

Arcserve® Backup for Windows

Enterprise Module Guide

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arcserve®

Pre-release Document, only for reference

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Arcserve Product References

This document references the following Arcserve products:

- Arcserve® Backup
- Arcserve® Unified Data Protection
- Arcserve® Unified Data Protection Agent for Windows
- Arcserve® Unified Data Protection Agent for Linux
- Arcserve® Replication and High Availability

Contact Arcserve

The Arcserve Support team offers a rich set of resources for resolving your technical issues and provides easy access to important product information.

<https://www.arcserve.com/support>

With Arcserve Support:

- You can get in direct touch with the same library of information that is shared internally by our Arcserve Support experts. This site provides you with access to our knowledge-base (KB) documents. From here you easily search for and find the product-related KB articles which contain field-tested solutions for many top issues and common problems.
- You can use our Live Chat link to instantly launch a real-time conversation between you and the Arcserve Support team. With Live Chat, you can get immediate answers to your concerns and questions, while still maintaining access to the product.
- You can participate in the Arcserve Global User Community to ask and answer questions, share tips and tricks, discuss best practices and participate in conversations with your peers.
- You can open a support ticket. By opening a support ticket online, you can expect a callback from one of our experts in the product area you are inquiring about.

You can access other helpful resources appropriate for your Arcserve product.

Documentation Changes

The following documentation updates have been made since the last release of this documentation:

- Updated to include user feedback, enhancements, corrections, and other minor changes to help improve the usability and understanding of the product or the documentation itself.
- Updated [General Considerations](#) (see page 13). This topic now includes information about increasing the amount of virtual address space for a 32-bit program when restoring multiple NTFS deduplication optimized files.
- Updated [Limitations of Backing up and Recovering Data Using the Image Option](#) (see page 13). This topic now includes file level restore limitations.
- Updated [Backup Job Definition](#) (see page 14). This topic now includes that Arcserve Backup does not use the Windows Server 2012 driver for Image Option.

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Chapter 1: Introducing the Arcserve Backup Enterprise Module

This section contains the following topics:

[Introduction to the Enterprise Module](#) (see page 7)

[Purpose of the Guide](#) (see page 8)

Introduction to the Enterprise Module

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

The Arcserve Backup Enterprise Module (Enterprise Module) is a separately-installed component that includes the following options and features:

- Multistreaming: two or more streams of backup data.
- Disk staging backups and tape staging backups with multistreaming and transmit three to 32 streams of backup data.

Note: If you do not license the Enterprise Module, Arcserve Backup lets you transmit two streams of backup data for disk staging and tape staging backup jobs, and one stream for custom backup jobs. A "custom" job is a job that does not utilize a rotation schedule, a grandfather-father-son (GFS) rotation, or media pools. For more information, see the *Administration Guide*.

- Media Management Option.
- Raw backup and restore of physical disks and volumes.
- Enterprise Option for VSS Hardware Snap-Shot.
- Enterprise Option for IBM 3494.
- Enterprise Option for StorageTek ACSLS.
- Image Option.

Note: The license for the Enterprise Module is registered on the primary or the stand-alone Arcserve Backup server.

Purpose of the Guide

The Enterprise Module Guide describes the following tasks:

- Executing backup and restore jobs using the Arcserve Backup Image Option.
- Executing backup and restore jobs using IBM® TotalStorage® Enterprise Automated Tape Library 3494 and StorageTek Automated Cartridge System Library Software.

Note: For more information about using the Enterprise Option for VSS Hardware Snap-Shot, see the Agent for Microsoft Volume Shadow Copy Service Guide. For more information about using multistreaming, multiplexing, disk staging backups, the MM Admin, and Raw Backup and Restore, see the Administration Guide or the online help.

Chapter 2: Image Option

This section contains the following topics:

[Introducing the Image Option](#) (see page 9)

[Installing the Image Option](#) (see page 11)

[Using the Image Option](#) (see page 12)

Introducing the Image Option

Arcserve Backup offers the Image option, which backs up data at a high speed. The option bypasses the file system, creates a snapshot image of the drive, and reads data blocks from the disk. The option treats the entire drive like a single file, and replaces the traditional method of traversing the file system file-by-file.

The option provides device independence. It writes to any device supported by Arcserve Backup, including media devices, media libraries, and media RAID devices.

Using the Arcserve Backup Image Option, you can do the following:

- Scan files to optimize performance. During this process the drives are scanned, and the information about the files present on the drive is used to optimize backup and restore performance.
- Perform optimized image drive level backup and restore operations. When backing up and restoring at the drive level, the option bypasses the file system to optimize the process.
- Restore individual files as well as full drives. The option can restore data at the file level and at the drive level.
- Back up Windows NT File System (NTFS) file systems, Windows NT File System (NTFS) Deduplication file systems, Resilient File System (ReFS) file systems, and File Allocation Table (FAT) file systems. In addition, the option lets you back up NTFS file systems with compressed and encrypted files, directories, and drives.
- Maintain all of the file information, such as file name, file size, date, and security.

How the Option Works

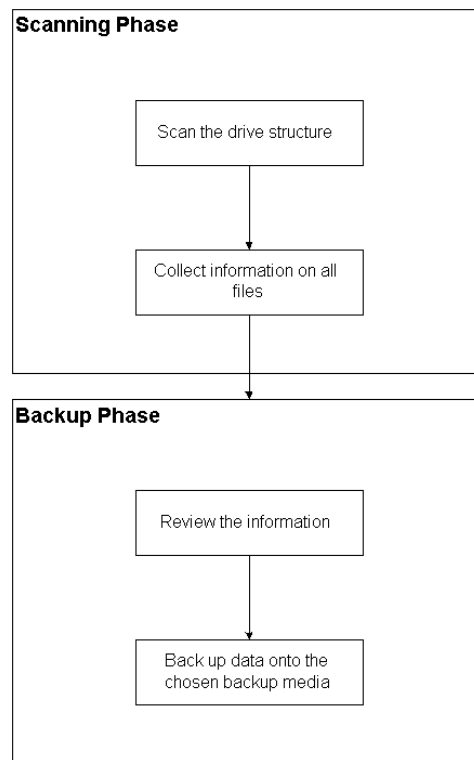
The Arcserve Backup Image Option performs a backup job in two phases.

Scanning Phase

The option collects information about all of the files on a drive including file name, file size, date, time, attributes, clusters used by the file, file security attributes, and any other information required to back up the file during the backup phase.

File Scanning is always enabled for FAT/FAT32. File scanning for NTFS, NTFS Deduplication is performed only when the Enable File Level Restore options is specified elected from the Image Backup Options dialog.

Note: File scanning is not supported on ReFS volumes.



Backup Phase

The Arcserve Backup Image Option backs up data in this phase. The backup engine reviews the information from the scanning phase, and then streams the data as fast as possible on to the backup media.

Backup Method

The Arcserve Backup Image Option backs up data by taking a snapshot of the drive at a specific point in time. Although the drive appears to be frozen at a particular time, it functions normally and lets other applications send read and write requests. This feature is known as the Snapshot feature, and it is automatically installed when you install the option.

This method has the following advantages:

- At the start of the backup process, the option does not attempt to lock the drive about to be backed up.
- If applications write to the drive while a backup operation is in progress, the integrity of the backup data is maintained at all times. The backup operation continues and is successful even when files are being written to during the backup process.

Installing the Image Option

To install the Image option, you should be familiar with the characteristics and requirements of the specified Windows operating systems, and with administrator responsibilities on those operating systems.

Installation Prerequisites

Before installing the option, verify the following:

- Your system configuration meets the minimum requirements needed to install the option.
For a list of requirements, see the readme file.
- You have administrator privileges on the computers on which you want to install the option.
- You have the following applications installed and working properly:
 - Arcserve Backup
 - Arcserve Backup Enterprise Module

Important! You must install the Enterprise Module (which automatically includes this option) and Arcserve Backup on the same computer. This computer can be located either locally or remotely.

Install the Image Option

The Image Option is installed locally when you install the Enterprise Module.

To install and configure the option

1. Install and configure the option using the Enterprise Module Configuration utility (EMConfig.exe) during the post-installation process.

Note: You can also access the EMConfig.exe utility from the Windows Start menu (click Start, All Programs, CA, ARCserve Backup, Enterprise Module Configuration).

2. Complete the installation and configuration procedure, and restart your computer when prompted.

Post-Installation Tasks

Complete the following tasks before you start using the Arcserve Backup Image Option:

Note: These tasks do not apply to Windows Server 2012 systems.

- Verify that the driver for the Arcserve Backup Image Option is loaded successfully by checking the registry key for the presence of the driver. An example of a registry key location is:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hbmnt

- After rebooting, check the Windows Event Viewer to ensure that the driver HBMNT5.SYS loaded successfully. The driver is installed in the following location:

[System Root]\System32\drivers\hbmnt5.sys

Using the Image Option

This section explains how you can use the Arcserve Backup Image Option Backup Manager to configure your backup jobs and restore data.

General Considerations

To run successful backup and restore jobs, consider the following:

- Keep some empty space on the drive where the option is installed. Because the option creates logs and temporary files to enhance performance, it needs space on this drive. Ideally, 15-20 MB free space should be sufficient.
- To accommodate the Snapshot feature, the option creates a temporary storage file on a local drive that has the greatest amount of free space available. In addition to the 15-20 MB free space suggested in the previous point, you must have at least 20 MB free for the Snapshot feature.
- While restoring an active system drive, you must have at least 50 MB available on the drive. This amount of space is needed to store additional temporary files and registry files when you back up and restore data.
- When restoring millions of NTFS deduplication optimized files, Microsoft Windows limits the amount of virtual address space of the image module. You can increase the amount of virtual address space for a 32-bit program by using a 4-GB Tuning (Windows) feature. After you enable the feature, the 32-bit image module can then access more than 2 GB of virtual memory and has more chances of completing the restore job. Alternatively, you can reduce the number of files to restore by dividing separate sets and submit separate jobs for each of the set.

Note: This only applies to the Image Option module when restoring millions of NTFS deduplication optimized files. For more information about how to increase the virtual address space limit, click the following link:

<http://msdn.microsoft.com/en-us/library/windows/desktop/bb613473%28v=vs.85%29.aspx>

Limitations of Backing up and Recovering Data Using the Image Option

When backing up and recovering data using the Image Option, consider the following limitations.

- The option does not support backing up and recovering data at application level granularity.
- The option does not support backing up and recovering the computer's system volume. For example, drive C:\.
- File level restore is not supported for ReFS Volumes.
- File level restore is not supported for NTFS Deduplication volumes when the "system volume information" folder is compressed or encrypted.

Backup Job Definition

You can use the Backup Manager to configure and set up your backup jobs. You can back up an image only on a computer where Arcserve Backup and the option are both installed.

You can back up a partition to a File System Device. The File System Device can be on the same partition, but the backup job may fail if the other drives do not have sufficient disk space. We recommend that you have the File System Device on a different drive.

During backup, the Snapshot feature is required to freeze the drive. The drive is then synchronized, which means that it waits for a period when nothing is being written to the drive. If this write-inactivity period cannot be found, the synchronization times out after a specified time and the freeze request fails. The inactivity period is the number of seconds of inactivity on the drive before the drive is deemed safe to freeze.

To change the default registry value for SyncTimeout, InactivityPeriod, and PreviewFilename, you must create the following key and set the values for these parameters:

```
Software\ComputerAssociates\CA ARCserve Backup\Base\TapeEngine\Image
```

While SyncTimeout is 80 seconds by default, the Inactivity Period is 3 seconds by default.

If the registry contains a value and a key for PreviewFilename, the path name identifies the location of the preview file. If the file name is not specified, the path name identifies the volume that contains the most free space and is on a drive that is not being backed up. (If there is only one drive, the path name identifies the only drive). If the PreviewFilename specifies one or more subdirectories, the subdirectories will automatically be created.

Be aware of the following behaviors:

- There is no attempt to validate the directory. During backup, if the directory cannot be accessed or created (due to an invalid volume), the backup job fails.
- Arcserve Backup does not use the driver on Windows Server 2012. Instead, Arcserve Backup uses VSS to take a snapshot of the device. Therefore, configuration of the registry key described in this topic is not applicable to backing up Windows Server 2012 systems.

Note: Encryption and compression are not supported as a global backup option.

Define Backup Jobs Using the Backup Manager

You can use the Backup Manager to configure and set up your backup jobs.

To configure and set up backup jobs

1. Open the Backup Manager and select the Source tab.

All sources available for backup are listed in the left pane.

Note: To successfully complete a backup job using the Backup Manager, you must select an entire drive on the computer that you are backing up.

2. Right-click on a *computer* node listed in the Source tab of the Backup Manager and select Use Image Option.

The Image Backup Options dialog opens.

3. Complete the fields in the dialog, and then click OK.

4. Right-click a *disk* node listed in the Source tab of the Backup Manager and select Use Image Option.

The Image Backup Options dialog opens.

5. Repeat steps 3 and 4.

You have configured and set up your backup jobs with the help of Backup Manager.

For more information about backing up using the Backup Manager, see the online help.

More information:

[Image Backup Options Dialog](#) (see page 16)

[How the Option Works](#) (see page 10)

Image Backup Options Dialog

The Image Backup Options dialog lets you configure backup jobs.

The Image Backup Options dialog contains the following fields:

These settings take precedence over machine options

Indicates that the settings on this dialog override any options that you may have specified on the node.

The dialog has the following options:

Enable file level restore (Slows down backups for NTFS volumes)

Enables restoring at the file level. However, this slows down the process when you back up NTFS volumes, because the IO has to generate the file/folder information by parsing the file system layout on the disk.

Add file records to database

Adds details of files to the database. This is helpful when you choose to enable restoring at file level, as the backup sessions will have the details of files in the database. If you do not add these details to the database, when you restore at the file level, you will have to merge the backup sessions with the file details before restoring.

The following fields let you specify the action when a volume freeze fails:

Fail backup immediately

Stops the backup process when a volume freeze fails.

Continue with backup

Continues with the backup process although a volume freeze has failed.

Retry specified number of times then fail backup

Attempts to continue the backup process for a preset number of times.

Number of retries

Specifies the number of times that the option attempts to complete the backup process.

Interval between retries (mins)

Specifies the number of minutes that the option waits after a failed backup attempt.

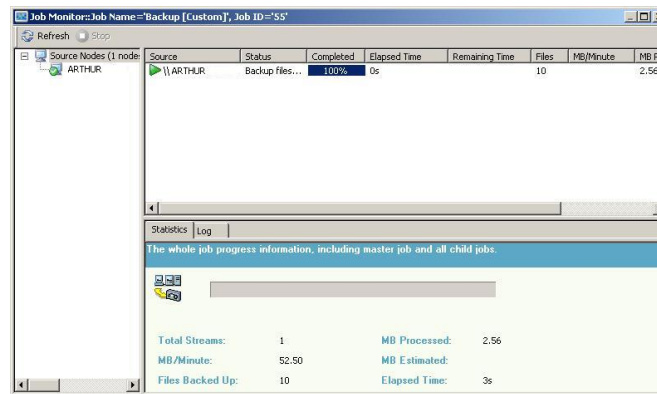
View Job Status

You can check the status of the backup jobs you have submitted, from the Job Status window.

To check the status of the backup job

1. On the Job Queue tab, select the job.
2. Right-click and choose Properties from the pop-up menu.

The Job Monitor dialog opens.



The Job Monitor dialog displays the current job attributes and the job complete percentage.

More Information:

[Job Monitor Dialog](#) (see page 18)

Job Monitor Dialog

The Job Monitor dialog displays the current job's attributes and the percentage of completion.

The dialog displays the following:

Job Name

Displays the type of job that is running, such as backup or restore.

Source

Displays the backup source computer name, the size of the backup and restore file, and the drive that is currently being backed up or restored.

Status

Displays the current job status.

Files

Displays the total number of files in the backup or restore job.

The Statistics pane displays the following:

Total Streams

Displays the total number of streams in the backup or restore job.

MB/Minute

Displays the current transfer rate used to transfer files during a backup or restore job.

Files Backed Up

Displays the total number of files in the backup job.

MB Processed

Displays the number of megabytes processed at this time.

MB Estimated

Displays the estimated number of megabytes in the current backup or restore job.

Elapsed Time

Displays the number of minutes and seconds that have elapsed from the time backup or restore started.

Remaining Time

Displays the number of estimated minutes and seconds remaining to complete the backup or restore job.

The Log tab displays the following:

Error

Displays the errors occurred during the backup or restore process.

Error and Warning

Displays the errors and warnings occurred during the backup or restore process.

All

Displays the backup or restore job information.

Restore Methods

Use one of the following methods to restore data backed up by the Arcserve Backup Image Option:

■ **Restore by Image**

Restores the entire drive in one pass. To be successful, the restore job must be completed from beginning to end. Canceling leaves the drive in an inconsistent stage, and therefore inaccessible. The following are the limitations of this method:

- The Restore by Image method supports only full volume restores. When you use the Restore by Image method, the agent overwrites the target volume, so be sure that the target drive selected is the one that you want to restore.

Important! The Restore by Image option overwrites your drive completely. Be sure this is what you want to do.

- In the Restore by Image method, selecting multiple sources is only permitted when using the Restore to Original Location option.
- The Restore by Image method supports cluster sizes up to 16 KB for NTFS partitions, and requires multiple drives or partitions to function properly. This option does not support single partitions.
- The Restore by Image method always overwrites existing files during restore operations, regardless of the restore options selected.

- The Restore by Image sessions cannot be restored to network drives. They require the same or greater local hard disk drive.
- During a Restore by Image session, the drive cannot have any open files. The option attempts to lock the drive before the restore process begins, and, if any files are open, the drive cannot be locked and the restore job fails.

- **Restore by Session/Restore by Tree**

Restores individual files and directories. Canceling a job that is in progress can leave many incomplete restored files on the drive.

The following global restore options are *not* supported at this time:

- **Destination**

Directory Structure and File Conflict Resolution

- **Operation**

Restore Registry Files and Event Logs

- **Virus**

Enable Virus Scanning, Skip, Rename, and Delete

The Arcserve Backup Image Option does not support the Restore by Backup Media method at this time.

Restore a Drive

Arcserve Backup restores the entire drive backed up by the Arcserve Backup Image Option.

To restore a drive

1. Open the Restore Manager.
2. On the Source tab, select the Restore by Image option in the drop-down list.
3. Select the drives containing the backup taken using the option.
4. (Optional) On the Destination tab, select the destination where you want to restore.
5. Click Submit on the toolbar.

The restore process starts or is scheduled to be executed.

Restore Individual Files

Arcserve Backup restores individual files backed up by the Arcserve Backup Image Option.

To restore individual files

1. Open the Restore Manager.
2. On the Source tab, select Restore by Session or Restore by Tree from the drop-down list.

The sessions appear in the session directory tree.

3. Select the files, folders, or both that you want to restore.

(Optional) On the Destination tab, clear the check mark next to Restore files to their original location(s) and then specify the location where you want to restore the data.

Click Submit on the toolbar.

The restore process starts or is scheduled to be executed.

Chapter 3: Enterprise Tape Library 3494 and StorageTek Options

This section contains the following topics:

[Introducing Enterprise Tape Library 3494 and StorageTek ACSLS](#) (see page 24)

[Option Architecture](#) (see page 26)

[Installing and Configuring](#) (see page 41)

[Using Enterprise Tape Library 3494 and StorageTek ACSLS](#) (see page 60)

Introducing Enterprise Tape Library 3494 and StorageTek ACSLS

Arcserve Backup offers two solutions for tape libraries, namely the Arcserve Backup Enterprise Option for IBM 3494 and the Arcserve Backup Enterprise Option for StorageTek ACSLS. These options let you use the large tape volume capacities of the IBM® TotalStorage® Enterprise Automated Tape Library 3494, and the tape libraries controlled by StorageTek Automated Cartridge System Library Software (ACSL) Manager software. Arcserve Backup server interfaces with the IBM TotalStorage Enterprise Automated Tape Library 3494 and StorageTek Automated Cartridge System Library Software to manage backup and restore operations, tape volume movement, and tape volume organization.

This section uses the following conventions:

Enterprise Tape Library 3494

Identifies IBM TotalStorage Enterprise Automated Tape Library 3494.

StorageTek ACSLS

Identifies StorageTek Automated Cartridge System Library Software.

the option

Identifies Enterprise Option for IBM 3494 or Enterprise Option for StorageTek ACSLS in general.

tape library

Identifies Enterprise Tape Library for 3494 or StorageTek ACSLS in general.

The options let several Arcserve Backup servers share a network-connected tape library. By using several 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 Arcserve Backup servers with complete storage data integrity.

These options also provide services that let Arcserve Backup perform backup, restore, and device management operations on the tape volumes. Each Arcserve Backup server performs these operations as if it is controlling its own separate library. Arcserve Backup server interprets the assigned tape volumes on the tape library as local tape volumes; however, the physical movement of tape volumes is managed exclusively by the tape library.

Important! The tape volumes in the tape library must have bar codes to use the option.

Enterprise Tape Library IBM 3494

After you install and configure the Enterprise Option for IBM 3494 on the Arcserve Backup server, you can use Arcserve Backup to manage backup and restore operations on the Enterprise Tape Library 3494.

Using the Enterprise Option for IBM 3494, the 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 Arcserve Backup server. The option lets you assign tape volumes in the Enterprise Tape Library 3494 to the logical library on the Arcserve Backup server. This configuration lets you use the features of Arcserve Backup to control the Enterprise Tape Library 3494.

Note: Each 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.

StorageTek ACSLS

After you install and configure the Enterprise Option for StorageTek ACSLS on the Arcserve Backup server, you can use Arcserve Backup to perform the following functions:

- Manage backup and restore operations
- Update the configuration of the virtual library on the Arcserve Backup server with device or tape volume changes on the StorageTek ACSLS tape library

The Enterprise Option for StorageTek ACSLS lets several 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.

Note: The term *mixed media* (or heterogeneous environment) refers to a mixture of tape drives and tape volumes in the StorageTek ACSLS tape library. In configurations where more than one tape drive is connected to an Arcserve Backup server, both tape drives must use media of the same type.

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

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

Option Architecture

This section describes the architecture of each tape library.

The options are separate software components installed on servers running Arcserve Backup. Several Arcserve Backup servers can share one tape library.

While the Arcserve Backup server logical library essentially partitions a large Enterprise Tape Library 3494 into independent, user-defined logical libraries, the Arcserve Backup server virtual library essentially partitions a large StorageTek ACSLS tape library into independent user-defined logical libraries.

Enterprise Tape Library 3494

The tape volume assignments on the Arcserve Backup server define the logical library. The tape volumes configured for the Enterprise Option for IBM 3494 are not part of a physical library connected to the Arcserve Backup server, but are interpreted by Arcserve Backup as a local library. The logical library configurations have a mutually exclusive set of tape volumes or a shared set of tape volumes, depending on whether the Arcserve Backup server is in a SAN.

Note: In configurations where multiple backup servers share the Enterprise Tape Library 3494, ensure that tape drives assigned to Arcserve Backup server are not assigned to any other backup servers.

Communication Interface

Each backup server communicates directly and independently with the Enterprise Option for IBM 3494. Although multiple backup servers may exist on the same network, Arcserve Backup servers do not communicate with other backup servers.

Note: For more information about using Arcserve Backup in a SAN, see the *Administration Guide*.

Communication between the Enterprise Tape Library 3494 and the Arcserve Backup server occurs through the following communication interfaces:

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

Library Request Flow for Enterprise Tape Library 3494

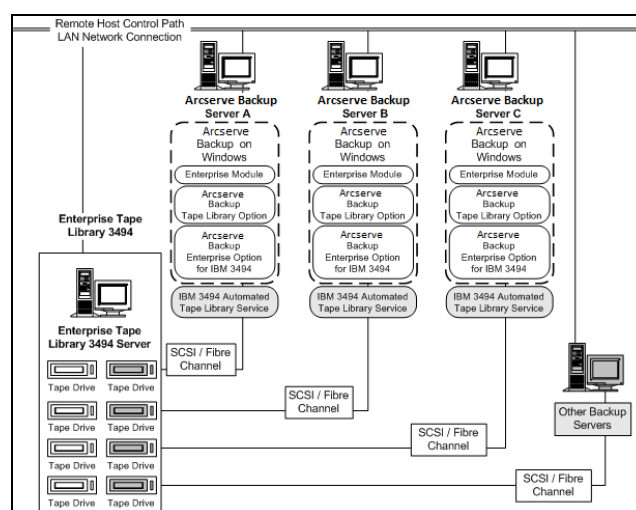
The IBM Automated Tape Library service sends library requests over the control path to the IBM Library Manager. The Library Manager queues and handles library requests from multiple backup servers in the order it receives the requests.

Mutually Exclusive Tape Volumes

In configurations where the Arcserve Backup server is not in a SAN, each Arcserve Backup server is configured to control a mutually exclusive set of tape volumes in the Enterprise Tape Library 3494. As a result, each Arcserve Backup server manages a user-defined subset of tape volumes on the Enterprise Tape Library 3494 that are unique to that Arcserve Backup server.

Mutually Exclusive Tape Volume Architecture

Each Arcserve Backup server has an autonomous view of the Enterprise Tape Library 3494 that shows only the locally assigned volumes. The following illustration shows the architecture of the Arcserve Backup Enterprise Option for IBM 3494 and the communication interfaces to the Enterprise Tape Library 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.

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.

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

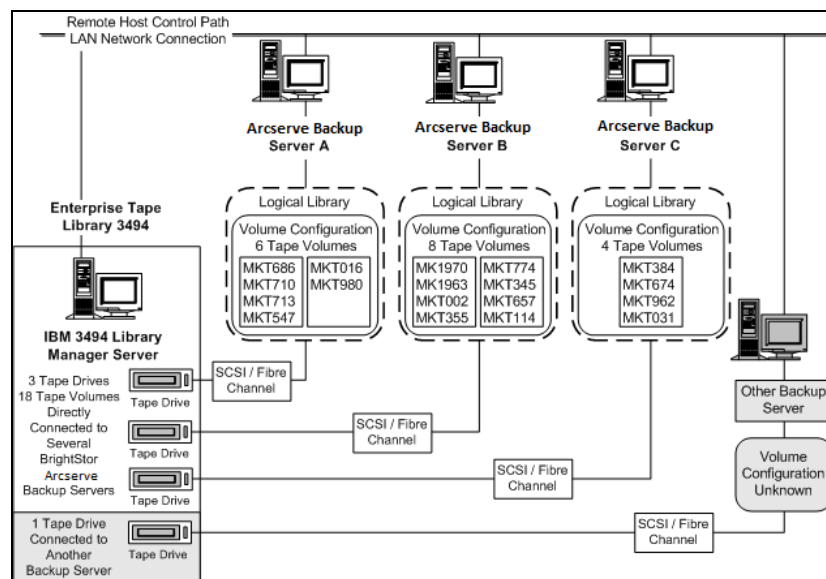
Note: If you are adding backup servers to an established configuration, avoid duplication by checking the current tape volume assignments before adding the new backup servers.

More Information:

[Library Configuration Tasks](#) (see page 48)

Volume Configuration Example

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

- Server A has six assigned tape volumes: MKT686, MKT710, MKT713, MKT547, MKT016, and MKT980
- 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 Arcserve Backup may have a different configuration. Other backup servers on the network can also share the Enterprise Tape Library 3494.

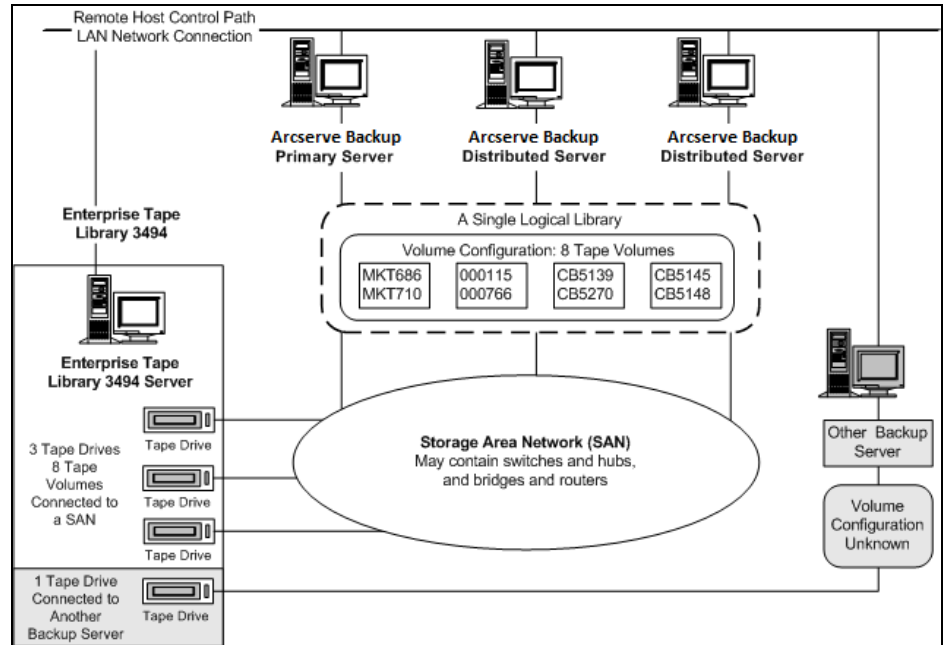
Shared Tape Volumes in a SAN

In a SAN, each Arcserve Backup server connects directly to a SAN, which, in turn connects to at least one tape drive in the Enterprise Tape Library 3494. In configurations with multiple 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 Enterprise Tape Library 3494. As a result, each Arcserve Backup server in the SAN shares the same user-defined subset of tape volumes on the Enterprise Tape Library 3494.

In a SAN, the Arcserve Backup servers share the same logical library configuration, the same tape volume configuration, and the same tape drive configuration.

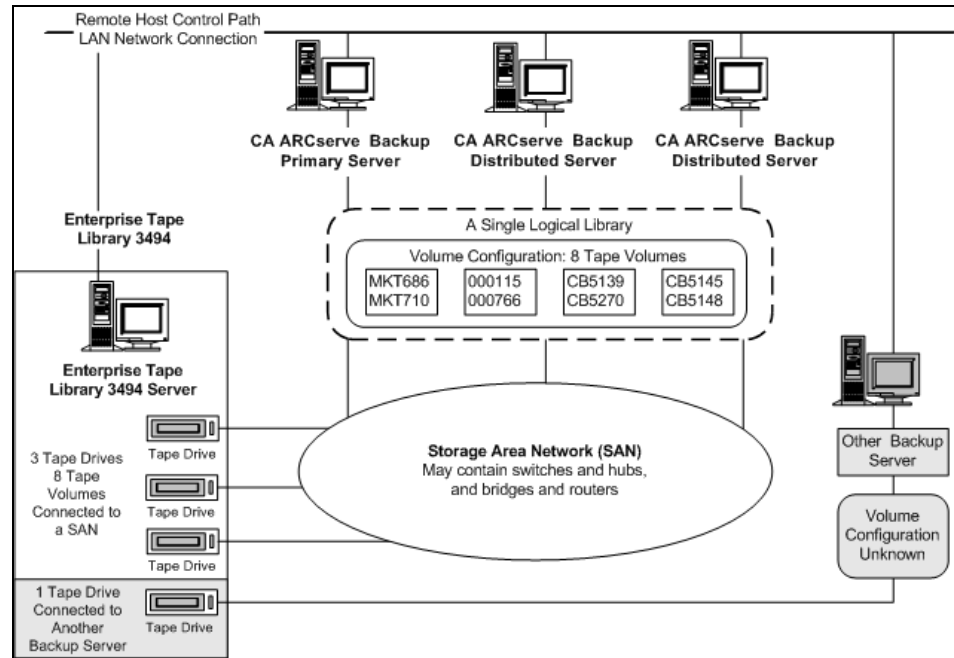
Note: For more information about using Arcserve Backup in a SAN, see *Appendix A: Storage Area Network Support* in the *Administration Guide*.

The Enterprise Option for IBM 3494 must reside on the Primary Server in the SAN. The following illustration shows the option architecture in a SAN and the SAN communication interface to the Enterprise Tape Library 3494:



SAN Shared Volume Configuration Example

The tape volume assignments determine the logical user-defined library shared by all 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 Enterprise Tape Library 3494 has three tape drives directly attached to a SAN. The tape volume assignments are the same for each Arcserve Backup server in the SAN. Another backup server on the network that is not running Arcserve Backup may have a different configuration.

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 Arcserve Backup server are assigned to the 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 Arcserve Backup server, the tape volumes move from the insert category FF00 to the 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 Arcserve Backup server is F00F.

Eject Category

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

StorageTek ACSLS

The virtual library is defined and configured by tape volume assignments for the Arcserve Backup server. The virtual library configuration is defined with mutually exclusive sets of tape volumes or with a shared set of tape volumes, depending on whether the Arcserve Backup server is in a SAN.

Communication Interface

Each backup server communicates directly and independently with the Enterprise Option for StorageTek ACSLS. Although multiple backup servers may exist on the same network, Arcserve Backup servers do not communicate with other backup servers unless they are in a SAN.

Note: For more information about using Arcserve Backup in a SAN, see the *Administration Guide*.

The communication interfaces between the StorageTek ACSLS tape library and the Arcserve Backup server consist of an Ethernet LAN control path and a (SCSI) Small Computer System Interface or fibre channel data path. The control path and the data path are two different paths.

Control Path

The StorageTek ACSLS Library Attach software on the Arcserve Backup server is connected to the StorageTek ACSLS library through an Ethernet LAN control path. The StorageTek Library Attach software sends library requests over the Ethernet LAN control path directly to the ACSLS Manager software on the StorageTek ACSLS server.

Note: You can verify the network connectivity between the Arcserve Backup server and the StorageTek ACSLS tape library by using the StorageTek Library Attach software.

Data Path

Each Arcserve Backup server is independently connected to one or more tape drives in the StorageTek ACSLS tape library through SCSI or fiber channel data paths. The Arcserve Backup server reads and writes data on tape volumes in the tape library managed by StorageTek ACSLS by interacting directly with tape drives through the SCSI or fibre channel data path. In SAN configurations, the Arcserve Backup servers are connected to the SAN that is connected to the StorageTek ACSLS tape drives.

The following configurations support fibre attached tape drives:

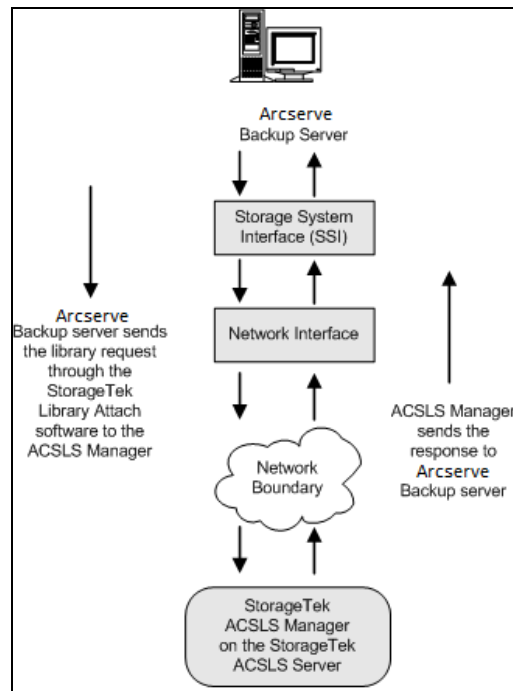
- The fibre attached tape drive is directly connected to the Arcserve Backup server
- The StorageTek ACSLS tape library is not shared by other Arcserve Backup servers
- In a SAN, where the Arcserve Backup SAN Option is installed on the primary SAN server

Library Request Flow for StorageTek ACSLS

StorageTek ACSLS processes the requests for library operations as follows:

- The Arcserve Backup server initiates requests for library operations.
- The StorageTek Library Attached software on the Arcserve Backup server transmits these requests to the ACSLS Manager on the StorageTek ACSLS server.
- The ACSLS Manager receives and interprets a library request, and performs the requested operation on the StorageTek ACSLS library.
- The ACSLS Manager also forms and returns a response to the Arcserve Backup server.

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



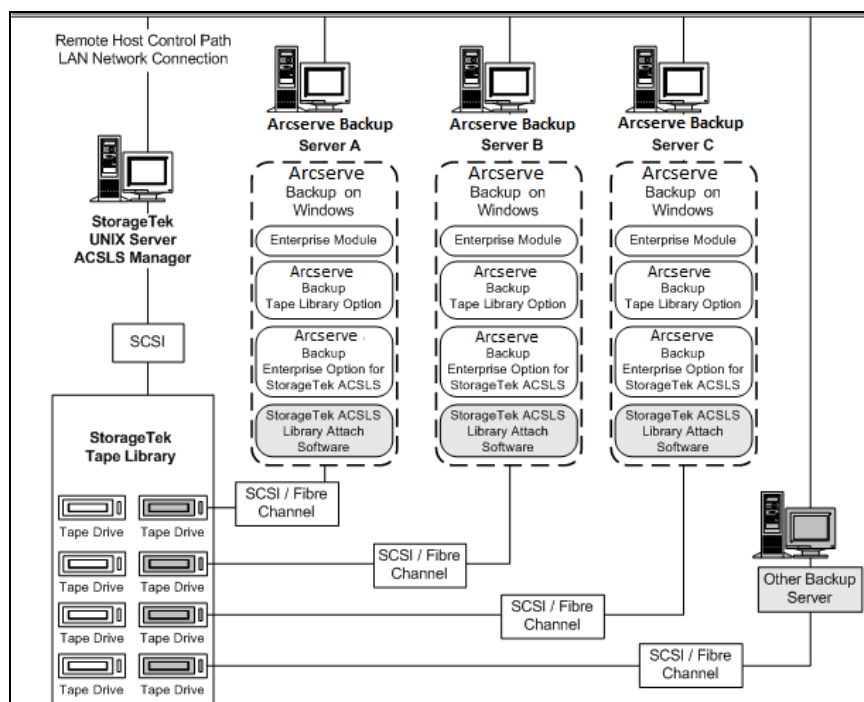
Mutually Exclusive Tape Volumes

In configurations where the Arcserve Backup server is not in a SAN, each Arcserve Backup server is directly connected to at least one tape drive in the StorageTek ACSLS tape library using independent SCSI data paths.

In configurations with multiple Arcserve Backup servers, each backup server is configured to control a mutually exclusive set of tape volumes in the StorageTek ACSLS tape library. Mutually exclusive tape volumes cannot be used or accessed by other backup servers attached to the network. As a result, each Arcserve Backup server manages a user-defined subset of tape volumes on the StorageTek ACSLS tape library that are unique to that Arcserve Backup server.

Mutually Exclusive Tape Volume Architecture

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



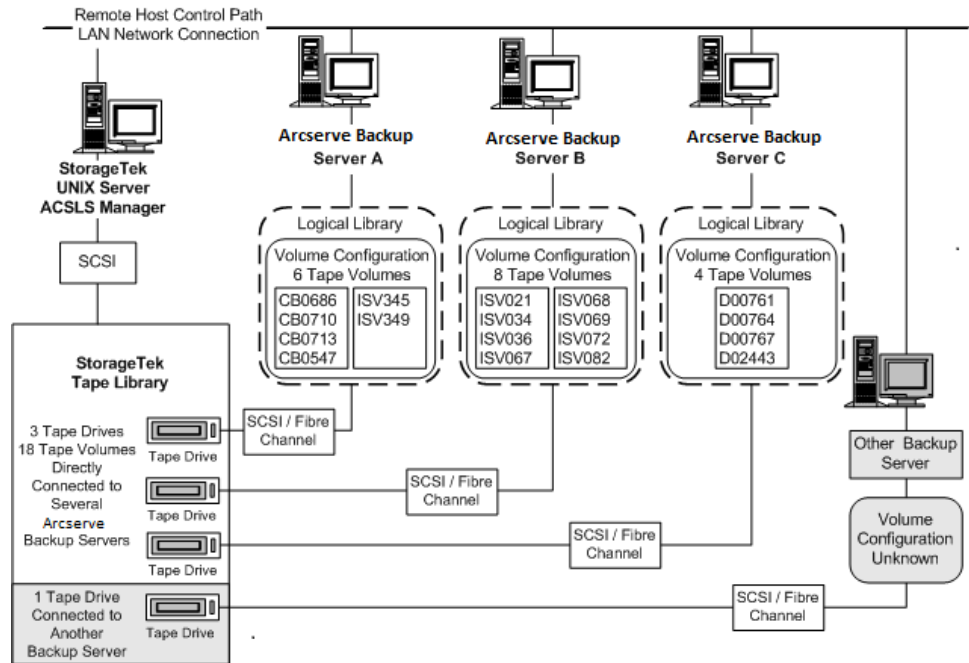
Because multiple backup servers share the StorageTek ACSLS tape library, you must ensure that each tape volume is assigned to only one backup server. The tape volumes assigned to each backup server must be mutually exclusive.

Important! If your Arcserve Backup servers are not in a SAN, 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 Tape Volume Configuration

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



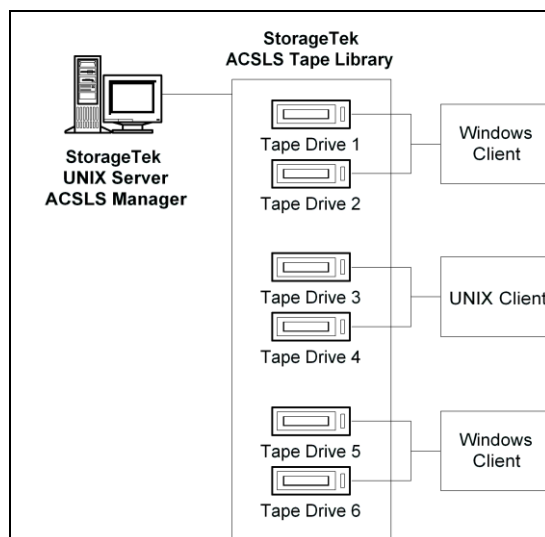
The example shows that the StorageTek ACSLS tape library has four tape drives directly attached to several backup servers on the network. The unique tape volume assignments for each Arcserve Backup server are:

- Server A has six assigned tape volumes: CB0686, CB0710, CB0713, CB0547, SV345, and ISV349
- Server B has eight assigned tape volumes: ISV021, ISV034, ISV036, ISV067, ISV068, ISV069, ISV072, and ISV082
- Server C has four assigned tape volumes: D00761, D00764, D00767, and D02443

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

Multiple Server Connections to Tape Drive Configuration

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



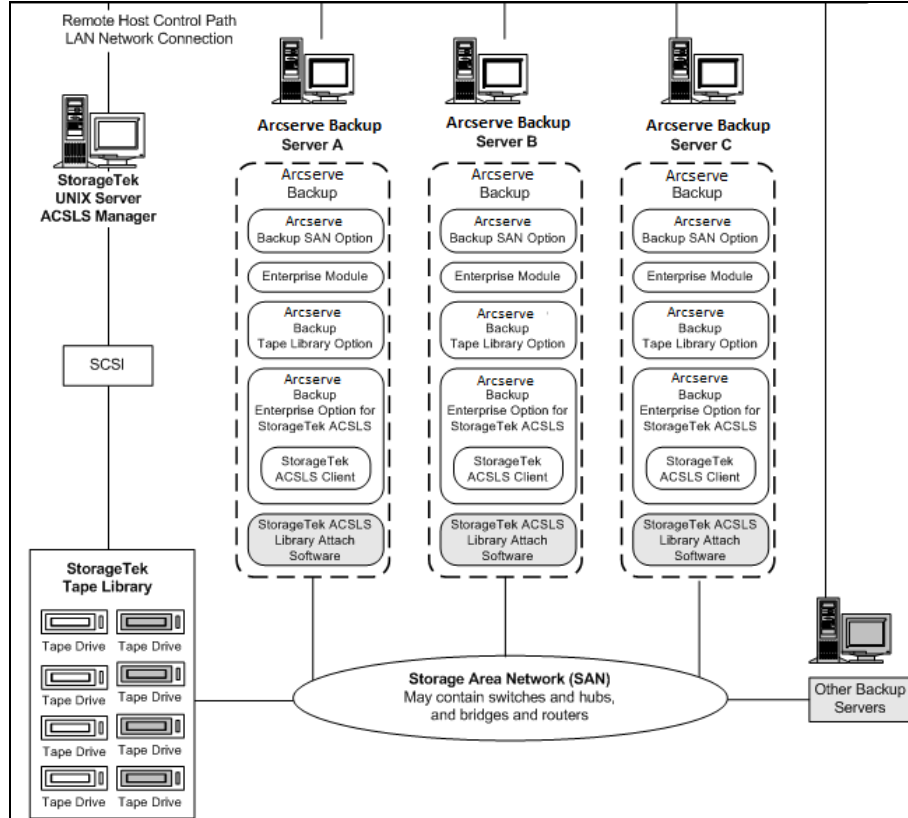
Note: In configurations where more than one tape drive is connected to a Arcserve Backup server, both tape drives must use media of the same type.

Shared Tape Volumes in a SAN

In a SAN, each 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 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 Arcserve Backup server in the SAN shares the same user-defined subset of tape volumes on the StorageTek ACSLS tape library.

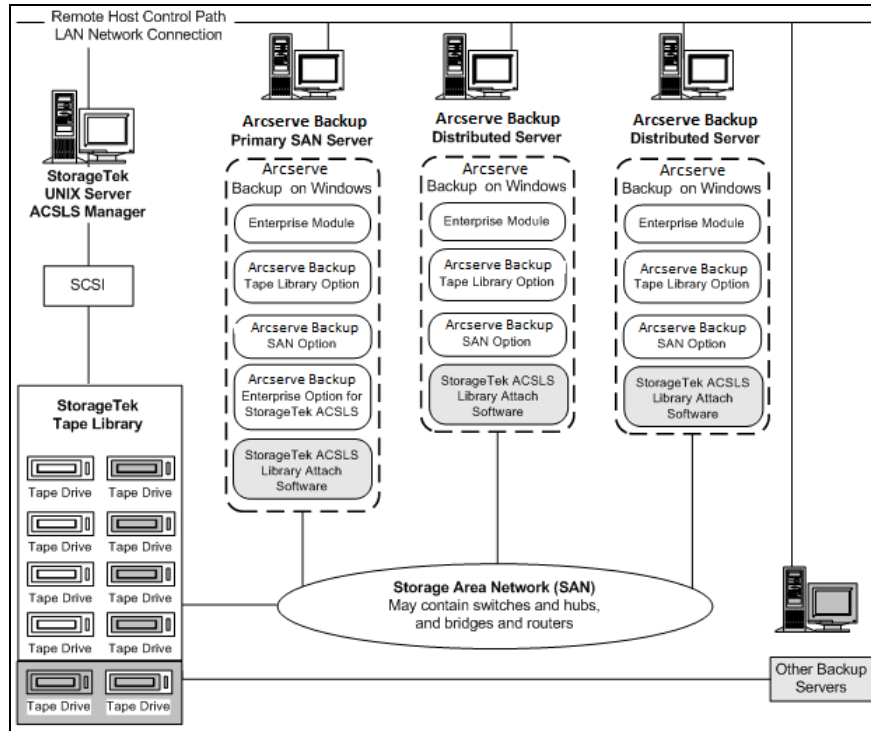
In a SAN, the Arcserve Backup servers have the same virtual library configuration, the same tape volume configuration, and the same tape drive configuration.

The Enterprise Option for StorageTek ACSLS must reside on each 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:



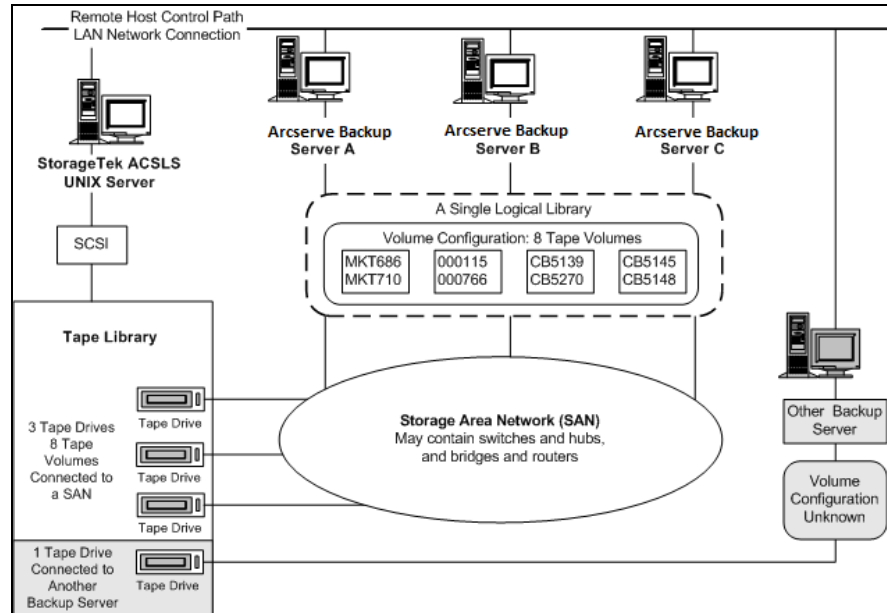
Shared Tape Volume Architecture

The following illustration shows the architecture of Arcserve Backup servers in a SAN and the SAN communication interface to the StorageTek ACSLS tape library:



Shared Tape Volume Configuration in a SAN

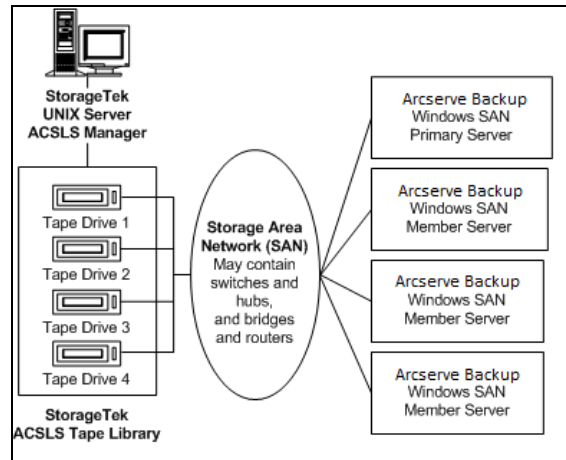
The tape volume assignments determine the user-defined logical library shared by all Arcserve Backup servers in the SAN. In the following illustration, a single set of tape volumes defines the logical library for the SAN:



The illustration 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 Arcserve Backup server in the SAN. Another backup server on the network that is not running Arcserve Backup may have a different configuration.

SAN Server Connection to Tape Drive Configuration

The tape drives on the StorageTek ACSLS library can be connected to a SAN, which in turn is connected to several Arcserve Backup servers, as shown in the following illustration:



Note: In configurations where more than one tape drive is connected to a Arcserve Backup server, both tape drives must use media of the same type.

Installing and Configuring

This section provides the information you need to install and configure the Arcserve Backup Enterprise Option for IBM 3494 and the Arcserve Backup Enterprise Option for StorageTek ACSLS.

To install these options, you must be familiar with the following:

- The characteristics and requirements of Windows operating system in general
- Administrator responsibilities of Windows operating systems in particular
- Enterprise Tape Library 3494
- StorageTek ACSLS

Installation Prerequisites

Before installing the option, verify the following:

- Your system configuration meets the minimum requirements needed to install the option.

For a list of requirements, see the readme file.

- You have administrator privileges on the computers on which you want to install the option.
- You have the following applications installed and working properly:
 - Arcserve Backup
 - Arcserve Backup Enterprise Module
 - Arcserve Backup Tape Library Option
 - IBM Automated Tape Library service or StorageTek ACSLS Library Attach software

Important! You must install the Enterprise Module (which automatically includes these options) and Arcserve Backup on the same computer.

- You know the host name, IP address, and password of the computer on which you are installing the option.
- You have the plan of your tape volume configuration.
- You have selected your library configuration method and gathered the required information to configure your library using the selected method.

Note: Contact your Arcserve Backup administrator to obtain the proper privileges.

Installation Prerequisites Exclusive for Enterprise Tape Library 3494

Before installing Enterprise Tape Library 3494, ensure the following:

- You have installed the IBM Automated Tape Library service Version 5.4 for 32-bit on the Arcserve Backup server.

Note: Arcserve Backup works only with IBM Automated Tape Library service for 32-bit software.

- You have downloaded and installed the latest device drivers for the IBM Automated Tape Library service for the IBM TotalStorage Enterprise Automated Tape Library 3494.

Important! You must ensure these two points before installing the Arcserve Backup Tape Library Option and the Enterprise Option for IBM 3494.

- You have added the server where you will install Arcserve Backup as a LAN host to Enterprise Tape Library 3494.
- You have established and configured the communication between Enterprise Tape Library 3494 and the Automated Tape Library service on the computer where you will install Arcserve Backup.
- You have established and configured communication between the IBM Library Manager control service on the Arcserve Backup server and the Enterprise Tape Library 3494. You can use the mtlib program to verify library connectivity.
- You have included the logical library name, the IP address of the Enterprise Tape Library 3494, and the Arcserve Backup server identifier (typically the host name) in the library configuration file, ibmatl.conf.
- You have connected the empty Enterprise Tape Library 3494 tape drives to the Arcserve Backup server.
- You have developed a tape volume configuration plan to ensure mutually exclusive tape volume assignments for each Arcserve Backup server. In addition, you have identified which tape volumes on the Enterprise Tape Library 3494 will be assigned to the Arcserve Backup server.

Note: For more information about obtaining and installing Enterprise Tape Library 3494 software and device drivers, see the IBM software documentation.

More Information:

[Library Configuration File](#) (see page 45)

[Library Configuration File Format](#) (see page 45)

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 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 Arcserve Backup server and the Enterprise Tape Library 3494.

You can 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 Arcserve Backup server.

Note: You can use the `mtlib` command to verify the status and connectivity of the Ethernet LAN control path between the IBM Library Manager Client and the IBM Library Manager Server.

More Information:

[Add LAN Host to Enterprise Tape Library 3494](#) (see page 46)
[Communication Interface](#) (see page 26)

IBM Components

The Enterprise Tape Library 3494 client is installed on the Arcserve Backup server. This client software is the IBM Automated Tape Library service and is used to establish communication between the Arcserve Backup server and the Enterprise Tape Library 3494.

IBM Library Manager

The IBM Library Manager controls the tape library robotics and maintains a database of tape volumes. The IBM Library Manager software resides on the Enterprise Tape Library 3494 and is controlled through the Enterprise Tape Library 3494 server console and by library requests received through the network.

IBM Automated Tape Library Service

The IBM Automated Tape Library service is a separate software component installed on the Arcserve Backup server. This service must be running for successful communication between the Arcserve Backup server and the Enterprise Tape Library 3494.

Library Configuration File

Before you install Arcserve Backup Enterprise Option for IBM 3494, you must configure communication between the Arcserve Backup server and the Enterprise Tape Library 3494 by editing the Enterprise Tape Library 3494 library configuration file. The name of the file is `ibmatl.conf`, and it is located in the `c:\winnt` directory.

Note: If the `c:\winnt` directory does not exist, it is created when you install the IBM Automated Tape Library service.

Use Notepad or any other 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

The library configuration file defines the symbolic library name, the IP address of the Enterprise Tape Library 3494, the identifier used by the IBM Library Manager control service, and an optional second Internet address for a high availability server. Any text following `#` is treated as a comment.

The format of the statements in the `ibmatl.conf` file is:

```
libraryname address identifier address2
```

The following list explains the parts of the statement:

libraryname

Indicates a symbolic name of the library.

Limits: 32 characters

address

Indicates a value that represents the IP address of the Enterprise Tape Library 3494.

identifier

Indicates the host name of the computer. The IBM Library Manager uses the identifier to locate the Arcserve Backup server. The *identifier* is also known as the *return alias*.

address2

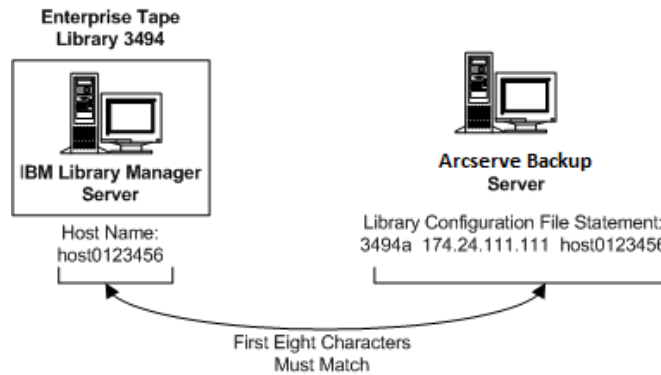
(Optional) Specifies a second IP address for a high availability server.

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 Library 3494 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 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 Arcserve Backup server:



Add LAN Host to Enterprise Tape Library 3494

As part of the installation prerequisites, you must 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 Arcserve Backup server.

To add a LAN host to the Enterprise Tape Library 3494

1. Use the library operator console and click Commands, LAN options, Add LAN Host.
2. Enter the Arcserve Backup server IP address and the host name.
3. Use the mtlib commands and confirm the connectivity between the Enterprise Tape Library 3494 and the IBM Automated Tape Library service on the Arcserve Backup server.

Installation Prerequisites Exclusive for StorageTek ACSLS

Before installing StorageTek ACSLS, ensure the following:

- You have installed and configured the StorageTek Library Attach software Version 1.4.2 for 32-bit on the Arcserve Backup server.
Note: Arcserve Backup works only with 32-bit StorageTek LibAttach software.
- You have established communication between the StorageTek ACSLS server and the Arcserve Backup server.
Important! Do this before installing the Enterprise Option for StorageTek ACSLS.
- You have established communication between the StorageTek ACSLS server and the StorageTek Library Attach software.
- You have configured the StorageTek ACSLS tape library and StorageTek ACSLS server.
- You have selected your library configuration method and gathered the required information to configure your library using the selected method.

StorageTek ACSLS Components

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.

The following StorageTek ACSLS communication interface software components are installed on the same computer as the Enterprise Option for StorageTek ACSLS:

- Library Attach software
Translates and routes messages between the ACSLS Manager and the Arcserve Backup server.
- Storage Server Interface (SSI)
Requests the movement of the tape volumes by sending requests to the Network Interface. It translates the library requests from the Arcserve Backup server into a format that can be interpreted by the ACSLS Manager software on the StorageTek ACSLS server.
- Network Interface
Handles the task of creating message packets for transfer across the network. The message packets consist of an address header, the actual data, and parity information. The parity information in the packet can be used for error correction.

Installation Process

Make sure you have 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 installation procedure include:

- Install the option.
- Configure the library during installation.
- Use the Quick Inventory option of the Arcserve Backup Device Manager and take an inventory of the device.

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

Install the Option

The option (Enterprise Option for IBM 3494 or Enterprise Option for StorageTek ACSLS) is installed locally when you install the Enterprise Module.

To install and configure the option

1. Install and configure the option using the Enterprise Module Configuration utility (EMConfig.exe) during the post-installation process.
Note: You can also access the EMConfig.exe utility from the Windows Start menu (click Start, All Programs, CA, ARCserve Backup, Enterprise Module Configuration).
2. Complete the installation and configuration procedure, and restart your computer when prompted.

Note: For more information about installing Arcserve Backup, see the *Implementation Guide*. For more information about installing and configuring the Tape Library Option, see the *Tape Library Option Guide*.

Important! The tape drive configuration occurs during the Tape Library Option installation. You must install the Tape Library Option before you install the option or during the same installation session. If the Arcserve Backup Tape Library Option is already installed, it will be reconfigured.

Library Configuration Tasks

Configuring the logical library tape volumes is an integral and important part of the option installation process. Configure the library by performing the following tasks:

- Assign tape volumes to the Arcserve Backup server.
- Use the Quick Inventory option of the Arcserve Backup Device Manager and take an inventory of the device.

Configuring your tape volumes consists of assigning tape volumes to create the logical library on the Arcserve Backup server. Review your tape volumes assignment plan before you assign the tape volumes.

You will not assign any cleaning tape volumes as part of your tape volume configuration. Tape cleaning is managed exclusively by Enterprise Tape Library 3494. As a result, the cleaning slot designation is not applicable for any backup servers connected to the Enterprise Tape Library 3494. On the Arcserve Backup server, the cleaning slot information is always <None>.

Note: You can access the tape cleaning schedule by using the Enterprise Tape Library 3494 control console.

More Information:

[Introducing Enterprise Tape Library 3494 and StorageTek ACSLS](#) (see page 24)
[Communication Interface](#) (see page 26)

Configure Enterprise Tape Library 3494 Drives

You must configure Enterprise Tape Library 3494 drives before configuring its volumes.

To configure Enterprise Tape Library 3494 drives

1. Click Start, Programs, Arcserve, ARCserve Backup, Enterprise Module Configuration.
The Configure Enterprise Module window appears.
2. Click Enterprise Tape Library 3494.
The IBM 3494 Library Configuration dialog opens.
3. Click Auto Config.
Arcserve Backup will search the library for any newly added drives and displays them in the drive list.

Configure Library for Enterprise Tape Library 3494

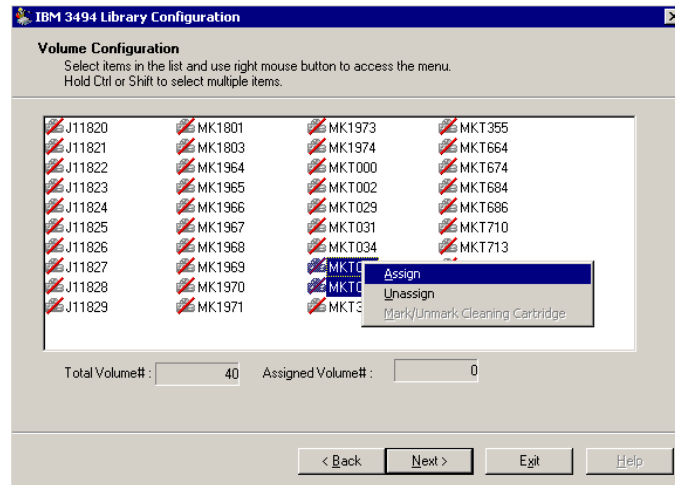
After all tape drives are configured as part of the installation, all tape volumes in the Enterprise Tape Library 3494 appear in the Volume Configuration dialog.

To configure your library tape volumes

1. Select one or more tape volumes that you want to assign to the logical library.

Note: Press and hold the Ctrl key to select multiple tape volumes.

2. Right-click the selected tape volumes, and select Assign.



Note: Initially the tape volumes are not assigned to the Arcserve Backup server. The unassigned status is indicated by a red slash through the tape volume icon.

3. Review your tape volume assignment and click Next.
A message reminds you to use the Arcserve Backup Device Manager to take an inventory before you use the Enterprise Tape Library 3494.
4. Click OK to close the message dialog.
A summary dialog opens to show the library tape drive configuration.
5. Click Finish to complete your library configuration.
A message appears to confirm your successful library configuration.
6. Click Exit.
The library configuration summary dialog opens.
7. Click Finish to complete your library configuration.
A message appears to confirm your successful library configuration.
8. Click Exit.
The Install Summary dialog opens.
9. After you configure your library, review the installation summary.
The Enterprise Option for IBM 3494 status shows Installation Completed and Configuration Completed.
10. Click Finish to complete the installation.
11. Use the Quick Inventory option and take an inventory of the Enterprise Tape Library 3494 to detect any changes that may have occurred while the Tape Engine was stopped.

Configure Library for StorageTek ACSLS

Configuring your library is an important step in installing the Enterprise Option for StorageTek ACSLS. You must have the Tape Library Option installed to configure the library. You can install the Tape Library Option before or during installation of the Enterprise Option for StorageTek ACSLS. During the installation of the Tape Library Option, the tape drives attached to the Arcserve Backup server are detected and assigned to the server.

Before configuring, remove all tape volumes from the tape drives in the StorageTek ACSLS library. After you assign the tape drives to the server and remove the tape volumes from the tape drives, configure the library by choosing either the manual or the automatic configuration methods. During configuration, the tape volumes in the StorageTek ACSLS library are read and initialized.

Library Configuration Tasks

Configuring the logical library is an integral and important part of the option installation process. Configure the library for the Enterprise Option for StorageTek ACSLS by completing the following library configuration tasks:

- Configure the tape drives, manually or automatically
- Assign tape volumes to the Arcserve Backup server to configure the logical library
- Use the Quick Inventory option of the Device Manager and take an inventory of the device

Configure Library Manually

The manual library configuration method lets you manually enter tape drive parameters. Use the manual library configuration method to configure the logical library if the tape drives in the StorageTek ACSLS library use a mixture of different types of tape volumes or if the StorageTek ACSLS library is shared with other backup servers.

The process of entering tape drive parameters assigns the tape drive to the logical library on the Arcserve Backup server. A green tick mark next to the tape drive in the Manual Configuration dialog indicates that you have entered the tape drive parameters.

Obtain Tape Drive Parameters

You can obtain the tape drive parameters by querying the status of the tape drives on the StorageTek ACSLS library.

Enter the following parameters for each tape drive:

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

More Information:

[StorageTek Tape Library Queries](#) (see page 63)

Configure Your Library Tape Drives Manually

You can configure the library tape drives either manually, or by using the wizard. This section gives you the procedure to configure the tape drives manually. Select Manual configuration if your StorageTek ACSLS library contains drives that use different types of media or if other libraries or stand-alone tape drives are present in your environment.

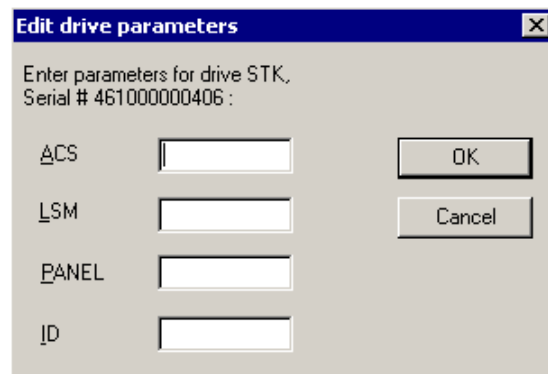
To configure the library tape drives manually

1. Select the manual library configuration method.
2. Click Next.

The Manual Configuration dialog displays a list of the tape drives that are attached to the Arcserve Backup server.

3. Select a tape drive to be configured.
4. Click Configure to enter the parameters of the selected tape drive.

The Edit drive parameters dialog opens.



5. Enter the ACS, LSM, Panel, and ID of the tape drive in the Edit drive parameters dialog.
6. Click OK.
The Edit drive parameters closes and a green tick mark appears for each configured tape drive.
7. Repeat the manual configuration for each tape drive.
8. Click Next to verify the configuration information and to initialize the tape drives.
The Volume Configuration dialog opens showing a list of unassigned tape volumes.

More Information:

[Configure Library Manually](#) (see page 51)

Automatic Library Configuration

The automatic library configuration method determines which tape drives in the StorageTek ACSLS library are connected to the Arcserve Backup server. Use this method if all tape drives in the StorageTek ACSLS library are of the same type.

The Arcserve Backup server performs the following device detection and verification tasks during automatic library configuration:

- Unloads all the tape drives in the StorageTek ACSLS library
- Loads the first tape drive
- Verifies the loaded tape drive
- Receives tape drive connection verification
- Unloads the first tape drive
- Repeats this verification process for each tape drive
- Reports the tape drive information on the Drive Configuration dialog

Note: The automatic library configuration method does not support a mixture of different types of tape volumes.

Configure your Library Tape Drives Automatically

This section gives you the procedure to configure the tape drives automatically. Use this method if all drives within your StorageTek ACSLS library use the same type of media.

To use the automatic library configuration method

1. Select the library automatic configuration method.

2. Click Next.

The automatic library configuration process is initiated.

3. Click Next.

The Volume Configuration dialog opens showing a list of unassigned tape volumes.

How You Configure Library Tape Volumes

Configuring your tape volumes consists of assigning tape volumes to create the logical library on the Arcserve Backup server. Review your tape volume assignment plan before you assign the tape volumes.

After you configure the tape drives, all tape volumes in the StorageTek ACSLS library are shown in the Volume Configuration dialog. Initially, the tape volumes are not assigned to the Arcserve Backup server. The unassigned status is indicated by a red slash through the tape volume icon.

More Information:

[StorageTek ACSLS](#) (see page 32)

Configure the Logical Library

You can configure the logical library by assigning tape volumes to the Arcserve Backup server.

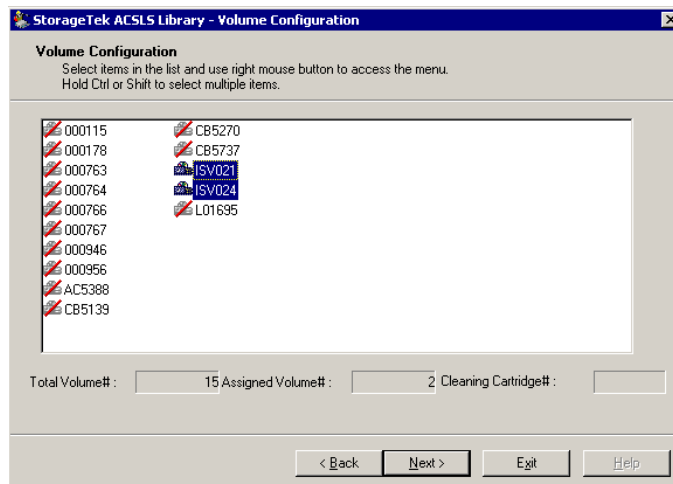
To configure your logical library

1. Select one or more tape volumes.

Note: Press and hold the Ctrl key to select multiple tape volumes.

- Right-click the selected tape volumes, and then select Assign.

The selected tape volumes are assigned to the Arcserve Backup server, as indicated by the tape volume icon (no red slash):



- Click Next.

A message reminds you to take an inventory of the StorageTek ACSLS library.

- Click OK.

The message dialog closes and a summary dialog opens to show the library tape drive configuration.

- Click Finish.

A message appears to confirm your successful library configuration.

- Click Exit.

The Install Summary dialog opens.

Configure the Cleaning Volume

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.

To configure the cleaning tape volume

- Open the StorageTek ACSLS Volume Configuration dialog, browse to the StorageTek ACSLS library and select a tape volume.
- Right-click the tape volume and select Mark/Unmark Cleaning Cartridge from the pop-up menu.

The selected tape volume is marked as the cleaning cartridge.

To configure more cleaning tape volumes

1. Ensure that the StorageTek ACSLS library is properly configured and initialized.
2. Open the Device Manager window.
3. Browse to and right-click the StorageTek ACSLS library. Select Library Properties from the pop-up menu.

The Library Properties dialog opens.

4. Select the Cleaning tab.
5. Select the desired cleaning tapes and click OK.

The Library Properties dialog closes. You have successfully configured the cleaning tape volumes.

Take Inventory of Slots

To enable Arcserve Backup to recognize changes in tape volume assignments, you must take an inventory of slots in the tape library affected by tape volume assignment changes.

To take inventory of slots

1. Log on to Arcserve Backup on the computer running the option.
2. Start Arcserve Backup.
3. Select Device from the Arcserve Backup home page.
4. Select the logical library.
5. Right-click the selected logical library, and select Inventory/Offline Slots.

The Inventory/Offline Slots dialog opens to show the tape volumes in the tape library.

6. Click to select the slots in the option affected by tape volume assignment changes.
7. Click Quick Inventory.
8. Click OK.

The inventory complete message appears.

9. Click OK.

Post-Installation Procedures

The post-installation tasks consist of verifying the pre-installation tasks and making changes to the library configuration.

How Library Configuration Updating Works

Library configuration involves tape drive configuration and tape volume assignment. Whenever you add or remove tape drives or change your tape volume assignments on the tape library, you must update the library configuration with these changes.

Important! You must stop the Tape Engine service to update the library configuration when tape drive and tape volume changes.

Update Device Configuration

You can update the library configuration with changes to tape drives by using the Enterprise Module Configuration Wizard on the Arcserve Backup server. Before you reconfigure your library, you must remove all tape volumes from the tape drives in the tape library. When you configure the device, all the tape volumes in the tape library are read and initialized.

Note: 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 Arcserve Backup server.

To update the library configuration with tape drive changes

1. Log on with administrator privileges to Arcserve Backup on the computer running the option.
2. Click Start, Programs, CA, ARCserve Backup, Enterprise Module Configuration.
The Enterprise Module Configuration dialog opens.
3. Click IBM 3494 or StorageTek ACSLS.
A message appears reminding you to remove tape volumes from all tape drives.
4. Remove tape volumes from all tape drives and click Yes to continue.
The <IBM 3494 or StorageTek ACSLS> Library Configuration dialog opens.
5. Select the manual or automatic library configuration method and configure your library.
6. Click Next.
The Drive Configuration dialog opens.
7. Click Next.
This completes updating library configuration.

More Information:

[Library Configuration Tasks](#) (see page 48)

Update Volume Configuration

You can update your volume configuration with changes to tape volumes on the tape library. After any changes to the tape volumes on the tape library, use the Volume Configuration option to change your tape volume configuration, and then use the Arcserve Backup Device Manager to take an inventory of the device.

Note: The import and export of tape volumes using the option is not supported.

To update the tape volume configuration

1. Log on with administrator privileges to Arcserve Backup on the computer running the option.
2. Click Start, Programs, Arcserve, ARCserve Backup, Enterprise Module Configuration. The Configure Enterprise Module window appears.
3. Click Enterprise Tape Library 3494 or StorageTek ACSLS. The Volume Configuration welcome dialog opens.
4. Click Next.

A message appears to show that the Tape Engine service will be stopped. Click Yes to continue.

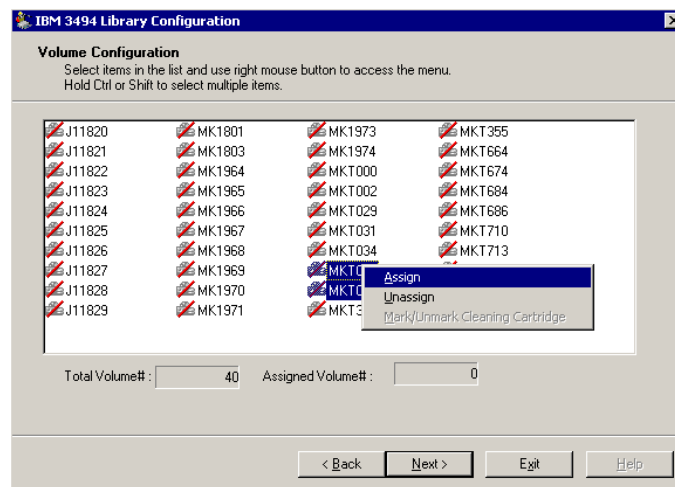
5. Click Next to continue the volume configuration.

The Volume Configuration dialog opens to show the current tape volume configuration; assigned tape volumes are followed by unassigned tape volumes.

6. Select one or more tape volumes that you want to assign to the logical library.

Note: Press and hold the Ctrl key to select multiple tape volumes.

7. Right-click the selected tape volumes, and select Assign.



8. Click Next.
A message appears to remind you to take an inventory for slots in the tape library affected by tape volume assignment changes.
9. Click OK to close the message.
The Volume Configuration Completed message appears.
10. Click Exit.
11. Click Yes to confirm the exit.
12. Use Arcserve Backup to take an inventory of the device.

More Information:

[Detect Tape Volume Updates](#) (see page 61)

[Take Inventory of Slots](#) (see page 56)

[Library Configuration Tasks](#) (see page 48)

[Configure Library for StorageTek ACSLS](#) (see page 51)

Configure the Options with File System Devices

Use this procedure if you already have File System Devices configured on the server and you have not configured the tape library yet.

To configure with File System Devices

1. Connect the tape drives to the system.
2. Start the Tape Engine.
3. Once you see the tape drives in the Device Manager, stop the Tape Engine.
4. Follow the steps starting with Step 2 in the section titled "Update Device Configuration".

Using Enterprise Tape Library 3494 and StorageTek ACSLS

This section contains information about using the options. After you install and configure the options on the Arcserve Backup server, you can use Arcserve Backup to perform the following tasks on the respective option:

- Enterprise Tape Library 3494--Manage backup and restore operations
- StorageTek ACSLS
 - Manage backup and restore operations
 - Update the configuration of the virtual library on the Arcserve Backup server with device or tape volume changes on the StorageTek ACSLS tape library

Note: Arcserve Backup supports disaster recovery using the Enterprise Option for StorageTek ACSLS. For more information on Disaster Recovery, see the *Disaster Recovery Option Guide*.

This section also contains information about using the following options:

- Enterprise Tape Library 3494 command line interface to query the status of the Enterprise Tape Library 3494
- StorageTek ACSLS cmd_proc utility to query the status of the tape drives and tape volumes in the StorageTek ACSLS tape library

Backup and Restore Operations

You can manage backup and restore operations with the option as if you are controlling a local library. Use the Backup Manager to perform backup operations and the Restore Manager to perform restore operations.

Note: For complete details on managing backup and restore operations, see the *Administration Guide*.

Detect Tape Volume Updates

After the initial library configuration, you can add or remove tape volumes. Before you can use tape volumes in the tape library for a logical library (for Enterprise Tape Library 3494) or a virtual library (for StorageTek ACSLS) on the Arcserve Backup server, you must perform the following tasks:

- Physically add tape volumes to, and remove tape volumes from, the tape library.
- Update tape volume configuration.
- Take an inventory of the device to update the Arcserve Backup server with the changes made to the tape volume configurations.

Note: You can use the Arcserve Backup Device Manager to view the existing tape volume assignments before adding or removing tape volumes.

Importing and exporting of tape volumes from Arcserve Backup is not supported with these options. Perform physical import and export of tape volumes using the tape library.

More Information:

[Take Inventory of Slots](#) (see page 56)

[Update Volume Configuration](#) (see page 58)

Enterprise Tape Library 3494 Command Line Interface

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, take an inventory of tape volumes, eject tape media, and verify connectivity between the Enterprise Tape Library 3494 and the IBM Library Manager control service on the Arcserve Backup server.

Query Using the mtlib Command

Use the mtlib command to query device and operational status, take an inventory of tape volumes, eject tape media, and verify connectivity between the Enterprise Tape Library 3494 and the IBM Library Manager control service on the Arcserve Backup server.

To use the mtlib command

1. On the Arcserve Backup host, 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.

mtlib Command--Query the Enterprise Tape Library 3494

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 assumed as 3494a.

This command has the following format:

```
mtlib -l 3494a [-qL | -qI | -qI -v | -DE]
```

-qL

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

-qI

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

-qI -v

(Optional) 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.

-DE

Queries the Enterprise Tape Library 3494 and returns device information.

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

StorageTek 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 in the StorageTek ACSLS tape library.

To query the status of the tape drives

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

```
query drive all
```

The command displays the following information:

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

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

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

In the preceding example, “0, 0, 0, 0” on the first line translates to ACS = 0, LSM = 0, Panel = 0, 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 Tape Volumes

The command, *query volume all*, provides information about the tape volumes, their status, their current location, and their type in the StorageTek ACSLS tape library.

To query the status of the tape volumes

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

```
query volume all
```

The command displays the following information:

```
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      LTO-100G
000096  ejected   0,-1, 0, 0, 0  LTO-100G
000097  ejected   0,-1, 0, 0, 0  LTO-100G
```


Appendix A: Troubleshooting

This appendix provides troubleshooting information to help you resolve issues that you can encounter in the Enterprise Module options.

You can encounter job failures and errors while performing backup and restore operations. To check the problems that can occur, select the Activity Log tab in the Job Status Manager.

The Activity Log contains time-stamped events with applicable error descriptions. Error incidents have the prefix E followed by a number (for example, E11018).

This section contains the following topics:

[Backup Process is Slow](#) (see page 65)

[Image Option: Drive Cannot be Frozen](#) (see page 66)

[Enterprise Tape Library 3494: Drives Cannot be Mapped to the Library](#) (see page 67)

Backup Process is Slow

Symptom

The backup process is very slow.

Solution

The most common reasons and solutions for which a backup process may be slow are:

- **Slow processor**

Older computers have slow processors and may not be able to handle the volume of data processed during the backup and restore process. This is normal if you have an older computer with a slow processor. If your computer is up-to-date, check your hardware performance and reboot your computer.

- **Poor processor performance**

Check your hardware performance and reboot your computer.

- **Open applications**

You may have applications running that use excessive processing power. Close all of your applications before you begin the backup and restore process.

Image Option: Drive Cannot be Frozen

Symptom

The drive cannot be frozen during a backup operation.

Note: This problem is specific to Image Option.

Solution

If there is any activity on the drive, the Arcserve Backup Image Option may not be able to freeze the drive. The following occurs if the drive cannot be frozen during a backup operation:

- If the drive does not freeze, and the Continue with Backup option has been selected for the freeze fail action, the option tries to lock the drive for exclusive access.
- If the drive cannot be locked and you change any data, the backup data may be inconsistent and unusable.

The drive cannot be locked for the following reasons:

- Windows Explorer has this drive expanded. Make sure the drive is not expanded.
- An MS-DOS command prompt dialog is opened with this drive letter. Close the MS-DOS command prompt dialog associated with the drive letter.
- An application has opened a file on the drive. Make sure you close all applications that may open a file on the drive that you are backing up.

Enterprise Tape Library 3494: Drives Cannot be Mapped to the Library

Symptom

Drives cannot not be mapped to the library.

Note: This problem is specific to the Enterprise Option for IBM 3494.

Solution

The reason for drives not being mapped to the library could be a registry entry, named Device Name.

To determine if drives are mapped

1. Click Settings, Control Panel, Administrative Tools, Computer Management, Device Manager.
2. Locate the IBM tape drives that are connected to the server from Enterprise Tape Library 3494.
3. If the tape drives appear under Other Drives, then you must download and install the latest device drivers for the tape drives from the IBM website.

Glossary

mixed media

If you are using the StorageTek ACSLS tape library, then the term *mixed media* (or heterogeneous environment) refers to a mixture of tape drives and tape volumes in the library.

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