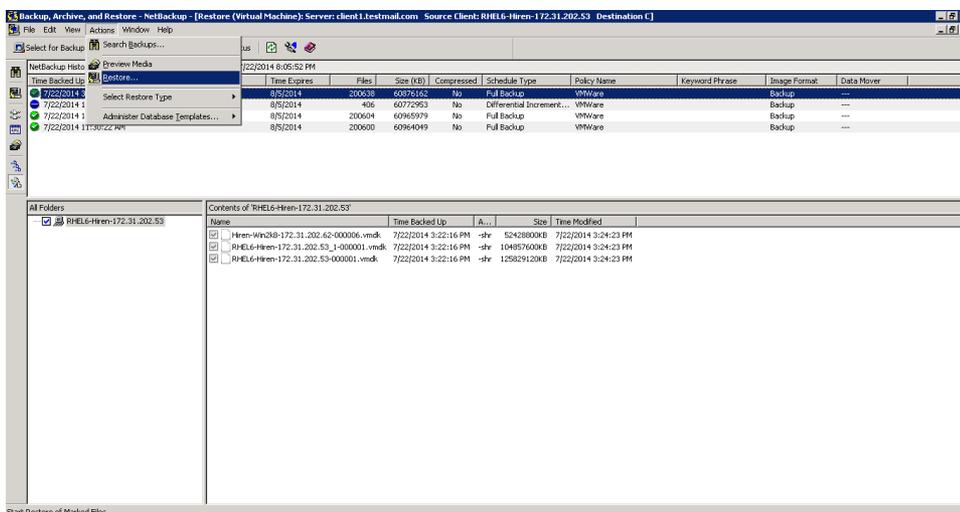
4. Select the backup of interest and the required data for restore from the catalog.

Figure 36 Selecting the backup and data



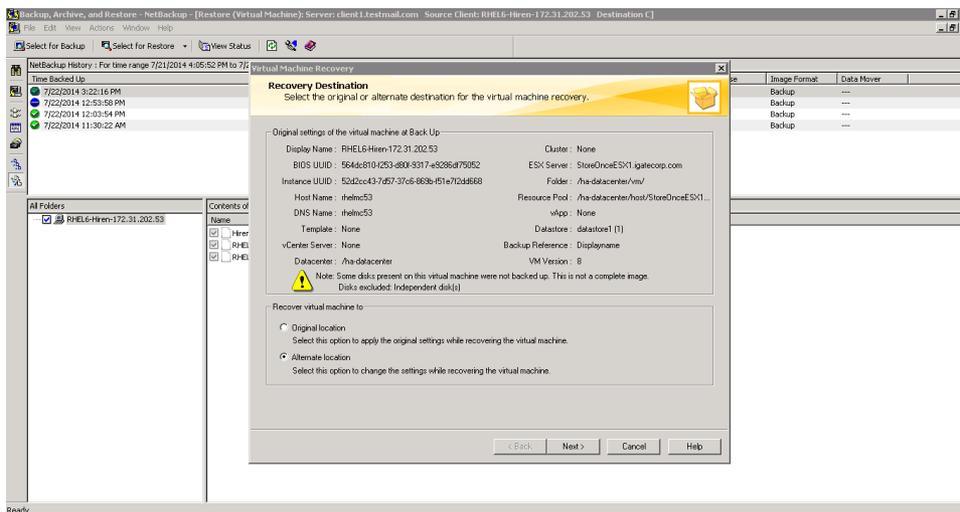
5. Select **Actions**→**Restore...** to open the Virtual Machine Recovery wizard.

Figure 37 Opening the Virtual Machine Recovery wizard



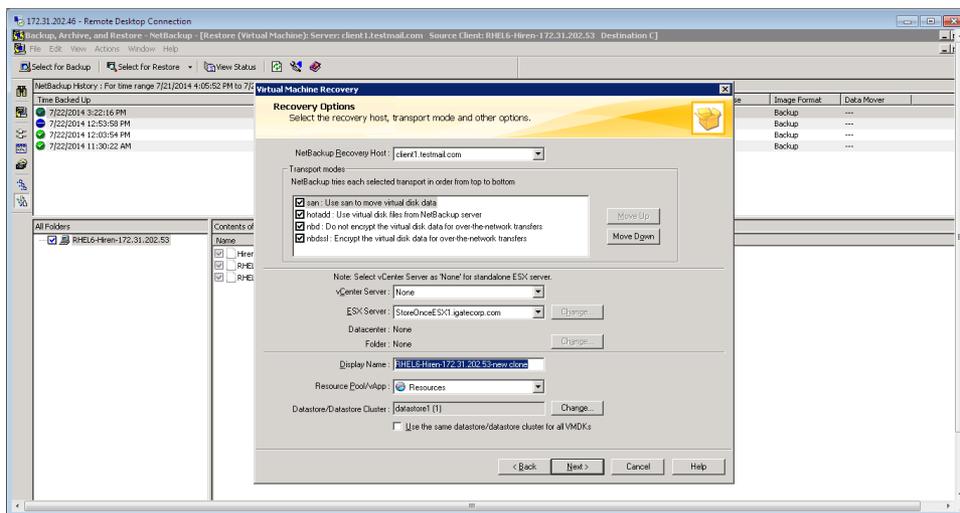
6. Select the destination location to restore the virtual machine backup.

Figure 38 Selecting the destination location



7. Specify the NetBackup media server to use and the VM name to create for the restore (if it is not the original location).

Figure 39 Selecting the NetBackup media server



8. Select any additional VM options for the restore.

Figure 40 Selecting VM options

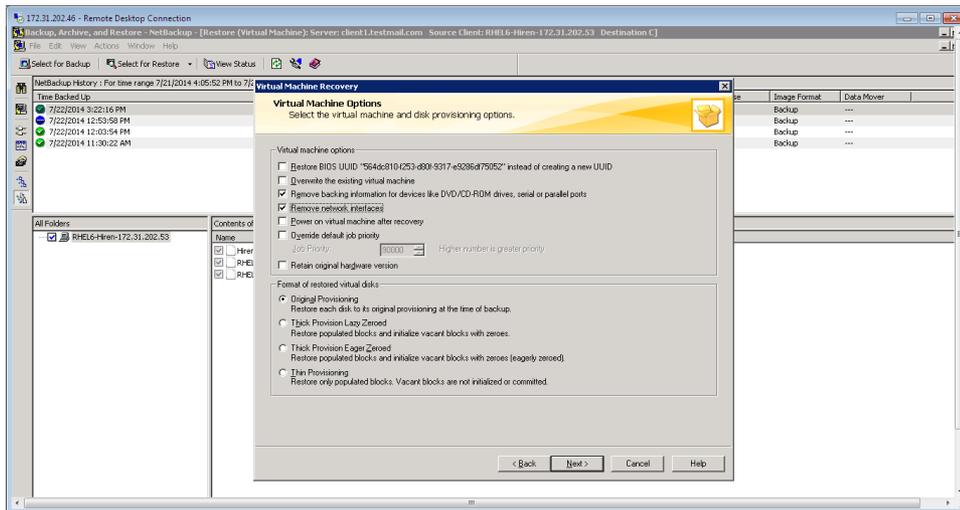
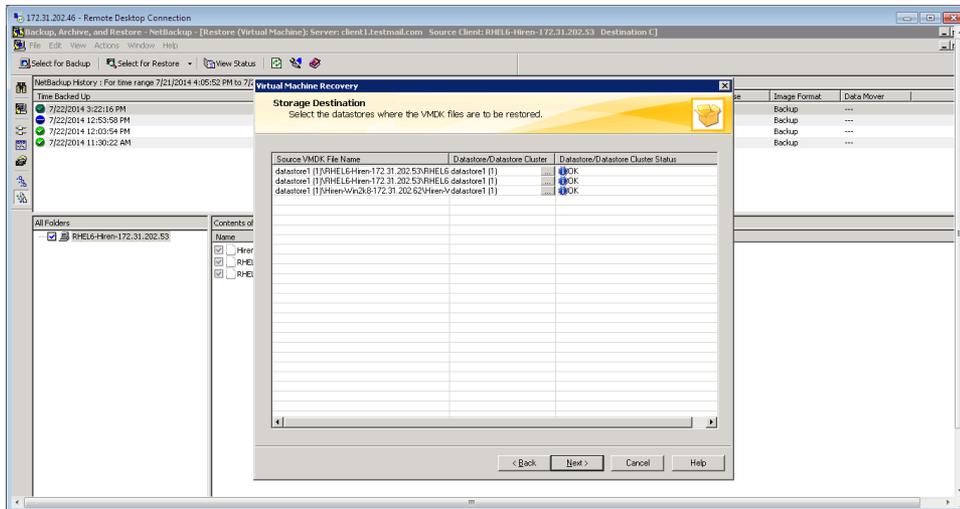
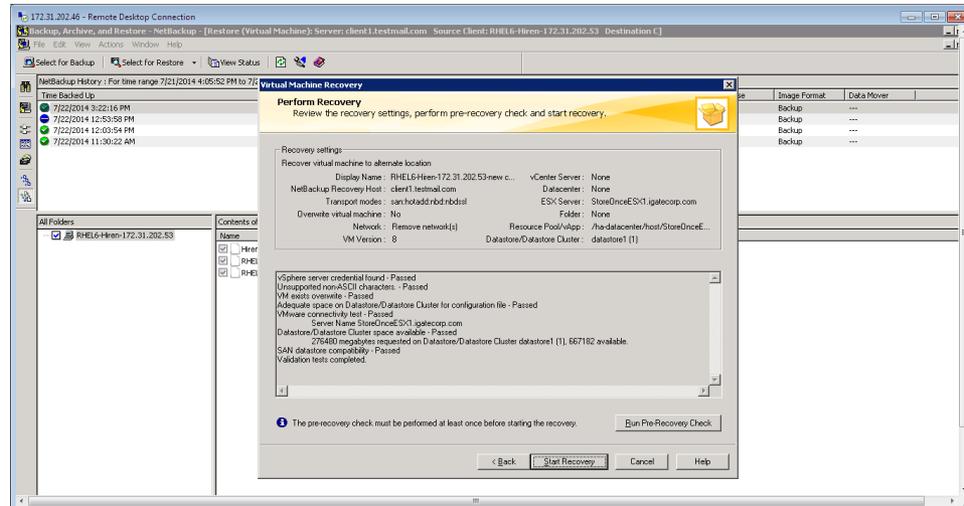


Figure 41 Selecting the Storage Destination



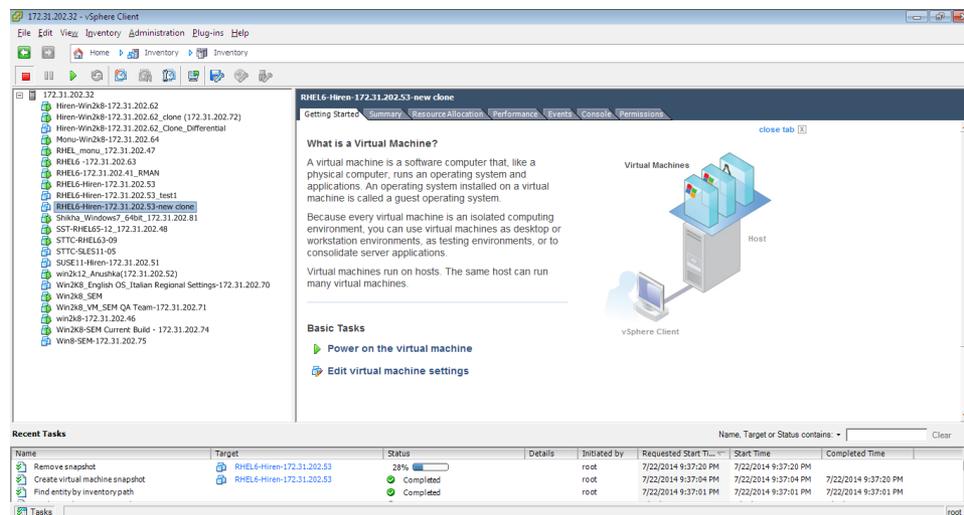
9. Click **Start Recovery**.

**Figure 42 Starting the Recovery**



The VM will appear in the list of the Virtual machine entries under the ESX host.

**Figure 43 The VM machine is restored**



# 12 Troubleshooting

**Table 4 Common OST Plug-in issues and solutions**

Symptom	Possible Cause	Solutions
Job failing with error code 83/84	Storage server is not reachable. HP OST logs show an -1106 error from the server.	Connectivity between the media server and the HP StoreOnce Backup System should be checked.
Job failing with error code 83/84	Storage server is overloaded, or the server is unable to service any more sessions. HP OST logs show an -1109 error from the server.	<p>Policies should be set up in such a way that maximum sessions are not reached on the HP StoreOnce Backup System.</p> <p>For information on StoreOnce Catalyst stores, see the <i>HP StoreOnce Backup System user guide</i> for your system available on the HP Enterprise Information Library page of the HP website: <a href="http://www.hp.com/go/storage/docs">www.hp.com/go/storage/docs</a></p> <p>Select <b>HP StoreOnce Backup</b> and then select your product.</p>
StoreOnce Catalyst stores are not listed while creating the disk pool.	Client permission is enabled for the HP StoreOnce Backup System service set.	Correct credentials matching the HP StoreOnce Backup System should be given at the NetBackup console. Only stores which have permissions to given credentials are granted access.
Receive the error, Authorization error, verify User name and Password, while registering storage server with NetBackup.	IP/host name used for registering is not correct.	<p>The storage server IP/host name provided while registering with NetBackup is incorrect.</p> <p>Fusion Manager IP/host name should be used if using an HP StoreOnce 2700, 4500, 4700, or 4900 (or older) models; the service set IP/FQDN and Fusion Manager (HP StoreOnce Backup System management console) IP/FQDN are the same.</p> <p>Service set IP/ FQDN should be used if you are using an HP StoreOnce 6500 or B6200 model; the service set IP/FQDN is different from Fusion Manager IP/FQDN. Fusion Manager IP/FQDN cannot be used for registering with NetBackup.</p>
Backup failing with error code 23.	This occurs when a large number of jobs are running on the target system and results in a client timeout.	The timeout value should be increased in NetBackup master server host properties.
Import jobs failing with error code 191.	Data classification is different for source and target SLP.	The SLP data classification at the source and target should be kept the same.
Backup jobs failing with error code 83/84.	The storage server is not licensed. OST logs show error code -1111.	The StoreOnce Catalyst license should be applied on the HP StoreOnce Backup Storage System server.
RDSM cannot connect...CORBA error. . is displayed while registering a storage server with NetBackup.	Invalid storage server IP/StoreOnce Catalyst over Fibre Channel interface identifier specified.	Check and provide the correct IP address/StoreOnce Catalyst over Fibre Channel identifier. If the problem persists, restart NetBackup services and use the correct IP address/identifier.

**Table 4 Common OST Plug-in issues and solutions** *(continued)*

Symptom	Possible Cause	Solutions
Disk pools are missing in the Remote Windows Java Admin Console.	A slow response to the Admin console from the NetBackup Server.	Increase the Java default timeout. See <a href="http://www.symantec.com/business/support/index?page=content&amp;id=TECH204939">www.symantec.com/business/support/index?page=content&amp;id=TECH204939</a> .
After installing NetBackup on Solaris, the configuration tabs are greyed out.	Firewall issue.	Clear the host cache using: #bpcintcmd -clear_host_cache Disable the firewall on Solaris using: #svcadm disable svc:/network/ipfilter:Default
Running the installer for 3.1 on AIX server gives the following error: cp: /usr/openv/lib/ost-plugins/libstspihpqMT.so: Cannot open or remove a file containing a running program. Cannot copy the OST libraries, files are in-use... Re-run the installer once problem is fixed...	The library is in use.	Perform one of the following: <ul style="list-style-type: none"> <li>• Shutdown NetBackup services</li> <li>• Manually delete the library from these locations: <ul style="list-style-type: none"> <li>◦ rm -f /usr/openv/lib/ost-plugins/libstspihpqMT.so</li> <li>◦ rm -f /usr/openv/lib/ost-plugins/libstspihpq.so</li> </ul> </li> </ul>
Selecting "Use Accelerator" and configuring NetBackup policy gives the following error: To use the Accelerator, select storage units from a supported storage server: PureDisk Deduplication (PDDO), Media Server Deduplication (MSDP), Symantec clouds, and other qualified storage servers. Currently configured and supported storage servers are: hp-StoreOnceCatalyst on [IP address], [IP address]. Storage Unit group is supported in failover mode only.	The Administration Console might not have picked up Accelerator configuration changes (possibly due to a command line configuration operation).	Restart the NetBackup Administration Console.
Accelerator backups fail with the following error: Info bpbbrm(pid=2428) The storage unit does not support accelerator Info bpbkar32(pid=0) done. status: 154: storage unit characteristics mismatched to request	NetBackup times out. OST and Catalyst logs do not show any errors.	In time, failed jobs are retried by NetBackup and the Accelerator Backup would complete.

**Table 4 Common OST Plug-in issues and solutions** *(continued)*

Symptom	Possible Cause	Solutions
Accelerator backups run slowly when using Windows media servers.	When switching between Clone and Write operations, backups are slowing down due to TCP Acknowledgment delays.	<p>Improve the performance by editing the Windows registry for "TcpAckFrequency" as follows:</p> <ol style="list-style-type: none"> <li>1. In the Windows registry, navigate to the HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\Tcpip\Parameters\Interfaces section.</li> <li>2. Select the interface/subnet being used for the StoreOnce operations.</li> <li>3. Right-click on the interface and select "New, DWORD (32-bit) Value." Rename it "TcpAckFrequency" (this is case sensitive).</li> <li>4. Right-click the new TcpAckFrequency value and select Modify, enter "1" and select the Hexadecimal option.</li> <li>5. Exit regedit.</li> </ol> <p>After a reboot to activate the change, Accelerator backups will run faster.</p>
Accelerator incremental backups can sometimes appear larger than the corresponding non-Accelerator incremental backups when using Windows clients.	The "Time overlap" feature is set in NetBackup and specifies the number of minutes to add to the date range for incremental backups. This could include additional files in the backup.	<p>Modify the "Time overlap" parameter (default value of 60 minutes) in the NetBackup settings:</p> <ol style="list-style-type: none"> <li>1. Navigate to <b>Host Properties</b>→<b>Clients</b>→<b>Client Properties</b>.</li> <li>2. Select <b>Windows Client</b>→<b>Client Settings</b>.</li> <li>3. Change "Time Overlap" to 0.</li> </ol> <p>For more details, see the Symantec NetBackup technical articles on "Time overlap."</p>
Accelerator backups fail.	The storage unit of the backup policy is changed after the first few Accelerator backups. Accelerator refers to parent backups for detecting changes and cannot find them in the new storage unit.	Clear the Accelerator track log file on the backup client or copy the backup policy with a different name and use the new policy for backups.
Accelerator backups fail with the error "multiple locks to parent unsupported."	The initial backup is run with "allow multiple data streams" disabled and later backups are run with "allow multiple data streams" enabled. Each of the child streams attempt to read from the same parent simultaneously which is not supported.	<p>When enabling "allow multiple data streams" at a later date, do one of the following:</p> <ul style="list-style-type: none"> <li>• Delete Client Track logs</li> <li>• Rename the Backup Policy</li> </ul>

---

# 13 Support and Other Resources

## Contacting HP

For worldwide technical support information, see the HP Support Center:

<http://www.hp.com/go/hpsc>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

## Subscription service

Receive, by email, support alerts announcing product support communications, driver updates, software releases, firmware updates, and customer-replaceable component information by signing up at <http://www.hp.com/go/myadvisory>.

To change options for support alerts you already receive, click the **Sign in** link on the right.

## Related information

### Product documentation

For the most recent user documentation, see the HP Enterprise Storage Information Library website:

[www.hp.com/go/storage/docs](http://www.hp.com/go/storage/docs)

Select **HP StoreOnce Backup** and then select your product.

The following documents provide information about the HP StoreOnce Backup system:

- *HP StoreOnce 6500 and B6200 Backup system user guide*: This guide contains detailed information on using the Web Management Interface. It also contains information on using the HP StoreOnce Catalyst feature.
- *HP StoreOnce 2700, 2900, 4500, 4700, and 4900 Backup system user guide*: This guide contains detailed information on using the Web Management Interface. It also contains information on using the HP StoreOnce Catalyst feature.
- *HP StoreOnce Backup system Concepts and Configuration Guidelines*: This guide advises how to plan the workload being placed on the HP StoreOnce Backup system in order to optimize performance and minimize the impact of deduplication, replication, and housekeeping operations competing for resources.
- *HP StoreOnce Backup system CLI Reference Guide*: This is the complete reference guide for the CLI command set. Some tasks can only be carried out from the CLI.

### Other useful websites

- HP Website: <http://www.hp.com>
- HP Storage Products: <http://www.hp.com/go/storage>
- HP Storage Information Library: <http://www.hp.com/go/storage/docs>
- HP Enterprise Backup Solutions Overview: <http://www.hp.com/go/ebc>

- HP Technical Support website: <http://www.hp.com/support>
- HP Technical Support Downloads website: <http://www.hp.com/support/downloads>
- HP Single Point of Connectivity Knowledge (SPOCK) website: <http://www.hp.com/storage/spock>
- HP partner and store locator: [http://www.hp.com/service\\_locator](http://www.hp.com/service_locator)
- White papers and Analyst reports: <http://www.hp.com/storage/whitepapers>

## Typographic conventions

**Table 5 Document conventions**

Convention	Element
Blue text: <a href="#">Table 5 (page 54)</a>	<ul style="list-style-type: none"> <li>• Cross-reference links and e-mail addresses</li> <li>• A cross reference to the glossary definition of the term in blue text</li> </ul>
Blue, bold, underlined text	email addresses
Blue, underlined text: <a href="http://www.hp.com">http://www.hp.com</a>	Website addresses
<b>Bold</b> text	<ul style="list-style-type: none"> <li>• Keys that are pressed</li> <li>• Text typed into a GUI element, such as a box</li> <li>• GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes</li> </ul>
<i>Italic</i> text	Text emphasis
Monospace text	<ul style="list-style-type: none"> <li>• File and directory names</li> <li>• System output</li> <li>• Code</li> <li>• Commands, their arguments, and argument values</li> </ul>
<i>Monospace, italic</i> text	<ul style="list-style-type: none"> <li>• Code variables</li> <li>• Command variables</li> </ul>
<b>Monospace, bold</b> text	Emphasized monospace text



**WARNING!** Indicates that failure to follow directions could result in bodily harm or death.



**CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.



**IMPORTANT:** Provides clarifying information or specific instructions.

**NOTE:** Provides additional information.



**TIP:** Provides helpful hints and shortcuts.

---

# Glossary

## A

**A.I.R.** Auto Image Replication. A NetBackup feature that protects against site outages by replicating backups between NetBackup domains.

**Accelerator** A NetBackup feature that facilitates intelligent backups to disk at the cost and speed of an incremental backup using change detection techniques on the client.

## B

**backup image** User data represented with header and content files.

## C

**client** Systems that are to be protected through the use of the NetBackup backup software.

## D

**disk pool** A collection of disk volumes. It is the storage destination of a NetBackup storage unit.

**disk volume** A StoreOnce Catalyst store.

## G

**Granular Recovery Technology** A feature that allows select items to be restored from database backups.

## M

**master server** A system with a NetBackup master server installed.

**media server** A system with a NetBackup media server installed along with the OST Plug-in.

## O

**optimized duplication** A low bandwidth copy operation.

**OST** OpenStorage.

## S

**storage unit** A label that NetBackup associates with physical storage.

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