

# BrightStor® ARCserve® Backup for Windows

## NDMP NAS Option Guide

r11.5



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# Chapter 1: Introducing the Option

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BrightStor® ARCserve® Backup offers the BrightStor® ARCserve® Backup NDMP NAS Option as one of its options. This option lets you back up and restore data on Network Attached Storage (NAS) devices using Network Data Management Protocol (NDMP). The BrightStor ARCserve Backup NDMP NAS Option application resides on the same application server as BrightStor ARCserve Backup and handles all communication between BrightStor ARCserve Backup and the NAS server that performs backup and restore jobs.

This chapter describes the features and architecture of the option. It also provides a basic overview of the backup and restore process, including the role of the Common Agent.

## Features

The NDMP NAS Option includes the following feature set:

- **Push Technology**—You can complete a backup more efficiently by processing the data locally at the NAS server. Push technology offloads system resources from the BrightStor ARCserve Backup host server and minimizes network traffic by initiating the backup and restore jobs remotely on the NAS server.
- **Real-time Remote Browsing**—System administrators can view real-time file and directory information about the remote target machine.  
**Note:** This feature requires NAS-vendor support.
- **Local and Three-way NDMP Backups and Restores**—As long as one NAS server has an attached tape device, you can use the attached tape device for backing up data from any other NAS servers in the configuration. The tape device does not need to be attached locally to the NAS server to back up or restore that server.
- **NAS Changer Support**—The NDMP NAS Option supports backing up and restoring NAS servers using changers or tape library units attached locally to a NAS server or remotely to a different NAS server. This feature lets you back up and restore a local or remote NAS server using a three-way NDMP backup or restore.

- **Multistream Support**—One agent can handle different requests and perform multiple jobs simultaneously.
- **Dynamic Device Sharing**—The option uses dynamic device sharing (DDS) to enable the BrightStor ARCserve Backup server to share tape library units (TLU) on a storage area network (SAN). You can share a TLU between multiple NAS servers exclusively, or share multiple NAS servers with a TLU and the BrightStor ARCserve Backup server. DDS enables your environment to choose the optimal device to back up and restore data. For more information about DDS, see Dynamic Device Sharing later in this chapter.

**Note:** To use dynamic device sharing, you must install the BrightStor® ARCserve® Backup Enterprise Module.

## Option Architecture

The NDMP NAS Option provides services that allow BrightStor ARCserve Backup to back up and restore files and directories. These services utilize several components in a variety of configurations to perform backups and restores.

### Network Data Management Protocol (NDMP)

NDMP is a communication protocol that allows interaction with a NAS server on the network. It lets a backup application, such as BrightStor ARCserve Backup, control the backup and retrieval of data performed by an NDMP server. The NDMP-enabled server executes on NAS servers. It enables data transfers between tape library units and disks connected locally and remotely to any NAS server on the network.

NDMP allows a network backup application, such as BrightStor ARCserve Backup, to initiate backup operations from a network node. The backup application does not perform data movement. Instead, the NDMP server executing on the NAS server performs the data transfer.

### NAS Server

The NAS server implements the NDMP protocol and performs the actual backup and restore operations. The NDMP server executes on the NAS server and is supplied by the manufacturer of the NAS server. BrightStor ARCserve Backup interfaces with the NDMP server running on the NAS server using NDMP.



## Remote Browsing

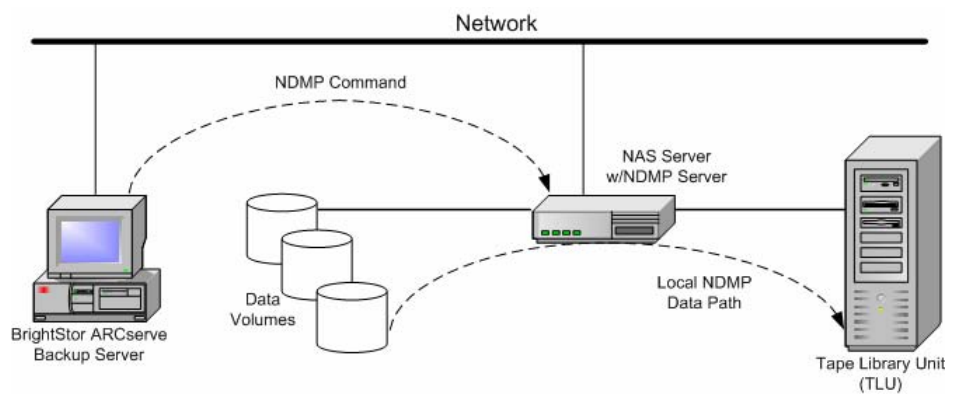
BrightStor ARCserve Backup automatically enumerates files and directories for Network Appliance servers that support NDMP Version 4. If a NAS server supports NDMP Version 3, volumes are automatically enumerated. For NAS servers with NDMP Version 2 support, you must provide information for browsing volumes to the nas.cfg file. For more information about configuring the nas.cfg file to enable remote browsing, see File System Configuration in the chapter “Installing the Option.”

## Supported NAS Backup Configurations

BrightStor ARCserve Backup supports NAS local and three-way NDMP backups.

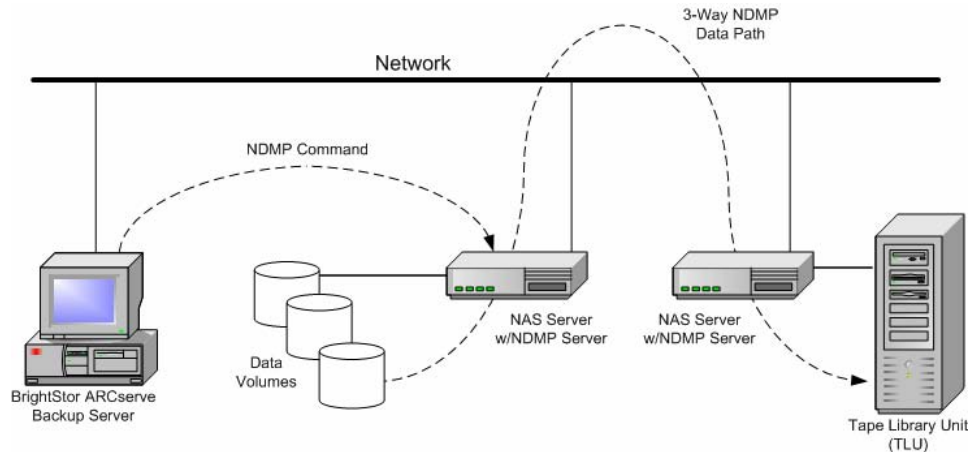
### NAS Local NDMP Backups

If a NAS server has a locally-attached tape device, BrightStor ARCserve Backup can trigger a serverless backup of the NAS server's data to this device, as shown in the illustration below:



## NAS Three-way NDMP Backups

Some NAS servers on the network may not have tape devices attached to them. As long as at least one NAS server has an attached tape device, that device can be used when backing up other NAS servers. For example, NAS Server 1 does not have a tape device attached to it, but NAS Server 2 does. The NDMP NAS Option can back up NAS Server 1's data to the tape device attached to NAS Server 2. This configuration is known as NAS three-way NDMP backup.



## How the Option Backs Up Data

BrightStor ARCserve Backup gives you great flexibility in specifying options, filters, and scheduling information for your jobs. You can use the Backup Manager to configure and to submit a backup job for data in your network. Choose any NAS server as your source and a tape device connected to a NAS server as your destination.

When you back up data from a file system, the Network Appliance NAS server creates a snapshot of that data set so that the backup reflects a consistent view of the data at the time of the backup. The data is then indirectly backed up from this snapshot.

For an overall description of the backup features of BrightStor ARCserve Backup, see the *Administrator Guide*.

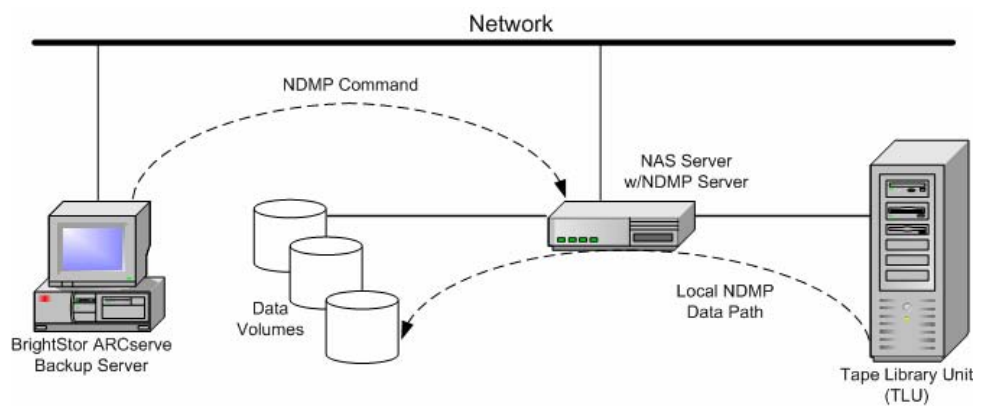
The BrightStor ARCserve Backup functionality available for backing up data depends on the NDMP version implemented and the type of NAS server. For information about vendor-specific restrictions, see the appendix "Feature Support Summary."

## How the Option Restores Data

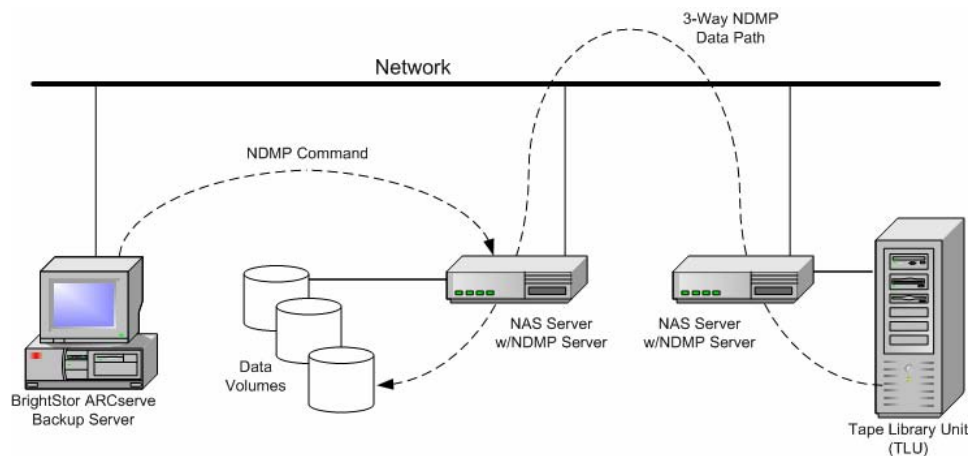
To restore data from a tape device to a NAS server, use the Restore Manager to configure and to submit the job. For an overall description of the restore features, see the *Administrator Guide*.

The BrightStor ARCserve Backup functionality available for restoration of data depends on the NDMP version implemented and the type of NAS server. For information about vendor-specific restrictions, see the appendix, "Feature Support Summary."

The following diagram illustrates a local restore:



The following diagram illustrates a three-way restore:



## Restore by Source

You can view NAS servers by clicking the Source tab of the Restore Manager. You can select individual NAS files or directories for recovery, as you can for other types of hosts or clients supported by BrightStor ARCserve Backup.

## Restore by Destination

Because NAS backups are third-party backups, they use the NAS vendor's proprietary format. Although most NAS servers use NDMP, it is advisable to perform backup and restore operations to the same vendor's type of server. Furthermore, you cannot restore the NAS session if you move the tape to a device locally connected to the BrightStor ARCserve Backup server.

Browsing and file or directory selection for restores functions in the same way as browsing NAS servers from the Source tab of the Backup Manager.

## Dynamic Device Sharing

**Note:** To use dynamic device sharing, you must install the BrightStor ARCserve Backup Enterprise Module.

In an environment composed of fibre attached storage devices with one or more BrightStor ARCserve Backup servers, complications can arise when exposing devices that reside on the fibre uniquely. Duplication of devices occurs when more than one fibre adapter exists to enumerate the devices on a fibre loop. Marshalling multiple media engines from a central management application must occur if individual media engines reside on the same SAN. In this case, an NDMP tape server running on a NAS device is considered a media engine. The BrightStor ARCserve Backup tape engine is also considered a media engine. Using this feature will allow them to integrate seamlessly.

When separate fibre adapters exist to enumerate devices on a fibre loop, DDS dynamically manages all duplicate references to a device. DDS gives you more flexibility in choosing how to design your storage topology.

Dynamic device sharing is cost efficient because only one library is needed for backing up NAS and non-NAS data. Additionally, DDS enables:

- Drives and tape library unit (TLU) control to be shared seamlessly between the local BrightStor ARCserve Backup server and the NAS server.
- NAS data to be backed up to the same tape that non-NAS data was backed up to.
- NAS and non-NAS jobs to be multi-streamed and packaged to run together. The optimal data path will be chosen on all backups and restores. All NAS servers can detect the drives and data. This eliminates the need for three-way backups, and only direct two-way data paths will be used for backing up data.

For information about how to configure your system to use DDS, see Dynamic Device Sharing Configuration in the chapter “Installing the Option.”

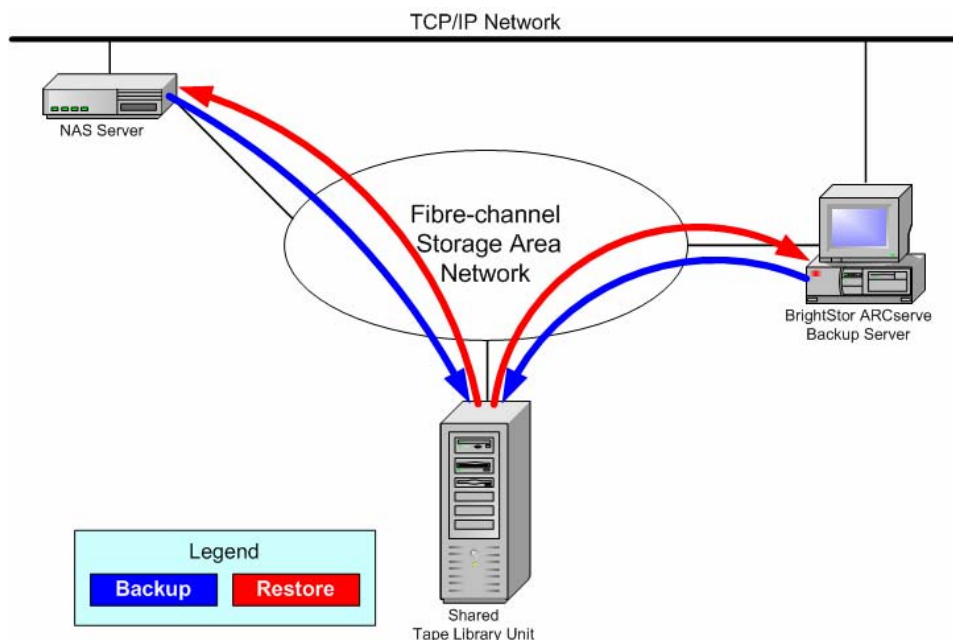
**Note:** DDS does not support restoration of local backups to a NAS server, or NAS server backups to the local BrightStor ARCserve Backup server. This limitation exists because NAS backups are third-party backups, and are written in a format that is proprietary to the NAS vendor.

## Supported DDS Configurations

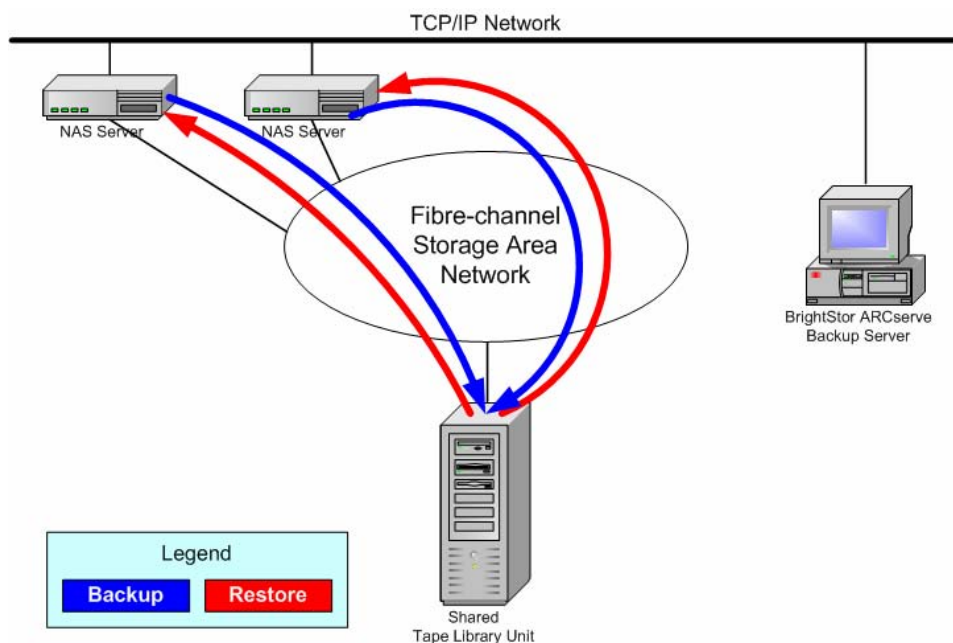
The NDMP NAS Option supports two fundamental DDS configurations:

- One or more NAS servers connected to the SAN that share a tape drive or TLU, and the BrightStor ARCserve Backup server is connected to the SAN.
- Two or more NAS servers connected to the SAN that share a tape drive or TLU, and the BrightStor ARCserve Backup server is not connected to the SAN.

The following graphic illustrates one or more NAS servers connected to the SAN that share a tape drive or TLU, and the BrightStor ARCserve Backup server is connected to the SAN.



The following graphic illustrates two or more NAS servers connected to the SAN that share a tape drive or TLU, and the BrightStor ARCserve Backup server is not connected to the SAN.



## Log Access

The NDMP NAS Option generates the information found in logs in the <base install>/Logs directory. The following list describes the available logs and the type of information each log provides.

- Tape.log—Generated by the BrightStor Tape Engine, the DDS Device Map section provides information that details whether or not the primary or secondary device reference chosen was optimal.
- LibSetup.log—Generated by the BrightStor ARCserve Backup Tape and Optical Library Option. This log provides information that details if duplicate device references were detected on all SCSI ports.





# Chapter 2: Installing the Option

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This chapter describes how to install and configure the NDMP NAS Option. The information in this chapter assumes you are familiar with the characteristics and requirements of the specified operating systems in general, and with administrator responsibilities on those operating systems in particular.

## Installation Prerequisites

If you wish to use the NDMP NAS Option, you must first prepare and configure the NAS server, and the BrightStor ARCserve Backup server. Before proceeding, verify that:

- Your system meets the minimum hardware and software requirements needed to install the NDMP NAS Option. For a list of requirements, see the readme file.
- The NAS server's operating system is compatible with BrightStor ARCserve Backup. For information about hardware and software requirements for Network Appliances, EMC Celerra, EMC CLARiiON IP4700, and Procom NAS servers, see appendices B through E.
- BrightStor ARCserve Backup is installed and working properly.
- You know the name and the password of the machine you are installing the option on.
- You have made a note of any changes to the default installation path.
- You have superuser privileges or the proper authority to install software on the computers where you will be installing the option.

## Option Installation

The NDMP NAS Option follows the standard installation procedure for the system components, agents, and options of BrightStor ARCserve Backup. For the detailed steps in this procedure, see the *Getting Started*.

After you complete the installation procedure, be sure to restart your computer when prompted.

## Option Configuration

After you have completed the NDMP NAS Option installation, you must configure the NAS servers, tape drives, or tape library units.

Prior to configuring the devices and drives, confirm the following:

- You can ping or access the NAS server from the server on which the NDMP NAS Option is installed.
- The NAS server being used as the destination for backup data can detect its locally attached drives or tape library units.
- The tape library units and NAS servers are certified by Computer Associates.
- The tape drives are certified by the NAS vendors.
- Verify that the tape drive is not already opened and in use by another NDMP session.

### Configure NAS Devices

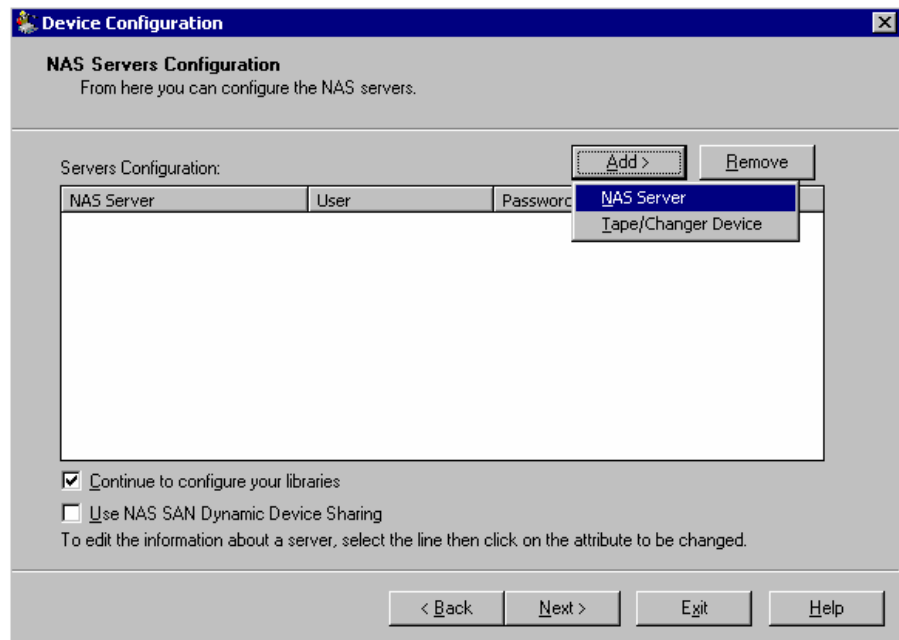
You can configure the NAS drives and tape devices either immediately after you install the NDMP NAS Option or from Device Configuration.

**Note:** If you are configuring the devices and drives immediately after installation, you can skip to Step 5 of the following instructions.

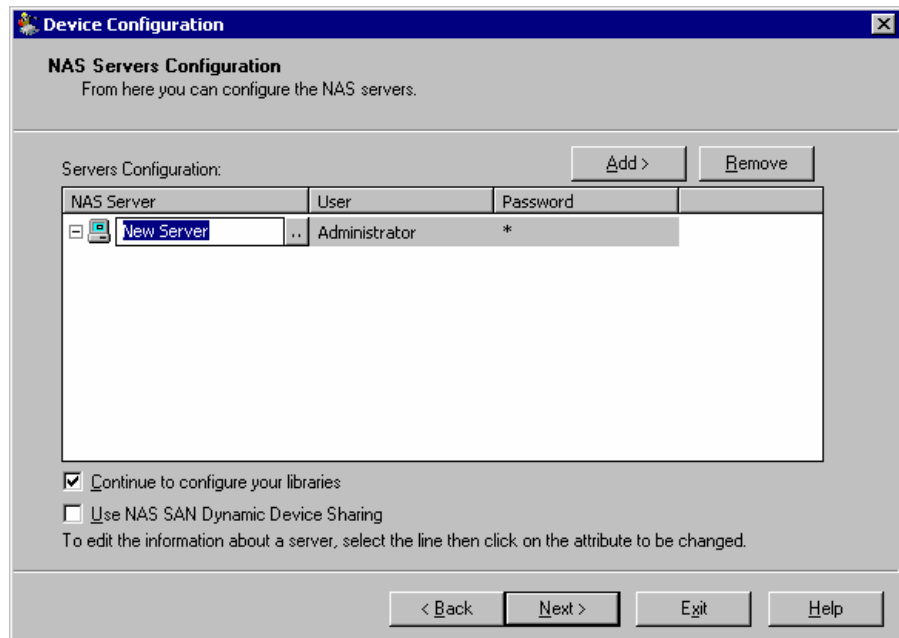
Perform the following steps to configure the NAS devices.

1. Select Device Configuration from the BrightStor ARCserve Backup Home Page.
2. On Device Configuration Welcome screen, click Next.
3. On the Options dialog, select NAS Servers and click Next.

4. Click Add, and Select NAS Server from the drop-down box as shown next:



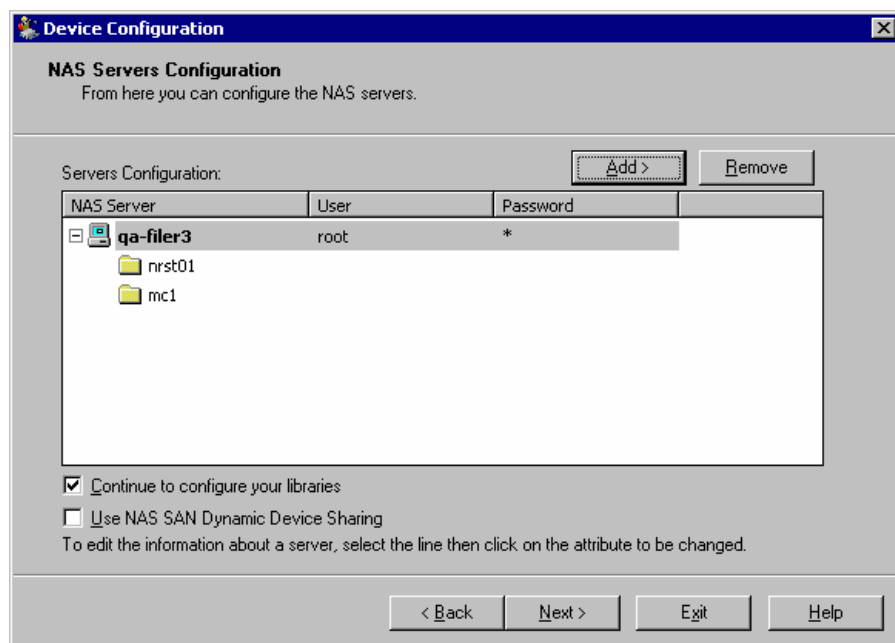
5. On the Device Configuration dialog, highlight New Server and enter the name of the NAS server, user name, and password. The user name and password must be associated with a NAS server account with NAS Administrative privileges.



Steps 6 and 7 are optional steps for NAS servers supporting NDMP Version 3. NDMP Version 3-enabled NAS servers allow the client to detect backup devices that are configured on the NAS server. The NDMP NAS Option performs this detection and displays all the detected devices. The format and usage rules governing the logical device names differ from one vendor to another. For information about how to determine vendor-specific logical device names, see appendixes B through E.

- If you are using NDMP Version 2 or Version 3, click Next and continue with Step 6.
  - If you are not continuing with Steps 6 and 7, go to Step 9.
6. Click Add, and select Tape/Changer Device to enter the tape drive or tape library unit configuration information.
  7. Highlight New Tape Device and enter the tape device information.

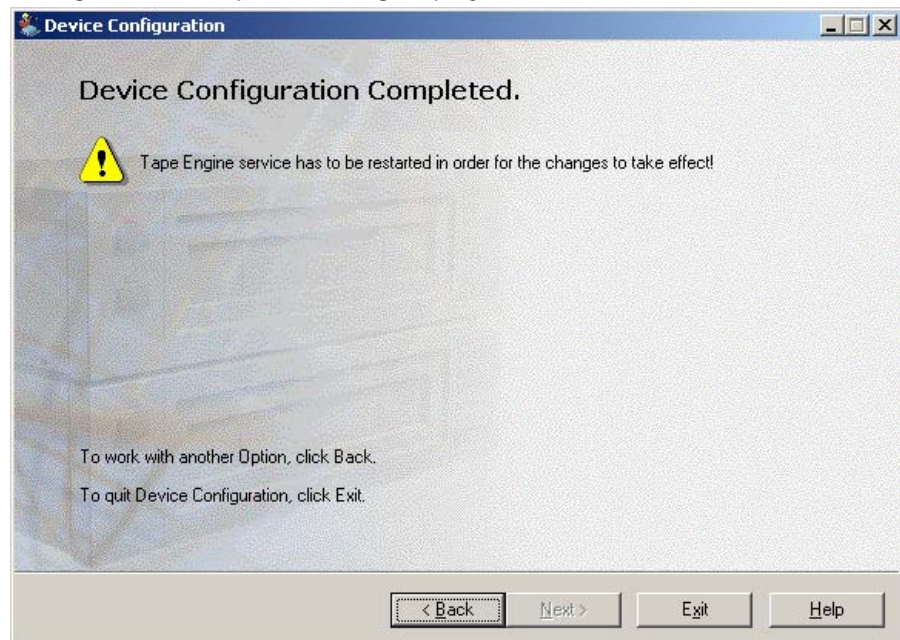
The information entered here is typically a logical device name that represents the tape device or tape library unit. A logical device name refers to a unique string that the NAS server or NDMP server uses to refer to the device.



8. Repeat Steps 4 and 5 (and optionally 6 and 7) for all additional NAS servers that you want to configure for use with the NDMP NAS Option. The BrightStor ARCserve Backup server can interact with more than one NAS server over the network.
9. If your environment has one of the following conditions, check the Use NAS SAN Dynamic Device Sharing check box.
  - One or more NAS servers connected to the SAN share a tape drive or TLU, and the BrightStor ARCserve Backup server is connected to the SAN.
  - Two or more NAS servers connected to the SAN share a tape drive or TLU, and the BrightStor ARCserve Backup server is not connected to the SAN.

**Note:** For more information about these environment conditions, see the section Supported DDS Configurations in the chapter “Introducing the Option.”

10. When you have finished adding all the server and tape devices, clear the Continue to configure your libraries check box, and click Finish. The Device Configuration Completed dialog displays as shown next:



11. Click Exit. If you are sure that you want to exit Device Configuration, click Yes.



12. Start the Tape Engine using the Server Admin program.

## File System Configuration

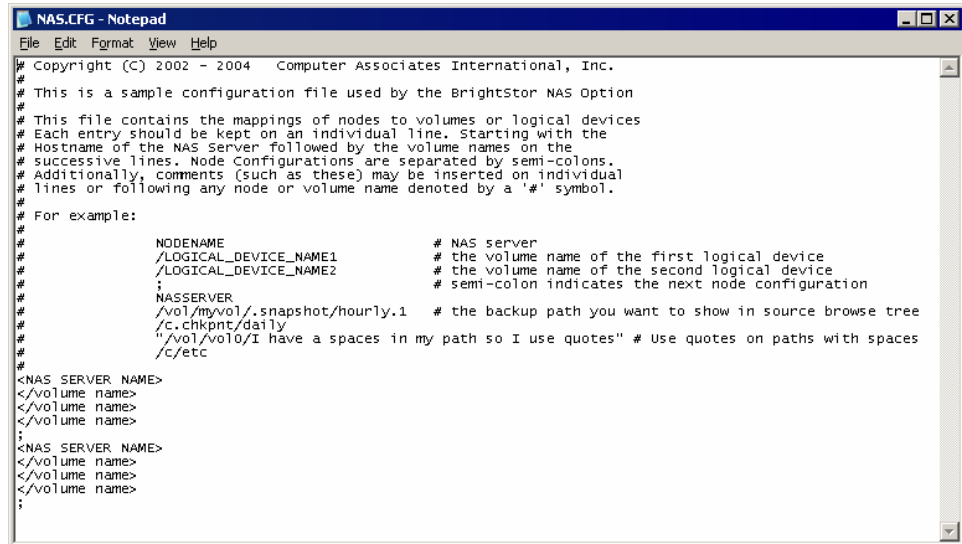
The NDMP NAS Option installs a configuration file called `nas.cfg` in the NAS Option folder. This is the file in which you specify the items that are eventually displayed on the Source tab of the Backup Manager. After configuring this file, you can browse the items entered in the Backup Manager.

### Configure NDMP Version 2

If the NAS servers support NDMP Version 2, you must configure the `nas.cfg` file. The BrightStor ARCserve Backup NDMP NAS Option cannot determine volume mappings for these servers. You must enter the volume information. To enter the volume information, use the following steps:

1. Open the `nas.cfg` file located in the `<base install>\NAS Option` folder.
2. On the first line, enter the host name of the NAS server.
3. Enter each logical device name on a separate line following.
4. Enter a semicolon to end each server configuration.
5. When you are finished adding NAS servers, close and save the file.

This example shows two NAS servers, each with three volume names added.

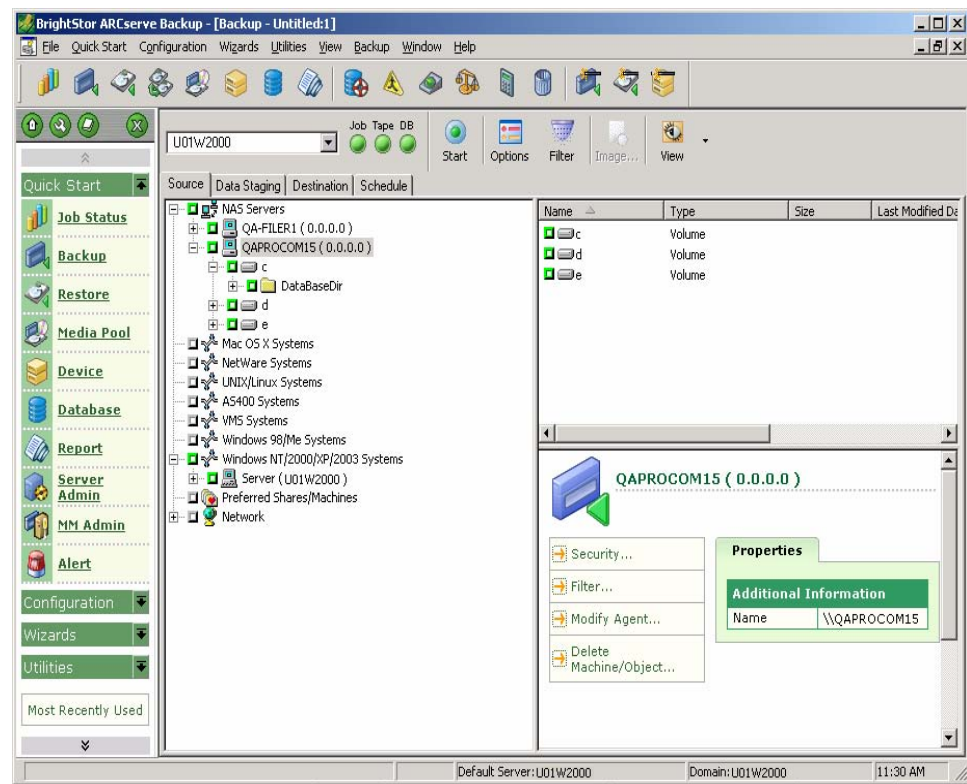


```

NAS.CFG - Notepad
File Edit Format View Help
# Copyright (C) 2002 - 2004 Computer Associates International, Inc.
# This is a sample configuration file used by the BrightStor NAS Option
# This file contains the mappings of nodes to volumes or logical devices
# Each entry should be kept on an individual line. Starting with the
# Hostname of the NAS server followed by the volume names on the
# successive lines. Node configurations are separated by semi-colons.
# Additionally, comments (such as these) may be inserted on individual
# lines or following any node or volume name denoted by a '#' symbol.
# For example:
#
# NODENAME                               # NAS server
# /LOGICAL_DEVICE_NAME1                 # the volume name of the first logical device
# /LOGICAL_DEVICE_NAME2                 # the volume name of the second logical device
# ;                                     # semi-colon indicates the next node configuration
#
# NASSERVER
# /vol/myvol/.snapshot/hourly.1         # the backup path you want to show in source browse tree
# /c.chkpt/daily
# "/vol/vol0/I have a spaces in my path so I use quotes" # Use quotes on paths with spaces
# /c/etc
#
# <NAS SERVER NAME>
# </volume name>
# </volume name>
# </volume name>
# ;
# <NAS SERVER NAME>
# </volume name>
# </volume name>
# </volume name>
# ;

```

An example of the corresponding Backup Manager screen follows:



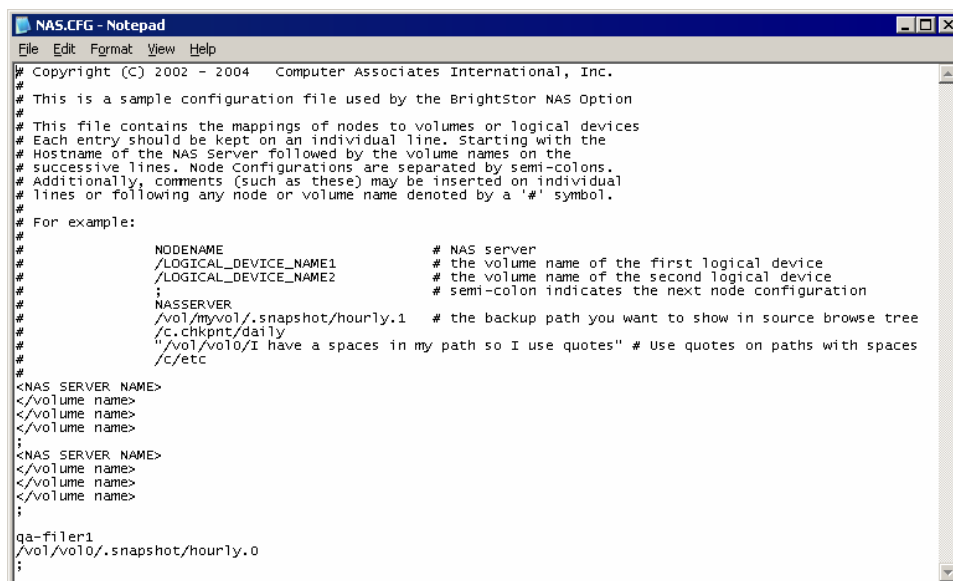
## Configure NDMP Version 3

When a NAS server supports NDMP Version 3, you can configure the `nas.cfg` file for partial-volume backups. The NDMP NAS Option cannot determine volume mappings for these servers. To perform partial-volume backups, you must enter the paths into the configuration file.

To enter the path information, use the following steps:

1. Open the `nas.cfg` file located in the `<base install>\NAS Option` folder.
2. On the first line, enter the host name of the NAS server.
3. Enter each absolute path, starting with the logical device name, on separate lines following the host name of the NAS server.
4. Enter a semicolon to end each server configuration.
5. Save the file.

The example below shows how the `nas.cfg` file would look if the user wanted to back up a partial volume consisting of database files.



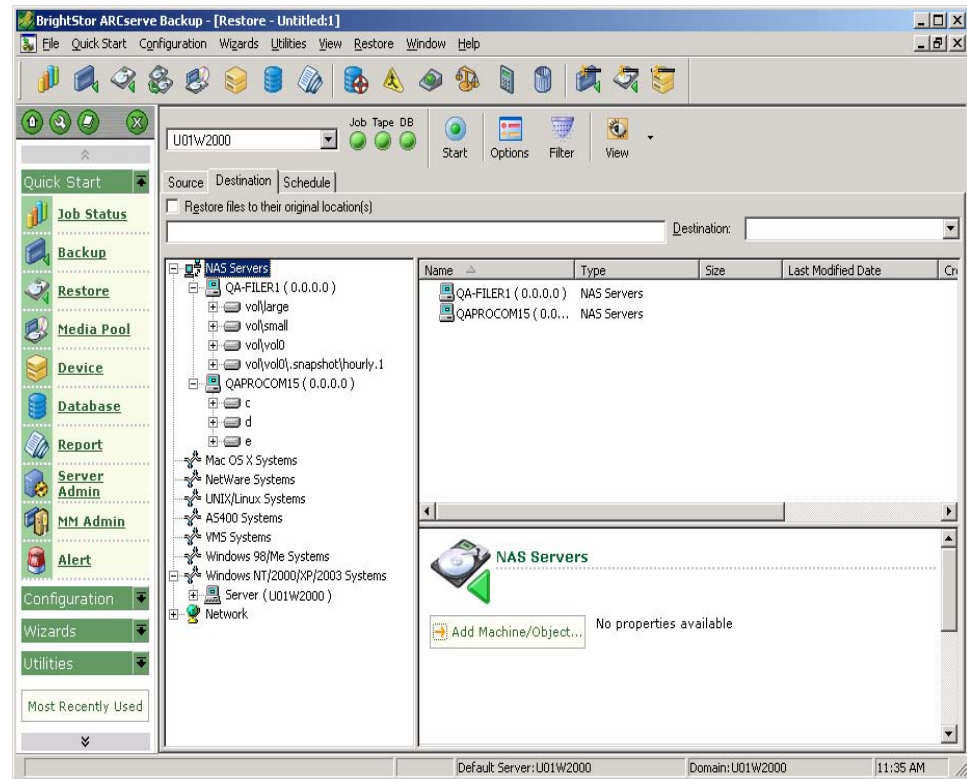
```

NAS.CFG - Notepad
File Edit Format View Help
# Copyright (C) 2002 - 2004 Computer Associates International, Inc.
# This is a sample configuration file used by the BrightStor NAS Option
# This file contains the mappings of nodes to volumes or logical devices
# Each entry should be kept on an individual line. Starting with the
# Hostname of the NAS server followed by the volume names on the
# successive lines. Node Configurations are separated by semi-colons.
# Additionally, comments (such as these) may be inserted on individual
# lines or following any node or volume name denoted by a '#' symbol.
# For example:
#
#          NODENAME                # NAS server
#          /LOGICAL_DEVICE_NAME1    # the volume name of the first logical device
#          /LOGICAL_DEVICE_NAME2    # the volume name of the second logical device
#          ;                         # semi-colon indicates the next node configuration
#          NASERVER
#          /vol/myvol/.snapshot/hourly.1 # the backup path you want to show in source browse tree
#          /c.chkpt/daily
#          "/vol/vol0/I have a spaces in my path so I use quotes" # Use quotes on paths with spaces
#          /c/etc
#
<NAS SERVER NAME>
</volume name>
</volume name>
</volume name>
;
<NAS SERVER NAME>
</volume name>
</volume name>
</volume name>
;
qa-filer1
/vol/vol0/.snapshot/hourly.0
;

```



An example of the corresponding Restore Manager screen follows:



## Configure NDMP Version 4

If you are using a NAS server with NDMP Version 4, and support for Snapshot Management Extensions, you do not have to use the nas.cfg file. However, currently only Network Appliance NAS servers support this functionality.

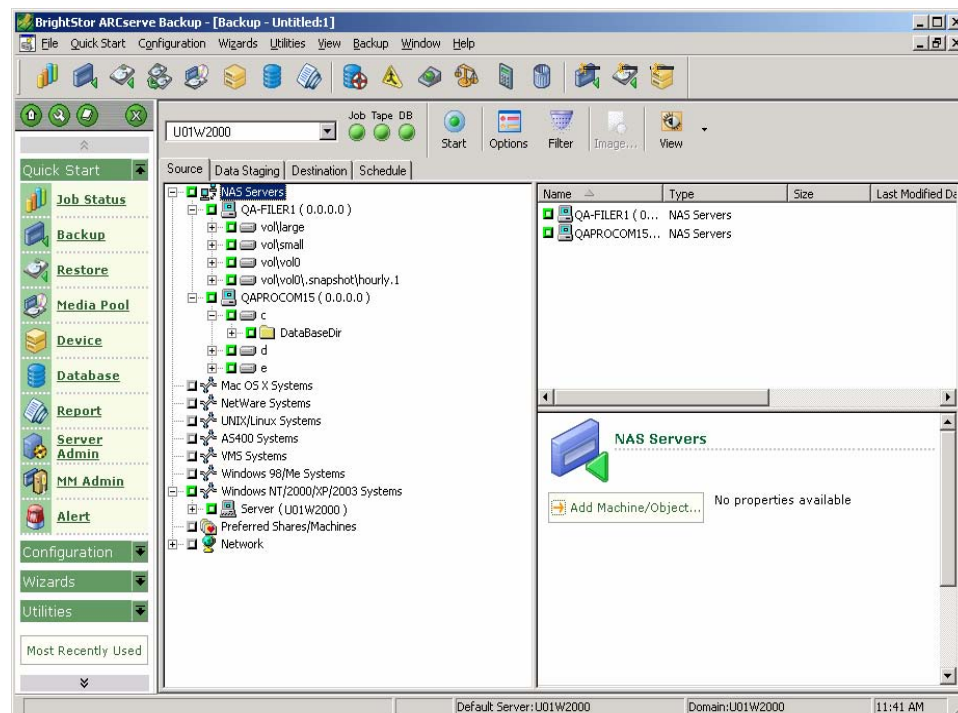
## Snapshots and Checkpoints Configuration

A snapshot or a checkpoint is an online, read-only copy of an entire file system that protects against deletions or modifications of files without duplicating file contents. Snapshots enable you to restore files and allow you back up the files to tape while the NAS server is in use. Snapshots of data on a file system can also be created and scheduled, as needed, by the NAS administrator.

If you are using a NAS server that supports a maximum of NDMP Version 3 to backup snapshots or checkpoints on your NAS server, you must configure the nas.cfg file. The file would be edited like it was for a partial-volume backup.

The following is an example of the Backup Manager screen showing a Network Appliance snapshot called hourly.0 and a Procom checkpoint called daily.

**Note:** The names of the snapshot files are vendor-specific.



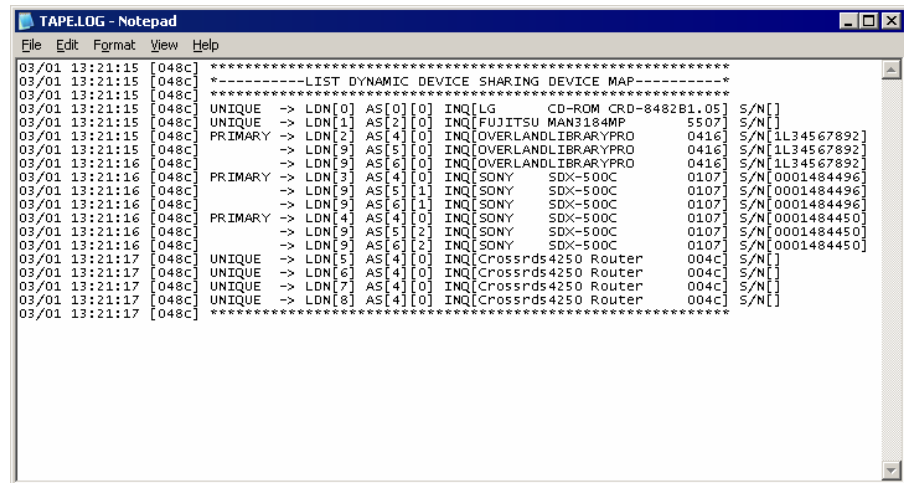
## Dynamic Device Sharing Configuration

To configure your system to use DDS, use the following guidelines:

**Note:** To use dynamic device sharing, you must install the BrightStor ARCserve Backup Enterprise Module.

- Open the fibre switch so that all of the NAS servers and BrightStor ARCserve Backup servers can detect all of the devices and each other.
- Configure a SCSI bridge or router such that it does not expose itself as a SCSI array device. NAS servers may not be able to connect to the SCSI bridge or router if it exposes itself as an array device.
- Verify that all NAS and BrightStor ARCserve Backup servers can detect all devices.
- Ensure that online TLUs are in the ready state.

- Confirm that devices are shared by enabling the Tape Engine Debug Log in Server Administration when starting the tape engine. This log (labeled tape.log) provides you with details about devices that are shared and not shared. The details can be found in the List Dynamic Device Sharing Device Map section of the Tape Engine Debug Log.



```

03/01 13:21:15 [048c] *****LIST DYNAMIC DEVICE SHARING DEVICE MAP*****
03/01 13:21:15 [048c] *****
03/01 13:21:15 [048c] UNIQUE -> LBN[0] AS[0][0] INQ[LG CD-ROM CRD-8482B1.05] S/N[]
03/01 13:21:15 [048c] UNIQUE -> LBN[1] AS[2][0] INQ[FUJITSU MAN3184MP 5507] S/N[]
03/01 13:21:15 [048c] PRIMARY -> LBN[2] AS[4][0] INQ[OVERLANDLIBRARYPRO 0416] S/N[1L34567892]
03/01 13:21:15 [048c] -> LBN[9] AS[5][0] INQ[OVERLANDLIBRARYPRO 0416] S/N[1L34567892]
03/01 13:21:16 [048c] -> LBN[9] AS[6][0] INQ[OVERLANDLIBRARYPRO 0416] S/N[1L34567892]
03/01 13:21:16 [048c] PRIMARY -> LBN[3] AS[4][0] INQ[SONY SDX-500C 0107] S/N[0001484496]
03/01 13:21:16 [048c] -> LBN[9] AS[5][1] INQ[SONY SDX-500C 0107] S/N[0001484496]
03/01 13:21:16 [048c] -> LBN[9] AS[6][1] INQ[SONY SDX-500C 0107] S/N[0001484496]
03/01 13:21:16 [048c] PRIMARY -> LBN[4] AS[4][0] INQ[SONY SDX-500C 0107] S/N[0001484450]
03/01 13:21:16 [048c] -> LBN[9] AS[5][2] INQ[SONY SDX-500C 0107] S/N[0001484450]
03/01 13:21:16 [048c] -> LBN[9] AS[6][2] INQ[SONY SDX-500C 0107] S/N[0001484450]
03/01 13:21:17 [048c] UNIQUE -> LBN[5] AS[4][0] INQ[Crossrds4250 Router 004c] S/N[]
03/01 13:21:17 [048c] UNIQUE -> LBN[6] AS[4][0] INQ[Crossrds4250 Router 004c] S/N[]
03/01 13:21:17 [048c] UNIQUE -> LBN[7] AS[4][0] INQ[Crossrds4250 Router 004c] S/N[]
03/01 13:21:17 [048c] UNIQUE -> LBN[8] AS[4][0] INQ[Crossrds4250 Router 004c] S/N[]
03/01 13:21:17 [048c] *****

```

- Verify that the tape drive is not already opened and in use by another NDMP session.

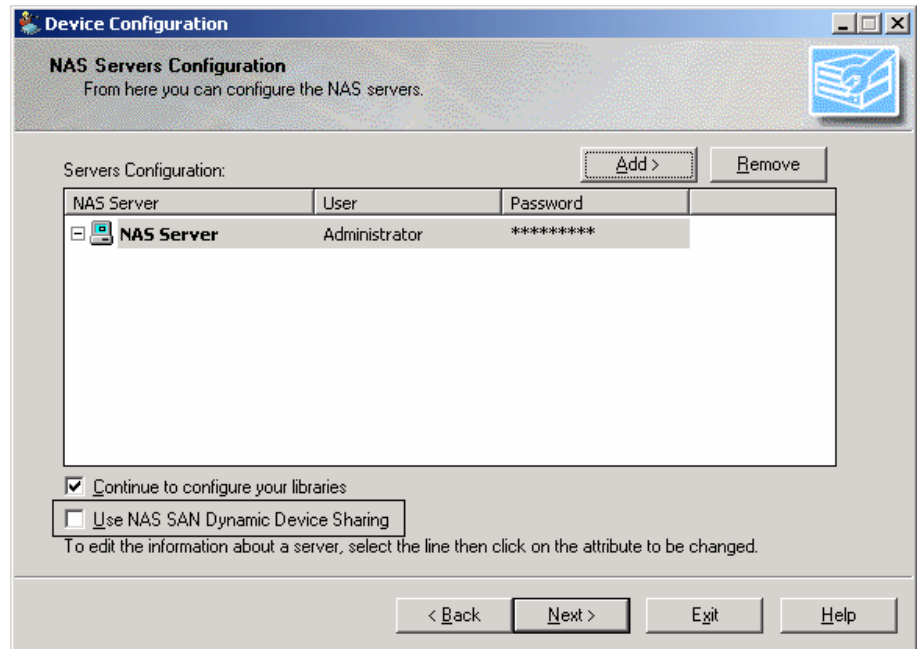
**Note:** Shared SCSI devices will show up under the local adapter. The group and adapter icon will be marked as shared.

Configuring your system to use DDS presents the following restrictions:

- If the BrightStor® ARCserve® Backup SAN Option is installed then the NDMP NAS Option must be installed on the primary backup server.
- The SAN must allow all member servers to detect attached backup devices.
- DDS does not function in a cross-platform environment.
- NAS servers must meet all of the vendor requirements by using certified devices and equipment to function properly and individually on the SAN.

## Enable DDS Using Device Configuration

1. Select the Use NAS SAN Dynamic Device Sharing check box on the NAS Servers Configuration dialog of Device Configuration.



2. Click Next to continue to the next NAS Servers Configuration dialog.

## Dynamically Shared Device Identification

The directory tree of the Device Manager window identifies dynamically shared devices with the icon shown in the following example. This example represents one dynamically shared changer with two drives.



Additionally, if a device is dynamically shared, you can view summary and detail information about the shared device in the Properties pane in the Device Manager window. The Summary tab for a dynamically shared device is shown in the following example:

**Summary** Details

Device Information	
Vendor	OVERLAND
Product Name	LIBRARYPRO
Firmware Version	0416
SCSI Compliance	N/A
Serial No.	1L34567892

Device Configuration	
Description	Device:9=Board:4,Bus:0,SCSI ID:0,LUN:7

This is a shared device connected to NAS.	
Shared by	NAS-SAN1
Shared by	ca-netapp



# Chapter 3: Using the Option

---

This chapter shows you how to perform a backup or a restore using the NDMP NAS Option. For an overall description of the backup features, see the *Administrator Guide*.

## Backup Operations

To back up data from your network, use the Backup Manager to configure and submit a backup job. You can use any NAS server as your source and a tape device connected to either the same NAS server or another NAS server as your destination. Although all NAS servers use NDMP, it is advisable to perform backup and restore operations to the same vendor's type of server.

The *Administrator Guide* provides a description of the BrightStor ARCserve Backup's backup features. When you select a NAS server for a backup, a customized set of standard BrightStor ARCserve Backup options is available. The version of NDMP in use on the NAS server causes some of the standard options not to be available. The unavailability of other options results from limitations of a vendor's particular server.

## Backup Options

When a NAS server is selected for a backup, a customized set of standard BrightStor ARCserve Backup options is available. Some of the standard options are not available due to the version of NDMP in use on the NAS server. Other options are not available due to the limitations of a vendor's particular server.

For instance, BrightStor ARCserve Backup does not support backing up multiple folders from the same volume as part of the same job on most NAS servers. You can select individual folders as part of separate jobs and schedule them to run concurrently. If you specify multiple folders, BrightStor ARCserve Backup recognizes only the first folder in a volume and ignores the rest of the folders specified.

NDMP versions 2 and 3 do not support multi-byte or Unicode names. This can cause the granularity of the backup session's restore view to be reduced.

Network Appliance NAS servers, however, enable you to backup multiple files and folders in a single volume.

For a more complete listing of vendor-specific NAS server limitations, see the appendix, "Feature Support Summary."

## Backup Prerequisites

Before you start a backup job, check the following:

- You are using the correct user name and password for security logins on the NAS server.
- You see the NAS devices in the BrightStor ARCserve Backup Device Manager.
- You can browse the NAS sever in the respective source and destination trees of the Backup Manager and Restore Manager.
- If you are backing up a snapshot or checkpoint, make sure the server is configured to create these files.
- Make sure the tape drives are certified by the NAS vendor.
- Make sure the tape library unit and the NAS server are certified by Computer Associates.

## Add a NAS Server

Use the following steps to add a NAS server to BrightStor ARCserve Backup:

1. On the Backup Manager's Source tab, right-click NAS Servers in the displayed tree.
2. Select Add Machine.
3. In the Add Server dialog that appears, enter the computer name and IP address. In the absence of an IP address, you should check the Use Computer Name Resolution box.

**Add Server** ? X

Add a New NAS Server.

Host Name : QA-FILER

☒ TCP/IP

☒ Use Computer Name Resolution

Enter IP address: (ex. 132.123.23.201)

0 . 0 . 0 . 0

☐ IPX/SPX

Enter IPX internal network number:  
(ex. 001C2F70-000000000001)

.

Add Close Help



4. Click Add to register the server with BrightStor ARCserve Backup.

**Note:** BrightStor ARCserve Backup prompts you to enter security information when you attempt to browse or expand the NAS server that you just added.

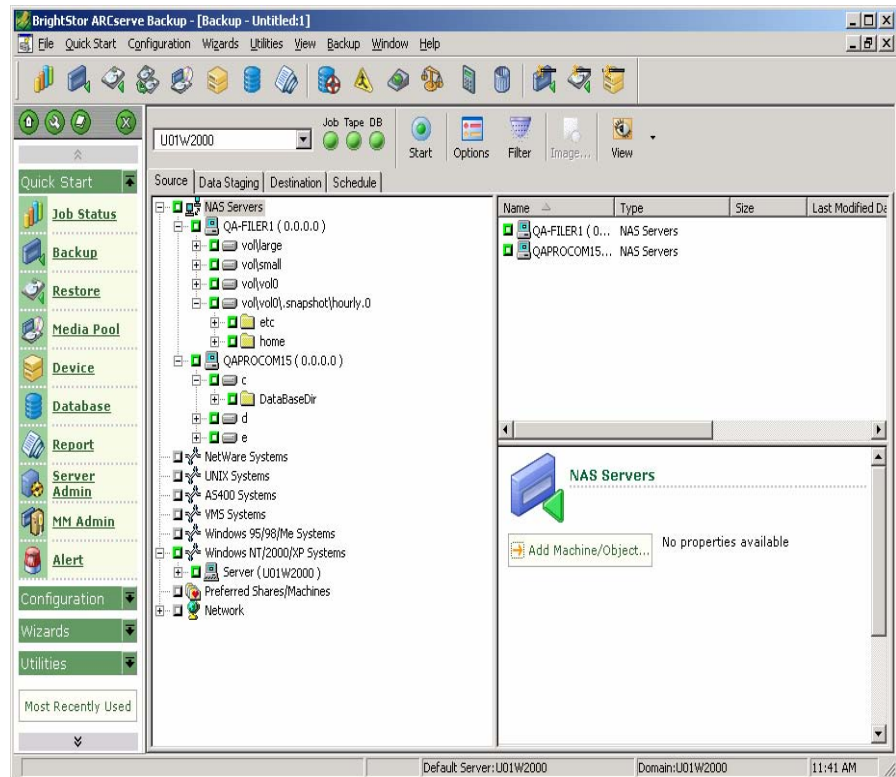
For Network Appliance NAS servers that support the NDMP Version 4 Snapshot Management Interface Extension, BrightStor ARCserve Backup enumerates the volumes, directories, and files on the NAS server. When using Network Appliance servers, you can select more than one subtree per volume. Other NAS vendors are limited to one selection per volume. For NAS servers that support NDMP Version 3, BrightStor ARCserve Backup can automatically enumerate all the volumes that are defined on the NAS server. For NAS servers that support NDMP Version 2, the volumes that need to be displayed in the source must be manually configured via the `nas.cfg` configuration file.

**Note:** For information about the `nas.cfg` file, see Option Configuration in the chapter “Installing the Option.”

## Back Up a NAS Server

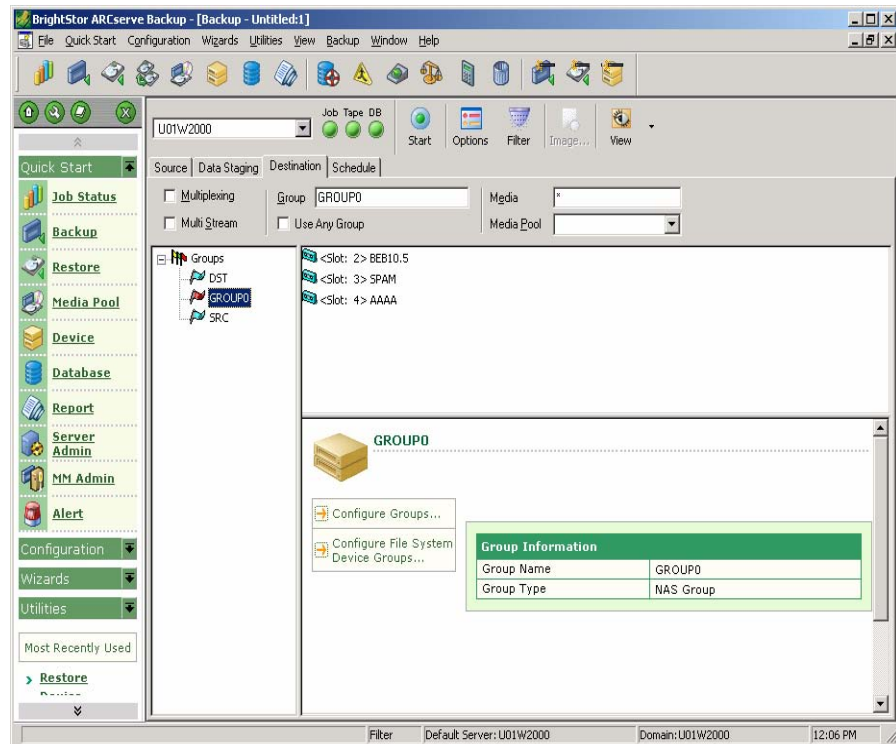
Use the following steps to backup a NAS server:

1. Expand a NAS server on the Source tab. This displays the volumes on the server. Backing up individual NAS server volumes, as well as an entire machine is supported.



2. Select the volumes for backup.
3. Click the Destination tab.

## 4. Select the device.



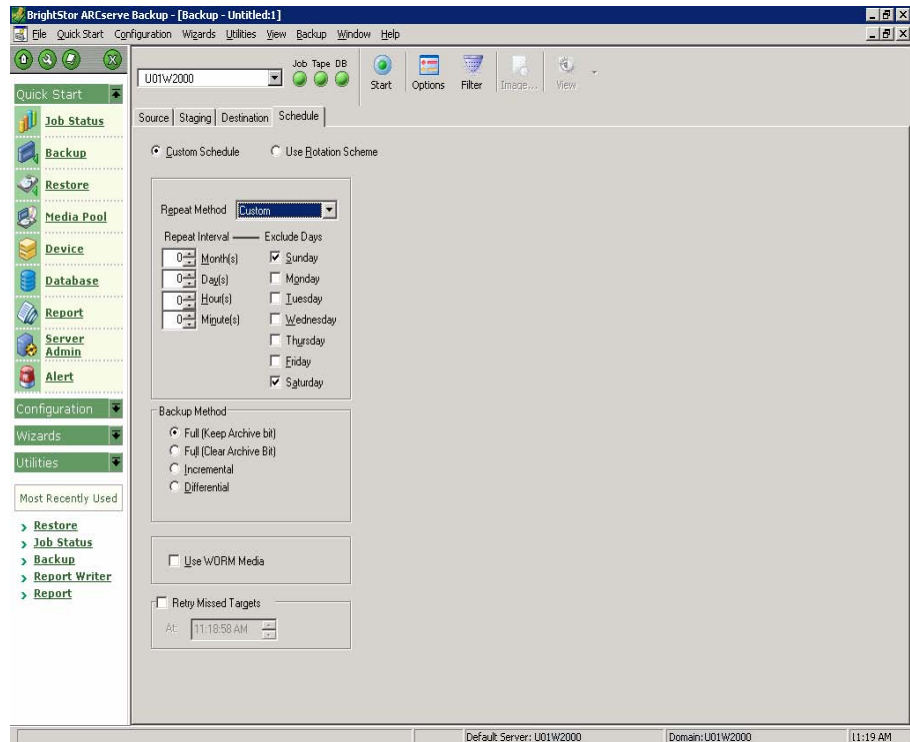
**Note:** You cannot back up a NAS server to a tape drive that is connected to the local BrightStor ARCserve Backup server. Also, you cannot select agents or the local file system on a BrightStor ARCserve Backup server and back them up to a tape drive connected to the NAS servers.

## Schedule a Backup

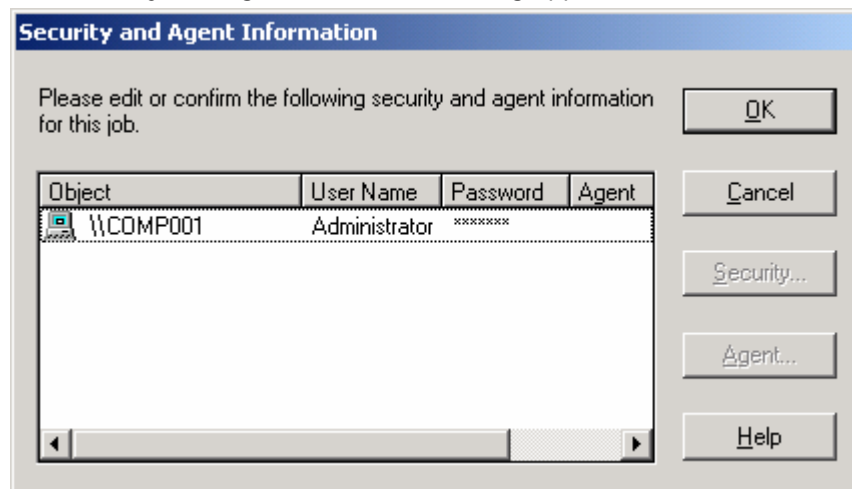
To schedule the backup, use the following steps:

1. Select the Schedule tab.

2. Select the desired Repeat Method from the drop-down list.



3. Check the Backup Method from the list.
4. Click the Start button.
5. The Security and Agent Information dialog appears as shown next:



Edit the information, or click OK.

The Submit Job dialog displays as shown next:

6. Select one of the following:

- Run Now – The backup starts immediately.
- Run On – Input the date and time to start the backup.

**Note:** For more information about saving jobs and job templates, see Job Templates, in the chapter “Customizing Your Jobs,” in the *Administrator Guide*.

7. Click OK.

You have completed the backup.

After submitting the backup job, you can monitor its progress by opening the Job Status Manager from the BrightStor ARCserve Backup Home Page.

BrightStor ARCserve Backup does not display a progress bar or percentage complete statistic in its Job Monitor when backing up EMC CLARiiON IP4700, Celerra, and Procom NAS servers.

**Note:** Even though all NAS servers use NDMP protocol, you should perform backups and restores to the same vendor’s servers or compatible hosts.

## Restore Operations

To restore data from a NAS server, use the BrightStor ARCserve Backup Restore Manager for configuring and submitting the job. You can restore data from the tape device attached directly to the local NAS server or from a tape device attached to a different NAS server.

The *Administrator Guide* provides a description of the BrightStor ARCserve Backup restore features. However, NAS server restores create some limitations for the normal functionality of the BrightStor ARCserve Backup. Some of these result from the NDMP protocol, while others result from limitations imposed by particular NAS servers.

## Restore Options

When a NAS server is selected for a restore job, the BrightStor ARCserve Backup options are global options that apply to all restore jobs in general. Options default to overwrite mode for restore jobs. You should be very careful when picking your restore location.

Some of the standard BrightStor ARCserve Backup restore options are not available for all NAS servers. Some of the limitations are due to the version of NDMP in use on the NAS server while other limitations are due to the vendor's equipment. For a complete list of vendor-specific NAS server limitations, see the appendix, "Feature Support Summary."

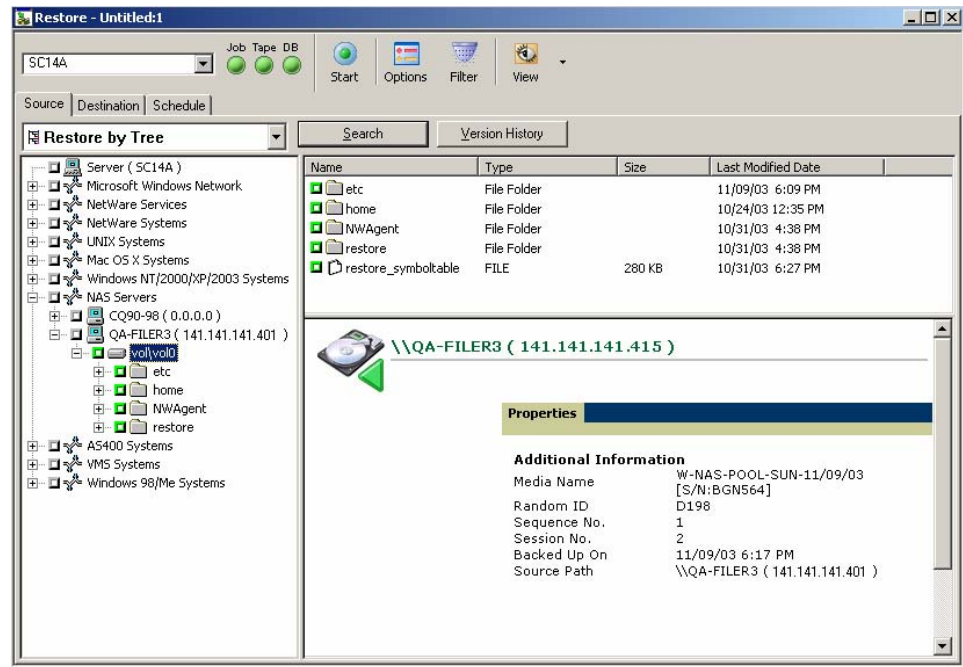
## Restore Methods

You can select the NAS files and directories for recovery or the NAS backup server and individual files and directories. After these files are selected for recovery, you must specify the destination.

### Restore by Tree

NAS servers are listed on the Source screen. You can select individual NAS files and directories for recovery.

The following screen shows the Source tab with the directories of one server expanded:



To restore by tree, perform the following steps:

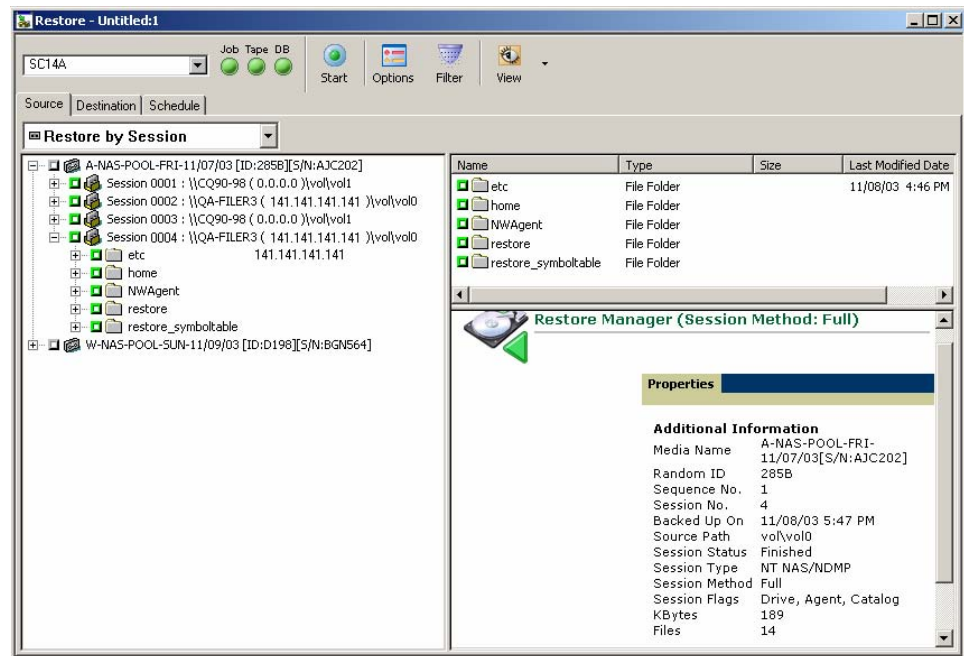
1. Select Restore by Tree.
2. Select the files or directories you want to restore.

For the steps to follow to complete this procedure, see Restore Destination Tab in this chapter.

## Restore by Session

You can use the Restore by Session function to restore NAS server backup sessions and individual files and directories.

The following screen shows the Source tab listing the NAS sessions available for restore.



To restore by session, perform the following steps:

1. Select Restore by Session.
2. Select the session or files that you want to restore.

For the steps to follow to complete this procedure, see Restore Destination Tab in this chapter.

## Restore Destination Tab

The following are limitations governing NAS recovery jobs:

- You can restore NAS server data only to another NAS server.
- You cannot restore to the BrightStor ARCserve Backup server, because it is not an NDMP server.
- You cannot restore to the original location with a snapshot or checkpoint. These are read-only copies of the file system.
- For snapshot sessions, you must use the default restore options. The Do not create base directories option should be selected.



- You can specify a directory path for restore. When you manually specify a destination path on the restore Destination tab, you can browse to select a restore destination, or enter the path to the restore destination using following format:

\\TEST\vol\vol0\destination

- When restoring using extract-restore mode, the original backup path will be appended to the path specified in the restore destination tree.
- If the tape library or tape library unit and the NAS vendor support Direct Access Restore (DAR), and you are restoring files, the original path will only be appended to the user-specified destination path if the restore options designate that behavior.

DAR supports file restoration only. If you choose to restore at least one folder, the restore reverts to scanning the session.

**Note:** Extract-restore mode scans the entire contents of a backup image to restore an item. Conversely, DAR traverses to the proper offset.

- The following limitations affect all restores on all NAS vendor appliances:

**Note:** The following options appear on the Destination tab of the Restore Manager, Global Options dialog.

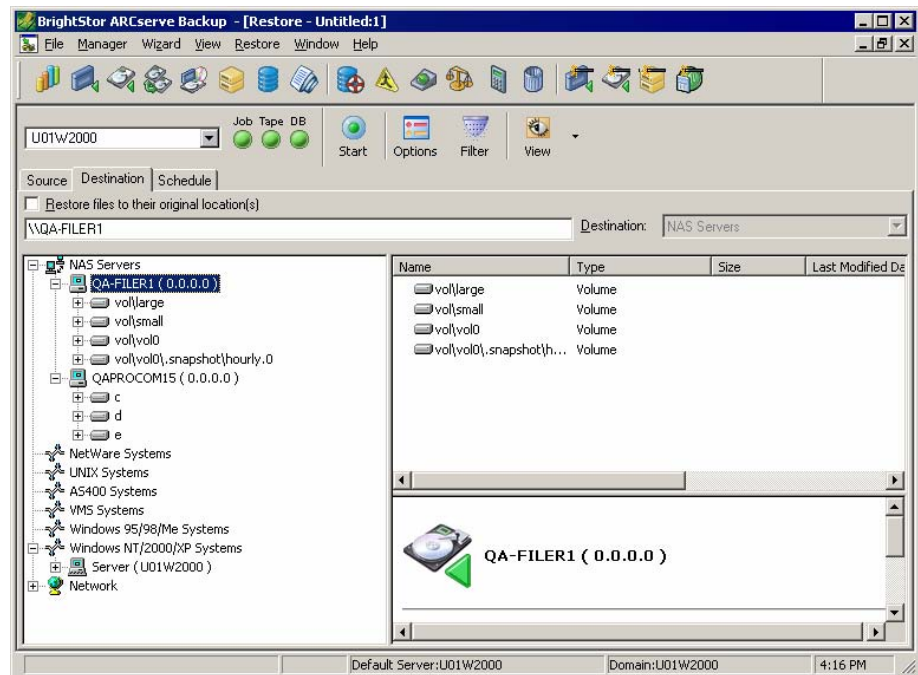
- When performing non-DAR restore operations, the NDMP NAS Option only supports the “Create Entire Path from the Root” Directory Structure option.
- The NDMP NAS Option does not support the “Do Not Create the Base Directories” Directory Structure option.

## Select Your Destination

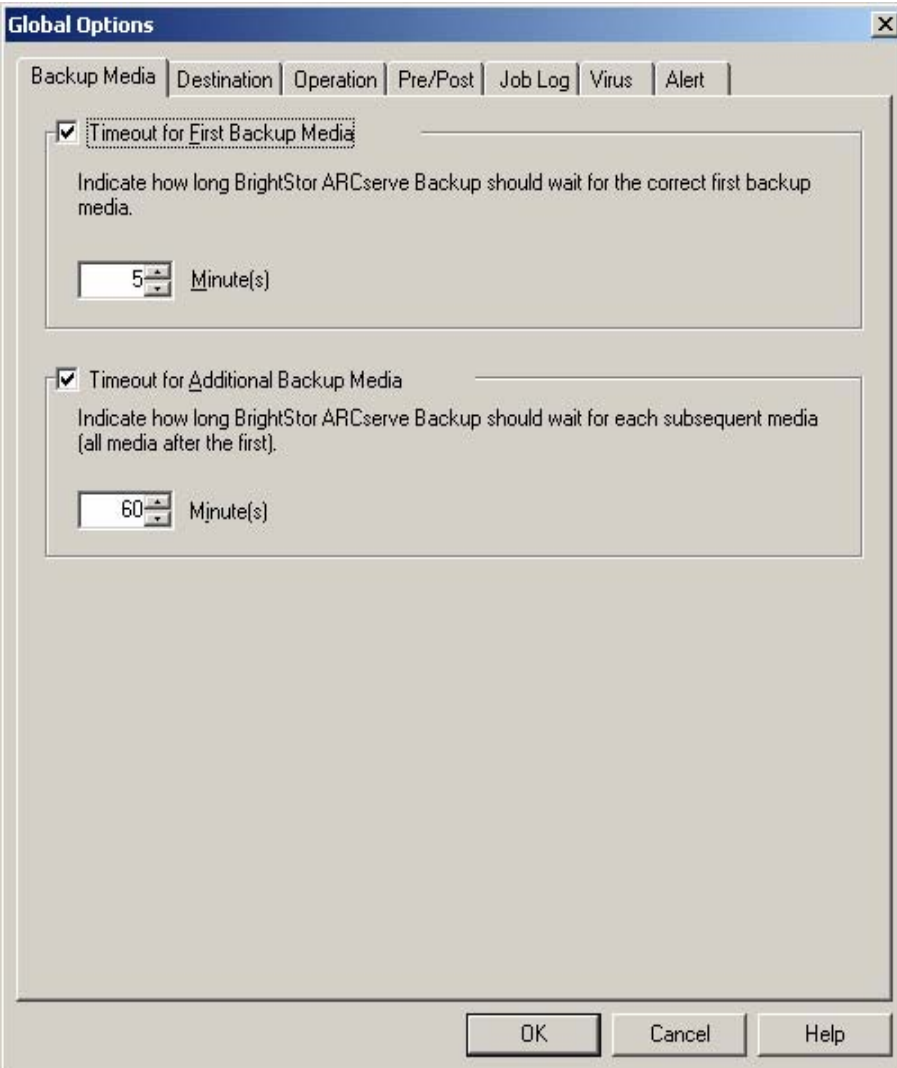
To select a destination, perform the following steps:

1. Select the Destination tab.

2. Select the file system path for the restore.



- From the Global Options dialog, select a supported restore option, and then click OK.



The image shows a 'Global Options' dialog box with a tabbed interface. The 'Backup Media' tab is selected. It contains two checked options, each with a descriptive text and a numeric input field followed by 'Minute(s)'. The first option is 'Timeout for First Backup Media' with a value of 5. The second option is 'Timeout for Additional Backup Media' with a value of 60. At the bottom right are 'OK', 'Cancel', and 'Help' buttons.

**Global Options**

Backup Media | Destination | Operation | Pre/Post | Job Log | Virus | Alert

☒ Timeout for First Backup Media

Indicate how long BrightStor ARCserve Backup should wait for the correct first backup media.

5 Minute(s)

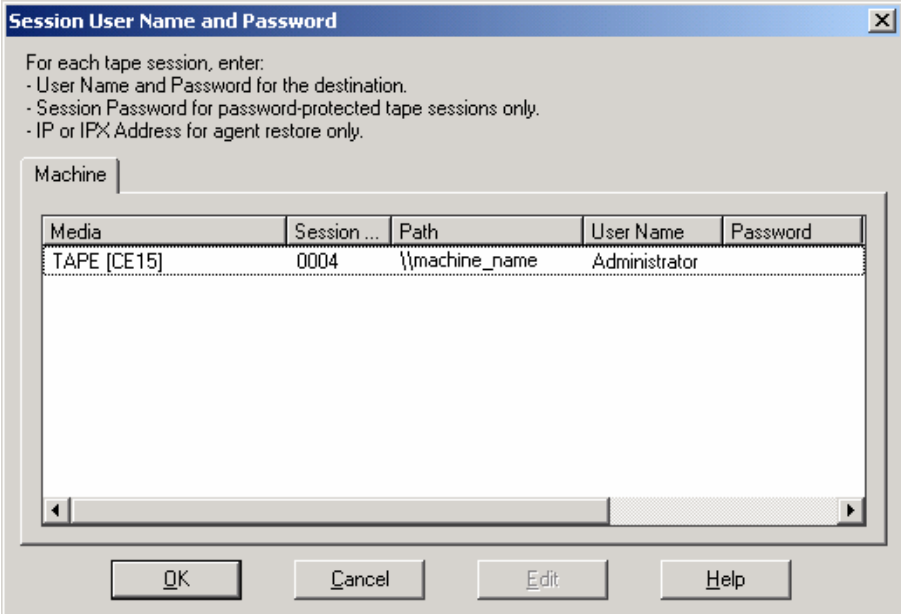
☒ Timeout for Additional Backup Media

Indicate how long BrightStor ARCserve Backup should wait for each subsequent media (all media after the first).

60 Minute(s)

OK Cancel Help

- Click the Start button. The Session User Name and Password dialog appears.



**Session User Name and Password**

For each tape session, enter:

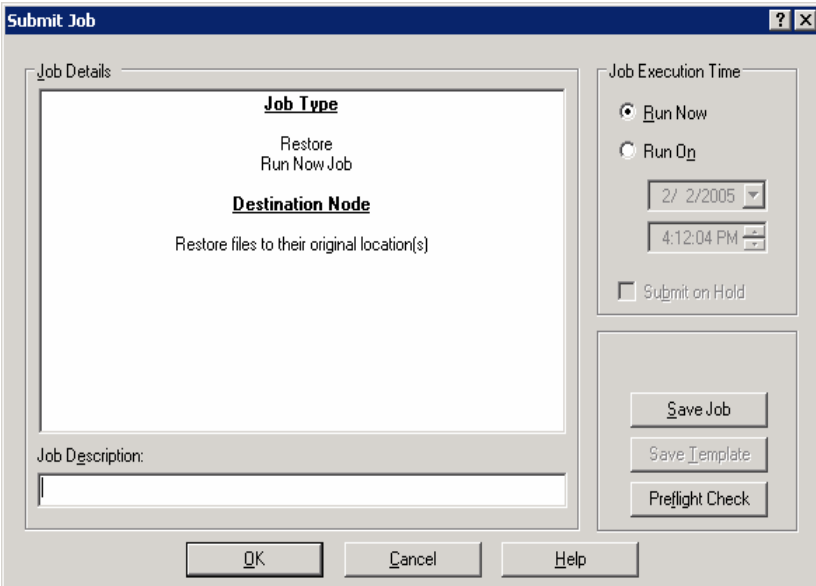
- User Name and Password for the destination.
- Session Password for password-protected tape sessions only.
- IP or IPX Address for agent restore only.

Machine

Media	Session ...	Path	User Name	Password
TAPE [CE15]	0004	\\machine_name	Administrator	

OK Cancel Edit Help

- Edit the information or click OK. The Submit Job dialog appears.



**Submit Job**

Job Details

**Job Type**

Restore  
Run Now Job

**Destination Node**

Restore files to their original location(s)

Job Description:

Job Execution Time

☒ Run Now  
☐ Run On

2/ 2/2005  
4:12:04 PM

☐ Submit on Hold

Save Job  
Save Template  
Preflight Check

OK Cancel Help

6. Select one of the following:

- Run Now – The restore starts immediately.
- Run On – Input the date and time to start the restore.

**Note:** For more information about saving jobs and job templates, see Job Templates, in the chapter “Customizing Your Jobs,” in the *Administrator Guide*.

7. Click OK.

You have completed the restore.

After submitting the restore job, you can monitor its progress by opening the Job Status Manager from the BrightStor ARCserve Backup Home Page.

BrightStor ARCserve Backup does not display a progress bar or percentage complete statistics in its Job Monitor when restoring EMC CLARiiON IP4700, Celerra, and Procom NAS servers.

**Note:** Even though all NAS servers use NDMP protocol, you should perform backups and restores to the same vendor’s servers or compatible hosts.

## Devices and Media

The Device Manager gives you information about storage devices that are connected to your network, the media in these devices, and the status of these devices. You can also use the Device Manager to manage the tape drives and media attached to NAS servers.

### Adapter, Device, and Group Views

The Device Manager shows adapter, device, and group information about tape devices attached to the NAS servers. This information updates after you run Device Configuration to configure devices attached to NAS servers and then restart the Tape Engine.

### Media Management

You can manage media by using the Device Manager to erase, format, and eject media from tape devices attached to NAS servers. The option also supports tape library units and all the media management functionality associated with it.

## Database Management

BrightStor ARCserve Backup stores backup job information for each backup job you run, including media and media device information, in the BrightStor ARCserve Backup database. You can use this information to perform intelligent restores by keeping track of each file and directory that you backed up to a specific media. When you want to restore a specific file, the database determines where the file is stored. For more information about the database, see the *Administrator Guide*.

## Reports

The information stored in the database can be used for many types of reports. You can access these reports with the Report Manager. The Report Manager provides several functions to help manage both reports and logs. For more information about reports, see the *Administrator Guide*.

## Utilities

BrightStor ARCserve Backup offers several utilities that you can use to manage files. The utilities supported by the NDMP NAS Option include the Copy, Count and Purge utilities. These utilities do not, however, use NDMP to complete their tasks. The NAS servers for these utilities are accessed through the Microsoft network tree.

**Note:** The Compare utility is not supported for sessions backed up using the option because the backup image is a third-party format.

### Merge Utility

Using the Merge utility, you can merge information from media attached to the NAS server into the BrightStor ARCserve Backup database. The information from the media is appended to the existing database files. You can also use the Merge utility to restore data from a BrightStor ARCserve Backup host different from the host used to create the backup.

### Scan Tape Utility

You can scan the NDMP NAS Option media for information about previously backed-up sessions with the Scan Tape utility.

NAS sessions, by contrast, are third-party backups with content that cannot be interpreted by the Scan Tape utility. The operation is limited to reporting the session-level details of the NAS session. You can also view the results of the media scan in the Report Manager under the Activity Log listing or under the User Log listing (if an additional log file is created). Furthermore, you can select a specific session or scan the entire media for session-level details.





# Appendix A: Using Network Appliance NAS Devices

---

This appendix contains information about how to configure and use Network Appliance NAS servers with the NDMP NAS Option.

## Network Appliance Servers Configuration

Before the NDMP NAS Option can use a Network Appliance server, you must set certain parameters on the NAS server. You can specify most of these server settings from the NAS server's web-based Administrative Interface or from any Telnet console.

### Access the Administrative Interface

To access the web-based Administrative Interface, enter the following URL in your web browser's address bar:

```
http://<IP address of the Netapp server>/na_admin/
```

You can also use Telnet to access the system by entering:

```
c:/> telnet <IP address of the NetApp>
```

Enter the administrator name and password to log in.

### User Accounts

The Network Appliance Data ONTAP operating system supports a system account named root. You can also configure optional administrative user accounts to control a server using a Telnet session on the server console, or the server's web-access site.

### NDMP

Network Appliance requires that you enable NDMP on the NAS server. To enable NDMP on the NAS server, you can use the web-based Administrative Interface or the Telnet session as described in the following sections.

## Enable NDMP Using the Web-based Administrative Interface

To enable the NDMP protocol using the web-based Administrative Interface, follow these steps:

1. Open the NAS server URL. For example:  
`http://<NAShostname>/na_admin`  
(Replace NAShostname with the real NAS host name.)
2. A menu bar appears on the left side of the page. Expand the NDMP section.
3. Select Enable/Disable.
4. Make sure that NDMP is enabled.

## Enable NDMP Using Telnet

To enable NDMP using Telnet, follow these steps:

1. Connect to the Network Appliance server.
2. Enter the command:  
`ndmpd status`  
This command shows if the NDMP status is on or off.
3. If the NDMP status is off, enable NDMP by entering the following command:  
`ndmpd on`

## Configure Tape Library Device Names

For the NDMP NAS Option to be able to perform backup and restore operations on a Network Appliance server, the backup devices must be configured properly. Part of the configuration process involves identifying the logical device names of the attached tape library devices. You only need to do this if you have a tape library attached to the NAS server.

1. Activate a Telnet session to issue commands on the server.
2. Enter the following command:

```
sysconfig -m
```

The name of the tape logical unit displays.

## Configure the Drive Access Path

The drive access path is the path that Network Appliance servers use to communicate with NDMP drives. Use the following steps to find the drive access path:

1. Use either a Telnet session or the URL: `http://<NAShostname>/na_admin` to connect to the server.
2. Enter the following command to display all the tape device access path information:

```
sysconfig -t
```

This displays all of the tape access path information:

```

Command Prompt - telnet CA-NETAPP
ca_netapp> sysconfig -t

Tape drive <0b.1> Quantum DLT8000
rst0l - rewind device, format is: 85937 bpi 35 GB
nrst0l - no rewind device, format is: 85937 bpi 35 GB
urst0l - unload/reload device, format is: 85937 bpi 35 GB
rst0m - rewind device, format is: 85937 bpi 70 GB <w/comp>
nrst0m - no rewind device, format is: 85937 bpi 70 GB <w/comp>
urst0m - unload/reload device, format is: 85937 bpi 70 GB <w/comp>
rst0h - rewind device, format is: 98250 bpi 40 GB
nrst0h - no rewind device, format is: 98250 bpi 40 GB
urst0h - unload/reload device, format is: 98250 bpi 40 GB
rst0a - rewind device, format is: 98250 bpi 80 GB <w/comp>
nrst0a - no rewind device, format is: 98250 bpi 80 GB <w/comp>
urst0a - unload/reload device, format is: 98250 bpi 80 GB <w/comp>

Tape drive <0b.2> Quantum DLT8000
rst1l - rewind device, format is: 85937 bpi 35 GB
nrst1l - no rewind device, format is: 85937 bpi 35 GB
urst1l - unload/reload device, format is: 85937 bpi 35 GB
rst1m - rewind device, format is: 85937 bpi 70 GB <w/comp>
nrst1m - no rewind device, format is: 85937 bpi 70 GB <w/comp>
urst1m - unload/reload device, format is: 85937 bpi 70 GB <w/comp>
rst1h - rewind device, format is: 98250 bpi 40 GB
nrst1h - no rewind device, format is: 98250 bpi 40 GB
urst1h - unload/reload device, format is: 98250 bpi 40 GB
rst1a - rewind device, format is: 98250 bpi 80 GB <w/comp>
nrst1a - no rewind device, format is: 98250 bpi 80 GB <w/comp>
urst1a - unload/reload device, format is: 98250 bpi 80 GB <w/comp>
ca_netapp>

```

The tape logical device names listed by Network Appliance NAS servers use the following syntax:

`xxxx#@`

The following table explains the symbols and the corresponding values for the logical device names.

Symbol	Value	Explanation
xxxx	nrst	A no-rewind sequential tape device. Opening and closing the device does not result in the device being automatically rewound.
	rst	A logical, sequential tape device that positions the actual device at the start of the tape during every open operation.

Symbol	Value	Explanation
	urst	A logical, sequential tape device that loads and unloads the physical device in its open and close calls.
#	numeric	The device number. Device numbers start at 0.
@	l	Low-density mode for tape writes.
	m	Medium-density mode for tape writes.
	h	High-density mode for tape writes.
	a	High-density mode with hardware compression for tape writes.

## Snapshots

You can use the NAS configuration file, `nas.cfg`, to browse the Network Appliance server's file system and snapshots. The `nas.cfg` file contains mappings of nodes to volumes or logical devices and their associated subdirectories that you may want to back up.

The configuration file allows you to do partial volume backups using the Backup Manager. If your Network Appliance server supports NDMP Version 4, you can automatically browse subdirectories and files in a volume and you do not need to configure the `nas.cfg` file for partial volume backups.

When you do back up data from a file system, the Network Appliance NAS server creates a snapshot of that data set so that the backup reflects a consistent view of the data at the time of the execution of the backup. The data is then indirectly backed up from this snapshot.

When you configure the `nas.cfg` file, you can auto-browse below the snapshot folder in the Backup Manager's source tree. To do this, enter the full path to the snapshot file under the Network Appliance server name in the configuration file.

The following is an example of configuring the Daily0 snapshot file:

```
/vol/vol0/.snapshot/Daily.0
```

The following rules apply when you enter information in the NAS configuration file for a Network Appliance NAS server:

- Keep each entry on an individual line.
- Start with the host name of the NAS server.
- Put the volume and directory names on the next lines.
- Separate configurations by semicolons.
- Insert comments using the # symbol on individual lines or following any line entry.

When performing a recovery operation using the configuration file, you can make multiple selections per volume for a job. If the configuration file has multiple snapshot paths, you can select any multiple of snapshot paths, as you would for normal Network Appliance backups. The following is an example of multiple-path designations in a nas.cfg file:

```
qa-server3
/vol/vol0/.snapshot/Daily.0
/vol/vol0/.snapshot/Monthly.1
/vol/vol0/.snapshot/Weekly.3
;
```

Snapshot backups should not be restored to the original location because they are read-only. You can, however, restore snapshot backups to an alternate location.

## Limitations

There are limitations when using a Network Appliance NAS device with the NDMP NAS Option. These limitations are based on the version of NDMP in use on the NAS server. Limitations include the following:

- For backups, the use of filters is limited to exclude file and directory entries.
- Filters are not supported on restores.
- Use of tape drives is limited to those that are supported by Network Appliance.

- Use of tape library units is limited to those supported by Computer Associates.
- Although Network Appliance NAS devices support Direct Access Restore (DAR), the option supports file restoration only. If you choose to restore at least one folder, the restore reverts to scanning the session.

For additional information about vendor-specific NAS server limitations, see the appendix Feature Support Summary.

# Appendix B: Using EMC Celerra NAS Devices

---

This appendix contains information about how to use EMC Celerra NAS servers with the NDMP NAS Option.

## Host Data Mover

The Celerra File Server supports up to a maximum of four simultaneous backup operations on an NDMP Host Data Mover. You can connect multiple Host Data Movers to the same tape library unit. The tape library unit can have multiple SCSI host connections.

The tape library unit can also have fibre-channel connections. Do not connect the Celerra File Server Control Station to the tape library unit. For each tape library unit SCSI connection, you can attach a maximum of two drives. You cannot daisy chain any of the Host Data Mover storage system SCSI connections to the tape library unit.

If an NDMP Host Data Mover fails over to its standby, you must physically connect the Host Data Mover's tape library unit cable to the standby.

The ability to connect a Host Data Mover to a tape library unit is dependent on the number of SCSI ports on a Host Data Mover. Some older models of a Host Data Mover may have only two SCSI ports. These are required for storage system connectivity and redundancy. You should not use these storage system SCSI ports for tape library unit connections.

## Configure the EMC Celerra Data Mover

Before the NDMP NAS Option can be used on an EMC Celerra NAS server, you must set parameters on the NAS server. You can specify most of these settings from any Telnet console.

You can use Telnet to access the system by entering the following command:

```
c::/> telnet <IP address of the Celerra>
```

Enter the administrator name and password to log in.

## User Accounts

You must set a user name and password for each NDMP Host Data Mover at the Celerra File Server Control Station. The user name and password must match those you will enter for the NDMP NAS Option.

## Enable NDMP

To access the NDMP Host Data Movers on an EMC Celerra server, you must first enable the server. Use the following steps to enable a device through a Telnet session:

1. Verify that each NDMP Host Data Mover can recognize its tape library units by entering the following command:

```
$ server_devconfig <server_name> -probe -scsi -nondisks
```

**Note:** In the following example, the EMC Celerra server recognizes a two-drive library. The jbox value represents the tape library unit. In the next statements, tape represents the tape drives.

```
chain=1, scsi-1
```

```
symm_id= 0 symm_type= 0
```

```
tid/lun= 0/0 type= jbox info= ATL P1000 62200501.21
```

```
tid/lun= 4/0 type= tape info= QUANTUM DLT7000 245Fq_
```

```
tid/lun= 5/0 type= tape info= QUANTUM DLT7000 245Fq_
```

2. Configure the devices with the Celerra File Server by adding them to the host database using the following command:

```
$ server_devconfig <server_name> -create -scsi -nondisks
```

When a device is configured, the server responds with the following:

```
<server_name>: done
```



3. Enter the following command to verify that the configuration is set:

```
$ server_devconfig <server_name> -list -scsi -nondisks
```

The server responds with the following:

```
<server_name>:
```

```
Scsi Device Table
```

```
name addr type info
```

```
jbox1 c1t010 jbox ATL P1000 62200501.21
```

```
tape2 c1t410 tape QUANTUM DLT7000 245Fq_
```

```
tape3 c1t510 tape QUANTUM DLT7000 245Fq_
```

To view more commands specific to the Celerra, review the *Celerra File Server Command Reference Manual*. The manual has a comprehensive listing of all commands.

## Logical Device Names Detection

If you do not want the NDMP NAS Option to automatically detect the drives, you can manually assign them when you configure the option. This is recommended if you are configuring your tape library unit and server on a SAN.

You must follow the previous instructions about how to determine the logical device names to be used in NDMP NAS Option. From the example in the previous section, they appear as c1t010, c1t410, and c1t510.

## nas.cfg File Configuration

BrightStor ARCserve Backup can automatically determine the volumes mounted on the EMC Celerra NAS servers. BrightStor ARCserve Backup employs NDMP Version 3 to interact with the volumes. To employ partial volume backups, you must configure the nas.cfg file. For more information about configuring the nas.cfg file, see in the chapter “Installing the Option.”

## Limitations

There are certain limitations in using the EMC Celerra NAS servers with NDMP NAS Option. Some of these limitations are based on the version of NDMP in use on the NAS server. Limitations include the following:

- Filters are not supported.
- The use of tape drives is limited to those certified by EMC Celerra and the NDMP NAS Option.
- The use of tape library units is limited to those certified by Computer Associates.
- Although EMC Celerra NAS devices support Direct Access Restore (DAR), the option supports file restoration only. If you choose to restore at least one folder, the restore reverts to scanning the session.
- The progress bar or percentage complete statistics in BrightStor ARCserve Backup does not display during a backup.

For information about vendor-specific restrictions, see the appendix “Feature Support Summary.”

# Appendix C: Using EMC CLARiiON IP4700 NAS Devices

---

This appendix contains information about how to use EMC CLARiiON IP4700 NAS Devices with the NDMP NAS Option.

## Configure the EMC CLARiiON IP4700 NAS Server

Before NDMP NAS Option can work with the EMC CLARiiON IP4700 NAS server, certain parameters must be set on the server. Most of these settings can be performed from the web-based Administrative Interface or directly from the console attached to the IP4700 NAS server.

To access the web-based Administrative Interface, enter the following URL in your Web browser address bar:

`http://<IP address of the IP4700>`

## User Accounts

To access the EMC CLARiiON IP4700 NAS server through the NDMP NAS Option, the proper administrator password must be set on the device. For the device to be accessible to the option, the administrator password must not be null or empty. To configure the option, use the following information:

Username: Administrator

Password: *<As set on the IP4700>*

## NDMP

If the NDMP NAS Option is properly installed on the device, NDMP is enabled by default on EMC CLARiiON IP4700 NAS servers.

## Logical Device Names

For NDMP NAS Option to be able to perform backup and restore operations on EMC CLARiiON IP4700 NAS servers, at least one server in the configuration must have tape drives or tape library units attached to it. The logical device names of the attached devices must be specified to the NDMP NAS Option.

These logical device names are automatically assigned to the devices by IP4700 depending on the SCSI settings and type of each device. The logical device names can also be determined from the Tape Drives menu of the web-based Administrative Interface.

The following is an example of a typical Tape Drives information screen:

```
SP-A(IP4700SPA) HP C1557A U709 /dev/c0b0t6d0
SP-A (IP4700SPA) SCSI Device /dev/c0b0t6d1
SP-B (IP4700SPB) QUANTUM SuperDLT1 1717 /dev/c0b0t3d0
SP-B (IP4700SPB) QUANTUM SuperDLT1 1717 /dev/c0b0t3d0
SP-B (IP4700SPB) SCSI Device /dev/c0b0t5d0
```

Each line consists of three components:

- Storage processor
- Device description
- Logical device name

For example, consider the first line:

```
SP-A (IP4700SPA) HP C1557A U709 /dev/c0b0t6d0
```

In this line:

```
Storage Processor = SP-A (IP4700SPA)
Device Description = HP C1557A U709
Logical Device Name = /dev/c0b0t6d0
```

The last part of the line contains the logical device name (in this example, /dev/c0b0t6d0) used when configuring the NDMP NAS Option.

The second line in this example is:

```
SP-A (IP4700SPA) SCSI Device /dev/c0b0t6d1
```

This has the device description "SCSI Device." This device description indicates that this device is a tape library unit, not a regular tape drive. This logical device name can be used to configure the tape library unit on the NDMP NAS Option.

## Network Configuration

When you configure the EMC CLARiiON IP4700 NAS server for the network, remember to:

- Assign a unique IP addresses to each of the storage processors in IP4700. The IP address must be set up from the console attached to the server.
- Unique host names must be assigned to each of the storage processors.
- The host names and IP addresses must be registered with the DNS server, so that they are accessible when the host name in any browser.

**Note:** If the host names are not properly configured in the DNS server and the storage processors are unable to resolve each other's names, backup and restore operations will not function properly.

If you have purchased the CIFS License from EMC, you should be able to access the volumes on the EMC CLARiiON IP4700 NAS server through Microsoft Windows. The domain name and WINS server must be configured on the IP4700.

## Volume Configuration

Volumes are configured in accordance with the requirements of the NAS device. For NDMP NAS Option to function correctly, at least one volume must be configured on the server.

Depending on the operating system from which the volumes are accessed, CIFS shared directories and NFS exports must be configured with appropriate level of access rights.

## Tape Drives and Tape Libraries

At least one tape drive or a tape library unit with at least one tape drive must be connected to the SCSI bus of an IP4700 in the NAS server configuration. Use the Tape Drive menu from the web-based Administrative Interface to ensure that the device is properly connected and is recognized by the IP4700. All of the tape drives and the tape library units must have an entry in the list.

## Limitations

There are limitations when using a EMC CLARiiON IP4700 NAS server with the NDMP NAS Option. Some of these limitations are based on the version of NDMP in use on the NAS server. The limitations include the following:

- Only full volume backups can be performed. Restore operations, however, can be performed on selected files or folders.
- Backup and restore operations do not support any kind of filtering.
- Snapshot functionality is not supported.
- Direct Access Restore (DAR) is not supported.
- The option does not display a progress bar or percentage complete statistic in the Job Monitor.
- EMC CLARiiON IP4700 restore operations only support the option Create Entire Path from the Root on the Destination tab of the Restore Manager Global Options dialog.

Furthermore, the NDMP NAS Option cannot determine the volumes created on the IP4700 server. These volumes need to be determined manually and the file `nas.cfg` must be properly configured. You can determine the volume names that you need enter on the `nas.cfg` file by viewing the web-based Administrative Interface.

The following is an example of volume information that you can view:

Name	Label	Size	Space Used	Status
A0		264910	15723	RDY
B0		264910	15569	RDY

The volume names ('A0' and 'B0' in this case) need to be put into the `nas.cfg` file.

# Appendix D: Using Procom NAS Devices

---

This appendix contains information on using the BrightStor ARCserve Backup NDMP NAS Option with Procom NAS devices.

## Procom Server Configuration

Before the NDMP NAS Option can be used with Procom devices, you must set certain parameters on the NAS server. You can specify most of these settings from the web-based Administrative Interface. Additionally, some settings are performed directly on the LCD panel available on the Procom device.

To access the web-based Administrative Interface, enter the following URL in your web browser address bar:

`http://<IP address of the Procom>`

## User Accounts

To access a Procom server through the NDMP NAS Option, an administrator password must be established on the Procom server. To access the Procom server, you would use the following information:

Username: administrator

Password: <As set on the Procom>

## Network Configuration

Network configuration involves assigning a unique IP address to the Procom server. If the DHCP server is available in the network, the Procom server can automatically obtain an IP address. You can determine the DHCP-assigned IP address by using the LCD panel on the Procom server.

You can manually assign an IP address to the server. You must use the LCD panel on the Procom server the first time you assign an IP address. You can configure additional parameters (for example, the DNS server and routing table) from the web-based interface.

You can access the Procom file system using either Microsoft Windows or UNIX. Each operating system has specific requirements to enable the access. These requirements are:

- For Microsoft Windows, the WINS server and domain name must be correctly set, and at least one share must be created.
- For UNIX, the appropriate exports must be created.

## Volume Configuration

Volumes are configured according to the requirements of the NAS server used. For the NDMP NAS Option to function correctly, at least one volume must be configured on the server serving as the data source of the backup operation.

NAS separates storage resources from network and application servers to simplify storage management and to provide file-level access to data, using standard protocols such as Network File System (NFS) or Common Internet File System (CIFS). A file system is located on the NAS server, and data is transferred to the client over standard network protocols. Depending on the operating system from which the volumes are to be accessed, CIFS shared directories and NFS exports must be configured with appropriate access rights.

## Tape Drives and Tape Library Units

At least one tape drive or a tape library unit with at least one tape drive must be connected to the SCSI bus of the Procom NAS server targeted as the destination for the backup data. You can read the System Log to verify that all the tape drives are properly connected and correctly detected by the Procom server.

## Logical Device Names

For the NDMP NAS Option to be able to perform backup and restore operations on a Procom server, the tape drives and tape library units attached to the server must be configured. This configuration differs depending on the firmware being on the NAS server.



## 4.1 Firmware Configuration

For Procom servers with 4.1 firmware, you must specify the logical device names in the configuration file. You can determine these names from the System Log, accessible through the web-based interface.

Two lines in the System Log provide information about the tape drives and tape library units connected to the Procom server. The following example shows sample lines from this log:

```
1/09 12:27 | robotape isp1?061 type=8 desc='HP C1557A '  
1/09 12:27 | tape isp1t060 'HP C1557A '
```

The line containing robotape indicates a tape library unit — not a regular tape device. Use the word after robotape to determine the logical device name for the tape library unit. In the example, this word is isp1?061. To obtain the logical device name for the tape library unit, replace the ? with r. Therefore, the logical device name is isp1r061.

The line containing tape indicates a tape drive connected to the Procom server. The word after tape (isp1t060 in this example) is the logical device name for the tape drive. There may be multiple entries in the log containing the word tape, if multiple tape drives were detected. In this situation, the log will contain one line for each detected tape drive.

## 4.2 Firmware Configuration

The NDMP NAS Option automatically detects connected tape devices attached to a Procom server with 4.2 firmware. Logical device names are automatically assigned to Procom servers, depending on the SCSI settings and type of each device.

## NAS Configuration File and Backups

You can use the NAS configuration file, nas.cfg, to virtually browse the file system and checkpoints. You can browse in the Backup Manager's and Restore Manager's respective source and destination trees. The nas.cfg file contains mappings of nodes to volumes or logical devices and their associated subdirectories that you may want to back up. This configuration file also allows you to do partial volume backups from the Backup Manager.

The following rules apply when you enter information in the NAS configuration file:

- Keep each entry on an individual line.
- Start with the host name of the NAS server.
- Place the volume and directory names on the next lines.
- Separate complete NAS server configurations by semicolons.
- Insert comments using the # symbol on individual lines or following any node or volume name.

For NAS servers, you can select only one path per file system for a backup job. You are encouraged to run multiple jobs if you have multiple, disparate subtrees that need to be backed up under one file system.

The following is an example of multiple path designations in a nas.cfg file. You can select only one path under /c and one path under /d in the job.

```
/c/dir1
/c/dir2
/c/dir3
/d/dir1
/d/dir2
/d/dir3
;
```

Checkpoint backups should not be restored to the original location because they are read-only. You can, however, restore checkpoint backups to an alternate location. The following is an example of multiple checkpoint designations in a nas.cfg file:

```
qaprocom15
/c.chkpt/daily
/c.chkpt/hourly
/c.chkpt/monthly
/c/etc
/c/etc/xyz
;
```

## Limitations

There are limitations when using a Procom server with the NDMP NAS Option. Some of these limitations include the following:

- Restore jobs do not support any kind of filtering.
- Direct access restores are not supported.
- Backup jobs support Exclude filters on directory and file names only.
- The NDMP NAS Option does not display a progress bar or percentage complete statistic in the Job Monitor.
- Procom restore operations only support the option Create Entire Path from the Root on the Destination tab of the Restore Manager Global Options dialog.

Some of these limitations arise because of the version of NDMP in use on the Procom server. If the Procom server is configured to use NDMP Version 2, or its firmware version is earlier than 4.02.10, the NDMP NAS Option cannot automatically determine the volumes created on the Procom server. You must determine the volume names and use the names to configure the nas.cfg file. These volume names can be determined from the web-based Administrative Interface.

To determine the names of the volumes, use the web-based Administrative Interface to display the File Volume Usage window. Volume names that are file volumes available on the Procom server appear in the name column. Insert these names into the nas.cfg file.

For additional information about vendor-specific NAS server limitations, see the appendix "Feature Support Summary."



# Appendix E: Frequently Asked Questions

---

This appendix provides answers to some commonly asked questions that you may have when using the NDMP NAS Option.

## **When should I use the NDMP NAS Option?**

You can use NDMP NAS Option when you need to back up data stored on a NAS server to a tape device that is connected to either the same NAS server or another NAS server. In either case, the NAS server must support NDMP.

## **Where should I install the option?**

You should install the option on the BrightStor ARCserve Backup server.

## **Can I archive the data on the NAS server to the backup device connected to the BrightStor ARCserve Backup server using the NDMP NAS Option?**

No. You can only use the NDMP NAS Option to archive the data on the NAS server to its locally attached tape device or to another NAS server with an attached tape device. If the data on the NAS server needs to be backed up to the device on the BrightStor ARCserve Backup server, you can use the Preferred Shares to back up the NAS sever.

However, the answer is Yes, if the backup device is shared between the BrightStor ARCserve Backup server and the NAS server using a qualified configuration supported by DDS.

**Note:** To allow BrightStor ARCserve Backup to connect to Network Appliance servers through Preferred Shares, you must create an ADMIN\$ share for the volume containing the /ETC folder on the NAS server. Additionally, you should not back up NAS devices through Preferred Shares, as it does not utilize the NAS-attached backup device or the NDMP protocol for proper NAS operating system backup procedures.

## **Can I archive the data on other non-NAS servers to the tape device connected to the NAS server?**

Yes, if the backup device is shared.

## **Can I archive the data from one NAS server to the device connected to another NAS server?**

Yes. BrightStor ARCserve Backup supports archiving and restoring data from a NAS server to its locally attached tape device as well as to a tape device attached to another NAS server.

**Can I move NAS tape devices from one NAS server to another NAS server?**

Yes. Moving tapes from one NAS server to another results in a 3-way restoration.

**Can I share a backup device on a SAN connected to the BrightStor ARCserve Backup server and the NAS device, and use the NDMP NAS Option to back up data from the NAS server to the shared backup device?**

Yes. The NDMP NAS Option supports sharing a backup device on the SAN.

**How do I view the Netapp system log?**

To view the Netapp System Log, use the following procedure:

1. Go to [http://<BABserver>/na\\_admin](http://<BABserver>/na_admin).
2. Log in to the server.
3. Choose Server View.
4. Select System Log messages.
5. Check the approximate time of the problem.

# Appendix F: Troubleshooting

---

This appendix describes common problems and gives tips and information on solving them.

## Devices Do Not Display in the Device Manager

### Reason:

There are two probable causes:

- The server name, user name, or user password is incorrect or not configured.
- The device may be in use.

### Action:

If the devices do not appear in the Device Manager, you should:

- Verify that the name of the server and user name and password were configured correctly using `camediad_setup`.
- Verify that the tape drive is not already opened and in use by another NDMP session. Check to see if there are any leading or trailing spaces in the logical device name strings.

If you configured the NAS server using a hostname, rather than an IP address, you should use the Backup Manager to configure the option to use the NAS server's hostname.

## How do I reinitialize a NAS server?

To perform a manual reinitialization of the NDMP NAS Option with the server, perform the following steps:

1. Stop all the sessions on the NETAPP NAS server by connecting to the server using Telnet and entering the following command:  

```
ndmpd -killall
```
2. Restart the NDMP NAS Option universal agent service.
3. If necessary, delete the device references under the Computer Associates \ BrightStor ARCserve \ Base \ Tape Engine registry key.
4. If you are reconfiguring tape library units, run Device Configuration.
5. Restart the Tape Engine using BrightStor ARCserve Backup Server Admin.

### How do I enable debugging?

To enable debugging on the NDMP server, use the following procedure:

1. Log in to the remote NAS server using Telnet.
2. Enter the following command:

```
ndmpd debug 50
```

**Note:** The number 50 indicates the level of debugging information.

The debugging information is written to a file that can be found in the root directory of the volume. The format of the file name is:

```
ndmpd.####
```

##### represents the date and time of the log.

### Can I use the Procom System Log and Environment Log to debug and troubleshoot problems?

Yes. You can access these logs by opening the web-based Administrative Interface and selecting the Monitoring and Notification option.

For example, to view the Procom System Log, follow these steps:

1. Go to <http://<machine>>  
Replace *machine* with the URL of the Procom server.
2. Log in to the server.
3. Select Monitoring and Notification.
4. Select View System Events.
5. Select Display Log.

### Cannot Access IP4700 Service Interface

The IP4700 Service Interface is accessible by entering the following URL in your Web browser:

```
http://<IP address of the IP4700>/aspop
```

On the IP4700 Service Interface, enter ping in the Function Tag field and the host name of IP4700 in the Arguments field. Click Execute. If the ping fails, the DNS configuration is not correct.



# Appendix G: Feature Support Summary

This appendix presents the supported and unsupported features of the NDMP NAS Option for Network Appliance, EMC, and Procom NAS servers. The backup and restore tables are organized by a dialog tab and the features contained on each tab. "All" indicates that everything on that dialog tab is either supported or unsupported.

## Backup Features

The following table lists the backup features for the NAS servers that the NDMP NAS Option supports:

Key:

✓— Supported options

✗— Unsupported options

**W**— Supported on Windows platforms only.

Tab	Feature	Network Appliance	EMC Celerra	EMC IP4700	Procom
Backup Media					
	Options for First Backup Media (All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
	Options for Additional Backup Media (All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
	Compression/Encryption Password (All)	✗	✗	✗	✗
Verification	(All)	✗	✗	✗	✗
Retry	(All)	✗	✗	✗	✗

Tab	Feature	Network Appliance	EMC Celerra	EMC IP4700	Procom
Operation	Delete Files After Backup/Disable File Estimate/Calculate and Store CRC on the Backup Media/Backup of BrightStor ARCserve Backup Database	x	x	x	x
	Eject Backup Media upon Completion	✓	W	W	W
	Database	✓	W	W	W
Pre/Post	(All)	✓	W	W	W
Job Log	(All)	✓	W	W	W
Virus	(All)	x	x	x	x
Replication	(All)	x	x	x	x
Alert	(All)	✓	W	W	W
Volume Shadow Copy Service					
	(All)	x	x	x	x
Media Exporting					
	Option	x	x	x	x
	Media Option	✓	W	W	W
Advanced	(All)	x	x	x	x
Filter	Exclude File and Directory Pattern	✓	x	x	W
	Include File and Directory Pattern	x	x	x	x
	All Other Filters	x	x	x	x

## Restore Features

The following table lists the restore features for the NAS servers that the NDMP NAS Option supports.

<b>Tab</b>	<b>Feature</b>	<b>Network Appliance</b>	<b>EMC Celerra</b>	<b>EMC IP4700</b>	<b>Procom</b>
Backup Media	(All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
Destination	Directory Structure	✓	<b>W</b>	x	x
	File Conflict Resolutions	x	x	x	x
Operation	Restore and Preserve Directory Attributes / Restore Registry and Event Logs	x	x	x	x
	Database	✓	<b>W</b>	<b>W</b>	<b>W</b>
Pre/Post	(All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
Job Log	(All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
Virus	(All)	x	x	x	x
Alert	(All)	✓	<b>W</b>	<b>W</b>	<b>W</b>
Filter	(All)	x	x	x	x

Key:

✓— Supported options

x— Unsupported options

**W**— Supported on Windows platforms only

## General Functionality

The following table lists the major options supported by the NDMP NAS Option.

Description	Network Appliance	EMC Celerra	EMC IP4700	Procom
Rotation Backup	✓	W	×	W
GFS Rotation Backup	✓	W	W	W
Custom Incremental Backup	×	W	×	W
Custom Differential Backup	×	W	W	W
Volume-Level Backup	✓	W	W	W
Directory and File-Level Backup	✓	W	×	W
Volume-Level Restore	✓	W	W	W
Directory and File-Level Restore	✓	W	W	W
Snapshot/Checkpoint	✓	×	×	W
Direct-Access Restore	✓	W	×	×

Key:

✓— Supported options

×

— Unsupported options

W— Supported on Windows platforms only

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