

Symantec NetBackup™ AdvancedDisk Storage Solutions Guide

Release 7.6 Draft

DRAFT

Symantec NetBackup™ AdvancedDisk Storage Solutions Guide

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- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
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Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

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Introducing AdvancedDisk

This chapter includes the following topics:

- [About the AdvancedDisk storage option](#)

About the AdvancedDisk storage option

The NetBackup AdvancedDisk storage option lets you use the disk storage that is exposed to NetBackup as a file system for backups. Storage can be direct attached storage (DAS), network attached storage (NAS), or storage area network (SAN) storage.

NetBackup requires exclusive access to the storage for capacity management and load balancing.

[Table 1-1](#) describes some of the benefits of AdvancedDisk storage.

Table 1-1 AdvancedDisk features and benefits

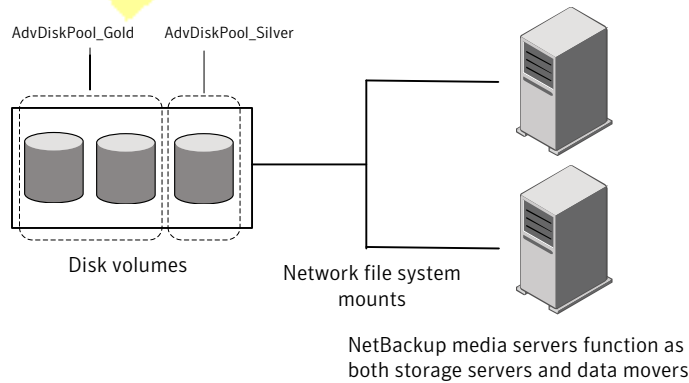
Feature	Benefit
Easy to deploy and use	NetBackup discovers the storage and uses NetBackup storage units and backup policies to use the storage.
Simplified growth	Lets you increase storage unit capacity by adding disks. Only add the capacity required, then update the NetBackup disk pools. Logical units of storage span physical boundaries, so you do not have to create new NetBackup storage units or change the backup policies.
Storage sharing	Multiple storage units can share a disk pool. Space is allocated dynamically as required. Automatic space allocation reduces the risk of backup failure.

Table 1-1 AdvancedDisk features and benefits (continued)

Feature	Benefit
Best fit selection	NetBackup predicts the size of the backup and selects the storage on which the backup fits best. The goal is to avoid out-of-space conditions and disk spanning.
Load balancing	Load balancing can occur at two levels, as follows: <ul style="list-style-type: none">■ Storage servers. If you have more than one storage server, NetBackup chooses the least busy media server for each backup. Load balancing increases the performance and the success of backup jobs.■ Storage unit groups. If you have more than one storage unit, you can choose the storage unit group Load Balance option. If the destination of each storage unit is a separate disk pool, NetBackup chooses the least busy disk pool.
Intelligent capacity management	NetBackup expires backup images when the storage that is consumed reaches a threshold. The disk pool high water mark applies to both individual disk volumes and to disk pools.
Storage lifecycle	You can classify data based on its importance and manage it differently throughout each stage of its life. After it has been duplicated, data can be selectively expired based on the relative importance to the business. you can ensure that important backups are available for rapid restore for longer periods, ensuring your recovery time objectives.

Figure 1-1 shows a media server and attached disks.

Figure 1-1 AdvancedDisk storage example



Licensing AdvancedDisk

This chapter includes the following topics:

- [About the AdvancedDisk license key](#)
- [Licensing AdvancedDisk](#)

About the AdvancedDisk license key

AdvancedDisk is a feature that is licensed separately from base NetBackup. The Data Protection Optimization Option license key activates AdvancedDisk.

You may have a single license key that activates both NetBackup and the Data Protection Optimization Option. Alternatively, you may have one license key that activates NetBackup and another key that activates the Data Protection Optimization Option.

See “[Licensing AdvancedDisk](#)” on page 14.

If you remove the Data Protection Optimization Option license key or if it expires, the following restrictions apply:

- You cannot create the disk pools or the storage units that reference AdvancedDisk disk pools.
- NetBackup jobs that attempt to use the disk pools or the storage units that are based on disk pools fail. The error message indicates that the feature is not licensed.

NetBackup does not delete the disk pools or the storage units that reference the disk pools. You can use them again if you enter a valid license key.

Licensing AdvancedDisk

No special installation is required for the NetBackup components of AdvancedDisk. However, you must enter a license key. If you installed the license key when you installed or upgraded NetBackup, you do not need to perform this procedure.

Enter the license key on the NetBackup master server. The following procedure describes how to use the **NetBackup Administration Console** to enter the license key.

To license AdvancedDisk

- 1 To add a license to a specific server, select **File > Change Server** and then select the server.
- 2 In the **NetBackup License Keys** dialog box, click **New**.
- 3 In the **Add a New License Key** dialog box, enter the license key and click **Add** or **OK**.
- 4 Click **Close**.
- 5 Restart all the NetBackup services and daemons.

Configuring AdvancedDisk

This chapter includes the following topics:

- [Configuring the AdvancedDisk option](#)
- [About AdvancedDisk file system requirements](#)
- [Configuring credentials for CIFS storage and disk storage units](#)
- [About AdvancedDisk storage servers](#)
- [About AdvancedDisk data movers](#)
- [About AdvancedDisk preferred or required read servers](#)
- [About data encryption for AdvancedDisk storage](#)
- [About key management for encryption of NetBackup AdvancedDisk storage](#)
- [Configuring key management for NetBackup AdvancedDisk storage encryption](#)
- [Configuring an AdvancedDisk storage server](#)
- [About AdvancedDisk disk pools](#)
- [Configuring a CIFS disk volume for AdvancedDisk encryption](#)
- [Configuring an AdvancedDisk disk pool](#)
- [Configuring an AdvancedDisk storage unit](#)
- [Creating a storage lifecycle policy](#)
- [Creating a backup policy](#)

Configuring the AdvancedDisk option

This section provides an overview of how to configure the NetBackup AdvancedDisk option.

Table 3-1 describes the configuration tasks.

To configure a base NetBackup environment, see the *NetBackup Administrator's Guide, Volume I*.

Table 3-1 AdvancedDisk configuration tasks

Step	Task	Section
Step 1	Learn about file system requirements	See “About AdvancedDisk file system requirements” on page 17.
Step 2	Learn about storage servers and data movers	See “About AdvancedDisk storage servers” on page 19. See “About AdvancedDisk data movers” on page 20.
Step 3	Optionally, configure the Key Management Service	The Key Management Service is required if you use data encryption for the AdvancedDisk storage. See “About data encryption for AdvancedDisk storage” on page 22.
Step 4	Configure a storage server	See “Configuring an AdvancedDisk storage server” on page 30.
Step 5	Learn about disk pools	See “About AdvancedDisk disk pools” on page 37.
Step 6	Optionally, configure CIFS disk volumes	For the AdvancedDisk_crypt disk type, you must configure CIFS volumes before you can add them to the disk pool. See “Configuring a CIFS disk volume for AdvancedDisk encryption” on page 38.
Step 7	Configure a disk pool	See “Configuring an AdvancedDisk disk pool” on page 39.
Step 8	Configure a storage unit	See “Configuring an AdvancedDisk storage unit” on page 50.
Step 9	Create a storage lifecycle policy	See “Creating a storage lifecycle policy” on page 54.
Step 10	Create a backup policy	See “Creating a backup policy” on page 62.

About AdvancedDisk file system requirements

AdvancedDisk can read and write any nonshared file system that NetBackup supports. However, AdvancedDisk is subject to any operating system or file system requirements or limitations. Requirements and limitations may exist beyond those mentioned in this topic.

For supported file systems, see the NetBackup operating system compatibility list at the Symantec support Web site, as follows:

<http://entsupport.symantec.com/>

The following are additional requirements and limitations for file systems:

CIFS Windows Common Internet File System (CIFS) requirements:

- Networked mapped devices are not visible to Windows services; therefore, NetBackup cannot discover CIFS disk volumes. You must use the UNC naming convention to specify the CIFS volumes that you want to use for **AdvancedDisk** disk pools.
- You must configure two Windows services to use the same credentials. See “[Configuring credentials for CIFS storage and disk storage units](#)” on page 18.
- In the **DiskPool Configuration Wizard**, you must use the Windows Universal Naming Convention to specify the CIFS volumes that you want to use for AdvancedDisk disk pools. (Networked mapped devices are not visible to Windows services; therefore, NetBackup cannot discover CIFS disk volumes.)
- You cannot delete a disk pool that is created by specifying volumes (such as for CIFS volumes). The disk pool exists until you delete its storage server.

NFS Network File System (NFS) requirements:

- You must use manual mount points. Automatic mount and unmount can change mount points, which may cause disk resources to be unavailable.
- The NFS server that exports the mount points must be configured to allow root access to the file systems.
- NFS uses a file system paradigm to manage objects. Therefore, carefully choose the volumes to include in the disk pool.
For example, NetBackup does not filter out common file system mount points, such as / and /usr on UNIX and Linux systems. You should not use those mount points for storage.
- Symantec recommends that you do not span backup images across NFS volumes in an AdvancedDisk disk pool. File system full conditions cannot be detected adequately. Therefore, a disk pool based on NFS volumes should be comprised of only one volume.

ZFS Symantec recommends that you do not span backup images across ZFS volumes in an AdvancedDisk disk pool. File system full conditions cannot be detected adequately. Therefore, a disk pool based on ZFS volumes should be comprised of only one volume.

Disk pool configuration may affect how you configure your file systems.

See [“Configuring an AdvancedDisk disk pool”](#) on page 39.

Configuring credentials for CIFS storage and disk storage units

For Common Internet File System (CIFS) storage with AdvancedDisk, two NetBackup services on Windows computers require matching credentials.

The following NetBackup services on Windows media servers to which the CIFS storage is attached must use the same credentials:

- **NetBackup Client Service**
The NetBackup Client Service is either `bpcd.exe` or `bpinetd.exe`, depending on NetBackup release level. Regardless of the binary file name, the service requires the credentials.
- **NetBackup Remote Manager and Monitor Service**
The NetBackup Remote Manager and Monitor Service binary file name is `nbrmms.exe`.

The credentials must be valid Windows credentials that allow read and write access to the storage. Configure the credentials on the media server or media servers that have a file system mount on the CIFS storage.

If credentials are not configured, NetBackup marks all CIFS AdvancedDisk storage units that use the UNC naming convention as DOWN.

To configure service credentials

- 1 In Windows, open the **Services** dialog box. How you open **Services** depends on the Windows version.
- 2 Double-click the service name to open the **Properties** dialog box for the service.
- 3 In the **General** tab, select the service that requires additional credentials. Click **Stop** to stop the service.
- 4 Select the **Log On** tab.
- 5 Select **This account** and then enter the credentials. Click **Apply**.

- 6 Select the **General** tab.
- 7 Click **Start** to start the service.
- 8 Repeat the steps 2 to 7 for each service that requires additional credentials.

About AdvancedDisk storage servers

A storage server is a NetBackup media server that mounts the disk storage and writes data to and reads data from the disk storage.

For AdvancedDisk, NetBackup media servers function as both storage servers and data movers.

See [“About AdvancedDisk data movers”](#) on page 20.

Multiple storage servers can exist. The storage servers share the storage equally.

If you configure more than one storage server, be aware of the following:

- Each media server must mount the file systems of all the disk volumes within a disk pool.
- The mount points must be the same on each media server.
NetBackup does not validate mount points, so you must ensure that the mount points are the same for each media server. You also must ensure that the mount points are valid.
- To obtain a consolidated list of disk volumes, NetBackup queries every media server. For large sets of servers, queries may affect performance.
- Disk volume status is monitored on a single media server. Which server monitors the status can change. Therefore, a change in disk volume availability on one media server may not be reflected in the disk volume status NetBackup reports.

An AdvancedDisk storage server can have the attributes that can help you manage your restore and your duplication traffic.

See [“About AdvancedDisk preferred or required read servers”](#) on page 20.

Storage servers are either **AdvancedDisk** type or **AdvancedDisk_crypt** type.

See [“About data encryption for AdvancedDisk storage”](#) on page 22.

Whether or not you want to specify storage server attributes or use encryption determines how you configure the storage servers.

See [“Configuring an AdvancedDisk storage server”](#) on page 30.

About AdvancedDisk data movers

A data mover transfers data from primary storage (a NetBackup client) to secondary storage during backups. It also can move data back to primary storage during restores and from secondary storage to tertiary storage during duplication.

You do not configure data movers separately. For AdvancedDisk, NetBackup media servers function as both storage servers and data movers. Data movers are configured when you configure storage servers.

About AdvancedDisk preferred or required read servers

When you configure a storage server, you can specify that you want it to be preferred or required for restore jobs. You also can specify whether a server should be required for the read side of duplication jobs. These attributes can help manage the restore and the duplication traffic.

Table 3-2 Preferred or required read server descriptions

Server attribute	Description
PrefRestore	<p>The server is preferred for the read side of restore operations. You can configure more than one server as preferred for restore.</p> <p>If you configure preferred for restore but not required for restore, NetBackup considers preferred storage servers for jobs first. If none are available, NetBackup considers any configured storage server.</p> <p>Normal NetBackup load balancing occurs among all storage servers marked PrefRestore.</p>
ReqRestore	<p>The server is required for the read side of restore operations. You can configure more than one server as required for restore.</p> <p>If you configure required servers for restore but not preferred servers, jobs queue until a required server is available to execute the job. Other servers are never considered for restore jobs. Normal NetBackup rules for job retry apply.</p> <p>If you configure both preferred and required storage servers and a required server is not available, NetBackup considers preferred servers for jobs. If none are available, jobs queue until a required or preferred server is available. Other servers are never considered for restore jobs.</p> <p>Normal NetBackup load balancing occurs for all required servers. Load balancing does not occur between the required and preferred servers.</p>

Table 3-2 Preferred or required read server descriptions (*continued*)

Server attribute	Description
ReqDuplicate	<p>The server is required for the read side of duplication operations. You can configure more than one server as required for duplication.</p> <p>If any server is configured as required for duplication, NetBackup considers only required for duplication servers for jobs. If a required server is unavailable, jobs queue until a required server is available to execute the job. Normal NetBackup rules for job retry apply.</p> <p>Required for duplication also applies to storage server allocation for synthetic backup operations.</p>

Only the media servers that are configured in the storage unit are considered for jobs. Therefore, if you configure a subset of the disk pool media servers in a storage unit, NetBackup selects from those servers only.

If you use the preferred or required restore or duplication attributes for a storage server, the following may occur:

- A restore operation uses a storage server that does not have a `PrefRestore` or `ReqRestore` attribute. Reasons may be as follows:
 - The destination disk pool does not include a storage server with a restore or a duplication attribute.
 - A preferred or required storage server cannot be used because it is unavailable (NetBackup considers it DOWN).
- A restore or a duplication operation is queued.
The reason may be that a preferred or required storage server cannot be used because it is unavailable (NetBackup considers it DOWN).

If you do not configure preferred or required restore servers, NetBackup uses normal criteria to select a media server for restore or duplication. (That is, if you configure more than one storage server.)

Information about how NetBackup balances storage unit and media server load is available.

See “Maximum concurrent jobs” in the *NetBackup Administrator’s Guide, Volume I*.

You can use preferred or required restore servers rather than the **Media host override** host property.

Information about the **Media host override** property is available.

See “General Server properties” in the *NetBackup Administrator’s Guide, Volume I*.

About data encryption for AdvancedDisk storage

You can encrypt your data on the storage. To use encryption, you must use the **AdvancedDisk_crypt** type when you configure the storage servers and the disk pools. You also must use the `nbdevconfig` command to configure the storage servers and the disk pools.

NetBackup uses the Key Management Service to manage encryption keys. You must configure KMS so that NetBackup can use AdvancedDisk encryption.

See “[About key management for encryption of NetBackup AdvancedDisk storage](#)” on page 22.

After you configure KMS and **AdvancedDisk_crypt** storage servers and disk pools, NetBackup uses encryption for backup jobs to those **AdvancedDisk_crypt** disk pools.

AdvancedDisk encryption is supported on a subset of operating systems that are supported by NetBackup. For supported systems, see the NetBackup compatibility lists on the NetBackup support landing page.

<http://www.symantec.com/>

About key management for encryption of NetBackup AdvancedDisk storage

NetBackup uses the Key Management Service (KMS) to manage the keys for the data encryption for disk storage. KMS is a NetBackup master server-based symmetric key management service. The service runs on the NetBackup master server. An additional license is not required to use the KMS functionality.

The following table describes the encryption keys that are required for the KMS database.

Table 3-3 Encryption keys required for the KMS database

Key	Description
Host Master Key	The host master key protects the key database. You can enter a key (a passphrase in KMS terminology) A Host Master Key and an ID.

Table 3-3 Encryption keys required for the KMS database (*continued*)

Key	Description
Key Protection Key	A Key Protection Key passphrase and ID. The key protection key protects individual records in the key database.

The following table describes the encryption keys that are required for each storage server and volume combination.

Table 3-4 Encryption keys required for each storage server and volume combination

Key	Description
A key group	<p>Each storage server and volume combination requires a key group. The key group name must use the following format:</p> <pre>storage_server_name:volume_name</pre> <p>The following is the criteria for the key group name:</p> <ul style="list-style-type: none"> ■ For <i>storage_server_name</i>, you must use the same name that you used when you configured the storage server. If you used a short name, use the same short name. If you used the fully-qualified domain name, use the same fully-qualified domain name. ■ The <i>volume_name</i> must be the last directory name in the pathname to the volume. For example, if the pathname is <code>/mnt/disk/hdd1</code>, the <i>volume_name</i> must be <code>hdd1</code>. ■ The <i>volume_name</i> must not contain forward or backward slash characters. Therefore, on Windows hosts you must specify a directory name not a drive letter.
A key record	Each key group you create requires a key record. A key record stores the actual key.

See “[Configuring key management for NetBackup AdvancedDisk storage encryption](#)” on page 24.

See “[Displaying KMS key information for AdvancedDisk encryption](#)” on page 82.

See “[About data encryption for AdvancedDisk storage](#)” on page 22.

More information about KMS is available.

See the *NetBackup Security and Encryption Guide*.

Configuring key management for NetBackup AdvancedDisk storage encryption

This topic is an overview of how to configure key management manually by using NetBackup commands.

For AdvancedDisk storage, encryption is optional. If you do not use encryption, you do not have to configure key management. To use encryption, you must first configure key management manually by following the steps in [Table 3-5](#).

Table 3-5 Configure key management manually

Step	Task	Instructions
Step 1	Learn about NetBackup key management	See “About key management for encryption of NetBackup AdvancedDisk storage” on page 22.
Step 2	Set up the KMS database	See “Setting up the KMS database for NetBackup AdvancedDisk storage encryption” on page 24.
Step 3	Create the key groups	Each storage server and volume combination requires a key group. See “Creating a KMS key group for NetBackup AdvancedDisk storage encryption” on page 26.
Step 4	Create the key records	Each key group requires a key record. The key record contains the encryption key. See “Creating a KMS key for NetBackup AdvancedDisk storage encryption” on page 27.
Step 5	Save a record of the key names	The record of the key names lets you recreate the keys if they are lost. See “Saving a record of the KMS key names for NetBackup AdvancedDisk storage encryption” on page 28.

See [“Displaying KMS key information for AdvancedDisk encryption”](#) on page 82.

See [“About data encryption for AdvancedDisk storage”](#) on page 22.

Setting up the KMS database for NetBackup AdvancedDisk storage encryption

Setting up the KMS database is the first task in the process of configuring the NetBackup Key Management Service manually.

See “[Configuring key management for NetBackup AdvancedDisk storage encryption](#)” on page 24.

To set up the KMS database

- 1 On the NetBackup master server, create the KMS database by running the `nbkms` command with the `-createemptydb` option, as follows:

UNIX: `/usr/opensv/netbackup/bin/nbkms -createemptydb`

Windows: `install_path\Veritas\NetBackup\bin\nbkms.exe -createemptydb`

The following prompt appears:

Enter the Host Master Key (HMK) passphrase (or hit ENTER to use a randomly generated HMK). The passphrase will not be displayed on the screen.

Enter passphrase :

- 2 Enter a passphrase for the host master key (HMK) or press **Enter** to create a randomly generated key.

After you enter the Host Master Key passphrase, the following prompt appears:

An ID will be associated with the Host Master Key (HMK) just created. The ID will assist you in determining the HMK associated with any key store.

Enter HMK ID :

- 3 Enter an ID for the HMK. This ID can be anything descriptive that you want to use to identify the HMK.

After you enter the Host Master Key ID, the following prompt appears:

Enter the Key Protection Key (KPK) passphrase (or hit ENTER to use a randomly generated KPK). The passphrase will not be displayed on the screen.

Enter passphrase :

- 4 Enter a passphrase for the key protection key.

After you enter the Key Protection Key passphrase, the following prompt appears:

An ID will be associated with the Key Protection Key (KPK) just created. The ID will assist you in determining the KPK associated with any key store.
Enter KPK ID :

- 5 Enter an ID for the KPK. The ID can be anything descriptive that you want to use to identify the KPK.
- 6 Start the NetBackup Key Management Service on the master server. You can do so in the **Activity Monitor** of the **NetBackup Administration Console**.
After you start the service, the initial database setup is complete.
- 7 After you set up the database, create key groups for the volumes in the disk pool.

Creating a KMS key group for NetBackup AdvancedDisk storage encryption

Creating a KMS key group is the second task in the process of configuring the NetBackup Key Management Service manually.

See “[Configuring key management for NetBackup AdvancedDisk storage encryption](#)” on page 24.

A key group is a container for key records. Each storage server and volume combination requires a key group in the following format:

`storage_server_name:volume_name`

To create a KMS key group

- 1 On the NetBackup master server, create a key group by using the `nbkmsutil` command and the `-createkg` option. The following is the command syntax:

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbkmsutil -createkg -kgname storage_server_name:volume_name`

Windows: `install_path\Veritas\NetBackup\bin\admincmd\nbkmsutil -createkg -kgname storage_server_name:volume_name`

The following is the criteria for the key group name:

- For `storage_server_name`, you must use the same name that you used when you configured the storage server. If you used a short name, use the

same short name. If you used the fully-qualified domain name, use the same fully-qualified domain name.

- The *volume_name* must be the last directory name in the path name to the volume. For example, if the pathname is `/mnt/disk/hdd1`, the *volume_name* must be `hdd1`.
- The *volume_name* must not contain forward or backward slash characters. Therefore, on Windows hosts you must specify a directory name not a drive letter.

The following is an example:

```
nbkmsutil -createkg -kgname
AdvDiskServer1.symantecs.org:AdvDisk_Volume
```

- 2 After you create the key groups, create a key record for each group.

See [“Creating a KMS key for NetBackup AdvancedDisk storage encryption”](#) on page 27.

Creating a KMS key for NetBackup AdvancedDisk storage encryption

Creating a KMS key is the third and the final task in the process of configuring the NetBackup Key Management Service manually. A KMS key is also known as a *key record*.

See [“Configuring key management for NetBackup AdvancedDisk storage encryption”](#) on page 24.

Each key group requires at least one key record. The key record contains the encryption key itself and information about the key. The key is used to encrypt and decrypt data.

For the key name, Symantec recommends that you use the volume name that you used in the key group name. (A key name is optional. If you use a key name, you can use any name for the key name.)

Note: If you create more than one key for a key group, only the last key remains active.

To create a KMS key

- 1 On the NetBackup master server, create a key record by using the `nbkmsutil` command and the `-createkey` option.

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbkmsutil -createkey
-keyname keyname -kname storage_server_name:volume_name -activate`

Windows: `install_path\Veritas\NetBackup\bin\admincmd\nbkmsutil
-createkey -keyname keyname -kname
storage_server_name:volume_name -activate`

You are prompted to enter a passphrase. The following is an example:

```
nbkmsutil -createkey -keyname AdvDisk_Volume -kname  
AdvDiskServer1.symantecs.org:AdvDisk_Volume -activate
```

Enter a passphrase:

- 2 Enter and then re-enter a passphrase; this passphrase should differ from any passphrases you entered already.
Save a record of the passphrase.

Saving a record of the KMS key names for NetBackup AdvancedDisk storage encryption

Symantec recommends that you save a record of the encryption key names. The key tag that is listed in the output is necessary if you need to recover or recreate the keys.

To save a record of the key names

- 1 To determine the key group names, use the following command on the primary image owner master server:

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbkmsutil -listkgs`

Windows: `install_path\Program`

`Files\Veritas\NetBackup\bin\admincmd\nbkmsutil.exe -listkgs`

The following is example output:

```
Key Group Name       : AdvDiskServer1.symantecs.org:AdvDisk_Volume
Supported Cipher     : AES_256
Number of Keys       : 1
Has Active Key       : Yes
Creation Time        : Tues Jan 01 01:00:00 2013
Last Modification Time: Tues Jan 01 01:00:00 2013
Description          : -
```

DRAFT

- 2 For each key group, write all of the keys that belong to a key group to a file. Run the command on the primary image owner master server. The following is the command syntax:

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbkmsutil -listkeys -kgname keyname > filename.txt`

Windows: `install_path\Program`

`Files\Veritas\NetBackup\bin\admincmd\nbkmsutil.exe -listkeys -kgname keyname > filename.txt`

The following is example output for a key group named

CloudStorageVendor.com:symc_volume_for_backups:

```
nbkmsutil.exe -listkeys -kgname keyname >
keys_for_AdvDiskServer1.symantecs.org:AdvDisk_Volume.txt

Key Group Name      : AdvDiskServer1.symantecs.org:AdvDisk_Volume
Supported Cipher    : AES_256
Number of Keys      : 1
Has Active Key      : Yes
Creation Time       : Tues Jan 01 01:00:00 2013
Last Modification Time: Tues Jan 01 01:00:00 2013
Description         : -

Key Tag            : 867d710aa7f4c64dcdd2cec6...cced0c831c1812c510acd05
Key Name           : dp-key
Current State      : ACTIVE
Creation Time      : Wed Nov 30 17:06:26 2013
Last Modification Time: Wed Nov 30 17:06:26 2013
Description        : -

Number of Keys: 1
```

- 3 Include in the file the passphrase that you used to create the key record.
- 4 Store the file in a secure location.

Configuring an AdvancedDisk storage server

Configure in this context means to configure as a storage server a NetBackup media server that can mount the storage.

See [“About AdvancedDisk storage servers”](#) on page 19.

How you configure an AdvancedDisk storage server depends on several factors, as follows:

Encrypted storage	<p>If you want to encrypt the storage, you must use the NetBackup <code>nbdevconfig</code> command.</p> <p>For the AdvancedDisk_crypt type of storage server, you must specify the <code>-st</code> option with a value of 5.</p> <p>See “About data encryption for AdvancedDisk storage” on page 22.</p> <p>See “To configure an AdvancedDisk storage server by using the command line” on page 32.</p>
Storage server attributes	<p>If you want to specify preferred or required attributes for the storage server, you must use the NetBackup <code>nbdevconfig</code> command.</p> <p>See “About AdvancedDisk preferred or required read servers” on page 20.</p> <p>See “To configure an AdvancedDisk storage server by using the command line” on page 32.</p>
No encryption or attributes	<p>Symantec recommends that you use the Storage Server Configuration Wizard to configure the AdvancedDisk type of storage server.</p> <p>See “To configure an AdvancedDisk storage server by using the wizard” on page 32.</p>

You can configure multiple storage servers for the same storage. Doing so provides load balancing and redundancy in case of a storage server failure. The following procedures explain how to configure multiple storage servers.

When you configure an AdvancedDisk storage server, it also is configured as a data mover.

See [“About AdvancedDisk data movers”](#) on page 20.

To configure an AdvancedDisk storage server by using the command line

- 1 Run the following command on the NetBackup master server or the media server:

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbdevconfig -creatests -storage_server hostname -stype server_type -st 5 -media_server hostname [-setattribute attribute]`

Windows: `install_path\NetBackup\bin\admincmd\nbdev config -creatests -storage_server hostname -stype server_type -st 5 -media_server hostname [-setattribute attribute]`

See [“AdvancedDisk storage server options”](#) on page 36.

- 2 To verify that the storage server was configured correctly, run the following command:

UNIX: `/usr/opensv/netbackup/bin/admincmd/nbdevquery -liststs -u`

Windows: `install_path\NetBackup\bin\admincmd\nbdevquery -liststs -u`

The following is an excerpt of the command output that shows the proper storage type for AdvancedDisk (Formatted Disk, Direct Attached):

```
Storage Server      : AdvDiskServer.symantecs.org
Storage Server Type : AdvancedDisk_crypt
Storage Type        : Formatted Disk, Direct Attached
State               : UP
```

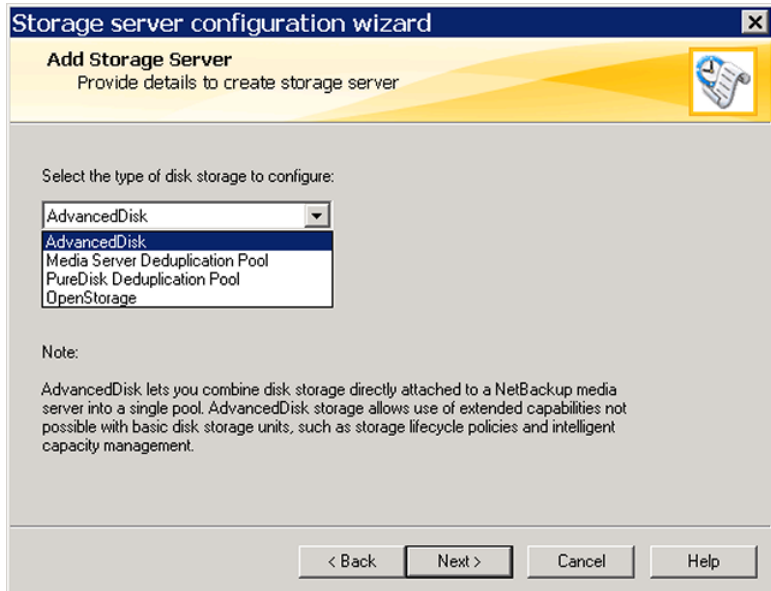
- 3 After the storage server is created, you can do the following.
 - To configure another storage server, go to step 1 and then repeat the steps in this procedure.
 - If you have finished configuring storage servers, configure a disk pool. See [“Configuring an AdvancedDisk disk pool”](#) on page 39.

To configure an AdvancedDisk storage server by using the wizard

- 1 In the **NetBackup Administration Console**, select either **NetBackup Management** or **Media and Device Management**.
- 2 In the right pane, click **Configure Disk Storage Servers**.
- 3 Click **Next** on the welcome panel of the wizard.

The **Add Storage Server** panel appears.

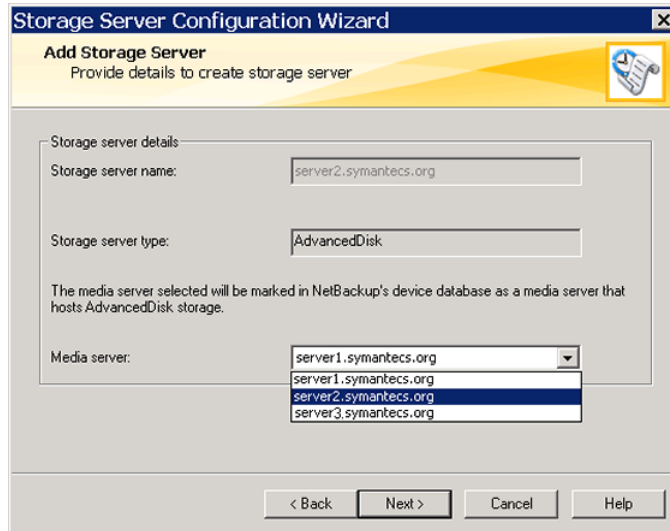
- 4 On the **Add Storage Server** panel, select **AdvancedDisk** from the drop-down menu. The following is an example of the wizard panel:



The types of storage servers that you can configure depend on the options for which you are licensed.

Click **Next**. A wizard panel about **Storage server details** appears.

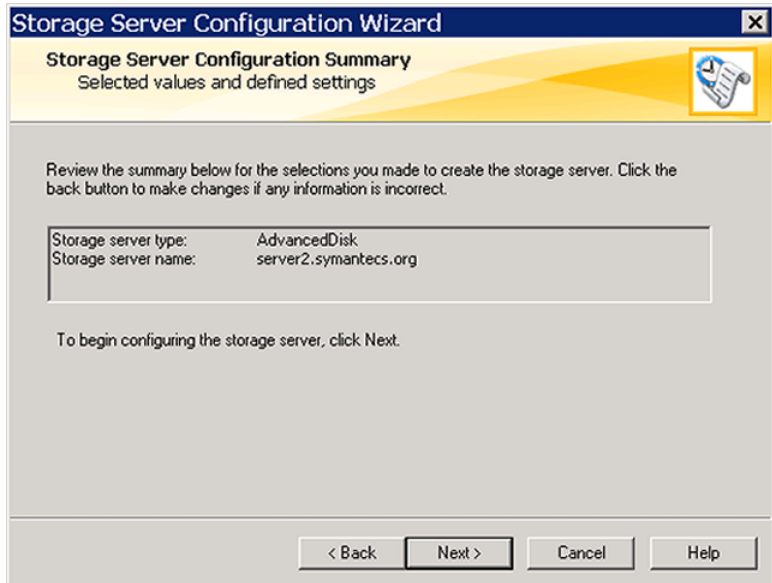
- 5 For the **Storage server details**, select the media server that you want to configure as an AdvancedDisk storage server from the **Media server** drop-down menu. Then, click **Next**. The following is an example of the wizard panel:



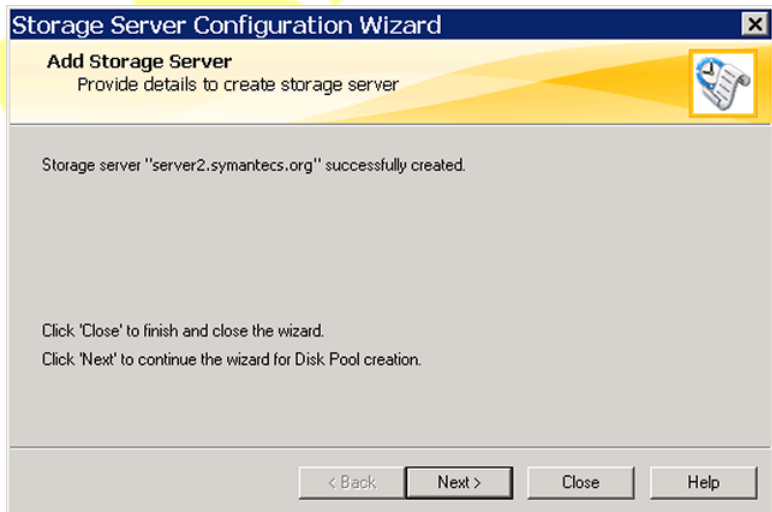
The image shows a screenshot of the 'Storage Server Configuration Wizard' window, specifically the 'Add Storage Server' step. The window has a title bar with the text 'Storage Server Configuration Wizard' and a close button. Below the title bar is a yellow header area with the text 'Add Storage Server' and 'Provide details to create storage server'. To the right of the header is a small icon of a document with a checkmark. The main area of the window is divided into two sections. The top section is titled 'Storage server details' and contains two text input fields: 'Storage server name' with the value 'server2.symantecs.org' and 'Storage server type' with the value 'AdvancedDisk'. Below these fields is a paragraph of text: 'The media server selected will be marked in NetBackup's device database as a media server that hosts AdvancedDisk storage.' The bottom section is titled 'Media server' and contains a dropdown menu with the value 'server1.symantecs.org'. The dropdown menu is open, showing a list of four options: 'server1.symantecs.org', 'server1.symantecs.org', 'server2.symantecs.org' (which is highlighted with a blue background), and 'server3.symantecs.org'. At the bottom of the window are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

The **Storage Server Configuration Summary** panel appears.

- 6 On the **Storage Server Configuration Summary** panel, verify the selections. If OK, click **Next**. The following is an example of the wizard panel:



- 7 After NetBackup creates the storage server, a wizard panel describes the successful action. The following is an example of the wizard panel:



After the storage server is created, you can do the following.

- To configure another storage server, click **Close** and then repeat the steps in this procedure.
- To configure a disk pool for this storage server, click **Next**.
Configure a disk pool if you have finished configuring the storage servers that can access the disk pool.
See [“Configuring an AdvancedDisk disk pool”](#) on page 39.

AdvancedDisk storage server options

The following are the `nbdevconfig` command options that are used to configure storage servers.

Table 3-6 Options to configure AdvancedDisk storage server

Option	Description
<code>-storage_server storage_server</code>	The name of the NetBackup media server that has a file system mount on the storage.
<code>-stype server_type</code>	For AdvancedDisk with encryption, use AdvancedDisk_crypt , otherwise use AdvancedDisk . Note: If you specify AdvancedDisk_crypt as the <code>-stype</code> , you must specify an <code>-st</code> value of 5 on the command line.
<code>-st storage_type</code>	A numeric value that specifies the storage server properties. For AdvancedDisk, the default value is 5 (direct attached, formatted disk). Note: For an AdvancedDisk_crypt <code>-stype</code> , you must specify <code>-st 5</code> on the command line.
<code>-media_server hostname</code>	Use the same name as the storage server name.
<code>-setattribute attribute</code>	An attribute to apply to the storage server for the read side of restore or duplication operations. The following are the attributes: <ul style="list-style-type: none">■ PrefRestore. The storage server is preferred for the read side of restore operations. More than one storage server can have the PrefRestore attribute.■ ReqRestore. The storage server is required for the read side of restore operations. More than one storage server can have the ReqRestore attribute.■ ReqDuplicate. The storage server is required for the read side of duplication operations. More than one storage server can have the ReqDuplicate attribute. See “About AdvancedDisk preferred or required read servers” on page 20.

About AdvancedDisk disk pools

A disk pool represents disk volumes on the underlying disk storage. NetBackup aggregates the disk volumes into pools of storage you can use for backups. A disk pool is the storage destination of a NetBackup storage unit.

When NetBackup sends backup data to a disk pool, NetBackup selects disk volumes based on available capacity and predicted size of the backup. NetBackup tries to write backup data to a single volume. If necessary, backup images span disk volumes in a disk pool. Backup images do not span across multiple disk pools.

For AdvancedDisk, NetBackup assumes exclusive ownership of the disk resources that comprise the disk pool. If you share those resources with other users, NetBackup cannot manage disk pool capacity or storage lifecycle policies correctly.

The following are disk volume considerations for AdvancedDisk storage:

Disk size and performance	NetBackup assumes that all disk volumes within a disk pool are similar in size and performance characteristics. Although you can use dissimilar disk volumes in a disk pool, performance may be unpredictable.
---------------------------	--

If you have the disk volumes that have significantly different characteristics, group them into multiple disk pools. Each of those disk pools should contain the volumes that have similar characteristics.

Disk spanning	If necessary, backup images span disk volumes in a disk pool. To reduce disk spanning, each volume in a disk pool should be larger than your largest backup.
---------------	--

Note: Some file systems limitations can affect whether or not NetBackup can detect file system capacity accurately. On those file systems, Symantec recommends that you do not span backup images across volumes.

See [“About AdvancedDisk file system requirements”](#) on page 17.

Disk contention	NetBackup queues backup and restore jobs if insufficient resources are available. To limit the possibility of disk write contention between backup jobs (and therefore job queuing), ensure that a disk pool contains a sufficient number of volumes. The number of volumes should be equal to or greater than the total number of maximum concurrent jobs that are allowed in all of the storage units that use a disk pool.
-----------------	--

Volume managers	The AdvancedDisk storage implementation presents mounted file systems as disk volumes to NetBackup. Therefore, you can use AdvancedDisk disk pools with the volume managers that work at a level closer to the hardware than the file system.
-----------------	---

Symantec recommends that disk pool and disk volume names be unique across your enterprise.

Disk pools are either **AdvancedDisk** type or **AdvancedDisk_crypt** type.

See [“About data encryption for AdvancedDisk storage”](#) on page 22.

For the **AdvancedDisk_crypt** disk type, you must configure the disk volumes before you configure the disk pool.

See [“Configuring a CIFS disk volume for AdvancedDisk encryption”](#) on page 38.

See [“Configuring an AdvancedDisk disk pool”](#) on page 39.

If an AdvancedDisk disk pool is a storage destination in a storage lifecycle policy, NetBackup capacity management applies.

See [“Capacity managed retention type for SLP operations”](#) on page 60.

Configuring a CIFS disk volume for AdvancedDisk encryption

AdvancedDisk_crypt and CIFS only.

For the **AdvancedDisk_crypt** disk type, you must use the NetBackup `nbdevconfig` command to specify each CIFS disk volume for the disk pool.

(Alternatively, for the **AdvancedDisk** disk type, the **Disk Pool Configuration Wizard** lets you specify the CIFS volumes.)

Symantec recommends that disk volume and disk pool names be unique across your enterprise.

You must first configure storage servers.

See [“Configuring an AdvancedDisk storage server”](#) on page 30.

To configure an AdvancedDisk disk volume by using the command line

- 1 On the NetBackup master server, configure the volume by using the following command:

```
nbdevconfig -createdv -storage_server hostname -stype server_type  
-dv disk_volume_name -dp disk_pool_name
```

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

The following describe the options:

<code>-storage_server <i>hostname</i></code>	The name of the NetBackup media server that has a file system mount on the storage.
<code>-stype <i>server_type</i></code>	For AdvancedDisk with encryption, use AdvancedDisk_crypt , otherwise use AdvancedDisk .
<code>-dv <i>disk_volume_name</i></code>	The name of the disk volume; use UNC notation.
<code>-dp <i>disk_pool_name</i></code>	The name of the disk pool for the volume.

- 2 Repeat step 1 for each disk volume that you want to add.

Configuring an AdvancedDisk disk pool

Two methods exist to configure an AdvancedDisk disk pool, as follows:

The Disk Pool Configuration Wizard

Symantec recommends that you use the **Disk Pool Configuration Wizard** to configure the **AdvancedDisk** type of disk pool. However, in one use case, you must use the `nbdevconfig` command.

When you configure a storage server, that wizard continues to the **Disk Pool Configuration Wizard**. Therefore, you may not need to invoke the disk pool wizard separately.

See [“To configure an AdvancedDisk disk pool by using the wizard”](#) on page 40.

The `nbdevconfig` command

You must use the `nbdevconfig` command if you configured an **AdvancedDisk_crypt** type of storage server.

See [“To configure an AdvancedDisk storage server by using the command line”](#) on page 32.

If you use Common Internet File System (CIFS) volumes for your storage, you must configure the CIFS volumes before you configure the disk pool. (For the `nbdevconfig` command only; the wizard lets you add CIFS volumes to the disk pool.)

See [“Configuring a CIFS disk volume for AdvancedDisk encryption”](#) on page 38.

When you create an AdvancedDisk disk pool, you specify or select the following:

- The NetBackup media servers that share the storage.
 The media servers must be configured as storage servers. They also function as data movers.

When you specify the storage servers, you associate them with the disk pool. Only those storage servers can access the disk pool.

See [“About AdvancedDisk storage servers”](#) on page 19.

- The disk volumes to include in the pool. If you use multiple storage servers for the same disk pool, you must use the same mount point on all storage servers for each volume.

Normally, NetBackup discovers the volumes on the host you specify in the **Disk Pool Configuration Wizard** or the `nbdevconfig` command line. However, NetBackup cannot discover Common Internet File System (CIFS) disk volumes. (Networked mapped devices are not visible to Windows services.) Therefore, you must use the Windows Universal Naming Convention to specify the CIFS volumes that you want to use for AdvancedDisk disk pools.

For **AdvancedDisk**, the **Disk Pool Configuration Wizard** lets you specify the CIFS volumes.

For **AdvancedDisk_crypt**, you must use the `nbdevconfig` command to specify the CIFS volumes *before* you configure the disk pool.

See [“Configuring a CIFS disk volume for AdvancedDisk encryption”](#) on page 38.

- The disk pool properties.

See [“AdvancedDisk disk pool properties”](#) on page 49.

Symantec recommends that disk volume and disk pool names be unique across your enterprise.

You must first configure storage servers.

See [“Configuring an AdvancedDisk storage server”](#) on page 30.

To configure an AdvancedDisk disk pool by using the wizard

- 1 If the **Disk Pool Configuration Wizard** was launched from the **Storage Server Configuration Wizard**, go to step 3.

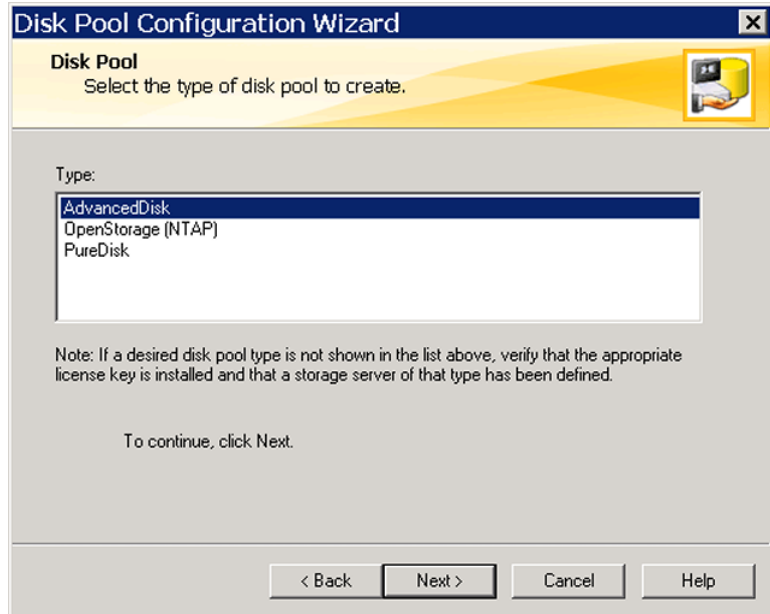
Otherwise, in the **NetBackup Administration Console**, select either **NetBackup Management** or **Media and Device Management**.

- 2 From the list of wizards in the right pane, click **Configure Disk Pool**.
- 3 Click **Next** on the welcome panel of the wizard.

The **Disk Pool** panel appears.

- 4 On the **Disk Pool** panel, select **AdvancedDisk** in the **Type** windows.

The following is an example of the wizard panel:

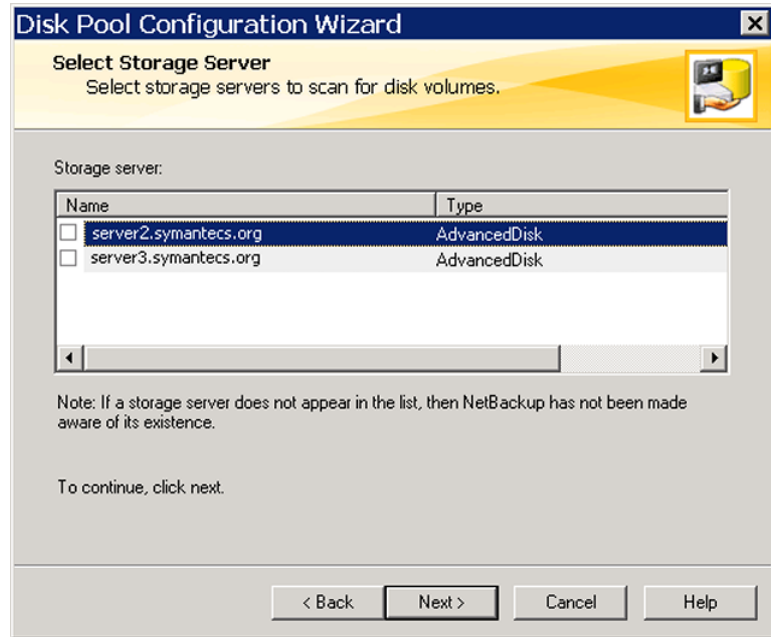


The types of disk pools that you can configure depend on the options for which you are licensed.

Click **Next**. The **Select Storage Server** wizard panel appears.

- 5 On the **Select Storage Server** panel, select the NetBackup media servers that you want to function as storage servers for this disk pool.

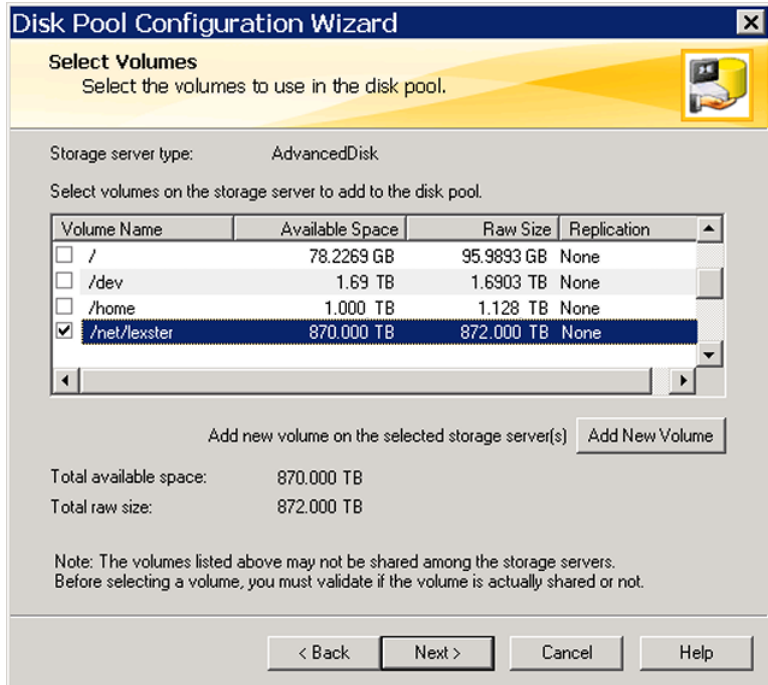
The following is an example of the wizard panel:



All NetBackup media servers that you configured as AdvancedDisk storage servers appear.

Click **Next**. The **Select Volumes** wizard panel appears.

- 6 On the **Select Volumes** panel, select the volumes for this disk pool.
The following is an example of the wizard panel:



The wizard panel displays the volumes available on the storage server. If you selected more than one storage server, volumes that are common to all of them appear.

NetBackup does not filter out common file system mount points, such as / and /usr. Therefore, carefully choose the volumes to include in a disk pool.

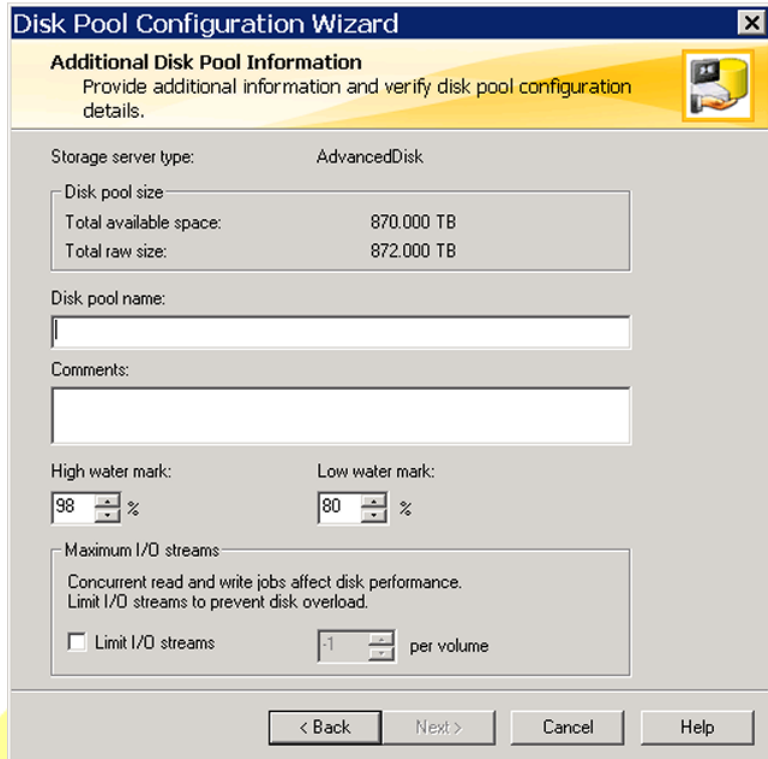
To specify a Common Internet File System (CIFS) disk volume, click **Add New Volume**. In the **Add New Volume** dialog box, enter the Windows Universal Naming Convention (UNC) pathname of the CIFS volume and then click **Validate and Add**.

See [“About AdvancedDisk file system requirements”](#) on page 17.

Click **Next**. The **Additional Disk Pool Information** wizard panel appears.

- 7 On the **Additional Disk Pool Information** panel, enter the values for this disk pool.

The following is an example of the wizard panel:



The screenshot shows the 'Disk Pool Configuration Wizard' window, specifically the 'Additional Disk Pool Information' panel. The panel has a yellow header with the title and a sub-header 'Provide additional information and verify disk pool configuration details.' Below the header, the 'Storage server type' is set to 'AdvancedDisk'. A 'Disk pool size' section contains two rows: 'Total available space: 870.000 TB' and 'Total raw size: 872.000 TB'. Below this is a 'Disk pool name' text box and a 'Comments' text box. The 'High water mark' is set to 98% and the 'Low water mark' is set to 80%. A 'Maximum I/O streams' section contains a checkbox for 'Limit I/O streams' (which is unchecked) and a spinner box set to '-1' with the text 'per volume'. At the bottom are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

Storage server type:		AdvancedDisk
Disk pool size		
Total available space:	870.000 TB	
Total raw size:	872.000 TB	
Disk pool name:		
Comments:		
High water mark:	98 %	Low water mark: 80 %
Maximum I/O streams		
Concurrent read and write jobs affect disk performance. Limit I/O streams to prevent disk overload.		
<input type="checkbox"/> Limit I/O streams	-1	per volume

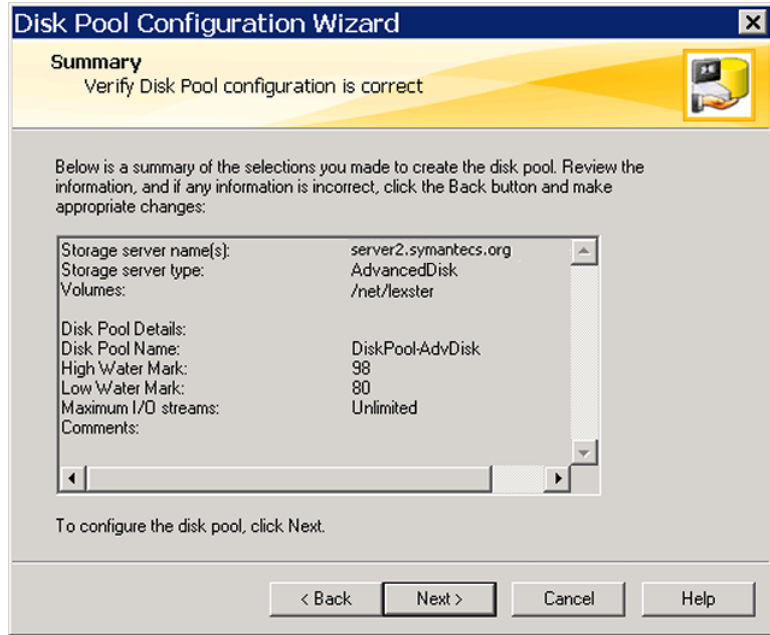
< Back Next > Cancel Help

See “[AdvancedDisk disk pool properties](#)” on page 49.

Click **Next**. The **Summary** wizard panel appears.

- 8 On the **Summary** panel, verify the selections. If OK, click **Next**.

The following is an example of the wizard panel:



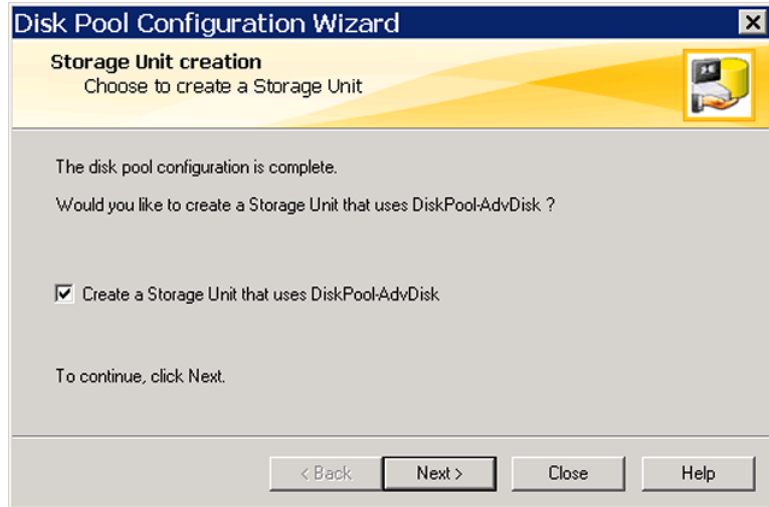
- 9 After NetBackup creates the disk pool, a wizard panel describes the successful action.

To continue, click **Next**.

The **Storage Unit creation** wizard panel appears.

- 10 To configure a storage unit for the disk pool, ensure that **Create a Storage Unit that uses *disk_pool_name*** is selected, then click **Next**. Otherwise, click **Close** to exit from the wizard.

The following is an example of the wizard panel:



If you click **Next**, a wizard screen appears in which you enter the details about the storage unit.

- 11 Enter the appropriate information for the storage unit.

The following is an example of the wizard panel:

Disk Pool Configuration Wizard

Storage Unit Creation
Enter details to create storage unit.

Disk Pool: DiskPool-AdvDisk
Storage server type: AdvancedDisk
Storage unit name:

Media Server

☒ Use any available media server to transport data
☐ Use only the selected media servers:

☐ server2.symantecs.org
☐ server3.symantecs.org

Maximum concurrent jobs:
Maximum fragment size: MB

< Back Next > Cancel Help

See [“AdvancedDisk storage unit properties”](#) on page 52.

Click **Next** to create the storage unit.

- 12 After NetBackup configures the storage unit, the **Finished** panel appears. Click **Finish** to exit from the wizard.

To configure an AdvancedDisk disk pool by using the `nbdevconfig` command

- 1 On one of the storage servers, write the volumes that are available to a text file by using the following command:

```
nbdevconfig -previewdv -storage_server hostname -stype server_type
> filename
```

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

The following describe the options:

<code>-storage_server <i>hostname</i></code>	The name of the NetBackup media server that has a file system mount on the storage.
<code>-stype <i>server_type</i></code>	For AdvancedDisk with encryption, use AdvancedDisk_crypt , otherwise use AdvancedDisk .
<code>> <i>filename</i></code>	The name of the file into which to write the volume information. Symantec recommends that you use a name that describes its purpose.

- 2 Copy the file that you created in step 1 to the master server.
- 3 In a text editor, delete the line for each volume that you do not want to be in the disk pool.

Each volume that is listed in the file must be exposed to each AdvancedDisk storage server on the same mount point.

- 4 Configure the disk pool by using the following command:

```
nbdevconfig -createdp -dp disk_pool_name -stype server_type
-storage_servers hostname... -dvlist filename [-reason "string"]
[-lwm low_watermark_percent] [-max_io_streams n] [-comment
comment] [-M master_server] [-reason "string"]
```

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

<code>-dp <i>disk_pool_name</i></code>	The name of the disk pool. Use the same name that you used when you configured the disk volumes.
<code>-stype <i>server_type</i></code>	For AdvancedDisk with encryption, use AdvancedDisk_crypt , otherwise use AdvancedDisk .
<code>-storage_servers <i>hostname</i></code>	The name of each storage server that has a file system mount on the storage. Specify all NetBackup media servers that are storage servers for this disk pool.
<code>-dvlist <i>filename</i></code>	The name of the file that contains the information about the volumes for the disk pool.

<code>-hwm <i>high_watermark</i></code>	See “AdvancedDisk disk pool properties” on page 49.
<code>-lwm <i>low_watermark</i></code>	See “AdvancedDisk disk pool properties” on page 49.
<code>-max_io_streams <i>n</i></code>	See “AdvancedDisk disk pool properties” on page 49.
<code>-comment <i>comment</i></code>	See “AdvancedDisk disk pool properties” on page 49.
<code>-M <i>master_server</i></code>	The name of the master server.
<code>-reason "<i>string</i>"</code>	The reason that you create the disk pool.

AdvancedDisk disk pool properties

Table 3-7 describes the disk pool properties.

Table 3-7 AdvancedDisk disk pool properties

Property	Description
Name	The disk pool name.
Storage server	The storage server or storage servers. All NetBackup media servers that have a mount on the storage are listed. They share the storage for read and write purposes.
Disk volumes	The disk volumes that comprise the disk pool.
Total size	The total amount of space available in the disk pool.
Total raw size	The total raw, unformatted size of the storage in the disk pool.
Comment	A comment that is associated with the disk pool.

Table 3-7 AdvancedDisk disk pool properties (*continued*)

Property	Description
High water mark	<p>The High water mark setting is a threshold that triggers the following actions:</p> <ul style="list-style-type: none"> ■ When an individual volume in the disk pool reaches the High water mark, NetBackup considers the volume full. NetBackup chooses a different volume in the disk pool to write backup images to. ■ When all volumes in the disk pool reach the High water mark, the disk pool is considered full. NetBackup fails any backup jobs that are assigned to a storage unit in which the disk pool is full. NetBackup also does not assign new jobs to a storage unit in which the disk pool is full. ■ NetBackup begins image cleanup when a volume reaches the High water mark; image cleanup expires the images that are no longer valid. For a disk pool that is full, NetBackup again assigns jobs to the storage unit when image cleanup reduces any disk volume's capacity to less than the High water mark. If the storage unit for the disk pool is in a capacity-managed storage lifecycle policy, other factors affect image cleanup. See “Capacity managed retention type for SLP operations” on page 60. <p>The default is 98%.</p>
Low water mark	<p>The Low water mark is a threshold at which NetBackup stops image cleanup.</p> <p>The Low water mark setting cannot be greater than or equal to the High water mark setting.</p> <p>The default is 80%.</p>
Limit I/O streams	<p>Select this option to limit the number of read and write streams (that is, jobs) for each volume in the disk pool. A job may read backup images or write backup images. By default, there is no limit.</p> <p>When the limit is reached, NetBackup chooses another volume, if available. If not available, NetBackup queues jobs until a volume is available.</p> <p>Too many jobs that read and write data may degrade disk performance because of disk thrashing. (Disk thrashing is when the read and write heads move between the cylinders excessively as they seek the data for competing jobs.)</p> <p>Fewer streams may improve throughput, which may increase the number of jobs that complete in a specific time period.</p>
per volume	<p>Select or enter the number of read and write streams to allow per volume.</p> <p>Many factors affect the optimal number of streams. Factors include but are not limited to disk speed, CPU speed, and the amount of memory.</p>

Configuring an AdvancedDisk storage unit

Create one or more storage units that reference the disk pool.

The **Disk Pool Configuration Wizard** lets you create a storage unit; therefore, you may have created a storage unit when you created a disk pool. To determine if storage units exist for the disk pool, see the **NetBackup Management > Storage > Storage Units** window of the **NetBackup Administration Console**.

See [“About AdvancedDisk storage unit recommendations”](#) on page 53.

More information about storage units is available.

See the *NetBackup Administrator's Guide, Volume I*.

To configure a storage unit from the Actions menu

- 1 In the **NetBackup Administration Console**, in the left pane, select **NetBackup Management > Storage > Storage Units**.
- 2 Click **Actions > New > Storage Unit**.

- 3 Complete the fields and set the options in the **New Storage Unit** dialog box. See [“AdvancedDisk storage unit properties”](#) on page 52.
- 4 Click **OK**.

AdvancedDisk storage unit properties

The following are the configuration options for a disk pool storage unit.

Table 3-8 AdvancedDisk storage unit properties

Property	Description
Storage unit name	Enter a unique name for the new storage unit. The name can describe the type of storage. The storage unit name is the name used to specify a storage unit for policies and schedules. The storage unit name cannot be changed after creation.
Storage unit type	Select Disk as the storage unit type.
Disk type	Select AdvancedDisk for the disk type.
Disk pool	Select the disk pool that contains the storage for this storage unit. All disk pools of the specified Disk type appear in the Disk pool list. If no disk pools are configured, no disk pools appear in the list.
Media server	<p>Specify the NetBackup media servers that can move data to and from the disk pool for this storage unit. Only the media servers that are configured as storage servers appear in the media servers list.</p> <p>Specify the media server or servers as follows:</p> <ul style="list-style-type: none">■ To allow any server in the media server list to access the disk storage (default), select Use any available media server.■ To restrict the media servers that can access the disk storage, select Only use the following media servers. Then, select the media servers to allow. The selection list includes only the media servers that are configured as storage servers for the disk pool. <p>NetBackup selects the media server to use when the policy runs.</p>
Maximum fragment size	<p>Specify the largest fragment size that NetBackup can create to store backups.</p> <p>The default maximum fragment size for a disk storage unit is 524,288 megabytes. To specify a maximum fragment size other than the default, enter a value from 20 megabytes to 524,288 megabytes.</p> <p>Backups to disk are usually fragmented to ensure that the backup does not exceed the maximum size that the file system allows.</p> <p>If an error occurs in a backup, the entire backup is discarded. The backup restarts from the beginning, not from the fragment where the error occurred. (An exception is for backups for which checkpoint and restart are enabled. In that case, fragments before and including the last checkpoint are retained; the fragments after the last checkpoint are discarded.)</p>

Table 3-8 AdvancedDisk storage unit properties (*continued*)

Property	Description
Maximum concurrent jobs	<p>Specify the maximum number of write jobs that NetBackup can send to a disk storage unit at one time. (Default: one job. The job count can range from 0 to 256.) This setting corresponds to the Maximum concurrent write drives setting for a tape storage unit.</p> <p>NetBackup queues jobs until the storage unit is available. If three backup jobs are scheduled and Maximum concurrent jobs is set to two, NetBackup starts the first two jobs and queues the third job. If a job contains multiple copies, each copy applies toward the Maximum concurrent jobs count.</p> <p>Maximum concurrent jobs controls the traffic for backup and duplication jobs but not restore jobs. The count applies to all servers in the storage unit, not per server. If you select multiple media servers in the storage unit and 1 for Maximum concurrent jobs, only one job runs at a time.</p> <p>The number to enter depends on the available disk space and the server's ability to run multiple backup processes.</p> <p>Warning: A Maximum concurrent jobs setting of 0 disables the storage unit.</p>

About AdvancedDisk storage unit recommendations

You can use storage unit properties to control how NetBackup moves backup and duplication data.

For example, you can configure a favorable client-to-server ratio for important clients by using the storage unit **Media server** setting.

See [“About configuring a favorable client-to-server ratio”](#) on page 53.

You also can use the storage unit **Maximum concurrent jobs** setting to control the backup or the duplication traffic that is sent to the media servers.

See [“About throttling traffic to the media servers”](#) on page 54.

About configuring a favorable client-to-server ratio

For a favorable client-to-server ratio, you can use one disk pool and configure multiple storage units to separate your backup traffic. Because all storage units use the same disk pool, you do not have to partition the storage.

For example, assume that you have 100 important clients, 500 regular clients, and four media servers. You can use two media servers to back up your most important clients and two media servers to back up your regular clients.

The following example describes how to configure a favorable client-to-server ratio:

- Configure the media servers for AdvancedDisk and configure the storage.
- Configure a disk pool.
- Configure a storage unit for your most important clients (such as STU-GOLD). Select the disk pool. Select **Only use the following media servers**. Select two media servers to use for your important backups.
- Create a backup policy for the 100 important clients and select the STU-GOLD storage unit. The media servers that are specified in the storage unit move the client data to the storage server.
- Configure another storage unit (such as STU-SILVER). Select the same disk pool. Select **Only use the following media servers**. Select the other two media servers.
- Configure a backup policy for the 500 regular clients and select the STU-SILVER storage unit. The media servers that are specified in the storage unit move the client data to the storage server.

Backup traffic is routed to the wanted data movers by the storage unit settings.

Note: NetBackup uses storage units for media server selection for write activity (backups and duplications) only. For restores, NetBackup chooses among all media servers that can access the disk pool.

About throttling traffic to the media servers

You can use the **Maximum concurrent jobs** settings on disk pool storage units to throttle the traffic to the media servers. Effectively, this setting also directs higher loads to specific media servers when you use multiple storage units for the same disk pool. A higher number of concurrent jobs means that the disk can be busier than if the number is lower.

For example, two storage units use the same set of media servers. One of the storage units (STU-GOLD) has a higher **Maximum concurrent jobs** setting than the other (STU-SILVER). More client backups occur for the storage unit with the higher **Maximum concurrent jobs** setting.

Creating a storage lifecycle policy

Creating a storage lifecycle policy consists of the following steps.

Table 3-9 Process to create a storage lifecycle policy

Step	Task	Reference topic
1	In the NetBackup Administration Console , select NetBackup Management > Storage > Storage Lifecycle Policies .	
2	Click Actions > New > Storage Lifecycle Policy (UNIX) or Actions > New > New Storage Lifecycle Policy (Windows).	
3	In the New Storage Lifecycle Policy dialog box, enter a Storage lifecycle policy name .	
4	Select a Data classification . (Optional.)	
5	Select the Priority for secondary operations .	This number represents the priority that jobs from secondary operations have in relationship to all other jobs. See “Storage Lifecycle Policy dialog box settings” on page 55.
6	Understand the impact of the hierarchy of operations in the SLP.	
7	Add operations to the storage lifecycle policy.	The operations act as protection instructions to NetBackup about the data. See “Adding a storage operation to a storage lifecycle policy” on page 59.
8	Click OK to create the storage lifecycle policy. NetBackup validates the SLP when it is first created and whenever it is changed.	
9	Configure a backup policy and select a storage lifecycle policy as the Policy storage .	See “Creating a backup policy” on page 62.

Storage Lifecycle Policy dialog box settings

A storage lifecycle policy consists of one or more operations.

The **New Storage Lifecycle** dialog box and the **Change Storage Lifecycle Policy** dialog box contain the following settings.

Figure 3-1 Configuration tab of the Storage Lifecycle Policy dialog box

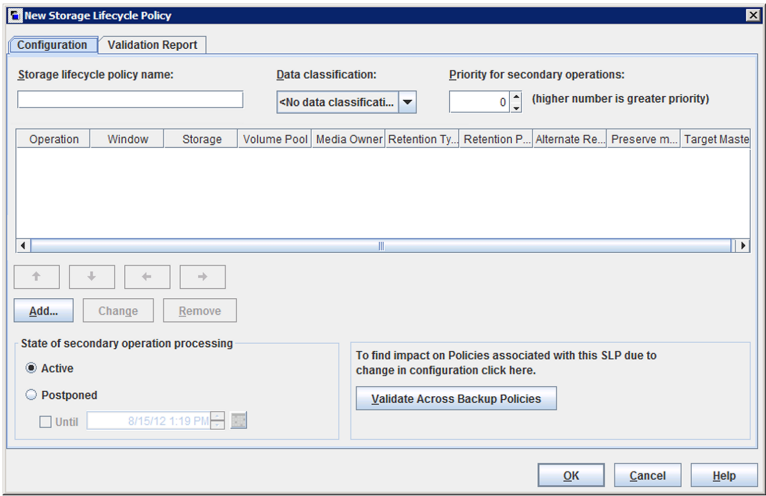


Table 3-10 Configuration tab of the Storage Lifecycle Policy dialog box

Setting	Description
Storage lifecycle policy name	The Storage lifecycle policy name describes the SLP. The name cannot be modified after the SLP is created.

Table 3-10 Configuration tab of the Storage Lifecycle Policy dialog box
(continued)

Setting	Description
Data classification	<p>Reviewers for FID3197: Is the following section about the new "Any" classification accurate and complete? Does this change any command descriptions for the NBU Commands Guide?</p> <p>The Data classification defines the level or classification of data that the SLP is allowed to process. The drop-down menu contains all of the defined classifications as well as the Any classification, which is unique to SLPs.</p> <p>The Any selection indicates to the SLP that it should preserve all images that are submitted, regardless of their data classification. It is available for SLP configuration only and is not available to configure a backup policy.</p> <p>In an Auto Image Replication configuration where the master server domains run different versions of NetBackup, see the following topic for special considerations:</p> <p>The Data classification is an optional setting.</p> <p>One data classification can be assigned to each SLP and applies to all operations in the SLP.</p> <p>If a data classification is selected (other than Any), the SLP stores only those images from the policies that are set up for that data classification. If no data classification is indicated, the SLP accepts images of any classification or no classification.</p> <p>The Data classification setting allows the NetBackup administrator to classify data based on relative importance. A classification represents a set of backup requirements. When data must meet different backup requirements, consider assigning different classifications.</p> <p>For example, email backup data can be assigned to the silver data classification and financial data backup may be assigned to the platinum classification.</p> <p>A backup policy associates backup data with a data classification. Policy data can be stored only in an SLP with the same data classification.</p> <p>Once data is backed up in an SLP, the data is managed according to the SLP configuration. The SLP defines what happens to the data from the initial backup until the last copy of the image has expired.</p>
Priority for secondary operations	<p>The Priority for secondary operations option is the priority that jobs from secondary operations have in relationship to all other jobs. The priority applies to the jobs that result from all operations except for Backup and Snapshot operations. Range: 0 (default) to 99999 (highest priority).</p> <p>For example, you may want to set the Priority for secondary operations for a policy with a gold data classification higher than for a policy with a silver data classification.</p> <p>The priority of the backup job is set in the backup policy on the Attributes tab.</p>

Table 3-10 Configuration tab of the Storage Lifecycle Policy dialog box
(continued)

Setting	Description
Operations	<p>The Operations list contains all of the operations in the SLP. Multiple operations imply that multiple copies are created.</p> <p>The list also contains the columns that display information about each operation. Note that not all columns display by default.</p> <p>For column descriptions, see the following topic:</p>
Active and Postponed	<p>Reviewers for FID2815: Is this accurate?</p> <p>The Active and Postponed options appear under State of Secondary Operation Processing and refer to the processing of all duplication operations in the SLP.</p> <p>Note: The Active and Postponed options apply to duplication operations that create tar-formatted images. For example, those created with <code>bpduplicate</code>. The Active and Postponed options do not affect the images that are duplicated as a result of OpenStorage optimized duplication, NDMP, or if one or more destination storage units are specified as part of a storage unit group.</p> <p>These options do not apply if either the source media server or the destination media server is not at NetBackup 7.6.</p> <ul style="list-style-type: none"> ■ Enable Active to let secondary operations continue as soon as possible. When changed from Postponed to Active, NetBackup continues to process the images, picking up where it left off when secondary operations were made inactive. ■ Enable Postponed to postpone the secondary operations for the entire SLP. Postponed does not postpone the creation of duplication jobs, it postpones the creation of images instead. The duplication jobs continue to be created, but they are not run until secondary operations are active again. <p>All secondary operations in the SLP are inactive indefinitely unless the administrator selects Active or until the Until option is selected and an activation date is indicated.</p>
Validate Across Backup Policies button	<p>Click this button to see how changes to this SLP can affect the policies that are associated with this SLP. The button generates a report that displays on the Validation Report tab.</p> <p>This button performs the same validation as the <code>-conflict</code> option performs when used with the <code>nbstl</code> command.</p>
Arrows	<p>Use the arrows to indicate the indentation (or hierarchy) of the source for each copy. One copy can be the source for many other copies.</p>

Adding a storage operation to a storage lifecycle policy

Use the following procedure to add a storage operation to a storage lifecycle policy:

To add a storage operation to a storage lifecycle policy

- 1 In the **NetBackup Administration Console**, select **NetBackup Management > Storage > Storage Lifecycle Policies**.
- 2 Click **Actions > New > New Storage Lifecycle Policy (Windows)** or **Actions > New > Storage Lifecycle Policy (UNIX)**.
- 3 In the **New Storage Lifecycle Policy** dialog box, enter a **Storage lifecycle policy name**.
- 4 Click **Add** to add operations to the SLP. The operations are the instructions for the SLP to follow and apply to the data that is specified in the backup policy.

To create a hierarchical SLP, select an operation to become the source of the next operation, then click **Add**.

New Storage Operation

Properties | Window

Source storage: stu_dp_msdp_bitumevm1 (Snapshot)

Operation: Backup From Snapshot

Destination Storage Attributes

Destination storage: STU-ACS-robot

Volume pool: NetBackup

Media owner: Any

Retention

Retention type: Fixed

Retention period: 2 weeks (level 1)

Duplication

Alternate read server:

☐ Postpone creation of this copy until the source copy is about to expire.

Advanced

OK Cancel Help

- 5 In the **Properties** tab of the **New Storage Operation** dialog box, select an **Operation** type. The name of the operation reflects its purpose in the SLP:

- 6 Indicate where the operation is to write the image. Depending on the operation, selections may include storage units or storage unit groups.

No BasicDisk or disk staging storage units can be used as storage unit selections in an SLP.
- 7 If the storage unit is a tape device or virtual tape library (VTL), indicate the **Volume pool** where the backups (or copies) are to be written.
- 8 Indicate the **Media owner** if the storage unit is a Media Manager type and server groups are configured.

By specifying a **Media owner**, you allow only those media servers to write to the media on which backup images for this policy are written.
- 9 Select the retention type for the operation:
- 10 Indicate an **Alternate read server** that is allowed to read a backup image originally written by a different media server.
- 11 Enable **Postpone creation of this copy until the source copy is about to expire** to defer the job. When this option is enabled, the job begins at least four hours before the source is to expire. The default of four hours can be changed by changing the **Deferred duplication offset time** parameter in the **SLP Parameters** host properties.
- 12 Click **OK** to create the storage operation.
- 13 Click the **Advanced** button to display options about how the window should behave if the window closes and a duplication operation is not yet complete.
- 14 The **Window** tab displays for the following operation types: **Backup From Snapshot**, **Duplication**, **Import**, **Index From Snapshot**, and **Replication**.

Create a window during which secondary operations can run.
- 15 Click **OK** to create the storage operation.

Capacity managed retention type for SLP operations

A **Capacity managed** operation means that NetBackup automatically manages the space on the storage, based on the **High water mark** setting for each volume. **Capacity managed** is not available to tape storage units since tape capacity is considered to be infinite.

The **High water mark** and **Low water mark** settings on the disk storage unit or disk pool determine how the space is managed.

See “[AdvancedDisk disk pool properties](#)” on page 49.

An image copy with a **Capacity Managed** retention is not eligible for expiration until its dependent copies have been created.

If space is needed for new images, NetBackup removes expired backup images from a capacity managed disk volume in two passes, as follows:

Pass one NetBackup removes any backup images that are past the **Desired cache period** setting. NetBackup removes images until the low water mark is reached or all images that are past the **Desired cache period** are removed.

Pass two Pass two processing is initiated if the outcome of the pass one processing is one of the following:

- The disk pool remains over the high water mark.
- The number of volumes in the disk pool under the high water mark is less than the number of media servers that access the disk pool.

NetBackup removes images until the low water mark is reached or all images that are not past the **Desired cache period** are removed.

An image may be deleted if it has not been duplicated for all operations in a storage lifecycle policy. If the operating system time is past the date that matches the longest retention period for an image, the image is eligible for deletion.

To see exactly when the storage reaches the low water mark value is difficult. A backup can occur at the same time as the expiration process occurs. After the backup is complete, the low water mark may be slightly greater than its lowest possible value.

The retention period for capacity managed storage is not assured as it is for a fixed retention period. The **Desired cache period** becomes a target that NetBackup tries to maintain. If the space is not required, the backup data could remain on the storage longer than the **Desired cache period** indicates.

Rules and recommendations for using the Capacity Managed retention type

Use the following recommendations and rules when configuring storage operations or when selecting the storage location for a policy:

- Symantec does not recommend allowing **Capacity Managed** images and **Fixed** retention images to be written to the same volume in a disk storage unit. The volume may fill with fixed-retention images and not allow the space management logic to operate as expected.
- All SLPs that write to a volume in a disk storage unit should write images of the same retention type: **Fixed** or **Capacity Managed**.

- Do not write images both to a volume in a disk storage unit within a storage lifecycle policy and to the same volume (by the storage unit) directly from a policy.
- Mark all disk storage units that are used with SLPs as **On demand only**.
- Check any storage unit groups to make sure that fixed and capacity-managed images cannot be written to the same volume in a disk storage unit.

Creating a backup policy

The easiest method to set up a backup policy is to use the **Policy Configuration Wizard**. This wizard guides you through the setup process by automatically choosing the best values for most configurations.

Not all policy configuration options are presented through the wizard. For example, calendar-based scheduling and the **Data Classification** setting. After the policy is created, modify the policy in the **Policies** utility to configure the options that are not part of the wizard.

Use the following procedure to create a policy using the Policy Configuration Wizard.

To create a policy with the Policy Configuration Wizard

- 1 In the **NetBackup Administration Console**, in the left pane, click **NetBackup Management**.
- 2 In the right pane, click **Create a Policy** to begin the **Policy Configuration Wizard**.
- 3 Click **Next** to start the wizard and follow the prompts.

Click **Help** on any wizard panel for assistance while running the wizard.

Use the following procedure to create a policy without using the Policy Configuration Wizard.

To create a policy without the Policy Configuration Wizard

- 1 In the **NetBackup Administration Console**, in the left pane, expand **NetBackup Management > Policies**.
- 2 On the **Actions** menu, click **New > Policy**.
- 3 Type a unique name for the new policy in the **Add a New Policy** dialog box.
- 4 If necessary, clear the **Use Policy Configuration Wizard** checkbox.

- 5 Click **OK**.
- 6 Configure the attributes, the schedules, the clients, and the backup selections for the new policy.

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Managing AdvancedDisk

This chapter includes the following topics:

- [Managing AdvancedDisk storage servers](#)
- [Managing AdvancedDisk disk pools](#)
- [About monitoring AdvancedDisk storage capacity and usage](#)
- [Monitoring NetBackup disk activity](#)
- [Viewing disk reports](#)
- [Displaying detailed AdvancedDisk storage usage information](#)
- [Displaying KMS key information for AdvancedDisk encryption](#)

Managing AdvancedDisk storage servers

After you configure AdvancedDisk, you can perform various tasks to manage storage servers.

See [“Viewing AdvancedDisk storage servers”](#) on page 66.

See [“Determining AdvancedDisk storage server state”](#) on page 66.

See [“Viewing AdvancedDisk storage server attributes”](#) on page 66.

See [“Removing AdvancedDisk storage server attributes”](#) on page 67.

See [“Removing an AdvancedDisk storage server from disk pool access”](#) on page 68.

See [“Deleting an AdvancedDisk storage server”](#) on page 68.

Viewing AdvancedDisk storage servers

Use the **NetBackup Administration Console** to view a list of storage servers already configured.

To view AdvancedDisk storage servers

- ◆ In the **NetBackup Administration Console**, in the left pane, expand **Media and Device Management > Credentials > Storage Server**.

The right pane, labeled **All Storage Servers**, shows all configured storage servers. AdvancedDisk storage servers show AdvancedDisk in the **Server Type** column.

Determining AdvancedDisk storage server state

Use the NetBackup `nbdevquery` command to determine the state of an AdvancedDisk storage server.

The following is the path to the `nbdevquery` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To determine AdvancedDisk storage server status

- ◆ Run the following command:

```
nbdevquery -liststs -stype AdvancedDisk -storage_server  
server_name -U
```

The **State** field shows either UP or DOWN.

Viewing AdvancedDisk storage server attributes

Use the NetBackup `nbdevquery` command to view the storage server attributes.

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To view AdvancedDisk storage server attributes

- ◆ Run the following command on the NetBackup master server or a storage server:

```
nbdevquery -liststs -storage_server storage_server -stype  
AdvancedDisk -U
```

The following is example output:

```
Storage Server      : advdisk_server.symantecs.com  
Storage Server Type : AdvancedDisk  
Storage Type       : Formatted Disk, Direct Attached  
State              : UP  
Flag               : PrefRestore
```

This example output is shortened; more flags may appear in actual output.

Removing AdvancedDisk storage server attributes

Use the `nbdevconfig` command to remove the following storage server attributes:

- Preferred restore server (`PrefRestore`)
- Required restore server (`ReqRestore`)
- Required duplication server (`ReqDuplicate`)

See [“About AdvancedDisk preferred or required read servers”](#) on page 20.

Attributes are added when you use the `nbdevconfig` command to configure a storage server.

See [“Configuring an AdvancedDisk storage server”](#) on page 30.

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To remove AdvancedDisk storage server attributes

- ◆ Run the following command on the NetBackup master server or on a storage server:

```
nbdevconfig -changests -storage_server storage_server -stype  
AdvancedDisk -clearattribute attribute
```

Removing an AdvancedDisk storage server from disk pool access

Use the `nbdevconfig` command to remove a storage server so that it no longer can access a disk pool. If NetBackup jobs exist that use that storage server, you cannot remove the storage server.

Warning: If you remove the only storage server, data may be lost. NetBackup cannot access the disk pool and the backup images on the disk pool.

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To remove an AdvancedDisk storage server from disk pool access

- 1 For every storage unit that specifies the **storage server** (media server) in **Use one of the following media servers**, clear the check box that specifies the media server.

This step is not required if the storage unit is configured to use any available media server.

- 2 If only one storage server exists, change the state of all disk pools on the array to DOWN. To do so, use the following command:

```
nbdevconfig -changestate -stype AdvancedDisk -dp disk_pool_name  
-state DOWN
```

- 3 Remove the storage server. The following is the command syntax:

```
nbdevconfig -changedp -stype AdvancedDisk -dp disk_pool_name  
-del_storage_servers storage_server
```

Deleting an AdvancedDisk storage server

If you delete a storage server, NetBackup removes the storage server only from your configuration.

The media server is not deleted from your configuration. To delete the media server, use the NetBackup `nbemmcmd` command.

If a disk pool is configured from the disk volumes that the storage server manages, you cannot delete the storage server.

Warning: Do not delete a storage server if its storage contains unexpired NetBackup images. If you do, data loss may occur.

To delete an AdvancedDisk storage server

- 1 In the **NetBackup Administration Console**, expand **Media and Device Management > Credentials > Storage Server**.
- 2 On the **Edit** menu, select **Delete**.
- 3 Click **Yes** in the confirmation dialog box.

Managing AdvancedDisk disk pools

After you configure AdvancedDisk, you can perform various tasks to manage your AdvancedDisk disk pools.

See [“Viewing AdvancedDisk disk pools”](#) on page 69.

See [“About changing the AdvancedDisk disk pool size”](#) on page 69.

See [“Adding volumes to an AdvancedDisk disk pool”](#) on page 70.

See [“Changing AdvancedDisk disk pool properties”](#) on page 70.

See [“Determining AdvancedDisk disk pool state”](#) on page 72.

See [“Changing AdvancedDisk disk pool state”](#) on page 72.

See [“Determining AdvancedDisk disk volume state”](#) on page 72.

See [“Changing AdvancedDisk disk volume state”](#) on page 73.

See [“Merging AdvancedDisk disk pools”](#) on page 74.

See [“Removing a volume from an AdvancedDisk disk pool”](#) on page 74.

See [“Inventorying a NetBackup disk pool”](#) on page 75.

See [“Deleting an AdvancedDisk disk pool”](#) on page 76.

Viewing AdvancedDisk disk pools

Use the **NetBackup Administration Console** to view configured disk pools.

To view disk pools

- ◆ In the **NetBackup Administration Console** tree, in the left pane, select **Media and Device Management > Devices > Disk Pools**.

The list appears in the right pane.

About changing the AdvancedDisk disk pool size

Two methods exist to change the size of a disk pool, as follows:

- If you use a logical volume manager, you can use it to change the size of a disk volume by adding LUNs to it. If you do, you must inventory the disk pool so that NetBackup reads the new size of the pool.
See [“Inventorying a NetBackup disk pool”](#) on page 75.
- If you do not use a logical volume manager, you can change the size by adding or removing volumes from the disk pool.
See [“Adding volumes to an AdvancedDisk disk pool”](#) on page 70.
See [“Removing a volume from an AdvancedDisk disk pool”](#) on page 74.

Adding volumes to an AdvancedDisk disk pool

You can expand a disk pool’s capacity by adding disk volumes to the disk pool. The names of the new volumes must differ from the names of the volumes in the current disk pool.

The NetBackup storage units that use the disk pool use the additional storage capacity automatically. You do not have to change the storage units.

(By default, NetBackup automatically increases disk pool capacity if the capacity of the underlying disk volumes increases. Similarly, NetBackup decreases the capacity of a disk pool if the underlying disk volume capacity decreases.)

Table 4-1 Add volumes process for an AdvancedDisk disk pool

Task	Procedure
Create a disk pool from the new disk volumes on the storage server.	See “Configuring an AdvancedDisk disk pool” on page 39.
Merge the disk pools.	When you merge the disk pools, specify the original disk pool as the primary one. NetBackup deletes the secondary disk pool after the merge. See “Merging AdvancedDisk disk pools” on page 74.

Changing AdvancedDisk disk pool properties

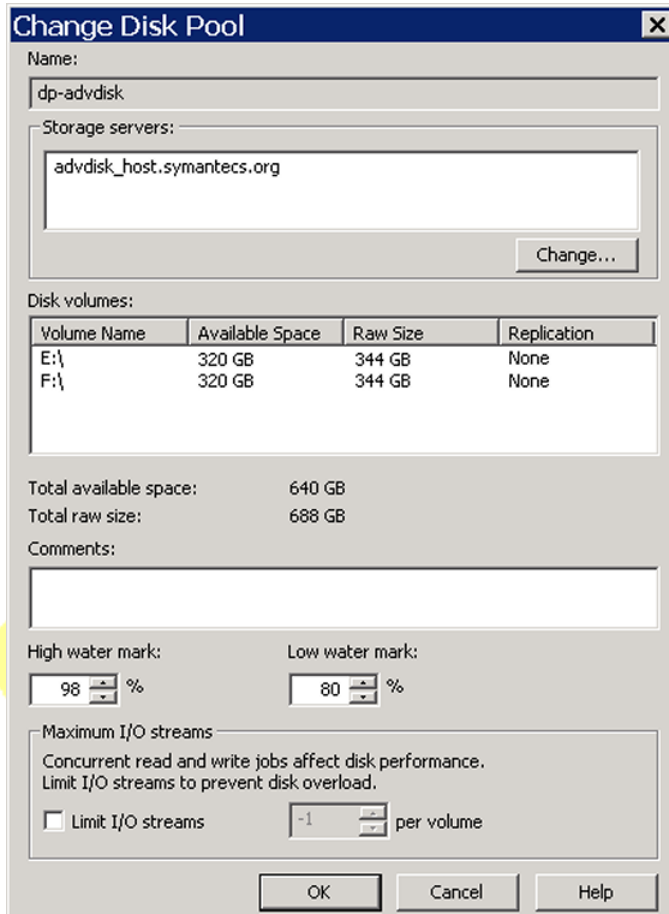
You can change the storage server for a disk pool and change the properties of a disk pool.

To add volumes to a disk pool, you must use a different procedure.

See [“Adding volumes to an AdvancedDisk disk pool”](#) on page 70.

To change disk pool properties

- 1 In the **NetBackup Administration Console**, in the left pane, expand **Media and Device Management > Devices > Disk Pools**.
- 2 In the right pane, select the disk pool that you want to change.
- 3 Click **Edit > Change**.



The **Change Disk Pool** dialog box is shown. It contains the following fields and controls:

- Name:** A text box containing "dp-advdisk".
- Storage servers:** A text box containing "advdisk_host.symantecs.org". A **Change...** button is located to the right of this box.
- Disk volumes:** A table with the following data:

Volume Name	Available Space	Raw Size	Replication
E:\	320 GB	344 GB	None
F:\	320 GB	344 GB	None
- Total available space:** 640 GB
- Total raw size:** 688 GB
- Comments:** A large empty text box.
- High water mark:** A spinner box set to 98 %.
- Low water mark:** A spinner box set to 80 %.
- Maximum I/O streams:** A section with the text "Concurrent read and write jobs affect disk performance. Limit I/O streams to prevent disk overload." and a checkbox labeled **Limit I/O streams** which is currently unchecked. To the right of the checkbox is a spinner box set to -1 per volume.
- At the bottom are **OK**, **Cancel**, and **Help** buttons.

- 4 In the **Change Disk Pool** dialog box, change storage servers or the properties. See ["AdvancedDisk disk pool properties"](#) on page 49.
- 5 Click **OK**.

Determining AdvancedDisk disk pool state

Disk pool state is UP or DOWN.

To determine AdvancedDisk disk pool state

- 1 In the **NetBackup Administration Console**, in the left pane, select **Media and Device Management > Device Monitor**.
- 2 Select the **Disk Pools** tab.
- 3 The state is displayed in the **Status** column.

Changing AdvancedDisk disk pool state

Disk pool state is UP or DOWN.

To change the state to DOWN, the disk pool must **not** be busy. If backup jobs are assigned to the disk pool, the state change fails. **Cancel** the backup jobs or wait until the jobs complete.

To change AdvancedDisk disk pool state

- 1 In the **NetBackup Administration Console**, in the left pane, select **Media and Device Management > Device Monitor**.
- 2 Select the **Disk Pools** tab.
- 3 Select the disk pool.
- 4 Select either **Actions > Up** or **Actions > Down**.

Determining AdvancedDisk disk volume state

Use the NetBackup `nbdevquery` command to determine the state of the volumes in AdvancedDisk disk pools.

The following is the path to the `nbdevquery` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To determine AdvancedDisk disk volume state

- 1 Determine the name of the disk volume. The following command lists the volumes in the specified disk pool:

```
nbdevquery -listdv -stype AdvancedDisk -dp disk_pool_name
```

To display the disk volumes in all AdvancedDisk disk pools, omit the `-dp` option.

- 2 Display the volume state by using the following command:

```
nbdevquery -listdv -dv disk_volume -stype AdvancedDisk
```

The *state* is either UP or DOWN.

Changing AdvancedDisk disk volume state

Use the NetBackup commands to change disk volume state. The state is UP or DOWN.

To change the state to DOWN, the disk pool in which the volume resides must not be busy. If backup jobs are assigned to the disk pool, the state change fails. Cancel the backup jobs or wait until the jobs complete.

NetBackup jobs still read from and write to a disk pool that has a downed volume, but the downed volume is unavailable.

The `nbdevconfig` command and the `nbdevquery` command reside in the following directory:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\netbackup\bin\admincmd`

To change the AdvancedDisk disk volume state

- 1 Determine the name of the disk volume. The following command lists all volumes in the specified disk pool:

```
nbdevquery -listdv -stype AdvancedDisk -dp disk_pool_name
```

To display the disk volumes in all disk pools, omit the `-dp` option.

- 2 Change the disk volume state. The following is the command syntax:

```
nbdevconfig -changestate -stype AdvancedDisk -dp disk_pool_name  
-dv vol_name -state state
```

The *state* is either UP or DOWN.

Merging AdvancedDisk disk pools

Use the NetBackup `nbdevconfig` command to merge existing disk pools.

NetBackup updates the catalog records to show the correct location of the backup images in those disk pools.

If the secondary disk pool is referenced by storage units, you must first delete those storage units.

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\netbackup\bin\admincmd`

To merge AdvancedDisk disk pools

- 1 Change the state of each disk pool to DOWN.

See [“Changing AdvancedDisk disk pool state”](#) on page 72.

If backup jobs are assigned to a disk pool, the state change fails. Cancel the backup jobs or wait until the jobs complete.

- 2 Merge the disk pools. The following is the command syntax. The primary disk pool is the one you want to retain; `nbdevconfig` deletes the secondary disk pool after the merge.

```
nbdevconfig -mergedps -stype AdvancedDisk -primarydp
disk_pool_name -secondarydp disk_pool_name
```

- 3 Change the state of the primary disk pool to UP.

See [“Changing AdvancedDisk disk pool state”](#) on page 72.

Removing a volume from an AdvancedDisk disk pool

Use the `nbdevconfig` command to remove a volume from a disk pool. The following are the prerequisites:

- NetBackup image fragments cannot exist on the disk volume.
- NetBackup jobs cannot be active on the disk volume.

By default, NetBackup automatically decreases disk pool capacity if you remove a disk volume.

The following is the path to the `nbdevconfig` command:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\NetBackup\bin\admincmd`

To remove a volume from an AdvancedDisk disk pool

- 1 Change the disk volume state to DOWN.
See [“Changing AdvancedDisk disk volume state”](#) on page 73.
- 2 Change the disk pool state to DOWN.
See [“Changing AdvancedDisk disk pool state”](#) on page 72.
- 3 Remove the volume by using the `nbdevconfig` command. The following is the command syntax:

```
nbdevconfig -deletedv -stype AdvancedDisk -dp disk_pool_name -dv vol_name
```
- 4 Change the disk pool state to UP.
See [“Changing AdvancedDisk disk pool state”](#) on page 72.

Inventorying a NetBackup disk pool

An inventory of a NetBackup disk pool reads the capacity of the disk volumes in the pool. An inventory operation lets you update NetBackup with the new capacity values if you do the following:

- Increase or decrease the size of the disk volumes in a disk pool.
- Add volumes to or remove volumes from a disk pool.

How you increase or decrease the underlying storage capacity depends on your storage implementation. You must complete that process before you inventory the disk pool.

To inventory a NetBackup disk pool

- 1 in the **NetBackup Administration Console**, select **Media and Device Management > Devices > Disk Pools**.
- 2 On the **Actions** menu, select **Inventory Disk Pools**.
- 3 In the **Inventory Disk Pool** dialog box, select the disk pool to inventory and then click **Start Inventory**.
- 4 To update the NetBackup catalog with the capacity values returned by the inventory, click **Update Configuration**.
- 5 To inventory another disk pool, go to step 3.
- 6 To exit, click **Close**.

Deleting an AdvancedDisk disk pool

If you delete a disk pool, NetBackup removes it from your configuration.

If a disk pool is the storage destination of a storage unit, you must first delete the storage unit.

Warning: Do not delete a disk pool that contains unexpired NetBackup images; if you do, data loss may occur.

To delete an AdvancedDisk disk pool

- 1 In the **NetBackup Administration Console**, in the left pane, select **Media and Device Management > Devices > Disk Pools**.
- 2 Select a disk pool
- 3 Click **Edit > Delete**.
- 4 In the **Delete Disk Pool** dialog box, verify that the disk pool is the one you want to delete and then click **OK**.

About monitoring AdvancedDisk storage capacity and usage

Table 4-2 describes the ways that you can monitor storage capacity and usage.

Table 4-2 Monitor storage capacity and usage

What	Description
The NetBackup Administration Console Disk Pools window	The Disk Pools window displays a value that was stored when NetBackup polled the disk pools. NetBackup polls every 5 minutes; therefore, the value may not be as current as the value that is displayed in the Storage Server window. To display the window, select Media and Device Management > Devices > Disk Pools .
The NetBackup Disk Pool status report	See “ Viewing disk reports ” on page 78.
NetBackup Administration Console Storage Server window	The storage server view displays real-time values. To display the window, select Media and Device Management > Credentials > Storage Servers .

Table 4-2 Monitor storage capacity and usage (*continued*)

What	Description
The NetBackup License Keys dialog box	<p>The summary of active capacity-based license features in the NetBackup License Keys dialog box. The summary displays the storage capacity for which you are licensed and the capacity used. It does not display the amount of physical storage space.</p> <p>To open the dialog box, select Help > License Keys in the NetBackup Administration Console.</p>
The <code>nbdevquery</code> command	See “Displaying detailed AdvancedDisk storage usage information” on page 79.

The NetBackup OpsCenter also provides information about storage capacity and usage.

See the *NetBackup OpsCenter Administrator's Guide*.

Monitoring NetBackup disk activity

You can monitor NetBackup disk-related activity and status by viewing the NetBackup log files.

Some NetBackup commands or processes write messages to their own log files. Other processes use Veritas unified log (VxUL) files. VxUL uses a standardized name and file format for log files. An originator ID (OID) identifies the process that writes the log messages.

[Table 4-3](#) shows the NetBackup logs for disk-related activity.

The messages that begin with a `sts_` prefix relate to the interaction with the storage vendor software plug-in. Most interaction occurs on the NetBackup media servers.

Table 4-3 NetBackup logs

Activity	VxUL OID	Processes that use the ID
Backups and restores	N/A	<p>Messages appear in the log files for the following processes:</p> <ul style="list-style-type: none"> ■ The <code>bpbm</code> backup and restore manager ■ The <code>bpdbm</code> database manager ■ The <code>bpdm</code> disk manager ■ The <code>bptm</code> tape manager for I/O operations

Table 4-3 NetBackup logs (*continued*)

Activity	VxUL OID	Processes that use the ID
Backups and restores	117	The nbjbm job manager.
Device configuration	111	The nbemm process.
Device configuration	178	The Disk Service Manager process that runs in the Enterprise Media Manager (EMM) process.
Device configuration	202	The Storage Server Interface process that runs in the Remote Manager and Monitor Service. RMMS runs on media servers.
Device configuration	230	The Remote Disk Service Manager interface (RDSM) that runs in the Remote Manager and Monitor Service. RMMS runs on media servers.

To view and manage VxUL log files, you must use NetBackup log commands. Information about how to use and manage logs on NetBackup servers is available. See the *NetBackup Troubleshooting Guide*.

Viewing disk reports

The NetBackup disk reports include information about the disk pools, disk storage units, disk logs, images that are stored on disk media, and storage capacity.

[Table 4-4](#) describes the disk reports available.

Table 4-4 Disk reports

Report	Description
Images on Disk	<p>The Images on Disk report generates the image list present on the disk storage units that are connected to the media server. The report is a subset of the Images on Media report; it shows only disk-specific columns.</p> <p>The report provides a summary of the storage unit contents. If a disk becomes bad or if a media server crashes, this report can let you know what data is lost.</p>

Table 4-4 Disk reports (continued)

Report	Description
Disk Logs	The Disk Logs report displays the media errors or the informational messages that are recorded in the NetBackup error catalog. The report is a subset of the Media Logs report; it shows only disk-specific columns.
Disk Storage Unit	<p>The Disk Storage Unit Status report displays the state of disk storage units in the current NetBackup configuration.</p> <p>For disk pool capacity, see the disk pools window in Media and Device Management > Devices > Disk Pools.</p> <p>Multiple storage units can point to the same disk pool. When the report query is by storage unit, the report counts the capacity of disk pool storage multiple times.</p>
Disk Pool Status	The Disk Pool Status report displays the state of disk pool storage units. This report displays only when an Enterprise Disk Option license is installed.

To view disk reports

- 1 In the **NetBackup Administration Console**, in the left pane, expand **NetBackup Management > Reports > Disk Reports**.
- 2 Select the name of a disk report.
- 3 In the right pane, select the report settings.
- 4 Click **Run Report**.

Displaying detailed AdvancedDisk storage usage information

The NetBackup `nbdevquery` command lets you display detailed information about the storage use of disk pools and disk volumes.

To determine the disk volume storage usage

- 1 Determine the names of all AdvancedDisk disk pools in your NetBackup domain:

```
nbdevquery -listdp -stype AdvancedDisk
```

```
V7.5 DiskPool-AdvDisk 1 201.00 201.00 3 98 80 -1 adv_server.symantecs.org
```

- 2 Determine disk volume names in the AdvancedDisk disk pool:

```
nbdevquery -listdv -stype AdvancedDisk -dp disk_pool_name
```

Replace *disk_pool_name* with the name of the disk pool for which you want to determine the volume names.

The following is example output:

```
V7.5 DiskPool-AdvDisk AdvancedDisk /advdisk_disc1 @aaaak 0.00 0.00 100 1 0
V7.5 DiskPool-AdvDisk AdvancedDisk /advdisk_disc2 @aaaal 200.00 79.75 60 1
V7.5 DiskPool-AdvDisk AdvancedDisk /advdisk_disc3 @aaaam 1.00 1.00 0 1 0 1
```

- 3 Display the usage information for a specific AdvancedDisk disk volume:

```
nbdevquery -listdv -stype AdvancedDisk -dp disk_pool_name -dv  
disk_volume_name -D
```

Replace *disk_pool_name* with the name of the disk pool for which you want to determine the volume names. Replace *disk_volume_name* with the name of the disk volume for which you want to display usage information.

The output from the command includes the following fields:

```
total_capacity      : 214748364800
total_phys_capacity : 214748364800
free_space          : 85625798656
free_phys_space     : 85625798656
potential_free_space : 0
committed_space     : 0
precommitted_space  : 0
```

See [“NetBackup disk volume capacity and usage reference”](#) on page 80.

NetBackup disk volume capacity and usage reference

NetBackup determines the space available for backups on a volume by using the following formula:

Available space equals `free_space` plus `potential_free_space` minus `committed_space`.

The `potential_free_space` value is used only for a disk volume that is capacity managed. A disk volume is capacity managed when its disk pool is capacity managed. A disk pool is capacity managed when it is a destination in a storage lifecycle policy and the **Retention Type** is **Capacity managed**.

Table 4-5 describes the capacity values that NetBackup uses for space calculations.

Table 4-5 Disk capacity values

Field	Description
<code>total_capacity</code>	The total size of the disk. This value is derived from the file system and is updated at 1-minute intervals.
<code>total_phys_capacity</code>	For the purposes of AdvancedDisk, <code>total_capacity</code> and <code>total_phys_capacity</code> should have the same values.
<code>free_space</code>	The amount of free space on the disk. This value is derived from the file system and is updated at 1-minute intervals.
<code>free_phys_space</code>	For the purposes of AdvancedDisk, <code>free_space</code> and <code>free_phys_space</code> should have the same values.
<code>potential_free_space</code>	The sum of all of the fragments on the disk that NetBackup duplicated as part of a storage lifecycle policy and that are eligible for expiration. A fragment becomes eligible for expiration when it has been duplicated successfully. NetBackup calculates <code>potential_free_space</code> at the end of duplication sessions and expiration sessions. The <code>potential_free_space</code> value may become stale between computations. However, the next computation provides an accurate value.

Table 4-5 Disk capacity values (continued)

Field	Description
committed_space	<p>The estimated size of all of the jobs-in-progress that write to the volume, based on the following:</p> <ul style="list-style-type: none">■ For an existing backup, NetBackup uses the size of the most recent backup plus 20%.■ For a new backup (including user backups), NetBackup uses the capacity of the disk volume over the high-water mark. For example, on a 2-TB volume that has a 98% high-water mark, NetBackup uses 40 GBs.■ For duplication jobs, NetBackup uses the size of the source image.
precommitted_space	<p>The <code>precommitted_space</code> is a helper value for <code>committed_space</code>. NetBackup decrements the value while a backup job runs. Each time NetBackup updates the capacity and free space information, NetBackup updates the value of <code>committed_space</code> to the current value of <code>precommitted_space</code>.</p> <p>This process ensures that all capacity-related values are updated at the same time to provide the most accurate usage description for the disk volume.</p>

Displaying KMS key information for AdvancedDisk encryption

You can use the `nbkmsutil` command to list the following information about the key groups and the key records:

- Key groups
- Keys

Note: Symantec recommends that you keep a record key information. The key tag that is listed in the output is necessary if you need to recover keys.

The following are the directories in which the `nbkmsutil` command resides:

- UNIX: `/usr/opensv/netbackup/bin/admincmd`
- Windows: `install_path\Veritas\NetBackup\bin\admincmd`

To display KMS key group information

- ◆ To list all of the key groups, use the `nbkmsutil` with the `-listkgs` option. The following is an example:

```
nbkmsutil -listkgs

Key Group Name      : AdvDiskServer1.symantecs.org:AdvDisk_Volume
Supported Cipher    : AES_256
Number of Keys      : 1
Has Active Key      : Yes
Creation Time       : Tues Jan 01 01:00:00 2013
Last Modification Time: Tues Jan 01 01:00:00 2013
Description         : -
```

To display KMS key information

- ◆ To list all of the keys that belong to a key group name, use the `nbkmsutil` with the `-listkeys` and `-kgname` options. The following is an example:

```
nbkmsutil -listkeys -kgname AdvDiskServer1.symantecs.org:AdvDisk_Volume

Key Group Name      : AdvDiskServer1.symantecs.org:AdvDisk_Volume
Supported Cipher    : AES_256
Number of Keys      : 1
Has Active Key      : Yes
Creation Time       : Wed Nov 30 16:53:48 2011
Last Modification Time: Wed Nov 30 16:53:48 2011
Description         : -

Key Tag            : 867d710aa7f4c64dcdd2cec6...cced0c831c1812c510acd05
Key Name           : dp-key
Current State      : ACTIVE
Creation Time      : Tues Jan 01 01:00:00 2013
Last Modification Time: Tues Jan 01 01:00:00 2013
Description        : -

Number of Keys: 1
```

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Troubleshooting AdvancedDisk

This chapter includes the following topics:

- [AdvancedDisk troubleshooting](#)
- [Resolving an incorrect storage type problem](#)

AdvancedDisk troubleshooting

The following may help you troubleshoot AdvancedDisk:

Table 5-1 AdvancedDisk troubleshooting

Problem	Solution
Unable to access storage	<p>If NetBackup cannot access the storage, one possible cause is that the storage server was created with the incorrect <code>nbdevconfig</code> storage type (<code>-st</code>) value. An AdvancedDisk storage server <code>-st</code> value is 5 (formatted disk, directly attached); values other than 5 are incorrect.</p> <p>More procedural information is available about resolving this problem.</p> <p>See “Resolving an incorrect storage type problem” on page 86.</p>
Multiple storage servers on Windows	<p>AdvancedDisk does not support Common Internet File System (CIFS). If you try to configure multiple storage servers, NetBackup returns the following message:</p> <pre>DSM does not support to use multiple Windows Storage Servers for server type: AdvancedDisk.</pre>
Volume state changes to DOWN when volume is unmounted	<p>If a volume becomes unmounted, NetBackup changes the volume state to DOWN. NetBackup jobs that require that volume fail.</p> <p>To change the volume state to UP, mount the file system</p>

Table 5-1 AdvancedDisk troubleshooting (continued)

Problem	Solution
Disk failure - AdvancedDisk	<p>If recovery mechanisms do not protect a disk that fails, the backup images on that disk are lost. Operating system read and write errors may occur for the volume that represents the disk. NetBackup cannot use that volume because of the errors, and NetBackup jobs may fail.</p> <p>To prevent NetBackup from trying to read from or write to the disk, you must change the volume state to DOWN in NetBackup. If the volume represents other disks that still function, those disks are not available because the volume state is DOWN. You may be able to read from the volume by mounting it manually. If so, you may be able to recover image fragments from any disks that did not fail.</p> <p>If you replace a failed disk, you can use the same mount point for the replacement disk. Change the volume state to UP, and NetBackup uses that volume again.</p> <p>Any valid backup images on that volume are available for restores.</p>

Resolving an incorrect storage type problem

First determine the storage server value to verify that the storage server was created with the incorrect `nbdevconfig` storage type value. Then proceed to resolving the problem if necessary.

To determine the storage server value

- ◆ Invoke the following command on the master server or a media server that functions as a storage server:

The following output shows an incorrect value for AdvancedDisk:

```
Storage Server      : halo
Storage Server Type : AdvancedDisk
Storage Type        : Formatted Disk, Network Attached
```

To resolve an incorrect storage type problem

- 1 Delete all disk pools that use the storage server.
 - 2 Delete the storage server.
 - 3 Reconfigure the storage server.
 - 4 Recreate the disk pools.
 - 5 If necessary, specify the new disk pools in the storage units.
- If you recreated the disk pools with the same names as the ones you deleted, this step is not necessary.

See [“AdvancedDisk troubleshooting”](#) on page 85.

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Storage Server Configuration Wizard

This chapter includes the following topics:

- [Reviewers: about these wizard help topics](#)
- [About the Storage Server Configuration Wizard](#)
- [Select Storage Type panel](#)
- [Add Storage Server panel \(AdvancedDisk\)](#)
- [AdvancedDisk Configuration Summary panel](#)
- [AdvancedDisk Storage Server Creation Progress panel](#)
- [Finished panel](#)

Reviewers: about these wizard help topics

The topics in this chapter are the actual help screens that users see when they click a Help button on a wizard screen. Please review these topics.

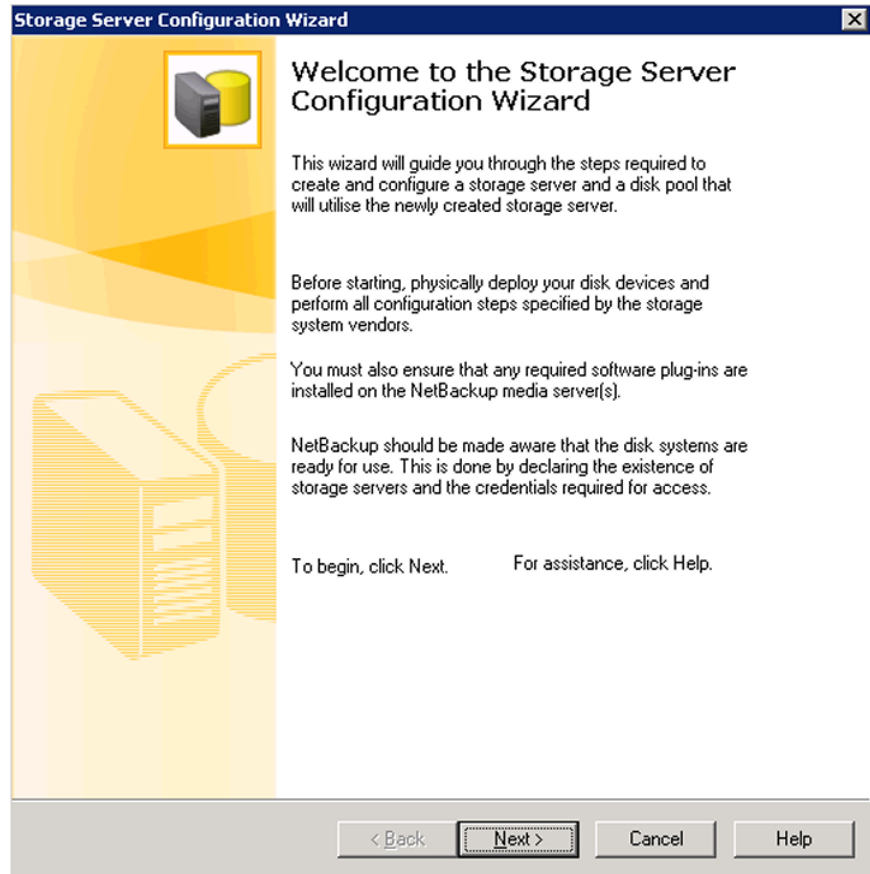
These wizard help topics are included in this guide only for review purposes.

*These wizard help topics will ***never*** appear in any guide that customers see.*

Also, the screen shots are not included in the wizard deliverable; they are included here for reference only. Please tell me if a wizard panel has been updated.

About the Storage Server Configuration Wizard

Figure 6-1 Screen shots for reference only; they do not appear in the help.

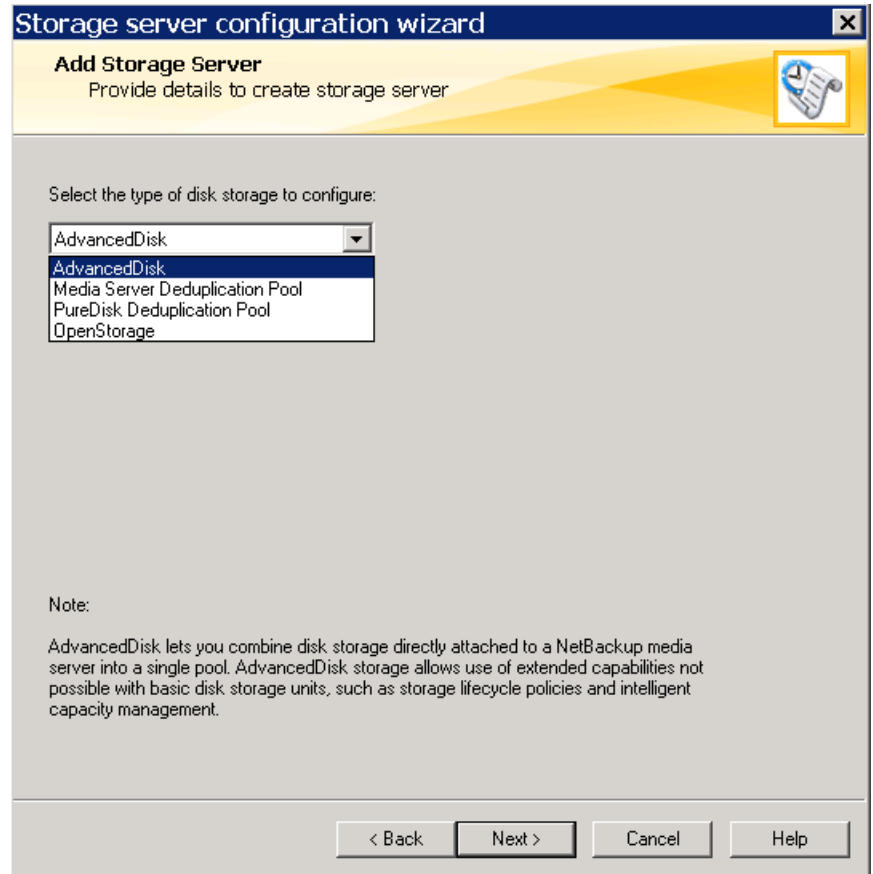


Use the **Storage Server Configuration Wizard** to configure storage servers for the following NetBackup disk types:

- **AdvancedDisk**
- **Media Server Deduplication Pool**
- **OpenStorage**
- **PureDisk Deduplication Pool**

Select Storage Type panel

Figure 6-2 Screen shots for reference only; they do not appear in the help.



Select the type of storage to configure, as follows:

AdvancedDisk

AdvancedDisk uses the storage on which a NetBackup media server has a file system mount.

See [“About AdvancedDisk file system requirements”](#) on page 17.

To share the storage among multiple media servers, run the wizard for each media server. Each media server must have the same mount point to the storage.

See [“About AdvancedDisk storage servers”](#) on page 19.

Media Server Deduplication Pool

Media Server Deduplication Pool uses storage attached to a NetBackup media server.

MSDP supports the replication to a remote master domain process.

OpenStorage

OpenStorage uses third-party vendor storage available through the Symantec OpenStorage API.

Select **OpenStorage** for the following storage types:

- For backups to disk appliance storage.
The storage vendor plug-in must be installed on the NetBackup media servers that connect to the storage.
- For snapshots using the NetBackup Replication Director.
For snapshot replication, the plug-in is packaged and installed with NetBackup.

The storage host must be installed, configured, and operational.

PureDisk Deduplication Pool

PureDisk Deduplication Pool uses an existing PureDisk storage pool as the storage destination.

Add Storage Server panel (AdvancedDisk)

Figure 6-3 Screen shots for reference only; they do not appear in the help.

Storage Server Configuration Wizard

Add Storage Server
Provide details to create storage server

Storage Server type:

Select media server*:

* The media server selected above will be marked in NetBackup's device database as a media server that hosts AdvancedDisk storage.

< Back Next > Cancel H

AdvancedDisk only.

Select the media server that has a file system mount on the storage. By default, the first media server is selected.

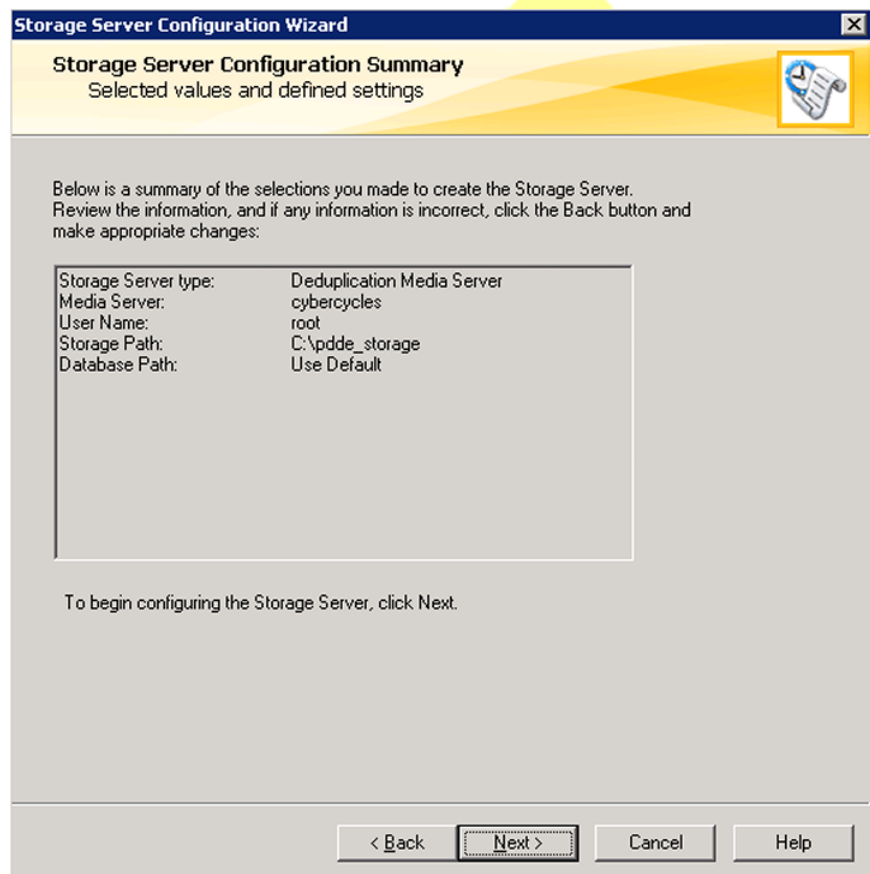
You can configure multiple storage servers for the same storage, as follows:

- Invoke the wizard for each storage server that you want to configure.
- Exit the wizard after you create each storage server (until the last storage server that you want to create). The wizard **Finished** panel lets you exit or continue to the **Disk Pool Configuration Wizard**.
- After you create the last storage server, continue to the **Disk Pool Configuration Wizard**.

See [“About AdvancedDisk storage servers”](#) on page 19.

AdvancedDisk Configuration Summary panel

Figure 6-4 Screen shots for reference only; they do not appear in the help.



AdvancedDisk only.

Review the summary of the storage server attributes.

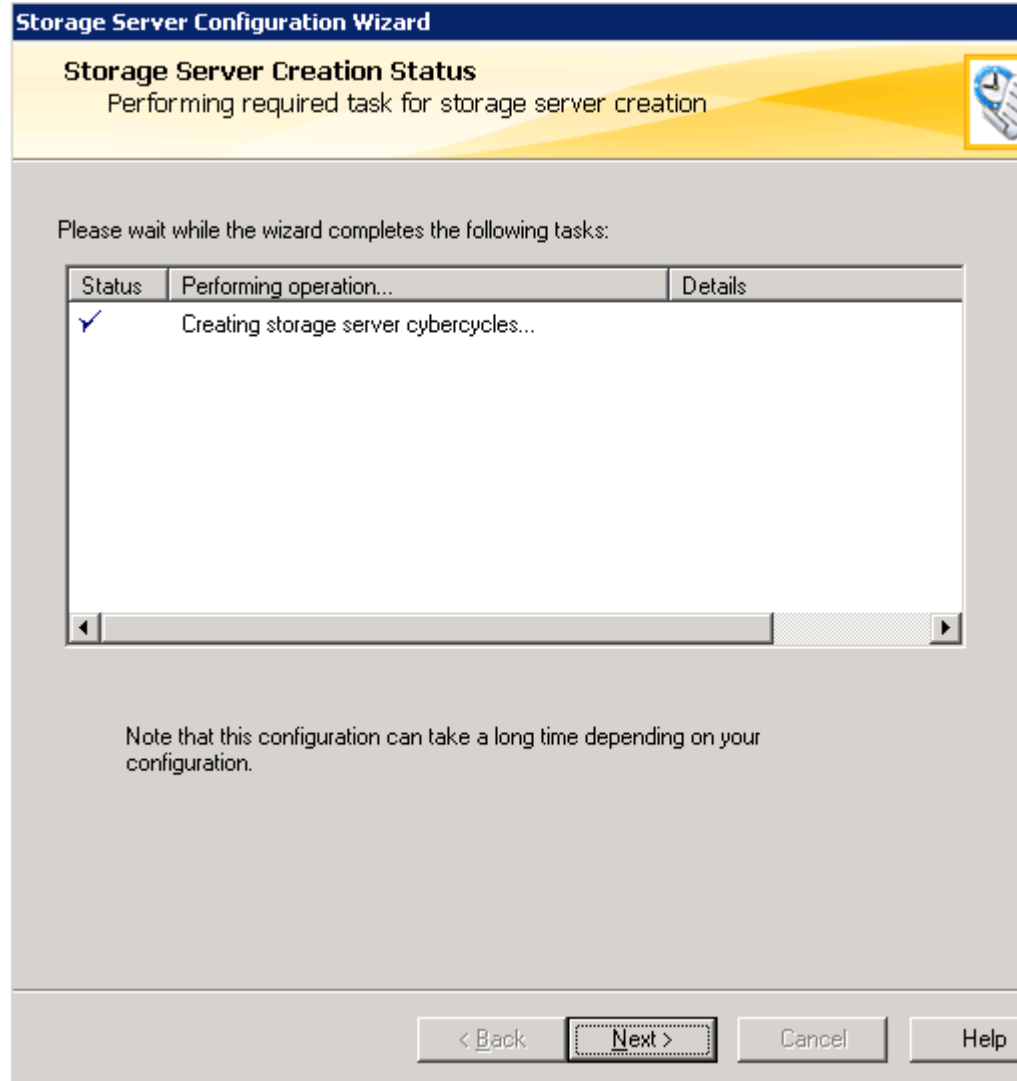
To change attributes, click **Back** to return the attribute to change.

To create the storage server, click **Next**.

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AdvancedDisk Storage Server Creation Progress panel

Figure 6-5 Screen shots for reference only; they do not appear in the help.

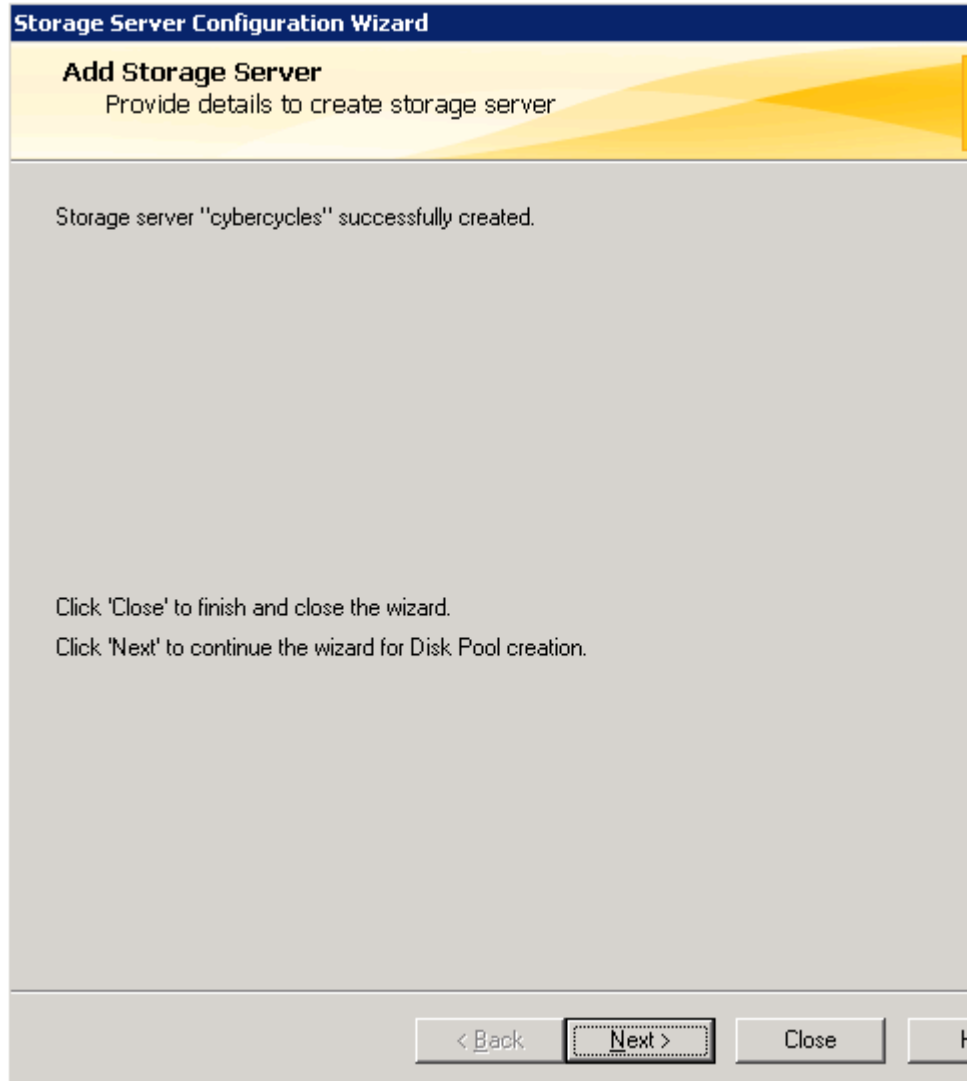


AdvancedDisk only.

Use this panel to monitor the status as NetBackup creates the storage server. Each step in the process is displayed. After NetBackup creates the storage server, the wizard displays a successfully created message on the panel.

Finished panel

Figure 6-6 Screen shots for reference only; they do not appear in the help.



The wizard created the storage server successfully.

Click **Next** to continue to the **Disk Pool Configuration Wizard**.

Click **Close** to exist the wizard.

DRAFT

Disk Pool Configuration Wizard

This chapter includes the following topics:

- [Reviewers: about these wizard help topics](#)
- [About the Disk Pool Configuration Wizard](#)
- [Disk Pool panel](#)
- [Select Storage Server panel](#)
- [Select Volumes panel](#)
- [Disk Pool Properties panel](#)
- [Summary panel](#)
- [Confirmation panel](#)
- [Storage Unit Option panel](#)
- [Create Storage Unit panel](#)
- [Finish panel](#)

Reviewers: about these wizard help topics

The topics in this chapter are the actual help screens that users see when they click a Help button on a wizard screen. Please review these topics.

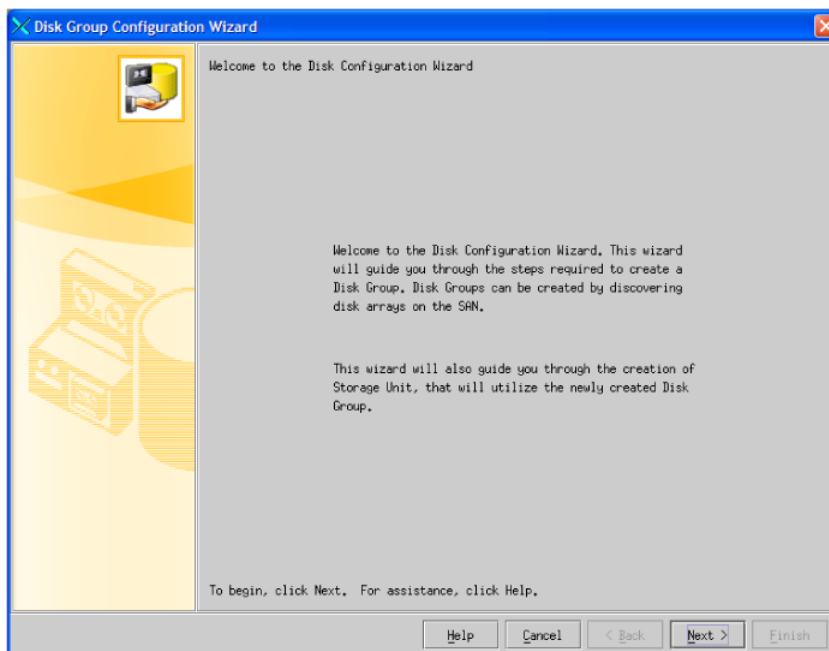
These wizard help topics are included in this guide only for review purposes.

*These wizard help topics will **never** appear in any guide that customers see.*

Also, the screen shots are not included in the wizard deliverable; they are included here for reference only. Please tell me if a wizard panel has been updated.

About the Disk Pool Configuration Wizard

Figure 7-1 [Writer's reference only]



Use the **Disk Pool Configuration Wizard** to create pools of disk volumes for backups by one or more media servers.

The wizard action depends on the NetBackup disk type, as follows:

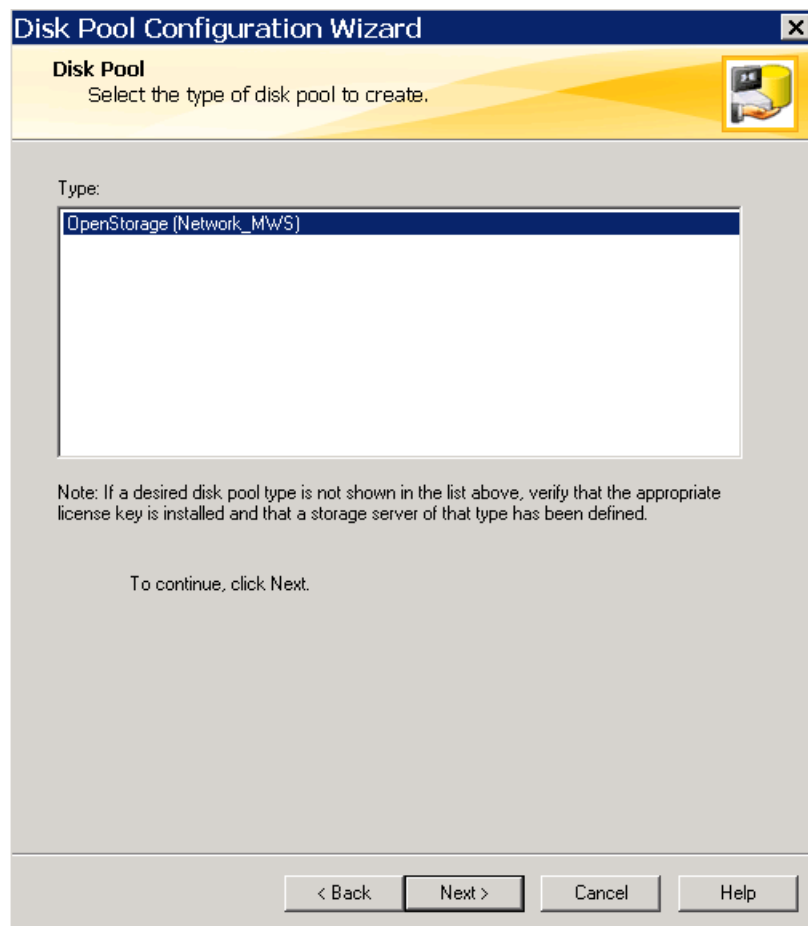
- | | |
|----------------------|---|
| AdvanceDisk | The wizard discovers the disk volumes that are attached to a NetBackup media server. (Attached means a file system mount on the storage.)

Use this wizard for AdvancedDisk |
| Cloud Storage | The wizard discovers the disk volumes that are exposed to NetBackup by the vendor's host. The host is configured as a storage server in NetBackup. |

- OpenStorage (AdvancedDisk_crypt)** For this type of disk pool, you must use the `nbdevconfig` command to configure disk pools.
- See “[About AdvancedDisk disk pools](#)” on page 37.
- See “[Configuring an AdvancedDisk disk pool](#)” on page 39.
- OpenStorage** The wizard discovers the disk volumes that are used for the following purposes:
- For backups to NetBackup storage.
 - For backups to disk appliance storage.
 - For snapshots to disk appliance storage using the NetBackup Replication Director.
- PureDisk** The wizard discovers the storage for one of the following disk pool types:
- A **Media Server Deduplication Pool** on the disk storage that is attached to a NetBackup deduplication media server.
 - A **PureDisk Deduplication Pool**, which represents a PureDisk storage pool.

Disk Pool panel

Figure 7-2 [Writer's reference only]



Select the type of disk pool to create from the following types. A disk pool type is available only if a storage server of that type exists.

AdvancedDisk

Select this option to create a disk pool on the disk storage that is attached to a NetBackup media server. (Attached means a file system mount on the storage.)

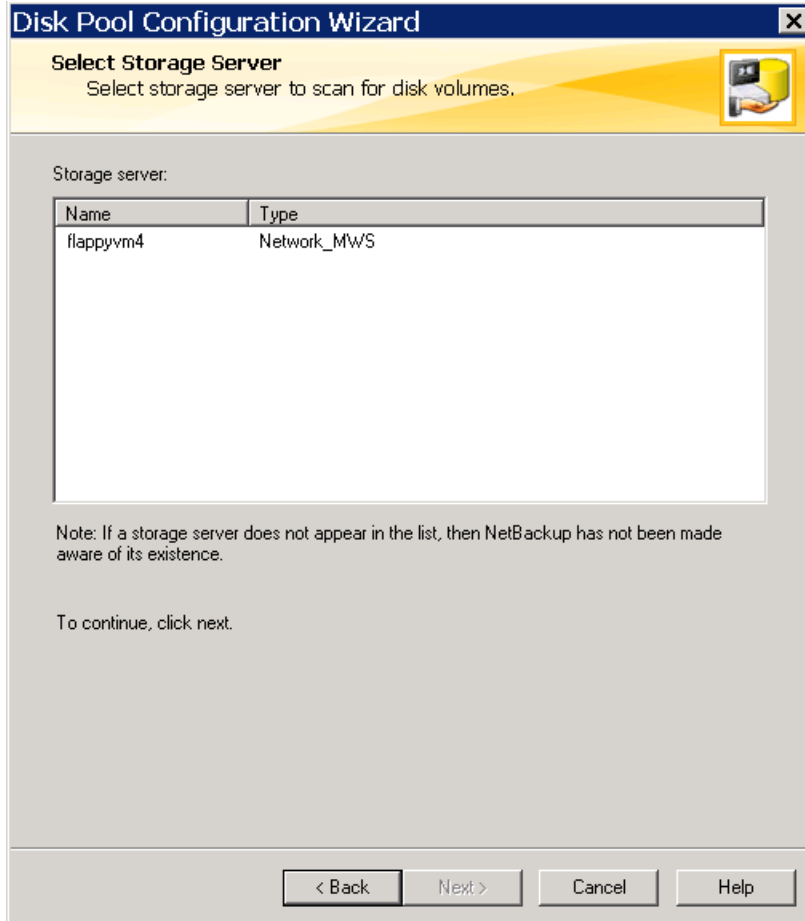
See [“About AdvancedDisk disk pools”](#) on page 37.

See [“Configuring an AdvancedDisk disk pool”](#) on page 39.

Cloud Storage (<i>Solution</i>)	<p>Select this option for backups to cloud storage. <i>Solution</i> represents the string that identifies your cloud storage provider. If you configured the storage server for encryption, _crypt is appended to the string.</p> <p>The wizard discovers the disk volumes that are exposed to NetBackup by the vendor's host. The host is configured as a storage server in NetBackup.</p>
OpenStorage (AdvancedDisk_crypt)	<p>For an AdvancedDisk disk pool with encryption, you must use the <code>nbdevconfig</code> command to configure the disk pool.</p> <p>See “About AdvancedDisk disk pools” on page 37.</p> <p>See “Configuring an AdvancedDisk disk pool” on page 39.</p>
OpenStorage (<i>Solution</i>)	<p>Select the OpenStorage (<i>Solution</i>) type for disk pools for backups or snapshots to disk appliance storage.</p> <p><i>Solution</i> represents one of the following strings:</p> <ul style="list-style-type: none">■ For backups, the vendor provides the string for <i>Solution</i>. The string may represent the vendor, the vendor device, or something else that is meaningful.■ For the snapshots that use the NetBackup Replication Director, the string is the Network_ prefix and a string that identifies the vendor, such as NTAP.■ For NetBackup storage, select one of the following:<ul style="list-style-type: none">■ For non-encrypted storage, select the Type that includes SureScale or SureScale_crypt.■ For encrypted storage, select the Type that includes SureScale_crypt.
PureDisk	<p>Select this option to create one of the following disk pool types:</p> <ul style="list-style-type: none">■ A Media Server Deduplication Pool on the disk storage that is attached to a NetBackup deduplication media server.■ A PureDisk Deduplication Pool, which represents a PureDisk storage pool.

Select Storage Server panel

Figure 7-3 [Writer's reference only]



You configured the storage server earlier in the configuration process.
What you select for the storage server depends on the disk type, as follows:

AdvancedDisk

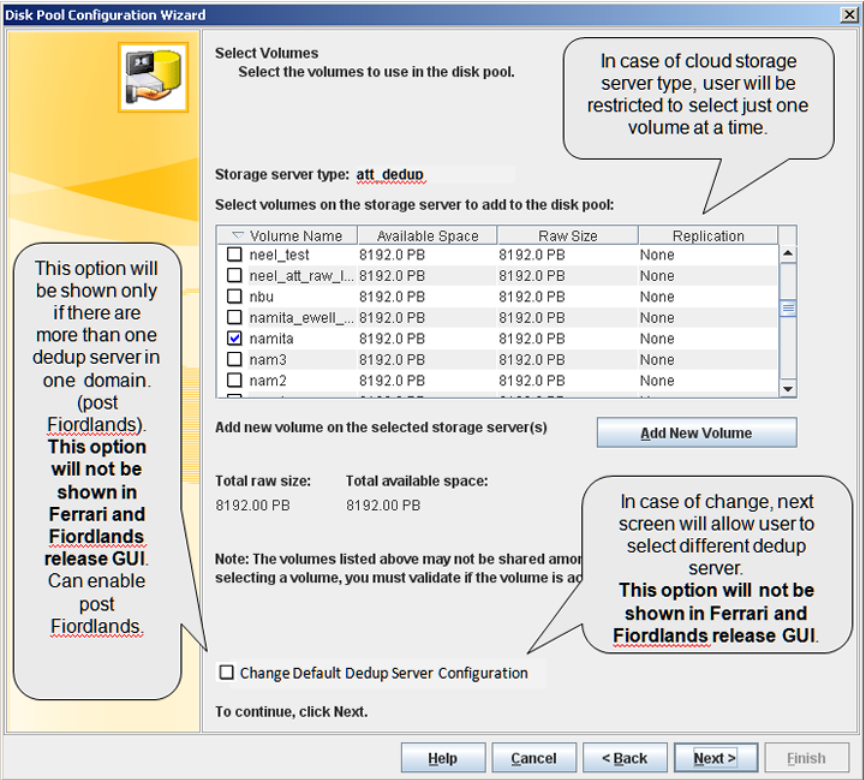
Select the media server or media servers that have a file system mount on the storage. The NetBackup media servers function as both storage servers and data movers.

See [“About AdvancedDisk storage servers”](#) on page 19.

Cloud Storage	For backups to cloud storage, select the cloud storage vendor's host that functions as the storage server.
OpenStorage	For backups to disk appliance storage, the disk appliance host is the storage server.
PureDisk	Select the storage server for the Media Server Deduplication Pool or PureDisk Deduplication Pool storage.
Replication Director	<p>For snapshots that use the NetBackup Replication Director with NetApp, the DFM server is the storage server.</p> <p>The host that you select depends on the storage type, as follows:</p> <p>For a NetBackup 5230 appliance storage, select the NetBackup appliance that hosts the storage.</p> <p>For a NetBackup 5400 appliance, select the virtual host name of the appliance. On the 5400 appliance, the virtual host name is also known as the Media Server Group Director Network Name.</p>

Select Volumes panel

Figure 7-4 [Writer's reference only]



Select the disk volume or disk volumes to include in the disk pool.

NetBackup requires exclusive use of the disk resources. If the volumes are used for purposes other than backups, NetBackup cannot manage disk pool capacity or manage storage lifecycle policies correctly. Therefore, NetBackup must be the only entity that uses the volumes.

See the following for the information that can help you select the disk pool volumes:

AdvancedDisk	<p>The wizard panel displays the volumes available on the storage server. If you selected more than one storage server, volumes that are common to all of them appear.</p> <p>See “About AdvancedDisk disk pools” on page 37.</p> <p>File system requirements or limitations may affect the volumes that you choose for the disk pool.</p> <p>See “About AdvancedDisk file system requirements” on page 17.</p>
Cloud Storage	<p>Cloud storage includes storage on supported cloud storage vendor hosts.</p> <p>The wizard panel displays the volumes that the cloud storage server exposes to NetBackup. The storage server is a vendor's host. You can select only one volume.</p> <p>If you select a volume on a storage destination that requires encryption, a dialog box appears in which you must enter the encryption passphrase.</p> <p>If no volumes are available, click Add New Volume</p> <p>Information about the requirements for volume names is available in the following topics:</p>
PureDisk	<p>For a PureDisk type of disk pool, all disk storage is exposed as a single volume. The PureDiskVolume is a virtual name for the entire storage that is dedicated to the deduplicated backups.</p> <p>PureDisk is the type for the following disk pools:</p> <ul style="list-style-type: none">■ A Media Server Deduplication Pool on the disk storage that is attached to a NetBackup deduplication media server.■ A PureDisk Deduplication Pool, which represents a PureDisk storage pool.

Disk Pool Properties panel

Figure 7-5 [Writer's reference only]

Disk Pool Properties
Provide additional details and verify the information to create a disk pool

Storage server: daytonvm5
Storage server type: Network_MWS
Disk pool configured for: Snapshot

Disk Pool Size:
Total raw size: 74.42 GB
Total available space: 52.07 GB

Disk Pool name:

Comments:

Maximum I/O Streams
Concurrent read and write jobs affect disk performance.
Limit I/O streams to prevent disk overload.
☐ Limit I/O streams: per volume

To begin, click Next. For assistance, click Help.

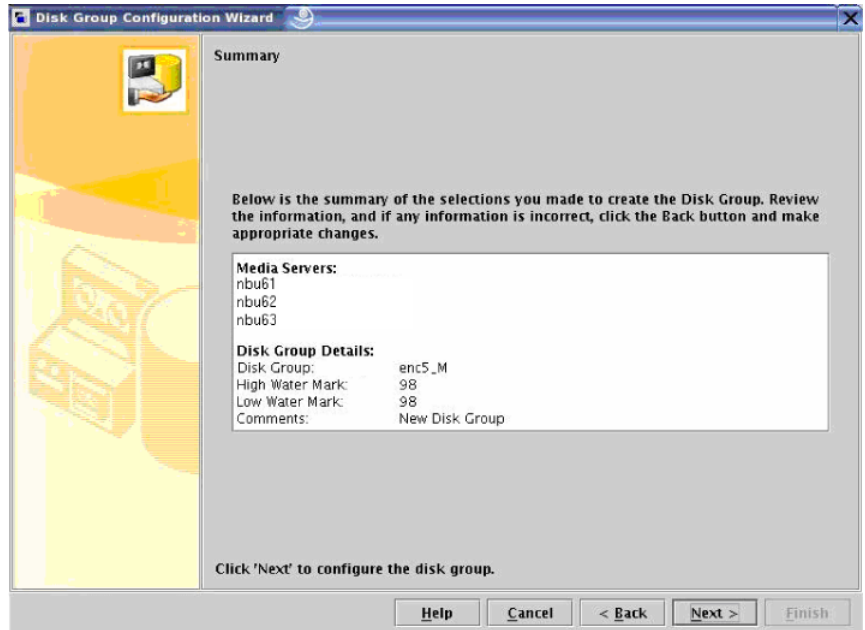
Help Cancel < Back Next > Finish

This wizard panel displays the existing properties for the disk pool. Use this panel to configure the remaining disk pool properties. The properties that you can configure depend on the disk pool type.

See “[AdvancedDisk disk pool properties](#)” on page 49.

Summary panel

Figure 7-6 [Writer's reference only]



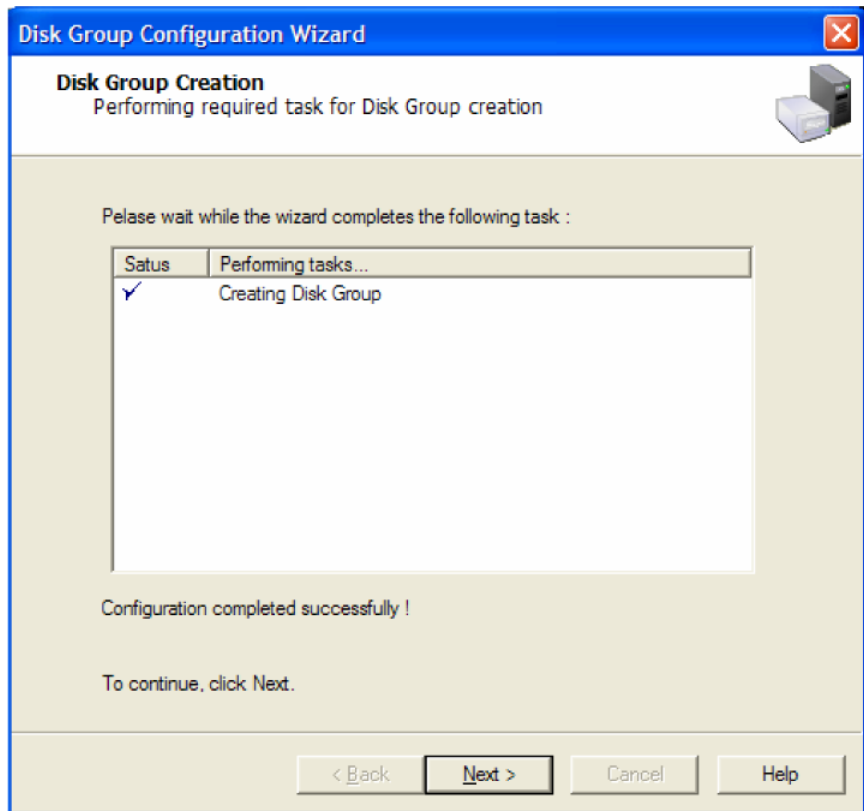
The Summary panel shows your selections to create the NetBackup disk pool.

Click **Back** to return and change the selection.

Click **Next** to create the NetBackup disk pool.

Confirmation panel

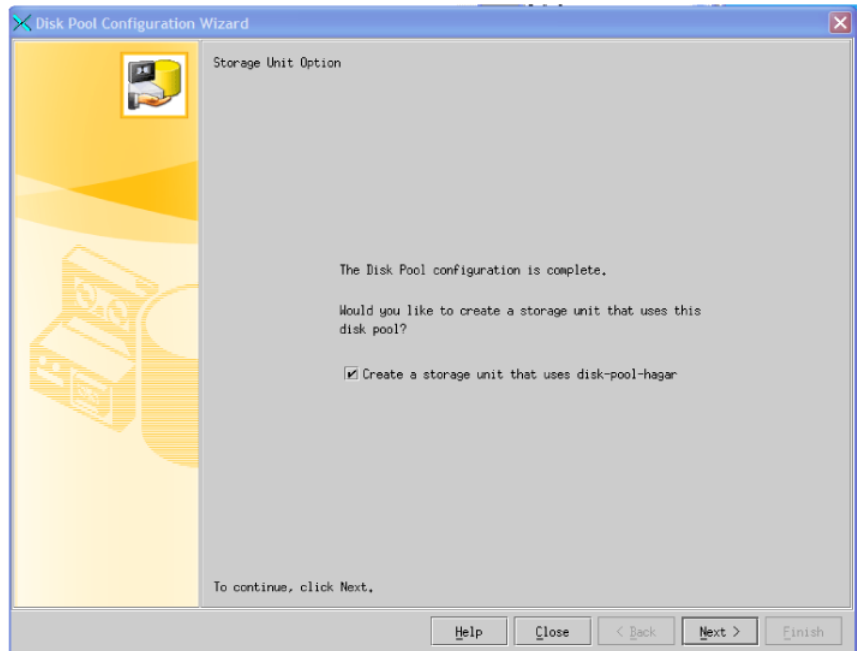
Figure 7-7 [Writer's reference only]



After the wizard creates the disk pool, click **Next** to continue.

Storage Unit Option panel

Figure 7-8 [Writer's reference only]



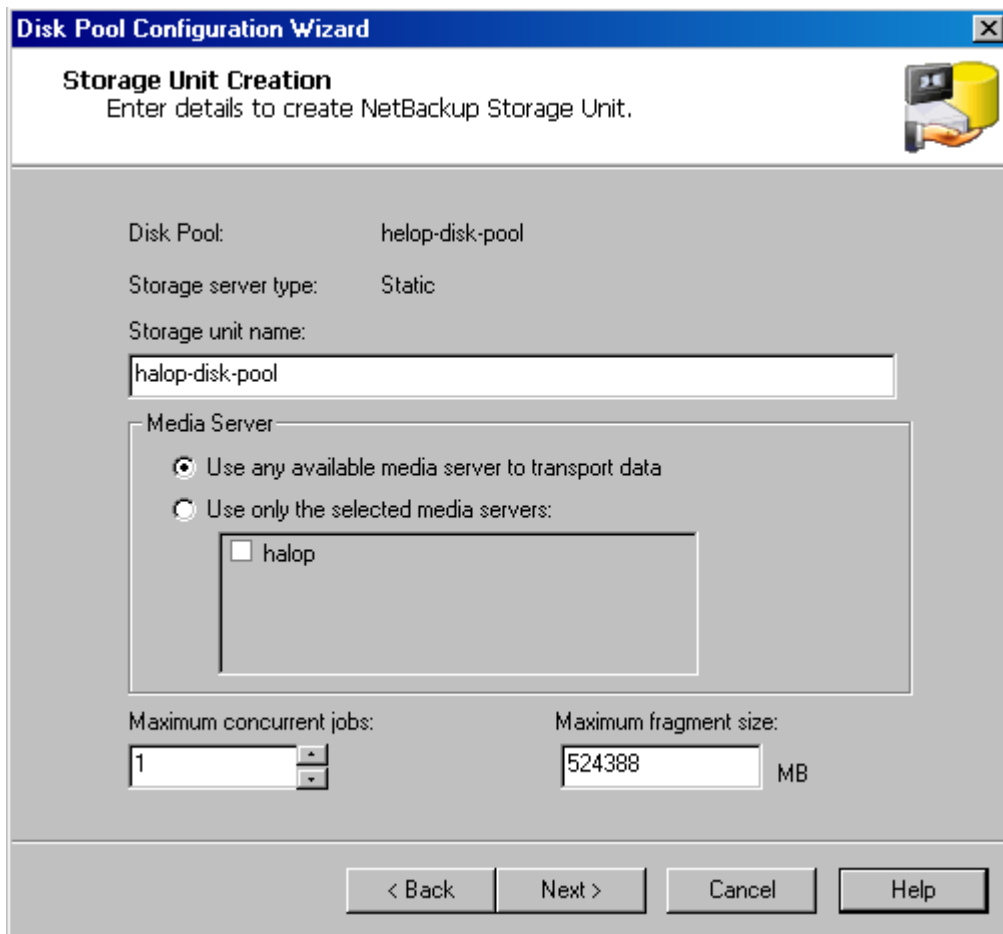
To create a storage unit that uses the disk pool, select **Create a storage unit that uses *diskpoolname***, and then click **Next**.

The wizard creates only one storage unit that uses the disk pool. However, more than one storage unit can use a disk pool. To create other storage units that use the disk pool, use **NetBackup Management > Storage** in the **NetBackup Administration Console**.

To exit the wizard, click **Close**. If you exit, you can create a storage unit later.

Create Storage Unit panel

Figure 7-9 [Writer's reference only]



The screenshot shows the 'Storage Unit Creation' panel of the 'Disk Pool Configuration Wizard'. The title bar reads 'Disk Pool Configuration Wizard'. Below the title bar, the panel is titled 'Storage Unit Creation' with the instruction 'Enter details to create NetBackup Storage Unit.' and a small icon of a storage unit. The panel contains the following fields and controls:

- Disk Pool:** A text field containing 'helop-disk-pool'.
- Storage server type:** A text field containing 'Static'.
- Storage unit name:** A text field containing 'halop-disk-pool'.
- Media Server:** A section with two radio buttons:
 - ☒ Use any available media server to transport data
 - ☐ Use only the selected media servers:
 - A list box containing 'halop' with an unchecked checkbox.
- Maximum concurrent jobs:** A spin box set to '1'.
- Maximum fragment size:** A text field containing '524388' followed by 'MB'.

At the bottom of the panel are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

Specify the storage unit properties.

See [“AdvancedDisk storage unit properties”](#) on page 52.

Finish panel

Click **Finish** to exit the wizard.

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