

# BrightStor<sup>®</sup> ARCserve<sup>®</sup> Backup for UNIX

## Enterprise Option for StorageTek ACSLS Guide

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# Chapter 1: Introducing the Option

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BrightStor® ARCserve® Backup is a comprehensive distributed storage solution for applications, databases, distributed servers, and file systems. It provides backup and restore capabilities for databases, business-critical applications, and network clients.

Among the options BrightStor ARCserve Backup offers is the BrightStor® ARCserve® Backup Enterprise Option for StorageTek ACSLS. This option allows you to use the full capabilities of BrightStor ARCserve Backup with tape libraries controlled by StorageTek Automated Cartridge System Library Software (ACSLs) Manager software.

With this option, the BrightStor ARCserve Backup server can interface with the StorageTek ACSLS libraries to manage backup and restore operations, tape volume movement, and tape volume organization.

**Note:** This guide refers to StorageTek Automated Cartridge System Library Software (ACSLs) software as StorageTek ACSLS. This guide refers to tape libraries managed by StorageTek Automated Cartridge System Library Software (ACSLs) Manager software as StorageTek ACSLS tape libraries.

The Enterprise Option for StorageTek ACSLS lets several BrightStor ARCserve Backup servers share a network-connected StorageTek ACSLS tape library. StorageTek ACSLS functions as a central service provider for StorageTek ACSLS library operations in heterogeneous environments. This configuration lets you manage different application-dedicated libraries using one centralized library or string of libraries.

You can use the Enterprise Option for StorageTek ACSLS to divide large, complex backup requirements into manageable subsets and maximize backup and restore efficiency. Backup and restore jobs run simultaneously on all BrightStor ARCserve Backup servers with complete storage data integrity.

Using this option, the BrightStor ARCserve Backup server can assign tape volumes in the StorageTek ACSLS tape library to the logical library on the BrightStor ARCserve Backup server. This virtual library configuration lets you use the features of BrightStor ARCserve Backup to control the remote StorageTek ACSLS tape library as if it were connected locally.

**Note:** Each BrightStor ARCserve Backup server can manage one logical library configuration for the StorageTek ACSLS tape library. Each BrightStor ARCserve Backup server can physically connect to multiple tape drives of the same type.

This option also provides services that let BrightStor ARCserve Backup perform backup, restore, and device management operations on the StorageTek ACSLS tape volumes. Each BrightStor ARCserve Backup server performs these operations as if it were controlling its own separate library. In addition, the BrightStor ARCserve Backup server interprets the assigned tape volumes on the StorageTek ACSLS tape library as local tape volumes; however, the StorageTek ACSLS manages the physical movement of tape volumes.

**Note:** The tape volumes in the StorageTek ACSLS tape library must have bar codes to use the Enterprise Option for StorageTek ACSLS.

## Library Control Software

The StorageTek ACSLS tape library control software consists of the ACSLS Manager and the ACSLS Client applications.

**Note:** In addition to supporting communication interfaces with StorageTek ACSLS tape libraries managed by the StorageTek ACSLS tape library control software, the Enterprise Option for StorageTek ACSLS also supports communication with StorageTek tape libraries managed by StorageTek Library Station control software.

### ACSLs Manager

The ACSLS Manager software is installed on the StorageTek ACSLS server, which is connected to the StorageTek ACSLS tape library. The ACSLS Manager software functions as the central service provider for all tape library operations. The ACSLS Manager software enables the StorageTek ACSLS tape library to share library resources with multiple backup servers on the network.

### ACSLs Client

The ACSLS Client application is installed on the BrightStor ARCserve Backup server as part of the Enterprise Option for StorageTek ACSLS. The option gains access to tape volumes in the StorageTek ACSLS tape library through its ACSLS Client application, which, in turn, transmits the library requests to the ACSLS Manager software that is installed on the StorageTek ACSLS server. The ACSLS Client application maintains the tape drive to tape volume relationship.

## Communication Interfaces

The StorageTek ACSLS communication interfaces between the StorageTek ACSLS server and the BrightStor ARCserve Backup server include:

- StorageTek ACSLS components
- Ethernet LAN control path
- SCSI or fibre channel data paths

### StorageTek ACSLS Components

The StorageTek ACSLS components that support communication between the StorageTek ACSLS server and the StorageTek ACSLS client are installed as part of the Enterprise Option for StorageTek ACSLS. The StorageTek ACSLS components include the following interfaces:

- The Client System Interface (CSI) translates and routes messages between the ACSLS Manager software and the ACSLS Client software.
- The Storage Server Interface (SSI) requests the movement of the tape volumes by sending the requests to the Network Interface. The SSI service translates the library requests from the BrightStor ARCserve Backup server into a format that the ACSLS Manager can interpret.
- The Network Interface creates message packets for transfer across the network. The message packets consist of an address header, the actual data, and parity information.

**Note:** The CSI and SSI components enable the StorageTek firewall feature.

## Control Path and Data Path

The communication interfaces between the StorageTek ACSLS tape library and the BrightStor ARCserve Backup server consist of an Ethernet LAN control path and a SCSI or fibre channel data path. The control path and the data path are two different paths.

- The StorageTek ACSLS Client application on the BrightStor ARCserve Backup server is connected to the StorageTek ACSLS library through an Ethernet LAN control path. The ACSLS Client application sends library requests over this control path directly to the ACSLS Manager software on the StorageTek ACSLS server.
- Each BrightStor ARCserve Backup server is independently connected to one or more tape drives in the StorageTek ACSLS tape library through SCSI or fibre channel data paths. The BrightStor ARCserve Backup server reads and writes data on tape volumes by interacting directly with tape drives through the data path.

**Note:** In Storage Area Network (SAN) configurations, the BrightStor ARCserve Backup servers connect to the SAN, which, in turn, connects to the StorageTek ACSLS tape drives.

Each backup server communicates directly and independently with the StorageTek ACSLS. Although multiple backup servers may exist on the same network, BrightStor ARCserve Backup servers do not communicate with other backup servers unless they are in a SAN. For more information about using BrightStor ARCserve Backup in a SAN, see the *Storage Area Network (SAN) Option Guide*.



## Option Architecture

The Enterprise Option for StorageTek ACSLS is a separate software component installed on a server running BrightStor ARCserve Backup. The StorageTek ACSLS Client application is installed as part of the option.

Several BrightStor ARCserve Backup servers can share one StorageTek ACSLS tape library by creating virtual libraries on each BrightStor ARCserve Backup server. The BrightStor ARCserve Backup server virtual library essentially partitions a large StorageTek ACSLS tape library into independent user-defined logical libraries.

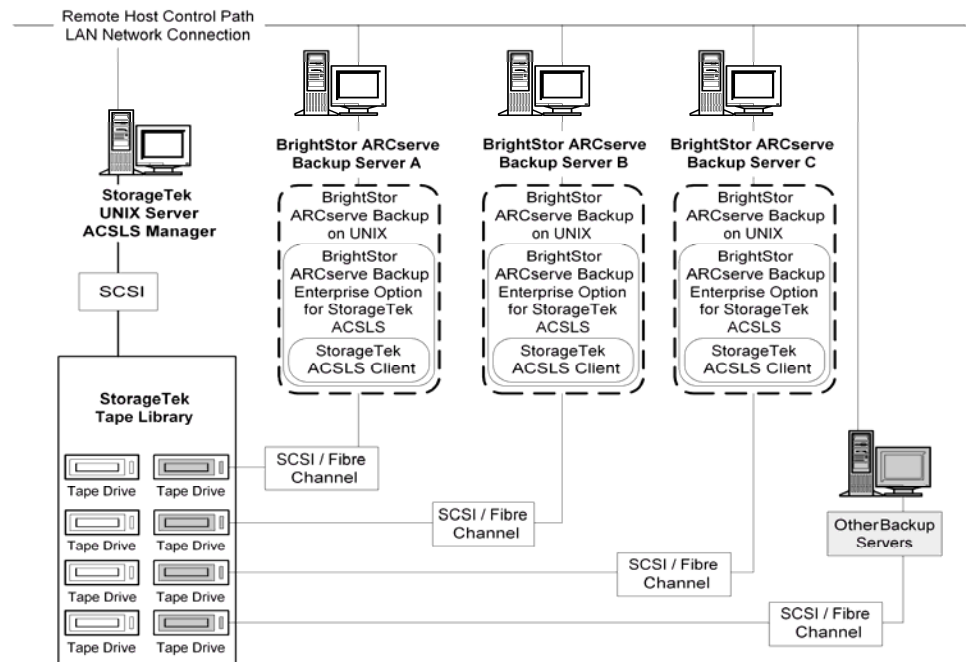
The tape volume assignments on the BrightStor ARCserve Backup server define the virtual library. The virtual library configurations have a mutually exclusive set of tape volumes or a shared set of tape volumes, depending on whether the BrightStor ARCserve Backup server is in a SAN.

The tape volume assignments for the BrightStor ARCserve Backup server are maintained in the volume configuration file. For more information about the volume configuration file, see Volume Configuration File in this chapter.

## Mutually Exclusive Tape Volumes

In configurations where the BrightStor ARCserve Backup server is not in a SAN, each BrightStor ARCserve Backup server is configured to control a mutually exclusive set of tape volumes in the StorageTek ACSLS tape library. As a result, each BrightStor ARCserve Backup server manages a user-defined subset of tape volumes on the StorageTek ACSLS tape library that are unique to that BrightStor ARCserve Backup server.

The following illustration shows the architecture of the Enterprise Option for StorageTek ACSLS and the communication interfaces to the StorageTek ACSLS tape library:



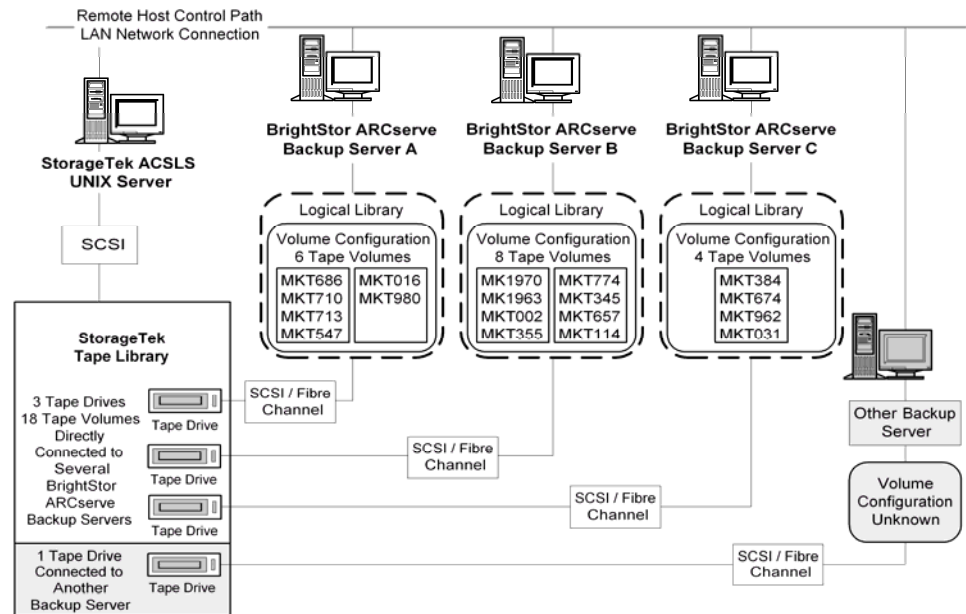
Since multiple backup servers share the StorageTek ACSLS tape library, you must ensure that each tape volume is assigned to only one backup server. This exclusive subset of tape volumes ensures the tape volumes cannot be used or accessed by other backup servers attached to the network.

**Important!** *If your BrightStor ARCserve Backup servers are not in a SAN environment, tape volumes must be mutually exclusive to each backup server or you could lose important backup data.*

Assigning mutually exclusive tape volumes requires careful planning. To assist you in your planning effort, you should document the tape volume assignment for each backup server that will share the StorageTek ACSLS tape library.

## Mutually Exclusive Volume Configuration Example

The tape volume assignments determine the volume configuration for the logical user-defined library on each BrightStor ARCserve Backup server. In the following example, a unique set of tape volumes defines the logical library for each BrightStor ARCserve Backup server:



The example shows that the StorageTek ACSLS tape library has four tape drives directly attached to several backup servers on the network. The unique tape volume assignments for each BrightStor ARCserve Backup server are:

- Server A has six assigned tape volumes: MKT686, MKT710, MKT713, MKT547, MKT016, and MKT 980
- Server B has eight assigned tape volumes: MK1970, MK1963, MKT002, MKT355, MKT774, MKT345, MKT657, and MKT114
- Server C has four assigned tape volumes: MKT384, MKT674, MKT962, and MKT031

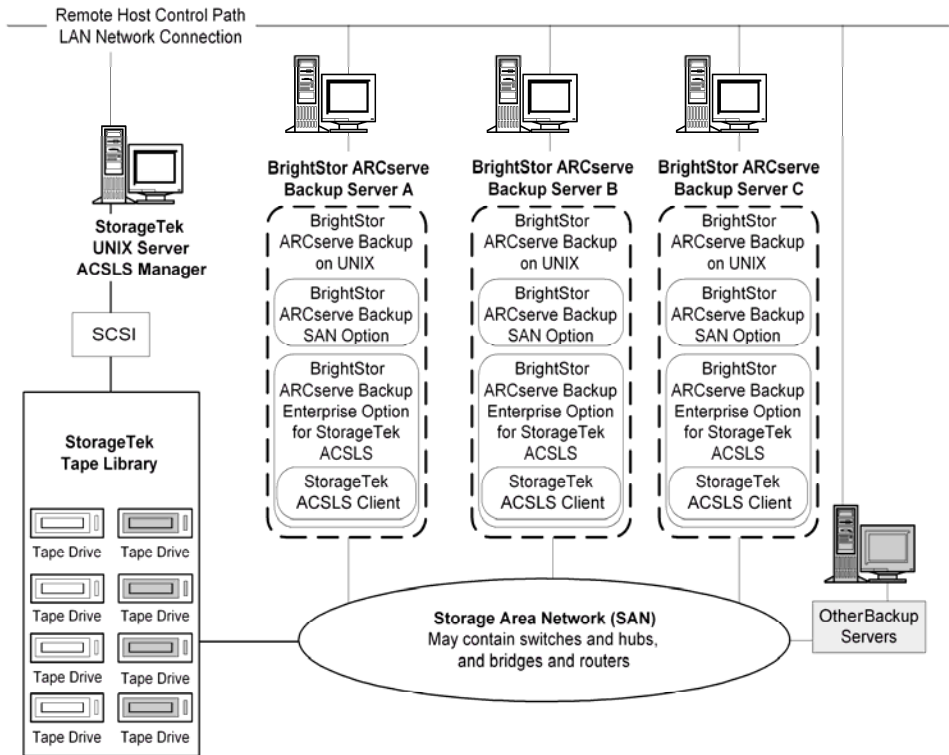
Another backup server on the network that is not running BrightStor ARCserve Backup may have a different configuration.

## Shared Tape Volumes in a SAN

In a SAN, each BrightStor ARCserve Backup server connects directly to a SAN, which, in turn, connects to at least one tape drive in the StorageTek ACSLS tape library. In configurations with multiple BrightStor ARCserve Backup servers in a SAN, each backup server is configured to control and share the same set of tape drives and tape volumes in the StorageTek ACSLS tape library. As a result, each BrightStor ARCserve Backup server in the SAN shares the same user-defined subset of tape volumes on the StorageTek ACSLS tape library.

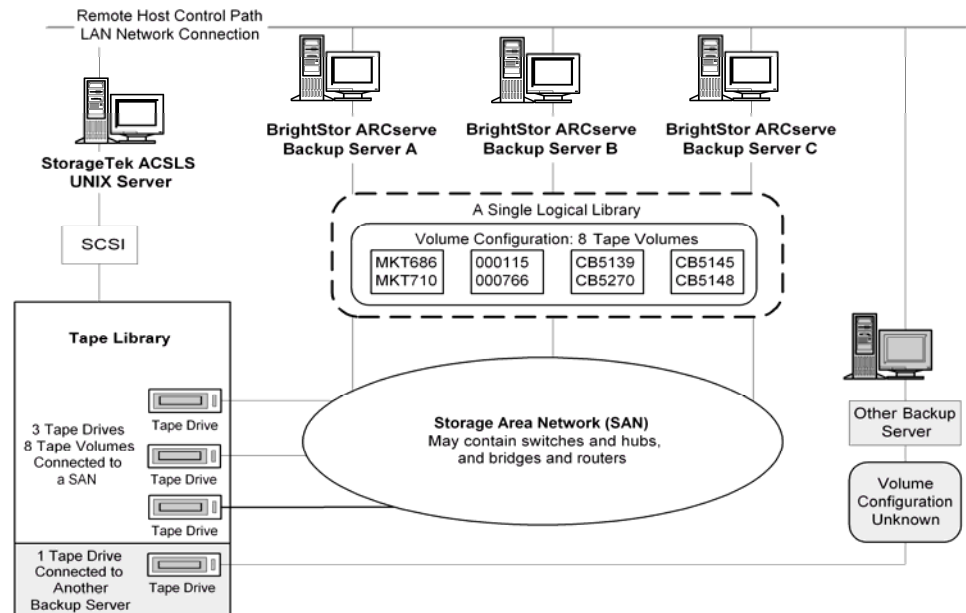
In a SAN, the BrightStor ARCserve Backup servers have the same virtual library configuration, the same tape volume configuration, and the same tape drive configuration.

The Enterprise Option for StorageTek ACSLS must reside on each BrightStor ARCserve Backup server in the SAN. The following illustration shows the option architecture in a SAN and the SAN communication interface to the StorageTek ACSLS tape library:



## SAN Shared Volume Configuration Example

The tape volume assignments determine the logical user-defined library shared by all BrightStor ARCserve Backup servers in the SAN. In the following example, a single set of tape volumes defines the logical library for the SAN:



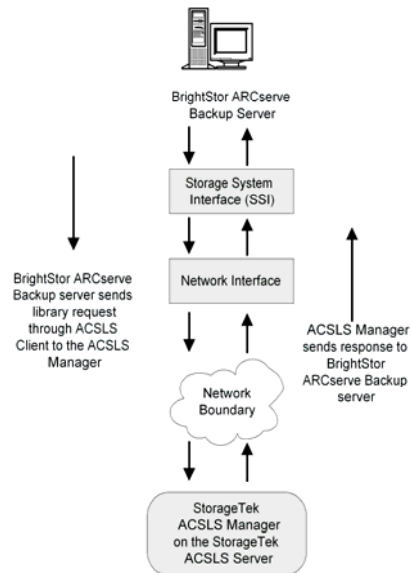
The example shows that the StorageTek ACSLS tape library has three tape drives directly attached to a SAN. The tape volume assignments are the same for each BrightStor ARCserve Backup server in the SAN. Another backup server on the network that is not running BrightStor ARCserve Backup may have a different configuration.

## Library Request Flow

The BrightStor ARCserve Backup server initiates library requests for tape volume movements, which are then transmitted by the ACSLS Client on the BrightStor ARCserve Backup server to the ACSLS Manager on the StorageTek ACSLS server. When the ACSLS Manager receives and interprets a library request, the requested operation is performed on the StorageTek ACSLS library. The ACSLS Manager forms and returns a response to the BrightStor ARCserve Backup server.

For example, if BrightStor ARCserve Backup sends a request to mount a tape volume, ACSLS Client transmits the request to the ACSLS Manager. The ACSLS Manager interprets the request and directs the StorageTek ACSLS tape library to locate and move the tape cartridge from its library storage cell to a specific tape drive.

The StorageTek ACSLS library request flow is shown in the following diagram:



## Library Configuration Files

This section contains information about the configuration files used in the configuration of the logical user-defined library on the BrightStor ARCserve Backup server. Review this information to become familiar with the library configuration files that enable communication between the BrightStor ARCserve Backup server and the StorageTek ACSLS tape library:

- BrightStor ARCserve Backup volume configuration file
- BrightStor ARCserve Backup tape drive configuration file
- BrightStor ARCserve Backup media server configuration file
- BrightStor ARCserve Backup network environment configuration file

## Volume Configuration File

The volume configuration file enables communication between the BrightStor ARCserve Backup server and the StorageTek ACSLS tape library. It assigns tape volumes in the StorageTek ACSLS tape library to virtual slots in the logical library. The slot numbers represent the configuration file entries, not the actual physical slots inside the StorageTek ACSLS tape library.

The volume configuration file is created when you configure your library, either during installation or when you run the csetup script. You maintain the tape volume assignments for the BrightStor ARCserve Backup server in this file.

The name of the volume configuration file is .nivol.cfg. The period before the nivol file name is required. The file is located in the \$BAB\_HOME/data directory. The volume configuration file contains a list of tape volumes; each tape volume is distinguished by its bar code.

**Important!** *If your BrightStor ARCserve Backup server is part of a SAN, the volume configuration file must be the same on all BrightStor ARCserve Backup servers in the SAN.*

**Note:** For more details about using BrightStor ARCserve Backup in a SAN, see the *Storage Area Network (SAN) Option Guide*.

## Cleaning Tape

If the StorageTek ACSLS tape library includes a cleaning tape volume, and cleaning is enabled in your BrightStor ARCserve Backup library configuration, the first bar code entry in the volume configuration file is the bar code of the cleaning tape volume. If cleaning is not enabled in your library configuration, the first slot is not reserved for a cleaning tape.

The cleaning tape volume is represented with a CLN or a DLT bar code prefix. Depending on the StorageTek ACSLS tape library model, the CLN bar code prefix may not be recognized. If your CLN bar code is not recognized, use a DLT bar code designation.

In mutually exclusive tape volume configurations, only one cleaning tape volume can be assigned to each BrightStor ARCserve Backup server. Cleaning tapes should not be shared among BrightStor ARCserve Backup servers.

In a SAN, the tape volume configuration is the same for each BrightStor ARCserve Backup server. Therefore, all BrightStor ARCserve Backup servers in the SAN share a single cleaning tape volume.

**Note:** The automatic cleaning function on the StorageTek ACSLS tape library is not supported and must be disabled on the StorageTek ACSLS tape library.

## Tape Volume Assignment

During the library configuration process, all tape volumes on the StorageTek ACSLS tape library are included in the volume configuration file and, by default, are automatically assigned to the BrightStor ARCserve Backup server. You must modify the volume configuration file during the configuration process to include only the tape volumes that you want to assign to the user-defined logical library.

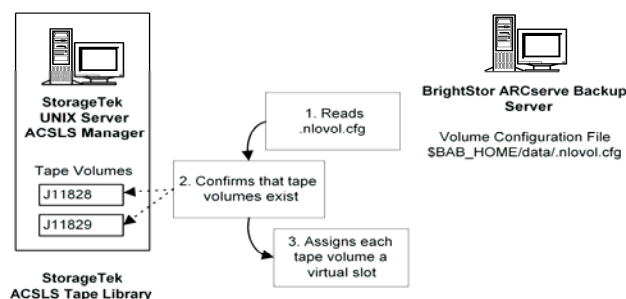
**Note:** The tape volume assignments define the library configuration for both the mutually exclusive configurations and for the shared tape volume configurations in a SAN.

**Important!** *You must delete the entries for the tape volumes that are assigned to other backup servers on the network.*

The BrightStor ARCserve Backup application uses the volume configuration file to perform the following functions:

- Read the list of tape volumes in the volume configuration file
- Check with the StorageTek ACSLS tape library to determine if the tape volumes physically exist
- Assign each tape volume to a slot in the virtual library based on its position in the volume configuration file

The following example shows the relationship between the volume configuration file on the BrightStor ARCserve Backup server and the tape volumes on the StorageTek ACSLS tape library:





## Format

Each line in the volume configuration file maps sequentially to a slot in the virtual view of the StorageTek ACSLS tape library. If you want to save a slot in the virtual library on the BrightStor ARCserve Backup server, you can add an empty slot to the volume configuration file.

Enter `*****` on any line to map that position to an empty slot.

```
CLN234 maps to a cleaning tape in slot 1
MK1803 maps to slot 2
MK1964 maps to slot 3
***** maps to empty slot 4
```

**Note:** Deleting a tape volume bar code from the list changes the slot positions of the tape volumes below it.

If you import tape volumes outside of BrightStor ARCserve Backup, entries for those tape volume bar codes are not added to the volume configuration file. If you want to use tape volumes that were imported outside of BrightStor ARCserve Backup, you must run the volume configuration script to update the bar code entries in the volume configuration file. For more information about running the volume configuration script, see Update the Volume Configuration File in the chapter "Installing the Option."

## Tape Drive Configuration File

The tape drive configuration file is created when you configure your library, during installation or when you run the `csetup` script. The tape drives physically connected to the BrightStor ARCserve Backup server are maintained in this file.

The name of the tape drive configuration file is `.nlodrv.cfg`. The period before the `nlodrv` file name is required. The file is located in the `$BAB_HOME/data` directory. The tape drive configuration file contains the number of tape drives and information about each tape drive.

**Note:** Text following `#` is treated as a comment.

The first entry in the tape drive configuration file specifies the number of tape drives physically connected to the BrightStor ARCserve Backup server. An entry for each tape drive follows the first entry. The library configuration process generates the device information in this file automatically.

The format of the statements in the tape drive configuration file, `.nlodrv.cfg`, is:

```
numberoftapedrives
asc    lsm    panel  drive  adapter scsi   lun    # comment
```

The following list explains the parts of the statement:

- *numberoftapedrives* is the number of tape drives physically connected to the BrightStor ARCserve Backup server

Each tape drive entry contains the following specifications:

- *asc* is the Automated Cartridge System (ACS) number
- *lsm* is the Logical Silo Module (LSM) number
- *panel* is the Panel number
- *drive* is the Drive number
- *scsi* is the SCSI ID device number
- *adapter* is the Adapter device number
- *lun* is the Logical Unit Number (LUN)
- *#* comments follow this character

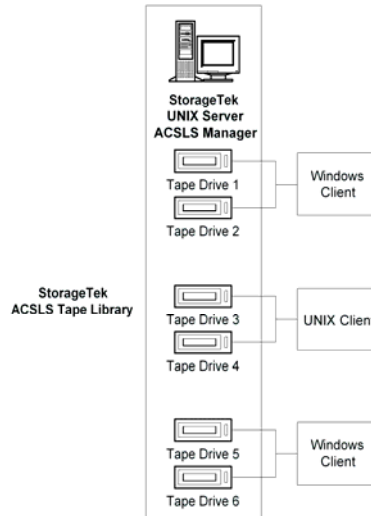
The following example of a tape drive configuration file shows a typical tape drive configuration:

```
# number of drives
1
# asc  lsm  panel  drive  adapter  scsi  lun  # STK T9840B 461000000406
   0    0    0     4     0       256  0
```

This example tape drive configuration file describes a tape drive with the following details:

- Automated Cartridge System (ACS) number is 0
- Logical Silo Module (LSM) number is 0
- Panel number is 0
- Drive number is 4
- SCSI ID is 256
- Logical Unit Number (LUN) is 0
- *# STK T9840B 461000000406* comment is automatically generated and identifies the serial number of the tape drive (461000000406).

The tape drives on the StorageTek ACSLS library can be distributed among several BrightStor ARCserve Backup servers to maximize backup and restore efficiency, as shown in the following illustration:



### Media Server Configuration File

The `$BAB_HOME/config/camediad.cfg` media server configuration file is installed with BrightStor ARCserve Backup, which uses this file as a guideline for media operations. The `camediad.cfg` file updates automatically with StorageTek ACSLS tape library information when you run the `csetup` configuration script, so no further editing is required. For more details updating the `camediad.cfg` file, see the *Administrator Guide*.

## csetup Configuration Script

The csetup configuration script searches for, and automatically detects, SCSI and fibre channel attached tape drives in the StorageTek ACSLS tape library. The device information in the media server configuration file is updated as a result of running this script.

**Important!** *All changes to the BrightStor ARCserve Backup media server configuration file should be made by running the csetup script, not by editing the file.*

The camediad.cfg media server configuration file contains sections. Each section contains settings and values that enable BrightStor ARCserve Backup to handle media operations.

The following sections in the media server configuration file contain device information related to the Enterprise Option for StorageTek ACSLS:

- The [SHARED\_CHANGER] section contains library parameters.  
**Note:** The information described in the SHARED\_CHANGER section displays on the screen when you run the csetup configuration script.
- The [DEVICE] section contains information about SCSI and fibre channel attached devices.
- The [CONFIG] section contains library configuration information.

## Library Parameters

The [SHARED\_CHANGER] section of the media server configuration file contains the library parameters. The following example shows a set of typical library parameters:

```
[SHARED_CHANGER]
S_CHANGER_NAME = "Virtual1" (0,7,0)
S_CLEANING_ENABLED NO
S_BARCODE_ENABLED YES
S_AUTOMAP_DRIVES_ENABLED YES
S_READ_SLOTS_FILE_ENABLED NO
S_CHANGER_IN_SAN YES
S_CHANGER_DEVICES = (0,2,0) (0,2,1)
S_CHANGER_GROUP = "g1" (0,2,0) FROM 1 TO 41
S_CHANGER_SLOTS = "number of slots"
[SHARED_CHANGER_END]
```

**Note:** The S\_CHANGER\_NAME Virtual1 is the default library name assigned during library setup. The Enterprise Option for StorageTek ACSLS uses Virtual1 for display purposes only. Even if multiple BrightStor ARCserve Backup servers share the StorageTek ACSLS tape library, each BrightStor ARCserve Backup server uses the same S\_CHANGER\_NAME of Virtual1.

## Device Parameters

The [DEVICE] section of the media server configuration file contains a list of device entries that enable the BrightStor ARCserve Backup server to access tape drives on the StorageTek ACSLS tape library. A DEVICE entry exists for each SCSI and fibre channel attached device. The following example shows a set of typical device parameters:

```
[DEVICE] ; Device Table
DEVICE = "/dev/rcha0,2,0"      SCSI    (0,2,0) "HL009LH  "
DEVICE = "/dev/rcha0,2,1"      SCSI    (0,2,1) "HL00AS1  "
DEVICE = "/usr/f1"            FS      (1,0,0) ""
DEVICE = "/usr/fs2"           FS      (1,1,0) ""
```

## Configuration Parameters

The [CONFIG] section of the media server configuration file contains parameters that enable the BrightStor ARCserve Backup server to access tape volumes on the StorageTek ACSLS tape library. The following example shows a set of typical library configuration parameters:

```
[CONFIG]
;DEBUG_LEVEL = 255           ; This will create comediad.dbg file
;EARLY_WARNING = 100
ENABLE_S_CHANGER=1
;AUTO_CLEAN_TIME = 0
SERVER_ON_FIBRE_LOOP = 1
IO_BUFFERS = 128
;DEVICE_SHARING_ENABLED = 1 ; share devices with other apps
MMO_BYPASS_UNKNOWN_ERR = 0 ; 1 = unknown media to database will be allowed to
be formatted or erased, 0 = will not allow
```

**Note:** Any line beginning with a semicolon (;) is treated as a comment.

## Network Environment Configuration File

The network environment configuration file is installed as part of the Enterprise Option for StorageTek ACSLS, which uses this file to configure network communication between the StorageTek ACSLS server and the BrightStor ARCserve Backup server. The name of the network environment configuration file is nloenv.cfg. The file is located in the \$BAB\_HOME/config directory.

The network environment configuration file updates automatically when you configure your library, so no further editing is required. During library configuration, you are prompted to enable the ACSLS firewall secure feature.

If you choose to enable this feature during the library configuration process, you will be prompted to specify values for the following ports:

- SSI\_INET\_PORT: the port number on the BrightStor ARCserve Backup server to listen for incoming StorageTek ACSLS responses. This value must match the value on the firewall protecting the BrightStor ARCserve Backup server.
- CSI\_HOSTPORT: the port number on the StorageTek ACSLS server that receives requests from the BrightStor ARCserve Backup server. This value must match the value configured on the StorageTek ACSLS server.

The following example shows the network environment configuration file with the StorageTek Library Attach firewall feature enabled:

```
# ----- NLO Config File -----  
CSI_HOSTNAME      2q  
ACSAPI_PACKET_VERSION4  
CSI_TCP_RPCSERVICE  TRUE  
CSI_UDP_RPCSERVICE FALSE  
CSI_CONNECT_AGETIME 172800  
CSI_RETRY_TIMEOUT   4  
CSI_RETRY_TRIES     5  
TRACE_VALUE        800000  
SSI_INET_PORT      50006  
CSI_HOSTPORT       50003
```

**Note:** Text following # is treated as a comment.

# Chapter 2: Installing the Option

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This chapter provides the information you need to install and configure the Enterprise Option for StorageTek ACSLS. The information in this chapter assumes you are familiar with:

- The characteristics and requirements of UNIX operating systems in general
- Administrator responsibilities with UNIX operating systems in particular
- The text-based vi editor
- StorageTek ACSLS

## System Requirements

This section describes software installation requirements specific to the Enterprise Option for StorageTek ACSLS. For a list of supported platforms, machine requirements, and required applications for this option, see the readme file. Check the Computer Associates web site located at [ca.com](http://ca.com) for any updates to the requirements.

The Enterprise Option for StorageTek ACSLS and BrightStor ARCserve Backup applications must be installed on the same computer for the option to function properly.

**Important!** *Communication between the StorageTek ACSLS server and the BrightStor ARCserve Backup server must be established before installing the option. Verify network connectivity by doing a network ping from the BrightStor ARCserve Backup server to the StorageTek ACSLS server.*

## Installation Prerequisites

Installation prerequisites are grouped into these categories:

- StorageTek ACSLS Components
- Install Privileges
- Data Path and Control Path Interfaces

Before installing the Enterprise Option for StorageTek ACSLS, verify that:

- Your system requirements meet the minimum requirements needed to install the Enterprise Option for StorageTek ACSLS. For a list of system requirements, see the readme file.
- You have root user privileges or the proper authority to install software on the computer where you are installing the option.
- You know the host name of the StorageTek ACSLS server.
- You have added the StorageTek ACSLS server as a LAN host to the BrightStor ARCserve Backup server.
- The StorageTek ACSLS tape library and StorageTek ACSLS server are correctly configured.
- The communication between the StorageTek ACSLS server and the BrightStor ARCserve Backup server is established and configured.
- You have planned your tape volume configuration.
- You have selected your library setup method and gathered the required information to configure your library using the selected method.

**Note:** Contact your BrightStor ARCserve Backup administrator to obtain the proper privileges if you do not have them.



## StorageTek ACSLS Components

Before installing the Enterprise Option for StorageTek ACSLS, verify that the following pre-installation tasks related to the StorageTek ACSLS components are complete:

- The StorageTek ACSLS server and the StorageTek ACSLS tape library are installed and configured.
- Communication between the BrightStor ARCserve Backup server and the StorageTek ACSLS server is established and configured.
- The StorageTek ACSLS tape drives that are connected to the computer running BrightStor ARCserve Backup server are empty.
- You have developed a tape volume configuration plan to identify which tape volumes on the StorageTek ACSLS will be assigned to the BrightStor ARCserve Backup server.

**Note:** For mutually exclusive volume configurations, you must ensure mutually exclusive tape volume assignments for each BrightStor ARCserve Backup server. For shared volume configurations in a SAN, you must define the tape volume configuration to be shared by the BrightStor ARCserve Backup servers in the SAN.

## Installation Privileges

Before installing the Enterprise Option for StorageTek ACSLS, verify that you have root user privileges or the proper authority to install software on the computers where you plan to install the option.

**Note:** Contact your administrator to obtain the proper rights if you do not have them.

## Data Path and Control Path Interfaces

Before starting the installation, you must establish the following StorageTek ACSLS communications:

- For mutually exclusive tape volume configurations: The SCSI or fibre channel data path between the BrightStor ARCserve Backup server and the StorageTek ACSLS tape drives.  
For shared tape volume configurations in a SAN: The connectivity between the BrightStor ARCserve Backup servers and the SAN, and between the SAN and the StorageTek ACSLS tape library.
- The Ethernet LAN control path between the BrightStor ARCserve Backup server and the StorageTek ACSLS server.

## LAN Host

Establish the Ethernet LAN connectivity between the BrightStor ARCserve Backup server and the StorageTek ACSLS server by updating the `/etc/hosts` file on the BrightStor ARCserve Backup server. The `/etc/hosts` file contains an entry statement for each computer in the LAN.

**Note:** Any line beginning with `#` is treated as a comment.

The format of the statements in the `/etc/hosts` file is:

```
address hostname optionalalias
```

The following list explains the parts of the statement:

- *address* is a value that represents the IP address of the StorageTek ACSLS server
- *hostname* is the official host name of the StorageTek ACSLS server
- *optionalalias* is an optional alias name for the StorageTek ACSLS server

In the following example, the IP address of the StorageTek ACSLS server is `174.24.222.333`, the official host name of that computer is `host05`, and there is no optional alias:

```
174.24.222.333 host05
```

## Adding a LAN Host

To add the StorageTek ACSLS server as a LAN host to the BrightStor ARCserve Backup server, follow these steps:

1. On the BrightStor ARCserve Backup server, log on with root privileges.
2. On a command line, use any UNIX text editor to edit the `/etc/hosts` file.
3. Add a statement that represents the StorageTek ACSLS server.
4. Save the `/etc/hosts` file.

**Note:** You can verify network connectivity by doing a network ping from the BrightStor ARCserve Backup server to the StorageTek ACSLS server.

## Library Setup Methods

Setting up your library is an important step in the Enterprise Option for StorageTek ACSLS installation. As part of the option installation, you must choose one of three library setup methods:

- Express—Library, tape drives, and device groups are automatically configured.
- Automatic—Library and tape drives are automatically configured. Device group setup is performed manually.
- Interactive—Setup of library, tape drives, and device groups is performed manually.

All three library setup methods configure your library by defining the library parameters in the SHARED\_CHANGER section of the media server configuration file, `camediad.cfg`.

## Device Groups

The device groups attached to the BrightStor ARCserve Backup server are the groups that are available for backup or restore operations. Each device group corresponds to one tape drive.

## Slot Overlapping

Slots can be shared between device groups. You configure slot overlapping for each device group during the library configuration process. The `S_CHANGER_GROUP` entry in the `SHARED_CHANGER` section of the `comediad.cfg` media server configuration file represents the slot overlapping parameters for each device group.

When slot overlapping is enabled, all the device groups share the same range of slots. The following example of the `SHARED_CHANGER` parameters shows a library with 41 slots and two tape drives; each tape drive is configured in a device group with a starting slot of 1 and an ending slot of 41 (all groups have access to all slots):

```
[SHARED_CHANGER]
S_CHANGER_NAME = "Virtual1" (0,7,0)
S_CLEANING_ENABLED NO
S_BARCODE_ENABLED YES
S_AUTOMAP_DRIVES_ENABLED YES
S_READ_SLOTS_FILE_ENABLED NO
S_CHANGER_IN_SAN YES
S_CHANGER_DEVICES = (0,2,0) (0,2,1)
S_CHANGER_GROUP = "CH_GRP0" (0,2,0) FROM 1 TO 41
S_CHANGER_SLOTS = "number of slots"
[SHARED_CHANGER_END]
```

When slot overlapping is not enabled, each device group has an exclusive set of slots that no other device group will use. The following example of the `SHARED_CHANGER` parameters shows a library with 40 slots and two tape drives; the first tape drive is configured in the `CH_GRP0` device group with a starting slot of 1 and an ending slot of 20 and the second tape drive is configured in the `CH_GRP1` device group with assigned slots 21 to 40:

```
[SHARED_CHANGER]
S_CHANGER_NAME = "Virtual1" (0,7,0)
S_CLEANING_ENABLED NO
S_BARCODE_ENABLED YES
S_AUTOMAP_DRIVES_ENABLED YES
S_READ_SLOTS_FILE_ENABLED NO
S_CHANGER_IN_SAN YES
S_CHANGER_DEVICES = (0,2,0) (0,2,1)
S_CHANGER_GROUP = "CH_GRP0" (0,2,0) FROM 1 TO 20
S_CHANGER_SLOTS = "number of slots"
[SHARED_CHANGER_END]
```

## Express Setup

The express setup method automatically configures the library, detects and assigns the attached tape drives, and defines the device groups. The express setup method for library configuration runs the `camediad` service. The `camediad` service performs the automatic device detection that determines which tape drives belong to which library. For more details about automatic device detection and configuration, see the section Automatic Device Detection in this chapter.

The express setup method defines the following parameters in the `camediad.cfg` file:

- Library name: `Virtual1`
- Automatic tape drive mapping: `Enabled`
- Device groups: One device group is created for each tape drive.
- Slot sharing: All the device groups share the same range of slots.

Express setup configures one group per tape drive; the groups are automatically configured for slot sharing. If you do not want to enable slot sharing, use the automatic or interactive setup method to separate the slots by groups.

The express setup method is not recommended when:

- The StorageTek ACSLS tape library contains mixed media.
- The BrightStor ARCserve Backup server is a SAN distributed server.
- Other applications share the StorageTek ACSLS tape library.

**Note:** The automatic device detection may run for a significant amount of time, depending on the number of tape drives.

## Automatic Setup

The automatic setup method configures the library, and detects and assigns the attached tape drives. The automatic setup method for library configuration runs the `camediad` service, which performs the automatic device detection that determines which tape drives belong to which library. For more details about automatic device detection and configuration, see Automatic Device Detection in this chapter.

The automatic setup method for library configuration defines the following parameters in the `camediad.cfg` file:

- Library name: Virtual1
- Automatic tape drive mapping: Enabled

The automatic setup method lets you define:

- Slot sharing
- Custom device groups

**Note:** Using automatic setup may take a significant amount of time if the library has many tape drives (for example, 40 tape drives). In this case, you must enter 40 group names and, if slot sharing is not implemented, you must also enter a starting slot and ending slot for each of the 40 groups.

### Automatic Device Detection

The express and automatic library setup methods perform automatic device detection and configuration tasks. These tasks require that at least one tape volume be present in the StorageTek ACSLS tape library.

**Note:** This tape volume must be a non-cleaning tape volume.

The automatic and express setup methods perform the following tasks to detect and assign tape drives:

1. Dismount all tape volumes in the StorageTek ACSLS tape drives.
2. Place the first available tape volume into the first tape drive in the StorageTek ACSLS tape library.
3. Issue a test unit ready command to all tape drives to determine which tape drive contains the tape volume.
4. Map that tape drive to the logical library.
5. Remove the tape volume from the tape drive and place the tape volume into the next tape drive in the StorageTek ACSLS tape library.
6. Repeat steps 3 through 5 until all tape drives in the StorageTek ACSLS tape library are mapped to the logical library.

The automatic setup method is not recommended when:

- The StorageTek ACSLS tape library contains mixed media.
- The BrightStor ARCserve Backup server is a SAN distributed server.
- Other applications share the StorageTek ACSLS tape library.

In any of these situations, use the interactive setup method to configure your library.

**Note:** If you use the automatic setup method in a SAN, ensure no jobs are running on the StorageTek ACSLS tape library. The automatic setup method dismounts all tape volumes without notifying other backup servers.

## Interactive Setup

The interactive setup method lets you manually define the library, tape drives, and device group configuration. The interactive setup method requires you to enter tape drive details by responding to the prompts with the Automated Cartridge System (acs) number, Logical Silo Module (lsm) number, panel number, and tape drive number.

You can configure groups the same way you configure them for an automatic setup and, like automatic setup, this can be tedious if the library has many tape drives.

**Note:** No tape volumes are required to be present in the StorageTek ACSLS tape library for this method.

Use the `cmd_proc` utility on the StorageTek ACSLS server to query the status of the tape drives in the StorageTek ACSLS tape library. For more details about using the `cmd_proc` utility, see Query the Status of Tape Drives in the chapter "Using the Option."

## How Option is Installed and Library is Configured

Make sure you have confirmed the installation prerequisites and performed the required pre-installation tasks. When you have completed these tasks and gathered all of the required information, you are ready to start the installation process.

The highlights of the Enterprise Option for StorageTek ACSLS installation are as follows:

- Performing pre-installation tasks.
- Mounting the installation CD.
- Installing the option by running the installation script.
- Configuring the library during installation or by running the csetup script. The library configuration lets you:
  - Choose a library configuration setup method (express, automatic, or interactive).
  - Confirm the library configuration parameters.
  - Modify the tape volume assignment.
  - Enable the StorageTek Library Attach firewall feature.

### Install the Option

You can install the Enterprise Option for StorageTek ACSLS during or after the installation of the BrightStor ARCserve Backup base product. The agents, options, and other components that you are installing during this installation session customize the order of the installation modules presented by the installation script. As a result, the actual sequence of installation prompts you see during your installation process may differ from those appearing in this section.

**Note:** If you have already installed the BrightStor ARCserve Backup base product, the prompts may also vary.

To install the Enterprise Option for StorageTek ACSLS, follow these steps:

1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. Mount the installation CD.
3. On a command line, enter `install` to start the installation script.
4. Respond to all prompts as appropriate for your system configuration.

See the *Getting Started* for the complete BrightStor ARCserve Backup installation procedure.



## Configure Your Library

Specifying the initial library configuration is an integral and important part of the installation process. Configure the library for the Enterprise Option for StorageTek ACSLS by choosing one of the following two methods:

- Configure the library during installation of the Enterprise Option for StorageTek ACSLS by responding to the prompts presented during the installation session.
- Configure the library after installation of the Enterprise Option for StorageTek ACSLS by running the csetup configuration script and responding to the prompts presented during the library configuration process.

**Note:** The agents, options, and other components installed on your system customize the order of configuration modules presented by the installation and csetup configuration scripts. As a result, the sequence of configuration prompts varies. If you have already installed the BrightStor ARCserve Backup base product, the prompts may also vary. Respond to all prompts as appropriate for your system configuration.

## Configure the Library During Installation

During the installation, camediad services are stopped. When you configure the library during initial installation, you do not have to stop or start any services on the BrightStor ARCserve Backup server.

To configure the Enterprise Option for StorageTek ACSLS during installation of the option, follow these steps:

1. Perform the option installation as described in *Install the Option* in this chapter.
2. Enter `y` when asked if you want to configure your libraries now.

**Note:** If the BrightStor ARCserve Backup base product is already installed and a library configuration already exists, you must remove the current library to allow the creation of a new library configuration.

3. Enter the appropriate number to select the ACSLS Network Library from the list of libraries.
4. Press Enter when prompted to continue.
5. Select the library setup method. Enter `e` to select Express, `a` to select Automatic, or `i` to select Interactive. For more information about library setup methods, see the section *Library Setup Methods* in this chapter.

6. Depending on the setup method you select, enter the appropriate information when prompted.
7. Review the defined library parameters.
8. Enter `y` to confirm the library parameters.
9. Edit the volume configuration file. Entering `yes` automatically starts the `vi` editor.  
**Note:** The name of the volume configuration file is `.nlovol.cfg`.
10. Remove the bar code entries for the tape volumes that you do not want to assign to the BrightStor ARCserve Backup server.
11. Save the file and exit the `vi` editor.
12. Enable or disable tape volume cleaning.
13. Identify whether the BrightStor ARCserve Backup server is in a SAN.  
**Important!** *If you have SAN enabled, you must manually edit the volume configuration file on each server to ensure that all BrightStor ARCserve Backup servers have the same volume configuration.*
14. Enable or disable slot overlapping.
15. Confirm the library configuration.
16. Enable or disable the BrightStor ARCserve Backup automatic cleaning feature.
17. Enter `3` to quit the library configuration script.  
**Important!** *Exit the configuration script carefully to avoid configuring your library again. Configuring your library again removes the configuration changes you just made.*
18. Enter `0` to exit.

## Configure the Library After Installation

After you install the Enterprise Option for StorageTek ACSLS, you can use the `cstart`, `cstop`, and `cstatus` commands to quickly start, stop, and view the status of BrightStor ARCserve Backup. Before you configure the library after initial installation, ensure that there are no jobs running on the BrightStor ARCserve Backup server. Use the `cstop` command to stop BrightStor ARCserve Backup services. For details on using the `cstop` command, see the *Administrator Guide*.

**Note:** You must use the `csetup` configuration script to configure the library after installation. Using the Device Manager to configure the library is not supported for the Enterprise Option for StorageTek ACSLS.

To configure the Enterprise Option for StorageTek ACSLS after the installation process is complete, follow these steps:

1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. On a command line, enter `cstop` to stop the BrightStor ARCserve Backup services.
3. On a command line, enter `csetup` to start the configuration script.
4. Enter 4 to select Media Server.
5. Enter `y` to continue.
6. Enter `n` if you do not want to enable backing up to disks. If you want to enable backup to disk, see the *Getting Started* for complete details.
7. Enter `y` when asked if you want to configure your libraries now.

**Note:** If you have already installed the BrightStor ARCserve Backup base product and a library configuration already exists, then you must remove the current library to allow the creation of a new one.

8. Enter the appropriate number to select the ACSLS Network Library from the list of libraries.
9. Press Enter when prompted to continue.
10. Select the library setup method. Enter `e` to select Express, `a` to select Automatic, or `i` to select Interactive. For more information about library setup methods, see the section Library Setup Methods in this chapter.
11. Depending on the setup method you select, enter the appropriate information when prompted.
12. Review the defined library parameters.
13. Enter `y` to confirm the library parameters.
14. Edit the volume configuration file. Entering `yes` automatically starts the vi editor.

**Note:** The name of the volume configuration file is `.nlovol.cfg`.

15. Remove the bar code entries for the tape volumes that you do not want to assign to the BrightStor ARCserve Backup server.
16. Save the file and exit the vi editor.
17. Enable or disable tape volume cleaning.
18. Identify whether the BrightStor ARCserve Backup server is in a SAN.

**Important!** *If you have SAN enabled, you must manually edit the volume configuration file on each server to ensure that all BrightStor ARCserve Backup servers have the same volume configuration.*

19. Enable or disable slot overlapping.
20. Confirm the library configuration.

21. Enable or disable the BrightStor ARCserve Backup automatic cleaning feature.
22. Enter 3 to quit the library configuration script.  
**Important!** *Exit the configuration script carefully to avoid configuring your library again. Configuring your library again removes the configuration changes you just made.*
23. Enter 0 to exit.
24. On a command line, enter cstart to start the BrightStor ARCserve Backup services.

## Library Configuration Update

If you add or remove tape drives on the StorageTek ACSLS tape library, you must update the library configuration to recognize these changes. You can update the library configuration with device changes by using one of the following configuration scripts:

- csetup
- camediad\_setup

**Important!** *All configuration changes must be made by running the csetup or the camediad\_setup configuration scripts.*

You can update the library configuration with changes to tape volumes and tape volume assignments on the StorageTek ACSLS tape library by importing and exporting tape volumes. For details about importing and exporting tape volumes, see Tape Volume Import and Export in the chapter “Using the Option.”

**Note:** Always perform the device and tape volume configuration changes on the StorageTek ACSLS tape library before you reconfigure your logical library on the BrightStor ARCserve Backup server.

## Reconfiguration of Entire Library

The csetup library configuration script is the master configuration script you use to create an initial library configuration and to change an existing one. For information about running the csetup configuration script to update your library configuration, see the procedure described in Configure Your Library in this chapter.

## Change Configuration Parameters

You run the `camediad_setup` media server setup script to change existing library configurations.

**Note:** You must stop the `camediad` services before running `camediad_setup` script. For more details about using the `bab -unload camediad` command, see the *Administrator Guide*.

To change your existing library configuration using the `camediad_setup` script, follow these steps:

1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. On a command line, enter `bab -unload camediad` to stop the `camediad` service.
3. On a command line, enter `camediad_setup` to run the media server setup script to update your library configuration.
4. Respond to all prompts as appropriate for your system configuration.
5. Enter `bab -load camediad` to start the `camediad` service.

## Add and Remove Tape Drives

After installing and configuring the Enterprise Option for StorageTek ACSLS, tape drives may be added to or removed from the StorageTek ACSLS tape library. Tape drives on the StorageTek ACSLS tape library can be physically connected to a SAN or to the computer on which the Enterprise Option for StorageTek ACSLS is installed. To enable BrightStor ARCserve Backup to recognize changes to the tape drive configuration, run the `csetup` configuration or the `camediad_setup` script.

**Note:** All tape drives in the StorageTek ACSLS tape library that are directly connected to the computer running BrightStor ARCserve Backup require the presence of at least one non-cleaning tape volume during automatic and express configuration.

To enable the BrightStor ARCserve Backup server to recognize device changes on the StorageTek ACSLS tape library, follow these steps:

1. Log on with root user privileges to BrightStor ARCserve Backup server.
2. On a command line, enter `cstop` to stop all the BrightStor ARCserve Backup services.
3. Physically add or remove the tape drives from the StorageTek ACSLS tape library.
4. Perform the necessary connections to the new tape drives or remove the connections from the tape drives being removed.

5. Confirm that the operating system on the BrightStor ARCserve Backup server can detect the device changes.

**Important:** *Ensure that the StorageTek ACSLS server has the correct information about all the existing drives.*

6. On a command line, run the csetup or the camediad\_setup configuration script to update your library configuration. For more information about running the csetup configuration script, see Configure Your Library in this chapter. For more information about running the camediad\_setup script, see Change Configuration Parameters in this chapter.
7. On a command line, enter cstart to start the BrightStor ARCserve Backup services.

## Add and Remove Tape Volumes

If the camediad service is running on the BrightStor ARCserve Backup server, the best method for adding or removing tape volumes is to import or export the tape volumes. This method eliminates the need to stop the camediad service. For more information about importing and exporting tape volumes, see Tape Volume Import and Export in the chapter “Using the Option.”

If the camediad service is not running, you can also use the csetup or camediad\_setup configuration scripts to add or remove tape volumes. This may be more time consuming, especially if your library has many tape volumes. For more information about running the csetup or the camediad\_setup configuration scripts to update your library configuration, see the procedures in Configure Your Library in this chapter.

## Update the Volume Configuration File

You can use the nlo\_volcfg.sh volume configuration script to update the .nlovol.cfg volume configuration file. When tape volumes are imported outside of BrightStor ARCserve Backup, the .nlovol.cfg volume configuration file does not contain bar code entries for tape volumes imported outside of BrightStor ARCserve Backup. In addition, you can specify that the bar code entries for the tape volumes are inserted into the volume configuration file in their original slots. For more information about the volume configuration file, see Volume Configuration File in the chapter “Introducing the Option.”

You can specify one tape volume bar code when you run the volume configuration script. If you want to update the volume configuration file with more than one tape volume bar code, run the script for as many times as needed.

Use the following options with the volume configuration script

Option	Description
-a	Adds the specified tape volume bar code entry to the volume configuration file
-d	Removes the specified tape volume bar code entry to the volume configuration file
-ac	Adds the specified cleaning tape volume bar code entry to the volume configuration file
-dc	Removes the specified cleaning tape volume bar code entry to the volume configuration file
-oa	Adds the specified tape volume bar code entry to the virtual slot from which it was exported. If this operation fails, the bar code entry is appended to the end of the volume configuration file.
-of	Adds the specified tape volume bar code entry to the virtual slot from which it was exported. If this operation fails, the bar code entry is added to the first available slot in the volume configuration file.

The following example of the `nlo_volcfg.sh` script adds bar code ABC123 to the volume configuration file:

```
nlo_volcfg.sh -a ABC123
```

The following example of the `nlo_volcfg.sh` script attempts to add bar code ABC456 to the original virtual slot in the volume configuration file. If the operation fails, the bar code is added to the first available slot in the file.

```
nlo_volcfg.sh -of ABC123
```

**Note:** Use the `-oa` and `-of` options to update the tape volume configuration file with bar codes of tape volumes that were previously exported and later imported outside of BrightStor ARCserve Backup.

**Important!** *Do not use this option if you have already imported the tape volumes using the Device Manager. Using the `-oa` and `-of` options will add bar code entries for the specified tape volumes, even if they are already imported. This will cause duplicate entries in the volume configuration file.*

## Uninstall the Option

To uninstall the Enterprise Option for StorageTek ACSLS from the BrightStor ARCserve Backup server, remove the Enterprise Option for StorageTek ACSLS package.

To uninstall the Enterprise Option for StorageTek ACSLS, follow these steps:

1. Use the grep command to search for and display the name of the Enterprise Option for StorageTek ACSLS package. Use the following grep command syntax for each platform:

### **AIX**

```
lslpp -L all | grep BAB
```

### **HP-UX**

```
swlist | grep BAB
```

### **Solaris**

```
pkginfo | grep BAB
```

**Note:** The name of the Enterprise Option for StorageTek ACSLS package is usually BABstklib.

2. Use the remove command to remove the package. Use the following remove command syntax for each platform:

### **AIX**

```
installp -u "packagename"
```

### **HP-UX**

```
swremove "packagename"
```

### **Solaris**

```
pkgrm "packpagename"
```



# Chapter 3: Using the Option

---

This chapter contains information about using the Enterprise Option for StorageTek ACSLS. After you install and configure the Enterprise Option for StorageTek ACSLS on the BrightStor ARCserve Backup server, you can use BrightStor ARCserve Backup to perform the following tasks:

- Manage backup and restore operations on the StorageTek ACSLS
- Import and export tape volumes from the StorageTek ACSLS tape library
- Update the configuration of the virtual library on the BrightStor ARCserve Backup server with device or tape volume changes on the StorageTek ACSLS tape library

This chapter also contains information about using the StorageTek ACSLS `cmd_proc` utility to query the status of the tape drives and tape volumes in the StorageTek ACSLS tape library.

## Management of Backup and Restore Operations

With the Enterprise Option for StorageTek ACSLS, you manage backup and restore operations as if you are controlling a local library. Use the Backup Manager and the Restore Manager to perform backup and restore operations on the BrightStor ARCserve Backup server.

Use the Backup Manager to perform backup operations and the Restore Manager to perform restore operations. For complete details on managing backup and restore operations, see the *Getting Started*.

**Note:** The tape volumes on the StorageTek ACSLS tape library appear as local tape volumes during backup and restore operations.

## Tape Volume Import and Export

Before you can use tape volumes for a virtual library on the BrightStor ARCserve Backup server, the tape volumes on the StorageTek ACSLS tape library must appear in the volume configuration file. The process of importing tape volumes automatically adds a bar code entry for each tape volume to the volume configuration file.

The process of exporting tape volumes removes the bar code entry for the exported tape volumes and makes those tape volumes unavailable to the BrightStor ARCserve Backup server. Tape volumes exported by the BrightStor ARCserve Backup server are placed in the cartridge access ports (CAP) of the StorageTek ACSLS tape library and can be physically removed from the StorageTek ACSLS tape library.

To insert and eject tape volumes from the StorageTek ACSLS tape library, you physically add tape volumes to, and remove them from, the CAP. If the number of tape volumes you import or export exceeds the capacity of the CAP on the StorageTek ACSLS tape library, you must open and close the CAP as needed.

**Note:** To ensure successful import and export operations, open and close the CAP on the StorageTek ACSLS tape library as required.

### Import and Export Considerations

Before you import or export tapes, consider the following configuration information:

- To support importing and exporting from BrightStor ARCserve Backup using either the Device Manager or the `ca_devmgr` command, ensure that the CAP is online and set to manual mode.
- To export tapes from BrightStor ARCserve Backup and import them manually, set the CAP to automatic mode.

For more information about setting the CAP modes, see the StorageTek ACSLS Administrator Guide.

## Import from StorageTek ACSLS

To import from the StorageTek ACSLS server directly, perform the following procedure:

1. Delete the asterisks (\*) before the tape bar code in the .nlvol.cfg file, located under the \$BAB\_HOME/data/ directory.
2. From the Device Manager, click the Mount/Dismount toolbar button. The Mount/Dismount dialog opens.
3. Select the group containing the slots you want to mount from the Group Name drop-down list.
4. Specify the range of slots to mount using the Starting slot and Ending slot fields.
5. To ensure that the media in these slots are moved to inventory during the mount, enable the Force inventory during mount option.
6. Click Mount.

For more information about mounting slots, see the Tape Library Option Guide.

## Tape Volume Imports

You can choose one of the following methods to import tape volumes into the StorageTek ACSLS tape library:

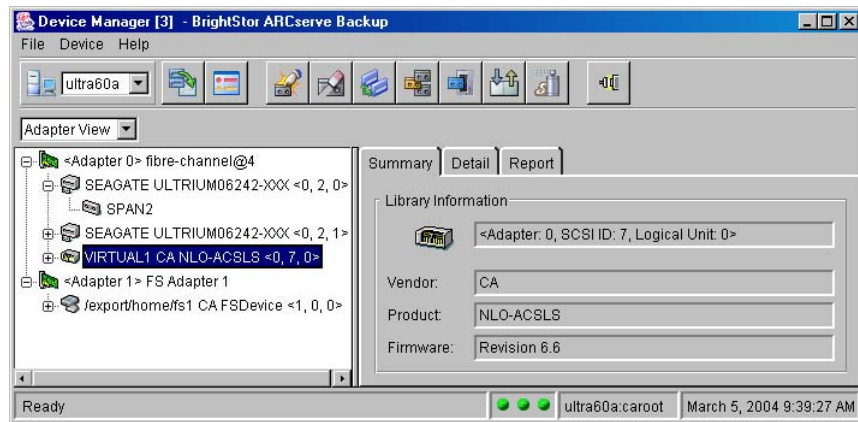
- Use the Device Manager
- Run the `ca_devmgr` command


### Use the Device Manager to Import Tape Volumes

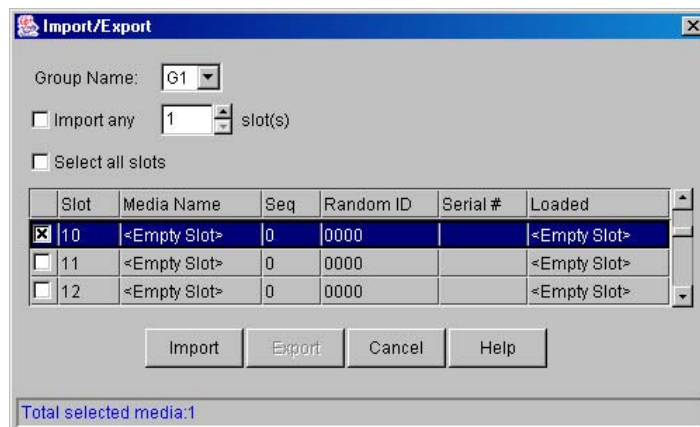
**Note:** For general information about using the Device Manager, see the *Administrator Guide*.

To use the Device Manager to import tape volumes into the StorageTek ACSLS tape library, follow these steps:

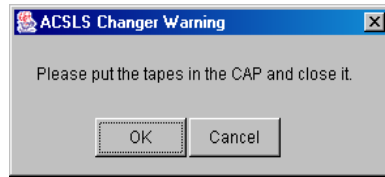
1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. Open the Device Manager main window on the BrightStor ARCserve Backup server.
3. Select the virtual library in the Device Manager window.



4. Click the Import/Export button  on the Device Manager toolbar. The Import/Export dialog appears.
5. Select the check box for each empty slot where you want to import a tape volume.



- Click the Import button. The ACSLS Changer Warning dialog appears:



- Click OK and then open the CAP on the StorageTek ACSLS tape library.
- Place the tape volumes in the CAP and close the CAP. The tape volumes are imported into the StorageTek ACSLS tape library and the volume configuration file is updated with the newly imported tape volumes.

**Note:** Force inventory is not required when importing tape volumes. However, if tape volumes are modified outside of BrightStor ARCserve Backup control, do a Force Inventory. For example, changes may occur to tape volumes that have been previously imported. If tape volumes are changed outside of BrightStor ARCserve Backup, the changes may not be recognized during import.

**Important!** Any time a tape volume is changed outside of BrightStor ARCserve Backup, select Mount/Dismount from the Device menu to force inventory during mount.

## Use the Command to Import Tape Volumes

The `ca_devmgr` command, the command line device management program, lets you import tape volumes by running this command from a BrightStor ARCserve Backup server. For details on using the `ca_devmgr` command to import tape volumes, see the *Administrator Guide*.

## Tape Volume Exports

You can choose one of the following methods to export tape volumes from the StorageTek ACSLS tape library:

- Use the Device Manager
- Run the `ca_devmgr` command

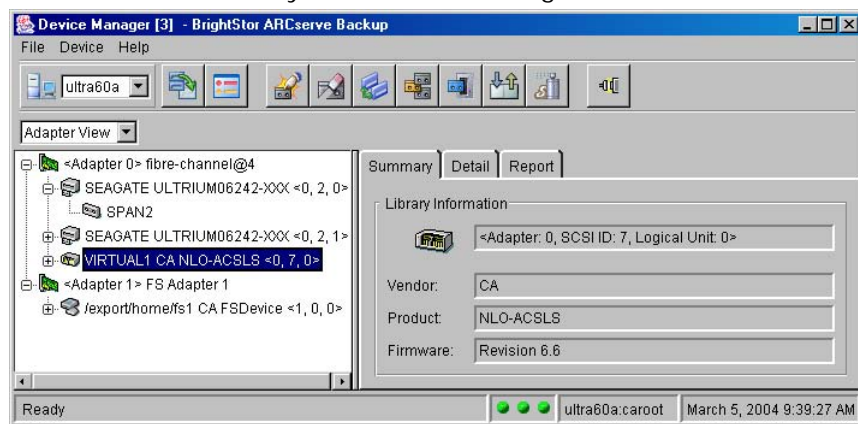
When you use the BrightStor ARCserve Backup server to export tape volumes from the StorageTek ACSLS tape library, the exported tape volumes are removed from the volume configuration file and are no longer available to the BrightStor ARCserve Backup server.


## Use the Device Manager to Export Tapes

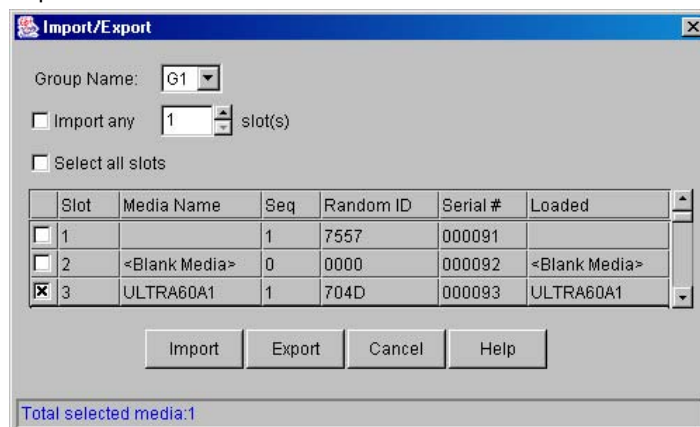
**Note:** For general information about using the Device Manager, see the *Administrator Guide*.

To use the Device Manager to export tape volumes from the StorageTek ACSLS tape library, follow these steps:

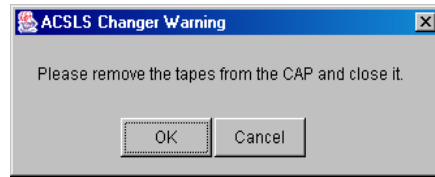
1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. Open the Device Manager main window on the BrightStor ARCserve Backup server.
3. Select the virtual library in the Device Manager window.



4. Click the Import/Export button  on the Device Manager toolbar. The Import/Export dialog appears.
5. Select the check box for each slot for the tape volumes you want to export.



- Click the Export button. The ACSLS Changer Warning dialog appears:



- Click OK and then open the CAP.
- Physically remove the tape volumes from the CAP in the StorageTek ACSLS tape library and close the CAP.
- The bar code entries for the exported tape volumes are removed from the volume configuration file and the tape volumes are not available to the BrightStor ARCserve Backup server.

### Use the Command to Export Tape Volumes

The `ca_devmgr` command, the command line device management program, lets you export tape volumes by running this command from a BrightStor ARCserve Backup server. For details on using the `ca_devmgr` command to export tape volumes, see the *Administrator Guide*.

## StorageTek ACSLS Tape Library Queries

The StorageTek ACSLS query commands provide an alternate method for determining the status of the tape drives and the tape volumes in the StorageTek ACSLS tape library. Use the `cmd_proc` utility on the StorageTek ACSLS server to query the status of the tape drives and the tape volumes in the StorageTek ACSLS tape library.

## Query the Status of Tape Drives

The command, `query drive all`, provides information about the tape volumes, the tape drives, their state, their status, and their type.

To query the status of the tape drives in the StorageTek ACSLS tape library, follow these steps:

1. Start the `cmd_proc` utility.

2. Enter

```
query drive all
```

The following example shows the format of the information returned:

```
2004-03-18 12:51:31      Drive Status
Identifier  State      Status      Volume      Type
0, 0, 0, 0  online    available   SGT-LT0
0, 0, 0, 1  online    available   SGT-LT0
0, 0, 0, 2  online    available   SGT-LT0
0, 0, 0, 3  online    available   SGT-LT0
```

The identifier consists of four digits, which represent the following:

- Automated Cartridge System (ACS)
- Logical Silo Module (LSM)
- Panel number (Panel)
- Drive ID number (Drive)

In the preceding example, "0, 0, 0, 0" on the first line translates to ACS = 0, LSM = 0, Panel = 0, Drive ID = 0 while "0, 0, 0, 3" on the fourth line translates to ACS = 0, LSM = 0, Panel = 0, Drive ID = 3.



## Query the Status of the Tape Volumes

The command, `query volume all`, provides information about the tape volumes, their status, their current location, and their type.

To query the status of the tape volumes in the StorageTek ACSLS tape library, follow these steps:

1. Start the `cmd_proc` utility.
2. Enter

```
query volume all
```

The following example shows the format of the information returned:

```
2004-03-18 13:05:04      Volume Status
Identifier  Status      Current Location      Type
000091     home       0, 0, 4, 0, 0        LTO-100G
000092     home       0, 0, 2, 3, 0        LTO-100G
000093     home       0, 0, 2, 1, 0        LTO-100G
000094     home       0, 0, 3, 0, 0        LTO-100G
000095     in drive   0, 0, 0, 0, 0        LTO-100G
000096     ejected    0,-1, 0, 0, 0        LTO-100G
000097     ejected    0,-1, 0, 0, 0        LTO-100G
```



# Appendix A: Frequently Asked Questions

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This appendix includes frequently asked questions to help you resolve issues that may arise when using the Enterprise Option for StorageTek ACSLS.

## **What is mixed media?**

The term mixed media refers to a mixture of tape drives and tape volumes in the StorageTek ACSLS tape library.

## **What setup method do I use to configure the logical library when StorageTek ACSLS tape library has mixed media?**

You must use the interactive setup method and specify all of the details about the tape drives connected to the StorageTek ACSLS tape library.

## **What setup method do I use to configure the logical library on a SAN distributed server?**

You should use the interactive setup method, since the express and automatic setup methods dismount all the tape volumes.

## **How do I verify network connectivity between the BrightStor ARCserve Backup server and the StorageTek ACSLS tape library?**

Verify network connectivity by doing a network ping from the BrightStor ARCserve Backup server to StorageTek ACSLS server. Verify that the StorageTek ACSLS server can communicate with the StorageTek ACSLS tape library.

## **How do I access the BrightStor ARCserve Backup Manager?**

Use an approved web browser to access the BrightStor ARCserve Backup Manager on this local UNIX server. Enter the host's IP address (or host name) with the BrightStor ARCserve Backup port suffix in the browser's URL address field. The default BrightStor ARCserve Backup port suffix is 6060, but it can be changed. For example:

```
http://172.24.111.111:6060
```

## **How do I change my library configuration?**

Run the csetup configuration script from a UNIX command line on the BrightStor ARCserve Backup server and select option 4 (Media Server); or run the camediad\_setup script.

**How do I determine what tape volumes are configured for the BrightStor ARCserve Backup server?**

Tape volume assignments for the BrightStor ARCserve Backup server are maintained in the volume configuration file in the \$BAB\_HOME/data directory. The name of the volume configuration file is .nlovol.cfg. The period before the nlovol file name is required. The volume configuration file contains a list of tape volumes; each tape volume is distinguished by its bar code.

**How do I ensure the volume configuration is the same for the BrightStor ARCserve Backup servers in the SAN?**

Tape volume assignments for the BrightStor ARCserve Backup server are maintained in the volume configuration file in the \$BAB\_HOME/data directory. The initial configuration must be performed manually for each server in the SAN. After the initial configuration, you make changes to the volume configuration on one BrightStor ARCserve Backup server and then propagate the file to the other BrightStor ARCserve Backup servers in your SAN.

**I added a new tape drive to the StorageTek ACSLS tape library. Why is one tape volume required to be in the StorageTek ACSLS tape library during express and automatic setup?**

The automatic device detection process uses that tape volume to detect and map the tape drives in the StorageTek ACSLS tape library.

**How do you remove a tape volume from the StorageTek ACSLS tape library?**

You can export tape volumes from the StorageTek ACSLS tape library by using the Device Manager or by running the ca\_devmgr script.

**What UNIX packages are installed with the BrightStor ARCserve Backup base product?**

BABmgr and BABsvr are UNIX packages installed with the BrightStor ARCserve Backup base product.

**What UNIX package is installed with the Enterprise Option for StorageTek ACSLS?**

The name of the Enterprise Option for StorageTek ACSLS package is usually BABstklib.

**When are tape volume assignments the same for more than one BrightStor ARCserve Backup server?**

The tape volume assignments are the same for multiple backup servers when the BrightStor ARCserve Backup server is in a SAN.

**Is the cleaning tape volume shared between backup servers?**

Yes, the cleaning tape volume is shared between backup servers when the backup servers are in a SAN, just as they share the same volume configuration for non-cleaning tape volumes. If the backup servers are not in a SAN, then each backup server has an assigned cleaning volume.



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