BrightStor® ARCserve® Backup for UNIX

Enterprise Option for IBM 3494 Guide

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Chapter 1: Introducing the Option

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 IBM 3494. This option allows you to use the full capabilities of BrightStor ARCserve Backup with the large tape volume capacities of the IBM® TotalStorage® Enterprise Automated Tape Library 3494. With this option, the BrightStor ARCserve Backup server can interface with the IBM TotalStorage Enterprise Automated Tape Library 3494 to manage backup and restore operations, tape volume movement, and tape volume organization.

Note: This guide refers to the IBM TotalStorage Enterprise Automated Tape Library 3494 as Enterprise Tape Library 3494.

Using the Enterprise Option for IBM 3494 lets several BrightStor ARCserve Backup servers share a network-connected Enterprise Tape Library 3494. By using several BrightStor ARCserve Backup servers, you can 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 automatically associate known or discovered physical tape drives in the Enterprise Tape Library 3494 with a logical local library on the BrightStor ARCserve Backup server. The option lets you assign tape volumes in the Enterprise Tape Library 3494 to the logical library on the BrightStor ARCserve Backup server. This configuration lets you use the features of BrightStor ARCserve Backup to control the Enterprise Tape Library 3494.

Note: Each BrightStor ARCserve Backup server can be physically connected to one Enterprise Tape Library 3494 and can manage one logical library configuration for the Enterprise Tape Library 3494.

This option also provides services that let BrightStor ARCserve Backup perform backup, restore, and device management operations on the Enterprise Tape Library 3494 tape volumes. Each BrightStor ARCserve Backup server performs these operations as if it is controlling its own separate library. In addition, the BrightStor ARCserve Backup server interprets the assigned tape volumes on the Enterprise Tape Library 3494 as local tape volumes; however, the physical location of tape volumes is managed exclusively by the Enterprise Tape Library 3494.

Important! *The tape volumes in the Enterprise Tape Library 3494 must have bar codes to use the BrightStor ARCserve Backup Enterprise Option for IBM 3494.*

Communication Interfaces

Communication between the Enterprise Tape Library 3494 and the BrightStor ARCserve Backup server occurs through these communication interfaces:

- The IBM Library Manager client on the BrightStor ARCserve Backup server connects to the Enterprise Tape Library 3494 through an Ethernet LAN control path.
- Each BrightStor ARCserve Backup server independently connects to one or more tape drives in the library through SCSI or fibre channel data paths.
- Other SCSI backup servers can also exist on the network and share the Enterprise Tape Library 3494.

Each backup server communicates directly and independently with the Enterprise Tape Library 3494. Although multiple backup servers may exist on the same network, BrightStor ARCserve Backup servers do not communicate with other backup servers.

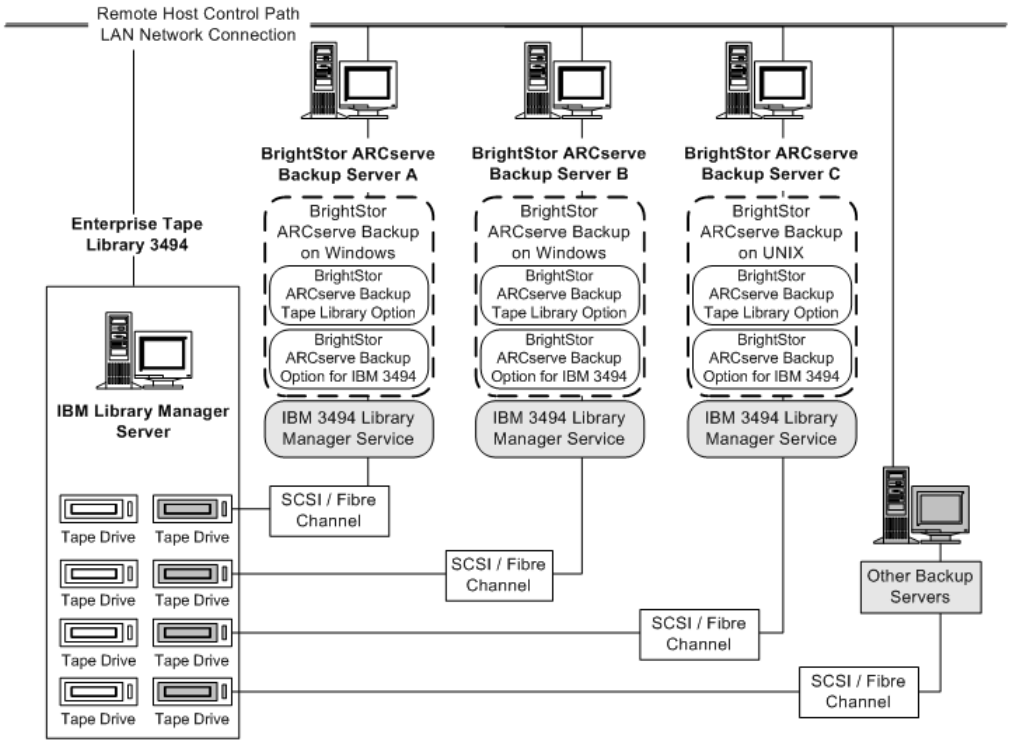
Option Architecture

The Enterprise Option for IBM 3494 is a separate software component installed on a server running BrightStor ARCserve Backup. Each BrightStor ARCserve Backup server is directly connected to at least one Enterprise Tape Library 3494 tape drive using independent SCSI or fibre channel data paths.

Several BrightStor ARCserve Backup servers can share one Enterprise Tape Library 3494. In configurations with multiple BrightStor ARCserve Backup servers, each backup server is configured to control a mutually exclusive set of tape volumes in the Enterprise Tape Library 3494. This type of configuration essentially partitions a large Enterprise Tape Library 3494 into independent user-defined logical libraries. As a result, each BrightStor ARCserve Backup server manages a user-defined subset of tape volumes on the Enterprise Tape Library 3494 that are unique to that BrightStor ARCserve Backup server.

Other backup servers on the network can also share the Enterprise Tape Library 3494 with the BrightStor ARCserve Backup servers. All backup servers on the network operate independently; no interactions between backup servers occur, even between multiple BrightStor ARCserve Backup servers.

Each BrightStor ARCserve Backup server has an autonomous view of the Enterprise Tape Library 3494 that shows only the locally assigned volumes. The tape volumes configured for the Enterprise Option for IBM 3494 are not part of a physical library connected to the BrightStor ARCserve Backup server, but are interpreted by BrightStor ARCserve Backup as a local library. The following illustration shows the architecture of the Enterprise Option for IBM 3494:



If multiple backup servers are sharing the same Enterprise Tape Library 3494, you must ensure that each tape volume is assigned to only one backup server. The tape volumes assigned to each backup server should be mutually exclusive, which means they cannot be used or accessed by other backup servers attached to the network.

Important! *If tape volumes are not mutually exclusive or are shared between backup servers, you risk losing important backup data.*

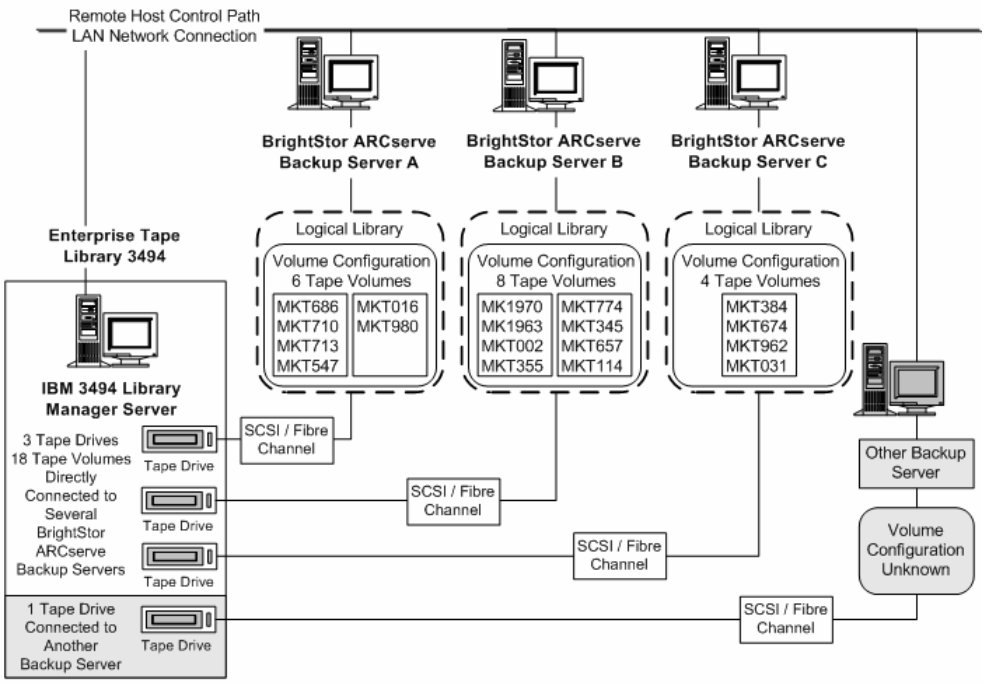
Assigning mutually exclusive tape volumes requires careful planning. To assist you in your planning effort, you should document the tape volume assignment for each backup server that will share the Enterprise Tape Library 3494. The tape volume assignments for the BrightStor ARCserve Backup server are maintained in the volume configuration file.

For more information on the volume configuration file, see Volume Configuration File in this chapter.

Note: If you are adding backup servers to an established configuration, avoid duplication by checking the current tape volume assignments before adding the new backup servers.

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 Enterprise Tape Library 3494 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. Other backup servers on the network can also share the Enterprise Tape Library 3494.

Tape Categories

The Enterprise Tape Library 3494 tracks the category number of each tape volume in the library. A single category number identifies all tape volumes used for the same purpose or application. The tape volumes imported into the Enterprise Tape Library 3494 by the BrightStor ARCserve Backup server are assigned to the BrightStor ARCserve Backup category F00F.

Insert Category

When a tape volume is first inserted into the library, either manually or automatically at the convenience I/O station, the tape volume is assigned to the insert category FF00. When tape volumes are imported into the BrightStor ARCserve Backup server, the tape volumes move from the insert category FF00 to the BrightStor ARCserve Backup category F00F.

Unique Application Category

Each backup server that shares the Enterprise Tape Library 3494 has its own access defined by tape volume categories. Each backup server must use a unique set of category numbers to identify that application. The unique application category for BrightStor ARCserve Backup server is F00F.

Eject Category

When a tape volume is assigned to the eject category, the tape volume is unavailable to the BrightStor ARCserve Backup server. The eject category is FF10.

Configuration Files

This section contains information about the configuration of the logical user-defined library on the BrightStor ARCserve Backup server. Review this information to become familiar with the library configuration file, the volume configuration file, and the media server configuration file.

The following configuration files enable communication between the BrightStor ARCserve Backup server and the Enterprise Tape Library 3494:

- Enterprise Tape Library 3494 library configuration file
- BrightStor ARCserve Backup volume configuration file
- BrightStor ARCserve Backup media server configuration file

Library Configuration File

An important pre-installation task includes editing the Enterprise Tape Library 3494 library configuration file. The name of the file is ibmatl.conf. The file is located in the /etc directory. The library configuration file defines the symbolic library name, the communication interface, the identifier to be used in conjunction with the IBM Library Manager control service, and an optional second Internet address for a high availability server.

Use vi, or another UNIX text editor, to edit the Enterprise Tape Library 3494 library configuration file before you install the Enterprise Option for IBM 3494.

Library Configuration File Format

Note: Any text following # is treated as a comment.

The format of the statements in the library configuration file, ibmatl.conf file, is:

```
libraryname address identifier address2
```

The following list explains the parts of the statement:

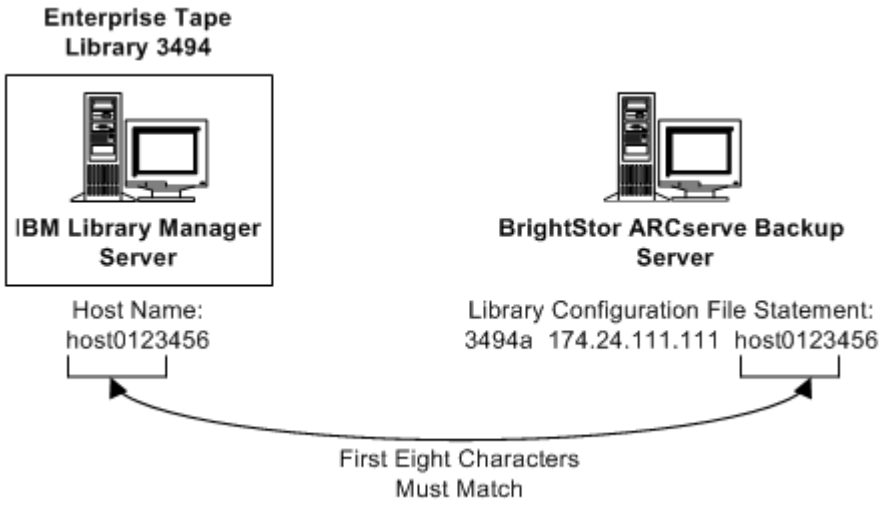
- *libraryname* is a symbolic name of the library. There is a 32 character limit for symbolic names.
- *address* is a value that represents the IP address of the Enterprise Tape Library 3494.
- *identifier* is used by the IBM Library Manager to locate the BrightStor ARCserve Backup server. A typical identifier is the host name of the computer. The identifier is also known as the return alias.
- *address2* is optional. It specifies a second IP address for a high availability server.

  Note: Do not specify the second IP address if you are not using a high availability server.

In the following example, the symbolic name of the library is 3494a, the IP address of the Enterprise Tape Library3494 is 174.24.111.111, and the host name is host01:

```
3494a     174.24.111.111     host01
```

The first eight characters of the identifier defined in this file must match the first eight characters of the LAN host specified for the BrightStor ARCserve Backup server in the Enterprise Tape Library 3494. The following example shows a definition of the LAN host on the Enterprise Tape Library 3494 and on the BrightStor ARCserve Backup server:



Note: To add a LAN host to the Enterprise Tape Library 3494, use the library operator console and choose Commands, LAN options, and then Add LAN Host. Enter the BrightStor ARCserve Backup server IP address and host name.

Volume Configuration File

The volume configuration file is created when you run the csetup script as part of the BrightStor ARCserve Backup installation. The tape volume assignments for the BrightStor ARCserve Backup server are maintained in this file.

The name of the file is *.libraryname*.cfg, where *libraryname* is the name of the logical user-defined library on the BrightStor ARCserve Backup server. The period before the library 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.

Note: The *libraryname* is specified as the first entry in the Enterprise Tape Library 3494 library configuration file /etc/ibmatl.conf.

For more information on the Enterprise Tape Library 3494 library configuration file, see Library Configuration File in this chapter.

During the configuration process, all tape volumes on the Enterprise Tape Library 3494 are included in the volume configuration file and, by default, are 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 on the BrightStor ARCserve Backup server.

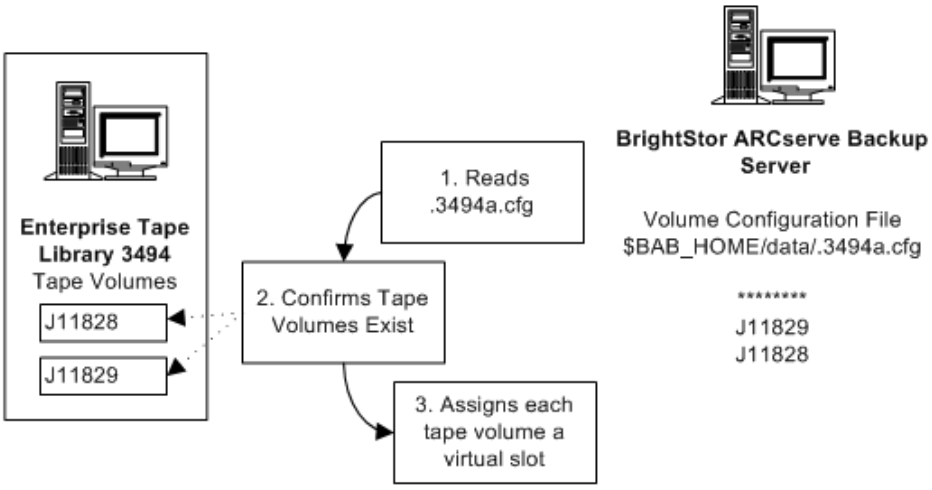
Important! *You must delete the entries for the tape volumes that are assigned to other backup servers on the network.*

The volume configuration file enables communication between the BrightStor ARCserve Backup server and the Enterprise Tape Library 3494 by assigning tape volumes in the Enterprise Tape Library 3494 to virtual slots in the logical library.

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 Enterprise Tape Library 3494 to determine if the tape volumes physically exist
- Assign each tape volume a slot in the virtual library based on the position in the volume file

The following example shows the relationship between the volume configuration file on the BrightStor ARCserve Backup server and the tape volumes on the Enterprise Tape Library 3494:



Volume Configuration Format

Each line in the volume configuration file is sequentially mapped to a slot in the Enterprise Tape Library 3494. 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, as shown in the following example:

```
MK1803  maps to slot 1
MK1964   maps to slot 2
******   maps to slot 3 (empty slot)
```

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

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 is updated automatically with Enterprise Tape Library 3494 information when you run the csetup configuration script, so no further editing is required.

For more information on how to update 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 devices and automatically updates the device information in the media server configuration file.

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.*

Note: Any line beginning with ; is treated as a comment.

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 IBM 3494:

- The [CHANGER] section contains library parameters. A [CHANGER] section exists for each library.
- The [DEVICE] section contains information on SCSI and fibre channel attached devices.
- The [CONFIG] section contains library configuration information.

Note: The information described in the CHANGER section is presented when you run the csetup configuration script to configure your library.

Library Parameters

The library parameters are maintained in the [CHANGER] section of the media server configuration file. A set of typical library parameters is shown in the following example:

```
[CHANGER]
CHANGER_NAME = "Virtual1" (0,7,0)
IBM3494_LIBRARY YES
CLEANING_ENABLED NO
BARCODE_ENABLED YES
AUTOMAP_DRIVES_ENABLED YES
READ_SLOTS_FILE_ENABLED NO
CHANGER_DEVICES = (0,1,0)
CHANGER_GROUP = "CH_GRP0" (0,1,0) FROM 1 TO 370
CHANGER_SLOTS = 370
[CHANGER_END]
```

Note: The CHANGER_NAME Virtual1 is the default library name assigned during library setup. This entry is used by the Enterprise Option for IBM 3494 for display purposes only. Even if multiple BrightStor ARCserve Backup servers share the Enterprise Tape Library 3494, each BrightStor ARCserve Backup server will have the same CHANGER_NAME of Virtual1.

Device Parameters

A list of device files that enables the BrightStor ARCserve Backup server to access tape drives on the Enterprise Tape Library 3494 is maintained in the [DEVICE] section of the media server configuration file. A DEVICE entry exists for each SCSI and fibre channel attached device. A set of typical device parameters is shown in the following example:

```
[DEVICE] ; Device Table
DEVICE = "/dev/rcha0,1,0"SCSI   (0,1,0)   "000001300526"
DEVICE = "/dev/rcha0,2,0"SCSI   (0,2,0)   "461000000406"
```

Configuration Parameters

Parameters that enable the BrightStor ARCserve Backup server to access tape volumes on the Enterprise Tape Library 3494 are maintained in the [CONFIG] section of the media server configuration file. A set of typical library configuration parameters is shown in the following example:

```
[CONFIG]
;DEBUG_LEVEL = 255;  This will create camediad.dbg file
;EARLY_WARNING = 100
ENABLE_S_CHANGER = 0
AUTO_CLEAN_TIME = 0
;SERVER_ON_FIBRE_LOOP = 1
ENABLE_IBM3494_CHANGER = 1
IO_BUFFERS = 128
;DEVICE_SHARING_ENABLED = 1; share devices with other apps
MMO_BYPASS_UNKNOWN_ERR = 0
```

Additional Libraries for AIX

If the BrightStor ARCserve Backup server where the option will be installed is using AIX, and also has a local SCSI (regular) tape library, you should configure the logical library on the network-connected Enterprise Tape Library 3494 before you configure the local SCSI tape library. If the local SCSI tape library is configured first, the Enterprise Option for IBM 3494 library configuration process may cause information about the local SCSI library to be unavailable. You can restore the local SCSI tape library configuration information in the media server configuration file by removing any comments added when the Enterprise Option for IBM 3494 was configured.

Note: Remove ; from the beginning of a line to remove the comment.

Chapter 2: Installing the Option

This chapter provides the information you need to install and configure the Enterprise Option for IBM 3494.

The information in this chapter assumes you are familiar with:

- The characteristics and requirements of UNIX operating systems in general
- Root user responsibilities with UNIX operating systems in particular
- Text-based vi editor
- Enterprise Tape Library 3494

System Requirements

This section describes software installation requirements specific to the Enterprise Option for IBM 3494.

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 http://ca.com/ for any updates to the requirements.

Additional System Requirements

For the Enterprise Option for IBM 3494 to function properly, the option and the following applications must be installed on the same computer:

- BrightStor ARCserve Backup
- Enterprise Tape Library 3494 Library Manager control service

Installation Prerequisites

Installation prerequisites are grouped into these categories:

- System Requirements and Preinstallation Tasks
- Enterprise Tape Library 3494
- Install Privileges
- Data Path and Control Path Interfaces

Before installing Enterprise Option for IBM 3494, verify that:

- Your system requirements meet the minimum requirements needed to install the Enterprise Option for IBM 3494. For a list of system requirements, see the readme file.
- You have the administrator privileges or the proper authority to install software on the computer where you will be installing the option.
- You know the host name, IP address, and password of the computer on which you are installing the option.
- You have installed Version 5.4 of the IBM Automated Tape Library service on the BrightStor ARCserve Backup server.
- You have added the server where you will install BrightStor ARCserve Backup as a LAN host to the Enterprise Tape Library 3494.
- The communication between the Enterprise Tape Library 3494 and the Automated Tape Library service on the computer where you will install BrightStor ARCserve Backup is established and configured.
- You have the plan of your tape volume configuration.

System Requirements and Preinstallation Tasks

Verify that your system requirements meet the minimum requirements needed to install the Enterprise Option for IBM 3494. For a list of system requirements, see the readme file.

Verify that you have performed the following installation tasks before you install the option:

- Define the symbolic library name, the IP address, and the identifier in the /etc/ibmatl.conf library configuration file.
- Remove the tape volumes from the tape drives that are physically connected to the BrightStor ARCserve Backup server.
- Plan your mutually exclusive tape volume configuration for each computer where you will install BrightStor ARCserve Backup.
- Select your library setup method.

Enterprise Tape Library 3494

Before installing the Enterprise Option for IBM 3494, verify that the following pre-installation tasks related to the Enterprise Tape Library 3494 are complete:

- Communication between the IBM Library Manager control service on the BrightStor ARCserve Backup server and the Enterprise Tape Library 3494 is established and configured. You can use the mtlib program to verify library connectivity.
- The Enterprise Tape Library 3494 tape drives that are connected to the BrightStor ARCserve Backup server are empty.
- The library name, the IP address of the BrightStor ARCserve Backup server, and the identifier are defined in the Enterprise Tape Library 3494 library configuration file, located in /etc/ibmatl.conf.

  For more information on the library configuration file, see Library Configuration File in the chapter "Introducing the Option".
- You have developed a tape volume configuration plan to ensure mutually exclusive tape volume assignments for each BrightStor ARCserve Backup server. Identify which tape volumes on the Enterprise Tape Library 3494 will be assigned to the BrightStor ARCserve Backup server.

Install Privileges

Before installing the Enterprise Option for IBM 3494, verify that you have root user privileges or the proper authority to install software on the computers where you plan to install the Enterprise Option for IBM 3494.

Note: Contact your BrightStor ARCserve Backup 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 Enterprise Tape Library 3494 communications:

- The SCSI or fibre channel data path between the BrightStor ARCserve Backup server and the Enterprise Tape Library 3494 tape drives.
- The Ethernet LAN control path between the IBM Automated Tape Library service on the BrightStor ARCserve Backup server and the Enterprise Tape Library 3494.

- Establish the Ethernet LAN connectivity by adding a LAN host to the Enterprise Tape Library 3494 server. The LAN host specified for the Enterprise Tape Library 3494 server must match the host name specified on the BrightStor ARCserve Backup server.

  Note: To add a LAN host to the Enterprise Tape Library 3494, use the library operator console and choose Commands, LAN options, and then Add LAN Host. Enter the BrightStor Enterprise Backup server IP address and host name. You can use mtlib commands to confirm connectivity between the Enterprise Tape Library 3494 and the IBM Automated Tape Library service on BrightStor ARCserve Backup Server

For more information on the communication interfaces used by the Enterprise Option for IBM 3494, see Communication Interfaces in the chapter "Introducing the Option".

IBM Library Manager Control Service Compatibility

In addition to establishing certain Enterprise Tape Library 3494 communications, you must install and configure Version 5.4 of the IBM Library Manager control service. Enterprise Option for IBM 3494 requires IBM Library Manager control service compatibility. Download and install the appropriate version of the IBM Library Manager control service from the IBM FTP site.

Library Setup Methods

Setting up your library is an important step in the Enterprise Option for IBM 3494 on the BrightStor ARCserve Backup installation. As part of the installation of the option on the BrightStor ARCserve Backup server, 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 CHANGER section of the media server configuration file called camediad.cfg file.

Device Groups

The device groups attached to the host server are the groups that are available to you for the backup or restore destination. Each device group corresponds to one tape drive.

All the device groups can share the same range of slots. For example, if you have a library with 100 slots and four tape drives; each tape drive is configured in a device group with a starting slot of 1 and an ending slot of 100 (all groups have access to all slots).

Tape Cleaning

The cleaning slot designation is not applicable for the Enterprise Option for IBM 3494. The Enterprise Tape Library 3494 completely controls the cleaning through the operator-specified schedule.

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 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, and the groups are automatically configured for slot sharing. If you do not want to implement slot sharing, use either the automatic or interactive setup method to separate the slots by groups.

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

Automatic Setup

The automatic setup method configures the library, detects and assigns the attached tape drives. 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 become tedious 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.

Interactive Setup

The interactive setup method enables you to manually define the library, tape drives, and device group configuration. The interactive setup method requires you to enter all configuration information manually; you must know which tape drives belong to which library. 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: The interactive method is not recommended if you do not know which tape drives belong to which library. For the Enterprise Tape Library 3494, this method should not be necessary.

Installation and Configuration Highlights

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 IBM 3494 installation include:

- Performing pre-installation tasks.
- Mounting the installation CD.
- Install the option by running the installation script.
- Configure 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.

Install the Option

You can install the option during or after the installation of the BrightStor ARCserve Backup base product. The order of the installation modules presented by the installation script is customized based on the agents, options, and other components that you are installing during this installation session. As a result, the sequence of installation prompts varies.

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

To install the Enterprise Option for IBM 3494, follow these steps:

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

See *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 IBM 3494 by choosing one of the following two methods:

- Configure the library during installation of the Enterprise Option for IBM 3494 by responding to the prompts presented during the installation session.
- Configure the library after installation of the Enterprise Option for IBM 3494 by running the csetup configuration script.

Note: The order of configuration modules presented by the installation and csetup configuration scripts is customized based on the agents, options, and other components installed on your system. 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, it is not necessary to stop or start any services on the BrightStor ARCserve Backup server.

To configure the Enterprise Option for IBM 3494 during the installation, follow these steps:

1. Perform the option installation as described in Install the Option topic in this chapter.
2. Enter 4 to select Media Server.
3. Enter y to continue.

   Note: Solaris users will receive an additional prompt. Enter n to skip the converttost module.

   For more information about the converttost script, see the *Tape Library Option Guide*.
4. 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 information.
5. Enter y when prompted to configure your IBM 3494 environment.
6. 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.
7. Enter the appropriate number to select the IBM 3494 Network Library from the list of libraries and press Enter when prompted to continue.
8. Select the library setup method. Enter e to select Express, a to select Automatic, or i to select Interactive.

   For more information on configuration methods, see Library Setup Methods in this chapter.
9. Depending on the setup method you select, enter the appropriate information when prompted.
10. Review the defined library parameters and enter y to confirm the library parameters.

11. Edit the volume configuration file. Entering yes automatically starts the vi editor.

    Note: The name of the volume configuration file is *.libraryname*.cfg (where *libraryname* is the user-defined library).

12. Remove the bar code entries for the tape volumes that you do not want to assign to the BrightStor ARCserve Backup server.

13. Save the file and exit the vi editor.

14. 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.*

15. Enter 0 to exit.

    Enterprise Option for IBM 3494 is configured during the installation.

Configure the Library After Installation

After you install the Enterprise Option for IBM 3494, you can use the cstart, cstop, and cstatus commands to quickly start, stop, and view the status of BrightStor ARCserve Backup. When you configure the library after initial installation, you must make sure that no jobs are running by using the cstop command to stop the BrightStor ARCserve Backup services. For details on using the cstop command, see the *Administrator Guide*.

To configure the Enterprise Option for IBM 3494 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.

   Note: Solaris users will receive an additional prompt. Enter n to skip the converttost module.

   For more information about the converttost script, see the *Tape Library Option Guide*.

6. Enter n if you do not want to enable backing up to disks. If you want to enable backup to disk, see *Getting Started* for complete details.
7. Enter y when prompted to configure your IBM 3494 environment.

8. 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.

9. Enter the appropriate number to select the IBM 3494 Network Library from the list of libraries and 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 on configuration methods, see 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 and enter y to confirm the library parameters.

13. Edit the volume configuration file. Entering yes automatically starts the vi editor.

    Note: The name of the volume configuration file is *.libraryname*.cfg (where *libraryname* is the user-defined library).

14. Remove the bar code entries for the tape volumes that you do not want to assign to the BrightStor ARCserve Backup server.

15. Save the file and exit the vi editor.

16. 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.*

17. Enter 0 to exit.

    On the command line, enter cstart to start the BrightStor ARCserve Backup services.

Post-Installation Procedures

Post-installation tasks consist of verifying the pre-installation tasks you performed before installing the Enterprise Option for IBM 3494 and making changes to the library configuration.

For more information on the pre-installation tasks, see Installation Prerequisites in this chapter.

Library Configuration Updates

If you add or remove tape drives on the Enterprise Tape Library 3494, you must update the library configuration with these changes. You can update the library configuration with device changes by using running one of two 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 Enterprise Tape Library 3494 by importing and exporting tape volumes.

Reconfigure Your Entire Library

The csetup library configuration script is the master configuration script you use during initial configuration and also for changing existing library configurations. For information on 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.

Tape Drive Changes

After installing and configuring the Enterprise Option for IBM 3494, tape drives may be added to or removed from the Enterprise Tape Library 3494. Tape drives on the Enterprise Tape Library 3494 can be physically connected to the computer on which the Enterprise Option for IBM 3494 is installed. To enable BrightStor ARCserve Backup to recognize changes to the tape drive configuration on the Enterprise Tape Library 3494, run the csetup configuration script.

Note: All tape drives in the Enterprise Tape Library 3494 that are directly connected to the computer running BrightStor ARCserve Backup should be empty during device configuration. Removing the tape volumes from the tape drives simplifies the device configuration.

Add or Remove Tape Drives

To recognize devices on the Enterprise Tape Library 3494 to be used by BrightStor ARCserve Backup operations, follow these steps:

1. Log on with root user privileges to BrightStor ARCserve Backup on the computer running the Enterprise Option for IBM 3494.
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 Enterprise Tape Library 3494.
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.
6. On a command line, run the csetup configuration script to update your library configuration.

   For more information on running the csetup configuration script, see the appendix "Frequently Asked Questions".
7. On a command line, enter cstart to start the BrightStor ARCserve Backup services.

Add or Remove Tape Volumes

If the BrightStor ARCserve Backup Enterprise Option for IBM 3494 is installed and the camediad service is running, the best method of adding and removing tape volumes is to import and export the tape volumes. This method eliminates the need to stop the camediad service.

For more information on importing and exporting tape volumes, see How Tape Volume Import and Export Works in the chapter "Using the Option".

If the camediad service is not running, you can also use the csetup or camediad_setup configuration scripts. This may be more time consuming, especially if your library has many tape volumes.

For more information on running the csetup or the camediad_setup configuration scripts to update your library configuration, see the procedures described in Configure Your Library topic in this chapter.

Uninstall the Option

To uninstall the Enterprise Option for IBM 3494 from the BrightStor ARCserve Backup server, you remove the BrightStor ARCserve Backup Enterprise Option for IBM 3494 package.

To uninstall the Enterprise Option for IBM 3494, follow these steps:

1. Use the grep command to search for and display the name of the BrightStor ARCserve Backup Enterprise Option for IBM 3494 package. The grep command syntax for each platform is:

   AIX

   ```
   lslpp –L all | grep BAB
   ```

   HP-UX

   ```
   swlist | grep BAB
   ```

   Solaris

   ```
   pkginfo | grep BAB
   ```

   Note: The name of the BrightStor ARCserve Backup Enterprise Option for IBM 3494 package is usually BABibmlib.

2. Use the remove command to remove the package.

   The remove command syntax for each platform is:

   AIX

   ```
   installp –u “packagename”
   ```

   HP-UX

   ```
   swremove “packagename”
   ```

   Solaris

   ```
   pkgrm “packpagename”
   ```

Note: You do not need to stop the IBM Library Manager control service to uninstall the option.

Chapter 3: Using the Option

This chapter contains information about using the Enterprise Option for IBM 3494. After you install and configure the Enterprise Option for IBM 3494 on the BrightStor ARCserve Backup server, you can use BrightStor ARCserve Backup to:

- Manage backup and restore operations on the Enterprise Tape Library 3494.
- Import and export tape volumes from the Enterprise Tape Library 3494.
- Update the configuration of the virtual library on the BrightStor ARCserve Backup server with device or tape volume changes on the Enterprise Tape Library 3494.

This chapter also contains information about using the Enterprise Tape Library 3494 command line interface.

Backup and Restore Operations

Each BrightStor ARCserve Backup server is configured with its own independent set of assigned tape volumes and operates independently from other backup servers on the network. Therefore, you manage backup and restore operations with the Enterprise Option for IBM 3494 as if you have exclusive control of a local library.

Backup and restore operations on the BrightStor ARCserve Backup server are performed with the Backup Manager and the Restore Manager. 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 Enterprise Tape Library 3494 appear as local tape volumes during backup and restore operations.

How Tape Volume Import and Export Works

Before you can use tape volumes on the BrightStor ARCserve Backup server, the tape volumes on the Enterprise Tape Library 3494 must appear in the volume configuration file and must be in the BrightStor ARCserve Backup tape category.

- The process of importing tape volumes automatically adds a bar code entry for each tape volume to the volume configuration file.
- Tape volumes imported by the BrightStor ARCserve Backup server are assigned to the BrightStor ARCserve Backup category.
- The process of exporting tape volumes makes those tape volumes unavailable to the BrightStor ARCserve Backup server.
- Tape volumes exported by the BrightStor ARCserve Backup server are moved to the eject category and are removed from the Enterprise Tape Library 3494.

Tape Volume Import Methods

You import tape volumes into the Enterprise Tape Library 3494 using one of the following three methods:

- Using the BrightStor ARCserve Backup Device Manager
- Running the ibm_3494ie script
- Running the ca_devmgr command

When you place tape volumes in the I/O station slots of the Enterprise Tape Library 3494, the tape volumes are moved to the insert category. When you import the tape volumes into the Enterprise Tape Library 3494, the tape volumes are moved from the insert category to the BrightStor ARCserve Backup category.

Important! *Before using the BrightStor ARCserve Backup server to import tape volumes, physically place the tape volumes in the I/O station slots of the Enterprise Tape Library 3494.*

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

Import Tape Volumes using Device Manager

To use the BrightStor ARCserve Backup Device Manager to import tape volumes into the Enterprise Tape Library 3494, follow these steps:

1. Physically insert the tapes into the Enterprise Tape Library 3494 library by placing the tapes in the I/O station slots.

   The IBM Library Manager control service on the Enterprise Tape Library 3494 moves the tapes to the slots in the library and places them in the insert category.

   Important! *Always wait for the library to finish physically moving the new tapes from the I/O station to their internal slots before proceeding.*

2. Log on with root user privileges to the BrightStor ARCserve Backup server.
3. Use the BrightStor ARCserve Backup Device Manager to import the tape volumes.

   The tapes are moved to the BrightStor ARCserve Backup category.

Import Tape Volumes using ibm_3494ie Script

To use the ibm_3494ie script to import tape volumes to the Enterprise Tape Library 3494, follow these steps:

1. Physically insert the tapes into the Enterprise Tape Library 3494 library by placing the tapes in the I/O station slots.

   The IBM Library Manager control service on the Enterprise Tape Library 3494 moves the tapes to the slots in the library and places them in the insert category.

   Important! *Always wait for the library to finish physically moving the new tapes from the I/O station to their internal slots before proceeding.*
2. Log on with root user privileges to the BrightStor ARCserve Backup server.
3. From the command line, run the ibm_3494ie script.
4. Respond to the prompts as appropriate for the import option you select.

   After you finish responding to the prompts, the tape volumes are moved from the insert category to the BrightStor ARCserve Backup category.

   Note: For more information on import options, see Import Options in this chapter.

Import Options

Specify one of the following methods of importing tape volumes when importing tape volumes using the ibm_3494ie script:

- Import one tape volume at a time. Identify each tape volume by its bar code identifier (ID).
- Import a range of tape volumes. Enter the first bar code of the range and the last bar code of the range. For example, you can import all bar code IDs that are in the insert category from bar code ABC123 to bar code ABC200. In a range of tapes, the tape volumes are listed in ascending alphabetical and numerical order.

  Note: Importing a range of bar codes is not recommended if the range contains nonconsecutive bar codes. All tapes in the insert category that are included in the specified range are imported.

- Import a specified number of tape volumes, regardless of their bar code IDs. You can import the first *x* number of tape volumes in the insert category. For example, you can import the first 10 tapes in the insert category.
- All the tape volumes in the insert category. Tape volumes in other categories are not imported.
- Any number of tape volumes into the specified slots.

Import Syntax

When you use the ibm_3494ie script to import tape volumes, the format of the command is:

```
ibm3494_ie -l 3494a -i -g CH_GRP0 -s 2
```

The import syntax of the ibm_3494ie script is defined in the following table:

Parameter	Description	Required
-l 3494a	Specifies the library name (3494a)	Yes
-i	Specifies import	Yes
-g CH_GRP0	Specifies the group name (CH_GRP0)	Yes
-s 2 4	Specifies slots (2 and 4)	No

You must specify the name of the library and the name of the group that will receive the imported tape volumes. Optionally, you can specify the slot numbers to receive the imported tape volumes. If you do not specify the slot numbers, you can specify the import method and any other additional information as required.

Note: You can use the BrightStor ARCserve Backup Device Manager to determine available slot numbers.

Imported tape volumes appear in the first empty slots of the specified group. If the number of tape volumes to be imported exceeds the number of empty slots in the group, the remaining tape volumes are added to the next group or to the slots that do not belong to any group.

Sample Import Tape Commands

You can use the ibm3494_ie command as shown in the following examples to import tape volumes to the Enterprise Tape Library 3494:

```
ibm3494_ie -l 3494a -i -g CH_GRP1 -s 4 12
```

Imports the first two tape volumes in the insert category into:

- The library named 3494a
- The group named CH_GRP1
- Slots 4 and 12

```
ibm3494_ie -l 3494a -i -g CH_GRP3
```

Imports tape volumes in the insert category into:

- The library named 3494a
- The group named CH_GRP3

During the script, you must specify which tape volumes to import by bar code, range, quantity, or category. Respond to all prompts as appropriate.

Sample Import Script

The following example of the ibm_3494ie import utility is a response to running ibm_3494ie script with the following options:

```
ibm_3494ie -l 3494a -i -g CH_GRP0
```

Resulting Script

```
IBM 3494 Import Utility
Welcome to the IBM 3494 Import Utility.
Please choose the method of importing your tapes.
o - One tape at a time
r - Range of tapes
f - First number of tapes from the insert category
a - All tapes in the insert category
q - Quit
Please enter your choice: (o|r|f|a|q) o
Do you wish to continue? (y|n|q) y
Please enter the number of tapes you wish to import: 1
Please enter the barcode of tape : J11821
Adding J11821 to list of tapes to import.
Importing media. This may take a while...
Import successful.
```

Import Tape Volumes using ca_devmgr Command

The ca_devmgr command, the command line device management program, lets you import tape volumes by running this command from a local or remote BrightStor ARCserve Backup server console window.

For information on using the ca_devmgr command to import tape volumes, see the *Administrator Guide*.

Tape Volume Export Methods

You can choose one of the following three methods to export tape volumes from the Enterprise Tape Library 3494:

- Using the BrightStor ARCserve Backup Device Manager
- Running the ibm_3494ie script
- Running the ca_devmgr command

When you use the BrightStor ARCserve Backup server to export tape volumes from the Enterprise Tape Library 3494, the exported tape volumes are moved to the eject category and are removed from the Enterprise Tape Library 3494. Exported tape volumes are not available to the BrightStor ARCserve Backup server.

For general information about using the BrightStor ARCserve Backup Device Manager, see the *Administrator Guide*.

Export Tape Volumes with the Device Manager

To use the BrightStor ARCserve Backup Device Manager to export tape volumes from the Enterprise Tape Library 3494, follow these steps:

1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. Use the Device Manager to select the slots containing the tape volumes that you want to export.

   The tapes are automatically moved to the I/O station and are moved to the export category.
3. Physically remove the tape volumes from the Enterprise Tape Library 3494.

Export Tape Volumes with the Script

To use the ibm_3494ie script to export tape volumes, follow these steps:

1. Log on with root user privileges to the BrightStor ARCserve Backup server.
2. On a command line, run the ibm_3494ie script to specify the slot numbers of the tape volumes to export.

   The tape volumes are moved to the export category and are not available to the BrightStor ARCserve Backup server.

Export Option

Slot numbers determine which tape volumes are exported. Slot numbers are the only option for exporting tape volumes on the Enterprise Tape Library 3494.

Export Syntax

When you use the ibm3494_ie script to export tape volumes, the format of the ibm3494_ie command is:

```
ibm3494_ie -l 3494a -e -g CH_GRP0 -s 2 5
```

You must specify the library name, the group name, and the slot numbers. The export syntax of the ibm3494_ie script is defined in the following table:

Syntax	Description	Required
-l 3494a	Specifies the library name (3494a)	Yes
-e	Specifies export	Yes
-g CH_GRP0	Specifies the group name (CH_GRP0)	Yes
-s 2 5	Specifies slots (2 and 5)	Yes

Sample Export Tape Commands

You can use the ibm3494_ie command as shown in the following examples to export tape volumes from the Enterprise Tape Library 3494.

```
ibm3494_ie -l 3494a -e -g CH_GRP0 -s 2 5 6 7
```

Exports tape volumes from:

- The library named 3494a
- The group named CH_GRP0
- Slots 2, 5, 6, and 7

```
ibm3494_ie -l 3494a -e -g CH_GRP2 -s 9
```

Exports tape volumes from:

- The library named 3494a
- The group named CH_GRP2
- Slot 9

Export Tape Volumes using ca_devmgr Command

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*.

How the Enterprise Tape Library 3494 Command Line Interface Works

You can use the Enterprise Tape Library 3494 command line interface to manage the Enterprise Tape Library 3494. Use the mtlib program to query device and operational status, inventory tape volumes, eject tape media, and verify connectivity between the Enterprise Tape Library 3494 and the IBM Library Manager control service on the BrightStor ARCserve Backup server.

Query the Enterprise Tape Library 3494 Using the mtlib Command

To use the mtlib command, follow these steps:

1. On the BrightStor ARCserve Backup host computer, open a console window.
2. Execute the mtlib command using the logical name of the Enterprise Tape Library 3494.

Note: The -l argument is required for each mtlib command.

Sample mtlib Commands

You can use the mtlib command as shown below to verify the status of the Enterprise Tape Library 3494. For the purpose of these sample commands, the logical name of the Enterprise Tape Library 3494 is 3494a.

```
mtlib -l 3494a -qL
```

Queries the Enterprise Tape Library 3494 and provides information on the library.

```
mtlib -l 3494a -qI
```

Queries the Enterprise Tape Library 3494 and provides information on the tape volumes in the Enterprise Tape Library 3494.

```
mtlib -l 3494a -qI -v
```

Queries the Enterprise Tape Library 3494 and provides verbose information on the tape volumes in the Enterprise Tape Library 3494. The verbose information includes the state of the tape volumes, whether a volume is logical, volume class, and volume type. This command is useful to determine if a tape is mounted.

```
mtlib -l 3494a -DE
```

Queries the Enterprise Tape Library 3494 and returns device information.

For complete information on using the mtlib command, see the Enterprise Tape Library 3494 documentation.

Appendix A: Frequently Asked Questions

This appendix includes frequently asked questions to help you resolve issues that may arise when using the Enterprise Option for IBM 3494.

How do I verify network connectivity to the Enterprise Tape Library 3494?

Verify network connectivity by doing a network ping from the BrightStor ARCserve Backup server to Enterprise Tape Library 3494.

How do I determine the IP address of the Enterprise Tape Library 3494?

You can determine the IP address of the Enterprise Tape Library 3494 by using the IBM Library Manager operator console. Choose Commands, LAN Options, and then LM LAN Information to determine the IP address of the Enterprise Tape Library 3494.

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. Your port suffix may vary. 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. Select 4 to configure the media server.

How do I define the name of the user-defined library on the BrightStor ARCserve Backup server?

Use vi, or another text editor, to edit the /etc/ibmatl.conf library configuration file. You must define the library parameters before you install and configure the Enterprise Option for IBM 3494.

How do I determine the name of the user-defined library on the BrightStor ARCserve Backup server?

Use vi, or another text editor, to view the /etc/ibmatl.conf library configuration file.

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 in the volume configuration file in the $BAB_HOME/data directory. The name of the file is *.libraryname*.cfg, where *libraryname* is the name of the logical user-defined library. The volume configuration file contains a list of tape volumes; each tape volume is distinguished by its bar code.

How can I verify the Ethernet LAN control path between the IBM Library Manager Client and the IBM Library Manager Server is working?

Use the mtlib command to verify status and connectivity.

How can I verify the connectivity to the Enterprise Tape Library 3494 tape drives?

Device connections are managed by the Enterprise Tape Library 3494 operating system. Follow the standard operating system instructions for connecting and verifying SCSI or fibre channel devices to the Enterprise Tape Library 3494.

Why do the tape drives have to be empty for the BrightStor ARCserve Backup device configuration?

Removing the tape volumes from the tape drives simplifies the device configuration. Since the Enterprise Tape Library 3494 can be shared among multiple backup servers on the network, tape volumes may be assigned to other backup servers. Not all tape volumes are assigned to the BrightStor ARCserve Backup server.

How do I remove a tape volume from the Enterprise Tape Library 3494?

You can choose one of three methods to export tape volumes from the Enterprise Tape Library 3494. You can use the BrightStor ARCserve Backup Device Manager, you can run the ibm3494_ie script, or you can run the ca_devmgr script.

Why is the cleaning slot disabled?

The cleaning slot is disabled because the cleaning slot designation is not applicable for the Enterprise Option for IBM 3494. The Enterprise Tape Library 3494 completely controls the cleaning through the operator-specified schedule.

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

The BrightStor ARCserve Backup base product installs the BABmgr and BABsvr packages.

What UNIX packages are installed with the BrightStor ARCserve Backup Enterprise Option for IBM 3494?

The name of the Enterprise Option for IBM 3494 package is usually BABibmlib.

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