

BrightStor® ARCserve® Backup for Windows

Administrator Guide

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Computer Associates®

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Chapter 1: Introducing BrightStor ARCserve Backup

BrightStor® ARCserve® Backup is a comprehensive, distributed storage management solution for distributed and multiplatform environments. The application can back up and restore data from all the machines on your network, (including machines running Windows, UNIX, NetWare, and Linux) using optional client agents. BrightStor ARCserve Backup also provides media and device management utilities.

BrightStor ARCserve Backup offers control from one management console. It can support small-scale and large-scale enterprise environments comprising of one machine or many, across different platforms and organizations.

Components

BrightStor ARCserve Backup comprises the following two main components that work together to back up, copy, and restore your data:

- BrightStor ARCserve Backup Manager
- BrightStor ARCserve Backup Server

Manager Components

Use the BrightStor ARCserve Backup Manager to perform tasks such as submitting backup and restore jobs, managing your database, and searching reports. You can install it on the same machine as the BrightStor ARCserve Backup Server or on a different machine, such as a Windows 2000 or a Windows Server 2003 system.

Note: The BrightStor ARCserve Backup Manager can display characters in other languages. To change the language, use the Regional Options dialog (Windows 2000) or Regional and Language Options dialog (Windows XP) available on the Control Panel. Consult your Microsoft Windows help for more information on language settings.

Server Components

The core components of BrightStor ARCserve Backup server are:

- Job Engine—Processes your jobs at their designated date and time. It scans the job queue for a job that is ready to run, then sends it to the appropriate handler.
- Tape Engine—Communicates with and controls your storage devices. The Tape Engine selects the device needed for a BrightStor ARCserve Backup job.
- Database Engine—By default, all operations within BrightStor ARCserve Backup are recorded by the Database Engine. This core service is responsible for maintaining a history of:
 - Files, directories, drives, and machines that BrightStor ARCserve Backup has backed up or copied.
 - Information about jobs that have been processed by BrightStor ARCserve Backup, such as the job type, logs, the final result of a job, and the start and end time.
 - Media used by BrightStor ARCserve Backup, such as its type, its name, the date it was first formatted, the date it expires, and the sessions on it.

You can control BrightStor ARCserve Backup services through the Server Admin tool.

BrightStor ARCserve Backup Functionality

BrightStor ARCserve Backup provides the components, functions, and utilities required by network managers to obtain and actively manage network backups.

Start the BrightStor ARCserve Backup Manager by selecting the Manager icon from the program group. The My First Backup tutorial opens the first time you start the Manager. Subsequently, the Home Page appears, but you can still access the tutorial from the Help menu. From the Home Page, you can start and access any BrightStor ARCserve Backup function using the following navigational features:

- Home Page—Provides news and support that links you to tools you can use to help solve problems with your computer. It also provides links to Quick Start, Configuration, Wizards, and Utilities.
- Navigation Bar—Quickly lets you independently access the Managers, Wizards, Utilities, and the most recently used screens. You can easily show or hide the Navigation Bar by selecting Navigation Bar from the View menu on the BrightStor ARCserve Backup Home Page.

- Quick Start—Provides quick links to BrightStor ARCserve Backup Manager functions.
- Configuration—Provides access to Device Configuration, which lets you quickly configure the backup devices on your server and to SAN configuration. You also can access the Central Database Configuration, which lets you designate a central server to host database information from other backup member servers.

From the Configuration menu you can also access Device Group Configuration, which lets you configure device groups and staging groups.

- Wizards—Simplifies the most common tasks of BrightStor ARCserve Backup. You can access the Backup, Restore, Device, Create Boot Kit, Job Scheduler, and Diagnostic Wizards.
- Utilities—Offers several utilities that you can use to manage your database and media. The utilities are Recover Database, Merge, Scan, Compare, Count, Copy, Purge, User Profile, and Report Writer.

BrightStor ARCserve Backup Managers

The Home Page provides quick links to BrightStor ARCserve Backup functions. You can access the BrightStor ARCserve Backup functions from the Quick Start menu on the Home Page, or from the Quick Start link on the Navigation Bar. The managers that you can access include the following:

- Job Status Manager—Monitors all pending, completed, and active jobs from the Job Status Manager window. You can schedule pending or completed jobs, submit new jobs, delete jobs, and stop active jobs. Log information is provided for each completed job.
- Backup Manager—Backs up data to media. You can schedule and configure backups of your machines and servers. Information about each backup job (such as the path and name of each file, as well as the media used) is logged in the BrightStor ARCserve Backup database. Using the Backup Manager you can:
 - Specify the source (data that you want to back up) and the destination (media) for your backup job.
 - Define your backup job to back up data on computers running other operating systems such as NetWare, UNIX, Linux, and Windows.
 - Use database agents running under Windows 2000 and 2003.

- **Restore Manager**—Restores data that has already been backed up by BrightStor ARCserve Backup. Using the Restore Manager you can:
 - Find all the versions of the files that were backed up.
 - Specify the source and destination of the restore job.
 - Define a backup method and specify a backup schedule.
 - Perform a complete or partial restore of your data.
- **Media Pool Manager**—Manages, creates, and maintains logical groupings of media for easy identification of backups, to allow efficient scheduling of the maintenance and recycling of your media. You can design media rotation schemes to suit your particular archive needs.
- **Device Manager**—Displays information about your storage devices and media. It also allows you to change a drive's compression mode, and perform media functions such as compression, formatting, erasing, ejecting, and retensioning. BrightStor ARCserve Backup supports a wide variety of media including 4mm, 8mm, DLT, QIC, Iomega's Zip or Jazz media, PDs, MO, and WORM formats.
- **Database Manager**—Displays information from the BrightStor ARCserve Backup database, such as the jobs processed by BrightStor ARCserve Backup, the media used by BrightStor ARCserve Backup, and the devices you are using with BrightStor ARCserve Backup.
- **Report Manager**—Generates reports from data in the BrightStor ARCserve Backup database. Various reports include information about backup schedules, media errors, backup devices, media pools, and media status and policies.
- **Server Admin**—Allows you to modify the BrightStor ARCserve Backup system account and manage the core BrightStor ARCserve Backup services: Job Engine, Tape Engine, and Database Engine. The Configuration icon allows you to configure tasks for these services including generating an alert and defining message logging. The Database Engine tab allows you to configure the database pruning job.
- **MM Admin** (available only with the BrightStor ARCserve Backup Enterprise Module)—Provides the tools you need to organize tape movement to off-site storage locations and protect, control, and manage media resources.
- **Alert Manager**—Sends messages to people in your organization, using various methods of communication, regarding events that occur during the functioning of BrightStor ARCserve Backup.

BrightStor ARCserve Backup Configuration Tools

BrightStor ARCserve Backup provides configuration tools you can use to configure devices and backup databases. The configuration tools include:

- Device Configuration—A tool that lets you easily configure backup devices, such as tape and optical libraries, RAID devices, removable drives, virtual libraries, and File System Devices (FSD). It also lets you enable or disable devices for Removable Storage Management (RSM).
- Device Group Configuration—A tool that lets you easily configure the device groups in your BrightStor ARCserve Backup environment and select the groups that you will use for the staging of data.
- SAN Configuration—A tool that lets you configure the relationship between the Primary and Distributed BrightStor ARCserve Backup servers.
- Central Database Configuration—An easy-to-use console lets you configure the various BrightStor ARCserve Backup host database systems.

BrightStor ARCserve Backup Wizards

BrightStor ARCserve Backup provides you with wizards to simplify the most common tasks of BrightStor ARCserve Backup. You can access the BrightStor ARCserve Backup wizards from the Wizards menu on the Home Page, or from the Wizards link on the Navigation Bar. The wizards that you can use include the following:

- Backup—Using the Backup Wizard you can easily select files that you want to backup, the media to use, and then quickly complete the remaining steps needed to start your backup job.
- Restore—Provides a quick and efficient method for submitting restore jobs. It lets you select one of two restore methods, the files you want to restore, a destination, and restore options.
- Device—Displays the devices you have installed on a local or remote system and lets you easily format, erase, compress, and eject your storage media.
- Create Boot Kit—Creates and updates precautionary and machine-specific boot kits that will allow you to quickly recover your data if a disaster occurs.

Note: The Create Boot Kit wizard is available only if the BrightStor® ARCserve® Backup Disaster Recovery Option is installed on your system. The BrightStor ARCserve Backup Disaster Recovery Option is licensed separately.

- Job Scheduler—Provides an easy way to quickly package and submit jobs that you would typically submit from the Command Prompt window. In addition to the commands associated with BrightStor ARCserve Backup, you can use this wizard for virtually any executable.
- Diagnostic—Gathers and packages various BrightStor ARCserve Backup system logs, which may be necessary for troubleshooting.

Note: The Diagnostic Wizard appears only if you install the Diagnostic Utility.

BrightStor ARCserve Backup Utilities

BrightStor ARCserve Backup offers several utilities that you can use to manage files. You can access the Utilities from the Navigation Bar on the Home Page. These utilities are described in the following section. For more information about the options available for each utility, see the online help.

Recover Database Utility

Each time you run a backup job, BrightStor ARCserve Backup records information in its databases about the machines, directories, and files that have been backed up, and the media that was used. This allows you to locate files whenever you need to restore them. This database information is backed up by default whenever you back up your BrightStor ARCserve Backup home directory. Alternatively, you can choose to backup the database files in every backup job regardless of whether the BrightStor ARCserve Backup home directory is selected for backup.

The Recover Database utility lets you restore this information to your BrightStor ARCserve Backup database, overwriting existing database files. You can use this utility at any time that you lose your BrightStor ARCserve Backup database files, such as after a disaster like a fire, flood, or machine crash.

The advanced database recovery options are:

- Backup Media—Specify media options for the job.
- Operation—Specify a date to restore the database. The database backed up on this date will be used. If no databases were backed up on that date, BrightStor ARCserve Backup restores the most recent database before the specified date.

- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the level of detail you want recorded in the Job Queue Log.
- Alert—Send messages about events in your operation.

Note: You cannot use the Recover Database option to perform a restore database operation for a BrightStor ARCserve Backup server using SQL as the database. You must install the BrightStor® ARCserve® Backup Agent for Microsoft SQL Server option on the server and backup and restore your BrightStor ARCserve Backup database as you would any other SQL database.

Merge Utility

Use the Merge Utility when you want to restore detailed session information in your BrightStor ARCserve Backup database.

Using the Merge utility you can merge a:

- Single session or an entire media.
- Range of sessions, using one of the following types of ranges:
 - Specific start session to a specific end session.
 - Specific start session to the end of the media.

For example, if a backup was created using BrightStor ARCserve Backup on a different server, you can use Merge to get the media information into the database in the BrightStor ARCserve Backup home directory. This will allow you to restore media backed up from another server at the file level. This can be useful if detailed information has been pruned from the database. (By default, detailed job information is pruned 30 days after the backup to conserve database space. This can be configured in the Server Admin Manager.)

By default, all newly merged session details are preserved for one week (7 days) in the BrightStor ARCserve Backup database, even if the newly merged session details are older than the prune retention time. For more information on database pruning, see the chapter "Administering the Backup Server."

For more information about using the Merge utility, see the online help.

Global Merge Options

BrightStor ARCserve Backup provides several types of advanced merge options:

- Backup Media—Specify media options for the job.
- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the level of detail you want recorded in the Job Queue Log.
- Database—Specify whether you want to record detailed information about the jobs, or job and session-level details only.
- Alert—Send messages about events in your operation.

For a detailed description of the global Merge options, see the online help.

Scan Utility

Use the Scan Utility when you need information about your media backup sessions. Each source that you choose to back up is saved on media as an individual session.

Using the Scan utility you can scan a:

- Single session or an entire media.
- Range of sessions, using one of the following types of ranges:
 - Specific start session to a specific end session.
 - Specific start session to the end of the media.

Results of the Scan job can be seen in the Job Queue. You would need to do this if you are trying to recover a BrightStor ARCserve Backup machine and you need to find the most recent backup of the BrightStor ARCserve Backup database so that you can restore it.

If you would like a Scan job to produce a detailed listing of your media contents, use the Log All activity feature on the scan options tab. You can also use the Scan utility if you want a list of the files that were backed up.

For more information about using the Scan utility, see the online help.

Global Scan Options

BrightStor ARCserve Backup provides several types of advanced scan options:

- Backup Media—Specify media options for the job.
- Operation—Specify some general options for the job such as to scan files with CRC verification or to enable database recording.
- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the level of detail you want recorded in the Job Queue Log.
- Alert—Send messages about events in your operation.

For a detailed description of the global Scan options, see the online help.

Compare Utility

Compare the contents of a media session to files on a machine. Results of the Compare job can be seen in the Job Queue. You could use this option after a backup to verify that the backup copied all of the files to media without error.

BrightStor ARCserve Backup provides several types of advanced compare options:

- Backup Media—Specify media options for the job.
- Operation—Specify whether to enable database recording.
- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the level of detail you want recorded in the Job Queue Log.
- Alert—Send messages about events in your operation.

Count Utility

The Count utility counts the number of files and directories on a machine. Results of the Count job can be seen in the Job Queue. You could use this option after a Copy job to verify that the Copy function copied all of the files from one disk to another without error.

BrightStor ARCserve Backup provides several types of advanced count options:

- Operation—Specify whether to enable database recording.
- Pre/Post—Run commands or batch files before and after the job.
- Job Log—Determine the level of detail you want recorded in the Job Queue Log.

- Virus—Scan files for viruses before they are counted.
- Alert—Send messages about events in your operation.

Copy Utility

The Copy utility allows you to copy files from one location to another. For example, you can run a copy job on your local machine to store files and directories on another machine that is going to be backed up to media.

Copy options determine related actions that occur during or after the copy operation:

- Retry—Specify when to retry open files and file sharing options.
- Operation—Specify operation options and whether or not to enable database recording.
- Destination—Specify options for the directory structure and file conflict resolutions.
- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the detail you want recorded in the Job Queue Log.
- Virus—Scans files for viruses before they are copied.
- Alert—Send messages about events in your operation.

Purge Utility

The Purge utility allows you to delete files and directories from a machine. Results can be seen in the Job Queue.

BrightStor ARCserve Backup provides several types of advanced purge options:

- Operation—Specify some general options for the job such as to remove directories or enable database recording.
- Pre/Post—Run commands or batch files before or after the job.
- Job Log—Determine the level of detail to record in the Job Queue Log.
- Alert—Send messages about events in your operation.

Report Writer Utility

Create custom reports or generate predefined reports based on backup activity for a defined period. You can specify a query or filter report data. Generated reports can be previewed on screen, printed, and saved in either .csv or .xml format.

cabatch Utility

The cabatch Utility is a job management tool that allows you to submit and delete jobs in local or remote BrightStor ARCserve Backup job queues from the command line. You can also use the cabatch utility to modify the execution times of jobs in these queues. You can use job scripts created in the BrightStor ARCserve Backup Manager or in a text file created using the cabatch Job Information Template in the BrightStor ARCserve Backup home directory.

For more information on the cabatch utility, see the appendix "Using Command Line Utilities."

User Profile Utility

The User Profile Utility lets the BrightStor ARCserve Backup administrator manage user profiles and provide access to BrightStor ARCserve Backup.

When you install BrightStor ARCserve Backup, the caroot user profile is set up, by default, with the administrator group assigned to it. The Administrator group provides control over all BrightStor ARCserve Backup functions operating within a given BrightStor ARCserve Backup domain.

Using the User Profile utility the BrightStor ARCserve Backup server administrators can:

- Add a user.
- Delete a user.
- Change a user's password.
- Assign a user to a group.

BrightStor ARCserve Backup Command Line Utilities

BrightStor ARCserve Backup offers command line utilities that enable direct control over almost all operations that can be performed by a BrightStor ARCserve Backup server via the DOS prompt. It provides an alternative method of accessing almost all of the operations available from the BrightStor ARCserve Backup Manager.

A full description and use of these command line utilities can be found in the appendix "Using Command Line Utilities."

BrightStor ARCserve Backup Security

The following sections describe BrightStor ARCserve Backup security functionality.

BrightStor ARCserve Backup Administrator Profile

BrightStor ARCserve Backup is designed with a root-level, super user profile that provides complete control of BrightStor ARCserve Backup. This profile, referred to as “caroot,” is set up when you install BrightStor ARCserve Backup for the first time. You can set the password for caroot during installation or later using the ca_auth utility.

Important! *You should not leave the password blank for caroot.*

The caroot user profile controls access to only the BrightStor ARCserve Backup Manager and backup-related functions, and should not be confused with the security required to log in to your operating system.

Equivalence

BrightStor ARCserve Backup allows you to create equivalence to caroot for any Windows account. A user who has been granted equivalence to caroot can run all of the command line utilities but cannot log in to the BrightStor ARCserve Backup Home Page. Creating equivalence has the following advantages:

- Ease of command line usage—When you create equivalence for a Windows user, the equivalence performs an implicit login on behalf of the logged-in user whenever a command line function requires authentication. Therefore, the command line utilities can be run without requiring the user to enter a user name and password each time a command is submitted.
- Access Restriction—Although a user that is equivalent to caroot can run all of the command line utilities, the user does not have access to the BrightStor ARCserve Backup Manager. Access to the interface is granted only through the caroot account or through a BrightStor ARCserve Backup user account with the proper privileges. You cannot use an account that has only been granted equivalency to login to the interface. For more information about how to give additional BrightStor ARCserve Backup users access to the Home Page, use the ca_auth utility.

System Account

The BrightStor ARCserve Backup services require a valid Windows system account that has Administrator and Backup Operator privileges on the local machine. The services use this account to access local resources, such as the hard drive and the local network.

You are given the option of entering a Windows system account when you first install BrightStor ARCserve Backup. If you enter a Windows account during installation, BrightStor ARCserve Backup automatically grants this account Administrator and Backup Operator privileges. If you select Skip during installation, you must enter a valid Windows system account using the BrightStor ARCserve Backup Server Administrator and grant it the required privileges manually.

You can change the system account information at any time using the BrightStor ARCserve Backup Server Administrator or the bconfig.exe utility.

Equivalency and the System Account

Do not confuse the caroot user profile with the BrightStor ARCserve Backup System Account. The caroot user profile is used to control access to the BrightStor ARCserve Backup Manager and its related backup functions; the system account provides the security privileges needed by BrightStor ARCserve Backup services to operate on the local machine.

Although the System Account and the caroot user profile perform different functions, in order for BrightStor ARCserve Backup to run all of its jobs successfully, you must grant the System Account equivalency to caroot. For example, if the System Account is named BackupAdmin, and the local machine name is BAB01, use the following ca_auth command to give the account equivalency to caroot:

```
ca_auth -equiv add BackupAdmin BAB01 caroot caroot caroot_password
```

For more information on security, see the chapter "Administering the Backup Server," the appendix "Using Command Line Utilities," or the online help.

Enterprise Level Password Management Utility

When the user password changes, every job in the job queue must be modified to reflect the change. Using the ca_jobsecmgr utility you can make global user password changes for all the jobs in the Job Queue for the local BrightStor ARCserve Backup Server (default).

Syntax

```
ca_jobsecmgr [server arguments] <current security> <new security>
```

Options

For a complete description of the options for this command, see the appendix "Using Command Line Utilities."

Centralized Cross-platform Management

BrightStor ARCserve Backup offers Cross-platform Management, which simplifies administration in cross-platform environments, including BrightStor ARCserve Backup for NetWare Version 9.0 and r11.1, and BrightStor ARCserve Backup for Linux Version 9.0, r11, and r11.1, backup servers, and remote environments. Its advanced management functionality enables backup administrators to centrally monitor and administer consistent backup policies throughout the environment. From one centralized console, administrators can back up, copy, and restore any machine in your network. They can also group preferred BrightStor ARCserve Backup servers, view job status, monitor active jobs, view Activity Logs, administer various BrightStor ARCserve Backup host database systems, and customize reports.

BrightStor ARCserve Backup Enterprise Module

The BrightStor® ARCserve® Backup Enterprise Module is a separately-installed component that enables the following advanced features:

- Multiplexing up to 32 streams
- Multistreaming
- The Media Management Administrator
- Dynamic Device Sharing between the BrightStor® ARCserve® Backup Storage Area Network (SAN) Option and the BrightStor® ARCserve® Backup NDMP NAS Option.
- Multistriping for the BrightStor® ARCserve® Backup Agent for Microsoft SQL Server.

In addition, the BrightStor ARCserve Backup Enterprise Module is a prerequisite for the following advanced agents and options:

- BrightStor® ARCserve® Backup Enterprise Option for IBM 3494
- BrightStor® ARCserve® Backup Enterprise Option for StorageTek ACSLS
- BrightStor® ARCserve® Backup Enterprise Option for Microsoft SQL Using HDS Snap-Shot
- BrightStor® ARCserve® Backup Enterprise Option for Microsoft SQL Using HP-XP Snap-shot
- BrightStor® ARCserve® Backup Enterprise Option for VSS Hardware Snap-Shot

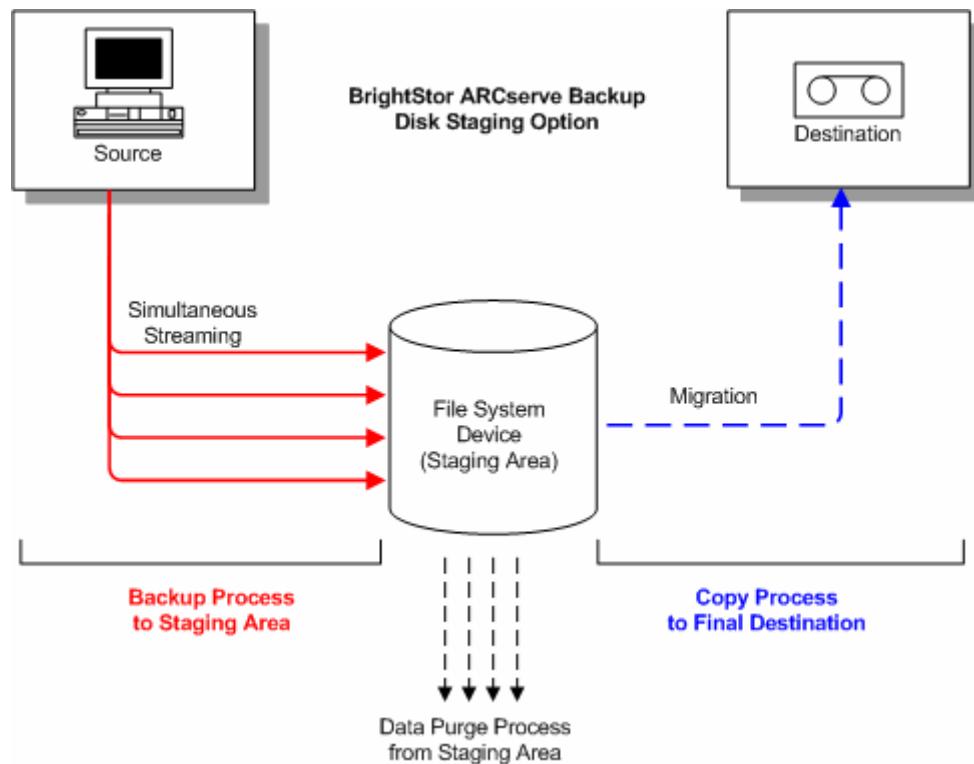
Note: For more information on advanced agents and options, see the corresponding agent and option guides.

Disk Staging Option

The Disk Staging Option allows you to back up data to a temporary data storage location (staging area), and then based on selected policy options, migrate (copy) the data to the final destination (which could be a tape or disk) or automatically purge the data from the staging area after a specified duration time. When necessary, the Disk Staging Option also allows you restore data directly from the staging area.

The Disk Staging Option is basically a two-part data backup process.

- **Backup Process**-Backs up data from the source to the staging area.
- **Copy Process**-Copies or migrates the backed-up data from the staging area to the final destination.



Disk Staging Option Overview

First, this option allows you to back up data to a file system device (FSD), which is used as a temporary staging area. A staging job can divide your backup job into several sub-jobs that run simultaneously. The Disk Staging Option allows you to utilize simultaneous streaming to send multiple streams of data to the FSD at the same time. Since the work is split up among several different drives, backup jobs with simultaneous streaming enabled can be completed significantly faster than regular backup jobs.

You can then migrate (copy) the data from the FSD to a final storage media (or from disk to tape). As a result, the tape drive can be kept streaming, thereby minimizing the shoeshine effect (starting, stopping, and repositioning the tape), and increasing both the life expectancy and efficiency of the tape drive. While the backup image is still on the FSD, data can be restored directly from it. The restore time is significantly reduced because restoring data from disk is generally faster than restoring from a tape (no delays due to tape load and seek latency).

During the backup-to-FSD process, if the FSD gets full or reaches the specified volume threshold, the Disk Staging Option allows you to create makeup jobs which would then back up the data directly to the final destination after the staging backup job fails. This increases the success rate of backups. In addition, if there are any errors during the copy-to-final destination process, the Disk Staging Option also allows you to create makeup jobs.

Note: Under disk full conditions, the makeup job created to back up the data to tape will always try to use a blank tape or a media from a scratch set. It will never try to append to an existing media.

The backup images are kept on the FSD until the retention time expires (as determined by the specified purge policy). At that time, the Disk Staging Option automatically purges the data from the FSD, and reclaims valuable disk space so that additional backups can continue.

For rotation jobs or GFS rotation jobs, the Disk Staging Option allows you to specify policies to disable staging for any particular day. This feature is helpful in situations where the FSD is full, is scheduled for maintenance, or has a problem.

Disk Staging Option Features

In addition, the Disk Staging Option provides or supports the following features:

- File System Device Capacity Management--The Disk Staging Option allows you to specify capacity thresholds of the file system device. The threshold can be represented as either the absolute value or as a percentage of the total volume capacity.
- Ensures that BrightStor ARCserve Backup does not use the full capacity of a disk. A backup job will fail when writing to a file system device if the total disk space used exceeds the threshold.

Important! *File System Devices (FSD) that are part of a staging group cannot be erased or formatted using the corresponding utility from the Device Manager window. To prevent accidental erasing or formatting of an FSD prior to the staged data being migrated to a final destination media, the Erase and Format toolbar buttons on the Device Manager window are disabled. If you want to erase or format the FSD, you can either use the command line (ca_devmgr) or disable the staging option for the selected FSD.*

- Increases your overall backup success rate. You can define staging policies that direct BrightStor ARCserve Backup to create a makeup job to back up directly to tape if an exceeds threshold condition occurs, and to create a makeup job on hold if a data migration failure occurs.
- Allows you to perform full, incremental, and differential backups.
- Pause Data Migration--The Disk Staging Option allows you to pause the migration of data from the FSD to the final destination (tape) by enabling the Pause Data Migration option. This feature allows you to continue backing up to the FSD, but pause the migration from the FSD to the final destination in case the tape library is scheduled for maintenance or has hardware problems.
- Simultaneous Streaming--Simultaneous streaming is a process that divides your backup jobs into several sub-jobs that run simultaneously. The Disk Staging Option allows you to utilize the simultaneous streaming feature to send multiple streams of data to the temporary staging device (FSD) at the same time. Since the work is split up among several different sessions (for concurrent writing to the FSD), simultaneous streaming-enabled backup jobs can be completed significantly faster than regular backup jobs. Simultaneous streaming also provides the capability to restore data while backup jobs are running.

Note: The Disk Staging Option provides you with the capability of streaming multiple jobs simultaneously to the FSD. The unlicensed Disk Staging Option allows you to stream two jobs simultaneously. To stream more than two jobs, you must license the Disk Staging Option. After you license the Disk Staging Option, you can stream up to 32 jobs simultaneously to the FSD.

- SnapLock Support--SnapLock™ is technology from Network Appliance that provides non-erasable, non-rewritable, Write Once Read Many (WORM) data protection. The Disk Staging Option allows you to enable SnapLock protection on the backup operation. When you back up data with SnapLock protection enabled, you cannot purge or over-write the backed up data until the specified retention time elapses. This ensures that the data on the FSD can not be deleted by any user, thus providing WORM support on disk with a retention time out. The retention time for the enabled SnapLock protection is determined by the specified settings for the staging Purge policies.
Note: The device must support SnapLock technology. If you enable SnapLock on a device that does not support SnapLock WORM protection, BrightStor ARCserve Backup write-protects the data, however, the data can be deleted from the device.
- Copy Image Tracking--BrightStor ARCserve Backup provides the capability to track copied images on different media. As a result, the merging of catalogs only has to be performed one time, and then all sessions which are copies of each other would point to the same catalogs.
- Flexible Restore Options--During the time period that the backed-up data is located both on the final destination media (tape) and on the FSD (prior to purging), the Disk Staging Option provides you with a choice for selecting the source for restoring the data. If the backup image is located on both the FSD and the final destination, you can choose where to restore it from.
- Smart Restore--BrightStor ARCserve Backup provides a transparent Smart Restore feature, which is further enhanced by the Disk Staging Option feature of providing multiple locations for the backed-up data. If during the restore process from either the FSD or from the final destination, a media or drive error occurs, BrightStor ARCserve Backup internally finds the alternate media and starts restoring the data from the alternate media. This increases the success rate of restores in the event of any hardware problems.
- Optimize Restore Option--If, during a restore operation, BrightStor ARCserve Backup discovers duplicate backup sessions, where one session resides on tape media and another session resides on a file system device, the Optimize Restore option directs BrightStor ARCserve Backup to restore the data from the session that resides on the file system device.
- Command Line Support--BrightStor ARCserve Backup allows you create backups to an FSD using either the graphical user interface (GUI) or the command line utility. In the event that a copy-to-tape operation fails, you can use the Query tool to analyze the file and session contents on the FSD. If you need to purge sessions from the FSD, you can use the Purge tool to remove data and free extra space on the FSD.

- Disk Staging Option Reports--BrightStor ARCserve Backup provides the capability to generate additional reports dedicated to the Disk Staging Option. Using these reports you can find the backup to disk status of every session, whether a session was copied, when the session was copied, where the session was copied, whether the session was SnapLocked, when the session will be purged from the FSD, and other valuable information.

Product Integration

The following sections include information on the products that BrightStor ARCserve Backup offers integration with.

BrightStor ARCserve Backup for Laptops & Desktops

BrightStor ARCserve Backup offers integration with BrightStor® ARCserve® Backup for Laptops & Desktops (formerly BrightStor® Mobile Backup). The product is a policy-based solution that provides continuous, intelligent backup of data from both desktop and laptop computers. It can back up all the important data on your company's laptops, remote workstations, and other computers that are frequently disconnected from the network.

However, even after this data has been backed up, the BrightStor ARCserve Backup for Laptops & Desktops server itself is still vulnerable to failure. By using BrightStor ARCserve Backup to back up your BrightStor ARCserve Backup for Laptops & Desktops data to media, you can protect yourself against the possibility of a disaster on your BrightStor ARCserve Backup for Laptops & Desktops server. To back up your BrightStor ARCserve Backup for Laptops & Desktops data, the BrightStor ARCserve Backup Agent for Windows must be installed on the computer running the BrightStor ARCserve Backup for Laptops & Desktops Server, even if the server is the local computer.

For information on how to back up and restore BrightStor ARCserve Backup for Laptops & Desktops data using BrightStor ARCserve Backup, see Back Up BrightStor ARCserve Backup for Laptops & Desktops Data in the chapter "Backing Up Data" and Restore BrightStor ARCserve Backup for Laptops & Desktops Data in the chapter "Restoring Data."

BrightStor Portal

BrightStor ARCserve Backup installs BrightStor® Portal iGateway and iSponsor by default. This facilitates communication between BrightStor Portal and BrightStor ARCserve Backup, allowing you to collect information from BrightStor ARCserve Backup and manage it using BrightStor Portal. BrightStor Portal lets you view this information from any web browser, which allows backup administrators to make policy-based decisions without installing the BrightStor ARCserve Backup Manager on their local machines. For more information on BrightStor Portal, see the BrightStor Portal documentation.

eTrust Antivirus Integration

BrightStor ARCserve Backup provides the scanning and curing components of eTrust® Antivirus, Computer Associates premier anti-virus engine to protect your data.

Note: BrightStor ARCserve Backup provides only the scanning and curing components. It does not provide a full install of eTrust Antivirus.

For more information about eTrust Antivirus integration, see eTrust Antivirus in the chapter “Administering the Backup Server.”

Microsoft Management Console Integration

If you are using Windows XP, 2000, or 2003, BrightStor ARCserve Backup seamlessly integrates with Microsoft Management Console. This allows you to customize your access to BrightStor ARCserve Backup. Using Microsoft Management Console, you can create shortcuts so that you can quickly open the powerful BrightStor ARCserve Backup components you need rather than accessing them via the program group. See the *Getting Started* for more information on how to integrate with Microsoft Management Console.

Unicenter NSM Integration

BrightStor ARCserve Backup integrates with the WorldView and the Job Management Option components of Unicenter® Network and Systems Management (NSM) (formerly known as Unicenter® TNG). The following sections include information on integration with each of these components.

Note: Prior to Unicenter NSM r11, the Job Management Option was referred to as Workload Management.

WorldView Integration

The WorldView Integration component supports Unicenter® NSM and Unicenter CA Common Services™ (CCS) (formerly known as Unicenter® TNG framework).

WorldView Integration Requirements

To integrate with WorldView, the following components are required:

- Unicenter NSM or CCS
- BrightStor ARCserve Backup
- BrightStor ARCserve Backup Unicenter Integration Option

Note: You must install BrightStor ARCserve Backup Unicenter Integration on the same computer that has the Unicenter WorldView components installed.

Object Creation

To integrate with WorldView, you must run the Object Creation program. The Object Creation program discovers BrightStor ARCserve Backup servers on the network and creates BrightStor ARCserve Backup objects in the Unicenter NSM repository. It creates these objects under each BrightStor ARCserve Backup server's Unispace

The Object Creation program also creates a business process view called BrightStor ARCserve Backup View, which represents a view of all BrightStor ARCserve Backup objects.

Note: Run the Unicenter Auto Discovery program prior to running the Object Creation program. If any new servers have been installed or the repository was rebuilt, Unicenter Auto Discovery discovers machines and synchronizes BrightStor ARCserve Backup servers on the network and objects in the repository. However, the discovery program cannot discover BrightStor ARCserve Backup UNIX on subnets not containing any Windows NT, Windows 2000, Windows 2003, and Windows XP machines. To discover these machines, you must specify the subnet containing the BrightStor ARCserve Backup UNIX machines you want to discover. To do this, use the DSCONFIG.EXE utility located in the BrightStor ARCserve Backup home directory. After specified, click the Discover Now button to discover the BrightStor ARCserve Backup Object Creation Utility.

Use the Object Creation Program

To use the Object Creation program, perform the following procedure.

Note: If you are working with a remote repository, see Remote Repositories in this chapter.

1. From the BrightStor ARCserve Backup program group, select Object Creation.
2. If you want to delete all BrightStor ARCserve Backup objects in the repository before creating new ones, select Delete existing objects. This allows you to synchronize BrightStor ARCserve Backup servers on the network and BrightStor ARCserve Backup objects in the repository. If you do not select this, the program adds new BrightStor ARCserve Backup objects and updates existing ones if necessary.
3. Click Start to proceed. When you are asked to sign on to the repository, enter the repository user ID and password, and then click OK.
4. Either wait until the process completes or click Stop to abort the operation.
5. Click Start to re-start or Close to exit the program.

Note: The setup program also creates BrightStor ARCserve Backup class definitions in the Unicenter object repository. If you rebuild the repository, all BrightStor ARCserve Backup class definitions will be removed. To recreate class definitions, re-install the program or run the CSTNGCLS.EXE utility. The CSTNGCLS.EXE utility is located in TNGWV\BIN directory (TNGFW\BIN if you are running CCS).

Remote Repositories

By default, the Object Creation program creates BrightStor ARCserve Backup objects in the local Unicenter repository. If the local WorldView is set up to work with a repository on a remote machine, the Object Creation program requires an additional parameter. To enter this parameter, run the Object Creation program from a command prompt and, from the BrightStor ARCserve Backup home directory, enter:

CSTNGX.EXE /R REPOSITORY_NAME

or

CSTNGX.EXE /R

If you do not specify the repository name with "/R" and click Start, a dialog appears prompting you to enter an available repository.

Note: CCS does not support remote repository configuration.

Unicenter Notification

BrightStor ARCserve Backup offers Alert Manager, which supports Unicenter Notification. Using Alert Manager, you can send all events to the Unicenter Event Manager Console and WorldView repository. For more information on using the Alert Manager with Unicenter, see the chapter "Using the Alert Manager."

Note: The Alert Notification Service must be running to send events to the Unicenter Event Management Console and WorldView repository.

Manage BrightStor ARCserve Backup Using Unicenter

Using the Unicenter 2D or 3D Map, you can see the BrightStor ARCserve Backup View and BrightStor ARCserve Backup Objects. When you right-click an object, the context menu opens. From the context menu, you can launch the Job Status Manager, BrightStor ARCserve Backup Wizard, Restore Wizard, Device Wizard, and the BrightStor ARCserve Backup Manager.

Job Management Option Integration

BrightStor ARCserve Backup integrates with the Job Management Option when you submit a backup job from the command line using the ca_backup.exe -waitForJobStatus, ca_restore.exe -waitForJobStatus, ca_merge.exe -waitForJobStatus, ca_scan.exe -waitForJobStatus, ca_qmgr.exe -waitForJobStatus, and cabatch.exe utilities. These utilities provide automation by using the /J (returns the job return code) and /W (wait for job completion) switches.

Note: Prior to Unicenter NSM r11, the Job Management Option was referred to as Workload Management.

When you use these utilities, BrightStor ARCserve Backup will wait until the operation is completed, and then exit with a return code that indicates the success or failure of the job. For more information on ca_backup, ca_restore, ca_merge, ca_scan, ca_qmgr, and cabatch, see the appendix "Using Command Line Utilities." Also, see cabatch Utility in this chapter.

To integrate with Job Management Option:

1. From the Command Prompt, enter caugui settings.
2. Click the Options tab on the right-hand side of the notebook.
3. Click the Job Management Option tab on the bottom of the notebook.
4. Enter Y in the Submit jobs on behalf of another user field.

5. From the Control Panel, select Administrative Tools, Services. When the Services dialog displays, highlight CA-Unicenter, right-click and select Stop. Then, right-click CA-Unicenter again and select Start.
6. Enter a Job Set.
7. Enter a Job with the following detail on the Submission Run-As tab:
 - Filename
 - User
 - Domain
 - Password
8. Demand Job.

BrightStor ARCserve Backup Preferences

To access the BrightStor ARCserve Backup Preferences dialog, from the manager windows select View and select Preferences from the menu bar.

Global Settings

You can set the following global preferences:

- Set Job Queue Refresh Rate to—Specify a time, in seconds, for periodic update of the Job Status Manager.
- Set Device Manager Refresh Rate to—Specify a time for periodic update of the Device Manager.
- Set Animated Speed to—Specify a speed at which the tape bitmap will rotate if animation is selected for the Device or Backup Manager.
- Show Removable Drives—This will display removable drives within the tree view. For example, this will display a floppy drive under My Computer.
- Show CDROM Drives—This will display CD ROM drives under My Computer within the tree view.
- Show Leaf Nodes—This will display all leaf nodes within the tree view. This means that files will be displayed under directories and that media will be displayed beneath drives.
- Auto Start All Engines—The appropriate BrightStor ARCserve Backup engines will start automatically when a manager is used.
- Show Registry —This will display the registry file in order to select for a backup.
- Default Manager—The appropriate BrightStor ARCserve Backup Manager will start automatically when BrightStor ARCserve Backup is loaded.

Library Filters

This feature applies only to library devices, and only affects those views in BrightStor ARCserve Backup in which a device or a group hierarchy is displayed (for example, in the Backup Manager under the Destination tab, or in the Device Manager view.) By default, none of the options are selected, and there are no default values for any of the choices.

Applying a filter can significantly reduce the amount of data that you have to deal with at one time, and is recommended for use with large libraries.

The library filter allows the following options:

- Show Write Protected Media in Format / Erase dialogs—Select this option to view write-protected media in all Format and Erase dialogs.
- Show Empty Slots—Select this option to view the empty slots in the library.
- Show Slots Between—Specify the range of slots to be displayed in the current manager. To define the range, enter the minimum and maximum number of slots allowed.
- Show Blank Media—Select this option to view the blank media in the library.
- Show Tapes Within Media Pool—Select this option to view the tapes within a particular media pool. Wildcards ("*" and "?") are accepted in the media pool.
- Show Tapes Matching Serial #—Select this option to view the tapes that match a certain serial number. Wildcards ("*" and "?") are accepted in the serial number.

Backup and Restore Operations on 64-bit Windows Platforms

Due to architectural differences between 64-bit and 32-bit Windows platforms, various elements of 64-bit operating systems cannot be accessed by 32-bit applications. These elements include areas of the Windows System Registry, system settings files included in a System State backup, and Volume Shadow Copy Service writers.

To overcome these limitations, and to successfully perform backup and restore operations when the BrightStor ARCserve Backup server is running a 64-bit version of Windows, you must install the 64-bit version of the BrightStor ARCserve Backup Client Agent on the BrightStor ARCserve Backup server.

This configuration lets the 64-bit Client Agent run as a native process on the local BrightStor ARCserve Backup server, which manifests the capability to perform browse, backup and restore operations on the local file system, System State, System Registry, and Volume Shadow Copy Service writers in the same manner as remote browse, backup, and restore operations using the 32-bit Client Agent for Windows.

For more information about BrightStor ARCserve Backup Agents and Options supported by 64-bit Windows platforms, see the [readme file](#).

Chapter 2: Planning Your Storage Environment

Protecting your data and managing your backup storage is fundamentally a policy issue rather than a technical problem. Technology can implement policy, but it cannot tell you what your policy should be.

Before you can use BrightStor ARCserve Backup software effectively, you need to analyze your organization's data storage requirements. You need to do the following:

- Understand how your organization's data resources are used.
- Understand how security and availability at any given time can affect your corporation's bottom line.
- Develop a comprehensive, high-level storage plan before you purchase additional hardware or configure BrightStor ARCserve Backup.

After you have a clear idea of your storage needs, this chapter can help you to develop a comprehensive implementation plan that allows for:

- Fast recovery of user-deleted files and directories, and database-related data.
- Centralized, single-point backup administration for networked systems.
- Backup operations that do not interfere significantly with normal business operations.
- Adequate quantities of media and adequate numbers of devices for your needs.
- Full recovery from catastrophic data loss.

Enterprise Storage Requirements

To determine your need for vault space, storage hardware, and storage media, you have to translate your high-level plan into a set of concrete requirements. You need to decide:

- How much you have to spend on media, hardware, and network improvements?
- How much data you really need to protect?
- When can you run backups without interfering with other work?

- How much traffic your network can handle during backup periods?
- How long you can wait for an average file or file system to be restored following a data loss?

The following sections discuss these issues in more detail.

Budget Considerations

Sometimes it pays to stress the obvious early in the planning of a major project: each of the parameters discussed in this chapter comes with a price tag attached. If you need speed, you need a faster, higher-bandwidth network and more and faster backup devices. Both require premium prices.

To meet your speed or data security requirements, you may need to buy more media. Media elements are surprisingly expensive, particularly for newer and faster backup devices.

You need to decide how much your organization can afford:

- To spend on a backup and recovery solution
- To lose in lost data and staff time

Then, do the following:

- Decide what you are prepared to do in order to keep both kinds of costs in bounds.
- Decide whether performance or economy is your primary concern.
- Evaluate the trade-offs discussed in the next section in light of this initial decision.

Network and Computer Infrastructure Requirements

If you have not already done so, you should familiarize yourself with the hardware, network, and site configuration that your backup and recovery plan supports. You should know:

- The numbers and types of computers and workstations you need to back up.
- The identities of computers that have media libraries or devices attached (these are the BrightStor ARCserve Backup servers).
- The type of SCSI or fiber cabling connecting each library to its server and the transfer rate of the cabling.
- The type of library on each server.
- The type of devices in each library and their transfer rate.

- The degree of data compression that you plan to use, if any.
- The types and capacities of your network, subnets, routers, and so on.

Data Transfer Requirements

The overall data transfer rate for your backup and recovery system sets the amount of time required for storage operations. You have to balance your backup window, backup data, and recovery speed requirements against the capabilities of your existing infrastructure and the budgetary constraints of your organization.

After you have quantified the amount of data that you have and the times when you can back it up, you can roughly estimate the minimum data transfer rate that you must achieve to fully back up the data in the allotted time. Use this requirement as a starting point for the decisions you make later in this chapter.

To calculate a rough, minimum transfer rate, divide the amount of data by the amount of time available to back up the data:

$$\text{data}_\text{backup} \div \text{backup_window} = \text{required_rate}$$

For example, if you have 1 Terabyte to back up and 5 hours available each night and you intend to back up everything in one session, you need to achieve a rate of 200 GB per hour.

Backup Schedule Requirements

The more data you have, the more time, hardware, media, and network bandwidth you require.

You need to decide:

- Whether you need to back up user data only.
- Whether you must also include system configurations and installed applications.
- Estimate the total size for the data that you must back up, allowing a reasonable margin for growth based on past experience in your organization.

Data Backup Window Considerations

As well as the amount of data that you have to back up, your infrastructure and management requirements will depend on the time that is available for backup operations in any given period. Ask yourself the following questions:

- Can you run backups during non-working hours, at night or on weekends?
- Do you have to run backups concurrently with normal business operations because your network is in use round the clock?

Identify the blocks of time that are available during the day and the week. If your organization shuts down for any long periods during the month or year, you might consider these times as well.

Hardware Data Transfer Rates

Your backup hardware is unlikely to be a limiting factor in reaching your target data transfer rate. Most devices are very fast. However, you should evaluate hardware speed at the planning stage. At a minimum, you must have enough hardware, or fast enough hardware, to write your data to storage media within the time allowed. Smaller numbers of fast devices or larger numbers of slower devices can often achieve the same total throughput. Use the information that follows to estimate the aggregate data transfer rate for your hardware.

SCSI or Fibre Interface Considerations

No device is faster than its connection to its data source. Current backup devices connect using standard SCSI or fibre interfaces. The following table lists the common varieties.

Version	Bus Width	Approximate Maximum Data-transfer Rate
Wide Ultra SCSI	16 bits	40 MB/seconds=144 GB/hour
Ultra2 SCSI	8 bits	40 MB/seconds=144 GB/hour
Wide Ultra2 SCSI	16 bits	80 MB/seconds=288 GB/hour
Ultra 160 SCSI	16 bits	160 MB/seconds=576 GB/hour
Ultra 320 SCSI	16 bits	320 MB/seconds=1152 GB/hour
Fibre Channel	1 Gb	100 MB/seconds=360 GB/hour
Fibre Channel	2 Gb	200 MB/seconds=720 GB/hour

You can see that many of the SCSI interfaces and fibre interfaces will be able to handle your requirement of 200 GB per hour. For example, if you are using a Wide Ultra2 SCSI you can achieve 200 GB in less than an hour. Even if you are using a slower SCSI controller you can use multiple SCSI controllers to achieve the aggregate data transfer rate of 200 GB per hour.

Obviously, the SCSI bus or fibre interface should seldom limit your ability to achieve your required data transfer rate. Any of these SCSI varieties could easily meet the 40 GB per hour requirement in our example. Indeed, most could handle the whole 200-GB job in under two hours. A Wide Ultra 160 SCSI could do it in about 30 minutes.

Tape Drive Considerations

There are many kinds of devices. A few of the most common are listed in the following table.

Device type	Approximate Transfer rate 2:1 (compressed data)	Maximum Capacity (compressed data)
DDS-4	6.0 MB/seconds=21.0 GB/hour	40 GB
AIT-2	12.0 MB/seconds=43.2 GB/hour	100 GB
AIT-3	31.2 MB/seconds=112.3 GB/hour	260 GB
DLT 7000	10.0 MB/seconds=36.0 GB/hour	70 GB
DLT 8000	12.0 MB/seconds=43.2 GB/hour	80 GB
Super DLT	24.0 MB/seconds=86.4 GB/hour	220 GB
Mammoth-2	24.0 MB/seconds=86.4 GB/hour	160 GB
Ultrium (LTO)	30.0 MB/seconds=108.0 GB/hour	200 GB
IBM 9890	20.0 MB/seconds=72.0 GB/hour	40 GB
IBM 3590E	15.0 MB/seconds=54.0 GB/hour	60 GB

Even though a single device may not be able to give the data transfer rate of 200 GB per hour set by our example, using multiple media devices should be able to achieve this aggregate transfer rate. For example, if you are using Ultrium tape drives, you need 2 tape drives to achieve 200 GB per hour, or 5 DLT 8000 drives to achieve the same throughput.

Network Bandwidth Considerations

Now you need to consider your network. More than any other factor, your available network bandwidth determines the amount of data that you can realistically transfer during a backup period. The following table compares the performance of different types of networks. As you can see, network performance can significantly impede large backup operations.

Network Type	Theoretical Transfer Rate	Realistic Throughput	Realistic Transfer Rate*
10Base-T Ethernet	10 mbps =1.25 MB/seconds	40-50%	500 KB/seconds=1.8 GB/hour
100Base-T Ethernet	100 mbps=12.5 MB/seconds	80%	10 MB/seconds=36 GB/hour
1 Gigabit Ethernet	1000 mbps=125 MB/seconds	70%	87.5 MB/seconds=315 GB/hour

* If you are backing up concurrently with other operations, remember that your backup operations will not achieve the maximum, realistic transfer rate listed.

Data Transfer Requirements and Resources Calculations

If the preliminary calculations outlined in the preceding sections show that your required data transfer rate is feasible given your existing infrastructure, you may be able to stop here. However, preliminary calculations usually uncover conflicts between stated requirements and available time and resources.

If minbandwidth is the amount of data that can be sent in a given time through the narrowest, slowest bottleneck in the path from the backup source to the backup media and if backupwindow is the time available, then the backup process is governed by the following equation:

$$\text{datatransferred} = \text{backupwindow} \times \text{minbandwidth}$$

In our example, we have a 5-hour window, fast storage devices, and 100Base-T Ethernet. So the Ethernet LAN is our weakest link, and the following equation is true:

$$\text{datatransferred} = 5 \text{ hrs} \times 36 \text{ GB/hour} = 180 \text{ GB}$$

Therefore, to back up 1 Terabyte of data, you have to do at least one of the following tasks:

- Increase the amount of time available to back up data.
- Increase the bandwidth available at the narrowest part of the data path.
- Reduce the size of *datatransferred* by backing up our 1 Terabyte in a series of smaller, independent operations.

The following sections suggest several possible alternatives that will achieve one or more of the above tasks.

Data Path Considerations

If you cannot decrease the amount of data that you need to move in the time available, then a possible solution is to increase the available bandwidth. You can do this either on the network that links data hosts to the BrightStor ARCserve Backup server or in the hardware that connects the server and the backup media.

Network Enhancements

The network is usually the most significant source of delays in the enterprise-backup environment. If a faster technology is available or feasible, an upgrade may be a good investment.

For example, if we have a 100Base-T Ethernet LAN and the same data transfer requirement as in the example we have been using so far (200 GB per hour), we cannot get backups done in the time allowed (5 hours). It would take approximately six times as long as we have to back everything up. A Gigabit Ethernet network would back up everything with time to spare and would benefit other business operations as well.

Storage Area Networks

A Storage Area Network (SAN) can improve backup performance significantly by moving data over the high-speed fibre connections rather than the slower network connections. In addition to the performance benefits derived from the high bandwidth fibre connectivity and low host CPU utilization, a SAN also improves the overall network performance by off loading the backup data transfer from the enterprise network to a dedicated storage network.

Though a SAN is expensive to implement and maintain, benefits go beyond just backup. A careful analysis of your requirements is necessary before a decision is made to implement a SAN. For information on how BrightStor ARCserve Backup can help you take advantage of a SAN, see the *Storage Area Network (SAN) Option Guide*.

SCSI Bus and Device Enhancements

In cases where poor device throughput is the limiting factor or when you have excess capacity on a fast network, you may need higher performance devices or more of your existing devices. If you use an older, slower drive technology, it may pay to upgrade to higher speed devices and faster SCSI buses. But in many cases, it may be better to add devices and, where necessary, libraries. You can then run storage operations in parallel using several devices at once.

Alternate Data Path Considerations

If you cannot upgrade the network or expand the time available for backups, you can almost always reduce the size of the data set that has to be handled during any particular instance of your backup. You achieve this by doing one of the following tasks:

- Segment your network.
- Segment your data so that it is backed up during a series of successive backups.
- Restrict the scope of your backups such that they only store data that has changed since the data set was last stored.

Segment Your Network

In many cases, you can make better use of your existing network bandwidth by placing BrightStor ARCserve Backup servers on different subnets.

- In the absence of subnets, all backup data has to cross a single network to reach the BrightStor ARCserve Backup servers. In effect, every piece of data travels sequentially to every node on the network.
- When you subnet your network, in effect you create two or more networks of equal speed, each of which handles a fraction of the backup data. Data travels in parallel.

In our example, if we backed up 500 GB on two subnets instead of 1 Terabyte on the entire network, we could back up twice as fast. Each subnet could transfer its 500 GB at 36 GB per hour for a total elapsed time of 14 hours (versus 28 hours). In our 5-hour backup window, we could transfer 360 GB, which, though not enough, is still far better than the 180 GB we could attain over a network that is not subnetted.

Segment Data

Nothing forces you to treat all of your organization's data as a single unit. It often makes better sense to *segment* the data into logically related chunks before trying to back it up. This reduces the time required for any single storage operation, makes better use of short backup periods and works better on slow networks. You still back up all of your data. You just do it in a series of shorter operations spread over several days.

We might, for instance, back up 20% of the 1 Terabyte of data in our example each night, Monday through Saturday. In the course of a week, this approach would back up our entire 1 Terabyte across the 100Base-T network, without exceeding the daily 5-hour backup period. As an added benefit, the compact backup elements make locating and restoring our data faster and easier by reducing the scope of searches.

The downside of this approach is that the entire data will not be backed up daily. Most organizations cannot afford to not have daily backups of complete data; therefore, this approach may not be suitable.

You might segment your data for backup purposes in any of the following ways:

- Business function (such as accounting, engineering, personnel management, sales, and shipping)
- Geographical location (such California development lab, St. Louis distribution center, New York business office, Miami business office, Tokyo business office, and Paris distribution center)
- Network location (such as NA005, NA002, NA003, JP001, and EU001)

Your segmentation scheme should, however, group the data into reasonably contiguous backup sources, so that the speed you gain is not lost in lengthy searches and additional network traffic.

Backup Scope

After you have segmented your data, you can further reduce the required data transfer rate by reducing the scope of some backups. Typically, a relatively small percentage of your data changes from day to day. While these changes need to be saved, a full backup is usually unnecessary.

For example, if you try to back up everything daily and only 10% of the data changes in the course of a day, you are spending 95% of your limited backup time storing data that is already backed up. When you include media consumption and wear and tear on your backup devices, this can be an expensive proposition.

You should consider backing up everything weekly, after 50% or more of your data has changed. You could then use the longer, weekend backup period for your longest storage operation. On a daily basis, you could back up the changes only. This would let you stay within the short, nightly back up window and would economize on media.

BrightStor ARCserve Backup provides options for you to address this issue with the following types of backups.

- Full backups—stores everything, regardless of when the data last changed.
- Differential backups—stores files that have changed since the last full backup.
- Incremental backups—stores files that have changed since the last full or incremental backup.

Creating the right mix of full and partial backup operations is something of a balancing act. Ideally, you want each version of each piece of data backed up once. You want to minimize unnecessary duplication that consumes media and time. Therefore, you should keep the following considerations in mind:

- Full backups store all of your data at once. They produce a complete, coherent image of the data as it was at the time of the backup. They also store the backed up data together in a single, easily managed storage object. As a result, backup strategies that rely exclusively on full backups are usually inefficient because the relative percentage of new data in the overall data set is generally small. Full backups save too many files that are already adequately backed up by a previous storage operation.

In exceptional situations, however, where the bulk of an organization's data changes substantially over short periods, a plan that relies on full backups exclusively may be the best choice. Because, in this case, most of the data is fresh at any given time, the full backup may actually be less prone to needless duplication than a mix of full and partial storage operations.

- Incremental and differential backups let you avoid network congestion and excessive media consumption. They better fit your existing hardware and bandwidth constraints and mesh better with your users' working hours. Incremental and differential backups are faster than full backups. If you do several of them between full backups, many files are still backed up more than once, because the differential backup backs up all files that have changed since the last full backup. This redundancy means that you can restore quickly, because all the data you need for a full recovery is stored in, at most, two data sets (the full and the last incremental).

Incremental and differential backups are only economical when the volume of changes is small compared to the volume of the data set as a whole. When this is the case, you can store changes on a small amount of media that is rewritten frequently.

Parallel Storage Operations (Multiple Streaming)

If device transfer rates limit your operations and if the necessary network bandwidth is available, you may want to set up your operations to use all of the available devices at once. By distributing the data across parallel streams, this approach greatly reduces the time required for backup operations. It does, however, consume more network bandwidth. Recovery after a catastrophic loss may be faster, since all available devices collaborate to restore all or most of the backup data at once. BrightStor ARCserve Backup has the capability to automatically create multiple streams based on the availability of tape devices.

Storage Capacity Requirements

So far, we have discussed factors that affect the speed with which backup and restore operations can be performed. But you also need to consider the volume of online data storage that you require.

Online Recovery Data Storage Requirements

You need to figure out how much recovery data you need to store online, in your robotic libraries. Data that is used primarily for archival purposes or for recovery after a catastrophe can be stored offline in a repository or vault. It is unlikely to be needed quickly. But recent backup data generally has to be available in a robotic library so that users can easily locate and swiftly recover the most recent, intact copies of the files they are most likely to lose.

To calculate the amount of recovery data you must store online, perform the following steps:

1. Estimate the size of an average, full backup.
2. Add the estimated size of an average incremental backup.
3. Multiply by the number of backup sets that your organization wants to have immediately available ("1" for the most recent, "2" for the two most recent, and so on). This is the amount of recovery data you need to keep online:

```
recoverydata = (avgsizefull + avgsizeincrements) × numberbackupskept
```

Backup Data Storage Requirements

You need to reserve online storage space for scheduled backup operations.

To calculate this space:

1. Estimate the size of an average, full backup.
2. Add the average, percent growth of the data set during a typical, full backup cycle.
3. Add the estimated size of an average incremental backup.
4. Add the average percent growth of the data set during a typical, incremental backup cycle.

Storage Capacities and Resources

Your ability to meet your storage-capacity requirements depends on the following criteria:

- The types of libraries you have
- The number of each type you have
- The types of media each library uses

After you have identified types and numbers of libraries that will be available, you can calculate the capacity of each library using the following formula:

`totalcapacity = numberslotsavailable × mediaelementcapacity`

In this formula, the `numberslotsavailable` is the number of slots available in the robotic library and `mediaelementcapacity` is the capacity of the media elements used by the installed drives.

Media Capacities

The raw capacity of the media varies with the type of drives, the type of media, and the degree of data compression that you are using. You should deduct the following from the raw capacity to arrive at the real data capacity:

Deduct ~10% for overhead.

This allows for the BrightStor ARCserve Backup media header and various engine-specific overhead information. Note that the overhead may be more if you are backing up a large number of very small files.

For example, if you try to back up 1 Terabyte on ten media elements that hold 100 GB each (after deducting overhead), media usage will require 100% efficient every time you back up. Because this is unlikely, you need to use eleven media elements. On the other hand, you can back up 1 Terabyte to six cartridges that hold 200 GB each (after deducting overhead), because you have a healthy 200-GB (20%) cushion.

The allowances specified above are important. If you do not set aside space for overhead and variations in media usage, you may run out of media during a backup operation and may, consequently, not have a timely and complete backup.

Factors Affecting Storage Capacity Calculations

Media elements have lifetimes that are usually specified in usage time or numbers of uses or passes across the media. Make sure you take media aging into account when calculating the number of tapes required. Consult the manufacturer's recommendations.

Restrictive media-selection criteria and extensive off-site storage can increase your need for media well beyond the minimums calculated previously.

Finally, the overall size of the data you need to back up usually increases over time. The amount of data increases faster in some organizations than it does in others, but the total amount almost always increases. The preceding calculations assume a more-or-less constant amount of data. So, when you estimate how much you need to back up (1 terabyte in the examples), always allow for growth. Then check periodically to be sure that you always have enough extra storage to accommodate emerging needs.

Testing Plans and Assumptions

After you have made the required estimates, performed all the necessary calculations, and formulated a plan that should work for your organization, you should test it. Set up a pilot test configuration using a scaled down environment and run tests.

Note: You can simplify the pilot tests by using file system devices. You can set file system devices to /dev/null, thereby eliminating the requirement of dedicated disk space for pilot tests.

Using the BrightStor ARCserve Backup logs, you can see how good your estimates were. Use the backup logs to:

- Determine if you estimated the correct amount of backup data correctly by checking the size of a full backup generated by your plan.
- Check your estimate of the average percent change in your data by checking the size of the incremental backups.
- Make sure that all the data that should be backed up is backed up.
- Verify if your data and network segmentation tactics have worked as intended.

Catastrophic Events

So far, we have focused on the major threat to your data—routine losses due to equipment failure or operator error—and on the processes common to all backup and recovery efforts. But there are some additional considerations when you are planning your organization's recovery from a major catastrophe.

A catastrophe is a natural or man-made disaster, such as a fire or flood that results in the loss of multiple hosts, a data center, or an entire network, including locally stored backup media and hardware. To handle an extreme emergency, you must provide secure, off-site storage for some of your backup media, and you must keep the off-site data current.

Risk Assessment

Before going further, decide what sorts of disaster you can realistically prepare for, given the importance of your data, the expense of protecting it, the magnitude of the risk, and the corporate policies that apply to your sites.

Consider the following questions.

- What is the likelihood that your organization will face a large-scale disaster that affects the whole region or metropolitan area? Such catastrophes might include earthquakes, large floods, or acts of war.
- What is the likelihood of smaller disasters, such as building fires, localized flooding, or vandalism?
- How much data would you lose in a large disaster? In a small disaster?
- How severely would the loss affect your organization in each case?
- How much is your organization prepared to spend to defend against each of the risks you identify?

Off-Site Repository Considerations

In storage management, the selection of an off-site repository or *vault* is the result of a series of trade-offs.

Vault Security Considerations

The vault should be isolated enough from your main facility to protect the off-site data from the kind of catastrophes you are prepared to guard against.

For example:

- If earthquakes are the biggest threat you need to deal with, the vault should be in an earthquake-resistant building at some distance from your main site or even in another city or a different seismic zone.
- If fire or local flooding is the danger, a storage room in an upper floor of the building across the street might be enough.

Vault Accessibility Considerations

Measures that isolate your data repository from your primary site also make it harder (and more expensive) to keep the data in the remote repository current. To be of use, off-site data has to be reasonably up-to-date, which means it has to be reasonably accessible. A vault in a distant city might protect the data against even the most extreme disasters, but it might be impractical to ship media there on a daily basis.

Vault Expense Considerations

In general, the more secure a vault is, the more expensive it is to use. You pay more for more secure storage facilities. It often takes longer to get media to and from these facilities. The more media you store off-site, the more you have to buy for your main site.

Disaster Recovery Archive Considerations

Because catastrophes will, by definition, strike your infrastructure as well as your backup media, you should assume that you will have to rebuild systems completely before you can start the actual data recovery. For this reason, you should always maintain the following off site:

- Media elements that contain bootable operating systems for the BrightStor ARCserve Backup servers.
- A current, complete backup of the file systems, databases, and mail servers supported by BrightStor ARCserve Backup.

You may want to include BrightStor ARCserve Backup distribution media and a text file that lists your hardware configuration parameters.

Disaster Recovery Testing

To be sure that your data is available after a disaster, you have to periodically test the data that you are archiving. Routine file-backup routines get tested every time a user cannot restore a deleted file. You soon hear about problems and, in general, the results are not too costly. But disasters are, by definition, rare and expensive. When your data center has just burned down, it is too late to find out that your backup routine does not work. So be sure to test these infrequently used processes on a regular basis.

Whenever you install new software or hardware, or change existing procedures, complete the following tests:

- Backup to media as you would for off-site storage and disaster recovery.
- Verify that the backup operation stored all the specified data successfully.
- Simulate a post-catastrophe recovery operation using the backup media from the test.

You should also run brief, simulated, backup and restore operations whenever the opportunity arises. Routine testing lets you exercise and assess your storage processes on an ongoing basis.

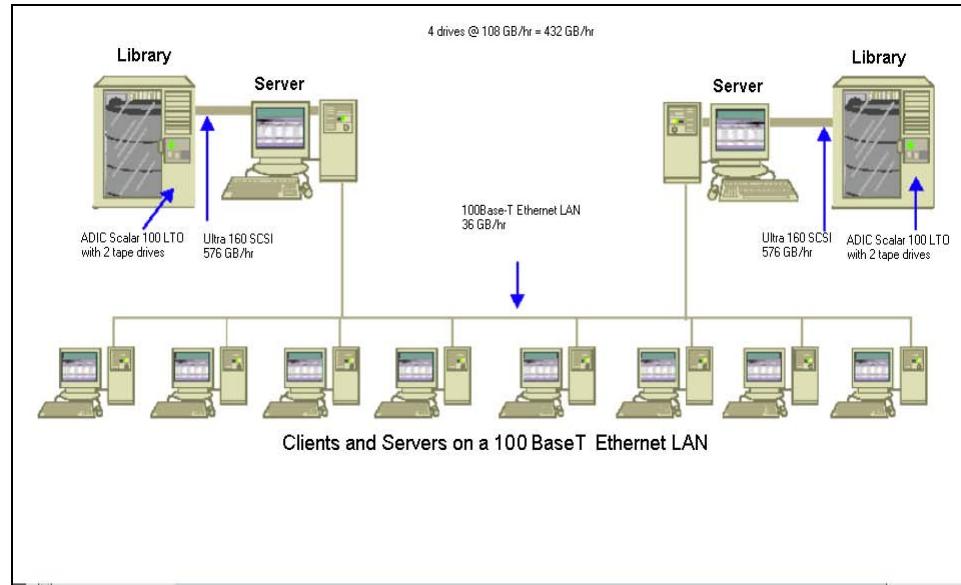
Sample Calculations

The examples below illustrate some representative situations that a backup and recovery plan has to deal with.

Note: It is assumed that the backup server has enough CPU power and memory, and the hard disk speed on the client or server is adequate.

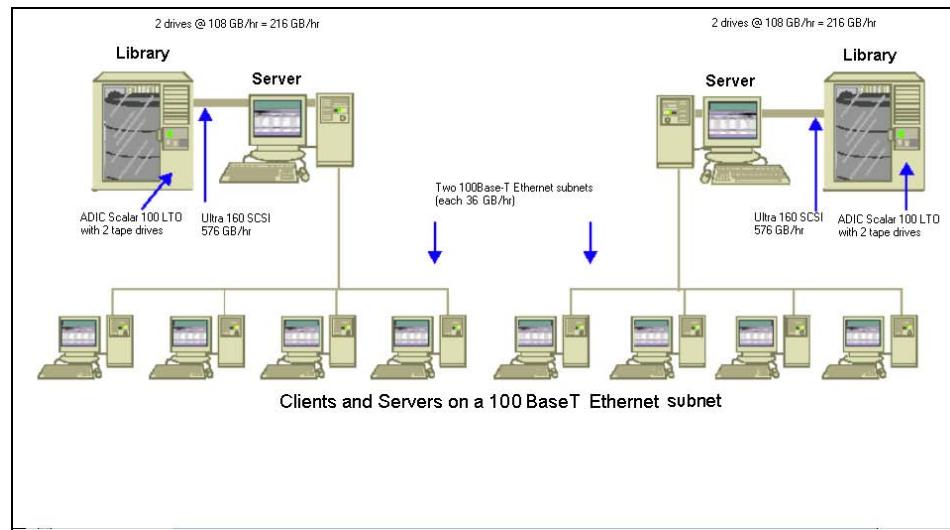
Transfer Rate for Clients and Servers on a 100Base-T Ethernet LAN With No Subnets

In this configuration, data cannot move across the network faster than 36 GB per hour, regardless of the number of servers and libraries available. To back up 1 Terabyte of data, the backup operation must run for 28 hrs.



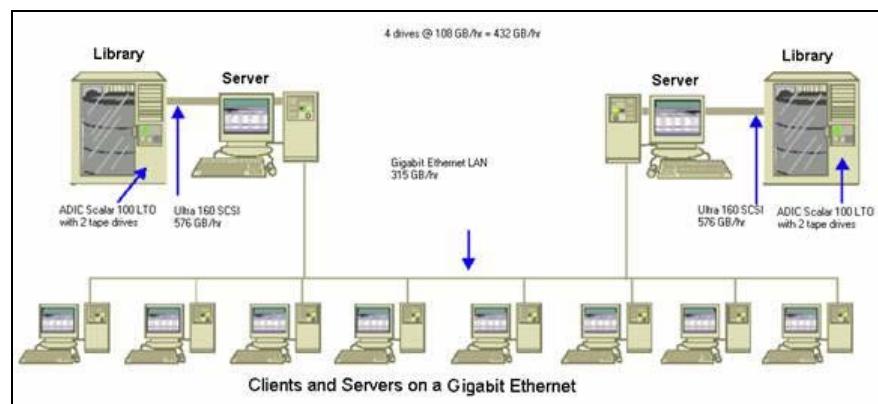
Transfer Rate for Clients and Servers on Two 100Base-T Ethernet Subnets

In this configuration, you can move twice as much data at the 36 GB per hour 100Base-T data rate. To back up 1 Terabyte of data, each subnet has to handle only 500 GB, so the operation takes 14 hours. Some performance is lost because the network cannot keep the media drives in each library streaming along at their combined 36 GB per hour optimum speed.



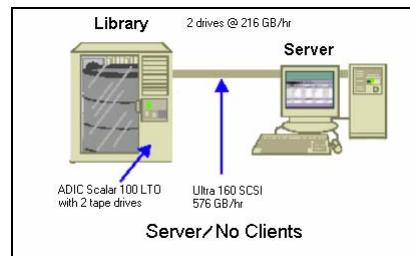
Transfer Rate for Clients and Servers on a Gigabit Ethernet Network

In this configuration, you move data at 315 GB per hour data ratio. To back up 1 Terabyte of data, the backup operation must run for 3 hours.



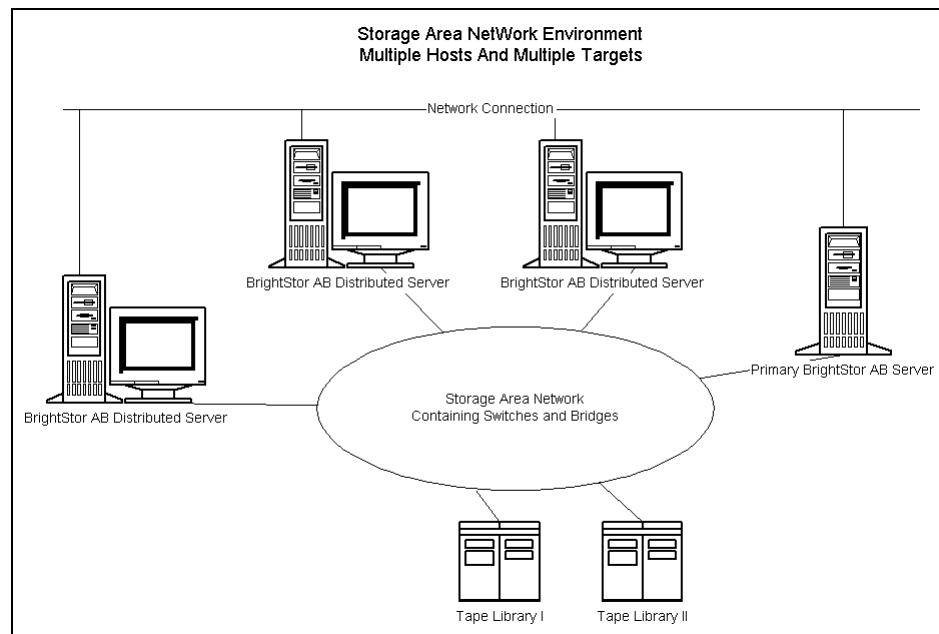
Transfer Rate For a Server With No Clients

In this case, the 216 GB per hour drives are the limiting factor, assuming that disk system or server is not the bottleneck. The system would take 5 hours to back up 1 Terabyte.



Transfer Rate For Server With SAN Option

In this configuration, local backups of each server on the SAN can achieve a data transfer rate of 432 GB per hour.



Storage Capacity For Two Sets of Recovery Data, One Full and One Incremental Backup

Assume the following:

- You have to do a full backup of 1 Terabyte of user data per week.
- You have to do daily incremental backups.
- About 10% of the data changes daily.
- The data from the last two backup cycles are available, online, for fast recovery.
- You are using LTO tape drives with 2:1 compression in a library with 20 slots.
- All media are used as efficiently as possible.

First, calculate the amount of capacity you need to store the output of the current backup operations. LTO media elements have a raw capacity of 200 GB with 2:1 compression. After you deduct 10% for overhead, the real capacity is close to 180 GB. The 1 Terabyte full backup thus requires:

$$1 \text{ Terabyte} \div 180 \text{ GB / media element} = 6 \text{ media elements}$$

Using the above equation, you can also calculate the safety margin as follows:

$$(6 \times 180 - 1000) \div 1000 = 8\%$$

Because six tapes (1 Terabyte) provide an 8% safety margin, you do not need to add extra tapes. In this example, you need only 6 LTO tapes to store a full backup. Based on the rate of change you estimated, the incremental backups amount to:

$$1 \text{ Terabyte} \times 10\% \text{ changed} \div \text{incremental} \times 5 \text{ incrementals} = 500 \text{ GB changed}$$

Therefore, at a minimum, you need the following:

$$500 \text{ GB} \div 180 \text{ GB / media element} = 3 \text{ media elements}$$

Because three tapes (500 GB) provides a 9% safety margin, you do not need to add extra tapes. You need only three tapes to store a single set of incremental backup data.

Next, calculate the amount of storage space you need for your online recovery data. You need to retain the last two backup sets in the library, so you need 9 tapes for the oldest set of recovery data and 9 tapes for the newest set. To store your recovery data you need 18 tapes.

Therefore, your total storage requirement is as follows:

9 tapes for current backup + 18 tapes for recovery = 27 tapes

Next, you calculate the capacity of the library by deducting cleaning slots:

20 slots/library - 1 cleaning slot = 19 available slots

Therefore, you have a deficit of $27 - 19 = 8$ slots and must do one of the following:

- Add a library.
- Compress the stored data.
- Store only one set of recovery data online.

Chapter 3: Backing Up Data

BrightStor ARCserve Backup allows you to back up most machines attached to your Windows network using one of the following sources:

- Administrative shared drives
- User-shared files, directories, and drives

Because BrightStor ARCserve Backup separates and lists Windows machines by the domain or workgroup to which they belong, you can easily back up all the machines belonging to a specific domain or workgroup, by selecting the name of the domain or workgroup.

The optional BrightStor ARCserve Backup Client Agents allow you to communicate with remote workstations in various environments. This provides complete system backups, including system information from non-Windows systems, such as NetWare or UNIX.

Similarly, the optional Backup Agents allow BrightStor ARCserve Backup to back up and restore online databases such as Microsoft Exchange, Lotus Domino, Microsoft SQL Server, Oracle, IBM Informix and Ingres.

If you have Unicenter NSM installed, you can use the monitoring agent to monitor BrightStor ARCserve Backup. This agent can be used to start and stop services, monitor the status of the BrightStor ARCserve Backup processes and media, and report on the failure of backup jobs. For more information, see Unicenter Monitoring Agent."

Backup Wizard

The Backup Wizard guides you through the process of creating and submitting a backup job of a single machine without running the Backup Manager. For procedural information on how to submit backup jobs using the Backup Wizard, see the *Getting Started*.

Backup Manager

The Backup Manager lets you customize your backup jobs using filters, options, and scheduling. For procedural information on how to submit backup jobs using the Backup Manager, see the online help.

You can use the Backup Manager to:

- Back up to various media or create a customized backup scheme.
- Use filters to selectively exclude or include directories and files from backup jobs.
- Create an automated backup scheme using the Grandfather-Father-Son (GFS) rotation scheme.
- Apply filters to local source objects (such as volumes and nodes) or globally to the entire backup job, or to both at the same time.

BrightStor ARCserve Backup allows you to back up the Windows registry as well as the system state for Windows systems. Each backup job requires a source and a destination (media). The Backup Manager screen provides four tabs to customize your backup job:

- Source
- Staging
- Destination
- Schedule

Specify the Source

The source is the path that you want to back up. You can easily find the files you want to back up by browsing through the left panel to select the user-shared drives and directories.

When selecting a source, you can either choose to back up an entire server or you can select individual drives, directories, and files to back up. To select an entire server, click the green box next to the server name. When you do this, all of the drives, directories, and files on the server are automatically selected.

To select individual drives, directories, and files to back up, expand a server name and click the green boxes next to each drive, directory, and file.

Local Backup Options

You can right-click individual drive, directory, and file names to customize local backup options. If you have database agents installed, you can also right-click them to customize local backup agent options. If you want to customize local backup or local backup agent options, your job must be packaged explicitly, which means you must select drives, directories, files, or database agents individually as your source even if you want to back up an entire server. You cannot click the green box next to the server name, and then customize local backup options for individual drives, directories, files, or database agents. For more information on using local options, see Local Backup Options in this chapter. For more information on dynamic and explicit job packaging, see the *Getting Started*.

Backup Manager Considerations on 64-bit Windows Platforms

If the BrightStor ARCserve Backup server is running on a 64-bit Windows platform, the following considerations apply:

- Removable drives on the local machine (for example, floppy, flash, CD, and DVD drives) do not appear in the Backup Manager Source directory tree.
- Objects backed up using jobs packaged locally on the 64-bit Windows machine are backed up using the 64-bit Windows Client Agent. The backed up objects can include files, folders, drives, System State files, the Windows Registry, and Volume Shadow Copy Service writer backups.
- Database agent objects backed up using network-based communication (for example, Oracle and Microsoft Exchange) appear in the Backup Manager Source directory tree in the same manner—regardless of whether they were backed up using a 32-bit or 64-bit Windows platform.

Entire Node Backup

If you want to back up an entire node, BrightStor ARCserve Backup provides the capability to backup all file systems and databases on the specified node. The benefits of backing up an entire node are as follows:

- You can direct BrightStor ARCserve Backup to back up a selected node and all of its contents with a single click in the Backup Manager directory tree. BrightStor ARCserve Backup will back up all file systems, databases, and drives in the directory tree when you specify the node.
- You can create a single backup job for the entire node. Tracking several to many backup jobs on a single node can become a difficult and time consuming maintenance task.

- You can modify the node without having to modify preconfigured backup jobs. For example, if you add a drive to the node, BrightStor ARCserve Backup detects the new drive automatically and backs up the entire node when you run the backup job.

Note: This feature supports Centralized Cross-platform Management, as discussed in the chapter “Introducing BrightStor ARCserve Backup.”

Security and Agent Information Dialog

When backing up a node that includes database files, you must provide proper authentication to access all databases when creating the backup job. Proper authentication includes the User Name and Password for the corresponding databases. You do not need to provide this authentication when the backup job runs.

To facilitate database authentication, BrightStor ARCserve Backup presents the Security and Agent Information dialog when you are creating a backup job on an entire node. The Security and Agent Information dialog opens as you click the Submit toolbar button, or if you select Save or Save As from the File menu on the Backup Manager window.

The Security and Agent Information dialog serves two purposes:

- Display a list of all database files on the node.
- Set or change the User Name and Password for the database item selected in the Security and Agent Information dialog.

To back up an entire node containing database files, perform the following procedure:

1. From the Source tab of the Backup Manager, select the node that you want to back up.
2. Click the Submit toolbar button.

If the node contains database files, the Security and Agent Information dialog opens to display a list of all databases on the node, User Names, and Passwords.

3. Optionally, to set or change a User Name or Password, click the Security button. Enter the appropriate User Name and Password and click OK.

Note: In the Security dialog, you must specify User Name and Password with backup rights on that machine. For example, Administrator or root.

4. Click OK.

The Submit dialog opens. For procedural information on how to submit backup jobs using the Backup Manager, see the online help.

Specify the Backup Destination

The destination is the backup media device or disk. You can use the Destination tab in the Backup Manager to browse to and select the groups and device. Place an asterisk in the Group or Media field to use the first available drive and media in the group. If you want to use any available group, click the Use Any Group option. If you want to use a specific media pool, select it in the Media Pool field.

Note: If you select a Media Pool, BrightStor ARCserve Backup automatically checks the other destination and backup options you selected to verify that no restrictions or conflicts occur when you run the job. If BrightStor ARCserve Backup detects a conflict, a warning dialog opens.

To back up to disk using the Disk Staging Option, use Device Configuration and Device Group Configuration to configure the staging device. For more information about staging data, see the section "Backing Up Data Using the Disk Staging Option" in this chapter.

Wildcard Usage with Tape Library Groups

The wildcard characters' asterisk and question mark are supported in the Group field. When wildcard characters are used to specify a job's library group destination, the job is sent to a group whose name matches the criteria and has at least one available media, as long as there is at least one available drive associated with the library. A media is available when it is not being used by another job (Note: no special consideration is given to media suitability as determined by the job schema; for example, Media Pool). If more than one job uses wildcards and more than one group matches the selection criteria, all jobs go to the first group with an available media.

Typing a name in the media field forces the job to be directed to a group that matches the criteria and contains the specified media, even if the media is busy. If there is no media with the specified name in any of the matching groups, but there is a blank media in a matching group, it is used and renamed. If there is no blank media, the user is prompted to insert one.

Note: The media field does not support wildcard characters.

When a media pool is specified, a media from that pool is used if there is one available in the first matching group. If there is no such media in the group, but there is a blank media, it is renamed and added to the pool. If there is no blank media the user is prompted to insert one.

Backup Job Schedules and Rotations

You can configure your backup job to use a custom schedule or a rotation scheme by using the BrightStor ARCserve Backup template schemes or by specifying your own rotation parameters. You can also specify a repeat method and the following backup methods for each backup:

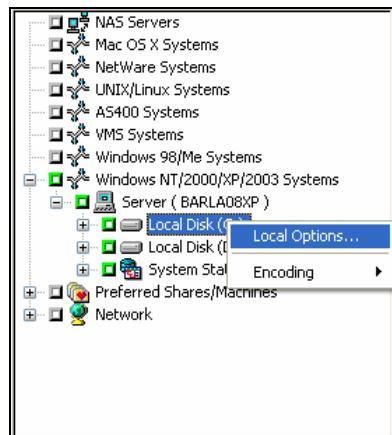
- Full (Keep Archive Bit)—Performed each time the job is repeated and keeps the archive bit.
- Full (Clear Archive Bit)—Performed each time the job is repeated and clears the archive bit.
- Incremental backup—Backs up only those files whose archive bits have been set since the last full or incremental backup was performed. After each backup, archive bits are reset so that they are not backed up during the next incremental backup job.
- Differential backup—Backs up only those files whose archive bits have been set since the last full backup was performed. Because differential backup jobs do not clear a file's archive bit, the files that were backed up in the last differential job are backed up again. It takes longer to process backup jobs using this method. However, this strategy requires only two sets of media to restore a differential backup; the full media set, and the differential media set. In the case of an incremental backup, you require the full media set and every incremental set until the latest set.

Note: The above-described backup methods do not apply to the Linux Client Agent.

For a description of detailed job scheduling features, see the chapter "Customizing Jobs," or the online help.

Local Backup Options

BrightStor ARCserve Backup gives you the power and flexibility to customize local options for specific drives that you want to back up. To do this, click the green box next to the drive directory, and then right-click the drive and select Local Options, as shown in the following example:



Note: When setting local options, you must select drives individually as your source even if you want to back up an entire server. You cannot click the green box next to the server name, and then customize local backup options for individual drives.

On the Local Options dialog, you can select the following options:

- **Backup Verification Options**

The Backup Verification options enable you to verify that your data was backed up correctly. The following options are available.

- **None**—If you select this, no verification will be performed on the data backed up.
- **Scan Backup Media Contents**—If you select this, BrightStor ARCserve Backup will scan the media and check that the header is readable for each file that is backed up.
- **Compare Backup Media to Disk**—Select this if you want BrightStor ARCserve Backup to read blocks from the media and compare, byte for byte, the data on the media against the files.

- Session/Encryption Password Option

Use this option to specify a password to protect the data.

- Session/Encryption Password—Enter a password for your backup job.

Important! *It is important that you remember the Session/Encryption password to restore this session. There is no way to reset this password.*

- Compression and Encryption Options

Use these options to specify whether files should be compressed or encrypted before they are backed up.

- Compress Files Before Backup Using Software Compression—Allows you to compress your files before running your backup job. Using this option directs BrightStor ARCserve Backup to compress files before backing them up using a software compression algorithm. Since most tape devices are equipped with a hardware-based compression mechanism, using both software and hardware compression is unnecessary and can lead to a slow backup job and poor compression results. Therefore, you should select this option only if your tape drive is not equipped with a hardware compression mechanism.
- Encrypt Files Before Backup—Allows you to encrypt your files before running your backup job.

- Volume Options

Note: This option is available for NetWare servers only.

- Disable Snapshot—If the BrightStor ARCserve Backup Agent for Open Files is installed on this server and you want this volume to be backed up without snapshot, select this option.

Note: If you have database agents installed, you can also right-click them to customize local backup agent options. If you do this (similar to setting local options on drives, directories, and files), you must select database agents individually as your source even if you want to back up an entire server (You cannot click the green box next to the server name, and then customize local backup agent options).

Local Backup Options for UNIX Agents

The following are the local options available when backing up a UNIX machine through the UNIX Client Agent.

Additional Options

- **Traverse Symbolic Link File**--BrightStor ARCserve Backup follows symbolic links and backs up the linked files.
- **Traverse NFS--Backs up NFS**--mounted drives.
- **Traverse Across File System**--BrightStor ARCserve Backup automatically includes locally mounted UNIX file systems in the backup.
- **Estimation Off**--Disables the estimation of the number of files and the amount of data to be backed up that takes place at the beginning of the backup job. Selecting this option decreases the time it takes to perform the backup.
- **Preserve File Access Time**--This option directs BrightStor ARCserve Backup to preserve the last access time of files when a backup is performed.

Note: The Access Time of a file is automatically updated by the operating system whenever a file is accessed (read or write). However, after a full backup is performed, the Access Times of all the backed up files are also updated. Therefore, if you want to track whether or not a file has actually been accessed (and not just backed up), you need to preserve the original access time.

- If this option is selected (check in box), BrightStor ARCserve Backup preserves the last file access time of any files that are backed up as the original value that was present before the backup was performed (Change Time will be updated). This is the default setting.
- If this option is not selected (no check in box), the last file access time of any files that are backed up is updated to the new value that is present when the backup is completed (Change Time will not be updated).

Note: For Windows based agents, you must apply this option globally. For more information, see Global Backup Job Options.

Media format to use for backup

- **BrightStor ARCserve Backup format**--This is a BrightStor ARCserve Backup proprietary tape format. This format is designed to overcome the limitations of tar/cpio formats and leverage other features like compression/encryption provided by BrightStor ARCserve Backup. For example, there are certain limitations with tar/cpio while backing up large files and huge data that may span across multiple tapes.

- **Posix tar format**--This is a Standard Posix Tar format. When you select this option, BrightStor ARCserve Backup creates a backup image in Posix Tar format. BrightStor ARCserve Backup or any tar utility can be used to restore data from an image created in this format. Using BrightStor ARCserve Backup format is recommended.

Posix cpio format--This is a Standard Posix CPIO format. When you select this option, BrightStor ARCserve Backup creates a backup image in Posix CPIO format. BrightStor ARCserve Backup or any CPIO utility can be used to restore data from an image created in this format. Using BrightStor ARCserve Backup format is recommended.

Global Backup Options

This section describes the global backup options you can select when submitting your backup job. For a description of additional backup job options and filtering features, see the chapter "Customizing Jobs."

To access the global options dialog, click the Options button in the Backup Manager. The available option tabs are:

- Alert
- Replication
- Media Exporting
- Advanced
- Volume Shadow Copy Service
- Backup Media
- Verification
- Retry
- Operation
- Pre/Post
- Job Log
- Virus

Backup Manager Virus Options

Since eTrust Antivirus is bundled with BrightStor ARCServe Backup, you can automatically scan for viruses during the backup operation using the virus scanning options.

Enable Virus Scanning—Select this option to enable virus scanning and the following options:

- Skip—Do not back up the infected file.
- Rename—Rename the infected files with the extension AVB. If a file with the same name and the extension AVB exists, then the extension AV0 is used, followed by AV1, AV2, and so on.
- Delete—Delete the infected file.
- Cure—Attempts to cure the infected file.
- Scan Compressed Files—Check each file in compressed archives individually. Selecting this option might affect the performance of the backup but provides increased virus protection.

Backup Manager Alert Options

You can use the Alert notification system to send messages about events that appear in the Activity Log during your backup operation. Choose one or more of the following events for which you want to be notified:

- Job Completed Successfully—All of the nodes and drives/shares were processed.
- Job Incomplete—Some nodes, drives, or shares were missed.
- Job Canceled by User—The user canceled the job.
- Job Failed—The job was started but could not be completed.
- Virus Detected—A virus was detected in one of the files to be backed up. See Virus options (Backup, Copy, Count)
- Customized Event—A customized event occurred. To specify this type of event, enter an error, warning, or notification code in the space below the Event drop-box.

Choose one or more of the defined Alert configurations. The <default> configuration means that you will use whatever is configured in Alert Manager. Click Configure to define further configurations. BrightStor ARCserve Backup provides the following defined Alert configurations:

- Broadcast
- Pager
- SMTP
- SNMP
- Event
- Printer
- E-Mail
- Lotus Notes
- Unicenter TNG

Select Attach Job Log to include the job log information in the Alert message. (This option applies for Trouble Tickets and Mail only.)

Note: The list you create using Alert Options is saved with the Job Script and the configuration defined using the Configuration button.

Replication Options

BrightStor ARCserve Backup fully integrates with BrightStor® High Availability. BrightStor High Availability provides High Availability for data and applications by copying data in real-time from a Primary server to a Secondary server. When BrightStor ARCserve Backup is backing up a server which is acting as a Secondary for a running Replication task, it can identify which data is replicated and is guaranteed to be identical to the corresponding live data on the Primary.

BrightStor ARCserve Backup can be configured to separately handle replicated and non-replicated data. A separate session can be used to store the replicated data. This session is configured so that the data appears as if it had been backed up directly from the Primary server.

BrightStor ARCserve Backup supports the following replication options:

- **Backup Replicated Data**—BrightStor ARCserve Backup backs up the data on your server including all replicated data, which will appear to have been copied from the primary servers. Each instance of replicated data is a separate session on the backup media. If you restore your data to the original location, the data goes to that primary machine, not to the server.
- **Skip Replicated Data**—BrightStor ARCserve Backup backs up only the data on your server and skips any replicated data.
- **Ignore Replication**—BrightStor ARCserve Backup backs up all data normally. It will not check to see if the data is replicated.

Media Exporting Options

At the end of a backup job, you can move media out of the library or to an off-site location for safe storage. If the job includes verification, the export is done at the end of the verification. This feature is available for regular and rotation jobs and supported on media libraries and RAID. BrightStor ARCserve Backup provides the following media exporting options:

- **None**—No media exporting will take place at the end of a backup job.
- **Export RAID1 Duplicate Tape After Job**—If the job spanned to multiple media, all the duplicate media used in this job is exported.

Note: This option is for RAID 1 support with libraries and mail slots only.

- **Export All Tapes After Job**—BrightStor ARCserve Backup exports all the media for the related backup. If the job spanned to multiple media, all the media used in this job is exported. If there are not enough mail slots to export all the media, the media that could not be exported is moved back to the original home slot. In single mail slot libraries, BrightStor ARCserve Backup retries a few times to check if the mail slot is empty to move the next media to the mail slot. If the operator does not move the media, BrightStor ARCserve Backup writes this information in the activity log.

Note: This option is for RAID 1 support with libraries and mail slots only.

Advanced Options

The Advanced options determine how BrightStor ARCserve Backup handles the file system extensions during a backup.

Windows System Options

Note: These options are only supported on the Windows 2000, XP, and 2003 operating systems.

The Windows system options available are:

- Traverse Directory Junctions and Volume Mount Points—Selecting this option causes the backup job to traverse the volume or the directory being specified to and take a backup of it. At the time of restore of this session, you can restore files and directories contained in the referred to volume or directory. When this option is not selected, the backup job does not back up the volume or the directory being referred to by the volume mount point or the directory junction respectively. Therefore, at the time of restore, you cannot restore a file or directory contained in the referred to volume or directory.
- Backup Mount Points as Part of the volume that they are mounted on—if you select this, the volumes referred to by the Volume Mount Points will be backed up as part of the same session as the Volume Mount Points. When this option is not selected, the volumes referred to by the Volume Mount Points are backed up as separate sessions

Note: This option is available only when the previous option, Traverse Directory Junctions and Volume Mount Points, is selected.

- Preserve File Hard Links—if you enable this, BrightStor ARCserve Backup preserves hard links during a restore.

Multiplexing Options

The following options regulate how BrightStor ARCserve Backup handles multiplexing.

- Multiplexing Chunk Size—Sets the performance of restore operations and memory usage. The chunk size value determines the amount of contiguous data written for one session before data from another session is multiplexed. The higher the value, the faster the restore on some drives, but at the cost of memory size during backup. For most drives, the default value of 1 MB is recommended.
- Maximum Number of Streams—Sets the maximum number of streams that can write to a tape at the same time. The default number of streams is 4 and the supported range is between 2 and 32.

Disaster Recovery Options

The Disaster Recovery options available are:

- Generate DR information for partially selected nodes—Disaster recovery information is normally generated when performing a full machine backup. However, there are special cases where you may need to keep the disaster recovery information updated but cannot perform full machine backups too often (like in a SAN shared disk environment). By enabling this option, you can generate or update a machine's disaster recovery information without having to back up everything on the machine.
- Include filtered sessions when generating restore session information-- When generating disaster recovery information, the BrightStor ARCserve Backup server keeps track of only the latest non-filtered backup sessions pertaining to the machine. By default, if you back up a machine using filters, the filtered backup sessions will not be used by disaster recovery when recovering the system. By enabling this option, you can alter the default behavior and have disaster recovery use the filtered backup sessions when recovering the system.

Important! *Enabling this option is very risky, especially for system volumes. Missing system files may lead to incomplete recovery.*

This option is disabled by default. When you enable this option, it works at the job level. If the job contains multiple machine backups, this option will apply to all machines.

Microsoft SQL Server Backup Options

For Microsoft SQL Server, BrightStor ARCserve Backup supports the following global option:

- Do not apply Differential or Incremental Backup Methods to Microsoft SQL Server databases--Enable this option if you do not want BrightStor ARCserve Backup to apply differential or incremental backup methods to Microsoft SQL Server database backups.

Note: For more information about incremental and differential backups as they relate to Microsoft SQL Server database backups, see the section "Rotation Schemes and Global Options" in the *Agent for Microsoft SQL Server Guide*.

Volume Shadow Copy Service Options

You can specify global options for using the Volume Shadow Copy Service (VSS). These options affect all Writers for VSS backups, but they do not apply to transportable VSS backups.

Note: For more information on VSS, see the *Microsoft Volume Shadow Copy Service Guide*.

On the Volume Shadow Copy Service tab, the File System Backup group box lets you specify how you want BrightStor ARCserve Backup to handle open files during file system backups. These options do not affect Writers and Components.

- **Use VSS**--Directs BrightStor ARCserve Backup to use VSS to handle the backup of open files.
If this check box is not selected, VSS support is not used and the BrightStor ARCserve Backup Agent for Open Files (if available) is used to handle open files. If the BrightStor ARCserve Backup Agent for Open Files is not available and Use VSS is not selected, a traditional backup is performed. However, the backup will be incomplete if there are any open files that cannot be backed up.
- **Revert to traditional backup if VSS fails**--Directs BrightStor ARCserve Backup to execute a traditional backup if an attempt to create a VSS backup fails. If the BrightStor ARCserve Backup Agent for Open Files is available, it is used to handle open files if this option is selected and the VSS backup fails.
If this check box is not selected and the VSS backup fails, the backup job fails.

The Writers and Components group box lets you specify how you want BrightStor ARCserve Backup to treat Writers and Components. These global options affect all Writers, except for those with Writer-specific options in place. For more information about setting Writer-specific options, see the *Microsoft Volume Shadow Copy Service Guide*.

- Files included by a writer will be excluded from file system backups—Prevents files that belong to a Component from being backed up by a traditional file system backup. This option offers the following advantages:
 - Avoids backing up files that have already been backed up by VSS.
 - By excluding files from traditional backups, fewer files are processed, and traditional backups take less time to complete.
 - Helps achieve successful backups by eliminating certain problems associated with files that must be processed as a group; for example, files associated with a Writer or database application. In a traditional backup, there is no mechanism to ensure that the files are processed together.
- Files excluded by a writer will be excluded from file system backups—Prevents files that have been excluded from being backed up by a Component from being backed up by a traditional file system backup.
There may be files associated with an application that should never be backed up (for example, the Windows page file). Each Writer is aware of whether its associated application maintains any such files. Selecting this option allows BrightStor ARCserve Backup to use this information when performing traditional backups.

- If a component file fails to backup the writer, the backup will terminate-- Cancels the backup of a Writer if the backup of any of the Components fail. The backup of a Component fails if one or more of its files cannot be successfully backed up.
Selecting this option ensures that and backup is consistent and that all of the files associated with a Writer are backed up before the backup is considered successful, regardless of how many Components are associated with the Writer.

Backup Manager Backup Media Options

You can specify the overwrite/append rules for the media used in your backup job while you are configuring the job. This section describes the rules so that you can determine which method is best for your purposes.

First Backup Media Options

The First Backup Media is the media you use when the backup job begins. The options for the first media are:

- Append to Media—Adds job sessions to the selected media.
- Overwrite Same Media Name, or Blank Media—Overwrites the media in the drive only if it is the name you specified for the job or if the media is blank. If neither of these conditions is met, BrightStor ARCserve Backup prompts you to supply the specific media name or a blank tape.
- Overwrite Same Media Name or Blank Media First, then Any Media— Overwrites the media in the drive only if it is the name you specified for the job or if the media is blank. If neither of these conditions is met, BrightStor ARCserve Backup reformats whatever media it finds in the drive (if there is no media in the drive and you are using a tape library, BrightStor ARCserve Backup picks the oldest free tape) and starts backing up files at the beginning of the media.
- Timeout for First Media—Specifies the number of minutes BrightStor ARCserve Backup will wait for a media to be inserted into a drive before it cancels the job.

Maximum Number of Sessions on a Single Tape

BrightStor ARCserve Backup allows up to 20000 sessions on a single tape and up to 25 sequences of a series of spanned tapes. For a file system device (FSD), the limitation is 65535 sessions on a single FSD. Keep this in mind when planning your backups, because, if your sessions are small, you can reach 20000 sessions very quickly. If you have a large amount of data to back up, you can quickly exceed 25 sequences, depending upon how much data each tape can hold.

Additional Backup Media Options

The additional backup media rules apply to jobs that require more than one media. You need to specify which media BrightStor ARCserve Backup can use when the job spans media. The additional backup media rules are:

- Overwrite Same Media Name, or Blank Media—Writes to the media in the device only if it has the same media name (but a different media ID) or if it is blank. When the job requires an additional media, BrightStor ARCserve Backup checks if the new media has the same name (but different media ID) or if it is a blank media. As long as the ID is different, BrightStor ARCserve Backup reformats the media, giving it the same name and ID as the first media. Only the sequence number is different.
- Overwrite Same Media Name or Blank Media First, then Any Media—Overwrite any media found in the device (as long as it has a different ID from the first media's ID). All subsequent media are reformatted with the same name and ID as the first media. Only the sequence number is different.
- Timeout for Additional Media—Specifies the number of minutes BrightStor ARCserve Backup will wait for a media to be inserted into a drive before it cancels the job.

Backup Data Security Options

To ensure security throughout your network, you can choose from the following methods:

- Session/Encryption Password—To enhance network security, specify a session/encryption password that will be required in order to restore this data from media.

Note: Make sure that you remember your password so that it is available when you want to restore your data. If you do not know your password, you will not be able to access the data!

- Compress Files Before Backup Using Software Compression—Specify whether files will be compressed before backup. Using this option directs BrightStor ARCserve Backup to compress files using software compression before backing them up using a software compression algorithm. Since most tape devices are equipped with a hardware-based compression mechanism, using both software and hardware compression is unnecessary and can lead to a slow backup job and poor compression results. Therefore, you should select this option only if your tape drive is not equipped with a hardware compression mechanism.

Important! *If you select this option and hardware-compression is available, BrightStor ARCserve Backup disables software-compression when the backup job runs.*

- Encrypt Files Before Backup—Specify whether BrightStor ARCserve Backup should encrypt files before backup. Encryption encodes your data so that it is non intelligible until recovered using BrightStor ARCserve Backup.

Distinguish Media by Name Only Option

BrightStor ARCserve Backup writes to any media that has the name specified in the Media text box on the Destination tab, regardless of the media's ID or sequence number. This option is useful if you are running a repeating Overwrite job with a specific media and you want to ensure that the same media is used for the job each time.

- When you enable this BrightStor ARCserve Backup looks for a media that has the name specified in the Media text box and uses it, regardless of the media's other identifying features.
- When you do not enable this option, the second time the backup job is run, BrightStor ARCserve Backup cannot always locate the original tape because some of its identifying features will have changed.

Note: If two or more media in the tape library have the same name, BrightStor ARCserve Backup uses the first media in the device group that matches the specified name. Therefore, we do not recommend that you use this option to perform a single occurrence overwrite.

Verification Options

BrightStor ARCserve Backup allows you to verify that your data was correctly backed up to media. You can verify data for the entire backup job or for a selected drive in your backup job. The global verification options (applied to the entire job) will be overridden by the options selected for a drive. BrightStor ARCserve Backup provides the following options for verification:

- None—The back up will not be verified.
- Scan Backup Media Contents—Check the proprietary BrightStor ARCserve Backup data area (the header) of each file on the backup media. If it is readable, BrightStor ARCserve Backup assumes the data is reliable. If it is not readable, the Activity Log is updated with this information. This is the fastest verification method.

If you selected Calculate and Store CRC Value on Backup Media on the Operation tab, BrightStor ARCserve Backup automatically performs CRC verification. This method assigns a value to the data that you copied to media and compares it to the value assigned to the data that you backed up. This enables you to identify the individual data packets that were backed up.

- Compare Backup Media to Disk—Data from the backup media is read and compared byte for byte against the source files. This option takes time, but ensures that all data on the backup media are exactly as on the disk. If BrightStor ARCserve Backup finds a mismatch, the errors are recorded in the Activity Log.

Retry Options

When BrightStor ARCserve Backup encounters an open file, the following options are provided:

- Open File Retry—determines how frequently BrightStor ARCserve Backup will attempt to back up or copy open files.
 - Retry Immediately—Back up or copy the file again, immediately after the first attempt failed. If the file is still unavailable, BrightStor ARCserve Backup writes information to the Activity Log, and the job is labeled “Incomplete.”
 - Retry After Job—Back up or copy the file again after all the other source files have been backed up. If the file is still unavailable, BrightStor ARCserve Backup writes information to the Activity Log, and the job is labeled “Incomplete.”
 - Number of Retries—Number of times you want to try to back up or copy the file.
 - Retry Interval (sec)—Period of time you want to wait between attempts.
- File Sharing—determines how BrightStor ARCserve Backup shares the files with other applications when backing up or copying a file.
 - Use Deny None if Deny Write Fails—[default] Attempt to place the file in “Deny Write” mode. If this is not possible (because the file is already open), then place the file into “Deny None” mode.
 - Use Lock Mode if Deny Write Fails—Attempt to place the file in “Deny Write” mode. If this is not possible (because the file is already open), then lock the file completely (prohibiting any user from opening or writing to the file). This option ensures the most recent version of the file is backed up or copied.

- Deny Write—Prevent another process from writing to the file while BrightStor ARCserve Backup has it open. If another process has the file open before BrightStor ARCserve Backup can open it, BrightStor ARCserve Backup will not back up the file (unless you specified an Open File Retry option).
- Deny None—Allow another process to read or write to the file, regardless of whether BrightStor ARCserve Backup opens it first. This option ensures that your files are up-to-date, although the file that was backed up or copied may not be the most recent version.

Note: If you use applications (such as email) that are in operation 24 hours a day, you may want to choose one of the Deny None methods. As long as no other process is writing to these files during the job, the backup or copy will be consistent. If you want to ensure that only the most current version of every file is backed up or copied, you should select a Deny Write or Lock Mode option.

Backup Manager Global Operation Options

The operation options for backup determine related actions that occur during or after the backup, and the level of information that is recorded in the database. BrightStor ARCserve Backup provides the following options:

- Disable File Estimate—By default, before any file is backed up to media, BrightStor ARCserve Backup performs an estimate of how long the job will take. Select this option if you want BrightStor ARCserve Backup to skip this function.
- Calculate and Store CRC Value on Backup Media—Calculating and storing the CRC value on the backup media will enable BrightStor ARCserve Backup to perform CRC verification during the backup job. To instruct BrightStor ARCserve Backup to use the CRC value stored on media, see the Backup Options, Verification tab.
- Delete Source Files After Backup to Media (use with caution)—Removes the files from the hard disk after the file backup is completed. This option deletes only the files from unprotected directories. By default, the following system directories are protected for UNIX, Linux, and Mac OS X:
 - /
 - /bin
 - /etc
 - /lib
 - /sbin
 - /usr/bin
 - /usr/sbin

You can protect other directories by modifying the applicable file system agent configuration file, *groom.cntl*, located on the client agent machine. The agent configuration file, *groom.cntl*, is specific to UNIX and Linux client agents.

By default, the following system directories are protected for NetWare:

- SYSTEM
- PUBLIC
- LOGIN
- ETC
- MAIL

On Windows, System State and system protected files are not deleted.

- Preserve File Access Time (Used for Windows file system only)—This option directs BrightStor ARCserve Backup to preserve the last access time of files when a backup is performed.

Note: The Access Time of a file is automatically updated by the operating system whenever a file is accessed (read or write). However, after a full backup is performed, the Access Times of all the backed up files are also updated. Therefore, if you want to track whether or not a file has actually been accessed (and not just backed up), you need to preserve the original access time.

- If this option is not selected (no check in box), the last file access time of any files that are backed up is updated to the new value that is present when the backup is completed. This is the default setting.
- If this option is selected (check in box), BrightStor ARCserve Backup preserves the last file access time of any files that are backed as the original value that was present before the backup was performed.

Note: For UNIX based agents, you must apply this option locally. For more information, see Local Backup Options for UNIX Agents in this chapter.

- Eject Backup Media upon Completion—Select one of the following options:
 - Use Default Device Setting—Select this if you want to use the setting you selected during library configuration.
 - Eject Media—Select this if you want to eject media from the drive after the job finishes. This helps prevent any other job from overwriting information on this media. If you select this, it overrides the setting you selected during library configuration.
 - Do not Eject Media—Select this if you do not want to eject media from the drive after the job finishes. If you select this, it overrides the setting you selected during library configuration.

Note: For more information on library configuration, see the section Tape Cleaning and Changing Configuration Details in the chapter "Configuring Devices."

- Backup BrightStor ARCserve Backup Database files—Select this option to back up the BrightStor ARCserve Backup database files with your backup job. You must also select whether to backup the database on every backup job or only when the BrightStor ARCserve Backup home directory is backed up, by clicking the appropriate option button.
- Database Options are:
 - Record Detail Information—Select this to log detail information and all information pertaining to the source and destination in the database. If you enabled the catalog database and select this, catalog files are stored in the CATALOG.DB folder after all detail information contained in the catalog files are merged into the database. If you did not enable the catalog database, the catalog files are deleted after the merge.
Note: For more information on the catalog database, including information on backing up and restoring when using this feature, see the chapter "Managing the Database and Reporting."
 - Record Job and Session Information Only—This is the recommended method. Select this to log only job and session information in the database. If you select this, no detail information will be merged into the database. If you enabled the catalog database and select this, catalog files are stored in the CATALOG.DB folder. If you did not enable the catalog database, catalog files are deleted afterwards.
 - Disable Database Recording—Select this if you do not want to log any information about this job in the database. Select this option if you are backing up the BrightStor ARCserve Backup database or if you have limited disk space.

Note: You must submit a Merge Media operation before you can use any of the database views to restore this data.

Backup Manager Pre/Post Options

These options allow you to run a command on your machine before or after the job is executed.

For example, you may want to use the Pre option to stop the application that owns the data you are about to back up, and then use the Post option to start it again.

Note: Commands with executables on remote systems are not supported.

BrightStor ARCserve Backup provides the pre and post options described in the next sections.

Run Command Before Job Options

Enter the path to and name of the file to be executed on the machine before the job takes off.

- On Exit Code— BrightStor ARCserve Backup detects exit codes of other programs. You can specify the following options for a particular exit code:
 - Run Job Immediately—The job runs immediately if the appropriate code is selected.
 - Skip Job—The job does not run if the appropriate exit code is detected.
 - Skip Post Application—Skip any commands specified to run after the job if the appropriate code is detected.
- Delay in Minutes—Specify the delay in which BrightStor ARCserve Backup waits before running a job when the appropriate exit code is detected.

Run Command After Job Options

Enter the path and name of the file to be executed on the machine after the job is completed.

Do Not Run Command If Options

Specify for a command not to run if BrightStor ARCserve Backup detects that a job fails, a job is incomplete, or a job is complete.

Note: This option is not available when you are using BrightStor ARCserve Backup to manage a UNIX or Linux based server.

Run Before/After Command As Options

The User Name and Password corresponds to the system of the host server selected, and is required to check the system privileges on that server.

The user name and password entered into these fields should not be confused with the BrightStor ARCserve Backup User Name and Password.

Backup Manager Job Log Options

The log options determine the level of detail that is included in the log report for the operation. The log options can be set in the following windows: Backup, Restore, Compare, Scan, Copy, Count, and Purge. BrightStor ARCserve Backup provides the following log options:

- Log All Activity—Record all of the activity that occurs while the job is running in the Job Log.
- Log Summary Only—Record summary information on the job (including source, destination, session number, and totals) and errors.
- Log Disabled—Do not record any information about this job in the Job Log.

Manage the BrightStor ARCserve Backup Agent for Open Files

If the BrightStor® ARCserve® Backup Agent for Open Files is installed on any of your computers, you can manage the BAOF Engine directly from the Backup Manager.

1. In the Backup Manager, go to the Source tab and select a server from the browser in the left pane.
2. If this server has the BAOF Engine installed, right-click the computer and select the following menu items or simply click these items in the Additional Information pane, on the bottom-right of the screen:
 - Configure Open File Agent—This displays the BAOF Configuration screen. From here, you can set various global settings for BAOF on the selected computer.
 - View Open File Agent Status—This displays the BAOF Status screen. This shows which files and groups BAOF is currently processing on the selected computer.
 - View Open File Agent Log File—This displays the Log File Viewer screen. This shows the log file for the selected computer.

For more information, see the *Agent for Open Files Guide*.

Local Job Redirection

Typically, if a backup job fails because of a device error, a media error, or because no media is available, the remaining source nodes in the job cannot be backed up. BrightStor ARCserve Backup offers protection against this problem through its Local Job Redirection functionality. Using Local Job Redirection, if a job fails because of a device error, media error, or because no media is available, BrightStor ARCserve Backup automatically redirects the job to another device group. This provides an added layer of protection and gives you an additional opportunity to run your job successfully.

Note: Local Job Redirection only supports backup jobs that use local tape devices. NAS server backup jobs are not supported. Also, Local Job Redirection does not support redirecting to NAS device groups. For example, if you submit a backup job and it fails because of a media error, it cannot be redirected to a NAS device group.

Backup jobs typically fail when a hardware error occurs. If you use Local Job Redirection, your job does not automatically fail. Instead, it attempts to redirect.

How Local Job Redirection Works

BrightStor ARCserve Backup automatically submits a Local Redirection Job to a different group if there is a device error, media error, or if the backup job cannot find a tape to use. The job can be redirected many times until all device groups have been tried.

BrightStor ARCserve Backup changes the structure of a redirected job as follows:

- Device Group—Changes the Device group of the job to any Device group other than the current group.
- Execution Time—Changes to the current time.
- GFS/Rotation Job—Changes to a Custom Backup job.
- Custom Repeating Job—Set to Run Once.
- Options for First Backup Media—Changes Overwrite Media to Append to Media.

Options and Circumstances Affecting Local Job Redirection

The Local Job Redirection feature responds as described to the following situations:

- Multistreaming—Sub-jobs are redirected. The Local Job Redirection feature does not apply to Master jobs.
Note: To use multistreaming, you must install the BrightStor ARCserve Backup Enterprise Module.
- Some Nodes Backed Up—if some of the source nodes in the job were backed up successfully before the media or device failure, the Local Job Redirection feature excludes them from the new job to eliminate data duplication.
- Retry Missed Target—if this option is selected for a GFS and Rotation backup when a device or media error occurs, all missed targets are retried in the local redirection backup jobs. A makeup job is not submitted.

Locate Redirected Jobs

If you configure your server for Local Job Redirection, you can check the Activity Log at any time to determine if a job was redirected and, if so, which device group the job was sent to.

The local redirection job uses the same Job ID as the original job. In the Activity Log, you can group messages by job to see the status of both the original job and redirected job under the same ID.

You can also check the job queue to determine if a job was redirected from another job. In the Job Queue, the description field indicates if the job was redirected.

Multistreaming

Note: To use multistreaming, you must install and license the BrightStor ARCserve Backup Enterprise Module.

Multistreaming offers you the advantage of using all the available tape devices on the system by splitting a single backup job into multiple jobs using all the tape devices. As a result, it will increase the overall backup throughput compared with the sequential method.

You can use all of the devices or you can specify a single group of devices. If the BrightStor® ARCserve® Backup Tape and Optical Library Option is installed and the group with the library is selected, multistreaming uses all library devices. If the BrightStor ARCserve Backup Tape and Optical Library Option is not installed, you can put devices into separate groups. For a changer, the total number of streams (slave jobs) that are created depends on the number of tape devices. For a single tape drive device, the total number of streams depends on the number of device groups.

Multistreaming is performed at the volume level for regular files (two volumes can run simultaneously on two separate devices), and at the database level for local database servers. Multistreaming is performed at node level for Preferred Shared Folder, remote database servers, and Windows Client Agents.

You can have only as many jobs running simultaneously as the number of devices or groups that are on the system. With multistreaming, one parent job is created that will trigger child jobs for as many volumes as you have. When a job is finished on one device, another job is executed until there are no more jobs to run.

Some characteristics and requirements of multistreaming are:

- Multistreaming always requires a media pool selection to prevent the tapes from being overwritten.
- Separate tape devices should be configured in separate groups for regular drives, however for changers, they can be configured to be in the same group..
- Multistreaming works with Rotation and GFS jobs.
- Canceling the master job cancels all of the slave jobs. For Windows, canceling and monitoring is checked between jobs for performance considerations.
- Pre and post operation and comments is supported at the master job level. Pre/post operations are not performed for slave jobs.
- Each slave job has a default job description with this pattern:

`MULTISTREAM[JOB[MID]]SUBJOB[SID]`

where MID is the master job ID and SID is the sub job (slave job) ID.

Note: The master job ID (MID) correlates to the Job No. column on the Job Status window, and the slave job ID (SID) correlates to the Job ID column on the Job Status window. Additionally, the Description column on the Job Status windows provides you with details about jobs that are scheduled to run.

- The multistreaming option is ignored if the groups you choose have only one device, or if only one object (volume, database, or remote node) backup is submitted.

Note: You should use the same types of tape devices for multistreaming jobs. In order to achieve the optimum performance with your multistreaming jobs, you should use a high-end server machine with multiple processors and at least 256 MB memory per processor.

Multiplexing

Multiplexing is a process in which data from multiple sources is written to the same media simultaneously. When a job that has multiple sources is submitted with the multiplexing option enabled, it is broken into child jobs—one for each source. These child jobs write data to the same media simultaneously.

Note: When using multiplexing, you can select the maximum number of streams that can write a tape at the same time. For more information on this setting, see the section Multiplexing Global Options in this chapter.

Multiplexing is useful when your tape drive throughput is faster than the rate at which data can be extracted from the source. Factors that can affect backup throughput are as follows:

- The kind of data being backed up. For example, backing up large number of small files reduces backup throughput because of the larger number of necessary file system operations (file open and close).
- Some databases may be inherently slow in providing data.
- The network throughput of the server being backed up.
- The disk performance on which the data resides.
- The server resources like CPU speed, memory size, page file size, network card, and amount of other activities on the server.
- Network backups that involve hundreds of servers.

When data is backed up over the network from multiple sources, most of the previous factors are involved, which reduces the throughput and increases the amount of time it takes to perform a backup. In addition, if the tape drive is not consistently streamed, the life of the tape drive is reduced drastically because of the SHOE-SHINE effect—when data is written intermittently, the drive has to stop, and then go back and forth on the media to adjust to the new position from where it has to write again. With multiplexing, data is continuously available and tape drives are constantly streaming. This decreases the amount of time it takes to perform a backup while increasing the life of the hardware.

Functions Supported by Multiplexing

The following table includes the functions that are supported and not supported by multiplexing.

Supported	Not Supported
<ul style="list-style-type: none">■ Multiple jobs can write to the same tape drive.■ Single session restore from multiplexing tapes.■ QFA restore from multiplexing tapes.■ Merge from multiplexing tapes.■ Disaster recovery.■ Session consolidation from a multiplexing tape to a non-multiplexing tape.■ Scan and compare on multiplexing tapes.	<ul style="list-style-type: none">■ Multiple restores simultaneously from a single multiplexing tape.■ Multiple session consolidation simultaneously from a single multiplexing tape to multiple non-multiplexing tapes.■ The Verify after Backup option.■ Disk staging during multiplexing.■ Multiplexing jobs cannot be submitted to NAS devices, File System Devices, RAID devices, and WORM media.■ Multiplexing is not available if you are using the Enterprise Option for Microsoft SQL Using HDS Snapshot, the Enterprise Option for VSS Hardware Snapshot, the Image Option, or the Serverless Backup Option.■ Multiplexing jobs cannot be submitted to a non-multiplexing media.■ Multiplexing is not supported on Optical Changers and DVD drives.■ Multiplexing is not supported for NAS sources.■ NetWare Directory Services (NDS) for NetWare sessions will be backed up at the end of a multiplexing job.

Multiplexing Job Options

To submit a multiplexing job, you must enable the Multiplexing feature on the Destination tab in the Backup Manager. In addition, you can select any of the following:

- Multiplexing media (multiplexing media appear with a blue circle with an M next to them)
- Blank media
- Media pool

Note: You cannot submit a multiplexing job to a tape library that has WORM media unless you use the Virtual Library option to split the tape library into groups so that one has WORM media and the other does not. If you do this, you can submit a multiplexing job to the group that does not have WORM media. For more information about the Virtual Library option, see Virtual Library Configuration Option in the chapter "Configuring Devices."

Multiplexing Global Options

BrightStor ARCserve Backup offers the following multiplexing global options:

- Multiplexing Chunk Size—Sets the performance of restore operations and memory usage. The chunk size value determines the amount of contiguous data written for one session before data from another session is multiplexed. The higher the value, the faster the restore on some drives, but at the cost of memory size during backup. For most drives, the default value of 1 MB is recommended.
- Maximum Number of Streams—Sets the maximum number of streams that can write to a tape at the same time. The default number of streams is 4 and the supported range is between 2 and 4. If you have the Enterprise Module installed, the supported range is between 2 and 32.

To set the multiplexing global options, in the Backup Manager, click the Options button. From the Advanced tab, move the slider to the desired chunk size value, select the maximum number of streams value, and then click OK.

Multiplexing Job Status Monitoring

After you submit a multiplexing job, you can monitor its status from the job queue in the Job Status Manager. In the Job Queue, multiplexing jobs appear in levels so that you can view the parent and child job relationship—children jobs appear as subjobs underneath the parent job:

Job Queue						
Server	Job...	J...	Status	Execution Time	Job Type	
172.24.123.456	1		READY	9/07/03 12:00 AM	DB Prun...	
172.16.0.0	2	362	READY	9/08/03 7:00 PM	Backup ...	
172.31.255.255	3	363	READY	9/08/03 8:00 PM	Backup ...	
10.255.255.255	4	364	READY	9/09/03 2:00 AM	Backup	
192.168.0.0	15	365	<input checked="" type="checkbox"/> DONE	9/08/03 2:00 AM	Backup	
192.168.255.255	16	366	<input checked="" type="checkbox"/> DONE	9/08/03 2:00 AM	Backup	
10.0.0.0	17	367	<input checked="" type="checkbox"/> DONE	9/08/03 2:00 AM	Backup	

In addition, the status of the parent job is the highest severity status of a child. For example, if Child 1 is successful, Child 2 is incomplete, and Child 3 has failed, the parent job will have a FAILED status.

Verify Multiplexing Data Integrity

If you want to verify the integrity of your data after your multiplexing job completes, use the Scan Utility to enable the Scan files global option with CRC verification and perform a scan media job.

For more information about the Scan Utility, see Scan Utility in the chapter “Introducing BrightStor ARCserve Backup” and the online help.

Submit a Backup Job

To submit a backup job, use the following procedure.

1. From the Backup Manager, select Source, Destination, Schedule, specify the options you require, and click Start to submit your job.
2. When the Security and Agent Information page opens, edit or confirm the security and agent information for your job, and click OK.
3. When the Submit Job page opens, select Run Now to run the job immediately, or select Run On and select a future date and time when you want the job to run.

For more information about the Run Now option, see Job Queue Tab in the chapter “Customizing Jobs.”

4. Enter a description for your job.
5. If you selected multiple sources to back up and want to set the priority in which the job sessions initiate, click Source Priority. Use the Top, Up, Down, and Bottom buttons to change the order in which the jobs are processed. When you finish setting priorities, click OK.
6. On the Submit Job page, click OK to submit your job.

For more information on submitting jobs using the Backup Wizard, see the *Getting Started*.

Disk Staging Option

The following sections provide conceptual information about backing up data using the Disk Staging Option.

Note: For information about configuring the Disk Staging Option, see the section *Staging Configuration* in this chapter. For information about using the Disk Staging Option, see the section *Backing Up Data Using the Disk Staging Option* in this chapter.

Staging Operations

The operations and tasks associated with the Disk Staging Option include the following:

- Specify and configure file system devices.
- Configure a file system device as a staging group and configure staging group parameters.
- Submit backup jobs to a staging group.
- Define policies for managing backup, data migration, and purge operations. For additional information about staging policies, see the section *Staging Policies* in this chapter.
- Perform simultaneous backup operations to a file system device in a staging group.
- Disable staging in rotation and GFS rotation backup jobs on any specified day of the week.
- View the status of master and child jobs in the Job Status Manager. The Job Status Manager displays a tree view of all master jobs and their corresponding child jobs for backup and migration operations.
- View the Activity Log (in Windows) displaying the logs of all the child jobs and migration jobs, and the purging activities of the master job in a tree format.

- Restore data from a staging device. If the data from a backup job resides in two locations (on the file system device and on the final destination media), you can direct BrightStor ARCserve Backup to restore the data from either location.
- Run command line tools that can analyze and purge data stored on a FSD in a staging group.
- Access reports using the Report Manager to capture information about purge and migration activities on FSDs.

Note: If you are using the licensed or unlicensed version of the Disk Staging Option, the BrightStor® ARCserve® Backup Serverless Backup Option is not supported.

How the Max Number of Streams Option Affects Backup and Restore Operations

Simultaneous streaming is a process that divides your backup jobs into several sub-jobs that run simultaneously. The Disk Staging Option allows you to utilize the simultaneous streaming feature to send multiple streams of data to a file system device (FSD) in a staging group. Since the work is split up among several different drives, simultaneous streaming-enabled backup jobs can be completed significantly faster than regular backup jobs.

BrightStor ARCserve Backup provides you with the capability of streaming multiple jobs simultaneously to the FSD. The base product allows you to write a maximum of two streams per job simultaneously, as well as two streams per staging group simultaneously. Licensing the Disk Staging Option enables you to increase the simultaneous streams to 32 (for each job and each staging group).

When you back up data using the Disk Staging Option, a backup job can spawn child jobs. Each child job employs one stream of data. The actual number of child jobs that the parent job can spawn varies depending upon whether the backup job is a node-level or a volume-level backup job. For a node-level backup job, the number of child jobs spawned depends upon the number of agents specified in the backup job. Similarly, for a volume-level backup job, the number of child jobs spawned depends upon the number of volumes specified in the backup job.

For example, if a backup job consists of backing up four nodes and the backup level is at the node level, the parent job can spawn a minimum of four child jobs. In this example, if you specify three streams, the master job can stream three child jobs simultaneously and start the fourth child job as one of the three previous child jobs end. After all child jobs are complete, the parent job is considered finished.

Disk Staging Option and Rotations

When you back up data using regular or GFS rotation rules, BrightStor ARCserve Backup provides you with the capability to suspend or disable staging in the backup jobs on any specified day of the week, bypassing the FSD, and backing up your data directly to its final destination media.

For example, if you detect that your FSD in a staging group is approaching or has exceeded its storage capacity threshold, backup jobs can fail. You can modify the staging job to disable staging on that day so that the data is backed directly to the final destination.

To verify whether staging for rotation and GFS rotations is disabled or enabled, open the Backup Manager, select the Schedule tab, and select the Rotation Rules tab. The Staging column in the Rotation Rules schedule displays the current status of all rotations and GFS rotations. To modify a rotation rule, click the Modify button below the schedule.

Staging Tab

To access the information and options on the staging tab, start the Backup Manager and select the staging tab.

The Staging tab contains the following options and informational fields:

Enable Staging

Click the Enable Staging check box to enable or disable staging backup operations for a particular group.

Group Field

Displays the name of the group selected for this job.

Note: A staging group must be selected in a staging job. Specifying a "*" group is not allowed for staging.

Policy

Opens the Staging Policy dialog. Using the Staging Policy dialog, you can specify staging policies for full, incremental, and differential backup operations. Staging policies allow you to specify copy policies, purge policies, enabling SnapLock protection, and other miscellaneous policies.

Max Number of Streams

Specifies the maximum number of simultaneous data streams that this job would be allowed to use while writing to the FSD in the staging group. For example, if the maximum number of streams is specified at 4, this means that at any point of time this staging job will have no more than 4 child jobs writing to the FSD simultaneously.

Staging Groups Directory Tree

Displays the names of the groups which were configured as staging groups.

Properties View

From the properties view in the Backup Manager, you can perform the following tasks:

- Configure Groups-Click this option to open the Device Group Configuration dialog.
- Configure File System Device Groups-Click this option to open the File System Device Group Configuration dialog.

Staging Configuration

Before you can back up data using the Disk Staging Option, you must perform the following tasks:

- Create file systems devices. First, you must specify the file system devices in your environment that you will use for staging operations. For more information, see Configure File System Device Groups To Use Staging in this chapter.
- **Important!** *Staging backup operations can quickly consume a large amount of free disk space on file system devices. Due to the maximum file size limitations of FAT 16 and FAT 32 file systems, you should not use these file systems on file system devices designated for staging operations.*
- Configure staging groups. After specifying the file system devices in your environment, you must configure the file system device group to a staging group. For more information, see Configure Staging Groups in this chapter.
- Configure staging policies. To perform backup operations using staging, you must define the backup, copy, and purge policies that BrightStor ARCserve Backup will use to manage data stored on staging devices. For more information, see Staging Policies in this chapter.

The following sections provide you with information about how to configure the Disk Staging Option.

Configure File System Device Groups To Use Staging

To configure file system device groups to use staging:

1. From the BrightStor ARCserve Backup Home Page, select the Configuration menu and click Device Group Configuration.
2. To browse to remote BrightStor ARCserve Backup server, clear the checkmark from the Use Default Server option and click Next. If you are using the local BrightStor ARCserve Backup server, go to Step 4.
3. Provide your login credentials to the remote server and click Next.
4. Select the Configure File System Device Groups option and click Next.
5. From the Groups list, select the group that you want to configure. To enable staging for the selected group, click the Enable Staging option and then modify the following options as needed:
 - Threshold--Specifies file system device capacity thresholds. The threshold can be represented as either the total number of MB or GB used, or as a percentage of the disk's total capacity used.
 - Maximum # Streams--Specifies the maximum number of simultaneous streams to the selected file system device group.
 - Enable SnapLock for this group--Enables SnapLock WORM protection on the file system device.
Note: The device must support SnapLock technology. If you enable SnapLock on a device that does not support SnapLock WORM protection, BrightStor ARCserve Backup write-protects the data, however, the data can be deleted from the device.
 - Pause data migration--Pauses the data migration operation.
 - Staging Chunk Size--Specify the maximum amount data to be written to the staging device per write operation.
Note: A higher chunk size can decrease the level of fragmentation on your staging device. However, a higher chunk size can adversely affect the throughput of data to the disk.
6. Repeat Step 5 as necessary to configure other groups.
7. Click Next and then click Finish.

Important! You can access the File System Device Group Configuration dialog by clicking the Configure File System Device Groups option located in the properties pane of the Backup Manager Staging tab and Destination tab.

Configure Staging Groups

To configure staging groups, use the following steps.

1. From the Backup Manager Window, click the Destination tab.
2. From the groups list, right-click a group and choose Configure File System Device Groups.

The File System Device Group Configuration dialog opens.

Note: You can also open the File System Device Group Configuration dialog by clicking the Configure File System Device Groups link located in the Properties view on the Destination tab.

3. Select the desired group and click the Enable staging check box.
4. Specify the file system device threshold. From the drop-down list, choose MB, GB or %.
5. When you enable disk staging, multiple streaming is enabled by default. If you:
 - Did not license the Disk Staging Option, you can specify up to two simultaneous streams.
 - Licensed the Disk Staging Option, you can specify up to 32 simultaneous streams.
6. If the file system device supports SnapLock, and you want to WORM-protect the backed up data, click the Enable SnapLock option.
7. Click OK.

After you complete these steps, the newly created file system device group appears in the Groups directory tree on the staging tab.

Note: Device groups identified as staging device groups do not appear in the Destination tab of the Backup Manager.

Staging Policies

The following sections describe defining staging copy, purge, and SnapLock policies for full backups, incremental and differential backups, and other miscellaneous options.

Staging Copy Policies

After BrightStor ARCserve Backup completes the backup to disk phase, copy policies let you specify when to copy the data to its final destination media.

The following information applies to Full, and Incremental/Differential copy policies.

- **Do not copy data option**—Choose this option if you do not want to copy the backup sessions to final destination media. For example, consider differential and incremental backup operations. Operations of this type tend to have short retention periods and are small with respect to overall size. If you do not copy the incremental and differential backups to final destination media, the need for tapes to store your backups diminishes.
- **Copy data After option**—Choose this option to direct BrightStor ARCserve Backup to start the copy from disk to final destination media operation after specified length of time elapses. BrightStor ARCserve Backup starts the copy to media operation based upon the occurrence of one of the following events:
 - **After job starts option**—Choose this option if you want to start the copy to media operation at a fixed point in time after the backup to disk operation starts.
 - **After job ends option**—Choose this option if you want to start the copy to media operation after the backup to disk operation ends.

Due to variations in the overall size of backup jobs and the length of time needed to complete backup to disk operations, simultaneous read and write operations to the disk staging device can occur. This option prevents simultaneous read and write operations to disk staging devices.

- **After each session is finished option**—Choose this option if you want to start the copy to media operation immediately after the backup to disk operation for the session is complete.

Most backup jobs consist of several sessions. When you specify this option, you can direct BrightStor ARCserve Backup to copy backup sessions to their final destination immediately after the backup job is finished. This option manifests simultaneous backup and copy operations. By performing backup and copy operations simultaneously, you can reduce the overall backup window and copy window.

Because this option induces simultaneous read and write operations on the FSD, you should only specify this option if you are using a high-speed device that can process many read and write operations simultaneously.

Note: For all Copy data after options, BrightStor ARCserve Backup will not migrate sessions to their final destination media until after the backup job for the session is complete. This capability includes scenarios when the copy retention period expires before the backup operation is complete.

- **Copy data At Option**—Choose this option to direct BrightStor ARCserve Backup to start the copy to media operation at a specific time of day. When you use this option you can direct BrightStor ARCserve Backup to start the migration process at a specific time on a daily basis.
 - Select the **Or after the job is finished whichever happens later** option if you suspect or anticipate the backup to disk operation to end after the specified start time for the copy to final destination operation. This option prevents BrightStor ARCserve Backup from copying sessions from disk to tape while the backup operation is in progress.

Staging Purge Policies

If you direct BrightStor ARCserve Backup to use copy policies, the data stored on your file system device will remain on the FSD until such time that the data is copied to final destination media.

Note: You can use the ca_devmgr command line utility to forcefully purge sessions that were not copied or not purged from a file system device. For more information, see the section "Staging Command Line Purge Tool" in the appendix Using Command Line Utilities.

Use the following information to determine how BrightStor ARCserve Backup will process backed up data stored on a file system device. This information applies to Full and Differential/Incremental backup to staging device operations.

- Purge data **After** option—Choose this option to direct BrightStor ARCserve Backup to start the purge operation after specified length of time elapses. BrightStor ARCserve Backup starts the purge operation based upon the occurrence of one of the following events:
 - **After job starts option**—Choose this option to direct BrightStor ARCserve Backup start the purge data from disk operation at a specified time after the backup to staging device operation starts.
 - **After job ends option**—Choose this option to direct BrightStor ARCserve Backup to start the purge data from disk operation at a specified time after the backup to staging device operation ends.

For example, if you have a high-performance disk with a limited amount free disk space, you can quickly reclaim disk space by specifying a short length of time under the At option and select the After job starts option. This approach ensures that the purge operation starts shortly after the copy to final destination media operation starts, as opposed to the using the After job ends option, which starts the purge operation after the copy to final destination media operation ends..

- Purge data **At** option—Choose this option to direct BrightStor ARCserve Backup to start the purge data from disk operation at a specific time of day. Use the spin box to specify the time of day that you want the operation to start.

Consider the following scenario: You have a backup job rotation scheme that starts at the same time daily and your high-performance disk maintains a limited amount of unused space. Using the purge data At option you can schedule the purge operation to start before the next backup operation starts. This approach helps to ensure that you have freed enough disk to prevent the backup job from failing.

Important! *If you specify a copy policy, BrightStor ARCserve Backup does not start the purge operation until after the copy to final media operation is finished.*

Staging Miscellaneous Policies

The Disk Staging Option supports the following Miscellaneous Policies.

The Miscellaneous tab on the Staging Policy dialog contains the following options:

Purge canceled sessions from disk immediately

- Use this option to direct BrightStor ARCserve Backup to delete sessions from the staging device immediately after a backup to staging device is canceled.

This option helps to reclaim free disk space on the staging device as quickly as possible.

Purge failed sessions from disk immediately

- Use this option to direct BrightStor ARCserve Backup to delete sessions from the staging device immediately after a backup to disk staging device fails.

This option helps to reclaim free disk space on the staging device as quickly as possible.

Create makeup jobs to back up data directly to final destination under disk full conditions

- Use this option to direct BrightStor ARCserve Backup to back up data directly to its final destination media if there is insufficient free space on the file system device in a staging group.

A backup operation will fail if there is insufficient free disk space on the staging device. To remedy this situation, BrightStor ARCserve Backup can divert the backup operation from the file system device in a staging group directly to the final destination media. A makeup job searches for blank media and media from a scratch. As such, specifying this option can increase the overall success rate of your backup operations when a "disk full" condition exists.

Create a makeup job on hold if a data migration job fails

- Use this option to direct BrightStor ARCserve Backup to create makeup jobs on HOLD if data migration (copy to tape) jobs fail.

A data migration job can fail if a media or tape drive error occurs during the copy to tape operation. Use this option to create a makeup job with a HOLD status that you can change to a READY status after correcting the tape drive or media errors. If an error condition exists, this option minimizes the needs to create tapecopy jobs.

Leave catalog details on disk

- Use this option to direct BrightStor ARCserve Backup to store the catalog details on the staging device.

Use this option to store the catalog files on the staging device in the CATALOG.DB directory.

Configure Staging Policies

To configure Staging policies, use the following steps.

1. From the Staging tab on the Backup Manager, select the Staging group that you want to configure and then check the Enable Staging check box.
2. Click the Policy button to open the Staging Policy dialog.
3. Select the Full Backup tab or the Differential/Incremental Backup tab.
4. Specify the Copy Policies for this job. For more information, see the section Staging Copy Policies in this chapter.

5. Specify the Purge Policies for this job. For more information, see the section *Staging Purge Policies* in this chapter.
6. If you want to delete-protect backup data, click the *Enable SnapLock* check box.

Note: The file system device must support SnapLock functionality to delete-protect data. BrightStor ARCserve Backup cannot detect if a file system device is capable of providing SnapLock security until the backup job is complete. As such, if you specify “*Enable SnapLock*” on a backup job and the file system device does not support SnapLock security, the backup job will run properly.
7. Select the *Miscellaneous* tab and choose the options that you want to apply to the job. For more information, see the section *Staging Miscellaneous Policies* in this chapter.
8. Click *OK*.

Backing Up Data Using the Disk Staging Option

The following sections provide you with information about how to back up data and use the Disk Staging Option.

Submit a Staging Backup Job Using the Backup Manager

Prior to performing a backup job using the Disk Staging Option, you must have already configured the staging groups. If you did not configure BrightStor ARCserve Backup to use the Disk Staging Option, see *Staging Configuration Tasks* in this chapter.

BrightStor ARCserve Backup provides you with the capability to submit a backup job using either the Backup Manager or the command line utility. This information describes how to perform a disk staging backup job using the Backup Manager. For information about how to submit a disk staging backup job using the command line utility, see *Submit a Staging Backup Job Using the Command Line* in this chapter.

To submit a backup job using the Disk Staging Option, use the following steps:

1. From the Backup Manager, access the *Source* tab and specify the volumes that you want to back up.
2. Access the *Staging* tab, check the *Enable Staging* check box, and specify the *Staging Group* that you want to use for staging.

Note: To run a staging backup job, you cannot specify a asterisk (*) in the *Group* field.
3. To modify the copy and purge policies, click the *Policy* button and modify the policies for the job, as necessary.

4. To modify the number of simultaneous streams during the backup operation, use the spin box to change the Max Number of Streams.
Note: BrightStor ARCserve Backup provides you with the capability of streaming multiple jobs simultaneously to the FSD. The base product allows you to write a maximum of two streams per job simultaneously, as well as two streams per staging group simultaneously. Installing the Disk Staging Option enables you to increase the simultaneous streams to 32 (for each job and each staging group).
5. Click the Start toolbar button to submit the backup job.

Submit a Staging Backup Job Using the Command Line

BrightStor ARCserve Backup provides you with the capability to submit a backup job using either the Backup Manager or the command line. The information contained in this section describes how to perform a staging backup job using the command line utility.

For information about how to submit a staging backup job using the Backup Manager, see the section **Submit a Backup Job Using the Disk Staging Option** in this chapter.

ca_backup Syntax

To submit a staging backup job using the ca_backup command line utility, use the following syntax:

```
ca_backup [-diskstage <groupname>]
[-purgeFailedSessions]
[-purgeCancelledSessions]
[-makeupJobToTape]
[-createDMJMakeupJobOnHold]
[-leaveCatalogsOnDisk]
[-chunkSize <size>]
[-maxStreams <Max # Streams>]
[-fullbackup
  [[-DONOTCOPY] |
   [-copyDataToDestination
     [afterjobstarts <weeks> <days> <hours> <minutes>] |
     [afterjobends <weeks> <days> <hours> <minutes>] |
     [aftersessionends <weeks> <days> <hours> <minutes>] |
     [at <hh:mm:ss> [afterjobends]]]]
  [-purgeData
    [afterjobstarts <weeks> <days> <hours> <minutes>] |
    [afterjobends <weeks> <days> <hours> <minutes>] |
    [at <hh:mm:ss>]]]
  [-ENABLESNAPLOCK] ]
[-incdiffbackup
  [[-DONOTCOPY] |
   [-copyDataToDestination
     [afterjobstarts <weeks> <days> <hours> <minutes>] |
     [afterjobends <weeks> <days> <hours> <minutes>] |
     [aftersessionends <weeks> <days> <hours> <minutes>] |
     [at <hh:mm:ss> [afterjobends]]]]
  [-purgeData
    [afterjobstarts <weeks> <days> <hours> <minutes>] |
    [afterjobends <weeks> <days> <hours> <minutes>] |
    [at <hh:mm:ss>]]]
  [-ENABLESNAPLOCK] ]]
```

Note: For a detailed description of the staging command line options, see the section ca_backup in the appendix "Using Command Line Utilities."

Modify a Staging Rotation Scheme

If you are using rotation or GFS rotation disk staging jobs, BrightStor ARCserve Backup provides you with the flexibility to disable staging on any specified day of the week.

To modify staging when using a rotation scheme:

1. Open the Backup Manager and select the Schedule tab.
2. Select the Use Rotation Scheme option, and then select the scheme name from the Scheme Name drop-down list.
3. Click the Rotation Rules tab.

The Staging column displays the current status of staging as it applies to your rotation scheme.

4. Select the Day Of Week for which you want to modify staging, and then click the Modify button.

The Configuration dialog opens.

5. From the Staging drop-down list, select Enable or Disabled.
6. Click OK.

Note: To disable staging for a staging group, see the section [Disable Staging](#) in this chapter.

Pause Data Migration

The Pause Data Migration option lets you temporarily stop the process of migrating data from the FSD to its final destination media. For example, if your tape library offline or you need to perform maintenance on the library, you can pause the data migration process and then restart it after the library is back online.

To pause data migration:

1. From the Staging Groups tree on the Staging tab, select the group that you want to pause.
2. Do one of the following:

- Right-click the group name and select Configure File System Device Groups from the pop-up menu.
- Click the Configure Staging Group option in the Properties view.

The Staging Group Configuration Dialog opens.

3. Check the Pause Data Migration option and click OK.

Note: To restart the data migration operation, repeat Steps 1 and 2, then clear the checkmark from the Pause data migration check box and click OK.

Disable Staging

BrightStor ARCserve Backup provides you with the capability to disable (or bypass) backup to FSD operations. When you use this option, data is backed up directly to its final destination media, rather than being backed up to the FSD.

There are two methods that you can use to perform this task:

- From the Rotation Rules tab on the Schedule tab of the Backup Manager.
- Using File System Device Group Configuration.

Backup Manager - Schedule Tab

To disable backup to staging device operations from the Backup Manager, perform the following steps:

1. From the Backup Manager, open the Schedule tab.
2. Select the Scheme Name from the drop-down list.
3. Click the Rotation Rules tab and select the rotation that you want to disable.
4. Click the Modify button.
The Configuration dialog opens.
5. From the Staging drop-down list on the Configuration dialog, select Disabled.
6. Click OK.

File System Device Group Configuration Dialog

To disable back up to staging device group operations using Device Group Configuration:

1. Open the Backup Manager and select the Staging tab.
2. Right-click the group that you want to disable and select Configure File System Device Groups from the pop-up menu.

The File System Device Group Configuration dialog opens, displaying all groups in your environment that are specified as file system device groups.

Note: The groups that are enabled for staging display with a corresponding dark blue flag. The groups that are not enabled for staging display with a corresponding light blue flag.

3. Select the group that you want to disable.
4. Clear the check mark from the Enable Staging check box.
5. Click OK.

Manage Staged Data When the Database Fails

When you use the Disk Staging Option to back up data, the information about the backup jobs, sessions, staging policies, and so on is stored in the BrightStor ARCserve Backup database. If the database fails, and you need to re-initialize the BrightStor ARCserve Backup database, the staging policies for the data residing on the file system device (FSD) that specify when to copy the data to the final destination media and when to purge the data from the FSD are no longer available.

If this situation occurs:

- BrightStor ARCserve Backup cannot copy (migrate) the data on the FSD to its final destination media.
- BrightStor ARCserve Backup cannot purge data from the FSD to reclaim disk space.
- Future backup jobs will probably fail due to an insufficient amount free disk space on the FSD.

There are two approaches you can use to remedy this situation:

- To retain all of the backup data stored on the FSD, you can use the tapecopy command line utility to copy all the backup data from the FSD to final destination media. (When you use this approach, media rotation rules, such as Friday tape or Monday tape may not be adhered to.) Then, you can use the -purge option from the Device Manager command line utility (ca_devmgr) to delete the data from the FSD and reclaim disk space.
- If you do not want to copy all of the data from the FSD to its final destination media, or purge all of the data from the FSD, you can use the Merge Manager to quickly merge only the session details (not the file details) from the FSD to the BrightStor ARCserve Backup database.

The process of merging session details is much faster than merging file details. To merge session details only, open the Merge Manager and select the "Record Job and Session Information Only" option before you run the merge job. You can access this option from the Database tab of the Global Options dialog.

After the Merge job is complete, this approach lets you specify the sessions that you want to copy to final destination media using the tapecopy command line utility. Then, to reclaim disk space, you can use the ca_devmgr -purge option to specify the sessions that you want to purge from the FSD.

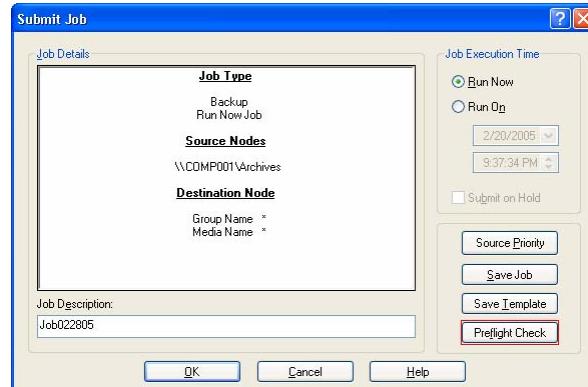
Preflight Check Utility

The preflight check (PFC) utility enables you to run vital checks on the BrightStor ARCserve Backup server and agents to detect conditions that may cause backup jobs to fail. The checks performed by PFC fall into the following categories:

- System Checks—These include checking system requirements for the server, available disk space for the database, and RPC service registration.
- BrightStor Checks—These include checking the BrightStor ARCserve Backup system account and its privileges, the status of the BrightStor engines, SAN server connectivity (if the BrightStor ARCserve Backup SAN Option is installed), and the health of the tape devices attached to the server.
- Agent Checks—These include checking the connection and credentials for any client and database agents needed for the job.
- Media Checks—These include checking the availability of media in the scratch set (if a media pool is specified for the job), checking the media expiration dates, and checking for source and destination conflicts for File System Devices.

The optimum time to run this command is a couple of hours before your jobs are scheduled to run so that you can have ample time to correct any problems that may appear in the PFC report. For more information on the PFC utility and its associated options, see the appendix "Using Command Line Utilities."

Before submitting a job, you can run a Preflight Check clicking the Preflight Check button on the Submit Job dialog as shown in the following example:



Example:

You submit a job and run the PFC utility. If the PFC utility detects that a device is not assigned to the device group that you are using for the backup job, the PFC utility reports a failed job. To correct the problem, you must either use a device group with an assigned device or assign a device to the device group that you are using for the job. If you do not take corrective action, the job will eventually fail.

This capability is also supported when you run the PFC command line utility. For more information, see the appendix "Using Command Line Utilities."

Disaster Recovery

To ensure against data loss, maintain current backups of all your servers and workstations. If you do not have these backups, BrightStor ARCserve Backup is limited in its ability to recover data. Be sure to create a media rotation scheme and a schedule to maintain current backups.

By default, the BrightStor ARCserve Backup server always generates or updates disaster recovery information for all full backup systems, even when the BrightStor ARCserve Backup Disaster Recovery Option is not installed. This ensures that the latest backup information is always available if the BrightStor ARCserve Backup Disaster Recovery Option is installed a later time.

Note: To disable the BrightStor ARCserve Backup server from generating or updating the disaster recovery information, create and set the following registry key value to 1 on the BrightStor ARCserve Backup server machine:

HKEY_LOCAL_MACHINE\SOFTWARE\Computer Associates\BrightStor ARCserve Backup\Base\Task\backup\SkipDRSession

See the *Disaster Recovery Option Guide* for more information.

Back Up BrightStor ARCserve Backup for Laptops & Desktops Data

If you use BrightStor® ARCserve® Backup for Laptops & Desktops, you can use BrightStor ARCserve Backup to back up your BrightStor ARCserve Backup for Laptops & Desktops data to media to protect yourself against the possibility of a disaster on your BrightStor ARCserve Backup for Laptops & Desktops server. Follow these steps to back up a BrightStor ARCserve Backup for Laptops & Desktops server.

Note: All BrightStor ARCserve Backup for Laptops & Desktops data on the BrightStor ARCserve Backup for Laptops & Desktops server is backed up.

1. Add the computer running the BrightStor ARCserve Backup for Laptops & Desktops server as a Client Agent. Perform the following steps:
 - a. Right-click the Windows NT/2000/XP/2003 Systems item in the Source tree.
 - b. Select Add Machine/Object from the pop-up menu.
 - c. Enter the required information in the Add Agent dialog. For help with the Add Agent dialog, click the Help button.
2. Expand the BrightStor ARCserve Backup for Laptops & Desktops server computer's node in the Source tree and select the BrightStor ARCserve Backup for Laptops & Desktops server box (it will turn green).
3. Submit the backup job as you would any other.

Note: After you have added the computer running the BrightStor ARCserve Backup for Laptops & Desktops server as a Client Agent, you can use the Backup Wizard to submit your backup job.

Migrated Files Management

To help manage the space on backup servers, BrightStor ARCserve Backup for Laptops & Desktops administrators have the option of migrating old backup data to a BrightStor ARCserve Backup server. The administrator defines criteria for old backup data—such as size and the date the file was last modified—on the BrightStor ARCserve Backup for Laptops & Desktops server. Migrating old backup data helps conserve space on the BrightStor ARCserve Backup for Laptops & Desktops server and provides a safe way to archive these files.

Over time, however, some of these file can become obsolete or expired. This can happen when:

- The BrightStor ARCserve Backup for Laptops & Desktops server restores the file to its local storage area, returning the file to the BrightStor ARCserve Backup for Laptops & Desktops server.
- The BrightStor ARCserve Backup for Laptops & Desktops server submits a newer version of a file; older versions of the file with the same name on the tape become obsolete and can no longer be used.
- The BrightStor ARCserve Backup for Laptops & Desktops client to whom the files belong is completely deleted from the server storage area.

In all cases, these files are marked “expired” in the BrightStor ARCserve Backup database.

This expiration of files results in a situation in which parts of the data stored on the BrightStor ARCserve Backup for Laptops & Desktops-dedicated tape are no longer needed, and the tape can be reused and placed in the BrightStor ARCserve Backup scratch set. The following are guidelines for reusing such BrightStor ARCserve Backup media:

- If all files on a tape are no longer being used, the tape can be reused.
- If there are only a few files on the tape, the BrightStor ARCserve Backup administrator can query the files, submit a restore, and free up the tape.

Note: Data Growth Restores cannot be performed on the session level.

Multiple Code Pages

The following sections describe how BrightStor ARCserve Backup supports the use of multiple code pages.

How BrightStor ARCserve Backup Supports Multiple Code Pages

A code page is a map of characters as they relate to a particular language. If the BrightStor ARCserve Backup server resides in an environment where different languages and their character sets are running on other computers, the Backup Manager and the Restore Manager may not be able to interpret and display recognizable text in the source tree.

When you encounter this situation, you can specify any code page supported in your environment. The code page lets BrightStor ARCserve Backup interpret the information and display the text in a format that is recognizable to you.

When you specify a code page at the node or volume level, BrightStor ARCserve Backup applies the characteristics of the code page to all child volumes, directories, and so on. Although code pages do not affect BrightStor ARCserve Backup functionality, BrightStor ARCserve Backup cannot present a code pages for more than one language at any time.

Specify Code Pages in the Backup Manager Window

You can change the code page on all tree items in the source tree. To specify a code page, use the following steps:

1. From Source tab on the Backup Manager window, right-click the node, volume, or directory for which you want to specify a code page.
2. From the Display Encoding right-click menu, select the desired code page.

BrightStor ARCserve Backup applies the new code page settings immediately.

Chapter 4: Restoring Data

This chapter includes information on the various tools and options BrightStor ARCserve Backup offers to let you safely and efficiently restore your data.

Restore Wizard

The BrightStor ARCserve Backup Restore Wizard guides you through the process of restoring your data. Using this wizard, you can submit a restore job to the BrightStor ARCserve Backup job queue without using the Restore Manager. The Restore Manager is provided to allow you to perform more customized restores using filters, options, and scheduling. The wizard offers two restore methods:

- Restore By Session (the default method)
- Restore By Query

For more information on how to use the Restore Wizard, see the online help or the *Getting Started*.

Restore Manager

The aim of running a successful restore job is to quickly identify the data you need and to retrieve it from the appropriate backup media.

BrightStor ARCserve Backup allows you to restore data to most machines attached to your Windows network. Each restore job requires a source and destination. The files selected as your source must originate from backup media created by BrightStor ARCserve Backup, and the destination must be a hard drive. The Restore Manager provides three tabs to customize your restore job:

- Source
- Destination
- Schedule

The optional BrightStor ARCserve Backup Client Agents allow you to communicate with remote workstations in various environments to restore data to non-Windows systems, such as NetWare or UNIX.

Similarly, the optional Backup Agents allow BrightStor ARCserve Backup to restore online databases and applications such as MS Exchange, Lotus Domino, MS SQL Server, Oracle, and IBM Informix.

For procedural information on how to submit a basic restore job, see the online help.

If Unicenter NSM is already installed, you can use the monitoring agent to monitor BrightStor ARCserve Backup. This agent can be used to start and stop services, monitor the status of the BrightStor ARCserve Backup processes and media, and report on the failure of backup jobs. For more information, see Unicenter Monitoring Agent in the chapter “Managing the Database and Reporting.”

Restore Source Specification Options

BrightStor ARCserve Backup makes it easy to find the files you want to restore. Because your requirements and circumstances can vary, BrightStor ARCserve Backup provides you with the following methods for selecting the data (the source) you want to restore:

- **Restore by Tree**—Restores a specific directory or drive from a display of files and directories that were backed up with BrightStor ARCserve Backup. Use this method when you do not know which media contains the data you need, but you know the machine from which the back up originated.

The Restore by Tree view displays only the last instance of a backup. To view and access all other instances, select the object that you want to restore and click the Version History button. If there are multiple partial backups of the same drive, the Restore by Tree view displays only the last backup. However, if there is a full volume backup of the drive available, the last full backup is displayed, instead of the last partial backup.

For example:

1. Drive D:\ contains two directories that are backed up on a weekly basis—D:\Temp and D:\Documents. D:\Temp and D:\Documents were both backed up on April 21 and April 28. A full backup of drive D:\ was performed on April 1.
2. The Restore Manager displays instances relating to the full backup of Drive D:\ performed on April 1.
3. To restore the April 28 instance of D:/Documents, select the D:/Documents directory in the Restore by Tree view and click the Version History button. From the Version History dialog, select the April 28 instance and then click the Select button.

The Restore by Tree view uses the BrightStor ARCserve Backup database; if the database engine is stopped, this method of restore will not work.

- **Restore by Session**—Allows you to select the session, and the files and directories you want to restore. Use this method when you know the media name, but are not certain about the session you want to restore. This view uses the BrightStor ARCserve Backup database; if the database engine is stopped, this method of restore will not work.
- **Restore by Query**—Restores files based on the search pattern used to locate the names of the files or directories. Use this method when you know the name of the file or directory you want to restore, but do not know the machine it was backed up from or the media it was backed up to. This view uses the BrightStor ARCserve Backup database; if the database engine is stopped, this method of restore will not work.

Note: If you are searching a Raima database, you can specify a maximum of 20 characters in the File Name field. File extensions and wildcards, such as ".TXT" and "*", apply to this total. Additionally, when you search a Raima database with a file name containing wildcards, the length of the file names returned by the query is limited to 23 characters minus the number of normal characters in the file name string. For example, if you specify "* .TXT" in the query, the longest file name returned is 19 characters; if you specify ".*" in the query, the longest file name returned is 22 characters.

- **Restore by Backup Media**—Restores a complete backup session from a specified media in a storage device. All files in the session are restored to the destination, unless filters are added to the restore job. Use this method when media was created by a different version of BrightStor ARCserve Backup or if the database does not recognize it.

Important! *If you cannot see the items that you would like to restore, the corresponding records may have been pruned from your database. You can repopulate your restore source selection by running the Merge utility. For more information about the Merge utility, see Merge Utility, in the chapter "Introducing BrightStor ARCserve Backup."*

Note: If you installed the BrightStor® ARCserve® Backup Image Option or the BrightStor® ARCserve® Backup Serverless Backup Option, you will also have Restore by Image/Serverless available. Use this method when you need to read and restore blocks of data quickly by bypassing the file system.

For more information on how to submit a restore job using each of these methods, see the online help.

Restore Manager Considerations on 64-bit Windows Platforms

If the BrightStor ARCserve Backup server is running on a 64-bit Windows platform, the following considerations apply:

- Information about objects backed up from the local server using the Client Agent for Windows appears in the Windows NT/2000/XP/2003 branch of Restore Manager Source tree. The objects can include files, folders, drives, System State files, the Windows Registry, and Volume Shadow Copy Service writer backups.
- Local database agent objects backed up using network-based communication appear in the Local Server branch the Restore Manager Source directory tree.
- Remote database agent objects backed up using network-based communication appear in the Microsoft Windows Network branch of the Restore Manager Source directory tree.

Version History

If you have backed up a volume, directory, or individual files on a node more than once, the path displays only once in the graphical tree, but you can still restore any version of your data in the database. Use the Version History button to view all the versions that you backed up and select the one that you need. Each version is identified by modification date, file size, media name, backup time, session number, type, and method.

Note: You can view the Version History when you use Restore by Tree as your source view.

Duplicate Backup Sessions

When you use the Disk Staging Option to back up data or copy media using the `tapecopy` command line utility, duplicates of backup sessions can exist in multiple locations. For example, you can define your staging copy and purge policies such that backup sessions remain on the file system device used for staging for a period of time after the copy to final destination media operation occurs. If the backup session was not purged from the file system device, data will reside on the file system device and the final destination media. If this situation presents itself, you can quickly restore the session by using data that resides on the file system device.

When you copy media, duplicate backup sessions exist on multiple media. If one media remains on site and the other media was vaulted, you can direct BrightStor ARCserve Backup to use the media that is on site to facilitate the restore operation.

To search for duplicate sessions, click the **Duplicates** button on the **Version History** dialog. The **Duplicates Sessions** dialog displays the original backup session and all of its copies. If duplicates for a session exist, you can direct BrightStor ARCserve Backup to use the session that allows you to restore the session as quickly as possible.

Smart Restore

BrightStor ARCserve Backup provides a transparent Smart Restore feature that can increase the overall success rate of your restore operations. If a media read error or a hardware error occurs during a restore job, BrightStor ARCserve Backup searches for an alternate media to use to complete the restore job. Consider the following scenario:

During a restore job, the restore source media jams and disables the library. BrightStor ARCserve Backup then searches for duplicates of the backup session. If a duplicate of the session exists, regardless of whether it exists on a file system device or another media, the restore operation continues without user intervention.

Note: If a second media error occurs during the restore job, the job will fail.

Multiple Code Pages

For more information about code pages, see [How BrightStor ARCserve Backup Supports Multiple Code Pages](#) in the chapter [Backing Up Data](#).

Specify Code Pages in the Restore Manager Window

You can change the code page on all tree items in the source tree. To specify a code page, use the following steps:

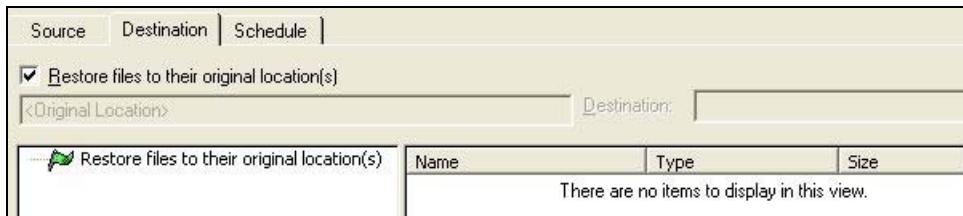
1. From Source tab on the Restore Manager window, right-click the node, volume, or directory for which you want to specify a code page.
2. From the Display Encoding right-click menu, select desired code page.
BrightStor ARCserve Backup applies the new code page settings immediately.

Restore Destination Specification Options

BrightStor ARCserve Backup provides you with two methods for selecting the destination you want to restore the data to:

- Restore files to their original location
- Restore to user-shared directories and drives

Note: The default method is to restore files to their original location. If you deselect this check box, you are presented with a list of machines, directories and files. You can select your specific destination from this list.



For information on how to select a destination, see the online help.

Restore Job Schedules

Jobs can be submitted so that they repeat as follows:

- Once—Do not repeat this job.
- Every n frequency—Repeat this job every specified number of Minutes, Hours, Days, Weeks, or Months.
- Day(s) of the Week—Repeat this job on the days that are checked off.
- Week(s) of the Month—Repeat this job on the weeks that are checked off.
- Day of the Month—Repeat this job on the specified day.
- Custom—Repeat this job on the month, day, hour, or minute specified.

Note: If you select the Run Job Now option when your storage device is busy, BrightStor ARCserve Backup reports that the storage device is busy and the job is not submitted to the job queue. You should schedule your job, keeping the current date and time. This way, when BrightStor ARCserve Backup discovers that the storage device is busy, it automatically retries the job until the drive becomes free.

For a description of detailed job scheduling features, see the chapter "Customizing Jobs" or the online help.

Restore Options

This section describes the global restore options you can select when submitting your restore job. To access the global options dialog, click the Options button in the Restore Manager. The available option tabs are:

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

Restore Manager Backup Media Options

The Restore Manager supports the following backup media options:

Timeout Options

You can specify a timeout period that BrightStor ARCserve Backup will wait to provide the media you need to restore your data. Available media options are:

- Timeout for First Backup Media—Period of time that BrightStor ARCserve Backup waits for the first media required for your restore job. If the time expires, the job fails.
- Timeout for Additional Backup Media—Period of time that BrightStor ARCserve Backup waits for any additional media to become available.

Optimize Restore

If, during a restore operation, BrightStor ARCserve Backup discovers duplicate backup sessions, where one session resides on tape media and another session resides on a file system device, the Optimize Restore option directs BrightStor ARCserve Backup to restore the data from the session that resides on the file system device.

The Optimize Restore option is a global setting that is applied to all restore operations, and is enabled by default.

Under most circumstances, restoring data from a file system device is faster than restoring from tape media. However, you may wish to consider disabling the Optimize Restore option if you are using tape media or a library with high-speed reading capabilities, or there is a known problem with your file system device.

To disable the Optimize Restore option, clear the check mark from the Optimize Restore check box.

Restore Manager Destination Options

Using this option, you can determine how the directory structure is created on the destination when files are restored and which files (if any) can be overwritten.

base directory

A *base directory* is the parent directory to the data, such as a file or directory, selected for restore. For example, if you specify restore *c:\xyz\file1* and *c:\xyx\file2*, the base directory for *file1* and *file2* is *xyz*.

The Restore Manager supports the following destination options:

- Directory Structure Options—select the method that BrightStor ARCserve Backup should use to create directories:
 - Do Not Create the Base Directories—(default) Do not create the base directory on the destination path, but create all subdirectories below the source base directory.
 - Create Directories from the Base—Create the destination path beginning from the base directory.
 - Create Entire Path from the Root—Create the entire source path on the destination. No files from any parent directories are restored. Only the directory path to the base directory is created on the destination.

- File Conflict Resolution Options—select the method that BrightStor ARCserve Backup should use when there are files on the destination disk that have the same name as files being copied from the source:
 - Overwrite All Files—Restore all source files to the destination regardless of conflicting file names. The files from the source will overwrite existing files on the destination.
 - Rename Files—Copy the source file to the destination with the same file name but a different extension. The format of the renamed extension will vary based upon the file system that is present on the target partition.
 - Restoring files to local NTFS partitions--If the length of file name is less than 251 characters, BrightStor ARCserve Backup appends '.___0' to the file name after the first restore. For all subsequent restores, BrightStor ARCserve Backup appends '.___1', '.___2', and so on to the file name. This rule applies to file names with and without a file extension.

If the length of file name is more than 251 characters, BrightStor ARCserve Backup truncates the file name at 251 characters and appends '.___0' to the file name after the first restore. For all subsequent restores, BrightStor ARCserve Backup appends '.___1', '.___2', and so on to the truncated file name.

- Restoring files using the Windows Client Agent and to local or remote FAT, FAT32, and NTFS partitions—if the length of file name is less than 251 characters and has a file extension, BrightStor ARCserve Backup replaces the last character of the file extension with the character 1 (for example, filename.tx1). For subsequent restores, BrightStor ARCserve Backup replaces the last character of the file extension with the character 2, 3, and so on. After the 10th restore, BrightStor ARCserve Backup replaces the last two characters of the file extension with 10, 11, 12, and so on (for example, filename.t10). After the 100th restore, BrightStor ARCserve Backup replaces the last three characters of the file extension with 100, 101, 102, and so on (for example, filename.100). After the 999th restore, BrightStor ARCserve Backup cannot rename the file extension, which causes the restore to fail. If the length of file name is less than 251 characters, and it does not have a file extension, BrightStor ARCserve Backup appends '._0' to the end of the file name. If BrightStor ARCserve Backup appends '._0' to the file name after the first restore, the renaming process appends two characters after the 10th restore (for example, filename._10), and after the 100th restore, the renaming process appends three characters to the file name (for example, filename.100). After the 999th restore, BrightStor ARCserve Backup cannot rename the file name, which causes the restore to fail.

If the length of file name is more than 251 characters, BrightStor ARCserve Backup renames the file using the same rules as restoring to local NTFS partitions.

- Skip Existing Files—Do not restore a source file if a file with the same name already exists on the destination.
- Overwrite with Newer Files Only—Only restore source files whose modification date is later than the modification date of the file with the same name on the destination.
- Confirm Overwrites (for Run Now only)—Before BrightStor ARCserve Backup tries to restore the source file, you will be prompted to confirm that you want the file on the destination to be overwritten when submitting a Run Now job.

- **VMS File Version Options**—Select one of the following options to determine how BrightStor ARCserve Backup should act when restoring VMS files that have the same names and version numbers as the files in the target restore directory:
 - **Create New File Version**—BrightStor ARCserve Backup will restore all files as new versions of the original. The files in the target directory will not be affected.
 - **Restore File Version (Overwrite)**—If a file in the target directory has the same name and version number as a file in the restore data, BrightStor ARCserve Backup will overwrite the file.
 - **Restore File Version (No Overwrite)**—If a file in the target directory has the same name and version number as a file in the restore data, BrightStor ARCserve Backup will not restore the file. All other files will be restored with their original names and version numbers.

Restore Manager Operation Options

Using this option, you can determine the related actions that occur during or after the job, and the level of information that is recorded in the BrightStor ARCserve Backup database. You can select from the following options:

- **Restore and Preserve Directory Attributes and Security Information**—Restore the existing directory attributes (such as Read Only, Archive, and Hidden) and security data to the machine.
- **Restore and Preserve File Attributes and Security Information**—Restore the existing file attributes (such as Read Only, Archive, and Hidden) and security data to the machine.
- **Restore Registry Files and Event Logs**—Restore registry files and event logs to the machine.
- **Record Job Information Only**—Record job information.
- **Disable Database Recording**—Do not record job information.

Restore Manager Pre/Post Options

These options allow you to run a command on your machine before or after the job is executed.

For example, you may want to use the Pre option to stop the application that owns the data you are about to back up, and then use the Post option to start it again.

Note: Commands with executables on remote systems are not supported.

- Run Command Before Job—select the following options to run a command on your machine before the job is executed:
 - Enter the path to, and name of, the file to be executed on the machine before the job starts.
 - On Exit Code—BrightStor ARCserve Backup detects exit codes of other programs. For a specified exit code, you can choose to run the job immediately, skip the job, or skip post application.
 - Delay in Minutes—Specify the delay that BrightStor ARCserve Backup waits before running a job when the specified exit code is detected.
- Run Command After Job—enter the path to, and name of, the file to be executed on the machine after the job is completed.
- Do Not Run Command If—specify that a command will not run if BrightStor ARCserve Backup detects the following events:
 - Job Fails—if a job fails, then the command will not run.
 - Job is Incomplete—if a job is not completed, then the command will not run.
 - Job is Complete—if a job is completed, then the command will run.
- Run Before/After Command As—The User Name and Password corresponds to that of the Local Host server selected, and is required to check the system privileges on that server. The user name and password entered into these fields should not be confused with the BrightStor ARCserve Backup User Name and Password.

Restore Manager Job Log Options

Using this option, you can determine the level of detail that is included in the log report for the restore job. You can view the log report in the Job Queue or Database Manager window (Job View). The log options are:

- Log All Activity—Record all of the activity that occurs while the job is running.
- Log Summary Only—Record summary information of the job (including source, destination, session number, and totals) and errors.
- Log Disabled—Do not record any information about this job in the job log.

Restore Manager Virus Options

Since eTrust Antivirus is bundled with BrightStor ARCserve Backup, you can automatically scan for viruses during the restore operation using the virus scanning options.

- Enable Virus Scanning—Select this option to enable virus scanning and the following options:
 - Skip—Do not restore the infected file.
 - Rename—Rename the infected files with the extension AVB. If a file with the same name and the extension AVB exists, then the extension AV0 is used, followed by AV1, AV2, and so on.
 - Delete—Delete the infected file.
 - Cure—Attempts to cure the infected file.
 - Scan Compressed Files—Check each file in compressed archives individually. Selecting this option might affect the performance of the restore but provides increased virus protection.

Restore Manager Alert Options

You can use the Alert notification system to send messages about events that appear in the Activity Log during your restore operation. Choose one or more of the following events for which you want to be notified:

- Job Completed Successfully—All of the nodes and drives/shares were processed.
- Job Incomplete—Some nodes, drives, or shares were missed.
- Job Canceled by User—The user canceled the job.

- Job Failed—The job was started but could not be completed.
- Virus Detected—A virus was detected in one of the files to be backed up. See Virus options (Backup, Copy, Count)
- Customized Event—A customized event occurred. To specify this type of event, enter an error, warning, or notification code in the space below the Event drop-box.

Choose one or more of the defined Alert configurations. The <default> configuration means that you will use whatever is configured in Alert Manager. Click Configure to define further configurations. BrightStor ARCserve Backup provides the following defined Alert configurations:

- Broadcast
- Pager
- SMTP
- SNMP
- Event
- Printer
- E-Mail
- Lotus Notes
- Unicenter TNG

Select Attach Job Log to include the job log information in the Alert message. (This option applies for Trouble Tickets and Mail only.)

Note: The list you create using Alert Options is saved with the Job Script and the configuration defined using the Configuration button.

System State Restore Options

Right-click the system state session to access the restore option context menu. The following options are available:

- Make the Restored Copy of the Active Directory Authoritative—This forces the restored copy to become the “authoritative” version of Active Directory on the system. This means that, even if the restored replica set is older than the current replicas, the older data is replicated to all of its replication partners. Authoritative restore is typically used to restore a system to a previously known state.

- When Restoring replicated data sets, mark the data as primary for all replicas—This forces the restored File Replication service data to be replicated to other servers. If this option is not enabled, the replicated data sets may not be replicated to other servers because the restored data will appear to be older than the data on other servers.
- Stop the Cluster if necessary to Restore the Cluster Database—This gives permission to stop a cluster service to restore the cluster database. This applies only to cluster machines. If this option is not enabled and the cluster service is running, BrightStor ARCserve Backup dumps the cluster database files into the%SYSTEMROOT%\clusbkup folder, but does not load them. BrightStor ARCserve Backup provides a utility program, caclurst.exe that lets you load the cluster database files at a later convenient time.
- Enable Quorum Drive Selection when Quorum Location Change (with drive letter selection)—This allows you to set the drive of the quorum resource that a cluster currently uses. If a cluster system was reconfigured to use a different quorum drive since the last system state backup, use this option to provide the new quorum drive. Otherwise, the backup copy of quorum drive will be used and the cluster database restore will fail.
- Do not Stop World Wide Web Service—This lets you continue the www service while the certificate server is being restored. The IIS Publishing Service may be using the certificate service dynamic files at the time of certificate server restore. For this reason, by default, WWW service will be stopped during certificate server restore. If you do not want it to stop, use this option.

Restore BrightStor ARCserve Backup for Laptops & Desktops Data

Since BrightStor ARCserve Backup backs up all the BrightStor ARCserve Backup for Laptops & Desktops data on your BrightStor ARCserve Backup for Laptops & Desktops server, you can only restore your BrightStor ARCserve Backup for Laptops & Desktops data to a fresh installation of the BrightStor ARCserve Backup for Laptops & Desktops server.

Follow these steps to restore your BrightStor ARCserve Backup for Laptops & Desktops data.

1. Ensure that a fresh copy of the BrightStor ARCserve Backup for Laptops & Desktops server has been installed on the computer to which you are restoring the data.
2. Ensure that the BrightStor ARCserve Backup for Laptops & Desktops server is not running on the target computer. To do so:
 - a. From the Control Panel, select Administrative Tools, then Services.
 - b. Select the BrightStor ARCserve Backup for Laptops & Desktops service in the right-hand pane.
 - c. From the Action menu, select Stop.
3. Open the Restore Manager, select the Source tab, and select Restore by Session from the drop-down list.
4. Select the BrightStor ARCserve Backup for Laptops & Desktops backup session you want to restore.
5. Submit the job.

Restore Migrated Files

To reclaim BrightStor ARCserve Backup tapes that contain BrightStor ARCserve Backup for Laptops & Desktops data, administrators can force the restoration of BrightStor ARCserve Backup for Laptops & Desktops files, regardless of whether these files are expired.

Forcing the restore returns these files to the BrightStor ARCserve Backup for Laptops & Desktops server and frees the BrightStor ARCserve Backup tape for use with other data. For information on how to force the restore of BrightStor ARCserve Backup for Laptops & Desktops files, see the online help.

Restore Data Backed Up Using Staging

The process for restoring data that was backed up using the Disk Staging Option is identical to the process of restoring data that was backed up to any other type of storage media. However, staging provides you with the option to restore data from the location that is most suitable to your needs.

When you perform backup operations using the Disk Staging Option, and the backed up data has been copied to its final destination media, the data can reside in two locations (the file system device and its final destination media). If you need to perform a restore operation and the data resides in two locations, you can restore the data directly from the staging device. Restore operations from staging devices are faster than tape-based restores.

To restore data that was backed up using staging, perform the following steps:

1. Open the Restore Manager and select the Restore by Tree method.
2. In the left pane of the Restore Manager, select the volume, drive, directory, or file you want to restore.
3. Click the Version History button.

BrightStor ARCserve Backup searches the databases and the Version History dialog opens displaying a list of all backed up versions of this file, directory, drive, or volume.

4. From this list, select the version you want to restore.

BrightStor ARCserve Backup presents you with a list of all duplicates for the session. Duplicates exist when clones of the session reside on the multiple media which might have happened because of disk staging jobs or tape copies.

Note: Restoring data from a disk is generally faster than restoring from a tape, because there are no delays due to the tape load and seek latency. If you need to restore data that exists in two locations (disk and tape), you can reduce the restore time by restoring directly from the disk rather than retrieving it from a tape.

- If you want to restore directly from the final destination, click OK to start the restore process.
- If you want to restore from a different location rather than from the final destination, click the Duplicates button.

The Duplicate Sessions dialog opens displaying any sessions which are duplicates or clones of each other (including the original session). If the selected session has no duplicates, the Duplicates field will be blank.

For each copy of the selected session, the Duplicates Session dialog displays the Modified Date, Size, Media Name, Backup Time, Session #, Type, and Media Type to help you decide the location from where you want to restore from.

After you select the session and click OK, the restore process will start.

Chapter 5: Customizing Jobs

BrightStor ARCserve Backup provides a number of methods to customize your jobs to suit your needs. This chapter discusses the following customization methods in further detail.

- Rotation schedules allow you to define standard and consistent intervals at which to rotate and retire backup media.
- Filters allow you to select the files and directories to be included in, or excluded from, your backup and restore jobs, based on a wide variety of criteria.
- Scheduling options provide you with the ability to schedule your jobs to run immediately, later, or on a regular basis.
- The Job Scheduler Wizard is a powerful tool that allows you to quickly and easily schedule and submit any job that can be entered at the command line.
- The Job Status Manager is a graphical tool that helps you centrally manage BrightStor ARCserve Backup servers enterprise-wide.
- Job scripts allow you to save the options, filters, and scheduling information you define for your job as a file, so you can re-use, copy, or efficiently resubmit jobs with these settings.
- Job templates let you use preconfigured settings to submit jobs on any machine running BrightStor ARCserve Backup without having to repeat the set up detail tasks for each job. The job template copies your configured backup schedule settings to be used again in the future on any machine.

Rotation Schemes

This section describes how to configure a rotation scheme for a backup job by using the BrightStor ARCserve Backup default scheme or by specifying your own rotation parameters. To access the parameters for configuring a rotation scheme, select the Schedule tab in the BrightStor ARCserve Backup Manager. The parameters that you can use are described below.

- Scheme Name—Select the type of rotation scheme you want, based on 5 or 7 days, and incremental, differential, or full backups. For more information on these standard schemes, see Calendar View Tab in this chapter to modify your rotation scheme.
- Start Date—The date the backup will start.

- Execution Time—The time the backup will start.
- Retry Missed Targets—To back up any missed target drives, enter a specific time that the job will repeat.
- Enable GFS—BrightStor ARCserve Backup allows you to select from pre-defined Grandfather-Father-Son (GFS) rotation schemes consisting of full weekly backup jobs combined with daily incremental and differential jobs. The GFS strategy is a method of maintaining backups on a daily, weekly, and monthly basis.

Accessible from the Backup Manager, the primary purpose of the GFS scheme is to suggest a minimum standard and consistent interval to rotate and retire the media. The daily backups are the Son. The last full backup in the week (the weekly backup) is the Father. The last full backup of the month (the monthly backup) is the Grandfather. GFS rotation schemes allow you to back up your servers for an entire year using a minimum of media.

GFS backup schemes are based on a five or seven-day weekly schedule beginning any day. A full backup is performed at least once a week. On all other days, full, partial, or no backups are performed. Using GFS rotation, you can restore data reliably for any day of the week by using the weekly full backup in conjunction with the daily incremental or differential backup jobs.

Note: A five-day GFS rotation scheme requires 21 media-per-year, while a seven-day scheme requires 23 media-per-year.

Although GFS rotation schemes are predefined, you can modify these schemes to suit your individual needs. You can deviate from your standard rotation scheme (for instance, if a holiday falls on Wednesday, your usual backup day).

- Append Media—if you specify the Enable GFS option, you can direct BrightStor ARCserve Backup allow data from GFS rotation to append to existing jobs on the media.
- Media Pool Name Prefix/Media Pool Used—if you select an existing rotation scheme and specify the Enable GFS option, the Media Pool Name Prefix option displays. Using this combination of options, you must specify a Media Pool Prefix in the space provided.

If you select a rotation scheme but do not specify the Enable GFS option, the Media Pool Used option displays. Using this combination of options, you must specify a non-shared media pool to the rotation scheme. If necessary, you can append data to media and change the media name.

- Daily Backup Method—The Daily Backup Method option lets you specify one of the following options for your daily backup jobs:
 - Full—All source files are backed up. This backup method clears the archive bit.
 - Incremental—Files that have changed since the last backup are backed up. This backup method clears the archive bit.
 - Differential - Archive Bit—Files that have changed since the last full backup job are backed up. This backup method does not change the archive bit.
- Use WORM Media option—The Use WORM Media option lets you direct BrightStor ARCserve Backup to use WORM media for all rotation rules. With this option enabled, you have the capability to use WORM media for daily, weekly, and monthly GFS backup jobs.

Important! BrightStor ARCserve Backup does not support the use of WORM media for multiplexing backup jobs. As such, when you enable the Multiplexing option on the Backup Manager Destination tab, the Use WORM Media option is disabled.

GFS Rotation Jobs on File System Devices

BrightStor ARCserve Backup supports using a GFS rotation scheme on File System Devices. A retention period for the media being used in the GFS rotation scheme can be determined using the following default retention cycle for a seven-day weekly rotation:

Frequency	Number of Media
Daily	6
Weekly	5
Monthly	12
Total	23

To run a rotation job beyond a year, a GFS rotation scheme requires 23 File System Devices to be created. These settings can be modified to meet your specific needs. Modifying the default values of the GFS rotation may change the number of FSDs required.

Note: Previously, only local disks were considered FSDs. You can now create FSDs that are accessible through a network share using a Universal Naming Convention (UNC) path. For more information on using BrightStor ARCserve Backup Device Configuration to configure your disk or disk array as a FSD, see the *Getting Started*.

Because a GFS rotation job may be using local disk drives and drive arrays, users must first make sure that there is enough space on the particular file system to store all the data being backed up for the entire retention period. Creating file system devices on a boot partition is not recommended because a boot disk that becomes full can cause the operating system to function abnormally.

Note: All file system devices need to be assigned to the same device group.

For more information on configuring a device group to be used by the GFS rotation scheme, or on how to set up a GFS rotation job, see the online help.

A configured GFS rotation job can run on a daily basis at a specified time. BrightStor ARCserve Backup utilizes file system devices similar to a physical tape. As needed on a daily basis, BrightStor ARCserve Backup moves tapes between the save sets and the scratch sets in the media pools, formats blank media, overwrites expired media, and tracks all operations in the database.

You can choose to duplicate backup data stored on the file system devices to physical tape media. The BrightStor ARCserve Backup Job Scheduler Wizard and Tapecopy utility provide the ability to automate the creation of the duplicate images.

The following sections describe the tabs available to customize your rotation job.

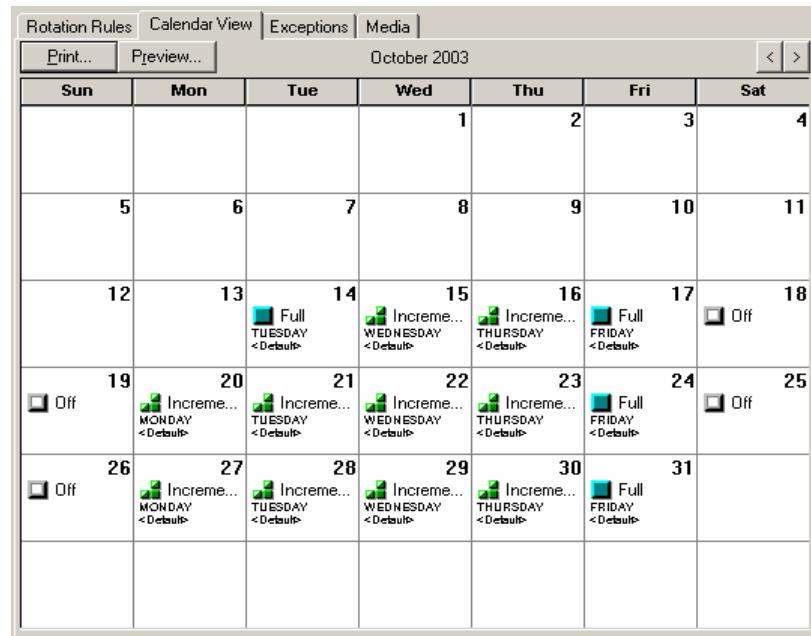
Rotation Rules Tab

You can modify the backup method or execution time for each day of the week.

Day of Week	Media Name	Method	Mode	Exec.Time	Disk Staging
Sunday	SUNDAY	Off			
Monday	MONDAY	Incremental	Overwrite	<Default>	Enabled
Tuesday	TUESDAY	Incremental	Overwrite	<Default>	Enabled
Wednesday	WEDNESDAY	Incremental	Overwrite	<Default>	Enabled
Thursday	THURSDAY	Incremental	Overwrite	<Default>	Enabled
Friday	FRIDAY	Full	Overwrite	<Default>	Disabled
Saturday	SATURDAY	Off			

Calendar View Tab

You can customize individual days. With GFS rotation either enabled or disabled, you can use the Calendar View feature to customize your rotation scheme according to the types of backups you want for particular days of the week or month, based on the calendar.



Note: This feature enables you to specify exceptions to the standard rotation scheme you are using.

Exceptions Tab

Define particular days on which the back up method and the execution time or date differs from the pre-existing schemes.

Media Tab

View information about the media pool you selected, including name, base serial number, next serial number, serial number range, minimum number of media, retention time, and prune retention time. You can also click the Daily, Weekly, or Monthly boxes to change the number of required media per year.

Preserve Media	Value
Daily	4
Weekly	5
Monthly	12
Total Media	21

Media Pool Specification

Specify a (non-shared) media pool to the rotation scheme. If necessary, you can append data to media and change the media name.

Backup Method Options

A combination of three different backup methods is available: full, differential, and incremental. See the section "Custom Schedules" in this chapter for detailed information about each of these methods.

Job Filters

Filters allow you to include or exclude files and directories from your backup and restore jobs, as well as from the utilities, such as Copy, Count, and Purge.

For backup jobs, filtering can be performed on a per node basis. This means you can include a directory from one node and exclude the same directory from another node. A backup job can have node-level (local) and job-level (global) filters for the same job. Node-level filters apply to one specific node, not the entire job. If you want to add a filter that applies to the entire job, use a job-level, or global, filter. If you specify local (node-level) filters and global (job-level) filters for a backup job, BrightStor ARCserve Backup applies the local filters and disregards the global filters.

You can include or exclude files based on the following criteria:

- Specific file names, patterns, attributes, and size.
- Specific directory names or patterns.
- Files accessed, modified, and created before, after, between, or within a specific date range.

BrightStor ARCserve Backup uses wildcards or replacement characters, except when it detects that an absolute path is specified. If a valid absolute path is specified, BrightStor ARCserve Backup will only exclude (or include) the absolute path specified, rather than excluding (or including) more directories, as it would for regular expression.

Important! *Be very careful when specifying filters for your backup or restore operation! Incorrectly applied filters may not back up or restore the data you need, and can result in lost data and wasted time!*

Filter Options

You can access the filter options from the Backup Manager, Restore Manager, Copy, Count, Scan, Compare, and Purge Utility windows.

- Exclude—Exclusions always take precedence over inclusions. For example, if you add a filter to include files that have an .exe extension, and you add another filter to exclude your \SYSTEM directory, all .exe files in the \SYSTEM directory are excluded.
- Include Filters—Results contain only those files that satisfy the filter specifications. For example, suppose you selected to back up your entire local hard drive, and you then set up a filter to include files in the \SYSTEM directory. The result would be that BrightStor ARCserve Backup would only back up files from your \SYSTEM directory. No other files would be backed up.

Types of Filters

Filters are available which enable you to include and exclude files to suit your needs. For details about how to apply filters, see the online help.

- File Pattern Filter—Use the File Pattern filter to include or exclude files from a job. You can specify a particular file name or you can use wildcards to specify a file pattern.
- Directory Filter—Use the Directory filter to include or exclude specific directories from a job. You can enter an entire directory name or provide a pattern that the directory name follows.

- **File Attributes Filter**—Use the File Attributes filter to include or exclude specific types of files from a job. Select as many of the following types of file attributes as you want:
 - Hidden—Files not shown in a directory listing. For example, IO.SYS is a hidden file.
 - System—Files that are unique to the machine you are using.
 - Archive—Files whose archive bit is set.
 - Read Only—Files that cannot be modified.
 - Compressed—NetWare system files identified as having a Compressed attribute.
- **File Modified Filters**—Use the files last modified attribute to include or exclude files, based on the time they were last changed. There are four options from which to choose:
 - Before—Files whose date matches, or whose date is earlier than this date, are included or excluded.
 - After—Files whose date matches, or whose date is later than this date, are included or excluded.
 - Between—Files whose date falls between the two dates are included or excluded from the job. You must specify two dates for this selection.
 - Within—Files whose date falls within the specified time are included or excluded from the job. You must specify the number of days, months, or years.
- **File Created Filters**—Use the files last created attribute to include or exclude files based on when they were created. There are four options from which to choose:
 - Before—Files whose date matches, or whose date is earlier than, this date is included or excluded.
 - After—Files whose date matches, or whose date is later than, this date is included or excluded.
 - Between—Files whose date falls between the two dates are included or excluded from the job. You must specify two dates for this selection.
 - Within—Files whose date falls within the specified time are included or excluded from the job. You must specify the number of days, months, or years.

- File Accessed Filters—Use the file last accessed attribute to include or exclude files based on when they were last accessed. There are four options from which to choose:
 - Before—Files whose date matches, or whose date is earlier than, this date is included or excluded.
 - After—Files whose date matches, or whose date is later than, this date is included or excluded.
 - Between—Files whose date falls between the two dates are included or excluded from the job. You must specify two dates for this selection.
 - Within—Files whose date falls within the specified time are included or excluded from the job. You must specify the number of days, months, or years.
- File Size Filters—Use the file size attribute to include or exclude files based on the specific size of the file. You can specify a size range from 0 to 99999999999 bytes, KB, MB, or GB. There are four options from which to choose:
 - Equal to—Files whose size matches the size range are included or excluded from the job.
 - Greater than—Files whose size matches or whose size is greater than the size range are included or excluded from the job.
 - Less than—Files whose size matches or whose size is less than the size range are included or excluded from the job.
 - Between—Files whose size falls between the two sizes are included or excluded from the job.

Schedule Custom Jobs

All jobs can all be scheduled using the Schedule options available in each Manager. Jobs can be submitted with a repeat method. For information about repeat methods, see Rotation Schemes or Custom Schedules in this chapter.

If you select the Run Job Now option when your storage device is busy, BrightStor ARCserve Backup reports that the storage device is busy and the job is not submitted to the Job Queue. You should schedule your job, keeping the current date and time. This way, when BrightStor ARCserve Backup discovers that the storage device is busy, it automatically retries the job until the drive becomes free.

You should select the Run Job Now option when:

- The job you are submitting is a one time only job that you want executed immediately.
- You want to monitor the job as it runs.

You should schedule your job when:

- You are submitting a single occurrence job but and you want it to run at a specific time.
- You are submitting a single occurrence job, but you do not want to run it now. You want to submit the job on Hold, and start it manually at a later time.
- You are submitting a job that should run regularly. This is especially useful for setting up a media rotation scheme for your network.
- Your storage device is busy and you want to run a backup job as soon as the drive is free. To do this, schedule your backup job with the current date and time.

For details on how to specify a scheduling option, see the online help.

Important! *All scheduled times for BrightStor ARCserve Backup jobs are based upon the time zone where the BrightStor ARCserve Backup server is located. If your agent machine is located in a different time zone than the BrightStor ARCserve Backup server, you will need to calculate the equivalent local time that you want the job to be run.*

Custom Schedules

You can select a custom schedule on the Schedule tab in the Backup Manager. A custom schedule enables you to run a backup job either once or on a repeating basis. You can specify the following parameter for a backup or restore job:

- Repeat Method—All jobs can be scheduled using the Schedule options available in each Manager. Jobs can be submitted with a repeat method of
 - Once—Do not repeat this job.
 - Every n frequency—Repeat this job every specified number of Minutes, Hours, Days, Weeks, or Months.
 - Day(s) of the Week—Repeat this job on the days that are checked off.
 - Week(s) of the Month—Repeat this job on the weeks that are checked off.
 - Day of the Month—Repeat this job on the specified day.
 - Custom—Repeat this at the specified interval, but exclude the days that are checked.

You can specify the following parameter for a backup job:

- **Backup Method**—This specifies what data will be backed up. Jobs can be submitted with a backup method of:
 - Full (Keep Archive Bit)—Performed each time the job is repeated and keeps the archive bit.
 - Full (Clear Archive Bit)—Performed each time the job is repeated and clears the archive bit.
 - Incremental backup—Backs up only those files whose archive bit have been set since the last full or incremental backup was performed. After each backup, archive bits are reset so that they are not backed up during the next incremental backup job.
 - Differential backup—Backs up only those files whose archive bits have been set since the last full backup was performed. Because differential backup jobs do not clear a file's archive bit, the files that were backed up in the last differential job are backed up again. Using this backup method, the backup jobs require more time to process than incremental backup jobs. However, this strategy requires less effort to restore servers and workstations because you will probably require fewer media to restore your machines.
- **Use WORM Media**—Directs BrightStor ARCserve Backup to use WORM media when the backup job runs.
- **Retry Missed Targets**—Reschedule a backup for any workstations or file servers that were missed during the backup job.

Job Scheduler Wizard

The BrightStor ARCserve Backup command line enables direct control over all operations that can be performed by a BrightStor ARCserve Backup server. The Job Scheduler Wizard provides an alternative to entering job scheduling commands in the Command Prompt window.

The benefits of using this wizard rather than the command line include:

- Jobs can be scheduled and repeated.
- Jobs appear in the Job Queue and Activity log.
- Jobs can be stopped in the Job Queue.
- The commands you can enter are not limited to BrightStor ARCserve Backup. You can use this wizard for virtually any executable, such as Notepad.exe.
- It provides an easy way to quickly package and submit jobs.

Important! All scheduled times for BrightStor ARCserve Backup jobs are based upon the time zone where the BrightStor ARCserve Backup server is located. If your agent machine is located in a different time zone than the BrightStor ARCserve Backup server, you will need to calculate the equivalent local time that you want the job to be run.

When you submit a job using the Job Scheduler Wizard, it is labeled as a generic job in the Job Queue and Activity log. Although you can modify a generic job using the Job Queue; you can only reschedule and stop it.

Important! You must have Administrator rights on the local Windows machine to submit jobs using the Job Scheduler Wizard.

Submit a Job Using the Job Scheduler Wizard

To submit a job using the Job Scheduler Wizard, use the following procedure:

1. Open the Job Scheduler Wizard. The Use Default Server check box is selected.

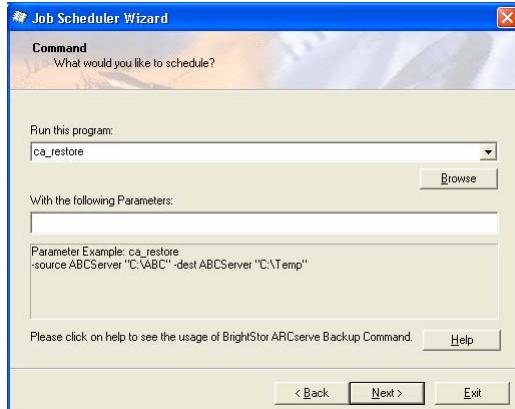


2. Do one of the following:
 - To use the default server, click Next and go to Step 5.
 - To use a different server, clear the Use Default Server check box, click Next, and continue to the next step.

3. On the Login Page dialog, select the computer you want to submit the job to from the Server to Manage drop-down list. A sample dialog is shown next:



4. Enter the user name and password required to log in to the computer and click Next.
5. On the Command dialog, enter or select a program from the drop-down list in the Run this program field. A sample dialog is shown next:

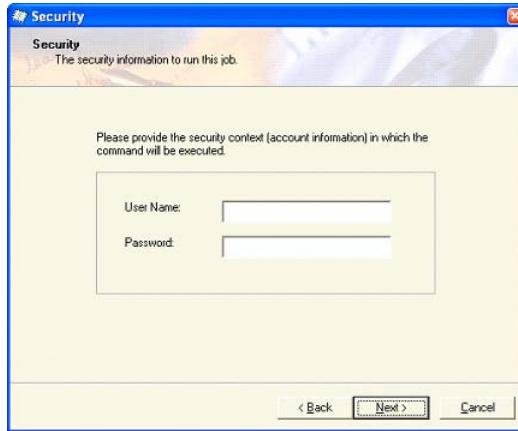


6. Specify the parameters for the command.

For example, if you entered ca_restore in the Run this program field, you can enter -source <Source Path> -dest <Destination Path> as the parameters. For a list of commands and the corresponding parameters, see the appendix "Using Command Line Utilities."

Important! The Job Scheduler Wizard does not validate parameters. If you specify incorrect parameters, the job will submit, but does not run. Therefore, you must make sure that you enter parameters accurately.

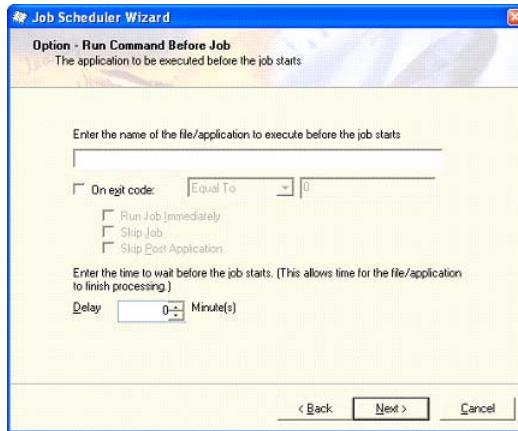
7. When you finish selecting a program and entering parameters, click Next. The Security dialog opens, as shown in the following example:



Enter a user name and password for the job and click Next.

Note: If the job you are scheduling involves a UNIX-based platform, continue to the next step. Otherwise, go to Step 11.

8. On the Option—Run Command Before Job dialog, enter the name of the file or application that you want to execute before the job starts. Specify the On exit code and Delay parameters and click Next.

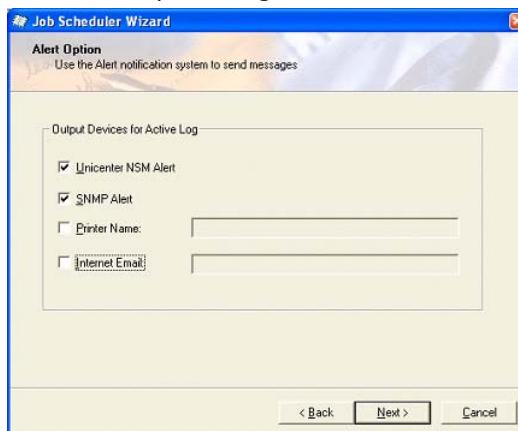


9. On the Option—Run Command After Job dialog, enter the name of the file or application that you want to execute when the job ends. For Run Before/After Command As, enter the following information and then click Next.
 - User Name—The name of the user under whom you want to run the job.
 - Password—The password for the user entered above.

A sample dialog is shown next:



10. On the Alert Option dialog, specify the alert notification options and click Next. A sample dialog is shown next:



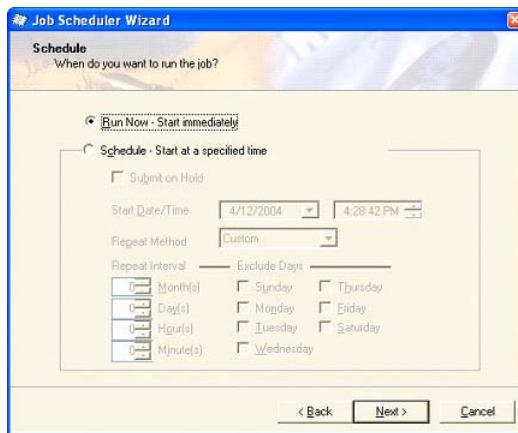
Note: To specify a printer, click the Printer Name check box and enter the printer name into the text box using the following format:

\\Server\Printer

11. On the Schedule dialog, select one of the following:

- Select Run Now to execute the job immediately.
- Select Schedule to execute the job at a specific time and date or to schedule the job to repeat. Then, select a date and time to run the job in the Start Date/Time field. If you want the job to repeat, select a Repeat Method and the associated criteria.

A sample dialog is shown next:



12. When you finish scheduling the job, click Next. The summary page opens, as shown in the following example:



A summary of what you selected appears in the Job Summary field.

13. Verify your job selections and enter a description for this job in the Description field. This description appears in the description column in the Job Queue and can be used to identify the job.
14. Click Submit. A message indicates if the job was successful and provides the job number you can use to identify the job in the Job Queue. If the job fails, a message indicates that it failed and provides the error code or a short message explaining the error. Click OK.

Job Status Manager

The Job Status Manager is a graphical tool that helps you centrally manage BrightStor ARCserve Backup servers across the enterprise.

You can use the Job Status Manager to:

- View all available BrightStor ARCserve Backup servers, job queues, and activity logs.
- Manage jobs—add, run, delete, modify, and reschedule jobs.
- Monitor progress of active jobs—view real-time status of active jobs in the queue.
- View job detail and job log information about all the jobs that have been executed.
- View activity and media logs.
- Stop an active job.
- Modify user names and passwords associated with a job.

Pop-up menus enable you to perform various operations with the Job Status Manager. These menus appear in both the left (server browser) and right (Job Queue) panels. To access a menu, right-click a selected item. When accessing a pop-up menu in the browser, the pointer must be on a selected group, server, or object. When accessing a pop-up menu in the Job Queue, a job must be selected.

Note: When you submit a job that spawns child jobs, the Job Queue tab and the Activity Log group the parent job together with all of its child jobs. Additionally, the Activity Log presents you with a description for the job.

Update Multiple Jobs

In your BrightStor ARCserve Backup environment, you can have several to many jobs listed in the Job Queue. If a situation arises where you need to change the READY or HOLD status on more than one job, you can update multiple jobs simultaneously. The updates that you can perform simultaneously include changing the job status from HOLD to READY, from READY to HOLD, and delete the job.

Note: If you select a job with child jobs, BrightStor ARCserve Backup applies the update to the parent job and all of its child jobs.

To update multiple jobs, use the following steps:

1. From the Job Status Manager, select the Job Queue tab.
2. Click to select the job that you want to update.
 - To select multiple adjacent jobs, press and hold the Shift key as you select the jobs.
 - To select multiple non-adjacent jobs, press and hold the Ctrl key as you select the jobs.
3. Right-click the selected jobs.
4. From the pop-up menu, select HOLD, READY, or Delete Job as warranted by the situation.

Servers and Groups Management

The server browser in the left panel makes it easy to navigate through BrightStor ARCserve Backup servers and their objects. You can manage your servers in groups. Select the server group and right-click for the following options:

- New Server Group—Appends a new server group at the end of the list and then allows you to edit the group name.
- Rename—Allows you to edit the group name.
- Delete—Deletes the currently selected group.
- Add Member—Adds a server to the selected group.

When you select a server, right-click for the following options:

- Start all engines—Starts the BrightStor ARCserve Backup engines.
- Stop all engines—Stops the BrightStor ARCserve Backup engines.
- Delete—Deletes the server from its group.
- Properties—Lists the status of the BrightStor ARCserve Backup engines for this server, build number, version, and options installed.
- Security—Displays the security information for each machine or share that is selected as a source.

For information about using these menu options, see the online help.

Job Queue Tab

The Job Queue tab on the right panel displays information about all jobs. Every time you run or schedule a job with the BrightStor ARCserve Backup Manager, you submit it to the Job Queue. BrightStor ARCserve Backup continuously scans the Job Queue for jobs that are waiting to execute. Select a job and right-click for the following options:

- READY/HOLD—Changes the job's status to HOLD or to READY (if it is currently on hold). HOLD signifies that the job is not scheduled to be executed, while READY means that the job can be executed.
- Add Job—You can quickly submit a job to the queue by using a previously saved script. (A script is a job that you saved to a file. It contains the original source, destination, option, and schedule information for the job.)
- Modify Job—Modifies a job. Allows you to add options or additional sources to an existing job, without having to create a new job.
- Reschedule Job—Quickly change a job's execution date, time, or status. It also allows you to resubmit a Done job that is still in the Job Queue. You may want to do this if your job was not successful when it first ran.
- Run Now—Available for jobs that have a Ready or Done status. This option is useful in the following scenarios:
 - You want to run a job earlier than the time it is scheduled to run
 - A scheduled job did not run because of a hardware problem and you want to run it immediately after the problem is fixed

If a device group is available, this option runs the job immediately. If you select Run Now and a device group is not available, the job stays in the queue and waits for a group to become available.

If you select the Run Now option for a repeating, rotation, or GFS rotation job, the following conditions apply:

- The job runs immediately and the existing schedule is not affected unless the time it takes to run the job overlaps with the next scheduled run. In this scenario, the scheduled run is skipped for that day. For example, if you have a job scheduled to run Monday through Friday at 9:00 p.m., you select Run Now at 6:00 p.m. and it does not finish till 10:00 p.m., the 9:00 p.m. scheduled run for that day is skipped.
- The backup method used for the job is the same backup method that will be used for the scheduled run that day. For example, if you have an incremental backup job scheduled for 9:00 p.m. and select Run Now at 6:00 p.m., the job that runs at 6:00 p.m. will be an incremental backup. If you select Run Now on a day that does **not** have a scheduled run, the backup method of the next scheduled job will be used. For example, if you have an incremental job scheduled to run Monday and you select Run Now on Saturday, the job that runs on Saturday will be an incremental backup.

- Stop Job—Cancels an active job from the BrightStor ARCserve Backup queue and reschedules it for its next regular interval.

Note: If you stop a job, the Last Result field displays "Canceled."

- Delete Job—Cancels the job and deletes it from the BrightStor ARCserve Backup queue completely.

You cannot use the Delete Job option on an active job. Use the Stop Job option if you want to delete an active job that repeats at intervals (determined when you create the job). Selecting the Delete Job button will interrupt and remove the job completely from the queue, and it will not be rescheduled. You will have to recreate the job if you did not save it to a script file.

For information about deleting the BrightStor ARCserve Backup database pruning job, see the section "BrightStor ARCserve Backup Database Pruning Jobs" in this chapter.

- Modify User Name—Modify the user name and password for server and source nodes.
- Sort By—Jobs in the queue are listed in order of execution time. This option changes the order in which jobs are listed in the queue. Sorting the Job Queue is for informational purposes only. It does not affect the order in which jobs are processed. To sort jobs, click any of the following fields: Status, Execution Time, Job Type, Server, Last Result, Owner, Total Files, and Description.

Note: You can resize these columns by using the "drag and drop" method with the mouse. Place the cursor on the divider between columns, click and hold down the left mouse button, and then move the divider in either direction until the column is the size you want.

- Properties—Double-click to call up the Job Properties dialog when the job is processing.

For more information about using these menu options, see the online help.

Job Status Types

When a job is in the BrightStor ARCserve Backup queue, it is listed with a status. The status can be one of the following:

- Done—A job that has already been executed with no repeat interval.
- Ready—A new one-time or repeating job (a backup job that runs every Friday, for example) waiting to be executed.
- Active—A job that is currently being executed.
- Hold—A job that is in the queue waiting to be executed later.

Completed jobs remain listed in the Job Queue for a specified number of hours. This period of time is set up through the BrightStor ARCserve Backup Server Admin feature. For more information, see the chapter “Administering the Backup Server.”

Last Result Field

The Last Result field tells you whether your executed job was successful. If it was not successful, the information in this field helps you determine why the job may have failed. The Last Result field may contain the following:

- Finished—All of the nodes and drives and shares were processed.
- Incomplete—The job was partially successful. Review the Activity log information to check the exact nature of what occurred to prevent job completion.
- Canceled—The job was intentionally canceled. The following actions may have occurred:
 - A user canceled the job from the Job Queue.
 - Someone answered NO or CANCEL to a console prompt.
 - The job required either a confirmation of OK, or media to be inserted before the time out was reached. (Time out is set in the media options in the Backup Manager window.)
- Failed—The job failed to perform its designated task. This usually occurs if BrightStor ARCserve Backup cannot back up any source nodes of a job (for example, if the agent is not loaded or an invalid password was entered) or if a hardware error occurs. If the job was started, but the Manager could not complete the job, you will receive “Run Failed” status. Review the Activity log information to check the exact nature of what occurred to prevent the job from completing.

- Run Failed—The job was started, but the program that runs the job failed, because either there was not enough memory to run the job or a DLL file was not found.
- Crashed—The job was started and a system error occurred which prevented BrightStor ARCserve Backup from completing its task, such as a memory violation that caused BrightStor ARCserve Backup or the operating system to be shut down. If a job has a status of Crashed, it can be retried after the Job Engine restarts. This can be set up through the BrightStor ARCserve Backup Server Admin in the Job Engine Configuration tab.

Backup Job Failure

If you determine that your job failed, you can use the information provided in the Last Result field to remedy the problem, and then resubmit it.

For more information, see the chapter "Administering the Backup Server."

Deleted BrightStor ARCserve Backup Database Pruning Jobs

When you attempt to delete the BrightStor ARCserve Backup database pruning job, a warning message opens. If you delete a database pruning job, the following conditions apply:

- If the BrightStor ARCserve Backup database pruning job is scheduled to run daily, the job reconvenes the next time it is scheduled to run. BrightStor ARCserve Backup prunes all records that were not pruned due to one or more deleted pruning jobs.
- Pruned records cannot be rolled back into the BrightStor ARCserve Backup database.
- Use the BrightStor ARCserve Backup Server Admin to restart the manually.

To restart the database pruning job manually, use the following procedure:

1. Start the BrightStor ARCserve Backup Server Admin and click the Config toolbar button.
The Configuration dialog opens.
2. Select the Database Engine tab.
3. Check the Submit Prune Job option.
4. Click OK.

View Job Details Using the Activity Log

The Activity Log tab on the right panel contains comprehensive information about all the operations performed by BrightStor ARCserve Backup.

Type	Date	Job	Session	Message
Information	10/30/2003 10:23...			[JOBQUEUE]: Status changed from ACTIVE to REA
Information	10/30/2003 10:23...			[JOBQUEUE]: Rescheduled for 10/31/03 at 12:00 A
Information	10/30/2003 10:23...	5		Reschedule Prune Database Job for 10/31/03 at 12
Information	10/30/2003 10:23...	5		End pruning logs.
Information	10/30/2003 10:23...	5		Begin pruning logs.
Information	10/30/2003 10:22...	5		Prune Database Operation Successful.
Information	10/30/2003 10:22...	5		** Summary for Job **
Information	10/30/2003 10:22...	5		End pruning database. (PRUNED=0)
Information	10/30/2003 10:22...	5		Pruning sessions older than 30 days.
Information	10/30/2003 10:22...	5		Begin pruning database.
Information	10/30/2003 10:22...	5		Run Prune Database Job Scheduled for 10/30/03 a
Information	10/30/2003 10:22...			[JOBQUEUE]: Status changed from READY to ACTI
Information	10/30/2003 10:22...			Tape Engine is Started.
Information	10/30/2003 10:22...			BAOF: Operation enabled.
Information	10/29/2003 06:42...			Message Engine is Stopped.
Information	10/29/2003 06:42...			Tape Engine is Stopped.
Information	10/29/2003 10:52...			[JOBQUEUE]: Status changed from ACTIVE to REA
Information	10/29/2003 10:52...			[JOBQUEUE]: Rescheduled for 10/30/03 at 12:00 A
Information	10/29/2003 10:52...	4		Reschedule Prune Database Job for 10/30/03 at 12
Information	10/29/2003 10:52...	4		End pruning logs.
Information	10/29/2003 10:52...	4		Begin pruning logs.
Information	10/29/2003 10:52...	4		Prune Database Operation Successful.
Information	10/29/2003 10:52...	4		** Summary for Job **
Information	10/29/2003 10:52...	4		End pruning database. (PRUNED=0)
Information	10/29/2003 10:52...	4		Pruning sessions older than 30 days.
Information	10/29/2003 10:52...	4		Begin pruning database.
Information	10/29/2003 10:52...	4		Run Prune Database Job Scheduled for 10/29/03 a
Information	10/29/2003 10:51...			[JOBQUEUE]: Status changed from READY to ACTI
Information	10/29/2003 10:51...			Tape Engine is Started.
Information	10/29/2003 10:51...			BAOF: Operation enabled.
Information	10/28/2003 01:20...			Message Engine is Stopped.

The log provides an audit trail of every job that is run. For each job, the log includes the following:

- Time the job started and ended
- Type of job
- Average throughput of the data
- Number of directories and files processed (backed up, restored, or copied)
- Job session number and job ID
- Result of the job
- Errors and warnings that occurred

You can scan this log every day to see if any errors occurred. You can also use it to find a session number in case you need to restore a specific session. You can organize the Activity log view or print it to a file.

Delete Activity Log Files

To conserve file space, you can delete the entire Activity log file or unnecessary log records older than a specific time period.



To delete files in the Activity log:

1. Click the Delete option button.
2. Select the criteria you want to apply in the Purge dialog box. Click the Entire Log option if you want to eliminate all log file records since inception. Choose the Partial option if you want to select a specific time period for deleted files. Using the down-arrows, you can choose the age criteria for a partial log file purge.
Note: You can only choose either the entire log or a partial file purge option.
3. Click OK.

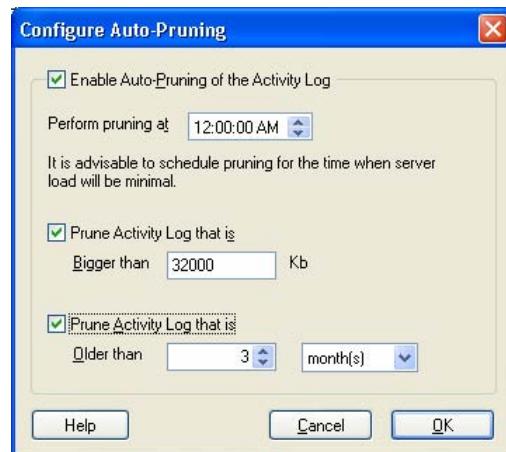
The log purge transaction displays in the Activity log after the file(s) are deleted.

You can also use the command line interface to purge job logs (or any other log file) from the Activity log. Use the `ca_log -purge` command to delete logs older than a specified period of time from any log file. You can also use the `ca_log -clear` command if you want to delete all log data from log files with no specified time period.

Note: For more information on the `ca_log` command, see the appendix "Using Command Line Utilities."

Schedule Activity Log Pruning

To conserve file space, you can schedule automatic Activity Log pruning. Using Activity Log pruning, you can direct BrightStor ARCserve Backup to delete unnecessary log records so that the Activity Log does not increase to greater than the specified size, does not contain the records older than the specified period of time, or both.



To schedule Activity Log pruning:

1. Click the drop-down menu next to the Log button and select Auto Prune Settings.
2. Select the option Enable Auto-Pruning of the Activity Log.
3. Select the time when you want the pruning operation to run. By default, pruning occurs at 12:00 a.m.
- Note:** The time you select should be the time at which the least amount of activity occurs. For example, if jobs usually do not run at 2:00 a.m., select 2:00 a.m. as the pruning time.
4. If you want to prune the Activity Log to prevent it from exceeding a specified size, select the option "Prune Activity Log that is bigger than" and specify the size criteria.
5. If you want to prune only log records older than a specific period of time, select the option "Prune Activity Log that is older than" and specify the time criteria.
6. Click OK.

Organize the Activity Log

BrightStor ARCserve Backup provides you with the capability to customize the type of information and how the information displays in the Activity Log.

Using the Organize dialog you can:

- Filter by message type--Specify the types of messages that you want to view in the Activity Log. You can view informational messages, error messages, warnings messages, or any combination thereof.
- Filter by message date--Specify a date or range of dates of messages that you want to view in the Activity Log. You can show all messages, filter messages such that only messages before or after a specified date display, or display a specific range of dates.
- Group by message type--Specify how you want to group the activity log messages. You can group by message type, job, and category.
 - The Group by Type option lets you group error messages, warning messages, and information messages.
 - When you specify the Group by Jobs option, the Activity Log groups the parent job together with all of its child jobs. For each parent job and its corresponding child jobs, the Activity Log presents you with a description for the job.
 - The Group by Category (Device Management only) option lets you group and view messages relating to device management functions, such as restore and format operations.
- Sort logs using the post date--Specify the date order in which you want the messages to display. You can specify the latest or oldest messages first.

Note: For specific information about Activity Log options, see the online help.

To organize the Activity Log:

1. Open the Job Status Manager and select the Activity Log tab.
2. Right-click any location on the Activity Log and select Organize from the pop-up menu.
The Organize dialog opens.
3. Specify the desired options and click OK.

Tape Log Tab

The Tape Log tab in the Job Status Manager displays if you enabled the option Show Tape Log on Job Status Manager while configuring the Tape Engine. For more information, see Tape Engine Configuration, in the chapter "Administering the Backup Server."

Note: After you enable the option "Show Tape Log on Job Status Manager," you must click Refresh in the Job Status Manager for the changes to take effect.

Job Detail Tab

The Job Detail tab in the bottom panel displays details about any job in the queue, including the source and destination targets and the job's schedule. If you have selected customization options such as Pre/Post backup requirements, they will be displayed here. After a job has started, you can view its sequence and session number.

Job Log Tab

The Job Log tab in the bottom panel displays information about specific jobs that have been executed. It is generated for each job that BrightStor ARCserve Backup runs. You can specify the level of detail in the log by choosing the Log options before you submit the job. For information on how to configure and view the log report for a job, see the online help.

BrightStor ARCserve Backup provides the following log options:

- Log All Activity—Record all of the activity that occurs while the job is running.
- Log Summary Only (default)—Record summary information on the job (including source, destination, session number, and totals) and errors.
- Log Disabled—Do not record any information about this job.

Job Scripts

A script is a job that you saved to a file. It contains the original source, destination, options, and schedule information for the job. It will also contain any filters you created to include and exclude files and directories.

Creating a script has the following advantages:

- You can re-use the same settings later.
- You can copy your settings to a different Windows machine running BrightStor ARCserve Backup.
- You can quickly resubmit regularly executed jobs after a job has been accidentally deleted.

Save Scripts

You can save almost any type of job as a script. After you create the job, click Start. In the Submit Job dialog, click Save to save the job criteria in a script. After you save the script, click OK to submit the job to the queue.

Use an Existing Script

To use an existing script, use the following steps.

1. Access the Job Queue tab of the Job Status Manager and click Add Job. The Add Job dialog opens.
2. Choose the path and file name of an existing script, and then click Open. Job scripts use the .asx file extension. The job information for the previously saved script will be displayed in the Job Queue as a new job.

For more information on how to create and use a script, see the online help.

Job Templates

A job template contains a series of settings such as the destination, options, and schedule information for the job. Similar to job scripts, a template can also contain any filters you created to include and exclude files and directories.

Job templates are different, however, from job scripts because they provide the flexibility to repeat custom backup schedule settings on other BrightStor ARCserve Backup machines. Because the job template does not retain the backup source information as the job script does, the template files can be copied and applied to any new server source running BrightStor ARCserve Backup. Contrarily, job scripts can not be modified to accommodate new server sources.

You can choose from seven default job templates or you can create a custom template to meet your individual backup needs. The default job templates are designed to meet specific backup tasks such as rotation scheme, backup method, and GFS options. The default job templates can be accessed from the File menu when you choose the Open Job Template option.

Create Custom Job Templates

You can create a custom job template that you can save for future jobs on any BrightStor ARCserve Backup machine.

To create a job template:

1. Open the Backup Manager by selecting Backup Manager from the Quick Start menu.
2. Make selections for your backup job by accessing the Source, Destination, and Schedule tabs.
3. Submit your job by clicking the Start button.
4. Click Save Template in the Submit Job dialog box to save your new job template with an .ast filename extension.

Note: While default job templates are stored in the Templates/Jobs folder in the BrightStor ARCserve Backup directory, you can save your template in any directory you want. To open your custom job template on a local machine or from a remote server, access the File menu and choose the Open Job Template option. After the job template is open, you can submit your job.

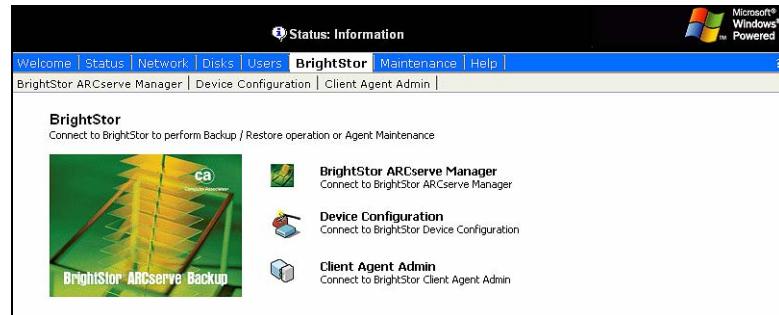
Windows-powered NAS and Storage Server 2003 Device Configuration

BrightStor ARCserve Backup provides support for backup and restore of Windows-powered NAS and Storage Server 2003 devices (referred to as Windows-powered NAS).

When you install BrightStor ARCserve Backup on Windows-powered NAS, a new BrightStor ARCserve Backup tab is available on the Web administration user interface for the device. By accessing the tab, you can connect directly with the BrightStor ARCserve Backup components.

Access BrightStor ARCserve Backup through the Windows-powered NAS Device

You can administer backup and restore jobs as well as perform agent maintenance for Windows-powered NAS devices through the Web interface. A seamless integration of the BrightStor ARCserve Backup Home Page is easily accessible from the Windows-powered NAS Web administration interface.



Links to BrightStor ARCserve Backup Manager, Device Configuration, or Client Agent Admin are displayed from the Windows-powered NAS menu option. The options available are dependent upon the options installed on the Windows-powered NAS Device.

Use the following table to determine what options are available in the Windows-powered NAS Web administration interface based on a specific BrightStor ARCserve Backup component install.

Installed BrightStor ARCserve Backup Component	Options Available in Windows-powered NAS Interface
BrightStor ARCserve Backup Manager	BrightStor ARCserve Backup Manager
BrightStor ARCserve Backup Server	Device Configuration
BrightStor ARCserve Backup Windows Client Agent	Agent Admin

BrightStor ARCserve Backup and Windows-powered NAS Device Configuration

The following describes basic Windows-powered NAS configurations supported by BrightStor ARCserve Backup.

Backup Devices Connected Directly to Windows-powered NAS Devices

You can configure and deploy BrightStor ARCserve Backup directly on a Windows-powered NAS as displayed in the following illustration:



You can use the Web interface integration provided by BrightStor ARCserve Backup on a remote server and perform backup and restore tasks as well as monitor scheduled jobs configured for the installation.

Backup Devices Connected to BrightStor ARCserve Backup Server

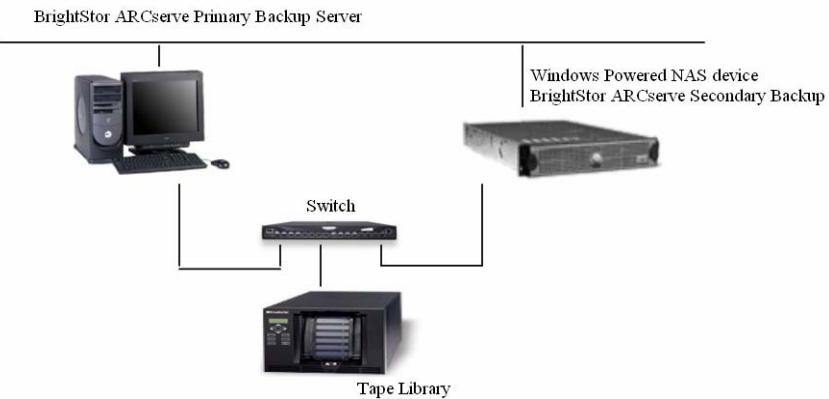
You can configure BrightStor ARCserve Backup Windows Client Agents on the Windows-powered NAS device. Agents can be administered using the integrated Web administration interface provided by BrightStor ARCserve Backup.

The Agents can be backed up from the remote BrightStor ARCserve Backup Server which may be running on another Windows-powered NAS device as shown in the following illustration.



Backup Devices Shared between BrightStor ARCserve Backup and Windows-powered NAS

You can configure BrightStor ARCserve Backup Server, Manager, and the SAN Option on a Windows-powered NAS device and create a secondary remote BrightStor ARCserve Backup server with a SAN Option. Both machines can connect to a shared backup device such as a tape library through a fiber switch as displayed in the following illustration.



VMware Virtual Machine Environments

BrightStor ARCserve Backup supports backup and restore operations in a VMware virtual environment where a Linux platform is the guest operating system, a Windows-based platform is hosting the virtual environment, and the BrightStor ARCserve base product is installed on the system hosting the VMware virtual environment.

BrightStor ARCserve Backup supports the following VMware applications:

- VMware Workstation
- VMware GSX
- VMware ESX Server

With this feature you can back up and restore VMware host partitions by using BrightStor® ARCserve® Backup Client Agents.

If you install the Linux client agent on a Linux virtual machine, BrightStor ARCserve Backup can back up and restore files, directories, and volumes on the local Linux virtual machine.

If you need more information about using VMware Workstation, see the application's online help system.

Guest Operating System Backup

The procedure for backing up a guest operating system is similar to that of backing up any other client agent. However, before you can back up a guest operating system, you must perform the following preconfiguration tasks on the machine hosting the VMware environment:

- Install the BrightStor ARCserve Backup Client Agents (Windows or Linux) on each guest operating system.
- Install the BrightStor ARCserve Backup application agent corresponding to the application that you want to protect on each guest operating system. For example, if you want to protect Microsoft SQL Server data, you must install the BrightStor® ARCserve® Backup Agent for Microsoft SQL Server.

For more information about installing BrightStor ARCserve Backup Client Agents, or any other BrightStor ARCserve Backup application agent, see the *Getting Started*. For more information about backing up data, see the chapter “Backing Up Data.”

Host Operating System Back Up

The process for backing up a host operating system is similar to that of backing up any other client agent. However, before you can back up a host operating system, you must install the appropriate BrightStor ARCserve Backup client agent (Windows or Linux) on the host operating system.

To ensure the highest level of data protection in VMware environments, you should back up the host operating system after installing the client agents and application agents on the guest operating systems..

Note: Although you should back up the host operating system on a regular basis, it is not necessary to back up the host operating system every time you run a backup job on the guest operating systems.

For more information about backing up data, see the chapter “Backing Up Data.”

Guest Operating System Restoration

The procedure required to restore a guest operating system is similar to that of restoring any other client agent. For more information about restoring data, see the chapter “Restoring Data.”

Guidelines for Recovering the Guest Operating System From a Disaster

The following list describes the guidelines that you should follow to recover a guest operating system from a disaster. These guidelines assume that you installed the appropriate client and application agents on the host operating system.

To recover a guest operating system from a disaster, perform the following tasks:

- Recover the guest operating system and install the client agent.
- Restore the guest operating system's data.
- Start the guest operating system.
- Recover the data corresponding to each guest operating system by restoring the client and application agent.

Chapter 6: Managing Devices and Media

BrightStor ARCserve Backup provides a number of ways to help you manage, monitor, and maintain your devices and media:

- The Device Manager gives you information about storage devices connected to your system, the media in these devices, and the status of these devices. It is the starting point for all media and device monitoring and maintenance operations.
- The Media Pool Manager lets you create, modify, delete, and manage media pools, collections of media managed as a unit to help you organize and protect your media.
- The Media Management Administrator (MMO) provides the tools you need to control, manage, and protect media resources.

This chapter discusses these device and media management tools in greater detail.

Device Manager

The Device Manager provides information about storage devices that are connected to your system, the media in these devices, and the status of these devices. When you highlight a storage device or the adapter card it is configured to, summary information is displayed about the adapter card or the storage device, such as the vendor, model name, and board configuration.

If you have more than one storage device connected to your machine, BrightStor ARCserve Backup lets you separate them into groups. Establishing device groups is the key to the flexibility and efficiency of BrightStor ARCserve Backup.

By default, BrightStor ARCserve Backup is installed with each storage device assigned to its own group. If identical storage devices (same make and model) are detected, it automatically places them in the same group. You can use Device Group Configuration to:

- Create a new device group
- Assign a device to a device group (including a RAID group)

- Remove a storage device from a device group
- Rename or delete a device group
- Use a RAID tape set as one unit

For details on how to use the Device Group Configuration functions, see the online help.

Media Movement

When you insert a media into a magazine slot or remove a media from a slot, you must either inventory this slot or remount the magazine.

Important! *If you are manually inserting media into a library, always insert media into slots, never into its library drives.*

Schedule Device Management Jobs

Under Device Management, you can submit a scheduled Format or Erase job. In the Format or Erase dialog, choose Run Now to run and submit the device command now or choose Schedule to submit a device command job to the BrightStor ARCserve Backup queue and run later. Specify the date and time you want to run the device command.

For more information about the Run Now option, see Job Queue Tab in the chapter "Customizing Jobs."

Maintenance Tasks

Using the Device Manager, you can perform the following maintenance tasks on your media:

- Format media
- Erase data
- Retension tapes
- Compress data
- Eject media
- Rebuild media (RAID only)
- Scan device (USB storage devices only)

Important! *Before you use these options, especially formatting and erasing, make sure you have the right media selected.*

Each of the maintenance functions is described in more detail below. For more information on the Device Manager, see the online help. For more information on Device Management functions specific for libraries, see the *Tape and Optical Library Option Guide*.

Each device option is discussed in more detail in the following sections.

Format Media Option

You must format your media before using it. Although BrightStor ARCserve Backup automatically formats blank media, you can use the Format Media option to manually format your media. Formatting writes a new label at the beginning of the media, effectively destroying all existing data on the media. If you are using a library drive, you can format a single media or multiple media.

Note: If you format multiplexing media, BrightStor ARCserve Backup formats it as regular media rather than multiplexing media. For more information on multiplexing, see Multiplexing in the chapter Backing Up Data.

You can also use the Format option to assign media to media pools. For more information on this topic, see Media Pools in this chapter.

Important! *Use this feature with care! After you format media, the data it contained (if any) and any job sessions associated with this media are permanently deleted.*

File System Devices (FSD) that are part of a staging group cannot be formatted using the Format Media option. To prevent accidental formatting of an FSD prior to the data being migrated to a final destination media, the Format toolbar button on the Device Manager window is disabled. If you want to format the FSD, you can either use the command line (ca_devmgr) or disable the staging option for the selected FSD.

The life span of a media generally depends on passes. A pass is defined as the storage device head passing over a given point on the media. For example, a backup without verification constitutes one pass, whereas a backup with verification constitutes two passes.

Media manufacturers rate their media's useful lives from about 500 to 1500 passes. This does not mean that the media is unusable after it reaches the maximum number. It means that the media is more susceptible to errors at this point.

The expiration date is a way of tracking how long the media has been in service so you can stop using it before it reaches the end of its useful life. When a media reaches its expiration date, you will still be able to use it, but when you use it, a note is made in the Activity Log that this media is expired.

If you are formatting new, blank media, the default expiration date will be three years from the current date. If you are reformatting media, the expiration date that appears will be the date you specified the first time the media was formatted.

Choose an expiration date based on how you will use the media. If you plan to use the media often, say, a few times a week, you should set the expiration date to a year from now, maybe even sooner than that. On the other hand, if you plan to use the media only once or twice a month, you can set the expiration date to two or three years from now.

Erase Media Option

Use the Erase Data option to erase all data from media. When you use this, BrightStor ARCserve Backup erases all references to the contents of this media from the database. If you re-format this media, its physical history (read and write passes, and so on) is carried over. If you are using a library drive, you can erase data from a single media or from multiple media.

File System Devices (FSD) that are part of a staging group cannot be erased using the Erase Media option. To prevent accidental erasing of staged data from an FSD prior to it being migrated to a final destination media, the Erase toolbar button on the Device Manager window is disabled. If you want to erase the data from the FSD, you can either use the command line (ca_devmgr) or disable the staging option for the selected FSD.

You can choose one of the following options to erase data:

- Quick Erase—A Quick Erase effectively erases the media but the history of the media is still available to BrightStor ARCserve Backup for tracking purposes. It overwrites the media label, thus making it much shorter than a Long Erase (which takes minutes to hours).
- Quick Erase Plus—This is the same Quick Erase, but also erases the bar code and serial number if this feature is enabled. The media is no longer traceable by BrightStor ARCserve Backup and information such as the expiration date is no longer carried forward.
- Long Erase—A Long Erase completely removes all data from media. It takes much longer than a Quick Erase, but the media is completely blank. For security reasons, if you want to make sure that the data on the media is erased completely, use Long Erase.
- Quick Erase and Convert to WORM—This option performs all the tasks associated with Quick Erase and then converts the tape to WORM media.

Note: To use this option, the changer must be a Quantum™ SDLT 600 drive or one of its descendent models, and the media must be at least SDLT-II or higher.

Erasing WORM Media

The Quick Erase and Convert to WORM option is not accessible unless BrightStor ARCserve Backup detects Quantum™ SDLT-II or higher media in the library slots. After you import media into a library, BrightStor ARCserve Backup automatically detects and differentiates WORM and non-WORM media in the slots. As such, you do not need to perform a full inventory of the slots after importing media. However, you should perform a full inventory after you install or upgrade BrightStor ARCserve Backup.

Retention Tapes Option

Use the Retension option to make sure a tape is evenly wound and properly tensioned to avoid errors, jamming, or breaking. You should retension a tape if you are having trouble writing to it or reading from it.

Note: This feature applies only to quarter inch cartridge tapes.

Compression Option

You can use the Compression option only if your storage device supports tape compression. If it does not, the Compression toolbar button will be disabled.

Under most circumstances, you should leave compression turned on. You should only turn it off if you plan to use a media in another drive that does not support compression. In this case, the drive that does not support compression will not be able to read the compressed data on the media.

Important! *You can only change compression when a blank tape is in the drive. This prevents mixing of uncompressed and compressed data between sessions on a tape.*

Eject Media Option

Use the Eject Media option to eject media from a storage device. If you are using a library drive and the library is highlighted, it will eject the media in all of the drives. If you select a particular storage device, it will only eject from that drive.

Important! *This task can only be used if the storage device supports this feature.*

Rebuild Media Option

Note: This option applies to RAID devices only.

This Rebuild option rebuilds a lost or damaged media. BrightStor ARCserve Backup will rebuild the target media.

Scan Device Option

Note: This option applies to USB storage devices only.

Use the Scan Device option to enumerate USB storage devices that are connected to the BrightStor ARCserve Backup server while the Tape Engine is running.

To scan a USB storage device using the Scan Device option

1. Open the Device Manager.
2. Connect the USB storage device to the BrightStor ARCserve Backup server.
3. Select the USB controller icon in the device directory tree and click the Scan Device toolbar button.

BrightStor ARCserve Backup detects and enumerates the device in the Device Manager device directory tree.

Important! If the drivers for the USB storage device are not Plug and Play (PnP) compatible, BrightStor ARCserve Backup may not be able to detect and enumerate the storage device. To remedy this situation, you must configure the USB storage device by stopping and restarting the Tape Engine.

To scan a USB storage device by stopping and starting the Tape Engine

1. Open the Device Manager and stop the Tape Engine.
To stop the Tape Engine, right-click the Tape service state icon located on the Device Manager toolbar and select Stop Engine.
2. Attach the USB storage device directly to the BrightStor ARCserve Backup server.
3. Restart the Tape Engine.
To start the Tape Engine, right-click the Tape service state icon located on the Device Manager toolbar and select Start Engine.

BrightStor ARCserve Backup detects and enumerates the device in the Device Manager device directory tree.

Library Support

BrightStor ARCserve Backup improves the time of auto-refresh (for devices/groups status) and provides useful filters and an easier way to execute multiple device commands (format/erase on a set of slots).

The filters will significantly reduce the amount of data and therefore will increase the manageability of the data and the performance of the application.

The following filters are available:

- Empty Slots filter—allows the user to see all non-empty slots or all slots of the library.
- Range Slot filter—filters the slots that belong to a certain range of slots.
- Media Pool filter—allows user to see only the tapes within a particular media pool.
- Bar code filter—if the library supports a bar code reader it will filter the media that match the bar code; otherwise it will match the serial number.

Note: The Media Pool and Bar code filters will accept wildcards.

The Library filters apply to the Device Manager and Backup Manager/Destination views. To set a filter or to see the current one, select the Library Filter tab in the Preferences menu. These filters apply to the current opened managers, not to all managers.

If a filter is applied to the view, the status bar indicates this by displaying FILTER in the second panel. By default, Device Manager and Backup Manager/Destination will filter the empty slots.

Device Management Functions for Libraries

Using the Device Manager, you can perform the following management tasks for your libraries.

- Label bar code and serial number media
- Inventory the slot range
- Format the slot range
- Erase the slot range
- Eject media from the library drives
- Mount magazine
- Dismount magazine
- Clean library drive (for tape libraries only)

- Import and export media
- Configure library groups
- Offline and online drives

Inventory Slots Option

The Inventory/Offline Slots option checks library slots to see if they are occupied, reads the media headers of any media it finds, then associates the media header of each media with the slot in which it was found. The slot in which each media was found is its home slot. You should use this option to inform the Tape Engine of any alterations made to the media in the library.

After you import media into a library, BrightStor ARCserve Backup automatically differentiates WORM and non-WORM media in the slots. As such, you do not need to perform a full inventory of the slots after importing media. However, you should perform a full inventory after you install or upgrade BrightStor ARCserve Backup.

The Inventory Slots option lets you perform the following tasks:

- Quick inventory—retrieve media information from the database.
- Regular inventory—read in all media information.
- Offline—dismount the media in the slot.

Note: You should only add and remove media when the Tape Engine is running so you can immediately inventory your slots.

Mount and Dismount Magazine Option

Use the Mount/Dismount option to load or remove a magazine from the library. Mounting a magazine initiates an inventory of the slots in the magazine. Dismounting a magazine returns all media to their home slots and prepares the magazine for removal. The time this process takes will vary according to the number of media in the magazine you are mounting or dismounting.

Note: Magazines must be mounted before library operations can start. You must dismount magazines before you physically remove them.

Import and Export Media Option

The Import/Export Media option allows you to add a new media to a large capacity library by specifying an empty slot to which the media can be assigned (import), or remove a media from a large capacity library (export). When you import media, the library reads the media and adds it to its inventory. Exporting makes it easy to remove a media for off-site storage, or to remove a media you suspect is bad.

This dialog contains the following fields and buttons:

- Mail Slot—Select either an empty slot to which to import a media, or a slot that contains the media you want to export.
- Import—Click this button to import media.
- Export—Click this button to export the media.
- OK—Click this button when you are done.
- Quick import—Retrieve media information from the database.
- Regular import—Read in all media information.

Note: If you want to import a cleaning tape, you must import it to the cleaning slot you specified during Device Configuration. If you import it to a different slot, you will receive unrecognized media errors.

Clean Tape Heads Option

Note: This option applies only to tape libraries.

Clean the heads of any drive in your tape library. To use this option, you must install a cleaning tape in the tape cleaning slot you specified during setup.

Mark Drives Offline and Online Option

You can mark drives as offline or online from Device Manager by right-clicking on the drive and selecting “offline” or “online” depending on the current state of the drive. This can be useful for marking defective drives in a library as offline, and prevents BrightStor ARCserve Backup from using the drive until it is repaired and marked “online.” Drives will display in a disabled mode when designated as offline.

Note: If there is media inside the drive you want to mark as online or offline, eject the media prior to marking the drive offline. BrightStor ARCserve Backup cannot access the media inside an offline drive.

Removable Drive Support

BrightStor ARCserve Backup supports SCSI removable devices allowing you to back up data, restore data, scan sessions, merge removable sessions, and manage removable media on your removable devices. The Backup Manager identifies and treats the removable media as tape media.

Note: To access the most up-to-date list of certified devices, click the Technical Support link on the BrightStor ARCserve Backup home page.

Write Once Read Many (WORM) Support

BrightStor ARCserve Backup allows you to back up your data either to rewriteable media or WORM media. WORM media, with significantly longer shelf life than magnetic media, manifests secure, long-term storage for data you do not want to erase.

BrightStor ARCserve Backup lets you mix WORM and non-WORM media in a library. From the Device Manager, you can identify WORM media by an icon with the letter "W" inside a red circle. In addition, BrightStor ARCserve Backup lets you specify WORM media for custom backup jobs.

The Backup Manager contains three options for Daily, Weekly, and Monthly WORM media rotations for use with GFS rotations. You can locate these options on the Backup Manager, Schedule tab, when you specify the Use Rotation Scheme option.

WORM Media Supported

BrightStor ARCserve Backup supports backing up data to the following WORM media:

- DLT WORM (DLTice)
- STK Volsafe
- IBM 3592 WORM
- LTO3 WORM
- SAIT WORM

WORM Media Considerations

The following list describes situations that can occur when using a DLT WORM device with DLT WORM media and how BrightStor ARCserve Backup responds to such situations.

- When a backup job spans tapes and the media is WORM media, BrightStor ARCserve Backup needs WORM media to complete the job.
 - If a blank WORM media is not available, and a blank DLT WORM-capable media is available, BrightStor ARCserve Backup automatically converts blank DLT media to DLT WORM media and then completes the backup job.
 - If WORM media is not available for a WORM job to continue, BrightStor ARCserve Backup does not convert non-blank media to WORM media.
- When you are running a backup job that specifies Use WORM Media and there is no WORM media available, BrightStor ARCserve Backup may convert blank WORM-capable media to WORM media for the job.

Note: For these scenarios, the available WORM media must be DLT SDLT-II or higher.

WORM Media Limitations

If you use WORM media, certain BrightStor ARCserve Backup features, specifically those involving media pools, reformatting, and overwriting or reusing media, are disabled because of the nature of the media. These limitations include the following:

- You cannot erase WORM media.
- You cannot submit an Overwrite job to WORM media.
- You cannot format WORM media unless the media is blank.
- You cannot use WORM media for multiplexing jobs.
- BrightStor ARCserve Backup does not automatically assign WORM media to the Scratch Set in a media pool. WORM media cannot be recycled and as such, is always assigned to the Save Set in a media pool.
- BrightStor ARCserve Backup cannot use WORM media with optical devices, file system devices, and the BrightStor ARCserve Backup Tape RAID Option.
- In cross-platform SAN environments, UNIX and NetWare do not support WORM media.

Prerequisites for Backing Up to Removable Media

Before you can back up to removable media, you must:

- Enable your removable device.
- Format your removable storage media.
- Configure removable device groups.

Enable Removable Drives

Before you can back up to your removable media, you must enable the drive so BrightStor ARCserve Backup can recognize it. Do this by clicking the Disk Configuration icon and configuring the removable drive by using the Administrative Tools.

Format Removable Media

After BrightStor ARCserve Backup recognizes your device, you must format your removable storage media as a BrightStor ARCserve Backup storage media. In the BrightStor ARCserve Backup graphical user interface, removable media is represented as if it is tape media. This is not an error. BrightStor ARCserve Backup treats removable media in the same manner as tape media.

Configure Removable Devices

You configure removable device groups through the Device Management feature. Using this feature, you can easily, create or delete new removable device groups, rename removable device groups, and assign or remove individual devices. You cannot assign a removable drive into a group of media drives. You must create a new group for the removable devices.

Configuring Devices

You can use Device Configuration to configure the backup devices on your server. This application allows you to configure a media library in the Windows environment.

From the Configuration menu on the home page, open Device Configuration. When the Welcome screen opens, click Next to continue and go to the screen where you can choose from the following:

- Tape/Optical Library
- RAID Device
- Removable Drive
- Virtual Library
- IBM 3494 Library
- StorageTek ACSLS
- File System Devices
- Enable/Disable Devices (for RSM)

Note: IBM 3494 Library and StorageTek ACSLS configuration are available only if you installed the BrightStor ARCserve Backup Enterprise Module.

To configure or modify the configuration of any of the above environments, choose the option and follow the procedures outlined for that option.

Tape and Optical Library Configuration

This option allows you to configure a tape or optical library in the Windows environment.

To configure a library device, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

There are three steps required to fully configure your library, which are outlined in the following sections.

For detailed information about configuring a tape or optical library, see the *Tape and Optical Library Option Guide*.

Device Assignment

Assigning a drive to a library allows BrightStor ARCserve Backup to recognize the drive's existence within the library.

Usually the manufacturer configures a library in such a way that the first library drive has the lowest SCSI ID number and the last library drive has the highest SCSI ID number.

Note: This is not always the case. See the documentation that came with your library for information on how its drives are configured.

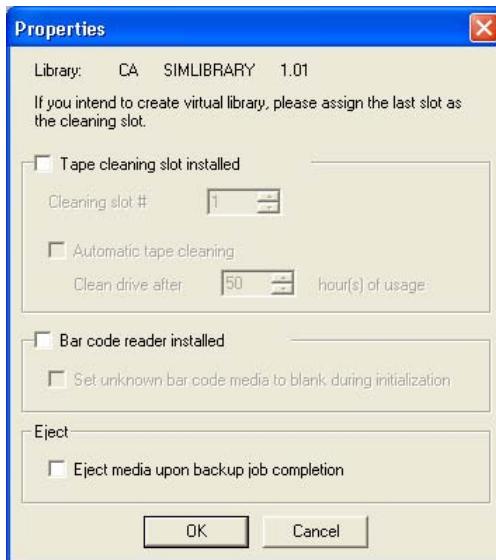
To automatically assign devices in multi-devices library, use the Auto Config feature.

Note: All drives must be empty for BrightStor ARCserve Backup to complete the drive configuration. This process may take a few minutes, depending on the number of drives in your library.

To manually assign a drive to a library, highlight the drive you want to assign from the Available Devices list and the library in which the drive should reside from the Library Devices list then use the Assign button to move the drive to the library. To un-assign a drive from a library, highlight the drive in the Library Devices list and click Remove.

Tape Cleaning and Changing Configuration Details

During library configuration, you can specify if you have a cleaning slot installed and change other configuration settings. To access these settings, highlight the library you want to configure and click Properties.



When the Properties dialog opens, you can select the following options:

- **Tape cleaning slot installed**—Enable this if your library has a tape cleaning slot installed and select a cleaning slot number.
If you want to import a cleaning tape, you must import it to the cleaning slot you specified here. If you import it to a different slot, you will receive unrecognized media errors.
Note: The Set Unknown Tapes to Blank option in the Tape Library Configuration dialog is not supported on WORM (Write Once Read Many) media. Do not enable this feature with WORM media.
- **Automatic tape cleaning**—Enable this if you want BrightStor ARCserve Backup to automatically clean tapes and select the threshold for when tapes should be cleaned.
- **Bar code reader installed**—This option is for tape libraries only. Enable this if you have a bar code reader installed and, if you want to set unknown bar code media to blank, enable the Set unknown bar code media to blank during initialization option.

- Eject media upon backup job completion—Enable this if you want to move tapes back to their slots after a backup job.

Note: You can override this option on a per job basis by enabling the global Do not Eject Media option for jobs. In addition, if you do not enable this option and later decide that you want to eject media after a particular job, you can enable the global Eject Media option for jobs. For more information on global options, see Global Backup Options in the chapter “Backing Up Your Data.”

Advanced Settings

You can revise the current configuration from the Summary dialog. The Summary dialog displays the choice you made when you configured the BrightStor ARCserve Backup Tape and Optical Library Option. Check if the devices configuration on your server matches your hardware setup.

The following advanced options are available:

- Library Quick Initialization—When this feature is enabled, it allows BrightStor ARCserve Backup to skip the library inventory process that is automatically activated when the Tape Engine is started. When this feature is disabled (the default), the entire library is inventoried each time BrightStor ARCserve Backup is started.

Note: Upon initial startup of the Tape Engine, the library is always initialized. This feature is used to disable the inventory process after the initial inventory.
- Mark Drive(s) Online/Offline—This allows you to mark defective drives (in a multi-drive library) as offline. BrightStor ARCserve Backup will continue to operate using the remaining non-defective drives. When the drive is repaired or replaced, it can be brought online.

RAID Device Configuration Option

This option allows you to configure a RAID device in the Windows environment.

To configure a RAID Device, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine. The following sections describe the steps required to fully configure your RAID device.

There are two steps required to fully configure your RAID device, which are outlined in the following sections.

For detailed information about configuring a RAID device, see the *Tape and Optical Library Option Guide*.

RAID Level Configuration

Choose the RAID device from the Device Configuration dialog.

When you click Next, the RAID Option Setup dialog appears, enabling you to:

- Create a new RAID device
- Assign a RAID level
- Delete an existing RAID
- Change the RAID level

To review the attributes of each RAID level, instructions on selecting a RAID level, and instructions on assigning drives to the RAID device, see the online help.

RAID Group Configuration

The RAID device must be added to a group in the BrightStor ARCserve Backup Device Manager, to perform backup, restore, and copy operations using that RAID device. When running the job, BrightStor ARCserve Backup automatically assigns a RAID device to a group, if it is not already assigned.

For information on how to manually assign a RAID device to a RAID group, see the online help.

Removable Drive Configuration Option

This option allows you to configure or modify the configuration of a removable drive in the Windows environment.

To configure a removable drive, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

Virtual Library Configuration Option

This option allows you to configure or modify the configuration of a virtual library in the Windows environment.

To configure a virtual library, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

The Virtual Library option is used to set up all virtual libraries. It enables you to define virtual libraries and their parameters, including the number of slots and drives required for the library. At minimum, a virtual library must have at least one slot and one drive associated with it.

Because the Virtual Library feature works on existing configured libraries, you must install the BrightStor ARCserve Backup Tape and Optical Library Option and configure your physical libraries prior to configuring virtual libraries.

Note: You must separate WORM (Write Once Read Many) and non-WORM media in the same library using the BrightStor ARCserve Backup Virtual Library Option through Device Configuration. If WORM and regular media are not separated, the Job Manager treats all media as WORM media. However, the Device Manager can manage these media correctly.

For more information about configuring a virtual library, see online help or the *BrightStor ARCserve Backup Tape and Optical Library Option Guide*.

IBM 3494 Library Configuration Option

This option allows you to configure or modify the configuration of an IBM 3494 library in the Windows environment.

Note: This option is available only if you installed the BrightStor ARCserve Backup Enterprise Module and the BrightStor ARCserve Backup Tape and Optical Library Option.

To configure an IBM 3494 Library, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

The configuration process consists of the following steps:

- The library setup checks for the Library Manager services to ensure they are running.
- The Library setup queries the Library Manager for available drives. The default is all drives are assigned to the library. You have the option to unassign any drives from the library.

Note: This process may take a few minutes, depending on the number of drives in your library. It is required that all drives, local or within the library are empty, for BrightStor ARCserve Backup to successfully complete the drive configuration.

The Library Configuration Options (Volume Configuration and Drive Configuration) allow you to further customize your library after installation. When you have finished adding the drive and volumes, restart the BrightStor ARCserve Backup Tape Engine and you will see the newly added drives and volumes.

Although the libraries you configured for the IBM 3494 Library Option are not physical libraries, BrightStor ARCserve Backup interprets them as such, thus allowing you to employ all of the features of the BrightStor ARCserve Backup Tape and Optical Library Option. With the BrightStor ARCserve Backup Tape and Optical Library Option, you can use the IBM 3494 Library Option configured drives in the same manner as you use a physical library with one exception; you cannot import or export a volume from the tape library.

For information on all of the tape library options, see the *Tape and Optical Library Option Guide*. For detailed information on volume and drive configuration, see the *Enterprise Option for IBM 3494 Guide*.

Control Devices Using Removable Storage Management

This option allows you to enable or disable devices for Removable Storage Management (RSM) in the Windows 2000 and Windows 2003 environment.

To enable or disable devices for RSM, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

Servers running Windows 2000 and Windows Server 2003 take control of all the devices attached to the server when the Removable Storage service is enabled. This service manages removable media, drives and libraries. To control these devices BrightStor ARCserve Backup must have exclusive access to them.

When RSM has exclusive control of device, BrightStor ARCserve Backup cannot send SCSI commands directly to the device. However, when BrightStor ARCserve Backup has exclusive control of a device, it can communicate (input and output commands) directly to the device.

When you choose the Enable/Disable Devices (for RSM) option, you are provided with a list of all the devices that are currently available in the system. BrightStor ARCserve Backup manages the devices currently selected. If you want another application to manage any device, clear the selected device.

Note: You do not need to disable a device in the RSM if the device driver is not installed on the BrightStor ARCserve Backup server. RSM functions in this manner because the lack of a device driver prevents RSM from detecting the device. BrightStor ARCserve Backup does not require the presence of a device driver to be able to detect a device.

StorageTek ACSLS Library Configuration Option

This option allows you to configure or modify the configuration of a StorageTek ACSLS Library in the Windows environment.

Note: This option is available only if you installed the BrightStor ARCserve Backup Enterprise Module and the BrightStor ARCserve Backup Tape and Optical Library Option.

To configure a StorageTek ACSLS library, the Tape Engine must be stopped. If your Tape Engine is running, a pop-up window is displayed to allow you to stop the engine.

The configuration process consists of the following steps:

- StorageTek ACSLS Option setup checks for LibAttach services to ensure they are running.
- StorageTek ACSLS Option setup instructs ACSLS to mount a volume in every drive. It will then assign the drives to the BrightStor ARCserve Backup server, as well as assign it a number that is based on the logic sequence of the drive.

Note: This process may take a few minutes, depending on the number of drives in your library.

The StorageTek ACSLS Option configuration options, Volume Configuration and Drive Configuration, allow you to further customize your library after installation. When you have finished adding the drive and volumes, restart the BrightStor ARCserve Backup Tape Engine and you will see the newly added drives and volumes.

Although the drives you configured for the StorageTek ACSLS Option are not physical libraries, BrightStor ARCserve Backup interprets them as such, thus allowing you to employ all of the features of the BrightStor ARCserve Backup Tape and Optical Library Option. With the BrightStor ARCserve Backup Tape and Optical Library Option, you can use the StorageTek ACSLS Option configured drives in the same manner as you use a physical library with one exception; you cannot import or export a volume from the tape library.

For information on all of the tape library options, see the *Tape and Optical Library Option Guide*. For detailed information on volume and drive Configuration, see the online help or the *Enterprise Option for StorageTek ACSLS Option Guide*.

File System Device Configuration

The File System Devices Configuration option lets you configure a File System Device (FSD), or modify the configuration of an FSD within the Windows environment. You must stop the Tape Engine service to configure an FSD.

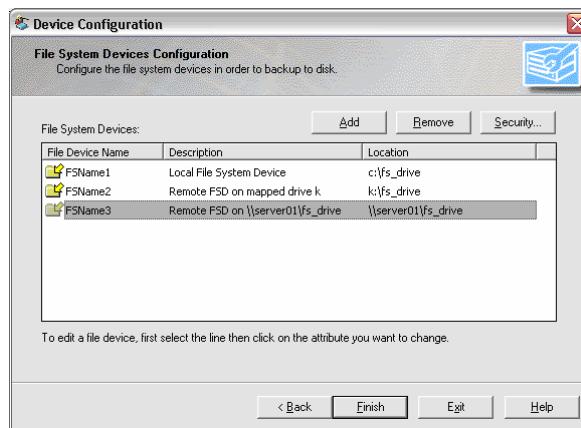
If the Tape Engine is running, Device Configuration presents a message box to let you to stop the Tape Engine. You configure an FSD to a folder on a specific drive. When you select the FSD as your backup destination, each session is stored as a file within that folder.

When you configure an FSD, you can:

- Create a new FSD by clicking Add.
- Delete an existing FSD by clicking Remove.
- Change the credentials of an FSD used for remote access by clicking Security.

Important! *Staging backup operations can quickly consume a large amount of free disk space on file system devices. Due to the maximum file size limitations of FAT 16 and FAT 32 file systems, you should not use these file systems on file system devices designated for staging operations.*

An example of the File System Devices Configuration dialog is shown next:



When you are creating an FSD, you can specify the Location of the FSD using any of the following formats:

- The path to the local folder, for example, c:\fs_drive.
- The path to the folder on the mapped drive, for example, k:\fs_drive.
- The UNC path, for example, \\server01\fs_drive.

When you use a mapped drive as an FSD:

- BrightStor ARCserve Backup can use the mapped drive, but you must have logged on to the mapped drive previously.
- If you map a drive for use as an FSD, BrightStor ARCserve Backup converts the mapped drive to a universal naming convention (UNC) path and prompts you to provide log in credentials when you click Finish. The following is an example of the Security dialog:



- The log in credentials provided must enable full access to the mapped drive.
- By default, BrightStor ARCserve Backup uses the BrightStor ARCserve Backup System Account to gain access to each remote FSD. You can change the credentials that you use with the selected file system device by using Security.
- Security is unnecessary for FSDs created to a local disk.

Add More than One File System Device to a Group

To add multiple file system devices to the same device group, the file device name you specify in Device Configuration should be the same for each device you want to include in the group. You can also use Configure Groups to place multiple file system devices in the same group after the file system devices have been created.

Device Commands for File System Devices

The device commands that are available for file system devices are:

- Format—Deletes the sessions from that folder.
- Erase—Deletes the sessions and writes a blank header file on that folder.

The device commands that are not available for file system devices are:

- Retension
- Compression
- Eject
- Long erase

For more information on how to configure a file system device, see the online help or the *Getting Started*.

Device Group Configuration

Device Group Configuration is an application that you can use to configure device groups and file system device groups.

Using Device Group Configuration you can:

- Configure groups--Create, remove, and rename groups, and define device to device group relationships (assign and unassign).
- Configure device group policies--Set staging group policies as it relates to disk thresholds and the maximum number of simultaneous streams of data.
- Pause data migration--Pause the process of copying data to its final destination in the event the final destination media is not available (for example, you are performing maintenance activities on a library).

To start Device Group Configuration, select Device Group Configuration from the Configuration menu on the BrightStor ARCserve Backup home page. After the Welcome to Device Group Configuration dialog opens, follow the on-screen instructions to configure the device groups in your environment.

Universal Serial Bus (USB) Storage Devices

BrightStor ARCserve Backup can detect the following types of Universal Serial Bus (USB) storage devices that are connected to the BrightStor ARCserve Backup server:

- Tape drives
- Media changers
- USB removable drives

After you connect the USB storage devices to your BrightStor ARCserve Backup server, you can use them for all of your backup and restore operations.

Note: If you disconnect a USB storage device from the BrightStor ARCserve Backup server, the configuration and grouping information for the device remain on the BrightStor ARCserve Backup server and are reassigned to the device when it is reconnected. If you manually reassign the group while the USB device is disconnected, the device is assigned to a new group after it is reconnected to the BrightStor ARCserve Backup server.

Configure USB Storage Devices

Use the Scan Device option to enable BrightStor ARCserve Backup to detect and enumerate USB storage devices. You can start the Scan Device option by clicking the Scan Device button on the Device Manager toolbar.

Important! The USB storage device drivers must be installed on the BrightStor ARCserve Backup server in order for BrightStor ARCserve Backup to detect and communicate with the devices.

Note: For more information about configuring USB storage devices, see the section Scan Device Option in this chapter.

DLTSage Error Handling

DLTSage is an error monitoring, reporting, and alerting technology developed by Quantum for use on SuperDLT tape drives. To receive tape drive alerts, you must use SuperDLT tape drives with DLTSage firmware.

BrightStor ARCserve Backup interfaces with the firmware on SuperDLT tape drives to analyze critical tape drive and media performance parameters collected for each track, segment, Magneto Resistive (MR) channel, and optical band. BrightStor ARCserve Backup uses the information collected to:

- Diagnose information such as threshold conditions and tape drive history.
- Identify high-risk tape drives and media that are approaching or have reached their end of life.
- Predict tape drive cleaning needs.
- Analyze tape drive environmental conditions.
- Generate media and hardware error messages.

How DLTSage Error Handling Works

BrightStor ARCserve Backup queries DLTSage using a SCSI Log Sense. If a hardware or media error occurs as a backup job starts, during a backup job, or after a backup job ends, BrightStor ARCserve Backup uses the information captured from the SCSI Log Sense to generate tape drive error messages that display in the Tape Log and the Activity Log.

An error message displays if any of the following conditions exist:

- The tape drive is experiencing difficulties reading from or writing to a tape.
- The tape drive cannot read from or write to a tape, or the media performance is severely degraded.
- The media exceeded its life or maximum number of passes expectancy.
- The tape drive may have a clogged head or needs cleaning.
- The tape drive has a cooling problem.
- There is a potential tape drive hardware failure.

If an error condition is detected, BrightStor ARCserve Backup may attempt to automatically correct the problem and complete the job. However, you must install the BrightStor ARCserve Backup Tape and Optical Library Option to use the capabilities of uninterrupted inline cleaning, drive usage balancing, and error-preventive drive selection features. For more information about automated error resolution, see the *Tape and Optical Library Option Guide*.

If the BrightStor ARCserve Backup Tape and Optical Library Option is not installed, you must cure the error condition or problem area manually. See the manufacturer's documentation, as necessary.

How BrightStor ARCserve Backup Cures Tape Drive Errors

If an error condition occurs, BrightStor ARCserve Backup performs a second attempt to complete the job. If the error persists, BrightStor ARCserve Backup stops the backup job. The tape drive then relays the information about the error condition to BrightStor ARCserve Backup. You can view the details about the error condition in the Activity Log.

The following is an example of the Activity Log:

Type	Date	Job	Session	Message
Show Errors, Warnings, Information				
Information	03/31/2004 05:00...			[208:QUEUE] Status changed from Done to Ready [Job No: 4] [Description: new tapeeing.dl]
Information	03/31/2004 05:00...			[208:QUEUE] Modified [Job No: 4] [Description: new tapeeing.dl]
Information	03/31/2004 05:00...			Run Backup Job Now.
Information	03/31/2004 05:00...			Start Backup Operation: (QUEUE=1, 208=1)
Information	03/31/2004 05:00...			Description: new tapeeing.dl
Information	03/31/2004 05:00...			Use media DLTSAGE03, serial # PUR316, ID C186, sequence #1
Information	03/31/2004 05:09...			Backup Method: Full.
Information	03/31/2004 05:10...			Source Directory: F:\TEST2\Windows 2000 SP2\ext16672
Information	03/31/2004 05:10...			Backup Session 9 on Media DLTSAGE03 Serial # PUR316
W9772	03/31/2004 05:10...			Auto-Cleaning Device[4], S:\NFRBD4\910001, due to hardware error. Usage since last clean: [00:13:49]
Information	03/31/2004 05:21...			Successfully clean tape drive[4] [Device:S:\NFRBLAND]
W9774	03/31/2004 05:22...			Auto-Cleaning on Device[4], S:\NFRBD4\910001 is successful. Job resuming...
Information	03/31/2004 05:23...			Catalog File Backed Up

After determining the cause of the error condition and curing the problem, you must restart the job.

Uninterrupted Drive Cleaning

A contaminated tape drive condition is usually discovered when you are running a backup job. A significant number of tape drive and media errors can be remedied by cleaning the tape drive.

For BrightStor ARCserve Backup to perform uninterrupted drive cleaning, you must have a cleaning tape installed in the tape cleaning slot specified during setup, and specified a cleaning schedule. If you did not specify a cleaning schedule, BrightStor ARCserve Backup defaults to a 100 hour period between scheduled tape cleaning operations.

If BrightStor ARCserve Backup detects a contaminated tape drive condition during a backup job, and a cleaning slot is configured, BrightStor ARCserve Backup automatically performs the following analyses and actions:

- If BrightStor ARCserve Backup detects a write error during a backup, and the symptoms relate to a contaminated tape drive or media, BrightStor ARCserve Backup makes a second attempt to write to the tape drive.
- If the second write attempt fails, BrightStor ARCserve Backup cleans the tape drive if one or more of the following conditions exist:
 - The tape drive was never previously cleaned.
 - DLTSage detected the need to clean the tape drive and drive usage exceeds one fourth of the scheduled cleaning.
 - Tape drive usage exceeds one third of the cleaning.
 - The user specified ForceClean the tape drive.

If BrightStor ARCserve Backup determines that a tape drive must be cleaned to continue a job, the following actions take place:

1. BrightStor ARCserve Backup pauses the job.
2. The library returns the tape to its home slot and locks the tape drive.
3. BrightStor ARCserve Backup directs the cleaning operation.
4. The library reloads the tape into the cleaned drive and aligns the tape with the buffer.
5. BrightStor ARCserve Backup resumes the job.

Media Pools

A media pool is a collection of media managed as a unit. Each media pool is assigned a name and the media are organized according to serial numbers. The assigned serial numbers are permanent and if you are using a device with a bar code reader, the bar code labels are used for the serial number of the media. The media pools are organized by the range of serial numbers of the media they contain and are divided into two sets, the Save Set and the Scratch Set.

Save Sets and Scratch Sets

The set of media containing important data that cannot be overwritten is called the Save Set. You can move media from the Save Set in one media pool to the Save Set in another media pool. Media that has not been formatted for the longest period will be used first.

Note: You will receive a warning if you try to format or erase media in a Save Set.

When the media meets certain criteria in a Save Set (minimum number of media in Save Set and retention period) they are recycled to the Scratch Set. Each time a media in the Scratch Set is written to, it moves from the Scratch Set to the Save Set. Additionally, if BrightStor ARCserve Backup detects non-blank media in the Scratch Set, the Media Pool Manager controls the usage of the media such that WORM media containing data is not used.

The retention period is the number of days in which a media has not been used before it is moved into the Scratch Set. For example, if you specify a retention period of 14 days, a media remains in the Save Set if it has been used within that specified time. If the media has not been used for 14 days, it is moved to the Scratch Set.

You define the minimum number of media contained within the Save Set. This is the number of media to be retained in the Save Set before the older media are recycled to the Scratch Set. This is a safeguard for preventing data loss in case backups are not done for extended periods of time.

Media pools apply to every media, regardless of which backup type and method were selected. BrightStor ARCserve Backup performs media pool maintenance at the beginning of a job, and will not allow media in the Save Set to be moved to the Scratch Set until two criteria are met:

- The oldest tape in the Save Set is compared and exceeds the retention time.
- The minimum required number of media is in the Save Set.

If the media meets these criteria, BrightStor ARCserve Backup prompts for a blank tape or accepts media from the Scratch Set.

Serial Numbers

The serial number of a media is one way to categorize media pools. You cannot change the serial number of media, but you can create a serial number for media by:

- Bar code—A number is read from a bar code label and this number becomes the serial number. A changer with a bar code reader is required for this method. This will override any previously defined media pool settings.
- Automatic— BrightStor ARCserve Backup automatically assigns a serial number for the media based on the base and range of serial numbers set when the pool was created.
 - Base—This is the base number, which BrightStor ARCserve Backup will use when automatically assigning serial numbers. The first media formatted will have the same serial number as the base number. Each media's serial number thereafter will be increased by one.
 - Range—You can specify the range (up to 31 digits) from which the media pool serial numbers will be categorized.

GFS Media Pools

Grandfather-Father-Son (GFS) Rotation media pools are based on basic media pooling architecture.

GFS Rotation jobs use three media pools: Daily, Weekly, and Monthly, which are based on the information you enter in the Media Pool Name Prefix field when submitting the job.

When a GFS Rotation job runs, BrightStor ARCserve Backup automatically formats and names your media according to the backup type, media pool, and date using the following syntax:

(backup type)-(user-defined media pool prefix)-(day-of-the-week)-(date)

Where..	Is...
backup type	F - full backup I - incremental backup D - differential backup W - weekly backup M - monthly backup
	A - all daily backups (full, incremental, and differential) when you use the Media Maximization option (enabled by default) and enable the Append Media option. For more information on the Media Maximization option, see Media Maximization in GFS Rotation Jobs in this chapter.
user-defined media pool prefix	The name you assigned to the media pool for your GFS Rotation scheme.
day of the week	An abbreviation for the day of the week on which the job was performed.
Date	The date on which the backup was performed in mm/dd/yy format.

This media naming convention allows you to easily identify backup media. For example, the media used for the first full backup in your rotation scheme will have the following name: F-TP-MON-11/1/00

Five-day rotation schemes have the following retention times for each media pool:

- Daily (_DLY)—six days (daily media in seven-day Rotation Schemes have a retention time of eight days)
- Weekly (_WLY)—five weeks
- Monthly (_MLY)—343 days

The following are the formulas used for calculating the number of media in the Save Sets and the retention times for the GFS media pools:

- Daily pool—This pool holds the media for daily backup jobs. The default retention period is six days and the number of Save Set media is based on the number of daily media in the GFS Rotation minus one [$\# \text{ of daily media} - 1$].
- Weekly pool—This pool holds the weekly media. The retention period equals the number of weekly media times seven, minus one [$(\# \text{ of weekly media} * 7) - 1$]. The number of save media is based on the number of weekly media in the GFS setup minus one [$\# \text{ of weekly media} - 1$].
- Monthly pool—This pool holds the monthly media. The retention period equals the number of monthly media times 29 minus five [$(\# \text{ of monthly media} * 29) - 5$]. The number of save media is based on the number of monthly media in the GFS setup minus one [$\# \text{ of monthly media} - 1$].

For more information on rotation schemes, including information on how to submit a rotation backup job, see the online help.

Media Maximization in GFS Rotation Jobs

By default, BrightStor ARCserve Backup enables the Media Maximization option, which lets you submit multiple GFS backup jobs using the same media pool. By sharing the same media pool, you can append multiple jobs to the same tape sets rather than creating new tape sets for each job. This drastically reduces the amount of media you use when submitting GFS Rotation jobs.

Note: To disable the Media Maximization option, set the NT registry DWORD value EnableMediaMaximization to 0. This registry key is as follows:

HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\ BrightStor ARCserve Backup\Base\Task\Backup.

Media Maximization Rules

To take full advantage of the Media Maximization option, use the following guidelines when submitting GFS backup jobs using the same media pool:

- Use the same Rotation Scheme—GFS jobs that use different rotation schemes may need different tape names. To ensure that multiple GFS jobs will share the media, use the same rotation scheme.
- Start GFS jobs on the same day—The first day of a GFS job is a full backup. Jobs that start with different dates may not be able to share media during the first week. To ensure that multiple GFS jobs will share media during the first week, start GFS jobs on the same day. Otherwise, media sharing will begin after the weekend.
- If you want to modify multiple GFS backup jobs to use a new media pool, modify them on the same day—This ensures that all jobs will share the media right away. Otherwise, media sharing will begin after the weekend.
- Modify existing GFS jobs to use the same media pool as other GFS jobs—if the existing GFS jobs you modified use the same rotation scheme, media sharing should begin right away. However, if any of the jobs have been running for less than one week, media sharing may begin after the weekend.

Media Maximization Methods

There are two different methods you can use to maximize your media usage. The method depends on whether you enable the Append Media feature when submitting your GFS backup job. Both methods significantly reduce the amount of media required. The following is a description of each method.

GFS Rotation Jobs without Append Media Enabled

If you submit GFS rotation jobs without the Append Media feature enabled, you can maximize media usage by submitting multiple jobs using the same media pool.

For example, if you submit three GFS rotation jobs all using the same media pool and 5-day rotation scheme, all three jobs share the same set of tapes. On each day of the rotation scheme, all three jobs append to the same tape:

- Monday = One tape that includes full backup data from job 1(day 1), job 2(day 1), and job 3(day 1)
- Tuesday = One tape that includes incremental backup data from job1(day 2), job 2(day 2), and job 3(day 2)
- Wednesday = One tape that includes incremental backup data from job 1(day 3), job 2(day 3), and job 3(day 3)
- Thursday = One tape that includes incremental backup data from job 1(day 4), job 2(day 4), and job 3(day 4)
- Friday = One tape that includes weekly backup data from job 1(day 5), job 2(day 5), and job 3(day 5)

This results in five tapes for the week.

Without the Media Maximization option, each job would require its own tape:

- Monday = Three full backup tapes. One tape for job1(day 1), one tape for job 2(day 1), and one tape for job 3(day 1)
- Tuesday = Three incremental backup tapes. One tape for job1(day 2), one tape for job 2(day 2), and one tape for job 3(day 2).
- Wednesday = Three incremental backup tapes. One tape for job1(day 3), one tape for job 2(day 3), and one tape for job 3(day 3).
- Thursday = Three incremental backup tapes. One tape for job1(day 4), one tape for job 2(day 4), and one tape for job 3(day 4).
- Friday = Three Weekly backup tapes. One tape for job1(day 5), one tape for job 2(day 5), and one tape for job 3(day 5).

Without the Media Maximization option, you need 15 tapes for the week.

Note: When submitting multiple GFS Rotation Jobs with the same media pool without Append Media enabled, tapes can be shared only if the same Backup Method is used. For example, a tape that has data from a full backup job can be shared only with data from another full backup job. It cannot be shared with data from incremental, differential, weekly, or monthly backup jobs.

GFS Rotation Jobs with Append Media Enabled

Similar to submitting GFS Rotation jobs without the Append Media feature enabled, you can maximize media usage when you enable Append Media by submitting multiple jobs using the same media pool. In addition, enabling Append Media also lets you maximize media usage by allowing you to share tapes among different jobs, regardless of the backup method that was used. (The only exceptions to this is weekly and monthly backup jobs. Weekly and monthly backup jobs can never share tapes with full, incremental, and differential backup jobs.)

For example, when submitting multiple GFS rotation jobs with the same media pool without Append Media enabled, a tape that has data from a full backup job can be shared only with data from another full backup job. If you enable Append Media, a tape that has full backup data can be shared with full, incremental, and differential data.

To share tapes among different jobs with different backup methods, BrightStor ARCServe Backup uses the same GFS rotation naming syntax, but it uses a different naming convention for backup types when the Append Media feature is enabled:

(backup type)-(user-defined media pool prefix)-(day-of-the-week)-(date)

Without Append Media	With Append Media
F - full backup	A - full backup
I - incremental backup	A - incremental backup
D - differential backup	A - differential backup
W - weekly backup	W - weekly backup
M - monthly backup	M - monthly backup

If you submit GFS rotation jobs with the Append Media feature enabled, you can maximize media usage by submitting multiple jobs using the same media pool and use the previous day's tape within the current week.

For example, if you submit three GFS rotation jobs all using the same media pool and 5-day rotation scheme, all three jobs share the same set of tapes. In addition, multiple days can share the same tape, drastically reducing the amount of tapes you use:

- Monday, Tuesday, Wednesday, Thursday = One tape that includes full backup data from job 1(day 1), job 2(day 1), and job 3(day 1), and incremental backup data from job 1 (days 2, 3, and 4), job 2(days 2,3, and 4), and job 3(days 2,3, and 4).
- Friday = One tape that includes weekly backup data from job 1(day 5), job 2(day 5), and job 3(day 5)

This results in two tapes for the week.

Without the Media Maximization option, each job requires its own set of tapes. Among these tapes, only the ones that include data from the same Backup Method can be shared:

- Monday = Three full backup tapes. One tape for job1(day 1), one tape for job 2(day 1), and one tape for job 3(day 1)
- Tuesday, Wednesday, Thursday = Three incremental backup tapes. One tape for job1(days 2, 3, and 4), one tape for job 2(days 2, 3, and 4), and one tape for job 3(days 2,3, and4).
- Friday = Three weekly backup tapes. One tape for job1(day 5), one tape for job 2(day 5), and one tape for job 3(day 5).

This results in nine tapes for the week.

Note: If you submit a GFS Rotation job with Append Media enabled and BrightStor ARCserve Backup cannot use the previous day's media for some reason, it will format a media in the Scratch Set or a blank media using the "With Append Media" naming convention. To minimize the likelihood of this situation occurring, see Media Maximization Rules in this chapter.

Overlapping Media Rules

Because the Media Maximization option allows multiple GFS jobs using the same media pool to share tapes, you may encounter a situation where a media is busy because it is being used by another GFS job. If this occurs when submitting a GFS backup job without Append Media enabled, the job waits for the tape to become available before appending. The default wait time is 10 minutes. If the media is still busy after 10 minutes, the job uses another tape.

If this occurs when submitting a GFS backup job with Append Media enabled, BrightStor ARCserve Backup tries to append to a previous day's media. If that media is busy, it waits 10 minutes. If the media is still busy after 10 minutes, the job uses the current date to generate another media and attempts to use it. If the new media is busy, the job waits 10 minutes. If this media is still busy after 10 minutes, the job formats another media with a new name.

Note: You can change the wait time by entering a new value for the Windows registry key GFSwaittime. This registry key is located in HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\ BrightStor ARCserve Backup\Base\Task\Backup.

Media Pool Manager

The Media Pool Manager allows you to create and maintain media pools. BrightStor ARCserve Backup creates a catalog file on your media to improve performance for merge jobs and database backup jobs. The Media Pool Manager helps you to perform the following tasks:

- Create a new media pool—To assign media to a media pool, you first need to create the media pool. A media pool name can consist of up to 16 uppercase characters.
- Delete an existing media pool—To delete a media pool, you must first re-assign the media to another media pool.
- Move media in a pool—You can move media from one set to another. You can also move media from a Scratch Set to a Save Set and vice versa by using the Assign Media and Remove Media options.
- Perform location maintenance—You can enter information about a new location, modify information about an existing location, or assign media to a location.
- Assign media to a media pool—You can assign media to a media pool during the process of formatting. When you format media using Device Management, you define certain media pooling information that will be associated with the media.
- Remove media from a media pool—You can remove media from a media pool.

For more information on how to perform these tasks, see the online help.

Note: Media Pool operations, backup jobs using the Overwrite option, Tape Erase operations, and backup jobs involving Media Pools (such as GFS rotation jobs) are not supported on WORM (Write Once Read Many) media. These operations are either blocked or disabled in WORM support updates.

Media Management Administrator

Note: To use MM Admin, you must install the BrightStor ARCserve Backup Enterprise Module.

MM Admin lets you protect, control, and manage your media resources. Using MM Admin, you can organize tape movement to off-site storage locations, define retention policies to ensure that your tapes are protected from being prematurely overwritten, secure access to tape-resident files, and maintain a comprehensive inventory of tape library resources.

MM Admin activities are recorded in the BrightStor ARCserve Backup Activity Log. This includes information, warnings, and errors. This important function allows you to centrally keep track of all media management operations.

To manage media using MM Admin, you must create a vault, create a schedule, select a vault criteria descriptor, and define a rotation. The following sections include information on each of these steps and cover all topics associated with managing your media using MM Admin.

Media Management and Tape Service

In data centers with off-site storage locations, tape volumes are typically cycled out of the central tape library to more secure storage areas (vaults), and then cycled back into the central library. MM Admin works with Tape Service to provide additional media control, rotation, slot number assignment, and reporting on vaulted tape volumes so that you can physically route these tape volumes to off-site storage locations and back to the data center, as necessary.

You can define vaulting criteria using MM Admin. The criteria for holding tape volumes in vaults can be different for each schedule and for each vault. As tape volumes meet these criteria, they are checked out of Tape Service with the proper vault code and reports are generated indicating the current location and destination to where the tape volumes must be moved.

Media Management Administrator Terms

The following are important terms associated with the MMO:

- **Vault**—Any identifiable storage area or location you define.
- **Slot**—Virtual slots in a vault are assigned when a tape volume is vaulted. Each slot is used to store one tape volume. By default, there are 32000 slots in a vault, but you can designate a different maximum number of slots as you create a vault.

- Schedule—Determines when a tape volume is to be placed in or removed from a vault.
- Rotation—Determines when to move tape volumes, and is associated with a schedule. Each rotation you define points to a vault.
- Vault Criteria Descriptor (VCD)—Defines the controlling data set you want to use for the selected tape volume. You can choose the controlling data set by media name or file name, or you can select an individual media as the controlling data set.
- Vault cycle—The actual movement of tape volumes. You must describe the vault, the tape volumes, and the rules for tape volume movement under the MMO by creating a Vault Criteria Descriptor (VCD) record. The MMO uses this descriptive information to execute a vault cycle when movement is scheduled.
- Reports—Each time you execute a vault cycle or an estimated vault cycle, BrightStor ARCServe Backup generates several reports before another vault cycle can be initiated. The Vault Selection Report contains a list of tape volumes to be selected for moving into the vaults through the VCD. The Shipping Report and the Receiving Report provide a reliable record of the result of the vault cycle and the current location of your tape volumes.

The Shipping Content Report and the Receiving Content Report provide you with basic session details—in addition to the information contained within the Shipping Report and the Receiving Report—such as the session number, source path, start date, size, and number of files.

An Inventory Report is also available, which you can generate at any time.

MM Admin Interface

The MM Admin interface is designed to make vault creation, scheduling, VCD creation, rotation, and report creation easy. The tools provided by MM Admin allow you to establish the vaulting policy needed for complete Media Management.

The MM Admin workspace includes a menu bar, the main MM Admin toolbar, and the MM management window. The left pane of the MM Management window displays the MM primary management server in a tree structure for easy navigation. The right pane displays information related to the object selected in the left pane. It also displays any output messages and reports generated during your MM Admin session.

MM Admin Toolbar

The MM Admin toolbar provides you with the following options:

Button	Description
 Initialize MM Database	Initializes the MM database.
 Retrieve Data	Retrieves data and displays the latest information if the database goes down.
 Refresh	Refreshes and updates the information displayed in the MM Admin window.
 Start Vault Cycle	Initiates the vault cycle process.
 Simulate Vault Cycle	Produces a Vault Selection Report that predicts how many tape volumes will be moved without actually updating location information.
 Find Media in Vault	Used to search for media by Tape Name or Serial Number.
 Property	Displays server properties.
 Print	Prints the information displayed in the right pane of the MM Admin window.
 Print Preview	Allows you to preview information before printing.

MM Admin Window

The objects in the left pane of the MM Admin window are arranged in an expandable tree. To view related information, double-click the branch you need. After you access a branch, you can add, modify, or delete objects from the tree structure using the available pop-up menus. Right-click any object to access pop-up menus.

When you open MM Admin, the MM primary management server is displayed at the top of the tree. Double-click the branch to expand it and access the following objects:

- Current Server—Displays information about the server you are currently using.
- Vault—Provides information about previously created vaults.
- Schedule—Lists the names of the previously created schedules, and allows you to access the Vault Criteria Descriptor and Rotation objects.
- Reports—Provides access to the seven available reports.
- Status—Allows you to view the status of the most recent operation.
- Find Media in Vault—Lets you access the Find Media dialog to locate a particular media.

Vault Object

When you select the Vault object in the left pane of the MM Admin interface, the right pane displays the following information about existing vaults:

- Vault Name—The name of a storage area or location you have defined.
- Max Slots—The maximum number of slots this vault can contain.
- Active Slots—The number of slots in use in the vault. Each slot in the vault stores one tape volume.
- Free Slots—The number of slots still available in the vault. Each slot in the vault stores one tape volume.
- Local—Yes in this column indicates that the Use in Local option was selected when the vault was created or updated and this vault will not be moved to other locations. A No indicates that this option was not selected. You can update a vault and disable this option at any time if you decide to move a vault off site.
- Create Date—The date the vault was created.
- Description—A description or comment about the vault, entered when the vault was created or updated.

Expand the Vault object to access individual vaults. When you select a vault, the right pane of the MM Admin window displays information about the vault and its slots. Each media in the vault is listed and identified by media name and slot name. The status of the slot, media export status, and the date the slot was created are also displayed. Right-click an existing vault to update it. To create a new vault, right-click the Vault object. For more information about creating, updating, or deleting a vault, see Create a Vault in this chapter.

Schedule Object

The Schedule object provides information about previously defined schedules and allows you to create new schedules. You must create a schedule before you define the Vault Criteria Descriptor and Rotation that determine selection and retention policies for your vault.

When you select the Schedule object, the right pane of the MM Admin window displays the names of previously defined schedules. These schedules are also listed under the Schedule object in the left pane. Right-click the Schedule object to create a new schedule. Right-click a specific schedule to delete it. For more information about creating or deleting a schedule, see Tape Volume Movement Scheduling in this chapter.

After you have named and created a schedule, the Vault Criteria Descriptor (VCD) and Rotation objects appear in the left pane of the MM Admin window.

Vault Criteria Descriptor Object

The Vault Criteria Descriptor (VCD) allows you to set source information that governs the tape volumes assigned to a vault. You can select a media pool name or a file name as the controlling data set. If you want to assign only one tape, select the Assigned by User option as the controlling data set. If you use this option, you must enter command line information. When this data set is vaulted, the tape volumes are assigned to slots in the vault.

When you select the Vault Criteria Descriptor object, the right pane of the MM Admin window displays columns listing the following information for existing VCDs:

- VCD Name—The name of the Vault Criteria Descriptor.
- VCD Type—Indicates whether the controlling data set is defined by media pool, file name, or by user.
- Media Pool—if the controlling data set is a media pool, the name of the media pool appears.
- Host Name—if the controlling data set is a file name, the host where the file resides appears in this column.
- Path/File Name—if the controlling data set is a file name, the full path and file name appear in this column.
- Create Date—The date the VCD was created.

In the right pane of the MM Admin window, right-click an existing VCD to update or delete it. Right-click the Vault Criteria Descriptor object in the left pane to create a new VCD. For more information about creating, updating, or deleting a VCD, see Tape Volumes and VCD Management in this chapter.

Rotation Object

Media management relies upon user-defined rotation policies to determine when and where tape volumes should be moved. Use the Rotation object to set or update the retention policies that determine when tapes will be moved or released from the vault and returned to Tape Service.

When you select the Rotation object, the right pane of the MM Admin interface lists the following information about previously defined rotations:

- Rotation Name—The name of the rotation.
- Vault Name—The name of the vault the rotation is associated with.
- Retention Hold Days—Starting from the Last Write date (the date the media was last written to), this indicates the number of days that the tape volumes will be held in this rotation.

Note: To view the Last Write date, expand the Vault object and highlight a media name in the top right-hand pane. The Last Write date appears in the lower right-hand pane.

- Retention Keep for Cycles—Indicates the specific number of vault cycles and tape volumes that are held in this rotation.
- Retention Days Elapsed from First Format Date—Indicates that tape volumes are held in this rotation until a specified number of days have elapsed since they were first formatted.
- Retention Permanent—Indicates that tape volumes will remain in this rotation permanently.
- Retention By Tape Expiration Date—Indicates that tape volumes remain in this rotation until the tape expiration dates have passed.
- Retention By Date—Indicates that tape volumes remain in this rotation until the specified date has passed.
- Create Date—The date the rotation was created.
- Description—A user-defined description of the rotation.

Existing rotations are also listed in the right pane of the MM Admin window under the Rotation object.

- To update an existing rotation, right-click the rotation name and select Update from the pop-up menu.
- To create a new rotation, right-click the Rotation object and select Create.

See Tape Volume Retention Policies in this chapter for more information about creating, updating, or deleting rotations.

Report Object

Although tape volume location information in the database is updated when you initiate a vault cycle, the physical movement of tape volumes is done manually. MM Admin generates reports indicating the current location and destination where the tape volumes must be moved so that you can route them to other storage locations and back to the data center, as necessary.

The Reports object provides access to the reports generated by the vault cycle process and the Inventory reports, which can be generated at any time. Expand the Reports object in the left pane of the MM Admin window to view the following report types:

- **Vault Selection Report**—Contains a list of tape volumes to be selected for moving into the vaults through the Vault Criteria Descriptor (VCD).
- **Shipping Report**—Contains a list of tape volumes to be pulled from each of the vaults.
- **Shipping Content Report**—Contains a list of tape volumes and sessions in each tape volume to be pulled from each of the vaults.
- **Receiving Report**—Contains a list of tape volumes to be distributed to the vaults.
- **Receiving Content Report**—Contains a list of tape volumes and sessions in each tape volume to be distributed to the vaults.
- **The Inventory Report, By Vault**—Lists tape volumes grouped by the vault where they reside.
- **The Inventory Report, By Media**—Lists tape volumes grouped by vault and shows Media name in front.

When you select a report type in the left pane of the MM Admin window, the right pane displays the contents, listing the available reports identified by date. Click a report to view it in the right lower pane. You can print any of these reports using the Print button on the MM Admin toolbar. At the time it is generated, you can also select to send a report by email if you configure the alert notification system to use Microsoft Exchange. For more information on sending reports using email, see How the Media Management Process Works in this chapter. For more information on using alerts, see the chapter "Using the Alert Manager."

The Inventory Reports are based on information in the Slot table, and can be generated at any time. The Shipping and Receiving Reports are based on movement records generated during a vaulting cycle, and are updated after each vault cycle process completes.

The Vault Selection Listing is produced each time the Start Vault Cycle command is executed. For each VCD processed, this listing identifies the first tape volume in the tape volume set and the controlling data set. This information is provided for all tape volume sets selected for the vaulting cycle.

Find Media in Vault Object

The Find Media in Vault object provides the quickest way to search vaults for a specific media, if, for example, you require that media to execute a restore job. You can choose to search for the media using its Tape Name or its Serial Number (case sensitive).

To open the Find Media in Vault dialog, right-click the Find Media in Vault object, and choose Find from the pop-up menu. Using this dialog you can set the criteria for your media search.

Status Object

MM Admin can run only one vault cycle at a time. To monitor the progress of the vault cycle, or to obtain current online status, double-click the Status object in the left pane of the MM Admin interface to view the following information:

- Current Status—The status of the current operation is displayed as either Active or Finished.
- Last Operator—The owner of the last operation executed.
- Last Operation Type—Operation types can be Ready, Vault Cycle, Commit, Browsing, Update, and Reset.
- Last Operation Started At—The date and time the last operation began.
- Last Operation Finished At—The date and time the last operation ended.

Reset the Status of Vault Processing

Use MM Admin to manually reset the status of Vault Processing if something goes wrong during the vault cycle, such as corruption of the MM Admin database. You can use the ca_mmo command line utility to reset the status. See [ca_mmo Command](#) in this chapter for more information about command line utilities for media management. After the status is reset, you can restart another vault cycle.

How the Media Management Process Works

The Media Management process includes setting a vaulting policy, scheduling tape volume movement, selecting tape volumes, defining retention policies, executing the vault cycle, and moving the media to the proper location.

After you set a vaulting policy and retention policies, the vaulting rotation process begins. You should run vault cycles as often as you run backup operations. For example, if you back up your data every day, you should also run a vault cycle every day. If you back up your data once a week, run a vault cycle once a week after your backup operation is complete.

The vault cycle process updates location information for tape volume sets, indicating movement into a vault or from a vault back to the Tape Service. You must initiate the process by clicking the Start Vault Cycle button on the MM Admin toolbar. You can also initiate the vault cycle using the `ca_mmo -init` command at the DOS prompt.

Note: You must click the Start Vault Cycle button every time you want current information on the MM location of the media.

Execute the Start Vault Cycle process to generate reports detailing the movement of the tape volumes and location information. The slots that already contain tape volumes and the new slots that will be vaulted are grouped together by their common schedule. Beginning with the first rotation in the schedule, tape volume sets are assigned to a vault and its slots based on the expiration criteria. Slots are automatically created and tape volumes automatically vaulted during this process.\

When the first rotation is satisfied, the next rotation in the schedule is processed, and so on through the entire schedule until all rotations have been exhausted. Media management then generates reports indicating the current location and destination where the tape volumes must be moved. If you do not want to remove these tapes manually, you can use the `ca_mmo -export` command at the DOS prompt so MM Admin automatically exports them. See Device Manager in this chapter for more information about command line utilities for media management.

You can use the Simulate Vault Cycle command to produce a Vault Selection Report. Use this command at any time to predict how many tape volumes will be moved without actually updating the location information. If you want to send the Vault Selection Report to someone by email, make sure your system is configured to send alerts using Microsoft Exchange and, from the Configuration menu, enable the option Send the report by E-mail. For more information on configuring alerts, see the chapter "Using the Alert Manager."

The vault cycle generates the Shipping and Receiving Reports, listing the old and new locations of the tape volume set, to provide you with the information you need to manage your media. These reports provide the following information:

- Shipping Report—tells you what media to pull manually, and where to send it.
- Shipping Content Report—lists all tape volumes and sessions in each tape volume to be pulled from each of the vaults.
- Receiving Report—tells you what media will be coming in to each particular vault.
- Receiving Content Report—lists all tape volumes and sessions in each tape volume to be distributed to the vaults.

If you want to send the shipping and receiving reports to someone by email, make sure your system is configured to send alerts using Microsoft Exchange and, from the Configuration menu, enable the option Send the report by E-mail. For more information on configuring alerts, see the chapter “Using the Alert Manager.”

When a tape volume comes under Media Management control, Tape Service updates the tape volume's location status to OFF_SITE. To prevent a tape volume from being used while under Media Management control, the tape volume is automatically checked out, and the location is updated to reflect this. Because all vaulted tape volumes are placed in checked out status, if you need to retrieve tape volumes, they must be checked into Tape Service before they can be used.

Vault Management

The first step in establishing a vaulting policy is to create a vault. You can create vaults using MM Admin.

Create a Vault

To create a new vault, right-click the Vault object to access the pop-up menu and select Create. When the Create Vault dialog appears, enter a name and description for the new vault.

Select the Use in Local option if this vault will not be moved to another location. If the tape volumes in this vault are to be maintained off site, do not select this option. Click Add to save and add the vault to the Vault branch in the MM management window.

When you create a vault, location information is automatically updated and integrated with the Location Maintenance feature in BrightStor ARCserve Backup. If you select a vaulted tape through BrightStor ARCserve Backup, vault location information appears. Location information is also updated in the BrightStor ARCserve Backup Media Pool Manager. If you select a vaulted tape for restore, a message appears indicating that the tape is OFF_SITE.

Modify a Vault

To modify information for a vault, double-click the Vault object in the left pane of the MM Admin window to access a list of existing vaults. Select the vault you want to update from the list, right-click, and select Update from the pop-up menu. When the Edit Vault dialog appears, make your changes and click OK to save the new settings.

Delete a Vault

Before you delete a vault, you must remove all media in it and make sure no rotations are associated with it. To delete a vault, right-click its name in the left pane of the MM Admin window and select Delete.

Tape Volume Movement Scheduling

Media Management relies upon a user-defined schedule to determine the tape volumes to move, and when and where to move them. When you select the Schedule object, you can view existing schedules in the right pane of the MM Admin window or you can define new rotation policies and vaulting criteria.

Create a Schedule

To create a new schedule, right-click the Schedule object in the left pane of the MM Admin window, and choose Create from the pop-up menu. When the Create Schedule dialog appears, enter a name for the schedule and click Add. The new schedule is saved and added to the Schedule branch in the MM management window.

After you create a schedule, the Vault Criteria Descriptor (VCD) and Rotation objects appear in the left pane of the MM Admin window. These objects allow you to select media and retention policies.

Delete a Schedule

To delete a tape volume movement schedule, use the following steps:

Note: Before you can delete a schedule, you must first ensure that any VCD and rotation for the schedule have been deleted.

1. Expand the list of schedules below the Schedule object.
2. Click the schedule you want to delete.
3. Delete the VCD and rotation for this schedule.
4. Right-click the schedule that you want to delete and choose Delete from the pop-up menu.
5. Click OK.

Tape Volumes and VCD Management

To assign media to vaults you must specify a VCD and rotation. You can select a media pool, file name, or an individual media for the controlling data set. When this data set is vaulted, its tape volume set is placed in slots in the vault. The assignment of slot numbers is based on the rotation records you defined.

Create a Vault Criteria Descriptor

After you have created a schedule, you must describe the rules for media selection by creating a VCD. To do this, in the left pane of the MM Admin window, under the Schedule object, select the Vault Criteria Descriptor object, right-click, and select Create. The Create Vault Criteria Descriptor dialog appears. Choose one of these options:

- To use a media pool name as the controlling data set, enter the name of the media pool or use the drop-down list to select a media pool name from the pool list. Only the media within the Save Set of the media pool can be vaulted. The media in the Scratch Set cannot be vaulted.
- To use a file name as the controlling data set, select the File Name option and enter the host name and the full path and file name from your backup, such as /opt/doc/readme.txt, in the appropriate fields. Browse through the Database or Restore Manager to obtain path or file information. MM will find the last tape used for the backup of this directory or file.

- If you want to use an individual media as the controlling data set, select the Assign by User option. This is useful in emergencies when you need to use a specific tape. If you use this option, you must use the command line utility ca_mmo -assign to specify a particular tape. See ca_mmo Command in this chapter for more information about command line utilities for media management.

Click Add to save the VCD and add it to the Vault Criteria Descriptor branch in the MM Admin window.

Modify a Vault Criteria Descriptor

To update or modify an existing VCD, use the following steps

1. Expand the list of schedules under the Schedule object.
2. Selected a schedule from the list.
3. Expand the schedule to display the Vault Criteria Descriptor and Rotation objects.
4. Right-click on the Vault Criteria Descriptor object, and choose Update from the pop-up menu.
5. Update or modify the Media Pool Name or File Name fields, and click OK to save the new setting for this VCD.

Delete a Vault Criteria Descriptor

To delete a schedule, you must first delete the associated rotation and VCD.

To delete a VCD

1. From the Schedule object, select the specific VCD from the list under the Vault Criteria Descriptor.
2. Right-click and select Delete from the pop-up menu.
3. Click OK.

Tape Volume Retention Policies

After you create a schedule, you must set the policies governing tape volume retention for your vault. To do this, use the Rotation object.

Note: The Rotation object appears in the left pane of the MM Admin window only after you create schedule.

Create a Rotation

To create a rotation, select the Schedule object in the left pane of the MM Admin window, double-click it, and select a schedule from the list. Double-click the schedule to access the Rotation object. Right-click the Rotation object and select Create. The Create Rotation dialog appears where you can set the following:

- Sequence Number—MM Admin automatically generates a sequence number for your rotation. Vault cycles start with the lowest sequence number. The default for a new rotation is 10 and the next new rotation that follows is 20. If you would rather assign a particular sequence number, select the Sequence Number option and select a number.
- Vault Name—A vault name must be specified for each rotation. You can select the name of a vault from the drop-down vault list.
- In the Retention fields, set any of the following conditions:
 - Hold Days—The number of days you want tape volumes to be retained.
 - Keep for Cycles—The number of vault cycles you want tape volumes to be retained in this rotation.
 - Days Elapsed from First Format Date—Starting from the day the tape volumes were first formatted, enter the number of days you want tape volumes to remain in this rotation.
 - By Date—Tape volumes are retained in this rotation until the date you enter here is reached.
 - By Tape Expiration Date—Tape volumes are retained in this rotation until their expiration date passes.
 - Permanent—All tape volumes are retained in this rotation permanently.

If a tape volume meets one of these conditions, it remains in the same rotation. None of these conditions have priority over the other so if any condition is true, the media will stay in the vault—even if conditions appear to conflict. For example, if you select 60 in the Hold Days field but enter a date that is only 30 days away in the By Date field, the tape volume will stay for 60 days.

When you click Add, the new rotation is saved and added to the Rotation branch in the MM management window.

When the Retention period for a tape volume expires, the tape volume is unvaulted and returned to Tape Service to be re-used.

Modify a Rotation

To modify an existing rotation, expand the Schedule object in the left pane of the MM Admin window and select a schedule from the tree. Double-click the schedule to access the Rotation object. Double-click the Rotation object and select a rotation in the right pane. Right-click the rotation and select Modify. When the Edit Rotation dialog appears, make changes and click OK to save the new settings.

Delete a Rotation

If you want to delete a schedule, you must first delete the associated rotation and VCD. To delete a rotation, in the right pane of the MM Admin window, select the rotation from the list under the Rotation object, right-click, and select Delete. When the confirmation appears, click Yes.

Slot Information

When tape volumes have been assigned to slots in a vault, MM Admin displays slot information for the vault. Select the Vault object in the left pane of the MM Admin window and expand it. When you select a particular vault from the list, the right pane of the MM Admin window displays a view of the vault and its slots.

This view provides the following information:

- Media Name—Lists the media name, ID, sequence number, and serial number.
- Slot Status—Either Active, Unvaulted, Temporary Check In, Manual Check In, or Manual Check In and Retire:
 - Active—The media has been sent to this vault.
 - Unvaulted—The media has not yet been sent to this vault.
 - Temporary Check In—The media will be checked in temporarily during the next vault cycle.
 - Manual Check In—The media will be checked in during the next vault cycle.
 - Manual Check In and Retire—The media will be checked in and retired during the next vault cycle.

- Slot Name—Lists the vault name and slot number.
- Media Export Status—Either Ready, Success, or Fail:
 - Ready—The default status. The media has been assigned to the vault, but has not been exported from the tape library to the mail slot yet.
 - Success—Appears once the media is successfully exported to the mail slot.
 - Fail—Appears if MM Admin failed to export the media to the mail slot.
- Local—Either Yes or No. Yes appears if the media belongs to a local machine. No appears if it belongs to a remote machine.
- Create Date—The date the slot was created.

When you highlight a media name, additional information appears in the Properties pane in the lower right-hand corner of the page. This information includes the media name, serial number, random ID, host name, slot status, slot name, media export status, media type, media class, last write, last read, and slot creation date. Because MM Admin lets you start a vault cycle only with local media, the media icon appears in yellow if the vaulted media is not a local media with a remote host name. If you want to start a vault cycle with a remote media, use the `ca_mmo -startall` command line utility. See `ca_mmo` Command in this chapter for more information about command line utilities for media management.

Because slots are automatically created when a tape volume is vaulted, you typically have no reason to update slot information.

Special Tape Volume Movement

Special circumstances may arise in which you need to move a particular tape volume. If this situation occurs, you have three options—Temporary Check In, Manual Check In, and Manual Check In and Retire. You also have the option to permanently vault a volume so that it does not return to Tape Service. The following sections describe each of these options.

Temporary Check In

The Temporary Check In option is useful for tracking media movement if you want to temporarily move a tape volume from a vault to use for a restore job, but want to return it back to the vault when the job is finished.

All tape volumes that are vaulted are in *checked out* status. Use the Temporary Check In option to change this status to *checked in* so that you can keep track of your tape volume while it is temporarily being used for a restore job. When you finish using the tape volume, the next vault cycle returns it to the vault and changes the status back to *checked out*.

For example, to perform an emergency restore operation using a tape volume from one of the vaults, use the Temporary Check In feature to temporarily check the tape volume in to Tape Service, execute the restore operation, and then run a vault cycle to return the tape volume to the vault.

Note: The Temporary Check In option is only for tracking tapes that are temporarily returned from the vault, and is not a requirement for the actual tape movement; if you do not use this option, you can still manually move a tape volume from a vault and return it when a job is finished. However, you should use this option because, if you do not use it and move a tape volume, there will be a discrepancy between the status of the tape volume that appears in the MM Admin and the actual location of the tape.

To use the Temporary Check In option, in the left pane of the MM Admin window, double-click the Vault object to see a list of existing vaults. Select a vault to display its information in the right pane. Select the name of the media you want to move, right-click, and select Temporary Check In.

Manual Check In

Use the Manual Check In option to check a tape volume back into Tape Service before the time it is scheduled to be checked in. When you manually check a tape volume back into Tape Service, it does not return to the vault.

To use the Manual Check In option, in the left pane of the MM Admin window, double-click the Vault object to see a list of existing vaults. Select a vault to display its information in the right pane. Select the name of the media you want to move, right-click, and select Manual Check In.

Manual Check In and Retire

Use the Manual Check In and Retire option to check a tape volume back into Tape Service before the time it is scheduled to be checked in, and retire it so it is no longer used.

To use the Manual Check In and Retire option, in the left pane of the MM Admin window, double-click the Vault object to see a list of existing vaults. Select a vault to display its information in the right pane. Select the name of the media you want to move, right-click, and select Manual Check In and Retire.

Permanent Retention

Use the Permanent Retention option to permanently vault slots and the tape volumes they contain. If you use this option, when a tape volume is vaulted, it does not return to Tape Service. The only way to return it is to change the vault status back to the default.

To permanently check tape volumes out of Tape Service, select the Permanent Retention option on the Create Rotation dialog.

Find Media in Vaults

To help you locate media in your vaults, MM Admin provides the Find Media in Vault feature. This feature is the fastest way to locate media in your vaults if you know the tape name or serial number of the tape volume you need. If you do not know this information, you can use the Database Manager to find the media.

In the left pane of the MM Admin window, select the Find Media in Vault object, right-click, and select Find. When the Find Media in Vault dialog appears, select one of the two methods:

- Find by Tape Name—Enter the tape name, the random ID, and the sequence number to identify the tape you want BrightStor ARCserve Backup to find.
- Find by Serial Number—Enter the serial number of the desired media. Please note that this is case sensitive. For example, serial number ABC123 is different from serial number abc123.

Click Find to begin the search. When the search is finished, the vault and slot information appears in the right pane of the MM Admin window.

ca_mmo Command

The ca_mmo command is the command line interface equivalent to the MM Admin window. You can enter the ca_mmo command at the DOS prompt. The options and switches associated with this command allow you to start vault cycles, automatically export all vaulted tapes to the mail slots of the changer, reset the vault status, initialize the MM Admin database, check in tapes to Tape Service, assign tapes to vaults, and print reports.

Note: When selecting a VCD, if you selected the Assign By User option as the controlling data set, you **must** use the ca_mmo -assign command to assign a specific tape.

For a complete list of the options and switches available for the ca_mmo command, see the appendix "Using Command Line Utilities."

As an alternative to using the command line, any command you can enter can also be submitted using the Job Scheduler Wizard. A benefit of submitting a job using this wizard is that the job appears in the Activity Log. Another benefit is that you can submit repeating jobs. For more information on submitting jobs using the Job Scheduler Wizard, see Job Scheduler Wizard in the chapter "Customizing Your Jobs."

Chapter 7: Managing the Database and Reporting

The BrightStor ARCserve Backup database maintains job, media, and device information on your system. The database information stored includes the jobs you run, sessions backed up, media used, along with detailed information from a backup job. The database keeps track of each file and directory that was backed up to media when you perform a restore. When you want to restore a specific file, the database determines which media a file is stored on.

The database information is also used to generate many types of BrightStor ARCserve Backup reports. All of the media pool and media location information is also stored in the database.

Database Manager

The Database Manager allows you to:

- Keep track of the location of your media.
- Determine the session number of your backup.
- Determine if media should be retired.
- View log information about jobs you have run.
- Delete old records from the database.
- Visually compare the size of your database to the total available disk space.

Note for SQL: The total database size reported by the BrightStor ARCserve Backup Database Manager is the size of the data device. You can obtain more information by browsing through the Microsoft SQL Server Enterprise Manager.

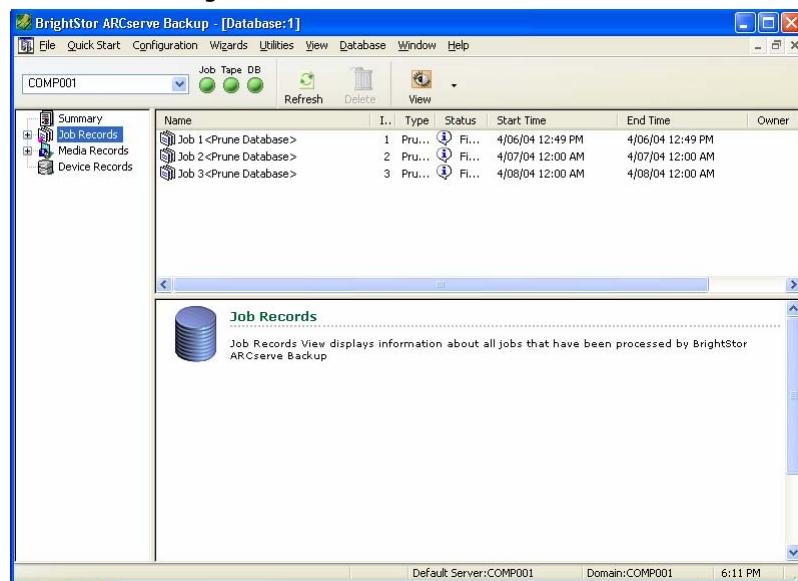
Information on all of the database backup operations performed is stored in the databasebackup.log file located in the Log directory on the BrightStor ARCserve Backup server. You can obtain details about a database failure from the log file. Whenever the database is backed up, the following information is added to the log file:

- Date the backup is performed
- Tape name
- Random ID
- Serial number (if any)
- Sequence number
- Session number

Database Views

When you open the Database Manager, the left panel displays the following options:

- Job Records—Jobs processed by BrightStor ARCserve Backup.
- Media Records—Media used by BrightStor ARCserve Backup.
- Device Records—Devices used by BrightStor ARCserve Backup.
- Summary—Space the database used on your hard disk, database type, and other settings.



Sort Order

To change the sort order of records displayed in the Job, Media, and Device Records view, click on the field name you want to sort.

Database Pruning

You can set BrightStor ARCserve Backup to remove old records from the database. For more information, see the chapter "Administering the Backup Server."

SQL Indexes Rebuilding

Note: This only applies when using Microsoft SQL as the BrightStor ARCserve Backup database.

You should rebuild the index periodically to keep the index size manageable. The index should be updated after running an overnight job in order to keep the database size small. If you do not have enough time to update all the indexes, update the key indexes: IX_astmdat_1, IX_astmdat_2, X_astmdat_3, K.pathname, and PK_filename. These indexes play an important role and dramatically affect the browsing speed dramatically in the Restore and Database Managers. See the Microsoft SQL online help for steps on rebuilding the SQL Index.

Error Reporting

The following statistical information is recorded in the database:

- Media Errors—Indicates data corruption occurred on the media preventing the read or write operation from successfully completing.
- Soft Read Errors—An error occurred while reading the media. BrightStor ARCserve Backup attempted to correct the problem in real-time. A higher number of soft read errors indicate possible defective media. Media should be replaced for any future backups.
- Soft Write Errors—A write error occurred during the backup. BrightStor ARCserve Backup is correcting the media problem in real time. A high number of soft write errors indicates the media should be replaced for future backups. Make sure the drive heads are cleaned after the current backup session is completed.

Device Records

If a drive has a critical error, the error log may contain some of the following information:

- Time—Time the error occurred.
- Sense Info—SCSI error code.
- Media—Number of media errors that occurred during the job.
- Soft Write—Number of soft write errors
- Soft Read—Number of soft read errors that occurred during the job.
- Media Usage—Amount of time the media was used during the job.
- KB written—Amount of data written to the media during the job.
- Times Formatted—Number of times media has been formatted.

Last Database Backup Information

Every time the BrightStor ARCserve Backup database is backed up successfully, the backup information is saved in a file called databaseBackup.log in the \Log subdirectory of the BrightStor ARCserve Backup home directory.

If you need to run a database recovery, you can check this file to find out which media contains the latest BrightStor ARCserve Backup database. You can also find media with a specific date of the BrightStor ARCserve Backup database.

Catalog Database

You can use the Enable Catalog Database feature to lower the database load and increase database performance. This is useful under the following circumstances:

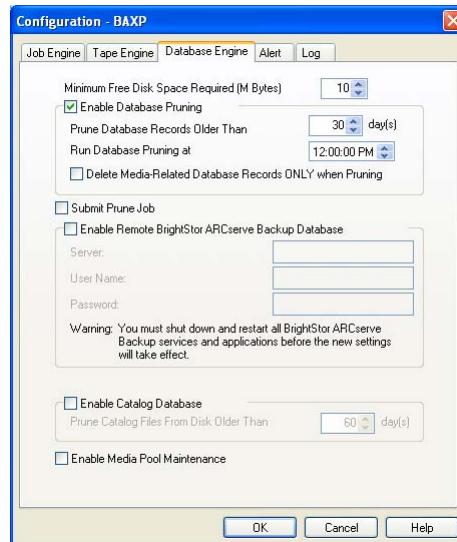
- You have a large enterprise to retain with a large number of servers to back up, huge amounts of data with fixed backup windows, need to retain backup information in the database for a long time.
- Your database is growing too big and it starts affecting performance.

If you enable the catalog database, BrightStor ARCserve Backup automatically provides transparent catalog database management functions: gets catalog file names, deletes catalog files, prunes catalog files using the preset database pruning cutoff date, purges catalog files, copies catalog files, and renames catalog files. For more flexibility, you can also choose to perform these functions manually using the BrightStor ARCserve Backup utilities. For more information on utilities, see the chapter "Introducing BrightStor ARCserve Backup."

Enable the Catalog Database

To enable the catalog database:

1. Open the Server Admin Manager.
2. Click the Config button.
3. Select the Database Engine tab as shown in the following example:



4. Click the Enable Catalog Database option at the bottom of the dialog and click OK.

Enable Media Pool Maintenance

Using the Enable Media Pool Maintenance option you can allow daily maintenance of the media pool. BrightStor ARCserve Backup performs media pool maintenance tasks according to the Prune job schedule.

To enable media pool maintenance, use the following steps:

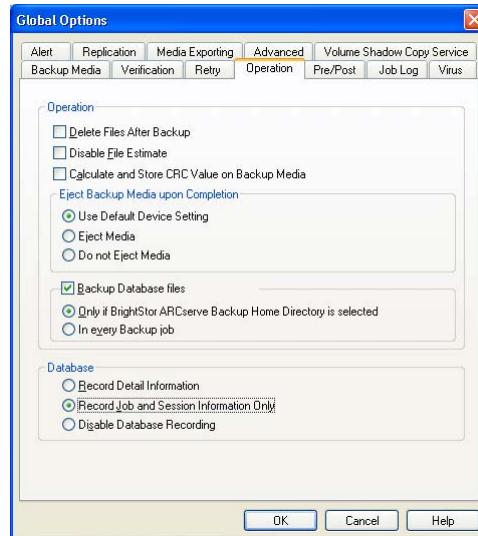
1. Open the Server Admin Manager.
2. Click the Config button.
3. Select the Database Engine tab.
4. Click the Enable Media Pool Maintenance option at the bottom of the dialog and click OK.

Configure Merge Options

If you enable the catalog database, you can take advantage of job-level merge options that allow you to choose how to handle catalog files after backup.

To configure merge options:

1. When submitting a job from the Backup Manager, click the Options button.
2. When the Global Options dialog appears, select the Operation tab, as shown in the following example:



3. On the bottom of the dialog, select one of the following database options, and click OK.
 - Record Detail Information—Select this option to log detail information pertaining to the source and destination in the database. If you enabled the catalog database and select this option, catalog files are stored in the catalog.db folder after all detail information contained in the catalog files are merged into the database. If you did not enable the catalog database, the catalog files are deleted after the merge.
 - Record Job and Session Information Only—This is the recommended option. Select this to log only job and session information in the database. If you select this option, no detail information is merged into the database. If you enabled the catalog database and select this option, catalog files are stored in the catalog.db folder. If you did not enable the catalog database, catalog files are deleted afterwards.
 - Disable Database Recording—Select this option if you do not want to log any information about this job in the database. Select this option if you are backing up the BrightStor ARCserve Backup database or if you have limited disk space.

Backup and Restore Jobs Using the Catalog Database

If you use the catalog database, perform the following procedures to submit backup and restore jobs using the Catalog Database.

Submit a Backup Job Using the Catalog Database

To submit a backup job using the catalog database:

1. If you have not enabled the catalog database yet, open the Server Admin Manager, click the Config button, choose the Database Engine tab, place a check mark in the Enable Catalog Database check box, and then click OK.
2. Open the Backup Manager.
3. When the Backup Manager appears, on the Source tab, select the items from the machine tree you want to back up.
4. Click the Destination tab and specify the media group and media (if you have a specific one in mind) you want the files backed up to.
5. Click the Schedule tab, select a backup method, and a schedule for this job.
6. Click the Options button.
7. When the Global Options dialog appears, click the Operation tab.

8. On the Operation tab, under the Database heading, select the Record Job and Session Information Only option and click OK. This option lets you record all information about this job in the database except detail information about individual files and folders. Detail information about individual files and folders is saved in a catalog file in the folder C:\Program Files\CA\ BrightStor ARCserve Backup\database.
Note: (Optional) From the Global Options dialog, select additional options for your backup job.
9. Click the Start button and when the Security and Agent Information dialog appears, edit or confirm the security and agent information for the job, and then click OK.
10. When the Submit Job page appears, select to run the job immediately by selecting Run Now, or select Run On and select a date and time when you want the job to run.
11. Enter a description for your job.
12. If you selected multiple sources to back up and want to set the priority in which the job sessions initiate, click Source Priority. Use the Top, Up, Down, and Bottom buttons to change the order in which the jobs are processed. When you finish setting priorities, click OK.
13. On the Submit Job page, click OK to submit your job.

Note: For more information on submitting backup jobs, see the chapter "Backing Up Data" and the online help.

Submit a Restore Job Using the Catalog Database

If you are restoring a whole session, follow the normal restore procedure provided in the online help.

Before you submit a restore job, you need to locate the folder or file you want to restore. To locate a folder or file, open Windows File Explorer and use the Search In Files function to search the catalog database folder for the folder or file you want to restore. If you are looking for a folder or file under a particular date, sort the catalog files by date to easily determine the time stamp of a file or folder.

To submit a restore job of a specific folder or file using the catalog database:

1. Open the Restore Manager.
2. Select the items from the machine tree on the Source tab that you want to restore.

3. Click the session you want located in the file or folder. If the session does not contain detail information, a dialog box appears asking if you want to merge the detail information. Click Yes to start merging the detail information.

Note: You can also use the Filter function to restore a file or folder. To do this, click the Filter button. When the Filter dialog appears, use the Include and Exclude functions to select the particular files or folders you want to restore, and then click OK. For more information on filters, see the chapter "Customizing Jobs" and the online help.
4. Click the Destination tab and select where you want the files restored to.
5. Click the Schedule tab and select a repeat method if you want to repeat this job.
6. Click the Start button and when the Security and Agent Information dialog appears, edit or confirm the security and agent information for the job, and then click OK.
7. When the Submit Job page appears, select to run the job immediately by selecting Run Now, or select Run On and select a date and time when you want the job to run.
8. Enter a description for your job and click OK to submit.

For more information on submitting restore jobs, see the chapter "Restoring Data" and the online help.

Management of Multiple Server Environments Using a Centralized Database

The BrightStor ARCserve Backup centralized database feature can help you manage enterprise multi-server environments. You can browse media information or generate reports for multiple servers at the same time. The members that are subordinate BrightStor ARCserve Backup machines on your network update the central BrightStor ARCserve Backup database with media session information and details from their own database. The central database is set up locally on a machine that manages it. Media session information for all of the BrightStor ARCserve Backup machines in your enterprise is also contained in this database.

You can configure the relationships between the central database and the databases of the domain's other BrightStor ARCserve Backup machines in the BrightStor ARCserve Backup Central Database Configuration.

Administrators can use the central database to perform the following functions:

- Query for historical information from multiple backup machines from a central location.
- Generate ad hoc reports for all of the individual BrightStor ARCserve Backup databases in your enterprise since all of your data resides in a central location.
- Restore machines from a central location in your enterprise.

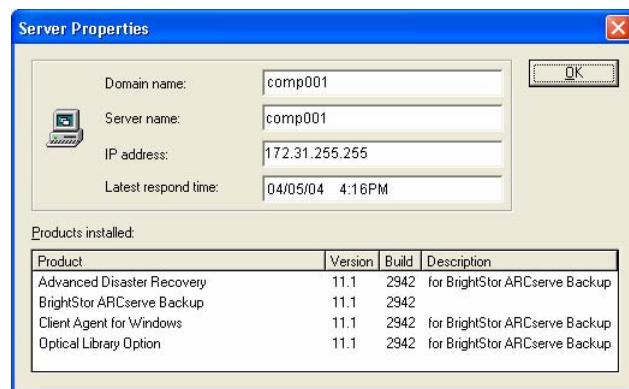
The first step in setting up a centralized scheme for BrightStor ARCserve Backup on your network is to configure your central databases.

Centralized Database Setup

You can manage the centralized database by running the Central Database Configuration. The tool allows you to manage your data location. You can access the feature by selecting Central DB Configuration from the Configuration menu.

To designate a server as your centralized database repository, select Assign Central Database from the Configuration menu in the Central Database Configuration window.

You can view the database size, free space, total space, and the database type in the list view. You can monitor the database size, server disk space, and utilization. Select the server and right-click, then select Properties to view the products installed on the server.



Add Members to a BrightStor ARCserve Backup Central Database

You must have BrightStor ARCserve Backup administrator rights to add members to a central database to establish an informational relationship between the central database and the subordinate databases. The data flows from the dependent BrightStor ARCserve Backup databases to the BrightStor ARCserve Backup central database. Dependent BrightStor ARCserve Backup machines can only send data to one central database.

If you select to write information to the BrightStor ARCserve Backup central database, the server and the database engine that the central database resides on must be running. To add a member to your central database, select the centralized database server and click Assign Member. You need to provide the security of each member (server) you add.

Configuration Options for Job Information Stored in Central Databases

In the Central Database Configuration, you can configure the information to store locally or in the central database. The following table details the different methods you can configure for the central and subordinate databases:

Central Database	Local Database
<ul style="list-style-type: none">Job summary information, including media session information, is recorded, but no job detail is stored.Do not check Include detail data to BrightStor ARCserve Backup Central Database option. (Default)	<ul style="list-style-type: none">Summary and detailed job information is recorded on the databases of the subordinate BrightStor ARCserve Backup machines.Check the Keep local copy option. (Default)
<ul style="list-style-type: none">Summary and detailed job information is recorded in the central BrightStor ARCserve Backup database.Check Include detail data to BrightStor ARCserve Backup Central Database.	<ul style="list-style-type: none">Summary and detailed job information is recorded on the databases of the subordinate BrightStor ARCserve Backup machines.Check Keep local copy. (Default)
<ul style="list-style-type: none">Job summary information, including media session information, is recorded, but no job detail is stored.Do not check Include detail data to BrightStor ARCserve Backup Central Database. (Default)	<ul style="list-style-type: none">No job details are recorded.Do not check Keep local copy.
<ul style="list-style-type: none">Summary and detailed job information is recorded in the central BrightStor ARCserve Backup database.Check Include detail data to BrightStor ARCserve Backup Central Database.	<ul style="list-style-type: none">No job details are recorded.Do not check Keep local copy.

Central Database Tasks

Use the central database to perform the following tasks:

- Search for historical information from multiple backup machines from a central location.
- Generate ad hoc reports for all the individual BrightStor ARCserve Backup databases in your enterprise because all of your data resides in a central location.
- Restore machines from a central location in your enterprise.

Remote Databases

You can specify a BrightStor ARCserve Backup server as your remote database. However, by doing so, you do not record any job information in the local server (dependent machine).

To configure a remote database, on the local server from the Server Admin Manager, click Configuration. Select the Database tab, and check the Enable Remote BrightStor ARCserve Backup Database option. You can redirect the information to a remote machine by completing the fields.

After entering all pertinent information, you need to shut down all services and restart them so that the settings can take effect.

The remote database setting is similar to other central database configurations; however, there are differences in the enabling a machine. A centralized database server knows its members and its configuration, whereas you can only enable or disable the remote server setting on the local machine. You can also modify the settings of a member of a centralized database.

Use Microsoft SQL as the BrightStor ARCserve Backup Database

The SetupSQL.exe utility lets you configure BrightStor ARCserve Backup to use Microsoft SQL as its database. You can run this utility during setup or at anytime thereafter if you want to switch the BrightStor ARCserve Backup database to MS SQL.

Note the following configuration considerations:

- If you switch the BrightStor ARCserve Backup database to MS SQL and your old database already contains data, the data is not transferred to the new database automatically.
- Always run the SetupSQL.exe utility from the BrightStor ARCserve Backup home directory. Do not run it from the product CD.

To use Microsoft SQL as your BrightStor ARCserve Backup database, perform the following procedure:

1. When the SQL Database System Account screen appears, select Use Windows security to use Windows security authentication mode or Use SQL server security to use MS SQL server security authentication mode. If you select Use SQL server security, you must enter a user name and a password.
Note: The MS SQL security authentication mode is most appropriate for the MS SQL server environment and the following steps describe this option.
2. In the SQL Server Type field, select Local, Remote, or Cluster SQL server type. If you select Remote, you must enter Remote Server Administrator Account information at the bottom of the screen.
3. In the Machine (Instance) field, enter the name of the SQL server. If your MS SQL server has multiple instances, also specify the instance that you want to use. For example, enter DBSQL\INSTANCE1 if you want SQL server INSTANCE1 on DBSQL machine to be used.
Note: The machine name always refers to the MS SQL server machine. This machine does not necessarily have BrightStor ARCserve Backup installed. If your BrightStor ARCserve Backup server and MS SQL server are not on the same machine, using SetupSQL.exe to configure remote BrightStor ARCserve Backup database is more efficient, especially when you have more than one BrightStor ARCserve Backup server.
4. Enter your Login ID.
5. Enter and confirm your password.
6. If you selected Remote in the SQL Server Type field, enter a Login ID and password for the Remote Server Administrator Account, then click Next.

7. The SQL Database Configuration window opens. Select Automatic configuration or Custom configuration and do one of the following:
 - If you select Automatic configuration, the SQL database will be automatically configured. After the configuration is complete, you must restart all BrightStor ARCserve Backup applications for the new settings to take effect.
 - If you select Custom configuration, BrightStor ARCserve Backup will guide you through the rest of the database creation process. After the configuration is complete, you must restart all BrightStor ARCserve Backup applications for the new settings to take effect.

Configuration of an ODBC Data Source to Enable a Remote Database

If you have another BrightStor ARCserve Backup server running that uses Microsoft SQL as its database, you can redirect the local database to the remote machine. BrightStor ARCserve Backup can use ODBC to connect to the Microsoft SQL server. You can direct the ODBC data source to another server if the server has SQL installed and the BrightStor ARCserve Backup SQL database is properly setup using the `setupsql.exe` utility. You also need to make sure the local server user is authenticated in the remote server.

Database Configuration Considerations

Use the following information to choose which database configuration best suits your needs:

- Central Database—Using the central database configuration can help you keep an organizational structure with different members and central database configurations. With this configuration, you can keep a local database for efficiency and convenience. In addition, using the central database configuration options, you do not have to store detail information in the central database. This reduces the central database load, reduces network traffic, and increases performance while still providing a global view of the data in your enterprise.

- Remote Database—Using a remote database provides a simple and transparent method of sharing a single database as if the database resides locally. When you use this configuration, you do not need a database on the local machine because all information is saved to the remote database. This configuration is optimal if the following conditions are evident:
 - There is not enough space locally for the database.
 - There is no organizational requirement and you want to take advantage of the ease of management that comes with having a single place for the database.
 - You want to have a separate machine that is not a BrightStor ARCserve Backup server to be a dedicated as a MS SQL server machine.
- You can configure the remote database using the Server Admin. The remote database can be either VLDB or MS SQL.
- Remote Database using MS SQL through ODBC—When you select MS SQL as your BrightStor ARCserve Backup database and your BrightStor ARCserve Backup server and the MS SQL server are not on the same machine, you can use the SetupSQL utility to configure a remote BrightStor ARCserve Backup database through ODBC. Using SetupSQL.exe to configure a remote BrightStor ARCserve Backup database is more efficient, especially when you have more than one BrightStor ARCserve Backup server.

Advanced RAIMA Very Large Database Maintenance

You have two database options when you install BrightStor ARCserve Backup—the standard BrightStor ARCserve Backup RAIMA Very Large Database (VLDB) or Microsoft SQL Server. By default, BrightStor ARCserve Backup installs VLDB on the server. The information in the following sections applies only when using VLDB.

VLDB Architecture

VLDB is composed of ten databases, each used to store specific information. The VLDB databases include the following:

- asjob
- aslogerr
- asmedia
- asmsg

- asmsgdat
- asobject
- asrhost
- astape
- astpdrv
- astpsdat
- astpsdat

The astpsdat database typically displays the largest amount of information in the restore screen, including detailed session information from backup jobs.

VLDB Utility Usage Considerations

If the server that hosts VLDB experiences unexpected problems, such as a power outage or some other failure, an inconsistency may occur in the database. If the database is inconsistent, you usually cannot view detailed session records. This can affect your ability to restore by session, tree, or query.

If you suspect that your database is experiencing inconsistencies, you can run the VLDB utilities for diagnostic purposes. However, before running the VLDB utilities, you may first want to consider other basic troubleshooting tips because the utilities may take a long time to run, and you cannot perform backup and restore functions while they are running. For information on these basic troubleshooting tips, click the BrightStor Technical Support link on the BrightStor ARCserve Backup home page.

The amount of time it takes to run the VLDB utilities varies greatly depending on the size of your database and the speed of your BrightStor ARCserve Backup server. Astpsdat is the largest part of the BrightStor ARCserve Backup VLDB. This database holds the most data and requires the most amount of time for the utilities to run.

Important! *You should consider the time requirements before running these utilities and ensure that they will not conflict with your normal backup and restore functions.*

VLDB Maintenance Utilities

All of the VLDB utilities are command line utilities that must be run from the BrightStor ARCserve Backup directory. Use the command prompt to access this directory and enter utilities.

Dbcheck is the first VLDB utility you should run. This checks the integrity of VLDB.

To run the dbcheck utility, enter the following syntax:

```
dbcheck -a -L casdb;admin;secret [DBNAME]
```

DBNAME is the name of the database to use for an integrity check (asjob, asmedia, asobject, asrhost, astape, astpdrv, astpsdat, asmsg, asmsgdat, or aslogerr). As dbcheck runs, information on the status of the database displays, ending with a final database summary.

If a problem with the database is detected after running the dbcheck utility, you can use the following utilities to repair the corruption:

- Dbdefrag—Run this utility only if you decreased pruning time and you want to make sure that you have as much free space as the largest database file.

Important! *You must run a prune job to remove records before you use the dbdefrag utility. Otherwise, the defrag will have nothing to do because there are no records marked as deleted.*

You can use the dbdefrag utility, followed by the keybuild utility, to compress a database after running a prune job and to repair corruption caused by broken links within VLDB entries (ex. A->B->C->...). If a link is corrupt or destroyed, VLDB cannot access data. Running this utility may remove these broken links and allow VLDB to access the data.

To run the dbdefrag utility, enter the following syntax:

```
Dbdefrag -a -L casdb;admin;secret [DBNAME]
```

DBNAME is the name of the database that you want to defrag (asjob, asmedia, asobject, asrhost, astape, astpdrv, astpsdat, asmsg, asmsgdat, or aslogerr).

- Keybuild—Use this utility only after you run the dbdefrag utility. This utility repairs high-level key corruption.

To run the keybuild utility, enter the following syntax:

```
keybuild -k -L casdb;admin;secret [DBNAME]
```

DBNAME is the name of the database that you want to repair (asjob, asmedia, asobject, asrhost, astape, astpdrv, astpsdat, asmsg, asmsgdat, or aslogerr). As keybuild runs, the status of the operations is displayed, ending with a final summary of the rebuilding process.

- Dbfix—Use this utility to check each entry in the database for corruption and repair any errors found.

To run the dbfix utility, enter the following syntax:

```
dbfix -a -L casdb;admin;secret [DBNAME]
```

DBNAME is the name of the database that you want to repair (asjob, asmedia, asobject, asrhost, astape, astpdrv, astpsdat, asmsg, asmsgdat, or aslogerr). As dbfix runs, the status of the operations is displayed, ending with a final summary of the repair process.

- DB DTL—Use this utility is to reduce the current VLDB Database size. The syntax for this utility is as follows:

```
DBDTL [options]
```

The DB DTL utility supports the following options:

-e <filename>

The Export option is used to dump the VLDB detail records into a user-defined file.

-i <filename>

The Import option is used to restore the VLDB detail records from a user-defined file.

-z <table name>

Initializes the VLDB detail records to reduce the database size.

-[?|h]

Invokes the DB DTL utility Help topic.

Microsoft SQL Server Database Configuration

You have two database options when you install BrightStor ARCserve Backup—the standard VLDB database or Microsoft SQL Server (7.0 or 2000).

By default, BrightStor ARCserve Backup installs VLDB on the server. If you want to use the Microsoft SQL Server database, your machine must have a minimum of 256 MB of RAM and meet the following requirements:

- MS SQL version 7.0:
 - Service Pack 3
 - ODBC Manager version v2.50.3006, v3.0.28.22, v3.510.3002.13, v3.510.3002.23, v3.510.3711.0, v3.520.3719.9, or v3.5204314.0
 - SQL Server driver version v2.65.0201, v2.65.0252, v3.60.0319, v3.70.0623, v3.70.6.90, or v3.70.8.12
- MS SQL 2000:
 - ODBC Manager version v3.520.6526.0 or higher

Note: Before installing BrightStor ARCserve Backup, verify that Microsoft SQL is installed.

If you select Microsoft SQL server during the setup by running the SETUPSQL.EXE utility after the installation, BrightStor ARCserve Backup creates a database under the SQL server and uses it as the backup and restore depository.

Note: For the SQL database to function properly, it must be started using Microsoft SQL Service Manager.

If you want to use SQL 2000 as the BrightStor ARCserve Backup database, you must choose Microsoft SQL Database during setup. If you have multiple instances of SQL 2000, you can select which instance you want for the BrightStor ARCserve Backup database from the drop-down list on the SQL Database System Account window.

You can also select a local or remote database from this window.

After you have selected the instance to use, enter the login ID and password for the instance. Enter a login ID and password for the Remote Server Administrator account if you selected Remote in the SQL Server Type field, and click Next.

Microsoft SQL Server Installation Considerations

Review the following information if you are using Microsoft SQL as the BrightStor ARCserve Backup database:

- Set the database security mode to SQL Security in the SQL ARCserve Manager. This applies when using SQL security as the authentication mode, which is mandatory with SQL 2000.
- If you are using an operating system that supports case-sensitive authentication, you should enable the case-sensitive authentication option when you install Microsoft SQL Server.
- You should use the *sa* account [which has the right to create devices] when prompted for the BrightStor ARCserve Backup Database (SQL) System Account during installation of BrightStor ARCserve Backup with Microsoft SQL support.
- The BrightStor ARCserve Backup Recover Database Utility and the global option Back up BrightStor ARCserve Backup Database Files do not support Microsoft SQL databases. You should use BrightStor ARCserve Backup Agent for MS SQL Server to back up the BrightStor ARCserve Backup database.
- If the MS SQL server account is changed, make the corresponding changes in the Server Admin in the BrightStor ARCserve Backup program Group.
- The BrightStor ARCserve Backup Database Engine polls the status of the MS SQL database periodically. If MS SQL does not respond in a timely fashion, the Database Engine assumes that the MS SQL server is unavailable and shuts down (red light). To avoid this situation, set the registry key to an appropriately longer value to increase the wait time for BrightStor ARCserve Backup Database Engine, as follows:
`HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base\Database\MSSQL\SQLLoginTimeout`
- If you specify SQL 2000 as the BrightStor ARCserve Backup database during setup, you can use Windows NT authentication or SQL authentication to communicate with SQL2000.

Data Transfer from a VLDB Database to a SQL Database

When configuring a Microsoft SQL database for BrightStor ARCserve Backup, you might want to transfer all existing information to the SQL database. You can use the transfer utility (DBtosql.EXE) located in the BrightStor ARCserve Backup home directory to transfer this job information from a BrightStor ARCserve Backup standard database to a Microsoft SQL database. However, any information existing in the database is overwritten.

Important! *You should not attempt to transfer information from a VLDB database to an SQL database containing information, because the SQL database might be overwritten. Instead, you should create a new SQL database for storing your BrightStor ARCserve Backup media and job information.*

SQL Connections

For each job that you run, you need two SQL connections. Be sure that you have set enough connections (or licenses) in your SQL server. To determine your default SQL connections, select Server and SQL server from the SQL ARCserve Manager. When you browse from the Configuration tab, you can see the user connections. Set these values to the appropriate user setting. If an error message appears, "Cannot Update Record," or "Failed to Login," you may have run out of connections. You should increase the open object to 2000.

Database Consistency Checks

When your database activity is low, we recommend that you run a database consistency check if you have a large database. Although it takes some time, it is important to determine that your SQL database is functioning well. For more information, see your Microsoft SQL guide.

Important! *Be sure to monitor the log size periodically. If a log is full, the database cannot function. Although the default setting is "truncate log on checkpoint," you should increase the log size to 50% of the database if you expect to keep a large number of records.*

Logs and Reports

BrightStor ARCserve Backup provides the following options for displaying logs and reports:

- Activity Log—Logs all BrightStor ARCserve Backup activity.
- Tape Log—Logs all tape activity (for debugging purposes only).
- Job Log—Logs activity related to a specific job.
- The Report Manager—Generates reports from the BrightStor ARCserve Backup database for viewing or printing.
- The Unicenter Monitoring Agent—Starts and stops services, monitors the status of the BrightStor ARCserve Backup processes and tape, and reports on the failure of backup jobs.

Activity Log Data

The Activity Log contains comprehensive information about the operations performed by BrightStor ARCserve Backup. It provides an audit trail of all BrightStor ARCserve Backup activity (including group activities) for every job that is run. You can scan this log every day to see if any errors have occurred. You can also use it to find out a session number in case you need to restore a specific session. The log is located on the upper right corner of the Job Status Manager.

The Activity Log has an organize feature which allows you to sort the log using filters, message grouping, or message post date. For further information on the Activity Log, see the chapter "Customizing Jobs."

Tape Log

The Tape Log contains messages sent by the tape drives to BrightStor ARCserve Backup. This log is not generated during normal operation. It is designed for debugging purposes only. To enable the Tape Log, use the Server Admin Configuration menu.

Note: In a cross-platform environment, the Tape Log does not display information for non-Windows servers. Only Windows server Tape Engine information is available for viewing in the GUI.

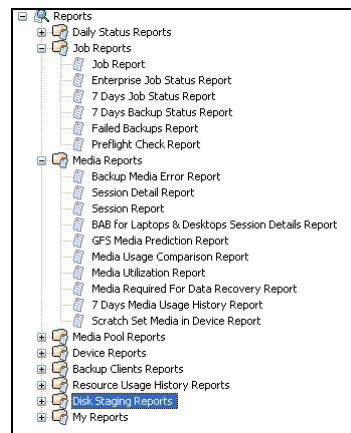
Job Log

A Job Log is generated for each job that is run by BrightStor ARCserve Backup. You can specify the level of detail in the log by choosing the log options before you submit the job. See the online help for how to configure and view the log report for a job. For further information on the job log, see the chapter "Customizing Jobs."

Report Manager

The Report Manager provides you with a variety of reports based on the backup activity stored in the BrightStor ARCserve Backup database. You can preview a report, print to a printer or file, as well as schedule when to generate a report.

Open the Reports Manager from the Quick Start menu or from the navigation section in the BrightStor ARCserve Backup Home Page. A collapsible tree provides an expandable view of reports in various categories.



Report Manager Reports

Using Report Manager, you can generate two types of reports: standard and custom. Both types of reports are described in further detail in this section. For a summary listing of each report and type, see Report Categories in this chapter.

Standard Reports

BrightStor ARCserve Backup provides several standard reports that display general backup and restore activity. The reports cover activity for job runs, media backups, and backup device errors. You can use a report filter to select the backup media you want to include in the report. Standard reports cannot be customized or scheduled to print at a specific time interval (not including the Preflight Check Report and GFS Media Prediction Report).

Custom Reports

Custom reports can be modified to meet your specific needs. Although the layout is similar to standard reports, custom reports are created using templates and saved in .XML format.

Note: You can adjust the layout of a custom report by modifying the width of the report columns. Open the Notepad application and search for the report you want to adjust. Add or change the WIDTH attribute of the FIELD tag in the report template.

Custom reports can be scheduled to run immediately or at a specified time or repeat interval. You can also elect to have the generated custom report sent to you by email.

There are two types of custom reports:

- Predefined —Available in seven categorical types when you install BrightStor ARCserve Backup. Predefined reports contain basic report data headings that you can modify to suit your specific needs using Report Writer.
- User-created —Using Report Writer, you can create a report without using a template as a guide. If you save your User-created report in the BrightStor ARCserve Backup\templates\reports folder, the title of your report displays in the My Reports folder in Report Manager.

Report Categories

The report categories that display in Report Manager originate from an external XML schema file (categories.xml) in the BrightStor ARCserve Backup home directory. You can change the display order of the report categories by editing the categories.xml file.

The following table describes the categories, and types available for standard and custom reports.

Report Category	Description of Standard Reports Available
Daily Status Reports	<p>This report category provides the status of all jobs executed within the last 24 hours, including reports that display all clients which failed backup and media written in the last 24 hours.</p> <p>The following reports are available:</p> <ul style="list-style-type: none">■ Daily Job Status Report (custom)■ Daily Backup Status Report (custom)■ Daily Failed Backups Report (custom)■ Recently Written Media Report (custom)
Job Reports	<p>This report category shows the status information for report jobs executed on a weekly basis. It provides reports showing all failed backups and a preflight check report that displays the status of report jobs scheduled to run at a future date.</p> <p>The following reports are available:</p> <ul style="list-style-type: none">■ Job Report (standard)■ Enterprise Job Status Report (standard)■ 7 Days Job Status Report (custom)■ 7 Days Backup Status Report (custom)■ Failed Backups Report (custom)■ <u>Preflight Check Report (standard)</u>

Report Category	Description of Standard Reports Available
Media Reports	<p>This report category shows detailed media information about sessions backed up, including a list of media errors generated. Forecasted media schedules for GFS jobs are also available.</p>
	<p>The following reports are available:</p> <ul style="list-style-type: none"> ■ Backup Media Error Report (standard) ■ Session Detail Report (standard) ■ Session Report (standard) ■ BAB for Laptops & Desktops Session Details Report (standard) ■ GFS Media Prediction Report (standard) ■ Media Usage Comparison Report (custom) ■ Media Utilization Report (custom) ■ Media Required for Data Recovery Report (custom) ■ 7 Days Media Usage History Report (custom) ■ Scratch Set Media in Device Report (standard)
Media Pool Reports	<p>This report category shows detailed media pool related information including the status of media in scratch sets and GFS rotation profiles.</p>
	<p>The following reports are available:</p> <ul style="list-style-type: none"> ■ Media Pool Report (standard) ■ Media Pool Location Report (standard) ■ GFS Rotation Profile Report (standard) ■ Detailed Media Pool Report (custom) ■ Media in Scratch Sets Report (custom)
Device Reports	<p>This report category shows information about backup devices used with BrightStor ARCserve Backup including the number of errors incurred during a backup on a device.</p>
	<p>The following report is available:</p> <ul style="list-style-type: none"> ■ Backup Device Report (standard)

Report Category	Description of Standard Reports Available
Disk Staging Reports	<p>This report category provides you with information that you can use to analyze and manage data that was backed up to a file system device using the Disk Staging Option.</p> <p>Disk Staging Reports let you view status information about migration sessions, SnapLock sessions, and sessions that did not purge from the staging device. The Summary report lets you view information about a specific job or a group of jobs based upon a user-specified range of dates.</p> <p>The following reports are available:</p> <ul style="list-style-type: none">■ Disk Staging Migration Report■ Disk Staging Purge Failed Report■ Disk Staging SnapLock Report■ Disk Staging Summary Report
Backup Clients	<p>This report category shows backup client information including database and client agent data sizes.</p> <p>The following reports are available:</p> <ul style="list-style-type: none">■ Backup Client Data Size Report (custom)■ Backup Clients and Job Associations Report (custom)■ Detailed Media Usage by Backup Clients Report (custom)
Resource Usage History Reports	<p>This report category shows forecasted usage information based on historical data.</p> <p>The following reports are available:</p> <ul style="list-style-type: none">■ 7 Days Media Usage History Report (custom)■ Media Utilization Report (custom)■ Media Usage Comparison Report (custom)■ Backup Window and Throughput Comparison Report (custom)
My Reports	<p>This report category shows user-created reports that are saved in the BrightStor ARCserve Backup\Templates\Reports folder.</p>

Custom Report Job Scheduling

There are two ways you can schedule a custom report to run —Report Manager or Job Schedule Wizard. From Report Manager, you can schedule two of the standard reports (Preflight Check Report and GFS Media Prediction Report) and custom reports that represent Predefined or User-Created which display in the report categories.

Schedule a Custom Report Using the Report Manager

To schedule a custom report from Report Manager:

1. Locate the report you want to schedule from the report list tree.
2. Click Schedule in the left panel pane next to the report description.
3. Specify the name and format type (.xml or .csv) for the report.
4. (Optional) Check the alert option box if you want to be alerted when report is sent by email and click Next.
5. Choose schedule options to run the report immediately or at a specific time and click Next.
6. Review your selection in the Job Summary page and enter a job description, if necessary.
7. Click Submit to execute the report job run.

Schedule a Custom Report Using the Job Scheduler Wizard

To schedule a custom report from the Job Scheduler Wizard:

1. Create a report template using the BrightStor ARCserve Backup Report Writer and save it to a file.
2. Locate the Job Scheduler Wizard executable in the BrightStor ARCserve Backup home directory and double click to launch it.
3. Select CAReports in the Run this program combo box and enter the report template name, the output file name where the report data will be stored, and silent mode (-s) mode as the parameters.

Note: For a full command line supported by the Report Writer, see the appendix "Using Command Line Utilities," or Command Line Usage in the online help.

Create Custom Reports Using the Report Writer Utility

Report Writer is a BrightStor ARCserve Backup utility that you can use to create custom reports. You can access Report Writer from the Utilities menu (or the Utilities section) in the BrightStor ARCserve Backup home page.

If you are using a Raima database, the specific ODBC driver must be installed. Report Writer checks to determine if the Raima ODBC driver is installed and installs it automatically if the driver is not present.

Note: Reports created using Report Writer can be previewed, printed, or scheduled in Report Manager.

To create and generate a custom report:

1. Open the Report Writer utility by selecting the Utilities menu and then choosing Report Writer.
2. Select the File menu and click Open to locate the report you want if you are generating a Predefined report. Otherwise, if you are generating a User-defined report, go to Step 3.
3. Enter a name for your report in the Report Title text box. Optionally, you can enter a description of your report in the Description text box.
4. In the Available Queries table, highlight the source from which you want to gather information for your report. When you highlight a source (such as Tape or Media Pool), the Available Columns table is populated with the types of data you can collect from the selected source. For example, if you select Job in the Available Queries table, you can choose to collect information about the Job Type, the Job Owner, the Job's Start Time, and several other items.

To select an item to include in your report, highlight the item in the Available Columns table and click Add. The item will be moved to the Report Columns table.

Note: You can create reports made up of information collected from multiple sources. For example, you could create a report that reports on Job Type, Tape Name, and Source Host.

5. Click Next to go to the Report Criteria screen. From this screen, you can customize your report in the following ways:
 - Set the order of the records—The records (or rows) in the columns of your report can be sorted in either ascending or descending order. By default, the records are ordered in ascending order.
 - Set the order of the columns—The column at the top of the Report Columns list will be the first (left-most) column in your report. To change the position of a column, highlight it in the Report Columns table and click the up or down arrow.
 - Set filters—The records for your report can be filtered for specific criteria that you define. Use the Enter Value field, along with the Operators and Condition drop-down menus, to specify the criteria for each type of record (each listing in the Report Columns table) in your report. After specifying a filter, click Add Criteria to add it to the Query Criteria table.

For example, to report only on jobs with a Job ID between 150 and 250, follow these steps:

- a. Click Job, Job ID in the Report Columns table.
- b. Set the Operators drop-down menu to ">=", type 150 in the Enter Value field, and set the Condition drop-down menu to "and." Then click Add Criteria.
- c. Set the Operators drop-down menu to "<=" and type 250 in the Enter Value field. Click Add Criteria. The Query Criteria table will reflect your criteria.

6. To run your report, click Generate Report.

Note: If you are using Report Writer to generate predefined Disk Staging Reports, the Add and Remove buttons are not accessible.

Report Generation for Multiple BrightStor ARCserve Backup Servers

You can generate reports for a BrightStor ARCserve Backup server at any time using the -m switch with the CAReports command line utility. If you want to generate reports for more than one BrightStor ARCserve Backup server, it is recommended that you create and store report templates on one server, and use remote servers as data sources. The customized report templates do not have to be updated for each BrightStor ARCserve Backup server. Use the -m switch for each server so that all template updates are batched as a generic job.

Note: You can use the -a switch with the CAReports command line utility to enable auto-file naming to generate daily reports.

Run a Session Details Report for BrightStor ARCserve Backup for Laptops & Desktops

The BrightStor ARCserve Backup for Laptops & Desktops Session Details Report identifies which (physical) tapes contain BrightStor ARCserve Backup for Laptops & Desktops data. The report also identifies BrightStor ARCserve Backup for Laptops & Desktops files that are expired. You can then make media management decisions based on this information. For example, if you find a tape that only contains expired BrightStor ARCserve Backup for Laptops & Desktops files, you may choose to reuse that tape for other purposes.

Follow these steps to run a BrightStor ARCserve Backup for Laptops & Desktops Session Details Report:

1. Open the Report Manager. There are several ways to do this:
 - From the BrightStor ARCserve Backup Home Page, click the Report Manager link in the Quick Start section.
 - From the Quick Start menu, select Report.
2. Expand Reports, expand Media Reports, and select BAB for Laptops & Desktops Session Details Report.
3. Select one of the viewing options to view the report: Print Preview, Print to File, or Print to Printer.

The report identifies all BrightStor ARCserve Backup for Laptops & Desktops files and their locations. If the value in the Name Space column is "Unknown," then the file is expired.

BrightStor Portal Reporting

BrightStor Portal is a separately sold management tool that provides a common interface for you to view, implement, report on, analyze, and monitor storage management procedures for many different technologies across a wide variety of platforms. Among these technologies is BrightStor ARCserve Backup.

If you use BrightStor Portal, you can use it to view and customize real-time reports on the backup and recovery tasks performed by BrightStor ARCserve Backup. To customize real-time reports, perform the following tasks:

- Configure the BrightStor Portal to perform a Host Discovery to discover the network objects that can have storage management applications/assets on them.
- Configure an Application Discovery to determine if BrightStor ARCserve Backup is available on the these hosts, and then, using the results of the Host and Application Discovery, specify the BrightStor ARCserve Backup Methods (or specific BrightStor ARCserve Backup components) you want to run reports on by using the Portal.

For more information on configuring BrightStor Portal, see the *BrightStor Portal Getting Started*.

After you have configured BrightStor Portal to work with BrightStor ARCserve Backup, click the Knowledge tab and navigate to your server name (the default path for BrightStor ARCserve Backup is BrightStor Portal Knowledge\Monitor\Backup\BrightStor ARCserve Backup *r11.1\servername*).

Select one of the BrightStor ARCserve Backup methods in the right-hand pane and view a report. When the report appears, you can customize it by clicking a column name to sort a column, a scissor icon to delete a row, and the buttons at the bottom of the screen to view your data in different formats (pie or bar charts, line graph, and trend graph).

Click the Save button to save your customizations or click the default query button to go back to the default view (prior to your customizations). You can also click the publish button to create a customized view of a report for users. You can specify the location where you want the report to appear in the menu, create a title for the report, and assign the level of access and permissions to the report.

Note: For more information on report customizations, see the BrightStor Portal documentation.

Unicenter Monitoring Agent

If Unicenter was installed before you installed BrightStor ARCserve Backup, you can use the Unicenter Monitoring Agent to monitor BrightStor ARCserve Backup. This agent can be used to start and stop services, monitor the status of the BrightStor ARCserve Backup processes and media, and report on the failure of backup jobs.

To use the Unicenter Monitoring Agent, you must install the manager with Unicenter and the agent with the BrightStor ARCserve Backup server.

The agent part starts automatically when you start the SNMP agent on the agent machine.

To start the manager part, follow these steps:

1. Open Programs/Unicenter TND (or TNG)/WorldView/2-D Map.
2. Run Unicenter AutoDiscovery to find the machine that has the BrightStor ARCserve Backup Unicenter Monitoring Agent installed.
3. Click the machine in the 2-D map.
The icon of the BrightStor ARCserve Backup Unicenter Monitoring Agent displays.
4. Right-click the icon to open a pop-up menu.
5. Click Object View, View Note, or View Agent to monitor the status of BrightStor ARCserve Backup processes, tapes, and jobs. (The information comes from the BrightStor ARCserve Backup database.)
6. Click View Agent to start or stop BrightStor ARCserve Backup services.

Diagnostic Utility

The BrightStor ARCserve Backup Diagnostic utility is a convenient tool for gathering and packaging various BrightStor ARCserve Backup and system logs, which may be necessary for troubleshooting.

Note: This utility is installed by default.

Diagnostic Utility Components

The BrightStor ARCserve Backup Diagnostic Utility has two components:

- Diagnostic Wizard
- Diagnostic Report Manager

You can launch the Diagnostic Wizard from the BrightStor ARCserve Backup program group. It allows you to configure what kind of report and log you want to generate.

You can run one of the two following report generation modes:

- Express Mode—Collects information about the local machine. Does not include advanced debugging information.
- Advanced Mode—Collects information about the local machine or a remote machine and generates reports with greater debugging information enabled. If you select this mode, you are prompted to rerun the relevant job so that the newly selected debug flags can be processed during the job and entered into the report.

The Diagnostic Wizard also lets you select where to place the log on your hard disk. After you complete the Diagnostic Wizard, a file is created. You can view this file from the Diagnostic Report Manager, which is also accessible from the BrightStor ARCserve Backup program group.

The following sections describe the process of running and reviewing an Express mode report.

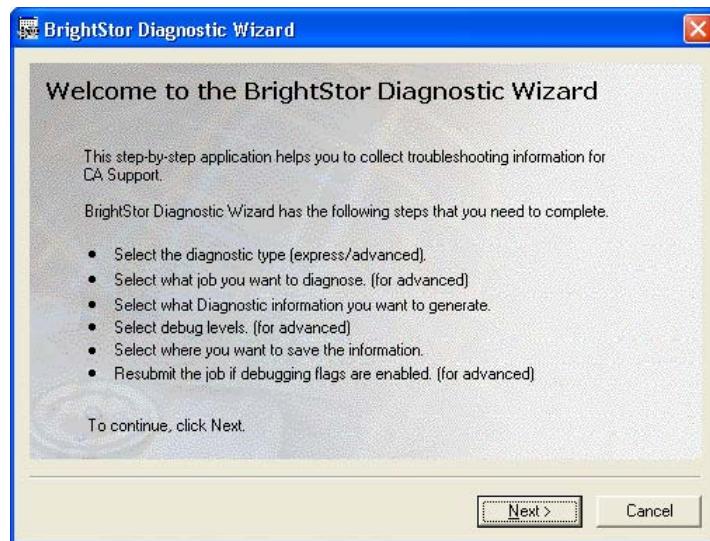
Note: To run the Diagnostic Wizard in the Advanced mode, choose the Advanced option on the Select Diagnostic Type screen, and then follow the on-screen instructions.

Create a Diagnostic Utility Express Mode Report

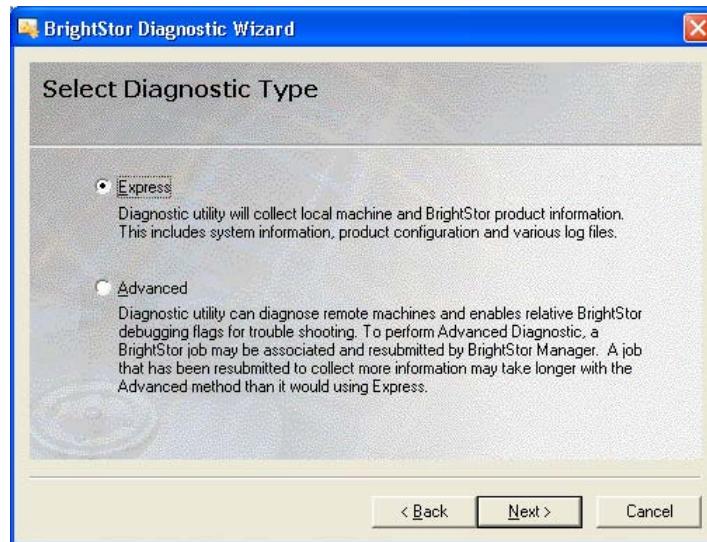
To create an Express Mode report:

1. Open the Diagnostic Wizard by selecting Start, Programs, Computer Associates, BrightStor, BrightStor ARCserve Backup, and then Diagnostic Wizard from the BrightStor ARCserve Backup program group.

The BrightStor Diagnostic Wizard dialog opens.



2. Click Next to open the Select Diagnostic Type dialog. From here, you can choose to collect diagnostic logs from either the local server or a remote server, as well as whether or not you want to include advanced debugging information in the report. Choose Express to gather local logs without including debugging information.



3. Click Next.

You can select the portions of the machine you want to gather logs from.

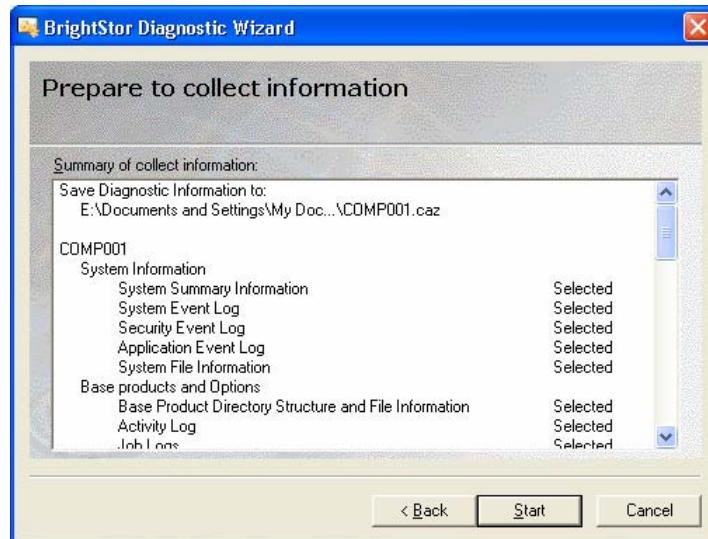


4. Continue following the prompts and select a location where you want to save the diagnostic information file.



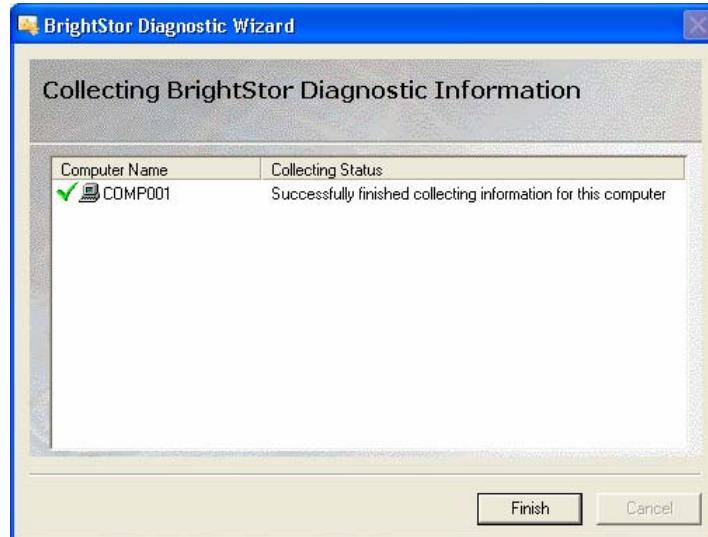
5. Click Next.

A summary of the logs to be collected is displayed.



6. Click Start.

This process can be lengthy, depending on the machine and the amount of information you requested.



7. When the process is complete, click OK, and then click Finish.

After the file has been created, you may be prompted to send it to Computer Associates support.

Review a Report Using the Diagnostic Report Manager

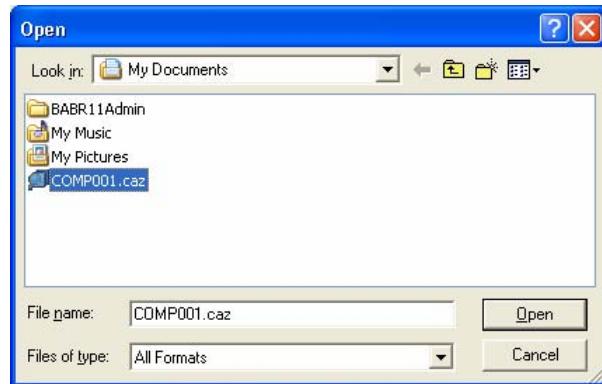
After the information you requested is collected, you can use the Diagnostic Report Manager to view it. To do this, complete the following steps:

1. Start the Diagnostic Report Manager by selecting Start, Programs, Computer Associates, BrightStor, BrightStor ARCServe Backup, and then select Diagnostic Report Manager from the BrightStor ARCServe Backup program group.

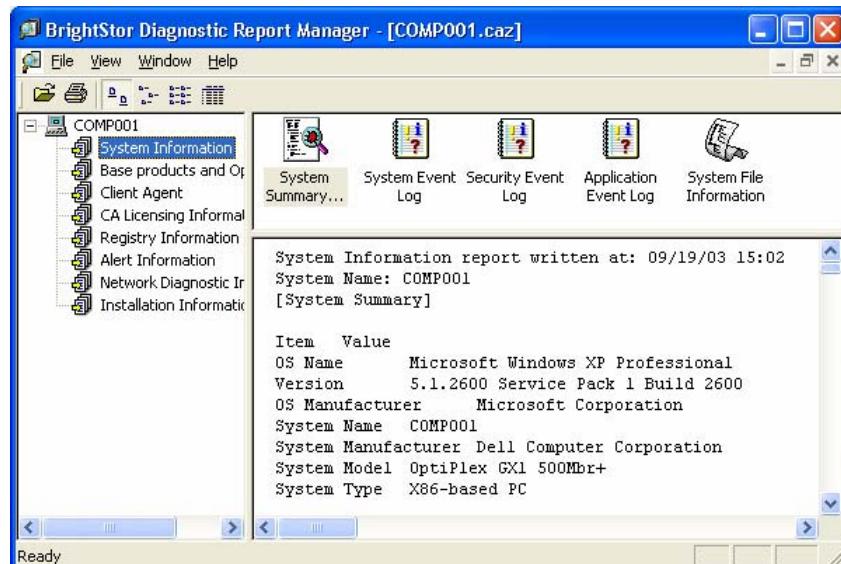
The Diagnostic Report Manager opens.

2. From the File menu, choose Open.

3. Locate your saved log file and click Open.



A console opens that shows a list of your logs on the left-hand side. Detailed information appears in the bottom-right pane as you select items in the left-hand pane.



From the File menu on the BrightStor Diagnostic Report Manager you can export, save, and print the selected log file.

Chapter 8: Administering the Backup Server

This chapter provides you with information that you can use to administer, manage, and maintain the BrightStor ARCserve Backup Server.

BrightStor ARCserve Backup Engines

The BrightStor ARCserve Backup Server consists of three functional engines:

- The Job Engine—This engine processes your jobs at their designated date and time. It scans the job queue for a job that is ready to run, then sends it to the appropriate handler.
- The Tape Engine—This engine communicates with, and controls, your storage devices. The Tape Engine selects the device needed for a BrightStor ARCserve Backup job.
- The Database Engine—This engine maintains a history of:
 - Information about jobs processed by BrightStor ARCserve Backup, such as the job type, the final result, the start and end time, submitter, and description.
 - Media used by BrightStor ARCserve Backup, such as its type, its name, the date it was first formatted, its expiration date, and the sessions on it.
 - Files, directories, drives, and machines that BrightStor ARCserve Backup has backed up or copied.

You can control these BrightStor ARCserve Backup engines in the BrightStor ARCserve Backup Server Admin. To view information about an individual engine, open the Server Admin from the Start menu or click Server Admin on the Managers menu and select a particular engine menu tab:

- Summary—shows you the current state of all the BrightStor ARCserve Backup engines and the number of days, hours, and minutes each engine has been running.
- Job Engine—displays information about the jobs submitted, such as the total number of jobs and the number of ACTIVE, READY, HOLD, and DONE jobs. It also shows the queues, which ones are being scanned, and the scanning interval.

- Tape Engine—displays information about jobs using the Tape Engine, such as the type of job, and who submitted it. It also displays information on media groups.
- Database Engine—displays the selected pruning information.

Engine Status

A stopped engine is an engine that is completely offline. This may be caused by errors, manual shutdown, or a new installation. Whatever the reason, it means that the services of that engine are not available.

The BrightStor ARCserve Backup engines are designed to run independently of each other. For example, if you stop the Tape Engine, the Database Engine and the Job Engine are not affected. They continue to run, performing their services as configured. The Database Engine continues to log pertinent BrightStor ARCserve Backup information in the database, and the Job Engine continues to scan the job queue and start jobs as required. If a job requires a storage device, the Job Engine launches the job, but the job fails because the Tape Engine is not able to communicate with the storage device. The Database Engine then logs this information.

Note: Although BrightStor ARCserve Backup still functions if one or two engines are not running, BrightStor ARCserve Backup needs all three engines running simultaneously to achieve complete functionality.

eTrust Antivirus Maintenance

BrightStor ARCserve Backup provides the scanning and curing components of eTrust Antivirus, Computer Associates' premier anti-virus engine, to protect your data.

Note: BrightStor ARCserve Backup provides only the scanning and curing components. It does not provide a full install of eTrust Antivirus.

The eTrust Antivirus program can be configured to download updated virus signature files and program modules. These updates are then distributed to the participating applications. When this is complete, eTrust Antivirus broadcasts a message stating that the update has been completed. Under certain conditions, you must stop and restart the job engine to fully update the anti-virus protection.

InoDist.ini is the file you use when downloading updated virus signature files and program modules. This file contains preconfigured settings that specify how and when engine and signature updates are collected from a distribution source. The InoDist.ini file typically does not need modifications. However, you can make changes if necessary. The following section includes information on the InoDist.ini file and its various settings.

Virus Signature Updates

Using InoDist.ini, you can update virus signatures by using the Job Scheduler Wizard, the command prompt, or by running them directly from the Web. If you use the Job Scheduler Wizard, you have the added benefit of scheduling your virus signature updates.

Obtain Virus Signature Updates Using the Job Scheduler Wizard

To use the Job Scheduler Wizard to update virus signatures:

1. Open the Job Scheduler Wizard.
2. On the Welcome screen, select the default server and click Next. If you do not select the default server before clicking Next, the login screen appears. If you use the default server, skip steps 3 and 4.
3. On the login screen, select the local server name for the machine you want to submit the job to.
4. Enter your user name and password to log into the server, and then click Next.
5. Select inodist from the drop-down list in the Run this program field.
6. In the Parameters field enter /cfg (full path to InoDist.ini). For example, C:\Program Files\CA\SharedComponents\ScanEngine\InoDist.ini.
7. Click Next to access the Security Page.
8. Select one of the following options:
 - Select Run Now to execute the job immediately.
 - Select Schedule to execute the job at a specific time and date or to schedule the job to repeat. If you want the job to repeat, select a Repeat Method and associated criteria.

9. When you finish scheduling the job, click Next.
10. Verify your job selections and enter a description of this job in the Description field. This description appears in the Description column in the Job Queue and can be used to identify the job.

11. Click Submit.

First, a message indicating that the job was submitted successfully appears. The message includes the job number, which you can use to identify the job in the Job Queue. Then a message indicating the Generic Job was successful appears. Click OK to close both message boxes.

If the job fails, a message appears to indicate that the job failed and the error code. You can view a short message describing the error in the Activity Log. Click OK to close the error message box.

For more information about using the Job Scheduler Wizard, see the chapter "Customizing Jobs."

Obtain Virus Signature Updates Using the Command Prompt

To use the command prompt to update signatures, open a command window and enter the following command:

```
C:\Program Files\CA\SharedComponents\ScanEngine>inodist /cfg inodist.ini
```

Obtain Virus Signature Updates Via the CA Support Site

To run an update from the web, access one of the following from the CA support site:

ftp://ftp.ca.com/pub/inoculan/scaneng/fi_nt86.exe

<http://support.ca.com/Download/virussig.html>

INODIST Utility

You can configure the eTrust Antivirus program to download updated virus signature files.

Syntax for the INODIST Utility

```
INODIST /cfg InoDist.ini
```

Signature Update Options in the InoDist.ini File

The InoDist.ini file contains sections that specify how, and when, engine and signature updates are collected from a distribution source. The InoDist.ini file is installed in C:\Program Files\CA\SharedComponents\ScanEngine. The directory can be viewed or edited using a text editor. The sections of the InoDist.ini file are described as follows:

[SOURCES]

The [SOURCES] section provides the name of the other sections in the InoDist.ini file that specify the connection for the signature download. There are three types of connections available from the user interface—FTP, UNC/Redistribution server, and Local Path. For more information about the options for each type of connection, see the following sections.

Important! The numeric values in the source list must be consecutive. Do not change the numeric order or create gaps in the numeric sequence.

Syntax for [SOURCES]

```
[SOURCES]
1 = SourceA
2 = SourceB
3 = SourceC
```

Options for [SOURCES]

The following options are required:

Option	Description
1 = SourceA	First source. For example, 1=UNC_0
2 = SourceB	Second source. For example, 2=UNC_1
3 = SourceC	Third source. For example, 3=FTP_0

Signature Source

For the signature sources described in the [SOURCES] section of the InoDist.ini file, a specific section exists to describe all of the information necessary to download from the remote site.

FTP Syntax

When FTP is selected as the download method, the following options are available:

```
[SourceA]
Method = FTP
HostName = ftpav.ca.com
UserName = anonymous
UserPassword = Somebody@somecompany.com
Fast Connection = 0
Proxy Name = UpdatePath = /pub/inocular/scaneng/
```

FTP Syntax Options

The following options are required:

Option	Description
Method = FTP	Use FTP as the download method.
HostName = ftpav.ca.com	The host name address.
UserName = anonymous	The user name for the FTP connection.
UserPassword = Somebody@somecompany. com	The user password for the FTP connection.

UNC/Redistribution Server Syntax

When UNC is indicated as the download method, the following options are available:

```
[SourceB]  
Method = UNC  
Path = \\usprusd1\inoupd$  
UserName = anonymous  
UserPassword = Somebody@somecompany.com
```

UNC/Redistribution Server Options

The following options are required:

Option	Description
Method = UNC	Use UNC as the download method.
Path = \\usprusd1\inoupd\$	The UNC path.
UserName = anonymous	The UNC user name.
UserPassword = Somebody@somecompany. com	The user password.

Syntax for Local Download

When Local is selected as the download method, the following options are available:

```
[SourceC]
Method = LOCAL
Path = c:\test
```

Options for Local Download

The following options are required:

Option	Description
Method	Use the local server as the download method.
Path	The local path.

[GET]

If you set UpdateLocalSignatures = 1 in the [POLICY] section, the [GET] section is empty. If you do not set UpdateLocalSignatures = 1, you can use the [GET] section to identify which platform or engine updates to download. You must set UpdateLocalSignatures = 0 in the [POLICY] setting for the [GET] section to be active.

Syntax for [GET]

```
[GET]
1 = SetA
2 = SetB
```

Options for [GET]

The following options are required:

Option	Description
1 = SetA	Download Set A files.
2 = SetB	Download Set B files.

[POLICY]

Use the [POLICY] options to identify actions to take during and after the signature download.

Syntax for [POLICY]

```
[POLICY]
UpdateLocalSignatures = 1
SignatureHoldTime = 0
MakeIncDownloading = 1
IsDistrubtionServer = 0
```

Options for [POLICY]

The following options are required:

Option	Description
UpdateLocalSignatures = 1	1 = Download signature files required to update the local machine, and use them to update the local machine, regardless of their inclusion in the [GET] section. 0 = Only files listed in the [GET] section will be downloaded, and they will not be used to update the local machine.
SignatureHoldTime = 0	Specify the number of hours to hold new signatures before making them available for download to other machines on the network.
MakeIncDownloading = 1	You can indicate that only files that have changed should be downloaded. This results in a smaller signature update file, and is known as an incremental download. An incremental download provides complete virus protection but may be faster than a full download. 1 = The download program will determine if a full update is necessary or if an incremental update can be used. 0 = Perform a full download.

Option	Description
IsDistributionServer = 0	1 = Maintain both full and incremental signature updates by downloading both and synchronizing them. If set to 1, this setting overrides the selection in MakeIncDownloading. We recommend that all redistribution servers maintain both full and incremental update signatures.

[OSID]

The [OSID] options map the platform name with the identifiers used to post items on the website. The values specified in this section appear in the signature set item section, in the Siglist.txt file found on the server, and in the user interface through a Platform.ini file.

Items in this section are set automatically, based on the list of currently supported platforms. Do not change the items in the [OSID] section.

Syntax for [OSID]

```
[OSID]
Linux (Intel) = 8
Sun Solaris = 9
;Windows 3x/Netware = 2
Windows 9x/ME = 3
Windows NT/2000 (x86) = 4
```

[ENGINEID]

The [ENGINEID] options map the engine names listed in the signature set to an ID value.

Syntax for [ENGINEID]

```
[ENGINEID]
INOCULATEIT = 1
VET = 2
```

BrightStor ARCserve Backup Engines Configuration

The BrightStor ARCserve Backup Server Admin allows you to configure each engine to suit your needs. Select Configuration from the BrightStor ARCserve Backup Server Admin menu for the following configuration options:

Job Engine Configuration

The BrightStor ARCserve Backup Job Engine controls the execution time of jobs in the job queue. It scans the job queue regularly, starting jobs as their execution dates and times are reached. BrightStor ARCserve Backup provides the following job engine options:

- Job Queue Scanning Interval (seconds)—The Job Engine constantly scans the job queue for jobs that should execute. By default, the job queue is scanned every 10 seconds. To change the time interval, specify a number from 1 - 9999.
- Retention Time for DONE Job (hours)—Jobs with a final status of DONE remain in the job queue for the time specified in this field. By default, BrightStor ARCserve Backup keeps DONE jobs for 24 hours before they are deleted from the queue. To change the time, specify a number between 0 and 999.
- Database Polling Interval (minutes)--The Job Engine periodically polls the BrightStor ARCserve Backup database to discover copied and purged sessions on staging enabled devices. The value specified in this field determines the time interval between polls. The default value for this field is one (1) minute, and the minimum value is one (1) minute.
- Message Type in Activity Log—The Activity Log contains information about all BrightStor ARCserve Backup activities. By default, notes, warnings, and errors that occur when running BrightStor ARCserve Backup appear in its Activity Log. To change the types of messages, specify one of the following values:
 - None—No messages appear.
 - Errors—Only errors that occur while running BrightStor ARCserve Backup appear.
 - Warnings & Errors—Warnings and errors that occur while running BrightStor ARCserve Backup appear.
 - Notes, Warnings & Errors—(default) Includes all notes, warnings, and errors that occur while running BrightStor ARCserve Backup.
 - Debug—Includes debugging information and all notes, warnings, and errors that occur while running BrightStor ARCserve Backup.
- Network Shares—By default, BrightStor ARCserve Backup opens Use All Shares in the Browser. This means that both Default Shares and User Shares are available for selection as either your source or destination for a job. To change the type of shares that are displayed in the Browser, specify one of the following:
 - Use Default Shares Only—Only administrative shares are available.
 - Use Users Shares Only—Only shares that have been specifically set by users are displayed.

- Buffer Size (K Bytes)—Define the buffer size used by BrightStor ARCserve Backup.
- Backup—Allows you to customize additional options in your backup jobs:
 - Record Hard Links for NTFS Volumes—(default is ON) If you back up hard links files, this information is included and preserved by default.
 - Confirm when Overwriting Media—(default is OFF) Any time a media is to be overwritten, BrightStor ARCserve Backup can prompt you to confirm that you really want this to happen. By default, this option is not set. If you set this option, a confirmation dialog is displayed. If you do not respond within five minutes, the job is cancelled. If you still have not confirmed after five minutes, the job will be canceled.
 - Backup Registry key details when an entire machine is selected—(default is OFF) You can turn on the option to back up the Registry key details for target machines by clicking on the Backup registry key details when an entire machine is selected check box.
- Enable Local Job Redirection—Ensures that your job does not fail because of a device error, media error, or because no media is available in the selected device group.
- Retry Crashed Jobs after Job Engine Restart—This option is a checkpoint mechanism. BrightStor ARCserve Backup attempts to restart a crashed job if this box is checked. It should only be turned on if a cluster environment is configured to allow for fail-over.
- Submit Makeup Jobs on HOLD—Use this option to place a hold status on a job rather than a ready status.
- Block pop-ups when data migration jobs finish--When a staging migration job is finished, pop-up messages display to inform you if a job was successful, failed, and so on. If you do not want pop-up messages to appear after the migration job is finished, enable this option.
- Block pop-ups when any job finishes--When a job is finished, pop-up messages display to inform you if a job was successful, failed, and so on. If you do not want pop-up messages to appear after a job is finished, enable this option.

Tape Engine Configuration

The BrightStor ARCserve Backup Tape Engine identifies all the backup devices that are connected to your system. The default configuration log options can be changed; for example, when you want to troubleshoot a hardware or Tape Engine specific problem.

To modify any of the options, settings, and parameters described in the following sections, start the BrightStor ARCserve Backup Server Admin and select the Tape Engine tab.

Tape Engine Message Log Options

The following lists describe tape engine message log options:

- **Level**—If you keep the default (Summary), you do not need to specify any other options. The available values are:
 - **None**— No information is logged. Tape Engine logging is halted and the Tape Engine Log does not appear in the Job Status Manager.
 - **Summary**—(default) Logs critical messages and reduces the size of the tape log by excluding unnecessary information. For this option, the Tape.log is present in the Job Status Manager. The Tape.log file, by default, is generated and stored in the BrightStor ARCserve Backup\Log folder. If the log path needs to be changed, you can do so by creating an alternate log path entry in the registry file. For more information on creating an alternate log path entry, see [Alternate Path to the Tape Engine Log](#) in this chapter.
 - **Detail**—This option logs all commands sent to the attached backup devices by BrightStor ARCserve Backup. Reads/Writes and Test Unit Ready commands are excluded. Tape Engine specific information, which may be used by CA Support to help troubleshoot backup and restore issues, is also logged. The Tape.log file, by default, is generated and stored in the BrightStor ARCserve Backup\Log folder. If the log path needs to be changed, you can do so by creating an alternate log path entry in the registry file.

The Tape.log file for this option can be viewed in the Job Status Manager by accessing the Tape Log tab.

- **Detail with Read/Writes**—Logs all commands sent to attached backup devices by BrightStor ARCserve Backup. Unlike the “Detail” option, this option includes Reads/Writes and Test Unit Ready commands. Tape Engine specific information, which may be used by CA Support to help troubleshoot backup and restore issues, is also logged. The Tape.log file, by default, is generated and stored in the BrightStor ARCserve Backup\Log folder. If the log path needs to be changed, you can do so by creating an alternate log path entry in the registry file.

For more information on creating an alternate log path entry, see [Alternate Path to the Tape Engine Log](#) in this chapter. The Tape.log file for this option can be viewed in the Job Status Manager by accessing the Tape Log tab.

Note: You may incur a potentially large log file size due to the Read/Write capability. The Read/Write logging may impede performance on the machine.

- Output—If you specified either "Summary," "Detail," or "Detail with Reads/Writes," you can define where you want the messages sent. Specify one of the following:
 - Both Screen and File—The messages are recorded in the Tape Engine Log as well as to a DOS box (the Tape Engine Message window).
 - Screen Only—The messages are sent to the Tape Engine Message window only.
 - File Only—(default) The messages are recorded in the Tape Engine log only. You can view the Tape Engine log in the Job Status Manager.

Important! If you select either option, Both Screen and File or Screen Only, you must configure the CA BrightStor Tape Engine service such that it can interact with your desktop and display the contents of the tape log in a DOS window.

To enable interaction with the desktop:

1. Open Windows Component Services and select the Local Services.
2. Locate and right-click CA BrightStor Tape Engine.
3. From the pop-up menu, select properties.
The CA BrightStor Tape Engine Properties (Local Computer) dialog opens.
4. Select the Log On tab.
5. Under Local System account, select the Allow service to interact with desktop check box and click Apply.
6. Click OK and close Windows Component Services.
7. Stop and then restart the CA BrightStor Tape Engine service.

Limit Log Size Options

This section of the Tape Engine tab lets you direct how BrightStor ARCserve Backup controls the behavior of the Tape Engine's log files. The available options are as follows:

- Limit Log Size By—Check the Limit Log Size By check box to enable Circular Logging. In the Limit Log Size By field enter the value that you want to specify as the maximum total size of all chunked TAPE.LOG files.

The Limit Log Size By value divided by the Log File Count value represents the maximum size of all chunked log files. For example, if you specify a Limit Log Size By value of 100 MB and a Log File Count of 10, BrightStor ARCserve Backup chunks TAPE.LOG when it reaches 10 MB (100/10 = 10).

The default value for the Limit Log Size By option is 100 MB, and the range is between 1 and 2000 MB.

To disable Circular Logging, clear the Limit Log Size By check box.

- Prune Logs Older Than—Use this option to specify the number of days that must elapse before BrightStor ARCserve Backup prunes the log files. The default value for the Prune Logs Older Than option is 100 days, and the range is between 1 and 365 days.
- Log File Split Criterion—The options in this section define the behavior of how BrightStor ARCserve Backup splits the log files.
 - Log File Count—Specifies the number of chunked log files BrightStor ARCserve Backup retains. The default value for the Log File Count option is 10, and the range is between 3 and 32.

Note: You can modify this setting only if the Limit Log File Size By option is specified.
 - Single Log File Size—This option works in conjunction with the Prune Logs Older Than option. When you specify the Single Log File Size and Prune Logs Older Than options, BrightStor ARCserve Backup switches to Circular Logging mechanisms when the TAPE.LOG reaches its maximum size, and deletes chunked log files when their age is greater than the value specified under the Prune Logs Older Than option. The default value for the Single Log File Size option is 10000 KB, and the range is between 1 and 100000 KB.

Note: You can modify this setting only if the Prune Logs Older Than option is specified.

Tape Engine General Options

BrightStor ARCserve Backup lets you specify the following options:

- Use Global Scratch Set—If you select this option, BrightStor ARCserve Backup uses a Global Scratch Set. The Global Scratch Set treats all of the scratch tapes in all media pools as one large Scratch Set. This ensures that backup jobs never fail if a scratch tape is not available in its own media pool.

When this option is enabled, the Media Pool Manager shows only the Save Set for each pool (not the Scratch Set), but adds an object called GlobalScratchSet. This object contains all of the media available in the scratch sets of all your media pools. If you right-click GlobalScratchSet and select Assign Media, you can move media from an unassigned set to the Scratch Set.

When you select a media in the Global Scratch Set, two extra properties appear as column headings on the top right-hand pane and on the Properties tab in the lower-right hand pane: Medium Type and Media Pool. If you click a column heading on the top right-hand pane, you can sort the list by that column. If the media you select in the Global Scratch Set is vaulted, it appears in a different color to indicate that it is inactive.

Note: If you enable the Global Scratch Set and submit a backup job using a specific media pool, BrightStor ARCserve Backup first attempts to find media in that media pool's Scratch Set. If no media is available, the Global Scratch Set media will be used. Also, if you specify a media pool and submit a backup job that spans tapes, media in the Global Scratch Set can be used.

- Show Tape Log on Job Status Manager—Select this option to view the Tape Log in the Job Status Manager. If the Activity Log is open when you enable this option, you must click Refresh to update the manager.

Note: This option is available only on Windows computers.

- Use TapeAlert—Enables BrightStor ARCserve Backup to detect and report TapeAlert flags asserted by your tape drives and libraries. If you do not want to receive TapeAlert-related messages, disable this option.

- When you enable this option, BrightStor ARCserve Backup queries all devices connected to BrightStor ARCserve Backup for TapeAlert flags in one minute intervals. If BrightStor ARCserve Backup detects a TapeAlert flag, it reports real-time details about the flag in the Activity Log and the Tape.log file.
 - When you disable this option, BrightStor ARCserve Backup does not maintain a separate thread-querying mechanism for detecting and reporting TapeAlert flags. As a result, BrightStor ARCserve Backup will not query for TapeAlert flags until the job is running and a SCSI error occurs. If BrightStor ARCserve Backup detects a TapeAlert flag while the job is running, it reports the details about the flag in the Activity Log and the Tape.log file.

Alternate Path to the Tape Engine Log

You can change the default tape log path if, for example, you want to move the log to a volume with more space. You can create an alternate location for the file by configuring a registry setting in the Windows NT registry. Create a String Value called "LogPath" under the following key:

HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base\TapeEngine\Debug

Set the value to the local drive path you want to use as the new log file location (for example, D:\temp\log). After the log path is established, you can enable it by either restarting the Tape Engine or changing one of the logging options described earlier. To change the tape log path back to the default, you can remove the "LogPath" value and restart the Tape Engine.

Note: Alternate paths can only be local drives as mapped drives are not supported for redirecting the log.

Circular Logging

Circular Logging lets you control the size and behavior of the Tape Engine log file. Using this feature, you can set a size limit that directs BrightStor ARCserve Backup to chunk the log file into smaller log files when a user-specified size limit is exceeded. Additionally, you can specify a retention period, total count, or both for log files. After the retention period elapses, BrightStor ARCserve Backup deletes the chunked log files.

The Tape Engine log file is labeled TAPE.LOG. It can be found in the CA\BrightStor ARCserve Backup\LOG directory.

To configure and use Circular Logging, start the Server Admin from the Quick Start menu on the BrightStor ARCserve Backup Home Page. For more information see the section "Specify Circular Logging Settings."

Log File Names

If you do not specify Circular Logging settings, BrightStor ARCserve Backup uses the default file name, TAPE.LOG. If you do specify settings, TAPE.LOG is still generated, but it is chunked into smaller files and the smaller files are named using the following format:

TAPE.LOG.####

where ##### represents the sequential log number created on a given day.

Example

For example, on a given day, the Tape Engine generates three log files based upon a file size limit of 100 MB. The log file names are as follows:

TAPE.LOG
TAPE.LOG.0001
TAPE.LOG.0002

How BrightStor ARCserve Backup Labels Log Files

To create the log files, BrightStor ARCserve Backup labels the log files using the following guidelines:

1. If TAPE.LOG reaches a specified value, BrightStor ARCserve Backup renames TAPE.LOG to TAPE.LOG.0001, and creates a new TAPE.LOG file.
2. If TAPE.LOG reaches a specified value for the second time, BrightStor ARCserve Backup renames TAPE.LOG.0001 to TAPE.LOG.0002, renames TAPE.LOG to TAPE.LOG.0001, and creates a new TAPE.LOG file.
3. If TAPE.LOG reaches a specified value for the third time, BrightStor ARCserve Backup renames TAPE.LOG.0002 to TAPE.LOG.0003, renames TAPE.LOG.0001 to TAPE.LOG.0002, renames TAPE.LOG to TAPE.LOG.0001, and creates a new TAPE.LOG file.

This process continues in a cyclical manner. BrightStor ARCserve Backup always retains the latest three log files.

Important! *BrightStor ARCserve Backup calculates the value in which a new log file is created based upon the amounts that you specify in the Limit Log Size By and Log File Count options. For example, if you specify a Log Limit Size By amount of 500 MB and a Log File Count of 10, BrightStor ARCserve Backup creates a new log file when the current log size exceeds (500 divided by 10) 50 MB.*

Specify Circular Logging Settings

Circular Logging lets you customize the characteristics of log files generated by the Tape Engine.

To specify Circular Logging settings:

1. From the BrightStor ARCserve Backup Home Page, click the Quick Start menu and select Server Admin.
The BrightStor ARCserve Backup Server Admin dialog opens.
2. From the Admin menu, select Configuration.
The Configuration dialog opens.

3. Click the Tape Engine tab.
4. To enable Circular logging, click the Limit Log Size By option in the Limit Log Size section of this dialog, and then specify then maximum size in MB. This amount represents the maximum size of all log files.
5. In the Log File Count field, select the number of log files that you want BrightStor ARCserve Backup to retain. This amount represents the maximum number of TAPE.LOG files that BrightStor ARCserve Backup will retain.
6. Click OK to apply the settings.

Note: After the log file count exceeds the number specified using the Log File Count option, BrightStor ARCserve Backup deletes the oldest log files.

Prune Log Files

To specify log file pruning only:

1. Disable the Limit Log Size By option.
2. Click the Prune Logs Older Than option and specify the number of days that you want to elapse before BrightStor ARCserve Backup prunes log files.
3. (Optional) In the Single Log File Size field, enter a size in KB to specify a size limit for a single log file. If you do not specify a value in the Single Log File Size field, BrightStor ARCserve Backup uses the default value, 10000 KB, as the size limitation for each single log file.
4. Click OK to apply the settings.

Important! *If you enable both Limit Log Size options (Limit Log Size By and Prune Logs Older Than), BrightStor ARCserve Backup prunes log files if either the total number of log files exceeds the Log File Count, or the date of the log files exceeds the number of days specified under the Prune Log Files Older Than option. You cannot specify a Single Log File Size—BrightStor ARCserve Backup uses the formula Total Log Size divided by Log File Count to calculate the Log File Size setting.*

Database Engine Configuration

The BrightStor ARCserve Backup Database Engine stores the following types of statistical information for all jobs processed.

- Files and directories that have been backed up, copied, and restored.
- Jobs that BrightStor ARCserve Backup has processed.
- Storage devices and media used for BrightStor ARCserve Backup operations.

BrightStor ARCserve Backup provides the following database engine options:

- Minimum Free Disk Space Required (M Bytes)—Use this option to specify the minimum amount of disk space (in megabytes) you want to reserve for the BrightStor ARCserve Backup standard database. By default, 10 MB of disk space is specified. To change the amount of disk space required, specify a number between 1 and 10. If your hard drive space is below this point, the database will not function correctly.
- Enable Database Pruning—When database pruning is enabled, information about the files and directories that were backed up or copied in a session is deleted. By default, this option is selected to free up space in the database file. It can be useful to disable this option to maintain the detailed information for restoring purposes, but be aware that your database can become very large if you do not prune it.

Note: By default, all newly merged session details are preserved for one week (7 days) in the BrightStor ARCserve Backup database, even if the newly merged session details are older than the prune retention time.

- Prune Database Records Older Than _ Day(s)—This field is active only if the Enable Database Pruning option is on. Specify how long records should be kept in the database before BrightStor ARCserve Backup prunes them. If pruning is enabled, records are pruned after they have been in the database for 30 days (the default setting). To change the length of time a record can remain in the database before it is pruned, specify a number between 1 and 999.
- Run Database Pruning at—This field is active only if the Enable Database Pruning option is on. Specify when you want the pruning operation to run. By default, pruning (if enabled) will occur at 12:00 p.m.

- Delete Media-Related database Records ONLY when Pruning—When you reformat or erase a media, BrightStor ARCserve Backup also deletes the records in the database that pertain to the media. Performing this extra step, however, can be a time-consuming process. Select this option to postpone deleting these records until pruning is performed.
- Submit Prune Job—Select this option to submit the pruning job now.
- Enable Remote ARCserve Backup Database—Allows you to direct the local BrightStor ARCserve Backup Server to use a remote BrightStor ARCserve Backup database as its local database. You can then use this database to submit a restore job to the local BrightStor ARCserve Backup Server. Configuration of the remote database is performed here as well. Enter the BrightStor ARCserve Backup server name, user name, password, and server operating system of the remote BrightStor ARCserve Backup database you want to enable.

- **Enable Catalog Database**—Select this option to store all catalog files in a CATALOG.DB folder to increase database performance time.
If you enable the Enable Catalog Database option, you can direct BrightStor ARCserve Backup to retain the catalog files until a specified number of days elapses. To do this, indicate the number of days that you want to retain the catalog files in the Prune Catalog Files From Disk Older Than field.
Note: Use this feature only for extremely large enterprise environments that have large amounts of data and servers to back up.
- **Enable Media Pool Maintenance**—When selected, all media scheduled to be moved from a media pool's Save Set to its Scratch Set are automatically moved any time a prune job is run.

Alert Configuration

Alert is a notification system that sends messages to people in your organization using various methods of communication. Alert does not generate its own messages. You must tell Alert what information you want to communicate and where you want to send it.

If you configure Alert from Server Admin, you can generate notifications for non-job related events, such as starting or stopping the Tape Engine. To do this, enter the words or phrases you want to communicate in exactly the same format as they appear in the Activity Log and click Add.

Or, if you want to send all activity log messages, enter an asterisk and click Add. Alert generates notification messages and sends them to the appropriate recipients. For information on selecting recipients and configuring methods to transmit Alert notifications, see the chapter "Using the Alert Manager."

Log Configuration

When you configure log messaging, you specify which messages may be written to the event log. By default, all messages are written. If you enable Message Logging into Windows Event Log, the following fields are enabled:

- **Exclude Message Type from logging**—You can select the type of message that should be excluded from the event log: Critical, Error, Note, Prompt or Warning.
- **Exclude Message Logging From**—You can choose to exclude all messages from a particular BrightStor ARCserve Backup module: BrightStor ARCserve Backup Admin, BrightStor ARCserve Backup Manager, Job Runner, Database Engine, Job Engine, Message Engine or Tape Engine.

Additional Server Admin Functions

You can use the Server Admin to perform the following functions:

- Change the system account
- Configure multiple NIC cards

BrightStor ARCserve Backup System Account Modification

The BrightStor ARCserve Backup Server requires a valid user account on the host Windows machine (initially entered during installation). You can change the system account at any time in the BrightStor ARCserve Backup Server Admin program by selecting Admin, BrightStor ARCserve Backup System Account.

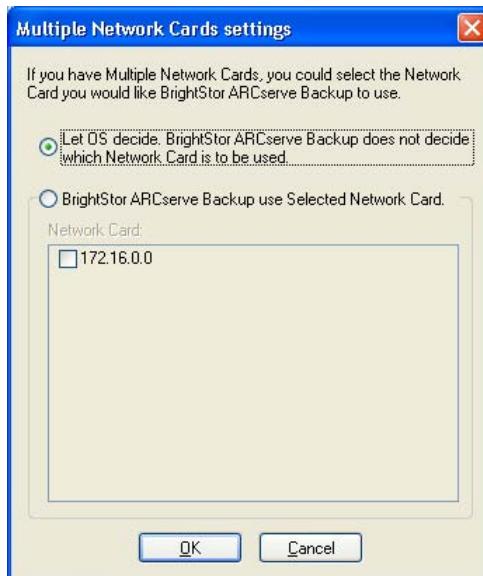
If you are using a Windows domain user account as the BrightStor ARCserve Backup server account, you must update BrightStor ARCserve Backup with the new password when you change your Windows domain password. To do this, in the BrightStor ARCserve Backup Server Admin, select Admin, BrightStor ARCserve Backup System Account, enter the new password, confirm it, and then click OK.

Support for Multiple Network Interface Cards

If the BrightStor ARCserve Backup server has more than one network connection then BrightStor ARCserve Backup can be configured to use a specific card for its backup and restore usage. If you configure BrightStor ARCserve Backup in this way, it will not interfere with the other cards that are attached to the system. You can configure BrightStor ARCserve Backup to use a set of NIC cards, which it effectively uses when performing multistreaming backups. You can also configure BrightStor ARCserve Backup to use an appropriate card from the configured set of NIC cards when connecting to a client agent.

You can configure the NIC cards from a pull down menu in the BrightStor ARCserve Backup Server Admin. You have the following options:

- Let the Operating System decide. BrightStor ARCserve Backup does not decide which NIC card is to be used.
- BrightStor ARCserve Backup uses a selected NIC card. The user can choose the priority of the NIC cards by moving them up or down the list. When configured in this manner, any job that BrightStor ARCserve Backup executes defaults to the first configured NIC card. In cases of data multistreaming where more than one process is created, each subsequent process will use the next configured NIC card.



BrightStor ARCserve Backup Domains

BrightStor ARCserve Backup Domains are a logical grouping of BrightStor ARCserve Backup servers that allow easier administration of BrightStor ARCserve Backup servers and users. In addition to providing a single sign-on to multiple BrightStor ARCserve Backup servers, it also provides the same access level (privileges) on all the servers for the same user.

A BrightStor ARCserve Backup Domain has a name and a list of BrightStor ARCserve Backup servers that belong to it. This allows a user managing the domain to select any server from the BrightStor ARCserve Backup Domain to perform database management, tape and device management, and backup policy and schedule management without requiring logging in to each BrightStor ARCserve Backup server separately. If a user can do a database purge operation on one server, this user can do the same on any server in the same domain.

Each domain has a name, a mandatory designated Primary server, and an optional Secondary server. Users can start and stop BrightStor ARCserve Backup services on any server in the BrightStor ARCserve Backup Domain.

Primary and Secondary Domain Servers

The Primary Domain server will synchronize information to the Secondary Domain server, which serves to provide fault tolerance in the event of failure of the primary. caroot is a predefined root (administrator) user in the BrightStor ARCserve Backup Domain.

Important! *When configuring the primary and secondary servers in a domain, the configuration information such as the domain name, primary domain server name, and optional secondary domain server name, must be the same on all machines in the domain. You must define the secondary name when you install the primary to allow the secondary server information to be validated for security reasons. You can reconfigure the secondary name using the command line utility ca_conf.exe or edit the config\discovery.cfg file in the BrightStor ARCserve Backup installation folder.*

Domain Configuration Using the ca_conf Utility

BrightStor ARCserve Backup provides a utility, called ca_conf, which you can use to change the BrightStor ARCserve Backup domain configuration after you install BrightStor ARCserve Backup. You can locate the executable for this utility in the BrightStor ARCserve Backup home directory. The executable is labeled ca_conf.exe.

Using this utility you can change domains for the current host machine and create a new domain by specifying the new Domain name and current host server as the Primary Domain server.

The basic parameters of a Domain are as follows:

- Primary server
- Secondary server
- Domain name

Note: If the Domain setting for a domain was changed (for example, Primary server or Secondary server), you should run this utility on all host member servers, including the Primary and Secondary Domain servers.

The ca_conf utility provides you with the following options:

Option	Description
d/D	Displays the current Domain configuration
c/C	Changes the current Domain configuration
s/S	Restarts the services
q/Q	Quit the utility

Note: When you change any parameter of the Domain configuration, related services restart automatically before you quit the utility.

If you specify the c/C option, to change the current configuration, the ca_conf utility presents you with the following options:

Option	Description
d/D	Changes the Domain name
p/P	Changes the Primary server in the Domain
s/S	Changes the Secondary server in the Domain
Any other key	Exits the sub-menu

To run the ca_conf utility, browse to and start the executable. After the utility starts, follow the on-screen instructions.

caroot Equivalence

By default, BrightStor ARCserve Backup creates a caroot equivalency for the administrator user on the Primary Domain Server, Secondary Domain server, and all BrightStor ARCserve Backup Domain member servers during setup. However, it does not create this equivalency for any other users on the Secondary Domain Servers and all other Domain member users. Hence, prior to using the command line utilities in a BrightStor ARCserve Backup Domain, you must create this equivalency.

By creating an equivalence list, all clients can use BrightStor ARCserve Backup without the user logging into the Domain. BrightStor ARCserve Backup can validate if the current user has equivalent access to the domain. The access rights to the operating system ensure a particular access level to the BrightStor ARCserve Backup domain.

Syntax

```
ca_auth -equiv add ntuser hostname BrightStorUser [caroot_username]
[caroot_password]
```

For example:

```
ca_auth -user add xyz@machine1 caroot caroot password
```

User xyz@machine1 can be defined as having equivalence to user caroot on BrightStor ARCserve Backup Domain ABC. If such equivalence is defined when user xyz logs into system machine1 – the user can execute BrightStor ARCserve Backup commands as a root user of the BrightStor ARCserve Backup domain and be automatically authenticated.

Manage User Profiles Using the User Profile Utility

The BrightStor ARCserve Backup User Profile utility lets the BrightStor ARCserve Backup administrator control user access to BrightStor ARCserve Backup.

The following sections describe how to:

- Add a user profile.
- Delete a user profile.
- Change a user's password.
- Assign a user to a group.

Add a User Using the User Profile Utility

A default user is created when BrightStor ARCserve Backup is installed. The default user name is caroot.

To add a new user profile, follow these steps:

1. Select User Profile from the Utilities menu on the BrightStor ARCserve Backup Manager Home Page.
The Profile Manager opens.
2. Click the Add User toolbar button.
The Add User dialog opens.
3. Enter a user name and password in the appropriate fields, and then re-enter the user's password to confirm the first entry.
4. Click OK.

Delete a User Using the User Profile Utility

To delete a user profile, follow these steps:

Note: You cannot delete the default BrightStor ARCserve Backup user name.

1. Select User Profile from the Utilities menu on the BrightStor ARCserve Backup Manager Home Page.
The Profile Manager opens.
2. Select the user profile that you want to modify and click the Delete User toolbar button.
3. Click OK to confirm.

Change a User Password Using the User Profile Utility

To change a user password, follow these steps:

1. Select User Profile from the Utilities menu on the BrightStor ARCserve Backup Manager Home Page.
The Profile Manager opens.
2. Select the user that you want to modify and click the Change Password toolbar button.
The Change User Password dialog opens.
3. Enter the old password, the new password, and then re-enter the new password.
4. Click OK.

Assign a User to a Group Using the User Profile Utility

To assign a user to a group, follow these steps.

1. Select User Profile from the Utilities menu on the BrightStor ARCserve Backup Manager Home Page.
The Profile Manager opens.
2. Select user that you want to modify and click the Assign Group toolbar button.
The Assign Groups dialog opens.
3. Select the group to which you want to assign this user and click OK.

Domain Management

To manage the domain user and groups, BrightStor ARCserve Backup provides a command line utility called ca_auth.

To verify the username:

```
ca_auth -user validate username [passwd]
```

To change the password for the domain user:

```
ca_auth -user chgpasswd username [passwd]
```

To add another user to the domain:

```
ca_auth -user add username [passwd]
```

To get all the users belonging to this domain:

```
ca_auth -user getall
```

For more information about domain user management, type ca_auth under the command prompt, or see the appendix "Using Command Line Utilities."

Discovery Configuration

Discovery Configuration is a service that you can use to periodically discover computers in your network for newly added or upgraded BrightStor ARCserve Backup software. A Discovery server runs as a background process that collects information from all other Discovery servers installed with Computer Associates' products across the corporate network.

Discovery Configuration allows you to distribute discovered network target information to remote servers. This capability allows administrators to decrease network traffic load created by Discovery servers to discover Windows domains or IP subnet addresses.

The Discovery Configuration allows you to perform the following tasks:

- Start or stop the discovery service
- Distribute tables with discovered network targets
- Add, remove or modify information in any of the three tables created by Discovery Configuration (IP subnets, IP subnet masks, and Windows domains)
- Set or modify Discovery Configuration parameters

You can open the Discovery Configuration at the command line or from Windows Explorer:

- Command line – access dsconfig.exe from the \Shared Components directory (for example, “C:\Program Files\CA\SharedComponents\BrightStor\CADS>dsconfig.exe”).
- Windows Explorer - Double-click on dsconfig.exe in the BrightStor ARCserve Backup directory where the Shared Components file is located.

See the online help for procedures on how to start or stop the discovery service or distribute tables with discovered network targets.

How the Discovery Service Detects Other Computers

A Discovery server is implemented as a Windows service. As soon as a Discovery server starts, it enumerates the list of products to create a behavior mask. Based on this mask, the Discovery server initializes the following required components:

- The Listen/Serialize component is initialized first and starts listening on a particular port (or Mailslot) for incoming packets (messages) from other Discovery servers. When a message is received, the Discovery server writes data (if any) into the repository (registry, for example) and then notifies the Query/Advertise component.
- The Query/Advertise component sends the message received from the Listen/Serialize component, (prepared with the product's list) directly to the Discovery server, which requested the data. The Query/Advertise component can also send messages as a broadcast message to the selected network targets (the list of IP Subnets or Windows Domains) if it is scheduled or initiated manually. It does this in order to query other Discovery servers across the network, and advertise its own list of BrightStor ARCserve Backup products.

Discovery Service Configuration Options

You can specify the transport protocol used to broadcast queries by choosing configuration options that meet your needs. Select the Configuration button in the Discovery Configuration.

In the Network tab, you can choose the protocols to discover and define the TCP/IP subnet sweep. Choose to enable discovery of BrightStor ARCserve Backup products if you want the discovery service to broadcast queries repeatedly with a specified interval.

Choose to enable network discovery if you want the Discovery server to run a process of discovering new Windows domains and IP subnets. By default, the Discovery server runs this process only when the discovery service is restarted. You can also modify the interval, depending on how dynamic your network environment is.

Note: It is not recommended that this option be run at all times because it continually broadcasts queries which can increase network traffic.

You can direct the Discovery Configuration application to clean its tables as the Discovery service starts. Discovery tables store information about computers with a BrightStor ARCserve Backup product installed. When you enable this option, the Discovery service purges the data from its tables, discovers computers with a BrightStor ARCserve Backup product installed, and then updates the tables with current, accurate data.

Important! *The Clean Up Discovery Table on Startup option is enabled by default. If you disable this option and uninstall BrightStor ARCserve Backup applications from systems from your environment, the details about these computers will remain in the tables when the Discovery service restarts.*

Discovery Configuration Dialog

You can use the Discovery Configuration dialog to perform the following tasks:

- Specify the transport protocol used to broadcast queries.
- Enable Discovery of BrightStor ARCserve Backup Products allows the Discovery Service (DS) to broadcast queries repeatedly, with a specified interval.

It is not recommended that this be run at all times because it continually broadcasts queries which could increase network traffic.

- Enable Network Discovery allows the DS to run a process of discovering new Windows domains and IP Subnets.

By default, the DS runs this process only when the Discovery Service is restarted. You can also modify the interval, depending on how dynamic your network environment is.

Network Tab

Use the Network tab to configure the following options:

- Specify the Protocols used to Discover.
- Specify the Protocols used to Reply.
- Enable Discovery of BrightStor ARCserve Backup Products.
- Enable Discovery using TCP/IP Subnet Sweep.
- Enable Network Discovery and specify the time interval.
- Specify BrightStor ARCserve Backup NetWare discovery settings.
- Direct the Discovery Service to clean the discovery tables on startup .

Adapters Tab

- Select IP address to Run Discovery.

IP Subnets/Windows Domains Discovery

In order to query and advertise, the Discovery Configuration needs the list of network targets to broadcast. For example, you might want to discover BrightStor ARCserve Backup products in only one IP subnet on a TCP/IP enabled network or in a list of subnets located physically in the same country.

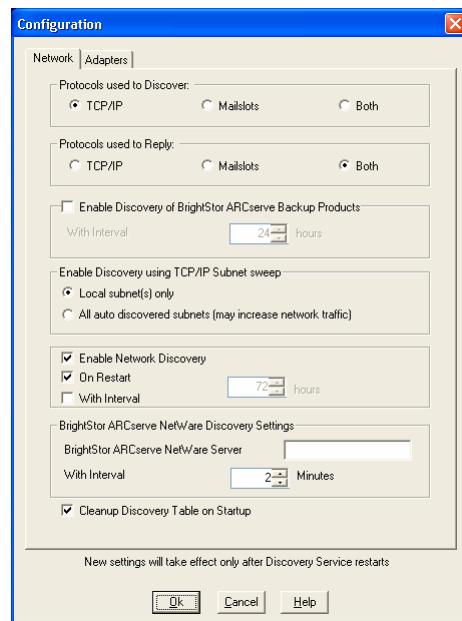
In another scenario, you might want to enumerate the entire corporate network to find all possible subnets and then filter some of them out. The discovery process runs in the background, and enumerates Windows network's resources. A list of Windows domains for subsequent Mailslot broadcasting or a listing of IP subnets for UDP broadcasting is created.

Note: This process may take some time, depending on the size of your network. It is recommended that the IP subnets and domains discovery be run during a time of minimum network traffic.

For information on starting and stopping the discovery service, see the online help.

Enable Discovery Using TCP/IP Subnet Sweep

You can configure to use a local or remote subnet sweep. The default setting is for a local subnet.

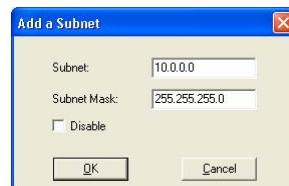


The discovery service broadcasts and retrieves all the information of the local subnet machines as well as manually-defined subnets and manually-defined machines. To add a machine name (IP address) manually, start Discovery and click the Add button on the Windows Domain tab.

Enter the IP address of the machine and click OK. The discovery service can then ping, publish, and return a product list from the specified machine.

Note: You can limit the discovery range by disabling any auto-discovered machine or Windows domain, which can reduce network traffic. Check the Disable box for an existing machine or Windows domain.

To add a remote subnet, start Discovery and click the Add button on the Subnet tab. The Add a Subnet dialog opens as shown in the following example:



Enter the Subnet and Subnet Mask and click OK. This enables the discovery service publish its product list to each machine to the specific subnet and also return product information for every machine in this subnet.

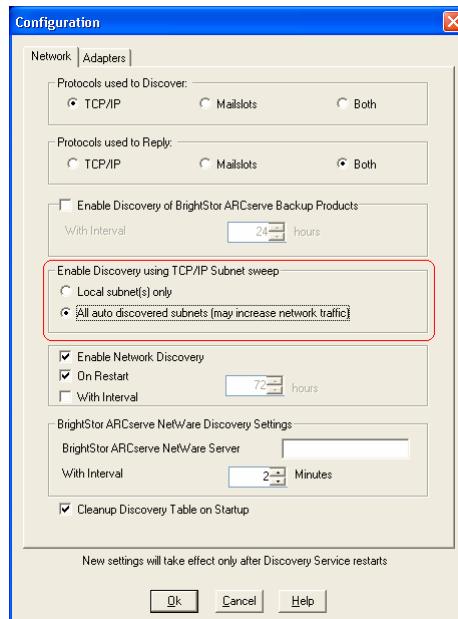
Note: You can limit the discovery range by disabling any auto-discovered machine or Windows domain, which can reduce network traffic. Check the Disable box for an existing machine or Windows domain.

If specific subnets use a different subnet mask you can add a subnet mask manually by starting Discovery and clicking the Add button on the Subnet Mask tab. The Add a Subnet Mask dialog opens as shown in the following example:



If you choose to perform an auto discovery, the discovery service will ping and publish a product list to each machine in each subnet listed in the Discovery Configuration Subnet tab and retrieve the product information from the remote machine.

To do this, start Discovery and click the Configure button on the Summary tab. The Configuration dialog opens as shown in the following example:



The Discovery server initiates an IP address sweep for remote subnets by using the auto-discovered subnets, subnet masks, machine, or Windows domains along with the manually-configured subnets, subnet masks, machines or Windows domains. Selecting this option may increase network traffic and can take a considerable amount of time to complete, depending on the size of your network. We recommend that you run this option during a time of minimum network traffic.

Note: If you choose to discover BrightStor products in remote subnets, the discovery service does not rely on a UDP broadcast to locate remote instances. You need to know the size of the subnet and range of IP addresses using a subnet mask.

Multiple Success Audit Messages Appear in the Event Viewer

If you enable both Success and Failure for Audit object access under Local Security Policy, Local Policies, Local Audit Policy, you may receive multiple Success Audit messages under Security Events in the Event Viewer. To avoid receiving multiple Success Audit messages, perform the following procedure:

1. Create a key called MessageEngine Under the following registry key:
`HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base\Admin`
2. Create a DWORD value called Impersonate under the following key and set it to 0:
`HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base\Admin\MessageEngine`
3. Restart the CA BrightStor Message Engine service.

Discovery Configuration for the SAN Option

The Discovery service configuration for servers in a SAN environment require additional modifications in order for all servers to be discovered. To ensure that all SAN servers are enabled for discovery, one of the following options are available:

- Select the "All auto discovered subnets (may increase network traffic)" option in the Enable Discovery using TCP/IP Subnet sweep field in the Configuration dialog.
- Add other remote SAN machine names/IP addresses by accessing the Windows Domain tab.

Note: The configuration for each remote SAN server must be consistent to ensure accurate discovery. If you only configure one SAN server, other servers may still fail in discovery.

Discover Client Agent Systems with Non-default IP Addresses

If you select a non-default IP address for a client agent node, you must perform the following procedure to update the IP address to the new address, to allow you to add machines using AutoDiscovery:

1. On the agent machine, restart the discovery service (dsconfig.exe).
2. From the Backup Manager of the base server, delete the old machine object.
3. On the base server, restart the discovery service or launch AutoDiscovery using dsconfig.exe.
4. From the Backup Manager, add the machine with the new IP address using AutoDiscovery.
5. If you have a scheduled job in the queue, delete that job and recreate it to ensure that it runs properly.

Firewall Configuration to Optimize Communication

In an environment where you are using multiple BrightStor ARCserve Backup servers that reside across a firewall, or there is a firewall within a Storage Area Network (SAN) fibre loop, you must configure your servers to ensure the use of fixed ports and interfaces. The configuration on your BrightStor ARCserve Backup servers must match your firewall configuration so that BrightStor ARCserve Backup servers can communicate with each other.

A BrightStor ARCserve Backup server communicates with other BrightStor ARCserve Backup servers using a set of Remote Procedure Call (RPC) services. Each service can be identified by an interface (IP address) and a port. When you share data and tape libraries between BrightStor ARCserve Backup servers, the services communicate with each other using the interface and port information provided by the RPC infrastructure. RPC infrastructure, however, does not ensure specific port assignment. Therefore, you must know your RPC infrastructure and port number assignments to configure your firewall properly. To achieve static binding, additional configuration is required.

You can customize your environmental port communication settings by modifying the ports configuration file (PortsConfig.cfg) located in the CA\SharedComponents\BrightStor directory.

Ports Configuration File Guidelines

The following guidelines apply to modifying the ports configuration file:

- Changing port numbers requires the BrightStor ARCserve Backup ServiceName. For more information about service names, see Additional Resources in this chapter.
- Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Open Network Computing Remote Procedure Call (ONCRPC) services require only one port. If you do not provide a port number for these services, the default port is used.
- Microsoft Remote Procedure Call (MSRPC) services require only the BrightStor ARCserve Backup service name (ServiceName). BrightStor ARCserve Backup MSRPC-based services use system-assigned port numbers.
- You can use the key RPCServices for all Remote Procedure Call (RPC) services. This key lets BrightStor ARCserve Backup use system assigned ports for all BrightStor ARCserve Backup RPC-based services.
- Changing the port configuration file on one BrightStor ARCserve Backup server for MSRPC-based services does not ensure that BrightStor ARCserve Backup applies the changes to all remote BrightStor ARCserve Backup servers. You should modify the port configuration file on all remote BrightStor ARCserve Backup servers.
- For TCP communication-based services, you can specify different port ranges for different host names with many IP addresses.
- You should specify an IP address only if a machine has more than one network interface card (NIC) and you want to use a specific NIC for TCP communication.

Note: For more information about specific Microsoft Windows system port requirements, see the Microsoft Support web site.

Modify the Ports Configuration File

To modify the ports configuration file, perform the following steps:

1. Open PortsConfig.cfg using a text editor such as Notepad. You can access the file from the following directory:
`(installation_drive):\Program Files\CA\SharedComponents\BrightStor`
2. Add one or more lines of code using the following format:
`ServiceName(%s) PortRange_1;PortRange_2;...;PortRange_n [HostName(%s)]
 [IPAddress(%s)]`
 - Use the following format to specify a port or port range:
`SinglePort(number)`
 or
`PortBegin(number) - PortNumberEnd(number)`
 - Use the following format to specify an IP address:
`%d.%d.%d.%d`
 - The ServiceName is string without spaces.
 - The HostName is a string that represents a valid computer name.
3. Close PortsConfig.cfg and save your changes.
4. After changing the Portsconfig.cfg file, restart all services affected by the changes. For all BrightStor ARCserve Backup services, you can run cstop and cstart to stop and start the services.

To support backward compatibility, the keys corresponding to BrightStor ARCserve Backup database agents are written to the PortsConfig.cfg file below the comment section. The database agents affected are the Tape Engine (tapeengine), the Job Engine (jobengine), and the Database Engine (databaseengine). These BrightStor ARCserve Backup database agents send jobs to the BrightStor ARCserve Backup queue using old ports. If you do not have old agents using old ports in your network, you can safely remove these lines from the PortsConfig.cfg file. However, you must restart each BrightStor ARCserve Backup database agent service to enable communication using system ports.

Note: For more information about requirements for Microsoft Windows system services ports, see the Microsoft Support web site.

Ports Used by BrightStor ARCserve Backup Components

The following sections provide information about ports used by BrightStor ARCserve Backup components, primarily for Windows configurations.

External Ports Used for Communication

BrightStor ARCserve Backup uses the following external ports for communication:

Port 135

This is owned by Microsoft endpoint-mapper (Locator) Service and is not configurable. All BrightStor ARCserve Backup MSRPC services register their current ports with this service.

All BrightStor ARCserve Backup clients (for example, the Manager) contact this service to enumerate the actual port used by the BrightStor ARCserve Backup service and then contact the service directly.

Port 139/445

This is owned by Microsoft and is not a configurable port. BrightStor ARCserve Backup services use MSRPC over the Named Pipes transport. Microsoft requires this port to be open for all communication using MSRPC over Named pipes.

- Port 139 is used only when the BrightStor ARCserve Backup services are installed on Windows NT.
- Port 445 is used only when the BrightStor ARCserve Backup services are installed on Windows 2000, Windows XP, or Windows 2003.

Microsoft Windows System port requirements can be found at:

<http://support.microsoft.com/default.aspx?scid=kb;en-us;832017>

Ports Used by the BrightStor ARCserve Backup Base Product

For the BrightStor ARCserve Backup base product, you can configure the following ports in the PortsConfig.cfg file:

CA Remote Procedure Call service

This is the ONCRPC portmapper service. Other ONCRPC services such as caserved, cadiscovd, caatdh, caloggerd, lqserver, camediad, and idbserver use this service for registration. Clients that communicate using the other ONCRPC services first contact the ONCRPC portmapper service to enumerate the ports, and then contact the other ONCRPC service to communicate.

- Default Port: 111
- Protocol: TCP

RTC service

This service is used by GUI for enabling certain features. It is not used for backup and restore communication

- Default Port: Dynamic Port
- Protocol: TCP

Domain service (Cadiscovd.exe)

This service maintains a database of users, passwords, equivalences, and hosts for the BrightStor ARCserve Backup domain concept. This service is required for GUI communication.

- Default Port: Dynamic Port
- Protocol: TCP

Service controller (Caservd.exe)

This service is used to manage other services remotely and is required for GUI communication.

- Default Port: Dynamic Port
- Protocol: TCP

Authentication service (Caauthd.exe)

This service validates Caroot user login and equivalence. It is required for GUI and backup server communication.

- Default Port: Dynamic Port
- Protocol: TCP

Logger service (Caauthd.exe)

This service manages the Activity Log file and is required for GUI and backup server communication.

- Default Port: Dynamic Port
- Protocol: TCP

LDBServer.exe

This service is used for proxy for database communication and can only be configured using the command line. This service is not required for GUI and backup server communication.

- Default Port: Dynamic Port
- Protocol: TCP

LQServer.exe

This service is used for proxy for job queue communication and can only be configured using the command line. This service is not required for GUI and backup server communication

- Default Port: Dynamic Port
- Protocol: TCP

Mediasvr.exe

This service is used for proxy for tape engine communication and can only be configured using the command line. This service is not required for GUI and backup server communication.

- Default Port: Dynamic Port
- Protocol: TCP

Carunjob.exe

This service uses a port range for reconnection logic (on network communication failure) with the agents.

- Default Port: Dynamic Port
- Protocol: TCP

MS Endpoint Mapper Service

This is not a configurable port.

- Default Port: 135
- Protocol: TCP

Proactive backup service

The Client Agent administrator contacts this service for job submission. This service is not required for GUI browsing and backup and restore operations. This is not a configurable port.

- Default Port: 6055
- Protocol: TCP

GUI Communication with the Base Product

The manager contacts the remote services on the base product whose port numbers need to be configured in the PortsConfig.cfg file on the machine where the BrightStor ARCserve manager component is installed. Additionally, these services are installed on the manager component

CA Remote Procedure Call Service

This is the ONCRPC portmapper service. It is used for registration by other ONCRPC services. All clients to those services first contact this service to enumerate the ports and contact that service.

- Default Port: 111
- Protocol: TCP

For more information, see the section Ports Used by the BrightStor ARCserve Backup Base Product in this chapter.

Base Product Communication with BrightStor ARCserve Backup Agents and Options

The BrightStor ARCserve Backup server contacts the remote services on the agents whose port numbers need to be configured in the PortsConfig.cfg file on the machine where the Base product is installed.

For more information, see the section Ports Used by BrightStor ARCserve Backup Agents and Options in this chapter.

Ports Used by BrightStor ARCserve Backup Common Components

The following sections provide information about the ports used by BrightStor ARCserve Backup common components.

Discovery Service Communication Ports

The Discovery Service discovers BrightStor ARCserve Backup products, agents, and options on Windows platforms. You can configure the following ports in the PortsConfig.cfg file:

Discovery broadcast and response packets

- Default Port: 41524
- Protocol: UDP

Discovery response

- Default Port: 41523
- Protocol: TCP

Common Agent for UNIX and Linux Communication Ports

This information applies to all UNIX and Linux based agents, including client agents, database agents, and application agents. You can configure the following ports in the agent.cfg file:

Receiving and responding to discovery broadcast packets

- Default Port: 41524
- Protocol: UDP

Browsing, backup operations, and restore operations

- Default Port: 6051
- Protocol TCP

Ports Used by BrightStor ARCserve Backup Agents and Options

The following sections provide information about the ports used by BrightStor ARCserve Backup agents and options.

Agent for Microsoft SharePoint Communication Ports

For the SharePoint Database Router Agent and the SharePoint External Data Agent, you can configure the following ports in the PortsConfig.cfg file:

Universal Agent service

This service is used for browsing operations.

- Default Port: 6050
- Protocol: UDP

Universal Agent service

This service is used for browsing/backup/restore operations.

- Default Port: 6050
- Protocol: TCP

Note: For information about the communication ports used by the SharePoint Database Agent, see the section Agent for Microsoft SQL Server and the Agent for Microsoft SharePoint Database Communication Ports in this chapter.

Client Agent for Windows Communication Ports

For the Client Agent for Windows, you can configure the following ports in the PortsConfig.cfg file:

Universal Agent service

This service is used for browsing operations.

- Default Port: 6050
- Protocol: UDP

Universal Agent service

This service is used for browsing/backup/restore operations.

- Default Port: 6050
- Protocol: TCP

Agent for Microsoft Exchange Document Level Add-on Communication Ports

For the Agent for Microsoft Exchange Premium (Document Level) Add-on, you can configure the following communication ports in the PortsConfig.cfg file:

Universal Agent service

This service is used for browsing operations.

- Default Port: 6050
- Protocol: UDP

Universal Agent service

This service is used for browsing/backup/restore operations.

- Default Port: 6050
- Protocol: TCP

Agent for Microsoft SQL Server and the Agent for Microsoft SharePoint Database Communication Ports

For the Agent for Microsoft SQL Server and the Agent for Microsoft SharePoint Database, you can configure the following communication ports in the PortsConfig.cfg file:

Backup Agent Remote Service

This service is only used for TCP/IP backup/restores.

- Default Port: 6070
- Protocol: TCP

Backup Agent RPC Server

This service is required for GUI Browsing and for Named Pipes backup and restore operations.

- Default Port: 6071
- Protocol: TCP

MS Endpoint Mapper Service

This is not a configurable port.

- Default Port: 135
- Protocol: TCP

MS port (only Windows NT)

This service is only used for MSRPC using Named Pipes. This is not configurable port.

- Default Port: 139
- Protocol: TCP

MS port (only Win2000/WinXP/W2003)

This service is only used for MSRPC using Named Pipes. This is not configurable port.

- Default Port: 445
- Protocol: TCP

Agent for Microsoft Exchange Database Level and Brick Level Communication Ports

For the Exchange Database Level and Brick Level Agent, you can configure the following communication ports in the PortsConfig.cfg file:

Backup Agent Remote Service

This service is used for backup and restore operations.

- Default Port: 6074
- Protocol: TCP

Backup Agent RPC Service

This service is required for GUI Browsing and all backup and restore operations

- Default Port: 6071
- Protocol: TCP

MS Endpoint Mapper Service

This is not a configurable port

- Default Port: 135
- Protocol: TCP

MS port (only Windows NT)

This service is only used for MSRPC using Named Pipes. This is not a configurable port.

- Default Port: 139
- Protocol: TCP

MS port (only Win2000/WinXP/W2003)

This service is used for MSRPC using Named Pipes. This is not a configurable port.

- Default Port: 445
- Protocol: TCP

NDMP NAS Option Communication Ports

For the NDMP NAS Option, you can configure the following communication ports in the PortsConfig.cfg file:

NAS filer service

This service is used for communication with the NAS filer service. It is not required for GUI, backup, and restore communications.

- Default Port: 10000
- Protocol: TCP

BrightStor ARCserve Backup Database Agents Communication Ports

For BrightStor ARCserve Backup database agents, you can configure the following communication ports in the PortsConfig.cfg file:

Note: The settings listed below apply to the Agent for SAP R/3, the Agent for Oracle, the Agent for Ingres, the Agent for Lotus Notes, and the Agent for Sybase.

Backup Agent RPC Server

This service is required for GUI Browsing and for backup and restore operations.

- Default Port: 6071
- Protocol: TCP

MS Endpoint Mapper Service

This is not a configurable port.

- Default Port: 135
- Protocol: TCP

MS port (only Windows NT)

This service is only used for MSRPC using Named Pipes. This is not a configurable port.

- Default Port: 139
- Protocol: TCP

MS port (only Win2000/WinXP/W2003)

This service is only used for MSRPC using Named Pipes. This is not a configurable port.

- Default Port: 445
- Protocol: TCP

GUI Communication to BrightStor ARCserve Backup Agents

The BrightStor ARCserve Backup manager contacts the remote services on the agents whose port numbers need to be configured in the PortsConfig.cfg file on the machine where the manager component is installed.

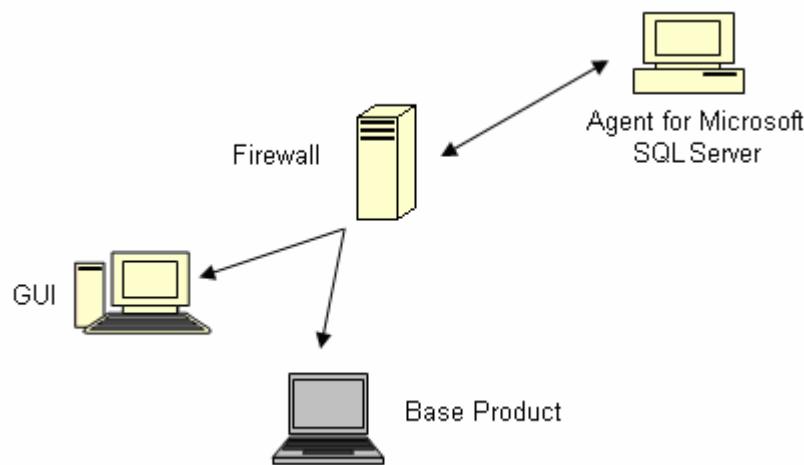
For more information, see the section *Ports Used by BrightStor ARCserve Backup Agents and Options* in this chapter.

How to Allow Agents and Database Agents to Communicate Through a Firewall

The following sections provide examples about how to allow BrightStor ARCserve Backup agents and database agents to communicate through a firewall.

Base Product Communicating with the Agent for Microsoft SQL Server

In this scenario, the agent is behind a firewall. The GUI and base product are outside the firewall on different machines.



On the machine with the Agent for Microsoft SQL Server, modify the Portsconfig.cfg file to contain the following entries:

```
ENABLE_CONFIGURABLE_PORTS=1
Dbagentsrpccserver 6071
Sqlagenttcpservice 6070
casdscsvctcp 41523
casdscsvcudp 41524
```

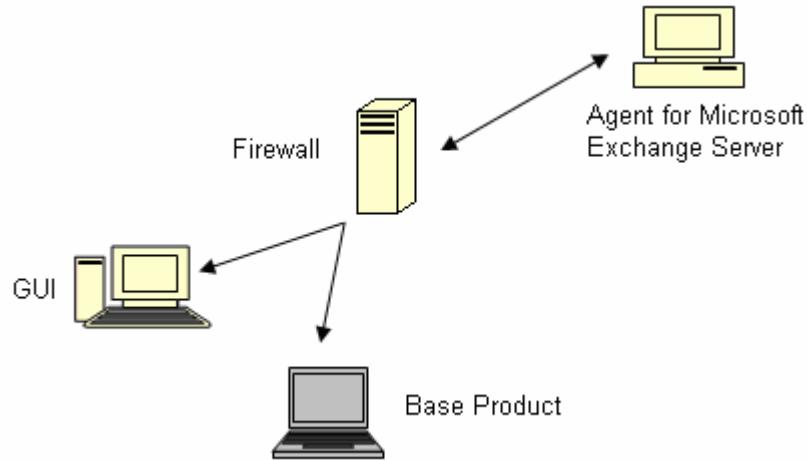
On the firewall, open the above four ports and additional port 135. Port 139 or Port 445 must be opened only if the Agent for Microsoft SQL Server is configured to use the Named Pipes transport. They should allow incoming connections to the agent machine.

On the machine where the base product is running and the GUI-only machine, add the following entries to the existing Portsconfig.cfg file:

```
ENABLE_CONFIGURABLE_PORTS=1
Dbagentsrpccserver 6071 SQLAgentMachineName
Sqlagenttcpservice 6070 SQLAgentMachineName
casdscsvctcp 41523
casdscsvcudp 41524
```

GUI Managing the Agent for Microsoft Exchange Using Named Pipes

In this scenario, the agent is behind a firewall, and the GUI and base product are outside the firewall on different machines.



On the machine with the Agent for Microsoft Exchange Server, modify the Portsconfig.cfg file to contain the following entries:

```
ENABLE_CONFIGURABLE_PORTS=1
Dbagentsrpccserver 6071
exchangeagenttcpserverlevel 6074
casdscsvctcp 41523
casdscsvcudp 41524
```

On the firewall, open the above four ports and additional port 135. Port 139 or Port 445 must be opened. They should allow incoming connections to the agent machine.

On the GUI machine, modify the Portsconfig.cfg file to contain the following entries:

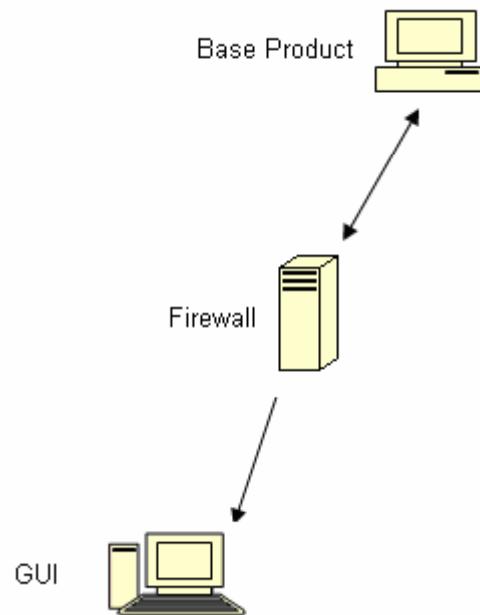
```
ENABLE_CONFIGURABLE_PORTS=1
Dbagentsrpccserver 6071 ExchangeAgentMachineName
```

On the machine where the base product is running, add the following entries to the existing Portsconfig.cfg file:

```
ENABLE_CONFIGURABLE_PORTS=1
exchangeagenttcpserverlevel 6074 ExchangeAgentMachineName
casdscsvctcp 41523
casdscsvcudp 41524
```

GUI Managing the Base Product

In this scenario, a firewall separates the GUI and the machine where the base product is running.



On the machine where the base product is running, modify the Portsconfig.cfg file to contain the following entries:

```
ENABLE_CONFIGURABLE_PORTS=1
Catirpc          111
jobengine        6503
databaseengine   6504
tapeengine       6502
rtcpports        6505
cadiscovd       9000
caservd          9001
caloggerd        9002
caauthd          9003
caqd             9004
camediad         9005
cadbd            9006
reconnection     9010-9050
casdscsvctcp    41523
casdscsvcudp    41524
```

On the firewall, open the above ports. These ports should allow incoming connections to the machine where the base product is running.

On the GUI machine, modify the Portsconfig.cfg file to contain the following entries:

```
ENABLE_CONFIGURABLE_PORTS=1
Catirpc          111  BaseproductMachinename
jobengine        6503 BaseproductMachinename
databaseengine   6504 BaseproductMachinename
tapeengine       6502 BaseproductMachinename
rtcports         6505 BaseproductMachinename
cadiscovd       9000 BaseproductMachinename
caservd          9001 BaseproductMachinename
caloggerd        9002 BaseproductMachinename
caauthd          9003 BaseproductMachinename
casdscsvctcp    41523
casdscsvcudp    41524
```

Additional Resources

The following tables list the BrightStor ARCserve Backup services that you can configure using the ports configuration file.

BrightStor ARCserve Backup MSRPC Services:

Service Display Name	Process Name	Key	Default Port	Service Type
Agent RPC Server	dbasvr.exe	dbagentsrpcesserver	System port	MSRPC
Tape Engine	tapeeng.exe	tapeengine	6502	MSRPC
Job Engine	jobeng.exe	jobengine	6503	MSRPC
Database Engine	dbeng.exe	databaseengine	6504	MSRPC
CA BrightStor Message Engine	msgeng.exe	rtcports	System port	MSRPC

BrightStor ARCserve Backup TCP Services:

Service Display Name	Process Name	Key	Default Port	Service Type
Agent Backup Service	dbasqlr.exe	sqlagenttcpse rvice	6070	TCP
Exchange server level backup	dbaexchr.exe	exchangeage nttcpserverle vel	6074	TCP
Universal Agent	univagent.exe	fsbackupservi ce	6050	TCP
Discovery service	casdscsvc.exe	casdscsvctcp	41523	TCP
NDMP NAS Option Agent	tapeeng.exe, UnivAgent.exe	nastcpservice	10000	TCP
Reconnection	carunjob.exe	reconnection	no port	TCP

BrightStor ARCserve Backup ONCRPC Services:

Service Display Name	Process Name	Key	Default Port	Service Type
Remote Procedure Call Server	catirpc.exe	catirpc	111	ONCRPC
Service Controller	caserved.exe	caservd	System port	ONCRPC
Domain Server	cadiscovd.exe	cadiscovd	System port	ONCRPC
Domain Server	caaauthd.exe	caaauthd	System port	ONCRPC
Domain Server	caloggerd.exe	caloggerd	System port	ONCRPC
caqd	lqserver.exe	caqd	System port	ONCRPC
cadbd	ldbserver.exe	cadbd	System port	ONCRPC
camediad	mediasvr.exe	camediad	System port	ONCRPC

BrightStor ARCserve Backup UDP Services:

Service Display Name	Process Name Key	Default Port	Service Type
Universal Agent	univagent.exe	fsbackupservice 6050	UDP
Discovery service	casdscsvc.exe	casdscsvcudp 41524	UDP

Examples of How to Modify the Ports Configuration File

This section describes examples of how to modify the PortsConfig.cfg file.

- Transmission Control Protocol (TCP), User Datagram Protocol (UDP), and Open Network Computing Remote Procedure Call (ONCRPC) services require only one port. If you do not provide a port number for these services, the default, hard-coded port is used. If you specify a port range, only the first available port from the range is used. The following are examples of how to change a TCP service:

```
sqlagenttcpservice           8000    machine_name
or
fsbackupservice              7000    machine_name
or
exchangeagenttcpserverlevel 6000    machine_name
```

- Machine A and D are BrightStor ARCserve Backup servers. Machine B and C are Client Agent machines. If you want to change the communication port between machine A and B to 7000, you can set the communication port between A and C to the default - 6050. Also on machine A, there is a client agent installed for the BrightStor ARCserve Backup server on machine D, and you want to change the communication port from D to A to 8000.

On machine B - client agent, add following lines to the PortsConfig.cfg file:

```
fsbackupservice              7000    MachineB
```

```
fsbackupserviceudp           7000    MachineB
```

- You can perform this change using the Admin.exe application installed by the client agent.
- You must restart the Universal Agent service.

- Machine A and D are BrightStor ARCserve Backup servers. Machine B and C are client agent machines. If you want machine A to browse and backup files on machine B, add the following to PortsConfig.cfg file:

```
fsbackupservice      7000  MachineB
fsbackupserviceudp  7000  MachineB
```

To allow the client agent from machine A to communicate with the BrightStor ARCserve Backup machine D, add the following lines to the PortsConfig.cfg file on machine A:

```
fsbackupservice      8000  MachineA
fsbackupserviceudp  8000  MachineA
```

You must restart the Universal Agent on machine A.

Note: You can apply this logic to the BrightStor® ARCserve® Backup Agent for Microsoft SQL Server (sqlagenttcpservice) and the BrightStor® ARCserve® Backup Agent for Microsoft Exchange Premium Add-on (exchangeagenttcpserverlevel) for TCP-based services (fsbackupservice, sqlagenttcpservice, exchangeagenttcpserverlevel).

- For BrightStor ARCserve Backup MSRPC services:

MSRPC listens over ncacn_ip_tcp and ncacn_np protocols. The ncacn_ip_tcp uses system assigned ports by default rather than hard-coded ports. The hostname and IP address are not required for the RPC Services.

For example, a change for an MSRPC service could be:

```
dbagentsrpccserver  9000
```

This setting means that the CA BrightStor Backup Agent RPC Server will try to use port 9000.

```
dbagentsrpccserver  9000;9001
```

This setting means that the CA BrightStor Backup Agent RPC Server will try to communicate using port 9000; if it does not succeed it will try to use port 9001. If it does not succeed BrightStor ARCserve Backup will write a message in the Windows Application Activity Log.

```
dbagentsrpccserver  9000-9500
```

This setting means that the CA BrightStor Backup Agent RPC Server tries to communicate using port 9000. If it does not succeed BrightStor ARCserve Backup will try to communicate using port 9001, and continue to attempt to communicate up to port 9500.

If it cannot use any port in the range, will write a message in the Windows Application Activity Log.

Ports Configuration File Configuration Considerations

When modifying the PortsConfig.cfg file, consider the following scenarios:

- If you want to change the Network Attached Storage (NAS) port on the BrightStor ARCserve Backup server, after installing the BrightStor ARCserve Backup NDMP NAS Option, you must change the port assignment on the NAS filer as well.
- The reconnection logic is implemented to avoid an existing network problem. This can occur when you perform client agent backups over the network. During the backup, the connection can be lost and the backup fails. If this occurs, you can specify the reconnection key and a port range which will be used during the backup. Use the reconnection key on the BrightStor ARCserve Backup server side.
- If you are using Computer Associates eTrust Firewall software, you should perform the following steps:
 - From the command prompt, access the following:
Program Files\CA\etrust\Firewall\Engine
 - Enter the following command:
fwadmin -msrpc_chk_states_off
- For remote computer management, BrightStor ARCserve Backup RPC services listen using the ncacn_ip_tcp and ncacn_np protocols. When using ncacn_ip_tcp, open the tcp ports (6502, 6503, 6504) and open the system ports 137-139,445 which are used by the Windows operating system when the ncacn_np protocol is used.

Note: If eTrust Firewall blocks RPC communication, BrightStor ARCserve Backup can respond slowly or stop responding completely.

- To change the port for the Universal Agent, you must change the communication port for all agents and options that use this service installed on the same machine (for example, the BrightStor ARCserve Backup Client Agent, the BrightStor ARCserve Backup Agent for Microsoft Exchange Premium Add-on, and the BrightStor ARCserve Backup NDMP NAS Option). If you add a machine with a Windows NT, Windows 2000, Windows XP, or Windows 2003 operating system, browsing functionality is performed through the Universal Agent.
- Changing the ports for the BrightStor ARCserve Backup Agent for Microsoft Exchange and the BrightStor ARCserve Backup Agent for Microsoft SQL Server is for TCP backups for these agents. The RPC server provides browsing capabilities for all BrightStor ARCserve Backup for Windows database agents.

- If you are upgrading from an older version of BrightStor ARCserve Backup and your current installation uses a configuration file labeled CAPortConfig.cfg for BrightStor ARCserve Backup Client Agents configurations, the installation process migrates CAPortConfig.cfg settings to the PortsConfig.cfg file.

For previous BrightStor ARCserve Backup installations, information in the CAPortConfig.cfg file is in the following format:

```
MachineName IPAddress      tcpport udpport
```

The above-described CAPortConfig.cfg settings migrate to PortsConfig.cfg in the following format:

```
fsbackupservice      tcpport machinename      IPAddress
fsbackupserviceudp  udpport machinename      IPAddress
```

Note: For more information about requirements for Microsoft Windows system services ports, see the Microsoft Support website.

Chapter 9: Using the Alert Manager

Alert is a notification system that sends messages to people in your organization using various methods of communication. For example, you can send alerts to the system administrator, or a hardware technician in or out of the office. You can also send alerts to groups of people in different segments of the network.

How the Alert Manager Works

The Alert Manager does not generate its own messages. You must configure the manager with the information you want to communicate and where you want to send it. Use the Alert options in the Backup Manager or Alert configuration in Server Admin to tell Alert what information you want to communicate. Use the Alert Manager or the Alert options in the Backup Manager to tell Alert how to send information and who to send it to. For more information on how you can select methods and specify recipients from within the Backup Manager, see the chapter "Backing Up Data."

The information you communicate through Alert is called an Event. Events are words or phrases that appear in the Activity Log. You can select predefined job-related events, such as "Job Completed Successfully" and "Job Incomplete." You can also customize job-related events, such as error, warning, or notification codes. In addition, you can specify non-job related events, such as starting or stopping the Tape Engine.

To select job-related events, in the Backup or Restore Manager, click Options, and then the Alert tab. Job-related events can also be accessed by selecting the Utilities menu and choosing any of the Utilities menu options. To select non-job related events, in Server Admin click Config, and then the Alert tab.

After you select events and they appear in the Activity Log, Alert generates notification messages and sends them to the appropriate recipients. For more information on selecting the information you want to communicate using Alert, see the chapter "Backing Up Data" for job-related events, and the chapter "Administering the Backup Server" for non-job related events.

Alerts can be sent in the following ways:

- Broadcasts—Sends pop-up messages to specific computers.
- CA Unicenter TNG Option—Sends messages to the TNG console and WorldView repository.
- Lotus Notes—Sends email messages using Lotus Notes.

- Microsoft Exchange—Sends email messages using Microsoft Exchange.
- NT Event Log—Places event information in the Event logs of local and remote machines.
- Pager—Sends alphanumeric pager messages.
- SMTP (Simple Mail Transfer Protocol)—Sends email messages using the standard email protocol on the Internet.
- SNMP (Simple Network Management Protocol)—Sends messages to SNMP managers, such as NetWare Management System (NMS), HP OpenView, and CA Unicenter TNG.
- Trouble Tickets—Sends printed documents to any print queue on your network.

Alert Manager Components

Alert is comprised of the following components:

- Alert Manager—The Alert Manager is used to configure how Alert sends its messages and to whom to send them.
- Alert Service ([Alert Notification Server] Service)—This service is responsible for the reception, processing, and distribution of Alert messages.
- ALBUILD.DLL—This .DLL acts as the channel between Alert and other applications. This file should be located in the Alert home directory.
- *.CFG—The application profile file is provided by an application. This *.CFG file must be present in the Windows directory so that Alert can handle messages generated by an application.

Alert Manager Configuration

Before you use Alert, you must first establish a service account. To do this, open the Alert Manager, go to the Service menu, and select Set Service Account.

Note: If the Alert Manager was previously installed with another Computer Associates product, it is not reinstalled to the BrightStor ARCserve Backup directory; it remains in the directory where it was previously installed.

You can send alerts using many communication mechanisms or applications. Any application that calls Alert specifies one of three event priorities—Critical, Warning, or Informational.

To view a list of the applications that call Alert, open the Alert Manager, and, in the left pane, expand Configuration and then expand Default or BrightStor ARCserve Backup. You can either use the Alert default settings, which will be used by all applications that use the Alert Service, or you can enter configuration information specifically for each application. If you choose the latter, these configurations override the default Alert configurations.

The following sections describe how to configure each of the available communication mechanisms. To begin, expand Configuration, and then expand BrightStor ARCserve Backup to view options discussed in the following sections.

Ports Option

The Ports option contains communication port profiles. Pagers and functions that use serial port access use these profiles. To configure, right-click Ports and select New Item. Enter the following information:

- Port—The name of the communications port you want the pager message to be broadcast from.
- Data Bits—The number of data bits, 7 or 8, which your modem uses.
- Baud Rate—The baud rate used by your modem.
- Parity—The parity setting, none, odd, or even, of your modem.
- Stop Bits—The number of stop bits, 1 or 2, which your modem uses.

If you want these settings to apply to any function that uses serial port access, place a check mark in the Use As Default box. When you are finished configuring port information, click OK.

Broadcast Alerts

You can use Alert broadcasts to communicate information to specific network users or groups. To configure broadcast options, right-click Broadcast and select New Item.

When the Broadcast Recipients page appears, enter or select all machine names in your network that you want to receive alert messages, and then click Add. For more information about adding broadcast recipients, see the online help.

CA Unicenter TNG

You can use CA Unicenter TNG to send messages to the Unicenter TNG console and World View repository when an alert is generated.

Note: Alert must be running on both the Event Management machine and the WorldView machine.

To configure CA Unicenter TNG settings, right-click CA Unicenter TNG and select Unicenter TNG Settings. When the Unicenter TNG Settings dialog appears, enter the following information:

- Event Management Machine—Enter the name of the machine that is running the Unicenter Event Management console.
- TNG World View Machine—Enter the name of the machine that contains the WorldView repository. If the WorldView machine is the same machine you are running Alert on, enter the user name and password for access to the Unicenter TNG repository.

You can also configure the TNG Event Map to set the criteria for Alert specifications in the Unicenter TNG environment. To do this, expand CA Unicenter TNG, right-click Critical, Warning, or Informational, and select Edit Item. When the Unicenter TNG Event Map screen appears, enter the following information:

- Application Event Priority—This displays the Application Event priority that is passed to Alert from the application. The categories can be Informational, Warning, or Critical. This field is automatically populated depending on which category you selected (under the CA Unicenter TNG object) in order to configure the TNG Event Map.
- Severity—Use this option to tailor the severity of the message that is passed from Alert to TNG. Select the type of alert message that you want to broadcast, Error, Fatal, Informational, Success, or Warning.
- Color—Select the color you want the message to display.
- Attribute—Set the message to blink or reverse. The default option sets the message to the TNG default.
- Flags—Select the appropriate check boxes to hold the message or highlight the message in the console.
- Sent to Console—Select the check box to send the alert message to the console.
- Update object status in WorldView Repository—Select this option in the TNG WorldView group to store the status of the current object in the WorldView Repository.

For more information about sending alerts using the CA Unicenter TNG Console and WorldView repository, see the online help.

Sample TNG Alert Scenarios

If you want to send informational alerts to the Unicenter TNG Console using blue text, configure a recipient as follows:

Event Priority	Description
Informational	Application Event Priority
Blue	Color
4	Send to Console
4	Send to World View

If you want to send error alerts to the Unicenter TNG Console using red text, and have the object status in the World View repository updated, configure another recipient as follows:

Event Priority	Description
Critical	Application Event Priority
Red	Color
4	Send to Console
4	Send to World View

Email Notification

You can use either Lotus Notes or Microsoft Exchange to email notification messages to specific users.

Important! *You must install Lotus Notes or Microsoft Exchange Client to set up configuration data and to send messages. See your Windows manual for instructions on how to set up your email account.*

Lotus Notes

To configure Lotus Notes settings, right-click Lotus Notes and select Lotus Notes Settings. When the Lotus Notes Settings page appears, enter the following information:

- Lotus Notes Install Path—Enter the appropriate install path.
- Password—Enter your password.
- Use Specific Account—If you want Alert to switch to another user ID, place a check mark in this box and enter information in the following fields:
 - ID File—For example, joeuser.id
 - Mail Server—For example, NotesServer/NotesDomain
 - Mail File—For example, mail/joeuser.nsf

After you configure Lotus Notes Settings and right-click Lotus Notes, select New Item or Message Attributes.

If you select New Item, Alert contacts the Lotus Notes server to display the address book. Select the users to whom you want to send alerts.

If you select Message Attributes, you can attach files to the email alert. Enter a subject, click Add File to select the file you want to attach, and then click OK.

Microsoft Exchange

To configure Microsoft Exchange settings, right-click and select one of the following:

- New Item—Lets you select email recipients.
- Message Attributes—If you select this, you can attach files to the email alert. Enter a subject, click Add File to select the file you want to attach, and then click OK.
- MS Exchange Settings—If you select this, the Service Logon Settings dialog appears. This is the same dialog that appears when you set up a service account. Enter the domain, user name, and password you want to use with the Alert Service. Make sure the account and user you enter is an account with Login as Service rights and is also an account on the Microsoft Exchange Server. If you are running the Microsoft Exchange Client, you must also enter the name of the server and mailbox. The mailbox name is case-sensitive and should not be hidden in a folder.

Note: If you are using Microsoft Outlook, right-click your Microsoft Outlook icon and select Properties. Select Microsoft Exchange Server and click Properties to view the server and mailbox information you should enter.

Send Job Logs Via Email

In addition to sending email notification messages, you can also use Lotus Notes or Microsoft Exchange to email job logs. To do this, create a new item and select recipients. Then, in the Backup Manager, before you submit a job, click the Options icon or, from the Backup menu, select Options. When the Global Options dialog appears, click the Alert tab, place a check mark in the Attach Job Log box, and then click OK. After you submit the job, the job log is sent to the recipients you specified.

NT Event Log Notification

You can configure the event log so that Alert puts an event for a selected server in that machine's event log.

To configure event log configurations, right-click NT Event Log and select New Item. When the Eventlog Recipients dialog appears, enter or select all machine names in your network to which you want to send Alert messages, and then click Add.

Alert Manager Pager Options

You can use the Pager option to communicate information using alphanumeric pager messages. Before you can add pager recipients, you must configure communication ports. For more information about configuring ports, see Ports Option.

To set up pager configurations, right-click Pager and select New Item. When the Pager Configuration page appears, enter the following information:

- Owner Name—Enter the name of the pager recipient.
- Pager Type—Select alphanumeric pager. Numeric is not supported.
- Pager Number—Enter a maximum of 24 characters. If a digit, such as 9, is needed for a dial tone, you must include it in this field.

Enter a comma to indicate a one second pause. If you want a longer pause, enter a string of commas.

You can use a dash to separate digits, but it has no function. (Check your modem manual because this can vary by modem.)

- Pager ID—Enter up to eight digits to identify the pager that will receive the alerts.
- Site ID—Enter up to four digits to identify where the alert occurred. This ID is included in the message to the pager; therefore, if the number is less than four digits, use leading zeros.
- Connection Delay—Enter the number of seconds you want to wait before a connection is made with the pager company. This will vary with your pager company, location, time of day, telephone equipment, and telephone traffic. If the connection is not established immediately, adding a delay prevents the alert from being sent before the connection is established.
- Message Delay—Enter the number of seconds to wait between the time the connection is made and the time the alert message is sent.
- Port Configuration—Select the appropriate port configuration. See Ports Option in this chapter for information on how to create new port profiles.

Note: When sending an alphanumeric page, consult your paging service for proper modem settings. The Alert service requires the TAP protocol for alphanumeric pages.

Pager Message Options

You can send variations of the messages in the following list to an alphanumeric pager. Substitute the bracketed words with the actual information.

- Boot Virus Detected
- Manager Detected a Virus [*virusname*] in [*path*]
- Infected File [*servername/path*] Detected
- Infected File [*path*] Accessed by user name at workstation address

SMTP Notification

You can use SMTP to send email notification messages to recipients on the Internet. To configure SMTP settings, right-click SMTP and select New Item. When the SMTP Recipients page appears, enter the following information:

- Address—Enter the Internet email address for the recipient. For example, *johnsmith@bigcompany.com*.
- Display Name—Enter the name of the recipient.

SNMP Notification

You can use SNMP to send an SNMP trap to an SNMP manager. Examples of SNMP managers include NetWare Management System (NMS), HP OpenView, IBM NetView, and CA Unicenter TNG.

To configure SNMP settings, right-click SNMP and select New Item. When the SNMP Recipient page appears, enter the following information:

- Manager Name—Enter the name of the SNMP Manager.
- Send Via—Select one of the following options:
 - IPX—If you select this, enter the 8-byte network address of the machine where the SNMP manager is located. Next, enter the 12-byte node address of the machine where the SNMP manager is located. Use this field for Novell networks.
 - IP—If you select this, enter the IP address of the machine where the SNMP manager is located. Use this field if you are running the TCP/IP stack.

Trouble Tickets

You can use Trouble Tickets to communicate information through printed documents.

To configure Trouble Ticket settings, right-click Trouble Ticket and select New Item. When the Trouble Ticket Recipients page appears, enter the following information:

- Company—Enter the name of your company.
- Location—Enter the appropriate location information.
- Header—Enter the information that will appear at the top of each Trouble Ticket.

To select recipients, highlight a printer and click Add. When prompted, enter a user name and password to connect to the printer device.

In addition to using Trouble Tickets to send printed notification messages, you can also use Trouble Tickets to send job logs. To do this, create a new item and select recipients. Then, in the Backup Manager, before you submit a job, click the Options icon or, from the Backup menu, select Options. When the Global Options dialog appears, click the Alert tab, place a check mark in the Attach Job Log box, and then click OK. After you submit the job, the job log is sent to the recipients you specified.

Event Priorities

All applications calling Alert specify one of the following event priorities:

- Critical
- Warning
- Informational

Message Testing

To test any of the Alert messaging functions, from the toolbar, select Send Test Message. You should test each setting after you configure it.

To avoid unnecessary alarm, inform Alert recipients that you are performing a test.

Alert Activity Details

To review alert activity, expand the Activity group and select one of the following:

- Alert Summary—Displays the status of Alert.
- Alert Event Log—Stores every message that Alert generates. It displays the date and time a particular event occurred, the applications that sent the alert, and the application that generated the event.
- Alert Activity Log—Stores a historical listing of alerts.

You can view, print, or clear these logs.

Appendix A: Backing Up and Restoring MSCS Clusters

BrightStor ARCserve Backup is a fault-tolerant application, able to handle failover in cluster environments. It protects cluster nodes by backing up and restoring cluster-specific resources such as shared disks, quorum resources, disk signatures, and cluster registry hives.

Microsoft Cluster Server (MSCS) allows multiple Windows based servers to connect with one another so that they appear, to network clients, to be a single, highly available system. This appendix provides an overview of BrightStor ARCserve Backup cluster support, which allows you to back up, protect, and recover cluster nodes, and offers failover capabilities.

With the MSCS support provided by BrightStor ARCserve Backup, you can:

- Back up and restore MSCS nodes
- Run on, and take advantage of, MSCS high availability features such as:
 - Job failover from one BrightStor ARCserve Backup node in a cluster to another node
 - High availability through automatic failover of BrightStor ARCserve Backup services from one node in a cluster to another node
 - Install BrightStor ARCserve Backup to an Active/Passive cluster as your SAN primary server and allow continuation of distributed server backups upon failover
 - Manageability through standard cluster management tools
- Provide disaster protection for MSCS nodes using the BrightStor ARCserve Backup Disaster Recovery Option. For more information, see the *Disaster Recovery Option Guide*.
- Back up and restore applications, such as MS SQL Server and MS Exchange Server, installed on MSCS clusters using the BrightStor ARCserve Backup agents. For more information on available agents, see the chapter “Customizing Your Storage Environment” in the *BrightStor ARCserve Backup Getting Started*.

How Backing Up and Restoring MSCS Nodes Works

With MSCS, all cluster configuration information resides in a Cluster Database. The Cluster Database resides in the Windows registry on each cluster node and contains information about all physical and logical elements in a cluster, including cluster objects, their properties, and cluster configuration data. The Cluster Database contains the cluster state data that is replicated among nodes to ensure that all nodes in the cluster have a consistent configuration. The Cluster Database registry is located in %WINDIR%\CLUSTER\CLUSDB.

The Cluster Database is part of the Windows System State. When the System State is selected for backup, the Cluster Database is automatically included in this backup. Therefore, the Cluster Database is included in the system state backup only if the node is a part of a cluster and the cluster service is running on that node. If the cluster service is not running, the Cluster Database is not backed up.

During restore operations, the Cluster Database is restored as a part of the System State. The Cluster Database cannot be selectively restored as a single entity; it must be restored as a System State session restore.

To back up and restore the Cluster Database, it is sufficient to back up and restore the Windows System State with the cluster service running.

When a cluster node is in Directory Service Restore mode, the Logon properties of the Cluster Service User Account must be set as Administrator to ensure that BrightStor ARCserve Backup can be accessed while in Windows Safe Mode.

Note: Do not select the BrightStor ARCserve Backup Database as a part of a regular restore operation when BrightStor ARCserve Backup is installed on a shared drive in a cluster failover environment. Restoring the database in this way can corrupt the job queue.

BrightStor ARCserve Backup on an MSCS Cluster

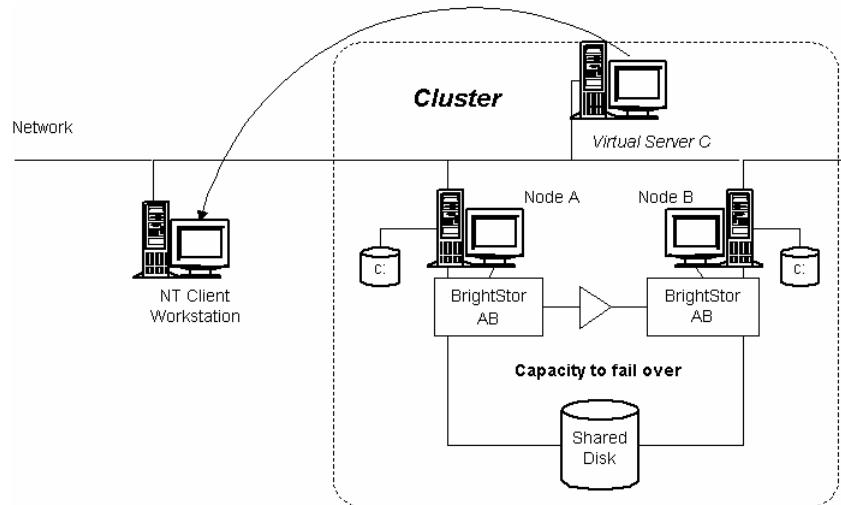
The following sections provide information about the advantages of using BrightStor ARCserve Backup server on a MSCS cluster.

Job Failover Capability

When the active BrightStor ARCserve Backup server in a cluster fails, BrightStor ARCserve Backup jobs are dispersed from the failed server to other BrightStor ARCserve Backup servers in the cluster. Once BrightStor ARCserve Backup services are resumed in another cluster node, any failed jobs from the previous server are rerun in a new cluster node.

You must install BrightStor ARCserve Backup on a shared disk to take advantage of this failover functionality. Job failover is supported in an Active/Passive configuration. Only in this configuration can the BrightStor ARCserve Backup job queue and database be shared among the nodes in a cluster.

When submitting jobs to the BrightStor ARCserve Backup installed in the cluster, you must use the virtual cluster node name as the BrightStor ARCserve Backup host name, rather than the physical node name.



When failover occurs, BrightStor ARCserve Backup recovers in another node, picks up the failed job from the BrightStor ARCserve Backup queue, and resumes the job from the volume where it failed.

When a failed BrightStor ARCserve Backup job is rerun on a new cluster node through the Checkpoints mechanism, the BrightStor ARCserve Backup job is restarted at the volume or disk where it failed.

High Availability Through Services Failover

If BrightStor ARCserve Backup is registered with the cluster, the Cluster Service provides BrightStor ARCserve Backup services with automatic failover capability. This failover solution improves BrightStor ARCserve Backup availability by allowing two or more servers to share the same virtual cluster node name and the same BrightStor ARCserve Backup installation on a shared hard disk within a cluster. The BrightStor ARCserve Backup services failover is supported in Active/Passive configuration.

Manageability through Cluster Resource DLL

BrightStor ARCserve Backup has its own cluster resource DLLs to extend Cluster Service capabilities to monitor and detect failures of BrightStor ARCserve Backup. The network name and IP address of a virtual server allows BrightStor ARCserve Backup to appear as a single system and take advantage of the capabilities of cluster management tools.

Installation Requirements for MSCS Cluster

The following sections provide information on the hardware and software requirements for installing BrightStor ARCserve Backup on a cluster.

Hardware Requirements

To use Microsoft Cluster Server, your system must meet the following hardware requirements:

- All cluster nodes should have identical hardware configurations (SCSI adapters, Fiber Adapters, RAID Adapters, network adapters, disk drives, for example).
- You should use separate SCSI/Fiber adapters for disk and tape devices.

Note: You should ensure that the hardware for all nodes is similar, if not identical, to make configuration easier and eliminate any potential compatibility problems.

Software Requirements

To use Microsoft Cluster Server, your system must meet the following software requirements:

- For Active/Passive job failover capability, BrightStor ARCserve Backup must be installed on a shared disk of the cluster with the same drive letter assigned to the volume from all nodes.
- Install the same BrightStor ARCserve Backup components on all nodes. You must configure each of these components in the same way.
- Use the same BrightStor ARCserve Backup Device Group Name for the same devices in BrightStor ARCserve Backup configuration on each node of the MSCS cluster. To ensure this, use the default Device Group Names assigned by BrightStor ARCserve Backup when you use Device Configuration.
- The BrightStor ARCserve Backup system accounts must be the same for all BrightStor ARCserve Backup servers installed on each of the cluster nodes.

Installation of BrightStor ARCserve Backup on a Cluster

The following sections provide information on installing and configuring BrightStor ARCserve Backup on a cluster, and how BrightStor ARCserve Backup can be installed on a MSCS node in a cluster.

Private Disks on Cluster Nodes Installation

BrightStor ARCserve Backup job failover is not supported on the private disks of cluster nodes. This configuration does not provide High Availability for BrightStor ARCserve Backup services. This installation is similar to normal BrightStor ARCserve Backup installation. See the *Getting Started* for installation information.

Install BrightStor ARCserve Backup on a Cluster Shared Disk

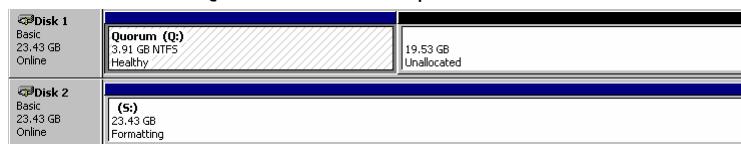
BrightStor ARCserve Backup supports job failover in this configuration. All BrightStor ARCserve Backup installations in the cluster share the same job files and BrightStor ARCserve Backup Database.

Important! When you configure file system devices in a cluster environment, you must locate these devices only on shared disks to allow them to be available after failover.

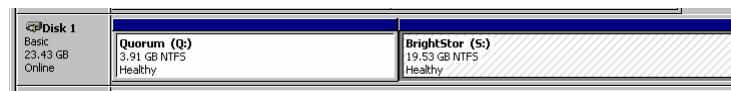
The following steps allow you to install BrightStor ARCserve Backup on a cluster shared disk:

1. Select the disk on which you want to install BrightStor ARCserve Backup and assign the same drive letter to this disk from all of the nodes in the cluster.
2. Create a temporary cluster group (for example, *Temporary Group*).
3. Create a physical disk resource in the temporary cluster group that points to the disk location where you are installing BrightStor ARCserve Backup (for example, S:). To install BrightStor ARCserve Backup in the same disk as the cluster Quorum (in the example, the cluster Quorum is in disk Q:), you need not create a new physical disk resource. Use the Disk Q: resource in Cluster Group and move it to *Temporary Group*.

The following illustrates a disk layout in which BrightStor ARCserve Backup and the cluster Quorum are on separate disks:

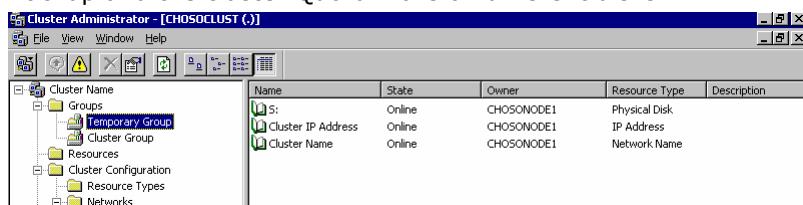


The following illustrates a disk layout in which BrightStor ARCserve Backup and the cluster Quorum are on the same disk:



4. Move the Cluster IP Address and Cluster Name resources from the *Cluster Group* to the *Temporary Group*. You may have to take both the groups offline to perform this operation.

The following illustrates the *Temporary Group* when BrightStor ARCserve Backup and the cluster Quorum are on different disks:



5. Move the *Temporary Group* to Node1
6. Install BrightStor ARCserve Backup components on node 1 in the S: volume.
7. Configure the Tape/Changer Devices on node 1.

8. Click Start, select Control Panel, select Administrative Tools, and select Services. In the Services dialog, change the Startup Type of the following services to Manual:

- CA- BrightStor ARCserve Backup Database Engine
- CA- BrightStor ARCserve Backup Domain Server
- CA- BrightStor ARCserve Backup Job Engine
- CA- BrightStor ARCserve Backup Message Engine
- CA- BrightStor ARCserve Backup Service Controller
- CA- BrightStor ARCserve Backup Tape Engine
- CA-Remote Procedure Call Server

In addition, you must stop these services if any are running.

9. Move the *Temporary Group* to node 2.
10. Install BrightStor ARCserve Backup components on node 2 in the S: volume.
11. Configure the Tape/Changer Devices on node 2. Ensure that this configuration is exactly the same as the configuration on node 1.
12. Click Start, select Control Panel, select Administrative Tools, and select Services. In the Services dialog, change the Startup Type of the following services to Manual:

- CA- BrightStor ARCserve Backup Database Engine
- CA- BrightStor ARCserve Backup Domain Server
- CA- BrightStor ARCserve Backup Job Engine
- CA- BrightStor ARCserve Backup Message Engine
- CA- BrightStor ARCserve Backup Service Controller
- CA- BrightStor ARCserve Backup Tape Engine
- CA-Remote Procedure Call Server

In addition, you must stop these services if any are running.

Note: If the Startup Type for these services is not set to Manual, service startup errors are generated in the system log of the passive nodes in the server. These errors occur because the cluster shared disks on which BrightStor ARCserve Backup was installed are not available.

Configure BrightStor ARCserve Backup for High Availability

The following steps provide an overview of the procedure to configure BrightStor ARCserve Backup for MSCS:

Note: You must install BrightStor ARCserve Backup on shared disks of a cluster before performing these steps.

1. Register BrightStor ARCserve Backup with MSCS.
2. Register the BrightStor ARCserve Backup registry hive for replication.
3. Move the Cluster IP Address, Cluster Name, and Shared Disk resources from the *Temporary Group* to the BrightStor AB Group.
4. Set up dependencies between BrightStor ARCserve Backup resources groups.
5. Bring the BrightStor ARCserve Backup cluster group online.
6. Give ownership of the *Temporary Group* to node 1.

The following sections provide detailed information regarding these procedures.

Register BrightStor ARCserve Backup with MSCS

During BrightStor ARCserve Backup installation, the setup program copies ascluster.dll and asclusterex.dll to the %SystemRoot%\System32 directory.

Run the following commands (you must include the quotes as shown in the commands) in any node of the cluster to create the resource type, resource, and group for BrightStor ARCserve Backup:

```
cluster resourcetype "BrightStorBKP" /create /dllname:ascluster.dll
cluster GROUP "BrightStor AB Group" /create
cluster resource "BrightStor AB" /create /group:"BrightStor AB Group"
/type:"BrightStorBKP"
```

Note: These commands must be entered exactly as shown to properly register the product with the cluster.

Register BrightStor ARCserve Backup Registry Hive for Replication

To register the BrightStor ARCserve Backup registry hive for replication, perform the following procedure:

1. Add a new resource to the BrightStor AB Group with the following entries:
 - Resource Name: BrightStor BKP Registry
 - Resource Type: Generic Service
 - Group: BrightStor AB Group
2. Specify the generic service name as *castapeengine*.
3. Add the following registry keys:

32-bit Windows Platforms

SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base

64-bit Windows Platforms

SOFTWARE\Wow6432Node\ComputerAssociates\BrightStor ARCserve Backup\Base

If you are installing BrightStor ARCserve Backup to an Active/Passive cluster set that will act as the primary SAN server, add the following registry keys in addition to the above registry key, after you have assigned SAN Distributed servers to the primary SAN server:

32-bit Windows Platforms

SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\ELODistributedServers
SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\ProductsConfigInfo

64-bit Windows Platforms

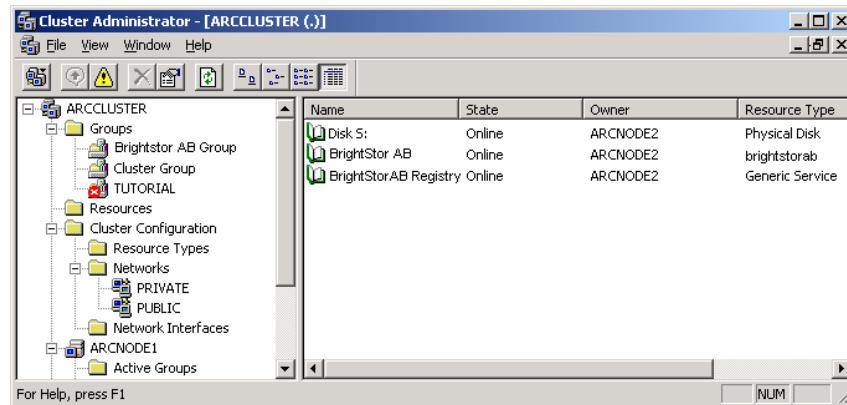
SOFTWARE\Wow6432Node\ComputerAssociates\BrightStor ARCserve Backup\ELODistributedServers
SOFTWARE\Wow6432Node\ComputerAssociates\BrightStor ARCserve Backup\ProductsConfigInfo

This guarantees the consistency of the data stored in the BrightStor ARCserve Backup registry hive.

Move the Cluster IP Address, Cluster Name, and Shared Disk from the Temporary Group

To move the cluster IP address, cluster name, and shared disk from the temporary group, use the following steps.

1. Move the resources Cluster Name, Cluster IP Address, and the Shared Disk S: resources from the *Temporary Group* to the BrightStor *AB Group*.
2. Delete the *Temporary Group*. The BrightStor *AB Group* should look similar to the following:



Set Up Dependencies Between BrightStor ARCserve Backup Groups

Set up dependencies between resources in the BrightStor *AB Group* according to the following table:

Group Member	Dependency
BrightStor AB	<ul style="list-style-type: none">■ BrightStor ARCserve Backup installation disk■ Cluster Name■ Cluster IP
BrightStor BKP Registry	<ul style="list-style-type: none">■ BrightStor ARCserve Backup installation disk■ BrightStor AB
Cluster Name	<ul style="list-style-type: none">■ BrightStor ARCserve Backup installation disk■ Cluster IP Address
Cluster IP Address	BrightStor ARCserve Backup installation disk
BrightStor ARCserve Backup installation disk	

Bring the BrightStor ARCserve Backup Cluster Group Online

You must bring the BrightStor ARCserve Backup cluster online. Use the Cluster Name name to connect to the BrightStor ARCserve Backup server. This always connects you to the node running the BrightStor ARCserve Backup server.

You can submit your critical backup jobs in the BrightStor ARCserve Backup server with the assurance that if the BrightStor ARCserve Backup server fails, the jobs fail over automatically to another node in the cluster.

Note: When BrightStor ARCserve Backup jobs fail over to new cluster nodes, the jobs are restarted at the volumes or disks where they failed.

Uninstall BrightStor ARCserve Backup from a Cluster

To uninstall BrightStor ARCserve Backup resources from the cluster, perform the following procedure:

1. Note the name and path of the BrightStor ARCserve Backup home directory and copy all of the following dll files from the BrightStor ARCserve Backup home directory to another location in the shared disk:

Note: Based upon your system's BrightStor ARCserve Backup configuration, not all of the DLLs in the following list will be present in your installation. You may find it easier to copy all of the DLLs from the BrightStor ARCserve Backup home directory.

- ASDCEN.dll
- ASetGUI.dll
- ASetupres.dll
- brand.dll
- ChgrGUI.dll
- cstool.dll
- cheyprod.dll
- DkStgOptGUI.dll
- DRGUI.dll
- ELOGUI.dll
- EntOptGUI.dll
- HBMINST.dll
- imagGUI.dll
- libetpki.dll
- OchgGUI.dll
- pthread.dll
- RaidGUI.dll
- SboGUI.dll
- SetupCLS.dll
- TngfGUI.dll
- NAS Option\brand.dll
- NAS Option\NASagGUI.dll
- NAS Option\setupcls.dll

2. Remove all dependencies from all the resources in the BrightStor *AB Group*, with one exception - the Cluster IP Address should continue to be a dependency of the Cluster Name.
3. Move the Cluster Name, Cluster IP, and Shared Disk resources to the *Cluster Group*.
4. Make sure that BrightStor ARCserve Backup resources are offline.
5. Delete all resources in the *BrightStor AB Group*.
6. Run the following commands:

```
cluster resource "BrightStor AB" /delete
cluster GROUP "BrightStor AB Group" /delete
cluster resourcetype "BrightStorBKP" /delete /type
```
7. Shut down all secondary nodes.
8. Uninstall all BrightStor ARCserve Backup and all BrightStor ARCserve Backup options from the primary node.
9. Move the shared disk to the secondary node.
10. Create a directory named after the BrightStor ARCserve Backup in the shared disk, if one does not exist already.
11. Move the files you copied in step 1 of this procedure to this directory.
12. Uninstall all BrightStor ARCserve Backup and all BrightStor ARCserve Backup options.
13. Start each individual secondary node and remove BrightStor ARCserve Backup and options from each node using the above procedure.
14. After you uninstall the last node, delete the DLL files (see Step 11) that you copied to the BrightStor ARCserve home directory, and then delete the BrightStor ARCserve Backup home directory.

You have successfully uninstalled BrightStor ARCserve Backup from a cluster.

MSCS Cluster Server Configuration in a SAN Environment

When you are configuring an MSCS cluster server to function in SAN environment, the following configuration considerations apply:

- MSCS cluster server functioning as a SAN primary server—To configure the cluster server as the SAN primary server in an Active/Passive cluster, configure the cluster server virtual computer name as the SAN primary server.
- MSCS cluster server functioning as a SAN distributed server—To configure the cluster server as a SAN distributed server in an Active/Passive cluster, configure the cluster server virtual computer name as a SAN distributed server.

Disaster Protection for MSCS Nodes

If you install the BrightStor ARCserve Backup Disaster Recovery Option and a disaster occurs, you can take advantage of fast and automated recovery of your cluster nodes. See the *Disaster Recovery Option Guide* for more information on using this option to protect your cluster nodes.

Application Level Backup and Restore on MSCS

BrightStor ARCserve Backup offers fast and intelligent backup and restore operations of applications such as Microsoft SQL Server and Microsoft Exchange Server installed on a cluster. For more information on available agents, see the chapter “Customize Your Storage Environment” in the *Getting Started*. For information on backing up and restoring applications installed on a cluster, see the corresponding BrightStor ARCserve Backup agent guide. For example, for information on backing up and restoring a Microsoft SQL Server, see the *Agent for Microsoft SQL Server Guide*.

BrightStor ARCserve Backup Cluster Support FAQ

The following sections provide answers to frequently asked questions about BrightStor ARCserve Backup cluster support.

How do I stop BrightStor ARCserve Backup services in a cluster node without failover occurring?

To shut down any BrightStor ARCserve Backup services for maintenance or configuration changes when you do not want BrightStor ARCserve Backup to fail over to another node, perform the following procedure:

1. Right-click the BrightStor AB resource, select Properties, and select Advanced.
2. Click the Do Not Restart button.
3. Perform the same steps for the BrightStor BKP Registry resource.

This enables you to stop the BrightStor ARCserve Backup engines without failing them over to other nodes.

Note: To restore failover for these services, right-click the BrightStor AB resource, select Properties, Advanced, and click the Restart button. Then, perform the same steps for the BrightStor BKP Registry resource.

How can I reliably back up MSCS Nodes with BrightStor ARCserve Backup installed on remote machines?

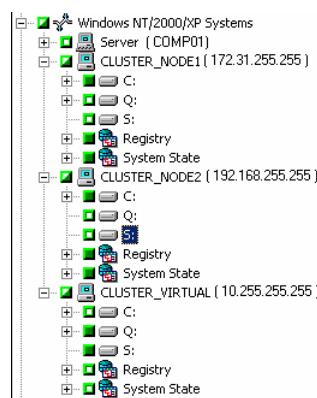
The BrightStor ARCserve Backup Windows File System Agent must be installed on each node of the cluster.

The challenge is to back up the shared disk reliably even if cluster shared disks fail over from one node to another. This can be done as follows:

1. Back up each of the nodes with their private disks, using the hostname when submitting the backup jobs.

Note: Because shared disks can move from one node to another and there is no reliable way of predicting which node will own the shared disks during backup, do **not** back up shared disks using this name.

2. Back up the shared disks, using the cluster virtual name when submitting the backup job. If the shared disks fail over from one node to another, the cluster virtual node name fails over with it, so that BrightStor ARCserve Backup always backs up the cluster shared disks. To ensure this, set up the cluster dependencies so that the cluster name and cluster shared disks fail over at the same time.



Note: To provide disaster protection for your cluster nodes, you must perform a full backup of each node.

When my jobs fail over from one cluster node to another, I receive messages such as "Failed to logon to database." How do I resolve this problem?

You can resolve this problem by ensuring that you use the cluster virtual name to connect to the server when submitting jobs to a BrightStor ARCserve Backup server configured for job failover.

When my jobs fail over from one cluster node to another, I receive messages such as "Please mount media XYZ, 1234." How do I resolve this problem?

If you select a backup media on the Destination tab of the Backup Manager when submitting a backup job, the job backs up only to that specific media. If the backup device is not shared among the cluster nodes, the specific media is not available after failover. As a result, the backup operation fails. To resolve this problem, select Destination at Group Level in the Backup Manager when submitting backup jobs.

This problem does not occur if you are backing up to a shared device.

Appendix B: Supporting NEC CLUSTERPRO/ExpressCluster Clusters

BrightStor ARCserve Backup is a fault-tolerant application, capable of handling failover and providing backup and restore capabilities for data residing in cluster environments.

NEC Cluster Server (CLUSTERPRO/ExpressCluster) allows multiple Windows based servers to connect with one another so that they appear to network clients to be a single, highly available system. BrightStor ARCserve Backup supports NEC CLUSTERPRO/ExpressCluster version 7.0 SE and LE.

BrightStor ARCserve Backup support for NEC CLUSTERPRO/ExpressCluster offers the following advantages:

- Ability to run on NEC CLUSTERPRO/ExpressCluster and take advantage of high availability features such as:
 - Automatic failover of BrightStor ARCserve Backup services from one node in a cluster to another node
 - Ability to fail jobs over from one BrightStor ARCserve Backup node in a cluster to another node when BrightStor ARCserve Backup failover occurs
 - Ability to restart jobs after failover
 - Ability to install BrightStor ARCserve Backup on an Active/Passive cluster as the SAN primary server to allow the continuation of distributed server backup operations after failover
 - Ability to use NEC cluster management tools
- Data backup and restore functionality for NEC cluster nodes.
- Disaster protection for NEC CLUSTERPRO/ExpressCluster nodes through the Disaster Recovery Option. For more information, see the *Disaster Recovery Option Guide*.

Installation in NEC CLUSTERPRO/ExpressCluster Environments

BrightStor ARCserve Backup can be installed and configured in a cluster environment either as a CLUSTERPRO/ExpressCluster-aware application or as a CLUSTERPRO/ExpressCluster unaware application.

CLUSTERPRO/ExpressCluster-unaware Application

There are no special requirements to install or configure BrightStor ARCserve Backup in this configuration. See the BrightStor ARCserve Backup product documentation for installation and configuration information.

CLUSTERPRO/ExpressCluster-aware Application

The following sections provide information relating to the installation and configuration of BrightStor ARCserve Backup as a CLUSTERPRO/ExpressCluster-aware application. Installing BrightStor ARCserve Backup as a CLUSTERPRO/ExpressCluster-aware application provides the following benefits:

- Ability to fail jobs over for BrightStor ARCserve Backup: When the active BrightStor ARCserve Backup server in a cluster fails, BrightStor ARCserve Backup jobs are moved from the failed server to another BrightStor ARCserve Backup server in the cluster. Once BrightStor ARCserve Backup services are resumed on another cluster node, any jobs that were active on the failed server are rerun on the cluster node to which the failover occurred.

When a failed BrightStor ARCserve Backup job is rerun on a new cluster node using the checkpoints mechanism, the job is restarted at the volume or disk on which it failed.

Note: This applies only to backup jobs configured to run without using the BrightStor® ARCserve® Backup Client Agent for Windows.

You must install BrightStor ARCserve Backup on a switched disk to take advantage of this failover functionality. Job failover is supported only in the Active/Passive configuration to allow the BrightStor ARCserve Backup job queue and database to be shared among the nodes in a cluster.

When submitting jobs to BrightStor ARCserve Backup installed in a cluster, you must use the virtual computer name as the BrightStor ARCserve Backup host name, rather than the physical node name.

- High availability for BrightStor ARCserve Backup through services failover: If BrightStor ARCserve Backup is registered with the NEC cluster, the Cluster Service provides BrightStor ARCserve Backup services with automatic failover, improving BrightStor ARCserve Backup availability by allowing two or more servers to share the same virtual computer name and the same BrightStor ARCserve Backup installation on a shared hard disk within a cluster. The BrightStor ARCserve Backup services failover is supported in the Active/Passive configuration.
- Ability to use cluster management tools: The virtual computer name and Floating IP address of a virtual server allows BrightStor ARCserve Backup to appear as a single system and take advantage of NEC cluster management tools.

CLUSTERPRO/ExpressCluster-aware Installation Requirements

The following sections provide the hardware and software requirements to install BrightStor ARCserve Backup on cluster nodes.

Hardware Requirements

You must meet the following hardware requirements to install BrightStor ARCserve Backup as a CLUSTERPRO/ExpressCluster-aware application:

- Ensure that all cluster nodes have identical hardware configurations (for example, SCSI adapters, Fiber Adapters, RAID Adapters, network adapters, and disk drives).
- Use separate SCSI/Fiber adapters for disk and tape devices.

Note: Ensure that the hardware for all nodes is similar, if not identical, to make configuration easier and eliminate any potential compatibility problems.

Software Requirements

You must satisfy the following software requirements to install BrightStor ARCserve Backup as a CLUSTERPRO/ExpressCluster-aware application:

- Install BrightStor ARCserve Backup on a switched disk of the cluster with the same drive letter assigned to the volume from all nodes for Active/Passive job failover capability.
- Install the same BrightStor ARCserve Backup components on all nodes. You must configure each of these components in the same way.
- Use the same BrightStor ARCserve Backup Device Group Name for the same devices in the BrightStor ARCserve Backup configuration on each node of the cluster. To ensure this, use the default Device Group Names assigned by BrightStor ARCserve Backup when you use Device Configuration.
- Use the same BrightStor ARCserve Backup system accounts for all BrightStor ARCserve Backup servers installed on each of the cluster nodes.
- Ensure that the Cluster nodes are in the same domain during the installation.

Uninstall BrightStor ARCserve Backup from a Cluster

To uninstall BrightStor ARCserve Backup from a cluster, perform the following procedure:

1. Identify the path of the BrightStor ARCserve Backup home directory and copy the following files from the BrightStor ARCserve Backup home directory to another location in the switched disk:
 - ASDCEN.dll
 - ASetGUI.dll
 - ASetupres.dll
 - brand.dll
 - ChgrGUI.dll
 - cstool.dll
 - cheyprod.dll
 - DkStgOptGUI.dll
 - DRGUI.dll
 - ELOGUI.dll
 - EntOptGUI.dll
 - HBMINST.dll
 - imagGUI.dll
 - libetpki.dll
 - OchgGUI.dll
 - pthread.dll
 - RaidGUI.dll
 - SboGUI.dll
 - SetupCLS.dll
 - TngfGUI.dll
 - NAS Option\brand.dll
 - NAS Option\NASagGUI.dll
 - NAS Option\setupcls.dll

Note: Due to differences between systems, not all of the listed DLLs are present in all installations. You may find it easier to copy all of the DLLs from the BrightStor ARCserve Backup home directory.

2. From the ExpressCluster Manager, stop BABGroup and change the group properties as follows:

- Delete the registry key BrightStor ARCserve Backup Base from BABGroup.
- Delete the BrightStor ARCserve Backup service start command from start.bat.
- Delete the BrightStor ARCserve Backup service stop command from stop.bat.

3. Start BABGroup on the primary node.
4. Uninstall BrightStor ARCserve Backup and all BrightStor ARCserve Backup options from the primary node.
5. From the ExpressCluster Manager, move BABGroup to another cluster node.
6. Temporarily recreate the BrightStor ARCserve Backup home directory on the switched disk, if necessary.
7. Copy the DLL files that you copied in Step 1 of this procedure to the BrightStor ARCserve Backup home directory.
8. Uninstall BrightStor ARCserve Backup and all BrightStor ARCserve Backup options from the cluster node.
9. Repeat these steps (beginning with the step in which you moved BABGroup to another cluster node) on all secondary nodes.
10. After you uninstall the last node, delete the DLL files (see Step 7) that you copied to the BrightStor ARCserve Backup home directory, and then delete the BrightStor ARCserve Backup home directory.

You have successfully uninstalled BrightStor ARCserve Backup from a cluster.

Install and Configure BrightStor ARCserve Backup as a Cluster-Aware Application

BrightStor ARCserve Backup supports job failover when installed on switched disks in a cluster. All BrightStor ARCserve Backup installations in the cluster share the same job files and the BrightStor ARCserve Backup database.

Important! When you configure file system devices in a cluster environment, you must locate these devices on shared or mirrored disks to allow them to be available after failover.

To install BrightStor ARCserve Backup on a cluster switched disk and configure it as a highly available Active/Passive installation, perform the following procedure:

1. Identify the volume on a switched disk (for example, S:\) on which to install BrightStor ARCserve Backup and identify the virtual computer name and IP Address to be used for the highly available BrightStor ARCserve Backup configuration.
2. From the ExpressCluster Manager, create the highly available group BABGroup on the primary cluster node. Ensure that this group includes the following resources:
 - Switched Disk resource (for example, shared disk S:).
 - Virtual computer name (for example, BABVirServer).
 - Floating IP Address in the same subnet as the public or physical IP of the cluster nodes.
 - Servers for group starting (for example, node1, node2).
3. From the ExpressCluster Manager, start BABGroup on the primary cluster node.
4. Install BrightStor ARCserve Backup on the primary cluster node. See the section **Install BrightStor ARCserve Backup on Cluster Nodes** in this document for this procedure.
5. From the ExpressCluster Manager, move BABGroup to another cluster node.
6. Repeat the preceding two steps on the other cluster nodes. Ensure that you install and configure BrightStor ARCserve Backup identically on all cluster nodes.
7. From the ExpressCluster Manager, stop BABGroup.
8. Add the following registry key to the registry key list for BABGroup:

`HKEY_LOCAL_MACHINE\SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\Base`

In addition, if you are installing BrightStor ARCserve Backup in an Active/Passive cluster set that acts as a primary or distributed SAN server, add the following registry keys after you assign SAN distributed servers to the primary SAN server:

`SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\ELODistributedServers`
`SOFTWARE\ComputerAssociates\BrightStor ARCserve Backup\ProductsConfigInfo`

9. Add the following commands to the BABGroup start script (start.bat) for normal and failover conditions. You must add these commands in the following order:

- armload CATIRPC /S /R 3 /FOV CATIRPC
- armload CASSvcControlSvr /S /R 3 /FOV CASSvcControlSvr
- armload CASUnivDomainSvr /S /R 3 /FOV CASUnivDomainSvr
- armload CASDBEngine /S /R 3 /FOV CASDBEngine
- armload CASMsgEngine /S /R 3 /FOV CASMsgEngine
- armload CASTapeEngine /S /R 3 /FOV CASTapeEngine
- armload CASJobEngine /S /R 3 /FOV CASJobEngine

10. Add the following commands to the BABGroup stop script (stop.bat) for normal and failover conditions. You must add these commands in the following order.

If you are using NEC CLUSTERPRO/ExpressCluster LE, add the following commands:

- armsleep 2
- armkill CASTapeEngine
- armkill CASJobEngine
- armkill CASDBEngine
- armkill CASMsgEngine
- armkill CASUnivDomainSvr
- armkill CASSvcControlSvr
- armkill CATIRPC

If you are using NEC CLUSTERPRO/ExpressCluster SE, add the following commands:

- armkill CASTapeEngine
- armkill CASJobEngine
- armkill CASDBEngine
- armkill CASMsgEngine

- armkill CASUnivDomainSvr
- armkill CASSvcControlSvr
- armkill CATIRPC

11. From the ExpressCluster Manager, start BABGroup.
12. Enable the Retry crashed jobs after Job Engine restart option in the Server Admin Job Engine.

BrightStor ARCserve Backup is now configured as a highly available application in the NEC CLUSTERPRO/ExpressCluster environment.

Install BrightStor ARCserve Backup on Cluster Nodes

To install BrightStor ARCserve Backup on the primary node of the cluster, perform the following procedure:

1. Enter the appropriate licensing information in the Installation wizard.
2. Install the BrightStor ARCserve Backup server and other base options on the switched disk (S:).
3. Install the BrightStor ARCserve Backup Client Agent for Windows on the local disk.
4. Choose the Standard database.
5. During Domain Configuration, perform one of the following procedures:
 - To make the cluster server act as the BrightStor ARCserve Backup domain server, select the option Make this server a BrightStor ARCserve Backup domain server, enter the domain name in the BrightStor ARCserve Backup Domain Name field, and enter the virtual computer name of BABGroup (for example, BABVirServer) in the Secondary Server Name field.
 - To make the cluster server act as a member of a domain in which the domain server is outside the cluster, select the option Make this server a member of a BrightStor ARCserve Backup domain, enter the domain name, and enter the primary and secondary server names for the domain you want the cluster server to join.
6. Make a note of the password provided for caroot to ensure that you set the same password when installing on all other cluster nodes.
The username and password used for the BrightStor ARCserve Backup system account should be identical and valid on all cluster nodes.
7. Configure all cluster nodes in an identical manner.

8. From the Windows Service Control manager, stop the following services and change their Startup type to Manual.
 - CA BrightStor Service Controller
 - CA Remote Procedure Call Server
 - CA BrightStor Domain Server
 - CA BrightStor Database Engine
 - CA BrightStor Message Engine
 - CA BrightStor Tape Engine
 - CA BrightStor Job Engine

Note: If the Startup type for these services is not set to Manual, NEC CLUSTERPRO/ExpressCluster does not start these services with armload and cannot stop them with armkill. You must perform this task on each node in the cluster.

Cluster Server Configuration in a SAN Environment

When you are configuring a CLUSTERPRO cluster server to function in SAN environment, the following configuration considerations apply:

- CLUSTERPRO cluster server functioning as a SAN primary server-To configure the cluster server as the SAN primary server in an Active/Passive cluster, configure the cluster server virtual computer name as the SAN primary server.
- CLUSTERPRO cluster server functioning as a SAN distributed server-To configure the cluster server as a SAN distributed server in an Active/Passive cluster, configure the cluster server virtual computer name as a SAN distributed server.

BrightStor ARCserve Backup Cluster Usage

The following list provides information to consider when using BrightStor ARCserve Backup cluster support:

- Ensure that the BrightStor ARCserve Backup cluster group is on line.
- Use the virtual server name or FIP to connect to the BrightStor ARCserve Backup server. This always connects you to the node running the BrightStor ARCserve Backup server and ensures that, if the BrightStor ARCserve Backup server fails, the jobs fail over automatically to another node in the cluster.

Note: When BrightStor ARCserve Backup jobs fail over to new cluster nodes, the jobs are restarted from the beginning.

BrightStor ARCserve Backup Command Line Considerations

To use the high availability functionality of BrightStor ARCserve Backup installed in the Active/Passive configuration, use the virtual server name when executing BrightStor ARCserve Backup commands, as in the following examples:

```
#ca_backup -cahost BABVirServer ...  
#ca_restore -cahost BABVirServer ...
```

General Considerations

The following provides general information to consider when using BrightStor ARCserve Backup cluster support:

- If your jobs fail over from one cluster node to another with the message "Failed to logon to database," ensure that you use the virtual computer name to connect to the server when submitting jobs to a BrightStor ARCserve Backup server configured for job failover.
- If your jobs fail over from one cluster node to another with the message "Please mount media XYZ, 1234," ensure that you select your backup job destination at Group Level in the Backup Manager when submitting backup jobs. If you select a backup media on the Destination tab of the Backup Manager when submitting a backup job, the job backs up only to that specific media. If the backup device is not shared among the cluster nodes, the specific media is not available after failover and the backup operation fails.

This does not occur if you back up your data to a shared device.

- If the Backup or Restore Manager does not respond, open a new Backup or Restore Manager. The initial manager may have become invalid after BrightStor ARCserve Backup failover.

Note: Do not select the BrightStor ARCserve Backup database as a part of a regular restore operation when BrightStor ARCserve Backup is installed on a shared drive in a cluster failover environment. Restoring the database in this way can corrupt the job queue.

- To back up the registry and system state information for cluster nodes, install and use the Client Agent for Windows. You must use the physical node names of the cluster nodes to browse and create these backup jobs.
- If you manually stopped and restarted the CA Remote Procedure Call service (CATIRPC) without using the cstop and cstart commands, the service cannot communicate with its port assignments properly, preventing user accounts with caroot equivalence from logging in to the BrightStor ARCserve Backup domain. To address this problem, run the cstop command and then run the cstart command to enable the service to communicate properly and allow user accounts with caroot equivalence to log in to the BrightStor ARCserve Backup domain.
- During failover of a BrightStor ARCserve Backup failover group, a message indicating that the disk partition was forcibly disconnected may appear in the CLUSTERPRO Manager. This message can be safely ignored.

Shut Down and Restore BrightStor ARCserve Backup Services

To shut down any BrightStor ARCserve Backup services for maintenance or configuration changes without causing BrightStor ARCserve Backup to fail over to another node, perform the following procedure:

1. Click Start, select All Programs, and select NEC ExpressCluster Server.
2. Select Task Manager to open the NEC Cluster TaskManager.
3. Select the service you want to control, right-click, and select Stop Monitoring from the pop-up menu.

This allows you to stop the BrightStor ARCserve Backup engines without failing them over to other nodes. Those services whose Startup type was changed to Manual during installation are controlled and monitored by the NEC cluster. If you do not perform this procedure and you stop one of these services manually (or if a service fails or stops because of unexpected errors) the NEC cluster monitors this change and restarts the service quickly.

To restore failover and monitoring for BrightStor ARCserve Backup services, perform the following procedure:

1. Click Start, select All Programs, and select NEC ExpressCluster Server.
2. Select Task Manager to open the NEC Cluster TaskManager.

Select the service you want to control, right-click, and select Start Monitoring from the pop-up menu.

Back Up with BrightStor ARCserve Backup Installed on Remote Machines

To back up NEC CLUSTERPRO/ExpressCluster nodes with BrightStor ARCserve Backup, the Client Agent for Windows must be installed on each node of the cluster. To back up the switched disk reliably, even if cluster switched disks fail over from one node to another, perform the following procedure:

1. Back up each of the nodes with their private disks. You must use the physical server name when submitting the backup jobs.
Note: To provide disaster protection for your cluster nodes, you must perform a full backup of each node.
2. Back up the switched disks. You must use the virtual computer name when submitting the backup job. If the switched disks fail over from one node to another, the virtual computer name fails over with it, so that BrightStor ARCserve Backup always backs up the cluster switched disks.
Note: Because switched disks can move from one node to another and there is no reliable way of predicting which node will own the switched disks during backup, do not back up the switched disks using the physical server name.

Appendix C: Using Command Line Utilities

The BrightStor ARCserve Backup command line utilities let you directly control all operations that can be performed by a BrightStor ARCserve Backup server from the Command Prompt window. Using the command line utilities provides an alternative method of accessing almost all of the operations available from the BrightStor ARCserve Backup manager interface. The command line also offers the added benefit of creating batch files that can be automatically executed by other programs.

To use the command line utilities, the complete BrightStor ARCserve Backup system must be installed on the server and you must create BrightStor ARCserve Backup equivalency to caroot. By default, BrightStor ARCserve Backup creates caroot equivalency for the administrator user on the primary domain server, secondary domain server, and all BrightStor ARCserve Backup domain member servers during setup. However, it does not create this equivalency for any other users on the secondary domain servers and all other domain member users. As a result, you must create this equivalency prior to using the command line utilities in a BrightStor ARCserve Backup domain. For more information about caroot and establishing equivalence, see `ca_auth` and `caroot` Equivalence in this appendix.

As an alternative to using the command line, a command you can enter can also be submitted using the Job Scheduler Wizard. Using the Job Scheduler Wizard provides these benefits:

- The job appears in the Activity Log.
- You can submit repeating jobs.

For more information on submitting jobs using the Job Scheduler Wizard, see Job Scheduler Wizard in the chapter “Customizing Your Jobs.”

Note: BrightStor ARCserve Backup command line utilities do not differentiate between WORM (Write Once Read Many) media and regular tapes. We recommend that you avoid using the command line with WORM media, or use it with extra caution.

Available Command Line Utilities

The following table provides available command line utilities with a description of their basic features:

Command Line Utility	Equivalent Manager	Use
Authsetup	None	Use to initialize the BrightStor ARCserve Backup authentication database on the primary and secondary BrightStor ARCserve Backup domain servers. You can also use this utility to set the password for caroot, create equivalences for the current OS user on all primary, secondary, and member servers of a BrightStor ARCserve Backup domain, and to create equivalences for the BrightStor ARCserve Backup System Account user on all primary, secondary, and member servers of a BrightStor ARCserve Backup domain.
bab	None	Use to control BrightStor ARCserve Backup services.
ca_auth	None	Use to create new users, delete users, change user passwords, and establish authentication equivalencies for a particular user.
ca_backup	Backup Manager	Use to submit backup jobs to the queue and set all associated options, filtering, GFS rotation, and rotation jobs.
ca_dbmgr	Database Manager and Media Pool Manager	Use to maintain the BrightStor ARCserve Backup database, including configuring media pools, querying database information, and setting database options.
ca_devmgr	Device Manager	Use to control storage devices, including formatting or erasing media in drives or changers.
ca_jobsecmgr	None	Use to make a global username or password change for all the jobs in the Job Queue.

Command Line Utility	Equivalent Manager	Use
ca_log	Report Manager	Use to view and maintain logs.
ca_merge	Merge Utility	Use to merge database information from backup media into the database.
ca_mmo	MM Admin	Use to protect, control, and manage your media resources. Note: To use this command, you must install the BrightStor ARCserve Backup Enterprise Module.
ca_qmgr	Job Status Manager	Use to monitor and control jobs submitted to the job queue.
ca_restore	Restore Manager	Use to submit restore jobs and set all associated options.
ca_scan	Scan Utility	Use to report information about one or more backup sessions on media.
cabatch	None	Use to submit jobs to a local or remote BrightStor ARCserve Backup job queue using an external script file, delete jobs from the job queue, and modify the execution times for all of the jobs in the job queue.
CAReports		Use to generate reports in BrightStor ARCserve Backup Report Writer. Provides options for running the report in silent mode and sending an alert using the BrightStor ARCserve Backup Alert Manager.
pfc	None	Use to run vital checks on the BrightStor ARCserve Backup server and agents to detect conditions that may cause backup jobs to fail.
tapecopy	None	Use to copy two different types media, or make session level tape copies.
tapecomp	None	Use to compare media to media.

Note: You cannot use the command line to control the BrightStor ARCserve Backup Optical Library Option..

Usage, Syntax, and Argument Information

Most features available from the various BrightStor ARCserve Backup GUIs are also available from the command line. The following sections provide details about the arguments, switches, and options available for each of the commands.

The syntax and use associated with each utility is displayed when the name of the utility is entered at the server console. For more detailed information including arguments and switches, you can enter the utility name followed by an argument.

Enclose all arguments containing spaces in quotes (""). For example:

```
ca_backup -source xyz -filesystem "c:\Program Files"
```

Authsetup Command

Authsetup lets you initialize the BrightStor ARCserve Backup authentication database on the primary and secondary BrightStor ARCserve Backup domain servers. You can also use it to set the password for caroot, create equivalences for the current operating system user on all primary, secondary, and member servers of a BrightStor ARCserve Backup domain, and to create equivalences for the BrightStor ARCserve Backup System Account user on all primary, secondary, and member servers of a BrightStor ARCserve Backup domain.

Authsetup Syntax

```
Authsetup /p=password[/s][/d]
```

Authsetup Options

The Authsetup command line utility supports the following options:

Option	Description
/p	Specify the password for caroot. This option is required. To set an empty password, enter Authsetup.exe -p "".
/s	Sets the silent mode for this utility. Use this option if you do not want to see message box notifications if some internal operations fail.

Option	Description
/d	Use this option to create debug logs for each Authsetup use.

bab Command

This command provides control over BrightStor ARCserve Backup services.

bab Syntax

```
bab [-cahost hostname] -load -unload -show -showcfg -reconfig -status
-removehost
```

Note: The [-cahost hostname] switch, which identifies the host, is optional. If you are using these commands locally, this switch is not needed. However, if you are performing these commands remotely, hostname is required.

bab Options

The bab command line utility supports the following options.

Option	Description
-load	Starts BrightStor ARCserve Backup daemons.
-unload [-force] [-quiet]	Stops BrightStor ARCserve Backup daemons.
-show [-v]	Shows the status of BrightStor ARCserve Backup daemons. Use the -v switch to show the status of the daemons in verbose output.
-showcfg [-v]	Shows the current status of a specific BrightStor ARCserve Backup service or all BrightStor ARCserve Backup services, as well as how the service is configured.
-removehost	Removes the host from your BrightStor ARCserve Backup environment.
-reconfig	Stops a specific BrightStor ARCserve Backup service or services, rereads the configuration file, and starts the service with new configuration file settings.
-status	Checks the status of all BrightStor ARCserve Backup services.

ca_auth Command

Use this command when you are logged in as equivalent to caroot to create new users, delete existing users, change any user's password, and establish and delete equivalencies for other users. When you are logged in as equivalent to a user other than caroot, you can use ca_auth to change and validate your password.

Note: If you are logged in as a user who has no equivalence to any BrightStor ARCserve Backup user, then you must be granted an equivalence before you can use ca_auth.

caroot

BrightStor ARCserve Backup is designed with a root-level, super user profile, to which complete control of BrightStor ARCserve Backup is granted. This profile, referred to as the "caroot" user profile, is set up during the first-time installation of BrightStor ARCserve Backup.

The password for the caroot profile can be set during installation, or it can be set or changed later using ca_auth or AuthSetup.exe, located in the BrightStor ARCserve Backup home directory. For security reasons, we recommend that you set a password on this account.

Note: The caroot user profile controls access to the BrightStor ARCserve Backup Manager GUI and backup-related functions, and should not be confused with the security required to log in to your operating system.

caroot Equivalence

BrightStor ARCserve Backup allows you to create users that are equivalent to caroot. A user that is equivalent to caroot has full access to all BrightStor ARCserve Backup features, and can work with the command line utilities, such as ca_backup and ca_restore. Any Windows user on any host can be granted equivalence to caroot. To grant a user equivalence to caroot, you must either be logged in as equivalent to caroot or know caroot's password.

Console utilities such as ca_backup, ca_restore, and ca_qmgr work with remote BrightStor ARCserve Backup servers for submitting and monitoring backup and restore jobs without requiring users to log in to BrightStor ARCserve Backup every time for each command.

ca_auth Syntax

```
ca_auth [-cahost hostname] -user [user manipulation options] -equiv [equivalence management options]
```

Note: The [-cahost hostname] switch, identifying the host, is optional. If you are using these commands locally, this switch is not needed. However, if you are performing these commands remotely, the hostname is required.

ca_auth Examples

The following are examples of syntax for the ca_auth command.

Use the following syntax to change the password for the **caroot** user:

```
ca_auth -user chgpasswd caroot [passwd]
```

Use the following syntax to add a user:

```
ca_auth -user add username [passwd]
```

Use the following syntax to delete a user:

```
ca_auth -user delete username
```

Use the following syntax to validate a user and the associated password:

```
ca_auth -user validate username [password]
```

This command adds a user (mike) and a password (caroot):

```
ca_auth -user add mike caroot
```

Note: You are prompted to enter the password for Mike in non-echo mode.

Use the following syntax to list all BrightStor ARCserve Backup users:

```
ca_auth -user getall
```

This command adds a Windows user (mike) that has a caroot equivalency to BrightStor ARCserve Backup Domain Server DOMAIN. The user name is caroot and the password is ccb:

```
ca_auth -equiv add mike DOMAIN caroot ccb
```

This command shows the current BrightStor ARCserve Backup user:

```
ca_auth -equiv whoami
```

ca_auth Equivalence Examples

Use the following syntax to set up equivalency:

```
ca_auth -equiv add ntuser hostName [caroot username] [caroot password]
```

For example, to add an equivalency for the Administrator on machine dev02-vir2:

```
ca_auth -equiv add Administrator dev02-vir2 'caroot' 'caroot password'
```

Use the following syntax to display the equivalence for the user you are logged in as:

```
ca_auth -equiv getequiv
```

Use the following syntax to display the equivalence for a user on a particular host machine:

```
ca_auth -equiv getequiv [ntuser hostName]
```

Use the following syntax to delete the equivalency for a user:

```
ca_auth -equiv delete ntuser hostName [caroot username] [caroot password]
```

Use the following syntax to see the user name you are logged in as on the local machine:

```
ca_auth -equiv whoami
```

ca_auth User Manipulation Options

When you are logged in as equivalent to caroot, you can use the following options to add, delete, and change the password of user accounts. When you are logged in as any other user, you can change and validate your password. All users can execute the -user getall command.

Option	Description
-user add <i>username</i> [<i>passwd</i>]	Adds a BrightStor ARCserve Backup user.
-user delete <i>username</i>	Deletes a user from the authentication database.
-user chgpasswd <i>username</i> [<i>passwd</i>]	Changes the password for the user you specify.

Option	Description
<code>-user validate <i>username</i> [<i>passwd</i>]</code>	Checks if the user name and password combination is valid and can be used for logging in to the BrightStor ARCserve Backup.
<code>-user group <i>username</i></code>	Provides the name of the user group to which a user belongs.
<code>-user getall</code>	Lists all users known to the BrightStor ARCserve Backup Authentication Service.

ca_auth Equivalence Management Options

When you are logged in as equivalent to caroot or if you know caroot's password, you can use the following options to manage equivalencies.

Option	Description
<code>-equiv add <i>ntuser</i> <i>hostName</i> [<i>BrightStorUser</i>] [<i>caroot_username</i>] [<i>caroot password</i>]</code>	Creates equivalence.
<code>-equiv getequiv</code>	Displays equivalence for the user who runs this command. See <code>-equiv whoami</code> .
<code>-equiv getequiv <i>ntuser</i> <i>hostName</i></code>	Displays equivalence for a user on a particular host machine.
<code>-equiv delete [<i>user</i>] [<i>host</i>] [<i>caroot username</i>] [<i>caroot password</i>]</code>	Deletes the equivalence for a user.
<code>-equiv whoami</code>	Displays the user name you are logged in as on the local machine.

ca_auth Miscellaneous Options

The ca_auth command line utility supports the following miscellaneous options.

Option	Description
-help	Opens the ca_auth Help topic.
-examples	Opens a Help topic with ca_auth usage examples.

ca_backup Command

This command lets you submit backup jobs to the queue and sets all associated options, filtering, GFS rotation, and rotation jobs.

ca_backup Syntax

```
ca_backup [-cahost <hostname>] [global options] [global filters] {source args}
[destination args] [schedule args] [run job args]
```

ca_backup Usage

The ca-backup command line utility supports the following platform-specific usage:

- Windows

```
ca_backup -source [<hostname> <hosttype>] [node options] -filesystem
<filesystem> | <folder path> [-filelist <file list>] [volume options]
```
- UNIX and Linux

```
ca_backup -source [<hostname> <hosttype>] [node options] -filesystem
<filesystem> [<relative directory>] [-filelist <file list>] [volume options]
```
- NetWare

```
ca_backup -NDS <NDS tree name> -username <NDS login name> -password <NDS
password> -NDSserver <server name> -NDSaddress <server address>
```

ca_backup Global Options

The ca_backup command line utility supports the following global backup options:

- Verification
- Database
- Session password and encryption key
- Multiplexing
- Log
- Pre and post
- Exit code
- File retry and sharing
- Job status
- Miscellaneous
- Save script

The tables in this section describe arguments for each of these options.

Verification Arguments

Argument	Description
-scan	Verifies the integrity of the backup by scanning the backup media and checking the header of each file. If the header is readable, the data is assumed reliable.
-compare	Verifies the integrity of the backup by reading blocks of data from the backup media and comparing the data byte for byte against the source files on the source machine.

Database Arguments

Argument	Description
-partialdbupdate	Records only job and session information into the BrightStor ARCserve Backup database.
-dbusername database username	Specify the database user name to use to log into the database to be backed up.

Session Password / Encryption Key Arguments

Argument	Description
-sessionpassword <session password>	Applies a password to each session backed up to media. To restore a session that was backed up using this argument, you must use the ca_restore -sessionpassword argument to execute the restore job.
-encryption <encryption key>	Encrypts files before the backup. To restore encrypted files, you must provide the encryption password. To restore a session that was backed up using this argument, you must use the ca_restore -tapesessionpw argument to execute the restore job.
-compression	Compresses files before the backup.

Multiplexing Tape Arguments

Argument	Description
-multiplextape	Submits a multiplexing job.

Log Arguments

Note: The following arguments apply to UNIX and Linux platforms only.

Argument	Description
-logfile <filename> [errorsonly allactivity]	Records activities during the running of the backup job to the specified filename. The can specify to record all activity or a summary of the activity.
-snmp	Enables SNMP Alert.
-tng	Enables Unicenter NSM Alert.
-email <email address>	Send a copy of the Activity log to a specified email address.

Argument	Description
-printer <printer name>	Sends a copy of the Activity log to the specified printer. Note: The printer must be set up in the asloggerd.cfg file located in the config subdirectory in the BrightStor ARCserve Backup home directory.

Pre / Post Arguments

Argument	Description
-preexec <command>	Runs the specified command before the job starts. The entire path of the command should be included. Note: To use this argument you must also specify the -prepostuser argument.
-postexec <command>	Runs the specified command after the job finishes. You should include the entire path of the command. Note: To use this argument you must also specify the -prepostuser argument.
-preexectimeout <minutes>	Specifies the time to wait in minutes before the backup job starts. This allows time for the pre-execute command to finish.
-prepostuser <username>	Specifies the name of the user who is submitting this backup job.
-prepostpassword <user password>	Specifies the password of the user who is submitting this backup job.

Exit Code Arguments

Argument	Description
-exitcode <exit code>	Specifies the exit code of the pre-execute command. Used with the -skip_delay, -skip_job, and -skip_post switches.
-skip_delay	Runs the backup job immediately if the specified exit code is received.
-skip_job	Skips the backup job completely if the specified exit code is received.

Argument	Description
-skip_post	Skips the post-execute command if the specified exit code is received.

File Retry / Sharing Arguments

Argument	Description
-retry now later off	Specifies to retry backing up open files that were missed during the initial backup.
-retrycount <count>	Specifies the number of retry attempts.
-retryinterval <seconds>	Specifies the interval in seconds between retry attempts.
-accessmethod [denynone denywritefails lockifdenywritefails denywrite denynone]	<p>These are file sharing options:</p> <ul style="list-style-type: none">denynone denywritefails--BrightStor ARCserve Backup attempts to place the file in deny write mode. If this is not possible because file is already open, it will be placed into deny none mode. This is default setting.lockifdenywritefails--BrightStor ARCserve Backup attempts to place the file in deny write mode. If this is not possible because file is already open, the file will be locked completely so that no user can open it or write to it. This option ensures that the most recent version of file is backed up.denywrite--Select this option to prevent another process from writing to the file while BrightStor ARCserve Backup has it open. If another process opens the file before BrightStor ARCserve Backup opens it, BrightStor ARCserve Backup will not backup the file, unless you selected one of the open File Retry options.denynone--Select this option to allow other processes to read or write to the file, regardless of whether BrightStor ARCserve Backup opens it first or opens it after another process already has it open. Although the backed up file may not be the most recent version, this option ensures that the file is up-to-date.

Job Status Arguments

Argument	Description
-waitForJobStatus <polling interval (secs)>	<p>The ca_backup command will wait until the job is completed, and then exit with a return code that indicates the success or fail outcome of the job. The polling interval value defines how often ca_backup checks the jobs' status with the Queue services. The default interval is 60 seconds.</p> <p>This is useful for Unicenter NSM (formerly known as TNG) scheduling. For more information on how to use this to integrate with Unicenter NSM, see Unicenter NSM Integration in the chapter "Introducing BrightStor ARCserve Backup."</p>

Miscellaneous Arguments

Argument	Description
-deletefiles	Deletes files after the backup
-noestimation	Disables file estimation.
-clearconn	Clears user connections before backup.
	Note: This argument applies to NetWare platforms only.
-f <filename>	Used to specify a file name that contains the switches and parameters for the command. This switch overcomes the shell limitation of 1024 character input from command line. You can also use this switch to hide passwords by saving them in a file.
-cleararchbit	Clears the archive bit after the backup (DOS and Windows only).

Save Script Arguments

Note: This argument applies to UNIX and Linux platforms only.

Argument	Description
-savescript script name	Instead of submitting this job to the Job Queue, the backup job is saved as a script that can be loaded into the Job Queue at a later time.

ca_backup Source Options

The ca_backup command supports the following syntax:

```
ca_backup -source [<hostname> <hosttype>] [<file list>] [node options]  
ca_backup -source [<hostname>] [node options] -filesystem <filesystem> [<relative  
directory>] [-inputfile <filename>] [volume options]  
ca_backup -source [<hostname>] [node options] -fsfile <filename> [volume options]
```

The ca_backup command line utility supports the following source options.

Option	Description
-source [<hostname><hosttype>]	Specifies the source machines to back up. If the optional <hostname> is not provided, the default source is the local machine. The -source switch can appear multiple times in a ca_backup command and must be used separately for each source machine to be backed up. If the -source switch is used without an additional switch, such as -file system, the entire source machine is backed up by default. Note: -source accepts only the host name for the machine, and the host name should be resolvable in your network.

Option	Description
-filesystem <folder pathname> <filesystem>	Specifies the file system or folder to back up. The -file system switch may appear multiple times in a ca_backup command and must be used for each file system to be backed up.
	Note: On Windows NT, if you are backing up a folder or a file with a space in the name, you must enclose the name in quotes.
-raw <raw device>	Specifies the raw device to backup. Note: This argument applies to UNIX and Linux platforms only.
-fsfile <filename>	Used to specify the path and name of an external text file that lists the file systems you want to back up. When you use this option, the ca_backup command opens the file and reads its contents to create the backup job. In this external text file, you can define the following information, depending on the level of granularity you want for your backup job:
	<ul style="list-style-type: none"> ■ The file systems you want to back up ■ The relative directories of the file systems you want to back up ■ The -filelist option and file names to specify the files to use within the targeted file system ■ The -inputfile option and file name to add files from another external file.
	To do this, use the following syntax:
	<code>[filesystem name] [relative_dir][-filelist <file1><file2>][-inputfile <filename>]</code>
-filelist <list of files>	Specifies individual files to back up. Used with the -filesystem switch.
-inputfile <filename>	Used to pass on the file name containing the list of files to be backed up. You can use this switch as an alternative to -filelist <list of files>. You can also use this along with the -source and -filesystem options.

ca_backup Destination Options

The ca_backup command line utility supports the following destination options.

Option	Description
-eject	Eject media at backup completion.
-export <all duplicate>	Export all media or duplicate media after backup job completion.
-mediapool <pool name>	Specifies the media pool to use for the backup job. This switch must be used with -rotation or -custom. If you use this with -rotation, the media pool name you enter is newly created and associated with this rotation job. If you use this with -custom, the media pool name you enter must already exist.
-group <group name>	Specify media group to use for the backup job.
-tape <tape name>	Specify name of media to use for the backup job.
-firsttapeopt <owritesameblank owritesameblankany owritesameanyblank>	For Windows platforms only , this option specifies media options for the first media used in the backup job. By default, this option is set to Append to Media. Note the distinction between a Blank media and Any media. Any media is formatted media which does not have the same media name as was provided in the job. The media selection search order is from left to right; therefore, if option owritesameblankany is specified, BrightStor ARCserve Backup first searches for a media with the same name as provided in the job and if it is found and is usable, the media is formatted using the same name and is used for the backup. If the same media name is not found, BrightStor ARCserve Backup will then search for a Blank media to use and if a Blank media is not available, BrightStor ARCserve Backup will then search for Any usable media to format and use for the backup.

Option	Description
<code>-spantapeopt</code> <code><owritesameblank </code> <code>owritesameblankany </code> <code>owritesameanyblank></code>	For Windows platforms only , this option specifies media options for any span media used in the backup job. By default, this option is set to Overwrite same or Blank. During spanning of media, if the option 'owritesameblank' is specified, then BrightStor ARCserve Backup first searches for a media with the same name and a higher sequence than the original media and if media is found and is usable, the media is formatted and used as the next sequence media. If a usable media is not found, then BrightStor ARCserve Backup will next search for a Blank media to use.
<code>-firsttapetimeout <minutes></code>	For UNIX and Linux platforms only , this option specifies media options for the first media used in the backup job. By default, this option is set to Append to Media. Note the distinction between a Blank media and Any media. Any media is formatted media which does not have the same media name as was provided in the job. The media selection search order is from left to right; therefore, if option 'owritesameblankany' is specified, BrightStor ARCserve Backup first searches for a media with the same name as provided in the job and if it is found and is usable, the media is formatted using the same name and is used for the backup. If the same media name is not found, BrightStor ARCserve Backup will then search for a Blank media to use and if a Blank media is not available, BrightStor ARCserve Backup will then search for Any usable media to format and use for the backup.

Option	Description
-spntapetimeout <minutes>	For UNIX and Linux platforms only, this option specifies media options for any span media used in the backup job. By default, this option is set to Overwrite same or Blank. During spanning of media, if the option 'writesameblank' is specified, then BrightStor ARCserve Backup first searches for a media with the same name and a higher sequence than the original media and if media is found and is usable, the media is formatted and used as the next sequence media. If a usable media is not found, then BrightStor ARCserve Backup will next search for a Blank media to use.

ca_backup Node Options

The ca_backup command line utility support the following node options.

Option	Description
-username <user name>	Specifies the user name of the source machine to back up. This will be the user who logged in to the specific machine.
-password <password>	Specifies the password for the user to be used to log in to the source machine.
-traversesymlink	Used to traverse symbolic links during the back up and back up the actual file the link points to, not simply the link itself. (UNIX machines only).
[[-traversedirandvol] [-bkmountpt]]	Used to traverse the directory junctions and volume mount points during the backup job. Note: You can use the -bkmountpt option only if the traverse directory junctions option is specified.
-traversenfs	Used to traverse mounted NFS file systems during the back up. By default, mounted file systems are skipped during the back up. (UNIX machines only).

Option	Description
-resetaccesstime <on off>	When BrightStor ARCServe Backup accesses a file to perform a backup, the access time of the file is changed. You have the option of resetting or not resetting this file access time. (UNIX machines only).
-noestimation	Used to disable file estimation prior to the backup.
-acrossfs	Used to traverse across the file system during backup. (UNIX machines only).
-filter <node filters>	For more information about ca_backup node filters, see the section ca_backup Filter Options in this appendix.

ca_backup Filter Options

The ca_backup command line utility supports the following filter options.

Option	Description
-filter include exclude file dir pattern	Specify to include or exclude files or directories based on the specified pattern. Note: If you select the include directory pattern filter and do not specify an absolute path, empty directories for all the directories that do not match the user provided criteria will be backed up. To avoid creating these empty directories during restore, disable the global restore option Create Empty Directories when creating your restore job. For more information on this option, see Create Empty Directories Option in the chapter "Restoring Data."
-filter include exclude attribute [hidden readonly system archive]	Specify to include or exclude files with the specified file attribute.
-filter include exclude date modify create access onorbefore onorafter mm/dd/yyyy	Specify to include or exclude files created, last modified, or accessed before, on, or after the specified date.

Option	Description
-filter include exclude date modify create access between <mm/dd/yyyy > <mm/dd/yyyy >	Specify to include or exclude files created, last modified, or accessed between the specified dates.
-filter include exclude date modify create access within count days months years	Specify to include or exclude files created, last modified, or accessed within the specified number of days, months, or years.

ca_backup Database Options

The ca_backup command line utility supports the following syntax for UNIX and Linux database backups.

```
ca_backup -source [<hostname>] [node options] -database <dbase type> <dbase name> [<tablespaces>] [dbase options]
```

For Oracle RMAN databases, use the following syntax:

```
ca_backup -source [<hostname>] [node options] -database ORACLERMAN <dbase name> [<tablespaces ...>] | [-table <tablespace name> <tablespace files> ...] [dbase options]
```

Note: For more information about the ca_backup commands and options for Oracle RMAN databases, see the section **ca_backup Oracle RMAN Specific Options** in this appendix.

If you are using the ca_backup command line utility to back up an Ingres database, use the following syntax:

```
ca_backup -source [<hostname> [node options]] -ingres_installation_id <ingres_installation_id> [-database INGRES [<ingres_dbname...>]] [-ingres_databaseandjournals <ingres_dbname...> -ingres_journals <ingres_dbname...>] [dbase options]
```

Where:

```
host type: unix | nt | nwagent | ntagent | w95agent| mac
```

Note: For more information about the ca_backup commands and options for Ingres databases, see the section **ca_backup Ingres Specific Options** in this appendix.

ca_backup Oracle RMAN Specific Options

The ca_backup command line utility supports the following Oracle RMAN specific command line options.

Backup Options:

Option	Description
-use_rmancat	Use a catalog (recommended): Indicates if an RMAN catalog is to be used for the operation or not. It is always recommended to use one because RMAN will use the database control file if not catalog is to be used. The loss of this control file will prevent RMAN from restoring the database. This will be a check box and it should be checked, by default.
-bkincremental	This is the alternative value of the Full Backup option. It tells RMAN to send only the blocks of data that have not been backed up since the last backup made, depending on the Incremental Level and Cumulative options described below. It is represented by a radio button in the Backup Manager and is not selected by default. Of course, Incremental Backup cannot be selected with Full Backup. It cannot be used if the Oracle object to be backed up is the control file or the archived logs.
-cumulative	This option indicates that RMAN will send data blocks that have been used since the last incremental backup made at level n-1 or lower. This is represented by a check box in the Backup Manager. The default value is unchecked.
-bkrecoveryarea	(Oracle 10g and higher): This check box is used to include the Oracle 10g Recovery Area in the list of objects to be backed up. It only applies to Oracle 10g. It should not be checked by default.

Common Commands:

Option	Description
-rman_catuser	Name of the Oracle user who owns the RMAN catalog.

Option	Description
-rman_catpassword	Password for that user that owns the RMAN catalog.
-rman_bakpieceprefix	Left part of the Backup Piece Format entry.
-rman_bakpiecesuffix	Right part of the Backup Piece Format entry.
-rman_alpattern	String pattern used to select the archived logs based on their name.
-rman_baktag	Use this option to enter a backup identifier called a 'tag'. This tag can then be used to identify which version of the Oracle objects should be used by RMAN during a restore operation.
-rman_script	Use this option to enter the path of an RMAN script. Providing a value for this field will cause the Oracle agent to ignore all other options that might have been entered by the user in the GUI. The script will be passed as is to RMAN and the Oracle agent will perform the backup operation normally.
-rman_incrementallevel	Use this option to specify the level of incremental backup to be performed. RMAN will only backup the data blocks that have changed since the last incremental backup of the specified level or less. The default value is zero and corresponds to a full backup. The valid values for this field vary between 0 and 4, for Oracle 8, 8i and 9i. With Oracle 10g, the levels are limited to 0 and 1 only. The user can enter data in this field only if the Incremental Backup option was selected.
-rman_numberofchannels	Use this option to specify how many channels to be allocated by RMAN to perform the backup operation. RMAN will submit jobs in parallel, one for each channel. The default value should be 1.
-rman_bakpiecesize	Use this option to limit the size of a backup piece generated by RMAN. When this option is set, if the data blocks to be backed up do not fit into a single backup piece, then RMAN will generate as many backup pieces as required to contain all the data. By default, the field should be empty. This means that RMAN will typically put the data from one backup command (for one channel) into a single backup piece.

Option	Description
-rman_readrate	<p>This is a performance tuning option. You can use it to slow down the rate at which RMAN reads data from the hard disk to avoid contention. By default, it is left empty, however if you want to set this option, the value represents the maximum number of buffers per second that RMAN can use to read data from the disk. The size of a buffer corresponds to the value DB_BLOCKSIZE * DB_FILE_DIRECT_IO_COUNT which are parameters defined in the Oracle database configuration.</p>
-rman_numfilesperbakset	<p>Use this option to limit the number of files (backup pieces) that RMAN should put per backup set. If not specified, then RMAN will use the lesser values of these 2: 64 or the number of input files divided by the number of channels. By default it should be left empty.</p>
-rman_maxopenfile	<p>Use this option to limit the total number of files that RMAN will open at the same time. This command lets you decrease the potential for a "too many open files" error. The default value for Oracle 8, 8i and 9i is 32. For Oracle 10g, the default value is 8. Leaving the field empty will make RMAN use the default.</p>
-rman_baksetsize	<p>Use this option to limit how much data should go into a backup set. This command determines the maximum size in KBytes that a backup set can have. By default it should also be left empty.</p>

Option	Description
-rman_blocksize	Use this option to specify a value that determines the size of the data blocks that RMAN will send to the Oracle agent when performing a backup. This field should be left empty by default. If the user enters a value for it, then the same block size must also be entered by the user when he wants to restore from this backup. Otherwise, RMAN will produce an error message indicating that there is a mismatch between the backup block size and the restore one. In that case, the value used during the backup will be put in the error message. If no value is provided, then RMAN uses 64 KB for Oracle 8 or 8i and 256 KB for Oracle 9i. This parameter does not exist anymore with Oracle 10g.
-rman_numcopies	Use this option to specify how many copies of the backup pieces will be generated by RMAN. The default should be 1. The valid values for this parameter are 1 to 4. Oracle 8.0 does not support this parameter.
-rman_archlogsel	The “Archived Logs Selection” section of this panel allows the user to select which archived logs will be backed up, assuming that the “archived logs” object has been included in the Source panel of the Backup Manager GUI. The selection is represented by radio button options. All: All archived logs will be backed up. This is the default option.
-rman_althread	Use this option to specify the thread number used to identify the Oracle server that generated the archived logs. This parameter is only used with the Time Based, SCN Based or Log Sequence Based options described below. It will be ignored if the All or Pattern Based option is used. The default value is 1.
	Note: This value is only useful for OPS (Oracle Parallel Server, for Oracle 8 and 8i) or RAC (Real Application Clusters, for Oracle 9i and 10g), otherwise the thread number is always one.

Option	Description
-rman_alfromscn	Use this option to indicate that the range of the archived logs to be backed up is not determined by the time, rather by the SCN (System Change Number). This field indicates the lowest SCN boundary for the archived logs selection. It can be left empty, assuming that the Until SCN field is not.
-rman_aluntilscn	Use this option to indicate that the range of the archived logs to be backed up is not determined by the time, rather by the SCN (System Change Number). This field is used to determine the upper SCN boundary to the archived logs selection. It is optional, as long as the user has entered a value for the From SCN field.
-rman_alfromlogseq	Use this option to specify that archived logs selection is to be based on the archived log sequence number. This field corresponds to the lowest log sequence number used to determine which archived logs will be backed up. This field can be left empty only if a value is provided for the Until Log Sequence one.
-rman_aluntillogseq	Use this option to indicate that the archived logs selection is to be based on the archived log sequence number. This field is used to enter the upper archived log sequence number boundary for the archived logs selection. Providing a value for this field is optional, as long as the user enters a value in the From Log Sequence field.
-rman_alfromtime	Use this option to indicate that the archived logs to be backed up will be selected based on the time they were created. This field determines the lower time boundary for the archived logs selection. Only the archived logs created after this time will be backed up.
-rman_aluntiltime	Use this option to indicate that the archived logs to be backed up will be selected based on the time they were created. This field determines the upper time boundary for the archived logs selection. Only the archived logs created before this time will be backed up.

ca_backup Ingres Specific Options

The ca_backup command line utility supports the following Ingres database specific options.

Option	Description
-ingres_installation_id <ingres_installation_id>	Specifies the installation ID of the Ingres database server. It will backup whole installation if none of database, ingres_databaseandjournals and ingres_journals is specified.
-database INGRES [<ingres_dbname>]	Indicates that you want to backup the listed databases and not their journals. You may enter the database INGRES parameter without indicating any Ingres database names. In this case the parameter will be ignored and will have no effect.
-ingres_databaseandjournals <ingres_dbname>	Specifies that both the data and journals of the database should be backed up.
-ingres_journals <ingres_dbname>	Specifies that only journals of the specified database should be backed up.
-ingres_purge_journals	This parameter specifies that the journals that are backed up should be purged afterwards.

ca_backup Schedule Options

The ca_backup command line utility supports the following schedule options.

Option	Description
-custom	Specifies the schedule type of the backup job as a custom schedule. By default, this is the schedule type used for backup jobs.
-repeat <months> <days> <hours> <minutes>	Used with -custom. Specifies a repeating interval for the backup job. By default, there is no repeating interval and a job only runs once. By specifying a repeating interval, a job runs every 'x' months/days/hours/minutes. The syntax of the command requires a value for each field of months, days, hours, and minutes. To schedule a repeating job every 1 day and 2 hours enter the following: ca_backup -custom -repeat 0 1 2 0.

Option	Description
-excludeday <Sun Mon Tue Wed Thu Fri Sat>*	Used with -custom. Excludes specific days from a repeating backup job.
-rotation	Specifies the schedule type of the backup job as a rotation schedule.
-jobunit <full diff incr off> <append overwrite> <media name>	Each job unit represents a day in the rotation schedule scheme, starting with Sunday and ending with Saturday. You can customize each day, although there are certain restrictions such as combining differential and incremental backups within the same rotation schedule.
	<p>Note: The first -jobunit switch is associated with Sunday, the next Monday, and so forth. It is your responsibility to account for each day of the week, meaning 7 -jobunit switches are required. By default, any job units (days) that have not been represented by a -jobunit switch are set to off and no backup takes place on that day. You have the option of not specifying the -jobunit switch, which sets the rotation schedule to the default 5-day incremental with a full backup on Friday. This is the same schedule that is seen from the Backup Manager.</p>
-saveset <number of tapes>	Used with the -rotation switch. Specifies the minimum number of media to keep in the Save Set of the created media pool.
-retention <days>	Specifies the media retention period in days, and is an attribute of the created media pool.
-exception <full diff incr off> <append overwrite> <mm/dd/yyyy>>	Lets you specify an exception condition from the regular rotation schedule. This feature is useful in the case of a holiday or other event where the user desires a different behavior for the backup job on that date.
-gfsrotation	Specifies the schedule type of the backup job as a GFS (Grandfather, Father, Son) rotation schedule.

Option	Description
-mpoolprefix <mediapool prefix>	Used with the -gfsrotation switch it is used as a prefix for naming three media pools (Daily, Weekly, and Monthly), which will be created and associated with this GFS rotation job. For example, if the prefix is "GFSJOB1," the 3 pools created will be: GFSJOB1_DLY, GFSJOB1_WLY, GFSJOB1_MLY.
-jobunit <full diff incr off>	Used with the -gfsrotation switch. Specifies the minimum number of media to preserve in the monthly media pool's Save Set. However, for GFS Rotation the arguments are limited to only being allowed to specify the type of backup, which occurs on the selected day.
-preservedaily <number of tapes>	Used with the -gfsrotation switch. Specifies the minimum number of media to preserve in the daily media pool's Save Set.
-preserveweekly <number of tapes>	Used with the -gfsrotation switch. Specifies the minimum number of media to preserve in the weekly media pool's Save Set.
-preservemonthly <number of tapes>	Used with the -gfsrotation switch. Specifies the minimum number of media to preserve in the monthly media pool's Save Set.
-reschedule <hh:mm>	Used with the -custom, -rotation, or -gfsrotation switch. Specify the time to run a Makeup job if there are missed targets in the original backup.
-exception <full diff incr off> <mm/dd/yyyy>	Used with the -gfsrotation switch. Specifies the minimum number of media to preserve in the monthly media pool's Save Set. However, for GFS Rotation the arguments are limited to only being allowed to specify the type of backup, which occurs on the exception date.

ca_backup Run Job Options

The ca_backup command line utility supports the following run job options.

Option	Description
-at <hh:mm>	Used to specify the execution time of the backup job.

Option	Description
-on <mm/dd/yyyy>	Used to specify the execution date of the backup job.
-hold -runjobnow	Used to submit the backup job on hold or to submit and execute the backup job immediately.
-description <description string>	Used to add comments to the job. Note: You must enclose a string in double quotes "" to handle blank spaces.

ca_backup Volume Options

The ca_backup command line utility supports the following volume options.

Option	Description
-volscan	Verifies the integrity of the file-system (volume) backup by scanning the backup media and checking the header of each file. If the header is readable, the data is assumed reliable.
-volcompare	Verifies the integrity of the file-system (volume) backup by reading blocks of data from the backup media and comparing the data byte-for-byte against the source files on the source machine.
-volgroomdisable	Disables the volume groom option.
-volsessionpw <session password>	Applies a session password to the session on media containing the file system (volume) backed up. To restore a session that was backed up using this option, you must use the ca_restore -tapesessionpw option to execute the restore job.
-volencryption <encryption key>	Encrypts files before the backup. In order to restore the encrypted files contained in this session, you must provide the encryption password.
-volcompression	Compresses files before the backup, for this file system (volume) only.

Option	Description
-priority <priority level>	For UNIX and Linux platforms only , use this option to assign a backup priority to the nodes/volumes in a job. Priority level ranges from 1 to 255, with 1 having the highest priority and 255 the lowest.

ca_backup Return Codes

The following codes are returned by ca_backup:

- 0—The job completed successfully.
- 1—The job failed.
- 2—The job is incomplete.
- 3—The job was cancelled.
- 4—The status of the job is unknown.
- 5—The job is still active.

ca_backup Miscellaneous Options

The ca_backup command line utility supports the following miscellaneous options.

Option	Description
-cahost <hostname>	Specifies the BrightStor ARCserve Backup server to use for the backup by providing the hostname is running. If the switch is not used, by default the cahost is set to the local machine.
-usage	Displays a list of basic ca_backup commands.
-allusage	Displays a list of all ca_backup commands and their switches.
-help	Opens the ca_backup Help topic.
-examples	Opens a Help topic with ca_backup usage examples.

ca_backup Staging Options

To execute a staging backup job using the ca_backup command line utility, use the following syntax:

```
ca_backup -diskstage [Miscellaneous Options] [Full Backup Policy]  
[Differential/Incremental Backup POLICY]
```

Full Backup Policy Syntax

```
ca_backup -diskstage [-fullbackup [-copyDataToDestination [afterjobstarts <weeks>  
<days> <hours> <minutes>] | [afterjobends <weeks> <days> <hours>  
<minutes>] | [aftersessionends <weeks> <days> <hours> <minutes>] | [at <hh:mm:ss>  
[afterjobends]]]]
```

Differential/Incremental Backup Policy Syntax

```
ca_backup -diskstage [-incdiffbackup [-copyDataToDestination [afterjobstarts  
<weeks> <days> <hours> <minutes>] | [afterjobends <weeks> <days> <hours>  
<minutes>] | [aftersessionends <weeks> <days> <hours> <minutes>] | [at <hh:mm:ss>  
[afterjobends]]]]
```

Miscellaneous Staging Policy Syntax

```
ca_backup -diskstage <GROUP NAME> [-maxstreams <Max # Streams>] [-chunksize  
[#chunkSize>] [-purgefailedsessions] [-purgecancelledsessions] [-makeupjobtotape]  
[-createdmjmakeupjobonhold] [-leaveCatalogsOnDisk]
```

The ca_backup command line utility supports the following staging backup options:

Option	Description
-diskstage <GROUP NAME>	Specifies that the backup job will use staging functionality and the name of the staging device group.
-maxStreams <Max # Streams>	Specifies how many streams BrightStor ARCserve Backup will use as it runs the backup job to the staging device.
-fullbackup	Specifies that the staging backup job consists of full backups.
-incdiffbackup	Specifies that the staging backup job consists of either incremental or differential backups.

Option	Description
<code>-copyDataToDestination [afterjobstarts <weeks> <days> <hours> <minutes>] [afterjobends <weeks> <days> <hours> <minutes>] [aftersessionends <weeks> <days> <hours> <minutes>] [at <hh:mm:ss> [afterjobends]]</code>	Specifies when the copy to final destination operation should commence. For - afterjobstarts, -afterjobends, and - aftersessionends, you need to input the desired length of time.
<code>-DONOTCOPY</code>	Directs the Disk Staging Option to back up data to a staging device, but do not copy the media to a final destination after the retention period elapses.
<code>-purgeData [afterjobstarts <weeks> <days> <hours> <minutes>] [afterjobends <weeks> <days> <hours> <minutes>] [at <hh:mm:ss>]</code>	Specifies when the purge data from disk operation should commence. For - afterjobstarts and -afterjobends, input the desired length of time that must elapse before the purge operation commences.
<code>-ENABLESNAPLOCK</code>	Directs backup job to use SnapLock security on the backup job.
<code>-chunksize <#chunkSize></code>	During a staging backup, directs BrightStor ARCserve Backup to divide the data into smaller chunks (or sub jobs) to be written to the disk. You must specify the maximum size or amount of data (in KB) contained in each chunk.
<code>-purgefailsessions</code>	If a session fails during the backup to disk (staging) process, directs BrightStor ARCserve Backup to mark this session for deletion (purged from disk) immediately. This helps to reclaim disk space as soon as possible.
<code>-purgecancelsessions</code>	If a session is cancelled during the backup to disk (staging) process, directs BrightStor ARCserve Backup to mark this session for deletion (purged from disk) immediately. This helps to reclaim disk space as soon as possible.

Option	Description
-makeupJobToTape	During the backup to disk (staging) process, if an error occurs because the disk is full, directs a makeup job to be created, which when run will directly backup to the final destination media (tape). This increases the chances of a successful backup even though the disk is full.
-createDMJMakeupJobOnHold	During a data migration job (DMJ), if a media or a tape drive error occurs, a makeup job would automatically be created on Hold. As a result, you do not have to create a tapecopy job. After fixing the drive or media error, you would then just need to change the status of the makeup job from Hold to Ready to execute the migration process (disk to tape).
-leaveCatalogsOnDisk	Directs BrightStor ARCserve Backup to leave the catalog files on the disk.

ca_backup Examples

The following are examples of syntax for the ca_backup command:

```
ca_backup -source machine1 -filesystem C:\DIR1 -filesystem D:\DIR2 -username
Administrator -password xyz
ca_backup -source machine1 -filesystem C:\DIR1 -filelist File1.TXT -filelist
File2.TXT -filelist FILE3.TXT -Group GROUP1 -tape TAPE1
```

Use the following syntax to submit a backup job to a remote BrightStor ARCserve Backup server:

```
ca_backup -cahost machine1 -source machine1 -filesystem D:\DIR1 -username
Administrator -password xyz
```

Use the following syntax to submit a backup job through the BrightStor® ARCserve® Backup Client Agent for Windows to back up data from a remote client machine:

```
ca_backup -source machine1 nt -filesystem C:\Folder1 -Filesystem D:\Folder2 -
filelist file.TXT -username Administrator -password xyz
ca_backup -source machine1 -filesystem "C:\Program Files\Back me up dir"(path
with spaces need to enclose "") -tape TAPE1 -runjobnow
```

ca_backup -filter Examples

The following are examples of syntax when using ca_backup -filter:

```
ca_backup [-filter include|exclude file|dir <pattern>]
ca_backup -source machine1 -filesystem c:\DIR -filter include file "*.doc"
ca_backup [-filter include|exclude date modify|create|access onorbefore|onorafter
<mm/dd/yyyy>]
ca_backup -source machine1 -filesystem c:\DELL -filter exclude dir khan
ca_backup -source machine1 -filesystem c:\DELL -filter exclude file ltrhd.doc
```

ca_backup -on -at Example

The following is an example of syntax when using ca_backup -on -at:

```
ca_backup -source machine1 -filesystem c:\DIR -filter include file "*.doc" -at
12:50 -on 08/08/2002
```

ca_backup Session Password Keys Examples

The following are examples of syntax when using ca_backup -sessionpassword:

```
ca_backup -source machine1 -filesystem c:\DIR -sessionpassword xyz
ca_restore -tape TAPE1 -session 2 -dest C:\DIR -sessionpassword xyz -username
Administrator -password abc
```

ca_backup Rotation Job Examples

The following are examples of syntax when using the ca_backup rotation job option:

```
ca_backup [-filter include|exclude date modify|create|access within <count>
days|months|years]
```

```
ca_backup -source machine1 -filesystem c:\DIR1 -filesystem "C:\Program Files\Back
me up dir" -rotation -mediapool testingpool -jobunit full append test
```

```
ca_backup -source machine1 -filesystem c:\DIR1 -rotation -mediapool testingpool -
jobunit full overwrite test1
```

```
ca_backup -source machine1 -filesystem c:\DIR1 -mediapool testingpool -exception
full append 12/12/2001
```

```
ca_backup -source machine1 -filesystem c:\DIR1 -gfsrotation -mpoolprefix khan -  
jobunit full  
  
ca_backup -source machine1 -filesystem C:\DIR1 -username root -password ARCserve  
-rotation -mediapool Pool1 - jobunit full overwrite -jobunit full overwrite -  
jobunit full overwrite -jobunit full overwrite -jobunit full overwrite -retention  
5 -tape "*"  
  
ca_backup -source machine1 -filesystem D:\DIR2 -username root -password ARCserve  
-gfsrotation -mpoolprefix GFSpool -jobunit full -jobunit incr -jobunit incr -  
jobunit incr -jobunit incr -jobunit incr -jobunit incr -description GFSpoolJob  
  
ca_backup -source machine1 -filesystem c:\dell -gfsrotation -mpoolprefix machine1  
-jobunit full -jobunit full -jobunit full -jobunit full -jobunit incr -jobunit  
incr -jobunit full -description pool  
  
ca_backup -source 141.202.243.173 unix -filesystem / ca_lic -username root -  
password ARCserve  
  
ca_backup -source apoc unix -filesystem / ca_lic -username root -password  
ARCserve  
  
ca_backup -source machine1 -filesystem C:\ca_lic -rotation -mediapool khan -  
jobunit off append * -jobunit incr append * -jobunit incr append * -jobunit incr  
append * -jobunit incr append * -jobunit full overwrite * -jobunit off append *  
  
ca_backup -source machine1 -filesystem c:\temp -rotation -mediapool hello -  
jobunit off overwrite -jobunit full overwrite -jobunit incr append -jobunit incr  
append -jobunit incr append -jobunit full overwrite -jobunit off overwrite  
  
ca_backup -source machine1 -filesystem C:\ca_lic -rotation -mediapool khan  
  
ca_backup -source dellwin2k -filesystem c:\temp -rotation -mediapool hello -  
jobunit off overwrite -jobunit full overwrite -jobunit incr append -jobunit incr  
append -jobunit incr append -jobunit full overwrite -jobunit off overwrite  
  
ca_backup -source machine1 -filesystem c:\Temp -rotation -mediapool test -jobunit  
off overwrite -jobunit full overwrite -jobunit incr append -jobunit incr append -  
jobunit incr append -jobunit full overwrite -jobunit off overwrite
```

ca_dbmgr Command

The ca_dbmgr command is the command line interface to the Database Manager and the Media Pool Manager. It allows you to maintain the BrightStor ARCserve Backup database, including configuring media pools.

You can query database information and set database options. This utility allows other programs to interact easily with backup events. All of the features available from the Database Manager and Media Pool Manager are available from the command line.

ca_dbmgr Syntax

```
ca_dbmgr [-cahost hostname] -show [display options] -mediapool [media pool  
management options] [database management options]
```

Note: The [-cahost hostname] switch, identifying the host, is optional. If you are using these commands locally, this switch is not needed. However, if you are performing these commands remotely, the hostname is required.

ca_dbmgr Display Options

The ca_dbmgr command line utility supports the display options listed below. These options allow you to display a variety of information about your database. To display information about your database, use the following syntax:

```
-show prune | summary | jobs <jobID> | _jobs [ -completed ] [ -cancelled ] [ -  
failed ] [ -incomplete ] [ -last <no_of> days|weeks|months ] | jobsessions  
<jobID> | tapes | tapesessions <tapeID[:seqNo]> | pools | poolmedia <poolName> |  
scratchmedia | savemedia
```

Option	Description
-show prune	Displays pruning status and settings.
-show summary	Displays a summary of information about your database, including database size limits, pruning and purging status, space information, and database record counts.
-show jobs <jobID>	Displays the status of the specified job, along with other information about the job.

Option	Description
-show jobs [-completed][[-cancelled][[-failed][[-incomplete]][-last <i>number</i> days]]]	<p>Displays information about all the jobs of a particular type. For example, enter the following command to view all completed jobs:</p> <pre>-show jobs -completed</pre> <p>You can also enter a time limit. For example:</p> <pre>-show jobs -last 2 days</pre> <p>If you enter the command without any parameters, you will be shown information on all jobs in the database.</p>
-show jobsessions <jobID>	Displays information about all the sessions contained in the specified job ID.
-show tapes tapesessions <tapeID [:seqNo]>	Displays information about the specified tape(s) or tape session(s).
-show pools poolmedia <poolName>	Displays information about the specified pools or pool media.
-show scratchmedia savemedia	Displays information about the tapes in your Scratch Set or your Save Set.

ca_dbmgr Display Options Examples

```
ca_dbmgr -cahost machine1 -show prune
ca_dbmgr -cahost machine1 -show summary
ca_dbmgr -cahost machine1 -show jobs 8
ca_dbmgr -cahost machine1 -show jobs -completed -last 8 days
ca_dbmgr -cahost machine1 -show jobsessions 8
ca_dbmgr -cahost machine1 -show tapes
ca_dbmgr -cahost machine1 -show tapesessions EF6C
ca_dbmgr -cahost machine1 -show pools
ca_dbmgr -cahost machine1 -show poolmedia POOL1
```

ca_dbmgr Media Pool Management Options

The ca_dbmgr command line utility supports the Media Pool Management options listed below and requires the following syntax:

```
-mediapool add <poolName> <saveTapes> [ -b <baseSerial> ] [ -i <serialIncr> ] [ -m <maxSerial> ] [ -retention <retentionDays> ] | modify <poolName> [ -save <saveTapes> ] [ -retention <retentionDays> ] | delete [-f] <poolName> [ <tapeID[:seqNo]> ] | move <tapeID[:seqNo]> <fromPoolName> <toPoolName> SCRATCH | SAVE
```

Option	Description
-mediapool add <poolName> <saveTapes> [-b <baseSerial>][-i <serialIncr>][-m <maxSerial>] [-retention <retentionDays>]	Creates a new media pool. You must specify the name of the media pool and the minimum number of media to keep in the Save Set. Optionally, you can specify serial number information and the retention period.
-mediapool modify <poolName> [-save saveTapes] [-retention retentionDays]	Allows you to change the minimum number of media to keep in the Save Set and the retention time for the specified media pool.
-mediapool delete [-f] <poolName> [<tapeID[:seqNo]>]	Deletes the specified tape from the specified media pool. If you enter the name of a media pool without specifying a tape, the entire media pool is deleted. Note: Use the -f switch to perform the deletion in non-interactive mode.
-mediapool move <tapeID[:seqNo]> <fromPoolName> <toPoolName> SCRATCH SAVE	Moves tapes from one media pool to the Scratch or Save Set of another media pool. Performs the same function as the Move Media option in the Media Pool Manager.

ca_dbmgr Media Pool Management Options Examples

```
ca_dbmgr -cahost machine1 -mediapool add POOL1 0 -b 1200000 -i 1000 -m 1299999 -retention 100

ca_dbmgr -cahost machine1 -mediapool modify POOL1 -save 0 -retention 99

ca_dbmgr -cahost machine1 -mediapool delete -f TMPPOOL EF6C

ca_dbmgr -cahost machine1 -mediapool move EF6C POOL1 POOL2 SAVE
```

ca_dbmgr Database Management Options

The ca_dbmgr command line utility supports the following database management options.

Option	Description
-tape delete <tapeID>[:seqNo]>	Deletes the specified tape from the database.
-prune on off set <count> days <hh:mm>	Allows you to set database pruning on or off, set the pruning period, and set the scheduled time for pruning jobs. For example, to specify that pruning should take place every seven days, and that the pruning operation should start at 5 PM, enter the following command: ca_dbmgr -prune set 7 days 17:00 Note: Pruning removes detail records older than the specified age, but retains job and session records.

ca_dbmgr Database Management Options Examples

```
ca_dbmgr -cahost machine1 -tape delete EF6C:1
ca_dbmgr -cahost machine1 -prune set 20 days 23:59
```

ca_dbmgr Miscellaneous Options

The ca_dbmgr command line utility supports the following miscellaneous options.

Option	Description
-usage	Displays a list of basic ca_dbmgr commands.
-allusage	Displays a list of all ca_dbmgr commands and their switches.
-help	Opens the ca_dbmgr help topic.
-examples	Opens a help topic with ca_dbmgr usage examples.

ca_devmgr Command

The ca_devmgr command, the command line device management program, allows you to perform various device management commands in BrightStor ARCserve Backup without interfacing with the Device Manager.

ca_devmgr Syntax

```
ca_devmgr [ -cahost <hostname> ] [ -command <parameters> ]
```

ca_devmgr Syntax Examples

Use the following syntax to view adapter information with SCSI IDs and adapter numbers:

```
ca_devmgr -adapterinfo
```

Use the following syntax to view tape information (name and serial number) for the specified adapter and SCSI number:

```
ca_devmgr -mediainfo 3 4
```

ca_devmgr Commands

The following are commands for ca_devmgr. Some commands refer to tape drive only, while some refer to tape libraries only. There are also some commands that pertain to both a tape drive and a tape library.

The commands are:

- General Commands—Commands that can be used whether you have a tape drive or a tape library attached to your system.
adapterinfo, deviceinfo, groupinfo, mediainfo, v
- Tape Drive Commands—Commands that are specific only to a tape drive.
format, erase, retension, compression, eject, reserve, unreserve
- Tape Library Commands—Commands that are specific only to a tape library.
chformat, cherase, load, unload, mount, dismount, import, export, onlinechanger, offlinechanger, getclntime, setclntime, clean, enabledrv, disabledrv
- Miscellaneous Commands—Commands that do not interact with a tape drive or a tape library, but interact with BrightStor ARCserve Backup.
setdebug, usage

ca_devmgr General Options

The ca_devmgr command line utility supports the following general commands.

Option	Description
-v <-adapterinfo> <-deviceinfo ...> <-groupinfo > <-mediainfo ...>	More of a verbose command, which can only be used with adapterinfo, deviceinfo, groupinfo, and mediainfo. The only difference in using the -v switch is that it prints additional information on the 4 commands.
-adapterinfo	This command will cycle through all the SCSI adapters attached to the system and print out the adapter name, adapter number, SCSI ID, vendor ID, product ID, and firmware of any tape drive or tape library that is connected to the system. Example: ca_devmgr -adapterinfo
-deviceinfo	This command will print out the type of device, SCSI ID, vendor ID, product ID, firmware, status, and device sharing (tape libraries only) information for any tape drive or tape library. The adapter number and SCSI ID options are required. Example: ca_devmgr -deviceinfo [<adapter #> <scsi ID><lun>]

Option	Description
<code>-groupinfo</code>	This command prints out the adapter number, SCSI ID, vendor ID, product ID, firmware, and status (tape libraries only) information on all the groups that have been configured in BrightStor ARCserve Backup. Example: <code>ca_devmgr -groupinfo</code> .
<code>-mediainfo</code>	This command will print out the tape name, tape ID, its sequence number, serial number, and expiration date for any tape device. For tape libraries, the same information is displayed including slot number, the status of whether or not the tape is loaded and write protected. For tape libraries, each slot displays. The adapter number and SCSI ID options are required. Example: <code>ca_devmgr -mediainfo [<adapter #> <scsi ID><lun>]</code>
<code>-regenerate <adapter #> <scsi ID> <scsi lun> <tape name> [<tape ID> <mm/dd/yyyy>]</code>	<p>This option is for use with file system devices if you accidentally delete the tape header. It lets you regenerate or rebuild a tape header with a specified tape name (<tape name>) for a file system device. After you generate a new tape header, you can then merge all of the sessions on the file system device into the BrightStor ARCserve Backup database, which enables the capability for point-and-select restores.</p> <p>If you know the original tape name (<tapename>) and its tape ID (<tapeID>), you can reuse them so that the session records in the BrightStor ARCserve Backup database can reconnect to the volume without having to merge the session records again. (You can check the original tape record in the BrightStor ARCserve Backup database for the tape name and tape ID).</p> <p>You can use the <mm/dd/yyyy> parameter to specify a different tape expiration date from the default date.</p>

ca_devmgr Tape Drive Options

The following table describes commands for use with tape drives.

Option	Description
-format	<p>This command formats a tape in a tape drive. The first three options, adapter number, SCSI ID, LUN, and the new name of the tape, are required. The date and serial number are optional. For example, ca_devmgr -format [<adapter #> <scsi ID> <lun> <tape name>] [<mm/dd/yy[yy]> <serial no.>].</p>
-erase	<p>This command erases a tape in a tape drive. The adapter number, and SCSI ID options are required. The options q, which stands for quick erase (destroy media label), qz, which stands for quick erase plus (destroy media label and serial number), and l, which stands for long erase (destroy all data on the media) are optional. By default, BrightStor ARCserve Backup performs a quick erase.</p> <p>Important: Using long erase erases the entire media from the beginning of the tape to end of the tape and may take a long time. For example, ca_devmgr -erase [<adapter #> <scsi ID><lun>] [q qz l].</p>
-retension	<p>This command retensions a tape in a tape drive. Both options, adapter number, and SCSI ID, are required. Example: ca_devmgr -retension [<adapter #> <scsi ID><lun>].</p>
-compression	<p>This command allows the compression on a tape drive to be either enabled or disabled. For this command to work the tape device must support compression and there must be a blank tape in the drive. The adapter number and SCSI ID options are required as well as the on or off flag. For example, ca_devmgr -compression [<adapter #> <scsi ID><lun>] on off.</p>
-eject	<p>This command ejects a tape from the tape drive. The tape drive must support the eject command in order for this command to work. The adapter number and SCSI ID options are required. Example: ca_devmgr -eject [<adapter #> <scsi ID><lun>].</p>

Option	Description
-purge	For more information about this option, see the section Staging Command Line Purge Tool in this appendix.
-query	For more information about this option, see the section Staging Command Line Query Tool in this appendix.

[ca_devmgr Tape Library Options](#)

The following table describes commands for use with tape libraries.

Option	Description
-chformat	<p>This command formats a single tape or multiple tapes in a tape library. For example, <code>ca_devmgr -chformat [<changer adapter #><changer scsi ID> <changer lun> SLOT <slot #> <tape name> [<mm/dd/yy[yy]> def [<serial no.>]] ...]</code></p> <p>This command requires the changer adapter number, changer LUN, and changer SCSI ID. It also requires the word "SLOT" and the slot number of where the tape to be formatted is located, as well as the tape name. The <code>mm/dd/yy[yy]</code>, which is for the expiration date is optional. The <code>def</code> switch stands for the default expiration date. You cannot use both the expiration date and the <code>def</code> switch at the same time. That is why the "<code> </code>" is there. The serial number is also optional. The 3 <code>.</code> at the end mean that you can specify more slot numbers.</p>

Option	Description
-cherase	<p>This command erases a single tape or multiple tapes in a tape library. For example,</p> <pre>ca_devmgr -cherase [<adapter #> <changer scsi ID> <changer lun> <slot #> [q qz l] [, <slot #> [q qz l],...]</pre> <p>ca_devmgr -cherase [<adapter #> <changer SCSI ID> <changer lun> <slot #> [q qz l] [, <slot #> [q qz l],...]</p> <p>The adapter number, changer SCSI ID, changer LUN, and the slot are required. The q, qz, and l are optional. Just like in the erase command, the q, qz, and l options do the same procedures. By default, the q option is used if none of the 3 are specified.</p>
-load	<p>This command loads a tape from a specified slot into a tape drive.</p> <pre>ca_devmgr -load [<changer adapter #> <changer scsi ID> <changer lun> <drive adapter #> <drive scsi ID> <drive lun> <slot #>]</pre> <p>In this command, the changer adapter number, changer SCSI ID, changer LUN, drive adapter number, drive SCSI ID, drive LUN, and the slot number are required.</p>
-unload	<p>This command unloads a tape from a tape drive and puts it back in the slot.</p> <p>For example, ca_devmgr -unload [<changer adapter #> <changer scsi ID> <changer lun> <drive adapter #> <drive scsi ID> <drive lun>]</p> <p>Here, the changer adapter number, changer SCSI ID, changer LUN, and the slot number are required.</p>

Option	Description
-mount	<p>This command takes inventory of your entire tape library. If your tape library does not have a bar code reader, it will then put all the media into the tape drive and read them. If your tape library does have a bar code reader, then you can specify whether or not to obtain the information from the database or have BrightStor ARCserve Backup read in all the media.</p> <p>For example, <code>ca_devmgr -mount <changer adapter #> <changer scsi ID> <changer lun> <beg. slot> <end slot> [q l]</code></p> <p>As you can see, the changer adapter number, changer SCSI ID, changer LUN, a beginning slot and an end slot are required. The beginning slot and end slot can be any slot number, as long as the slots conform to the group you are mounting. The end slot cannot be smaller than the beginning slot. Here, the q or l options are optional. The q stands for a quick mount, that is, if your tape library has a bar code reader, it will obtain the information from the BrightStor ARCserve Backup database. The q is the default switch for tape libraries with bar code readers. The l stands for long mount, which will force BrightStor ARCserve Backup to put each tape into the tape drive and read the information on it. Of course, if your tape library has no bar code reader, the q switch will not work, therefore, each tape has to be read in by the tape drive.</p>

Option	Description
-dismount	<p>This command dismounts the slots in the specified group within the range that is provided in the options. It then renames all slots to "Dismounted Slot." Unless BrightStor ARCserve Backup is restarted or a mount command is issued to the dismounted group, no other command can be issued to the dismounted slots.</p> <p><code>ca_devmgr -dismount <changer adapter #> <changer scsi ID> <changer lun> <beg. slot> <end slot></code></p> <p>Here, the changer adapter number, changer SCSI ID, changer LUN, the beginning slot, and the end slot are required.</p>
-import	<p>This command takes a tape from the import/export slot and place it into its destination slot. If your tape library has a bar code reader and it is enabled in BrightStor ARCserve Backup, the information will be taken from the database and the tape will not have to be read in by the drive. If, however, your tape library does not have a bar code reader, it will then place the tape into the drive to be read.</p> <p><code>ca_devmgr -import [<changer adapter #> <changer scsi ID> <changer lun> <slot #> [<slot #> ...]]</code></p> <p>The changer adapter number, changer LUN, changer SCSI ID, and slot number are required. The only optional switch is the extra <slot # ...>. This is for tape libraries that have more than one import/export slot. You can import multiple tapes at a time. If your tape library has only one import/export slot, then you can only import one tape at a time.</p>

Option	Description
<code>-export</code>	<p>This command allows you to take a tape from a slot in the tape library and put it in the import/export slot.</p> <p><code>ca_devmgr -export [<changer adapter #> <changer scsi ID> <changer lun> <slot #> [<slot #> ...]</code></p> <p>Like the import command, the changer adapter number, changer SCSI ID, changer LUN, and the slot number are required. The <code><slot # ...></code> is for multiple exporting of tapes. This, like the import command, can only be done if your tape library has more than one import/export slot.</p>
<code>-clean</code>	<p>This command takes a cleaning tape, if one is installed in the tape library, put it into the specified drive and clean the tape drive.</p> <p><code>ca_devmgr -clean [<changer adapter #> <changer scsi ID> <changer lun> <drive adapter #> <drive scsi ID> <drive lun>]</code></p> <p>The changer adapter number, changer SCSI ID, changer LUN, tape drive adapter number, tape drive SCSI ID, and drive LUN are required.</p>
<code>-ieinfo</code>	<p>This command displays information on the library's import/export slot, including whether or not it is full and, if full, the barcode number of the tape in the slot.</p> <p><code>ca_devmgr -ieinfo [<changer adapter #> <changer scsi ID> <changer LUN ID>]</code></p> <p>The changer adapter number, changer SCSI ID, and the changer LUN ID are all required.</p>

ca_devmgr Miscellaneous Options

The following table describes miscellaneous ca_devmgr commands.

Option	Description
<code>-setdebug</code>	Sets the debug level of BrightStor ARCserve Backup. <code>ca_devmgr -setdebug <debug level></code>
<code>-usage</code>	Displays a list of basic ca_devmgr commands.

Option	Description
-allusage	Displays a list of ca_devmgr commands and their switches.
-help	Opens the ca_devmgr Help topic.
-examples	Opens a Help topic with ca_devmgr usage examples.

Staging Command Line Purge Tool

If the staging device becomes full or exceeds its storage threshold, backup jobs will fail. To remedy this situation, BrightStor ARCserve Backup provides you with capability to purge sessions forcefully from a file system device using the ca_devmgr command line utility.

Note: Use the query tool to analyze the sessions on the disk device before running the purge tool.

Using the purge tool, you can perform the following tasks:

- Purge copied sessions
- Purge uncopied sessions

ca_devmgr Syntax:

To run the purge tool, use the following syntax:

```
ca_devmgr [-cahost <hostname>]
           [-force]
           -purge <adapter #> <scsi id> <lun>
           -sessions <list of space separated sessions> | <session range>
```

For example:

```
ca_devmgr [-cahost <hostname>]
           [-force]
           -purge <adapter #> <scsi id> <lun>
           -sessions <session001 session002 session003 ...> | -sessions <start session
           number>-<end session number> | -sessions all
```

The purge tool supports the following command line options:

Option	Description
-purge	Purges the specified copied sessions (only).

Option	Description
<code>-force</code>	Purges the specified uncopied sessions (only).
<code>-sessions <list of space separated sessions> <session range></code>	<p>Specifies the session number, the group of session numbers, the range of session numbers, or all session numbers that you want to purge.</p> <ul style="list-style-type: none">■ To specify a session number or group of session numbers, you must provide the session number or a list of space separated session numbers using the following syntax for the <code>-sessions</code> argument: <code>-sessions 1 2 3</code>■ To specify a range of sessions, use the following syntax for the <code><session range></code> argument: <code>-sessions 1-99</code>■ To specify all sessions, use the following syntax for the <code><session range></code> argument: <code>-sessions all</code>

Staging Command Line Query Tool

If a copy to media operation fails, BrightStor ARCserve Backup provides you with the capability to query the staging device designated to perform the copy to media operations. The query tool can help you identify problems and take corrective actions.

The query tool, `ca_devmgr`, provides you with a description of the following staging information:

- All copied and uncopied sessions
- All sessions with SnapLock security
- Retention period for each session
- All sessions that can be purged

ca_devmgr Syntax

To run the query tool, use the following syntax:

```
ca_devmgr [-cahost <hostname>]
           -query <adapter #> <scsi id> <lun>
           -all | -copied | -uncopied | -snaplocked | -purgable
           -sessions <list of space separated sessions> | all
```

The staging query tool supports the following command line options:

Option	Description
-copied	Displays a list of all copied sessions.
-uncopied	Displays a list of all sessions that were not copied.
-snaplocked	Displays a list of all sessions with SnapLock security enabled and the retention period for each session.
-purgable	Displays a list of all sessions that can be purged.
-sessions <list of space separated sessions> all	<p>Specifies the session number, the group of session numbers, or all session numbers that you want to query.</p> <ul style="list-style-type: none"> ■ To specify a session number or group of session numbers, you must provide the session number or a list of space separated session numbers using the following syntax for the -sessions argument: -sessions 1 2 3 ■ To specify all sessions, use the following syntax for the <session range> argument: -sessions all

ca_jobsecmgr Command

If a username or password changes, you must modify every job in the Job Queue to reflect the change. The ca_jobsecmgr command lets you make a global username or password change for all the jobs in the Job Queue.

You can make these changes for a specific BrightStor ARCserve Backup server or for all BrightStor ARCserve Backup servers in the current BrightStor ARCserve Backup domain.

Note: To run ca_jobsecmgr, you must have equivalency to a BrightStor ARCserve Backup user. In most cases, you can use the user defined for the BrightStor ARCserve Backup system account. To assign equivalencies, use ca_auth.

ca_jobsecmgr Syntax

```
ca_jobsecmgr [server arguments] <current security> <new security>
```

ca_jobsecmgr Options

The ca_jobsecmgr command supports the following options.

ca_jobsecmgr Server Arguments

The following server arguments are supported.

Note: You can use only one of the following arguments in a given ca_jobsecmgr command.

Option	Description
-s server	Use this to change the username or password on a specific BrightStor ARCserve Backup server.
-d	Use this to change the username or password on all servers in the BrightStor ARCserve Backup domain.

ca_jobsecmgr Current Security

After specifying one of the server arguments, you must provide the current security credentials for the job.

Option	Description
-u username	Use this to specify the current BrightStor ARCserve Backup username used for the jobs in the Job Queue. To specify a domain user, use the following format: \\Domain\\Username
-p password	Use this to specify the password for the BrightStor ARCserve Backup user used for the jobs.

ca_jobsecmgr New Security Options

Use these options to specify the new password and, optionally, a new user name.

Option	Description
-np newpassword	Use this to specify the new password.
[-nu newusername]	Optional. Use this to specify the new username for the jobs. To specify a domain user, use the following format: \\Domain\\User format

ca_jobsecmgr Examples

Use the following syntax to change the username and password on a specific BrightStor ARCserve Backup server:

```
ca_jobsecmgr -s machine1 -u administrator -p xyz -nu administrator2 -np xyz2
```

Use the following syntax to change the username and password on all servers in the BrightStor ARCserve Backup domain:

```
ca_jobsecmgr -d -u administrator -p xyz -nu administrator2 -np xyz2
```

ca_log Command

The ca_log command is the command line interface to the Report Manager as well as the Activity log. This command allows you to view and maintain BrightStor ARCserve Backup logs. All of the features available from the Report Manager are available from the command line.

ca_log Syntax

```
ca_log [-cahost hostname] -clear -delete -browse -view [view options] -purge  
[purge options] -schedprune [schedprune options]
```

Note: The [-cahost hostname] switch, identifying the host, is optional. If you are using these commands locally, this switch is not needed. However, if you are performing these commands remotely, the hostname is required.

ca_log Options

The ca_log command line utility supports the following options.

Option	Description
-clear <i>filename</i> [-yes]	Clears the log file and index files associated with a log file. All the information in the log file is discarded, and the resulting log file will have zero length.
-delete <i>filename</i> [-yes]	Delete the specified log file. Note: All the information in the log file is eliminated after a delete action. This command is generally used for deleting user logs and job logs. Some of the daemon log files such as activity.log, camediad.log, cadbd.log, and cauth.log, for example, are essential for functioning of BrightStor AB, and these log files can not be deleted by this command. You can only clear such log files using clear command.
-purge <i>filename</i> [-yes]	Delete the specified log file from the Activity log.
-purge <i>filename</i> [-olderthan <i>num, day[s] week[s] months[s] year{s}></i>]	Delete the specified log file based on age criteria from the Activity log.

Option	Description
-schedprune [-prunesize <i>kilobytes</i> -olderthan <i>num</i> <day[s] week[s] month[s] year[s]> -prunetime <i>HH:MM</i>]	Schedule the pruning of a log file based on the file size or older than criteria. If you specify both size and older than criteria, the pruning removes the oldest part of the log file keeping the latest information intact.
	Note: You can schedule pruning for activity log files only.
-prunesize <i>kilobytes</i>	Specify the maximum log file size above which the pruning will occur. The size should be specified in kilobyte units. For example, -prunesize 3200 allows activity log file to grow a maximum of 32MB.
-olderthan <num> <day[s] week[s] months[s] year{s}>	Specify that logs older than given number of days, weeks, months, or years will be removed from the log file.
-prunetime <HH:MM>	Specify the time at which the prune will happen on a daily basis.
-browse	Show all available log files.
-view <i>filename</i>	Show the specified log file
-view <i>filename</i> [-jobID <i>ID</i>]	Show the specified log file by job ID.
-view <i>filename</i> [-before <i>mm/dd/yyyy</i>]	Report all entries in the specified log file before the specified date.
-view <i>filename</i> [-after <i>mm/dd/yyyy</i>]	Report all entries in the specified log file after the specified date.
-view <i>filename</i> [-monitor]	Show entries to the specified log file as they are added, providing near real-time monitoring.
-view <filename> -sev	Displays the severity level of each entry in the specified log file. The severity levels are: <ul style="list-style-type: none"> ■ I-Information ■ W-Warning ■ E-Error Note: The -sev option can be used in conjunction with the -jobID, -before, and -after options.
-usage	Displays a list of basic ca_log commands.

Option	Description
-help	Opens the ca_log Help topic.
-examples	Opens a Help topic with ca_log usage examples.

ca_merge Command

The ca_merge command is the command line interface to the BrightStor ARCserve Backup Merge Manager utility. Use this command to create and submit merge jobs to the Job Queue. You can merge database information from backup media into your BrightStor ARCserve Backup database. All of the features available from the Merge Manager are available from the command line.

ca_merge Syntax

```
ca_merge [-cahost <hostname>] <source args> <run-job args> <options>
```

The [-cahost <hostname>] switch is an optional switch that identifies the name of the system hosting the operation. If you want to execute the operation on a remote system, this switch must be included in the command. If you want to execute this operation on your local system, this switch is not required and should not be included in the command.

Note: If you include -cahost in the command, you must also specify the *hostname* of the system (local or remote) hosting the operation.

ca_merge Usage

The commands, arguments, and switches available for the ca_merge command allow you to specify the data to be merged, allow you to submit the merge job to be run immediately, to submit the job on Hold, or to schedule the job for a later date and time.

Additionally, you can specify Pre/Post command options (including passwords), log options, output devices, first and span media options, and to save the merge job as a script.

ca_merge Source Arguments

The ca_merge command line utility supports the following source arguments.

Option	Description
-cahost <hostname>	Specify the BrightStor ARCserve Backup server to use for the merge by providing the hostname where the desired server is running. If this switch is not used, cahost is set to the local machine by default.
-group <group name>	Specify the tape group to use for the merge job.
-tape <tape name> [tape ID]	Specify the tape to use for the merge job. The tape ID is optional and is used if there are multiple tapes with the same name.
-currenttapeseq [- allsessions -session <session #>]	For Windows platforms, this option is used to specify to use the current tape sequence for the merge job.
-currenttapeseq [-allsessions -session <session range>]	For UNIX and Linux platforms, this option is used to specify to use the current tape sequence for the merge job.
-allsessions	Specify to merge all the sessions of the tape for the merge job.
-session <session range>	Specify to merge a single session or multiple sessions of the tape. Specify a session range to merge multiple sessions.

ca_merge Run Job Arguments

The ca_merge command line utility supports the following run job arguments.

Option	Description
-at <hh:mm>	Specify the execution time of the merge job.
-on <mm/dd/yyyy>	Specify the execution date of the merge job.
-hold	Submit the merge job on hold. Cannot be used with -runjobnow.
-runjobnow	Submit and execute the merge job immediately. Cannot be used with -hold.

Option	Description
-description <description string>	Add comments to the job. You must use double quotes "" to enclose the string and handle blank spaces.

ca_merge Logging Options

The ca_merge command line utility supports the following logging options. These options are for use on UNIX and Linux hosts.

Option	Description
-logfile <filename> [summary allactivity]	Record activities during the running of the merge job to the specified filename. The user can specify to record all activity or only a summary of the activity.
-snmp	Enable SNMP Alert.
-tng	Enable Unicenter NSM Alert.
-email <email address>	Send a copy of the Activity log to the specified email address.
-printer <printer name>	Send a copy of the Activity log to the specified printer. Note: The printer must be set up in the configuration file: \$BAB_HOME/config/asloggerd.cfg.

ca_merge Pre/Post Options

The ca_merge command line utility supports the following Pre/Post options.

Command	Description
-preexec <command>	Run the specified command before the job starts. The entire path of the command should be included. Note: To use this option you must also specify the -prepostuser option.
-postexec <command>	Run the specified command after the job finishes. The entire path of the command should be included. Note: To use this option you must also specify the -prepostuser option.

Command	Description
-preexecetimeout <minutes>	Specify the time to wait, in minutes, before the merge job starts to allow time for the pre-execute command to finish.
-prepostuser <username>	Specify the user name of the user submitting this merge job.
-prepostpassword <user password>	Specify the password of the user submitting this merge job.

ca_merge Exit Options

The ca_merge command line utility supports the following exit options.

Command	Description
-exitcode <exit code>	Specify the exit code of the pre-execute command. Used with the -skip_delay, -skip_job, and -skip_post switches.
-skip_delay	Run the merge job immediately if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).
-skip_job	Skip the merge job completely if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).
-skip_post	Skip the post-execute command if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).

ca_merge Miscellaneous Options

Media Options

The ca_merge command line utility supports the following media options.

Option	Description
<code>-firsttapetimeout <i>minutes</i></code>	Specify the time, in minutes, to wait for a usable media to be made available for the merge job. The default is 5 minutes. If a usable media is not made available within this time, the job times out and fails.
<code>-spantapetimeout <i>minutes</i></code>	Specify the time, in minutes, to wait for a usable span media to be made available for the merge job. The default is infinite; the job continues to wait and prompt until a usable media is loaded or the user cancels the job.

Job Status Options

The ca_merge command line utility supports the following job status options.

Option	Description
<code>-waitForJobStatus <polling interval (secs)></code>	The ca_merge command will wait until the job is completed, and then exit with a return code that indicates the success or fail outcome of the job. The polling interval value defines how often ca_merge checks the jobs' status with the Queue services. The default interval is 60 seconds. This is useful for Unicenter NSM (formerly known as TNG) scheduling. For more information on how to use this to integrate with Unicenter NSM, see Unicenter NSM Integration in the chapter "Introducing BrightStor ARCserve Backup."

Miscellaneous Options

The ca_merge command line utility supports the following miscellaneous options.

Option	Description
-list	Used to display a list of tapes available for the merge job.
-savescript <scriptname>	Used to save a job script (for use on UNIX and Linux platforms only).
-f <filename>	Used to specify a file name that contains the switches and parameters for the command. This switch overcomes the shell limitation of 1024 character input from command line. You can also use this switch to hide passwords by saving them in a file.
-help	Opens the ca_merge Help topic.
-usage	Displays a list of basic ca_merge commands.
-allusage	Displays a list of all ca_merge commands and their switches.
-examples	Opens a Help topic with ca_merge examples.

ca_mmo Command

You can use the ca_mmo command line utility to protect, control, and manage your media resources.

Note: To use this command, you must install the BrightStor ARCserve Backup Enterprise Module.

ca_mmo Syntax

```
ca_mmo -[vault options]
```

ca_mmo Options

The ca_mmo command line utility supports the options in the table below.

To start a vault cycle, use the following syntax:

```
ca_mmo -start | -startall [-alert] [-export] [-jid]
```

Option	Description
-start [-alert] [-export]	Starts a vault cycle. If you use only the -start command and the output has vaulted tapes that need to be sent to an offsite vault, you must export these tapes out of the changer manually. If you do not want to export tapes manually, use the -export command. When you use -export, MM Admin automatically exports all of the local vaulted tapes to the mailslots of the changer so you do not have to export them manually. If there are more vaulted tapes to export than mail slots, MM Admin waits for the Administrator to empty the mailslots so it can continue exporting the remaining tapes. If you want to receive a notification when mailslots need to be emptied, use the -alert option. After the notification occurs, MM Admin waits a maximum of 24 hours for the mailslots to be emptied.
-startAll [-alert] [-export]	Starts a vault cycle in a SAN. Use the -export switch with -startAll if you want to start a vault cycle in a SAN and export all of the local tapes and tapes in the SAN.
-export	Exports all tapes locally. This option is usually used independently if it is not used with the -start or -startAll options. This is useful if you do not want to export every time you run a vault cycle.
-exportAll	Exports all of the local tapes and all of the tapes in the SAN. This option is usually used independently if it is not used with the -start or -startAll options. This is useful if you do not want to export every time you run a vault cycle.
-jid	Specifies the Job ID.

Option	Description
-reset	Resets the vault status.
-init	Initializes the MM Admin database.
-checkin -tapename <Tape name> -tapeid <Tape id #> -seqnum <Tape seq #> -type <Check in type>	Checks media back into Tape Service using the tape name, ID, and sequence number. Check in type can be temporary <temp>, manually<manual>, or permanently (manual and retire) <manualretire>.
-checkin -serialnum <Tape serial #> -type <Check in type>	Checks media back into Tape Service using its serial number. Check in type can be temporary <temp>, manually<manual>, or permanently (manual and retire) <manualretire>.
-assign -tapename <Tape name> -tapeid <Tape id #> -seqnum <Tape seq #> -vaultname <Vault Name>	Assigns media into a vault using the tape name, ID, and sequence number. When selecting a VCD, if you selected the Assign by User option as the controlling data set, you must use either this command or the -assign -serialnum command to assign a specific tape.
-assign -serialnum <Tape serial #> -vaultname <Vault Name>	Assigns media into a vault using its serial number. When selecting a VCD, if you selected the Assign by User option as the controlling data set, you must use either this command or the -assign -tapename command to assign a specific tape.
-printreport <Print type>	Prints a report. Depending on which type of report you want to print, enter VaultSelection, Shipping, ShippingContent, Receiving, ReceivingContent, InventoryByMedia, InventoryByVault for <Print type>.
-usage	Displays a list of basic ca_mmo commands.
-allusage	Displays a list of all ca_mmo commands and their switches.

ca_mmo Examples

Use the following syntax to export all tapes locally:

```
ca_mmo -export
```

Use the following syntax to export all of the local tapes and all of the tapes in the SAN:

```
ca_mmo -exportAll
```

Use the following syntax to start the vault cycle and then export all of the local tapes:

```
ca_mmo -start -export
```

Use the following syntax to start the vault cycle in the SAN and then export all of the local tapes and tapes in the SAN:

```
ca_mmo -startAll -export
```

ca_qmgr Command

This command, the command line interface with the Job Status Manager, allows you to monitor and control jobs submitted to the BrightStor ARCServe Backup job queue. All of the features available from the Job Status and Activity Log Manager are available from the command line.

ca_qmgr Syntax

```
ca_qmgr [-cahost hostname]
```

Note: The [-cahost hostname] switch, identifying the host, is optional. If you are using these commands locally, this switch is not needed. However, if you are performing these commands remotely, the hostname is required.

ca_qmgr Examples

Use the following syntax to display the current job queue:

```
ca_qmgr -list
```

Use the following syntax to stop a currently running job (in this example, Job 5):

```
ca_qmgr -stop 5
```

Use the following syntax to delete a job (in this example, Job 5):

```
ca_qmgr -delete 5
```

Use the following syntax to display available job scripts:

```
ca_qmgr -listscripts
```

Use the following syntax to import and register a job script from a given path:

```
ca_qmgr -addscript C:\bkpjob1.aspx
```

Use the following syntax to load and run a saved job script:

```
ca_qmgr -load bkpjob1
```

ca_qmgr Job Queue Commands

The following commands let you view and control the job queue:

Option	Description
-list	Displays current job queue.
-usage	Displays a list of all ca_qmgr commands and their switches.

ca_qmgr Job Script Commands

The following commands let you control and use job scripts:

Option	Description
-listscripts	Displays available job scripts (in the BrightStor ARCserve Backup home directory folder). Example: "E:\Program Files\CA\ BrightStor ARCserve Backup\"). A job script is a saved job file that has an .asx extension. You can save any job as a job script from the BrightStor ARCserve Backup Manager.
-load <job script> [<script owner>]	Loads and runs a saved job script. To load a script, it must be in the BrightStor ARCserve Backup home directory.
-addscript <job script>	Imports and registers a job script from a given path. Specify this path along with the job script file name. The job script file is copied to the BrightStor ARCserve Backup home directory from the given path.
-removescript <job script> [<script owner>]	Removes and de-registers a job script. The job script file is deleted from the BrightStor ARCserve Backup home directory.

ca_qmgr Job-Specific Commands

The following commands let you monitor and control individual jobs:

Note: These commands are cross-platform. Use the job ID to back up UNIX servers and job # to back up Windows servers.

Option	Description
-changestatus <job #> ready hold	Changes the job status to ready, or puts a job on hold.
-changedate <job #> <mm/dd/yy [yy]>	Changes the date a job will run.

Option	Description
-changetime <job #> <hh:mm>	Changes the time a job will run.
-stop <job #>	Stops a currently running job. If it is a repeating job, the next job in the sequence is queued. If it is a run-once job, the job is stopped, and marked as Cancelled in the Last Result column of the job queue. If it is a job on hold, no action is taken.
	Note: If you use this option, your job will be stopped without asking for user confirmation.
-view <job #>	Displays job details. (Job Summary)
-delete <job #>	Deletes the job. If it is a repeating job, or a job on hold, the job is deleted. If it is a run-once job, the job is stopped and deleted. You will be asked to confirm that you want to delete the job.
-waitForJobStatus <job #> [<polling interval (secs)>]	The ca_qmgr command will wait until the job is completed, and then returns to prompt. The optional polling interval indicates the time to poll for the job status internally. The default interval is 60 seconds.
	This is useful for Unicenter NSM (formerly known as TNG) scheduling. For more information on how to use this to integrate with Unicenter NSM, see Unicenter NSM Integration in the chapter "Introducing BrightStor ARCserve Backup."
-help	Opens the ca_qmgr Help topic.
-examples	Opens a Help topic with ca_qmgr usage examples.

ca_restore Command

This command, the command line interface to the Restore Manager, allows you to create and submit restore jobs to the BrightStor ARCserve Backup Job queue, and to set all associated options. All of the features available from the Restore Manager are available from the command line.

ca_restore Syntax

```
ca_restore [-cahost <hostname>] [global options] [global filters] {source args}  
[destination args] [run job args] [info args]
```

ca_restore Source Options

The ca_restore command line utility supports the following source options.

Option	Description
-source [-group] [-filter]	Restore by tree view: This command displays lets you specify the file systems and files that you want to restore from a directory tree view. Note: If you use this option, you must specify the -username and -password options.
-source -tape -session [-group] [-tapesessionpw] [-filter]	Restore by tape session view: This command lets you select a specific tape and then select the specific files that you want to restore from the sessions on the media. Note: If you use this option, you must specify the -username and -password options.
-tape -session [-group] [-tapesessionpw] [-filter]	Restore by tape view: This command lets you select a specific tape and then select the session that you want to restore from the media.

Option	Description
-source [<hostname>] <filelist>	<p>Specify the files/directories to restore. The hostname is optional and if not provided, defaults to the local machine. If the -source switch is used alone and not in conjunction with the -tape and -session switches, then the Restore is treated as a file system view restore. For a file system view restore, the BrightStor ARCserve Backup database is used to determine which version of the file to restore is used. For example, a file may have been backed up several times, each time to a different session or even a different tape. When the user wishes to restore this file and does not specify the tape or session to use, then the BrightStor ARCserve Backup database determines the most recently backed up version of the file and restores this file.</p> <p>Note: If you use this option, you must specify the -username and -password options.</p>
-session <session no>	Specifies the tape session number to use for the restore job. This switch must be used with the -tape switch.

Option	Description
-tape <tape name> [<tape ID>]	Specify the tape to use for the restore job. The tape ID is optional and is used in the event that there are multiple tapes with the same name. If the -tape switch is used in conjunction with the -source switch, then the restore is treated as a Tape Session view restore and the BrightStor ARCserve Backup database is used in the restore. This means that the BrightStor ARCserve Backup database checks whether it has a record of the file and tape being specified for the restore. If not, then the restore job will not be submitted, even if all of the information provided is actually correct. In this case, the tape and session in question would need to be merged into the BrightStor ARCserve Backup database before this restore job could be submitted. If the -tape switch is not used in conjunction with the -source switch then the restore is treated as a Tape view restore, and the BrightStor ARCserve Backup database is not used. In this case, if the tape name or session number provided are invalid then the restore job will fail at run-time. The -tape switch must be used in conjunction with the -session switch.
-group <group name>	Specify the tape group to use for the restore job.
-startFromSeq <sequence number>	Specifies sequence no for the tape to restore partial sessions. This is useful if you do not have all the tapes of multtape backup. This option is available only with Tape Session View and Media View.
-filter	For more information, see ca_restore Filter Options.

Option	Description
-tapesessionpw <session password/encryption key>	<p>Specify the session password or encryption key needed in order to restore data from tape.</p> <ul style="list-style-type: none"> ■ If you used the ca_backup -volsessionpw option to execute the backup job, you must use this option to execute the restore job. ■ If you used the ca_backup -encryption argument to execute the backup job, you must use this argument to execute the restore job.

ca_restore Global Options

The ca_restore command line utility supports the following global restore options.

- Media
- Log
- Pre / Post
- Exit Code
- Session Password / Encryption Key

The tables in this section describe the arguments for each of these options

Media Arguments

Argument	Description
-firsttapetimeout <minutes>	Specifies the time in minutes to wait for a usable media to be made available for the restore job. By default, this value is 5 minutes. Thus if a usable media is not made available within this time period, the job will timeout and fail.
-spantapetimeout <minutes>	Specifies the time in minutes to wait for a usable span media to be made available for the restore job. By default, this value is infinite, i.e. the job will continue to wait and prompt until a usable media is loaded or the user cancels the job.

Log Arguments

Note: The following arguments apply to UNIX and Linux platforms only.

Argument	Description
-logfile <filename> [errorsonly allactivity]	Records activities during the running of the restore job to the specified filename. The can specify to record all activity or a summary of the activity.
-snmp	Enables SNMP Alert.
-tng	Enables Unicenter NSM Alert.
-email <email address>	Send a copy of the Activity log to a specified email address.
-printer <printer name>	Sends a copy of the Activity log to the specified printer. Note: The printer must be set up in the asloggerd.cfg file located in the config subdirectory in the BrightStor ARCserve Backup home directory.

Pre / Post Arguments

Argument	Description
-preexec <command>	Runs the specified command before the job starts. The entire path of the command should be included. Note: To use this argument you must also specify the -prepostuser argument.
-postexec <command>	Runs the specified command after the job finishes. The entire path of the command should be included. Note: To use this argument you must also specify the -prepostuser argument.
-preexectimeout <minutes>	The time to wait in minutes before the restore job starts. This allows time for the pre-execute command to finish.
-prepostuser <username>	Specifies the user name of the user submitting the restore job.
-prepostpassword <user password>	Specifies the password of the user who is submitting this restore job.

Exit Code Arguments

Argument	Description
-exitcode <exit code>	Specifies the exit code of the pre-execute command. Used in conjunction with the -skip_delay, -skip_job, and -skip_post switches.
-skip_delay	Runs the restore job immediately if the specified exit code is received.
-skip_job	Skip the restore job completely if the specified exit code is received.
-skip_post	Skip the post-execute command if the specified exit code is received.

Session Password / Encryption Key Arguments

Argument	Description
-sessionpassword <session password>	Specify the session password needed in order to restore data from tape. If you used the ca_backup -sessionpassword argument to execute the backup job, you must use this argument to execute the restore job.

ca_restore Filter Options

The ca_restore command line utility supports the following filter options.

Option	Description
-filter <include exclude> [<file dir> attribute date]	Applies a filter to the job. User must specify to include or exclude the desired pattern. Examples of filter types are: <ul style="list-style-type: none"> ■ file or directory ■ attribute ■ date
-filter include exclude attribute [hidden readonly system archiv]	Specify to include or exclude files with the specified file attribute. e]

Option	Description
-filter include exclude date modify create access onorbefore onorafter <i>mm/dd/yyyy</i>	Specify to include or exclude files created, last modified, or accessed before, on, or after the specified date.
-filter include exclude date modify create access between < <i>mm/dd/yyyy</i> > < <i>mm/dd/yyyy</i> > >	Specify to include or exclude files created, last modified, or accessed between the specified dates.
-filter include exclude date modify create access within count days months years	Specify to include or exclude files created, last modified, or accessed within the specified number of days, months, or years.

ca_restore Destination Options

The ca_restore command line utility supports the following destination options.

Option	Description
-dest [<hostname><hosttype>] <path>	Specify the destination machine and directory path to restore files to. The hostname is optional and, if not provided, defaults to the local machine. If the hostname is provided, the hosttype is mandatory. Available hosttypes are: unix, nt, nwagent, ntagent, and w95agent.
	You must provide a user name and password to connect to the target agent, and you can restore to a remote location only if a BrightStor ARCserve Backup Agent is running on the remote machine.
-orglocation	Use this switch to restore your files to their original machine and path.
-username <user name>	Specifies the user name of the destination machine to restore to. This will be the user used to log- in to the desired machine. Note: You must specify a -username if you use the ca_restore -source option.

Option	Description
-password <password>	Specifies the password for the user to be used to log in to the destination machine. Note: You must specify a -password if you use the ca_restore -source option.
-createemptydiroff	Do not create empty directories during restore.
-preserveuserspaceoff	Disables the preserve user space option. Does not restore the user space restrictions along with the files.
-preservedirsplaceoff	Disables the preserve directory space option. Does not restore the directory space restrictions along with the files.
-entirepath	Create the entire path from root during restore.
-base	Create directories from the base during restore.
-onconflict rename skip overwriteold	Specify action to take when a file with the same name is encountered during the restore.

Oracle-specific Destination Options

Option	Description
-oracle_controlfile	Oracle database restore specific. Specify to restore the Oracle control file.
-oracle_overwritelog	Oracle database restore specific. Specify to overwrite the existing log file.

ca_restore Run Job Options

The ca_restore command line utility supports the following Run Job options.

Option	Description
-at <hh:mm>	Used to specify the execution time of the restore job.
-on <mm/dd/yyyy>	Used to specify the execution date of the restore job.

Option	Description
-hold	Used to submit the restore job on hold. Cannot be used in conjunction with -runjobnow.
-runjobnow	Used to submit and execute the restore job immediately. Cannot be used in conjunction with -hold.
-description <description string>	Used to add comments to the job. Note: It is necessary to use double quotes "" to enclose the string and handle blank spaces.

[ca_restore Info Options](#)

The ca_restore command line utility supports the following information options.

Option	Description
-listgroups	Used to display a list of groups available for the restore job.
-listtapes	Used to display a list of tapes available for the restore job.
-listsessions <tape name> [<tape ID>]	Used to display a list of tape sessions that have been backed up to the specified tape and are available for restore.
-version [<host name>] <path>	Displays a version history of the specified file/directory that has been backed up. The host name is optional and defaults to the local machine if not provided.

Option	Description
<pre>-findfile <file name> ignorecase casesensitive <hostname> any <search path> inclsubdir noinclsubdir <mm/dd/yyyy> today <within #> days months years</pre>	<p>Used to determine whether a file has been backed up by searching the BrightStor ARCserve Backup database. The user provides the file name, whether the name is case-sensitive, the host name (or any if any host name applies), the path to search for the file (use "/" to search at the top-most level), whether or not to include sub directories during the search, the starting modification date, and the number of days, months or years from the starting modification date to search from.</p> <p>Note: If you use wildcards to search a RAIMA database, you are limited to a maximum of 20 characters. The file extension (for example, ".TXT" or ".*") counts towards this total.</p>

ca_restore Miscellaneous Options

The ca_restore command line utility supports the following miscellaneous options.

Option	Description
-cahost <hostname>	Specifies the BrightStor ARCserve Backup server to use for the restore by providing the hostname where the desired server is running. If the switch is not used, by default the cahost is set to the local machine.
-f <filename>	Used to specify a file name that contains the switches and parameters for the command. This switch overcomes the shell limitation of 1024 character input from command line. You can also use this switch to hide passwords by saving them in a file.
-usage	Displays a list of basic ca_restore commands.
-allusage	Displays a list all ca_restore commands and their switches.
-help	Opens the ca_restore Help topic.
-examples	Opens a Help topic with ca_restore usage examples.

ca_restore Examples

Use the following syntax to restore a folder to the original location with Restore By Tree:

```
ca_restore -source machine1 c:\DIR1 -dest machine1 c:\DIR1
```

Use the following syntax to restore a folder to an alternate location:

```
ca_restore -source machine1 c:\DIR1 -dest machine1 c:\ALTDIR
```

Use the following syntax to restore a folder to the original location with Restore By Session:

```
ca_restore -tape TAPE1 -session 3 -dest machine1 c:\DIR1
```

Use the following syntax to restore a folder to an alternate location:

```
ca_restore -tape TAPE1 -session 3 -dest machine1 c:\DIR1
ca_restore -tape TAPE1 -session 7 -dest machine1 c:\temp2
ca_restore -source machine1 c:\ca_lic\Lic98.dll -dest machine1 D:\temp
ca_restore -source c:\ca_lic -dest goyra03wsvr01 ntagent c:\DIR1 -username
Administrator -password 12345
```

The following syntax displays all tapes in the database:

```
ca_restore -listtapes
```

The following syntax displays all sessions on TAPE1:

```
ca_restore -listsessions TAPE1
```

Use the following syntax to search the BrightStor ARCserve Backup to check whether specific files have been backed up:

```
ca_restore -findfile lic98.dll ignorecase bluejays c:\ca_lic inclsubdir within 1
months
ca_restore -findfile * ignorecase any c:\ noinclsubdir within 1 days
ca_restore -findfile * ignorecase any c:\ inclsubdir within 1 months
ca_restore -findfile lic98.dll ignorecase any c:\ inclsubdir within 1 months
ca_restore -findfile lic98.dll ignorecase any c:\ca_lic inclsubdir today 1 day
ca_restore -findfile lic98.dll ignorecase any c:\ca_lic inclsubdir today 1 months
```

ca_scan Command

This command is the command line interface to the Scan Manager utility, and allows you to create and submit scan jobs to the Job Queue. All of the features available from the Scan Manager are available from the command line. Reports information about one or more backup sessions on media.

ca_scan Syntax

```
ca_scan [-cahost <hostname>] <source args> <run-job args> <options>
```

The [-cahost <hostname>] switch is an optional switch that identifies the name of the system hosting the operation. If you want to execute the operation on a remote system, this switch must be included in the command. If you want to execute this operation on your local system, this switch is not required and should not be included in the command.

Note: If you include -cahost in the command, you must also specify the *hostname* of the system (local or remote) hosting the operation.

ca_scan Usage

The commands, arguments, and switches available for the ca_scan command allow you to specify the data to be scanned, allow you to submit the scan job to be run immediately, to submit the job on Hold, or to schedule the job for a later date and time.

Additionally, you can specify Pre/Post command options (including passwords), log options, output devices, first and span media options, and to save the scan job as a script.

ca_scan Source Arguments

The ca_scan command line utility supports the following source arguments.

Option	Description
-cahost <hostname>	Specify the BrightStor ARCserve Backup server to use for the scan by providing the hostname where the desired server is running. If this switch is not used, cahost is set to the local machine by default.
-group <group name>	Specify the tape group to use for the scan job. If you do not know the name of the group, you can use the wildcard character '*' as in the following example: Group *. However, when you use the wildcard character, ca_scan will only scan media that corresponds to the first available tape group in the list of tape groups to be scanned, for example, "Group0."

Option	Description
-tape <tape name> [tape ID]	Specify the tape to use for the scan job. The tape ID is optional and is used in the event that there are multiple tapes with the same name.
-currenttapeseq [-allsessions -session <session #>]	For Windows platforms, this option is used to specify to use the current tape sequence for the scan job.
-currenttapeseq [-allsessions -session <session range>]	For UNIX and Linux platforms, this option is used to specify to use the current tape sequence for the scan job.
-allsessions	Specify to scan all the sessions of the tape for the scan job.
-session <session range>	Specify to scan a single session or multiple sessions of the tape. Specify a session range to scan multiple sessions.

ca_scan Run Job Arguments

The ca_scan command line utility supports the following run job arguments.

Option	Description
-at <hh:mm>	Specify the execution time of the scan job.
-on <mm/dd/yyyy>	Specify the execution date of the scan job.
-hold	Submit the scan job on hold. Cannot be used with -runjobnow.
-runjobnow	Submit and execute the scan job immediately. Cannot be used with -hold.
-description <description string>	Add comments to the job. You must use double quotes "" to enclose the string and handle blank spaces.

ca_scan Logging Options

The ca_scan command line utility supports the following logging options. These options are for use on UNIX and Linux hosts.

Option	Description
-logfile <filename> [summary allactivity]	Record activities during the running of the scan job to the specified filename. The user can specify to record all activity or only a summary of the activity.
-snmp	Enable SNMP Alert.
-tng	Enable Unicenter NSM Alert.
-email <email address>	Send a copy of the Activity log to the specified email address.
-printer <printer name>	Send a copy of the Activity log to the specified printer. Note: The printer must be set up in the configuration file: \$BAB_HOME/config/asloggerd.cfg.

ca_scan Pre/Post Options

The ca_scan command line utility supports the following Pre/Post options.

Command	Description
-preexec <command>	Run the specified command before the job starts. The entire path of the command should be included. Note: To use this option you must also specify the -prepostuser option.
-postexec <command>	Run the specified command after the job finishes. The entire path of the command should be included. Note: To use this option you must also specify the -prepostuser option.
-preexectimeout <minutes>	Specify the time to wait, in minutes, before the scan job starts to allow time for the pre-execute command to finish.
-prepostuser <username>	Specify the user name of the user submitting this scan job.

Command	Description
-prepostpassword <user password>	Specify the password of the user submitting this scan job.

ca_scan Exit Options

The ca_scan command line utility supports the following exit options.

Command	Description
-exitcode <exit code>	Specify the exit code of the pre-execute command. Used with the -skip_delay, -skip_job, and -skip_post switches.
-condition equalto greaterthan lessthan n_ notequalto	Specify the condition for pre execute command exit codes. Used with -exitcode. For greater than and less than conditions, only one exit code should be specified.
-skip_delay	Run the scan job immediately if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).
-skip_job	Skip the scan job completely if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).
-skip_post	Skip the post-execute command if the specified exit code is received. This option will be activated only if BrightStor ARCserve Backup detects that the exit codes meet the specified condition (Equal To, Greater Than, Less Than, or Not Equal To).

ca_scan Miscellaneous Options

Media Options

The ca_scan command line utility supports the following media options.

Option	Description
<code>-firsttapetimeout <i>minutes</i></code>	Specify the time, in minutes, to wait for a usable media to be made available for the scan job. The default is 5 minutes. If a usable media is not made available within this time, the job times out and fails.
<code>-spantapetimeout <i>minutes</i></code>	Specify the time, in minutes, to wait for a usable span media to be made available for the scan job. The default is infinite; the job continues to wait and prompt until a usable media is loaded or the user cancels the job.

Job Status Options

The ca_scan command line utility supports the following job status options.

Option	Description
<code>-waitForJobStatus <polling interval (secs)></code>	<p>The ca_scan command will wait until the job is completed, and then exit with a return code that indicates the success or fail outcome of the job. The polling interval value defines how often ca_scan checks the jobs' status with the Queue services. The default interval is 60 seconds.</p> <p>This is useful for Unicenter NSM (formerly known as TNG) scheduling. For more information on how to use this to integrate with Unicenter NSM, see Unicenter NSM Integration in the chapter "Introducing BrightStor ARCserve Backup."</p>

Miscellaneous Options

The ca_scan command line utility supports the following miscellaneous options.

Option	Description
-list	Used to display a list of tapes available for the scan job.
-savescript <scriptname>	Used to save a job script (for use on UNIX and Linux platforms only).
-f <filename>	Used to specify a file name that contains the switches and parameters for the command. This switch overcomes the shell limitation of 1024 character input from command line. You can also use this switch to hide passwords by saving them in a file.
-help	Opens the ca_scan Help topic.
-usage	Displays a list of basic ca_scan commands.
-allusage	Displays a list of all ca_scan commands and their switches.
-examples	Opens a Help topic with ca_scan examples.

ca_scan Examples

```
ca_scan -tape TAPE1 -allsessions
```

Use the following syntax to list groups, with tape names, available on a host server:

```
ca_scan -cahost machine1 -list
```

Use the following syntax to specify a session to scan for a tape:

```
ca_scan -tape Tape1 -session 2
```

cabatch Command

This command lets you submit jobs to a local or remote BrightStor ARCServe Backup job queue using an external script file, delete jobs from the job queue, and modify the execution times for all of the jobs in the job queue. It also provides automation by using the Job Management Option component of Unicenter NSM (formerly known TNG) by using the /J (returns the job return code) and /W (wait for job completion) switches.

Note: Prior to Unicenter NSM r11, the Job Management Option was referred to as Workload Management.

For more information on how to use this to integrate with Unicenter NSM, see Unicenter NSM Integration in the chapter "Introducing BrightStor ARCServe Backup."

cabatch Syntax 1

Use the following syntax to submit a job using a script file:

```
CABATCH /MODE=Execute|Submit /H=ServerName /S=<path>ScriptName
```

For example:

```
CABATCH /H=QANT /S=C:\\BACKUP.ASX /W
```

cabatch Syntax 1 Options

The cabatch command line utility supports the following options:

Option	Description
/RS[<i>Computer Name</i>]	Note: Specify the source computer name. If you do not specify a computer name, the host name will be used.
/RD[<i>Computer Name</i>]	Specify the destination computer name. Note: If you do not specify a computer name, the host name will be used.
/D [MM/DD/YY]	Specify the date you want to execute the job.

Option	Description
/T [HH:MM]	Specify the time you want to execute the job.
/G [device group]	Specify the device group name.
/TP[media name]	Specify the media name.
/TID[media id]	Specify the media ID.
/TSN[media sequence number]	Specify the media sequence number.
/POST[command]	Runs the specified command after the job finishes. The entire path of the command should be included.
/PRE[command]	Runs the specified command before the job starts. The entire path of the command should be included.
/PREPOSTUSER=user	Specifies the credentials of the user running the pre or post command.
/PREPOSTPWD=password	Specifies the password for the user running the pre or post command.
/SSN[session number]	Specify the session number for a restore job.
/RSessPW	Used to replace the session password.
/J	Use BrightStor ARCserve Backup job status as the return code.
/W	Waiting for job completion.

cabatch Syntax 2

Use the following syntax to delete all or the specified jobs from the job queue:

CABATCH /E=AL|BK|RS|C P|CT /H={ServerName}

or

CABATCH /E=AL|BK|RS|CP|CT /H=ServerName

cabatch Syntax 2 Options

The cabatch command line utility supports the following options.

Option	Description
/H [<i>server name</i>]	Specify the name of the server whose job queue you are deleting jobs from. If you enter "*", cabatch determines and uses the local computer name as the BrightStor ARCserve Backup server name.
AL	Delete all jobs.
BK	Delete backup jobs.
RS	Delete restore jobs.
CP	Delete copy jobs.
CT	Count the number of jobs.

cabatch Syntax 3

Use the following syntax to modify the execution time for all of the jobs in the job queue:

CABATCH /H=ServerName /MT=nnn

cabatch Syntax 3 Options

The cabatch command line utility supports the following options.

Option	Description
/H [<i>server name</i>]	Specify the name of the server whose job queue you are deleting jobs from. If you enter "*", cabatch determines and uses the local computer name as the BrightStor ARCserve Backup server name.
/MT[nnn]	Enter the positive "+" or negative "-" number of minutes to modify the job times. For example, -30.

cabatch Return Codes

The following are return codes for the cabatch command:

- 0—The job finished successfully.
- 1—The job is incomplete.
- 2—The job was cancelled.
- 3—The job failed.
- 4—The job crashed.
- 5—There was a system error.
- 6—There was a parameter error.
- 7—There was a memory failure. Close any non-critical applications that may be using memory and retry the job.
- 8—There was a generic error.

CAReports Command

This command generates reports using the BrightStor ARCserve Backup Report Writer. It provides options for running the report in silent mode and sending an alert via the BrightStor ARCserve Backup Alert Manager.

To view a description of all CAReports syntax, enter the following command:

CAReports /?

CAReports Syntax

```
CAReports -a -s -r <report_filename> -o <output_filename> -m <machine name> -f
<format type> -alert
```

CAReports Options

The CAReports command line utility supports the following options.

Option	Description
-a (or /a)	Enables the output of files automatically. Combined with the -o <path> switch, you can create new output files in a specific directory. The output file name follows the report template name convention. Using the additional switch, -o, existing files are not overwritten.
-r (or /r) <report_filename>	Specifies the name of the report template to be used for the report. If the -r option is not specified, the other options (-s, -o, -alert) are ignored.
-o (or/o) <output_filename>	Specifies the output file name where the results generated by running the report are saved. If a specified file exists, it is renamed '.bak'; for example, c:\temp\report.xml is renamed to: c:\temp\report.bak.xml.
-s (or /s)	Generates the report in silent mode (no dialogs or messages boxes). The -s option works with the -r option and should be used when the report is scheduled from the "Job Scheduler Wizard" tool.
-f (/f) <format_type>	The format of the output file: XML(*.xml), CSV(*.csv, *.txt).
-m (/m) <machine_name>	The name of the machine to be executed.
-alert (or /alert)	Sends an alert when the report is completed. The alerts should be set from Alert Manager, under "BrightStor AB" configuration.
-append	Use this option to append a new created report to an existing file.
Note: Both files must be in csv format.	

pfc Command

This command allows you to run vital checks on the BrightStor ARCserve Backup server and agents to detect conditions that may cause backup jobs to fail. The checks performed by pfc fall into four categories— system checks, BrightStor checks, agent checks, and media checks:

- **System Checks**—These include checking system requirements for the server, available disk space for the database, and RPC service registration.
- **BrightStor Checks**—These include checking the BrightStor system account and its privileges, the status of the BrightStor engines, SAN server connectivity (if the SAN option is installed), and the health of the tape devices attached to the server.
- **Agent Checks**—These include checking the connection and credentials for any client and database agents needed for the job.
- **Media Checks**—These include checking the availability of media in the scratch set (if a media pool is specified for the job), the media expiration dates, and for source and destination conflicts for file system devices.

When you run the pfc utility, it creates the following log:

PFC_SERVERNAME #####.LOG

This log includes the same information that appears in the output generated in the Command Prompt windows when you run pfc and is located in the BrightStor LOG directory. You can change this directory by using the -logpath option.

pfc Syntax

`pfc [-cahost <hostname>] [options] [filename(s)]`

pfc Examples

Use the following syntax to perform all checks, in non-interactive mode, on all READY jobs in the job queue:

`pfc -allchecks`

Use the following syntax to perform system checks in verbose and non-interactive mode:

```
pfc -syschecks -v -n
```

Use the following syntax to perform BrightStor checks and to start any BrightStor ARCserve Backup engines that are not running:

```
pfc -bchecks -s
```

Use the following syntax to perform agent checks for all READY jobs in the queue:

```
pfc -agentchecks -a
```

Use the following syntax to perform agent checks for job3:

```
pfc -agentchecks 00000003.job
```

Use the following syntax to perform agent checks for a job which is on HOLD:

```
pfc -agentchecks 00000003.job
```

Use the following syntax to perform media checks for job3 and job4:

```
pfc -mediachecks 00000003.job 00000004.job
```

Use the following syntax to perform media checks for job3, display the output on the console, and also log the output in a file in the /tmp directory:

```
pfc -mediachecks -logpath /tmp/ 00000003.job
```

pfc Options

The pfc command line utility supports the following options.

Option	Description
-cahost <hostname>	Lets you enter the hostname of the machine where you want to run pfc. This lets you run pfc remotely on any BrightStor ARCserve Backup machine and view the results. Note: This command works on Windows-based BrightStor ARCserve Backup r11, r11.1, and r11.5 machines only.

Option	Description
-allchecks	Performs all checks (system checks, BrightStor checks, agent checks, and media checks), in non-interactive mode, on all Ready jobs in the job queue. You cannot specify filenames when you use this switch.
-syschecks	Performs system checks.
-bchecks	Performs BrightStor checks.
-agentchecks <filename(s)>	Performs Agent checks. When you use this, you must specify one or more job script file names. For more information, see the filenames option. You can also use the -a switch with this option to run Agent checks for all jobs in the queue.
-mediachecks <filename(s)>	Performs media checks. When you use this, you must specify one or more job script file names. For more information, see the filenames option. You can also use the -a switch with this option to run media checks for all jobs in the queue.
-a	Specifies all Ready jobs in the job queue. You cannot specify filenames when you use this switch.
-n	Runs in non-interactive mode. When you use this, pfc does not stop during execution to prompt for input.
-s	Attempts to start any BrightStor ARCserve Backup engines that are not running.
-v	Runs in verbose mode. When you use this, pfc provides detailed information in its output to the Command Prompt window and log about the checks being performed. This includes information used for debugging, such as the name of the failing function and the error code returned when an API call fails.
-logpath <pathname>	Sets the path for log files. The default path is the BrightStor ARCserve Backup LOG directory.

Option	Description
-alert	<p>If you configured the Alert feature, this command lets you send an alert. For example, if you configured Alert to send email and use the -alert command, the PFC log is sent as an email attachment. For more information about configuring alerts, see the chapter "Administering the Backup Server."</p> <p>Note: This command works on Windows-based BrightStor ARCserve Backup r11, r11.1, and r11.5 machines only.</p>
<i>filename(s)</i>	<p>Specify a job script file name if you want to perform a check on a specific job. For example, 00000005.job. These files are located in the 00000001.qsd directory under the directory where BrightStor ARCserve Backup was installed.</p>

tapecomp Command

This command compares media to media. It can be used only with BrightStor ARCserve Backup generated media and must be used in the BrightStor ARCserve Backup home directory.

tapecomp Syntax

tapecomp [options]

tapecomp Options

The tapecomp command line utility supports the following options.

Option	Description
-s <source group name>	Specifies the source group name where your tape is located.
-d <destination group name>	Specifies the destination group name. This switch must be used in all cases.

Option	Description
<code>-r <source tape name></code>	Specifies the source tape name of the tape you want to compare.
<code>-t <dest tape name></code>	Specifies the destination tape name of the tape you want to compare.
<code>-n#</code>	Specifies the beginning source session number. The default is 1.
<code>-x#</code>	Specifies the beginning target session number. The default is 1.

Notes:

- This utility supports all BrightStor ARCserve Backup certified tape drives. The source and target can be different tape drive models.
- A log file is generated for each copy operation.
- The tape compare utility can compare from one particular session to the end or the entire media set.
- The source and target can have multiple media. The utility will ask for the next sequence media when it hits the end of the media.
- Utility progress can be monitored from the BrightStor ARCserve Backup Device Manager. It can also be called from the BrightStor ARCserve Backup post option.

tapecomp Examples

To compare all sessions on Tape1 in Source Group 0 to Tape2 in Destination Group 1:

```
tapecomp -sGROUP0 -rTAPE1 -dGROUP1 -tTAPE2
```

To compare all sessions from Session 3 on TAPE1 TEST in Source Group 0 with all sessions from Session 4 on target TAPE2 TEST in Destination Group 1:

```
tapecomp -sGROUP0 -r"TAPE1 TEST" -n3 -dGROUP1 -t"TAPE2 TEST" -x4
```

tapecopy Command

This command allows you to perform the following tasks:

- Make logical, media to media copies at session level, or of two different types of media.
- Specify WORM media as the target media.

tapecopy Syntax

Tape Copy Job (User Specified Source):

```
<Base Install Path>/tapecopy -s[source group] -d[destination group] -t[source  
tape name] {[source options] [destination options]}
```

Tape Consolidation Job (Database Specified Source):

```
<AB Install Path>/tapecopy -d[destination group] [query options]{-c[destination  
tape name] [destination options]}
```

tapecopy Examples

Tape Consolidation Jobs (Database Specified Source)

Copy All Sessions From Nodes Named AL2000 Before Noon, April 29, 2002:

```
tapecopy -d GROUP1 -qNode AL2000 -qOnOrBefore (4/29/2002,12:00)
```

Copy All Incremental Sessions After Noon, April 29, 2002:

```
tapecopy -d GROUP1 -qMethod INCR -qOnOrAfter (4/29/2002,12:00)
```

Append All Multistreaming Sessions From a Given Master Job ID to a Tape
Named "Everything":

```
tapecopy -d GROUP1 -qMID 232 -c Everything -idd F56 -zd 1
```

Copy All Sessions From All Hosts Except those in an Exclude List and specify a timeout of 10 minutes on connecting to source media and two hours on connecting to target media:

```
tapecopy -d GROUP1 -qNode * -qExclude AcctExcludes.txt -ws 10 -wd 120
```

Copy All Sessions From Nodes Named AL2000 in the last 24 hours and add to Media Pool "MyPool." Using the -m switch causes the tapecopy job to search for a target save/scratch/blank tape in the specified media pool. If a Save Set tape does not exist, BrightStor ARCserve Backup searches for a scratch/blank tape to format and use as the target tape:

```
tapecopy -d GROUP1 -qNode AL2000 -qPastTime 1 -m"MyPool"
```

Copy All Sessions between Noon, April 29, 2002 and April 30 by its Job Number:

```
tapecopy -d GROUP1 -qOnOrAfter (4/29/2002,12:00) -qOnOrBefore "<4/30/2002,12:00>" -qJobNo 21
```

Tape Copy Jobs (User Specified Source)

Append all session from source tape name "TAPE 1" to target name "TAPE 2":

```
tapecopy -s GROUP0 -d GROUP1 -t"TAPE 1" -c"TAPE 2" -idd C86 -zd 1
```

Copy all session from source tape name "TAPE 1" and format blank target tape name to "TAPE 2":

```
tapecopy -s GROUP0 -d GROUP1 -t"TAPE 1" -c"TAPE 2"
```

Copy from local source tape to remote blank tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -rd SERVERNAME(or IP address)
```

Copy from remote source tape to local blank tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -rs SERVERNAME(or IP address)
```

Copy All Sessions From Source Tape and Export Target Tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -ex
```

Copy All Sessions from Source Tape and Offline Target Tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -off
```

Copy all sessions starting from session 3 on source tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -n 3
```

Copy all non-blank tapes from source group and export target tapes:

```
tapecopy -s GROUP0 -d GROUP1 -entire -ex
```

Copy the 3 sessions after session 6 starting from session 6 on source tape:

```
tapecopy -s GROUP0 -d GROUP1 -t TAPE1 -n 6 -ntotal 3
```

tapecopy Options

The following sections describe tapecopy command line options.

tapecopy Query Options

The tapecopy command line utility supports the following query options.

Option	Description
<code>-qType <Backup Session Type></code>	Queries the BrightStor ARCserve Backup database session type. Examples are as follows: NetWare, MSNetDrive, UNIX, BABDatabase, OracleLog, SYBASE, LotusNotes, Informix, TAR, CPIO, UNIXImage, WindowsNT *Includes Win2k*, Windows98 *Includes Win95/ME*, NTSAP, UNIXSAP, ORACLE, ORACLE8, ORACLE9I, NTOracle, ORACLERMAN, UNIXRAW, UNIXSYBASE, DRTAR
<code>-qMethod <Backup Session Method></code>	Queries the BrightStor ARCserve Backup database for matching backup session method. Examples are as follows: FULL, DIFF, INCR. (Where FULL = full backup, DIFF = differential backup, and INCR = incremental backup.)
<code>-qNode <Backup Session Node></code>	Queries the BrightStor ARCserve Backup database for matching backup session node.

Option	Description
-qOnOrBefore <MM/DD/YYYY>, <hh:mm>	Queries the BrightStor ARCserve Backup database for the date and time less than given.
-qOnOrAfter <MM/DD/YYYY>, <hh:mm>	Queries the BrightStor ARCserve Backup database for the date and time greater than given.
-qMID <Master Job Number>	This option is used for consolidating multistreaming sessions. It queries the BrightStor ARCserve Backup database for all sessions subordinate to the master job number of a multistreaming job. The Master Job Number represents the job number of the parent multistreaming job.
-qJobNo <Job No query>	Queries the BrightStor ARCserve Backup database for all sessions subordinate to the job number.
-qMediaPool <Media Pool Name>	Queries the BrightStor ARCserve Backup database for matching media pool name.
-qPreview (View Query Details)	View query details option. This option gives a more in-depth view of the query result set. Use this with the database query options so that you do not commit to executing a copy routine. Instead, you will view the query result set in detail.
-qIgnoreRep (Ignore replication flag)	Ignores the natural filter for replicated sessions in the database. Use this if you want replicated sessions to appear in your consolidation query.
-qExclude <Exclude List File Name>	Specifies an exclude list of host names stored in a file located in the config directory under the BrightStor ARCserve Backup home directory.
-qPastTime <Number of Days>	Queries the number of days you specify, prior to the current date and time. Cannot be used in conjunction with -qOnOrBefore or -qOnOrAfter.

tapecopy Source Options

The tapecopy command line utility supports the following source options.

Option	Description
-activitybar disable	When tapecopy is running, a rotating activity bar displays indicating that tapecopy is active and copying sessions. This option lets you disable the activity bar.
-n <beginning session>	Starting session number option. Use this to specify the starting session number to begin copying from on the source tape. This cannot be used with query switches.
-ntotal <number of sessions>	Use this with the -n option. Allows you to specify the total number of sessions to copy beginning with the -n value you enter. This cannot be used with query switches.
-rs <Remote Server Name>	The remote source server name. Use this when you want to receive data from a remote host.
-entire <copy all non-blank in group>	Copy group option. Use this to copy all of the tapes in a group to another group. This switch is valid only within a changer.
-SCRIPT	Specifies the script file to be used for the tapecopy options.
-t <source tape name>	The source tape name. Use this to specify the name of the tape you want to copy. This cannot be used with the query switches.
-wormSrc	Filters source media such that only WORM capable media are included in the collection of source media to choose from. This option ensures that you are copying from WORM media.
-zs <source sequence no.>	The source sequence number. Use this to distinguish between the sequence numbers when you use the -t option. This cannot be used with query switches.
-s <source group name>	The source group name. Use this to specify the source group name where your tape is located. Do not use this with the query switches.

Option	Description
<code>-ids <source random ID></code>	Source random ID option. Use this to copy tapes with a specific random ID.
<code>-ws <wait on source in minutes></code>	Use this to specify a timeout for session availability. The session may be on a tape that is currently being used. The default timeout is 60 minutes.
<code>-eject (Eject Media)</code>	The eject Option. Use this option to eject the source media.

tapecopy Destination Options

The tapecopy command line utility supports the following destination options.

Option	Description
<code>-rd <remote server name></code>	The remote destination server name. Use this when you want to send data to a remote host.
<code>-zd <destination sequence no.></code>	The destination sequence number. This distinguishes between sequence numbers when you use the <code>-c</code> option.
<code>-d <destination group name></code>	The destination group name. This switch must be used in all cases.
<code>-c <destination tape name></code>	The target tape name. Use this to specify the format name for blank tapes. If part of a specified tape key (uniquely identified target tape), use this to specify the name of a tape to search for and append or overwrite to.
<code>-wormDst</code>	Filters destination media such that only WORM capable media are included in the collection of destination media to choose from. This option ensures that you are copying to WORM media.
<code>-v <vault name></code>	Use this to specify a vault name for the newly created tape to be added to. You must have MMO configured so that you can specify vaulting tapes from the command line.
<code>-dSerialNum <serial number></code>	Use this to connect to a destination tape by serial number. If you use this, you do not need to specify a destination tape key using <code>-zd</code> , <code>-idd</code> , and <code>-c</code> .

Option	Description
-k (Force Vaulting on Incomplete Copy)	Used only with -v. If you use this, destination tapes will still be marked as vaulted on an incomplete tapecopy.
-m <Asgn Media Pool Name>	Assign tape to media pool option. Use this when you want to assign your newly consolidated tape to a media pool.
	This powerful switch helps automate scheduled, unattended tapecopy jobs. When you use this, the tapecopy job searches for a target Save Set tape in the specified media pool to append to. If a Save Set tape does not exist, it searches for a scratch tape to format and use as the target tape. If a save or scratch tape does not exist, it tries to connect to a blank tape and format it as its target tape.
-idr <Destination Random ID>	Destination random ID option. Use this option to copy to tapes with a random ID.
-o (Overwrite)	Overwrite option. Use this when specifying a target tape key (tape name, random ID, and sequence number). If you use this option, you must also use -c, -zd, and -idd.
-off (Offline)	Offline option. Offlines the target tapes at the end of the copy operation. This switch is valid for changers only.
-ex (Export)	Exports target tapes at the end of the copy operation. This switch is valid for changers only.
-wd <Wait On Destination Tape in Minutes>	Use this to specify the timeout in minutes for a successful connection to a destination tape. The default is 60 minutes.
-g (Turn on Detail Merge)	Turn on merge details option. The default for a query copy is to merge the session headers to the database. This will merge the session details.
-h (Turn off Format Database)	Turns off the format database option.
-jid <Job ID>	Specifies the Job ID.

Option	Description
-fDstMux	<p>Use this if you want source sessions to be copied in a multiplexing format to the destination media. If your destination media is blank, it will be formatted as a multiplexing media.</p> <p>Note: You cannot append a multiplexing session to a non-multiplexing media format.</p> <p>This switch cannot be used in conjunction with -zd and -zs.</p>

tapecopy Defaults

The default for Tape Copy Jobs (non-database query copies), are as follows:

- If -t is specified, tapecopy looks for a blank tape in the destination group and formats it with the source tape name, random ID, and sequence number. If there are not enough blank tapes, the operation fails.
- To overwrite an existing tape, you must use the -o option. To overwrite an existing tape or append to it, you must uniquely identify the target tape by using -c, -zd, and -idd.
- When -c (target tape name) is specified, tapecopy looks for a blank tape and formats it to the specified name. If you do not uniquely identify a target tape (if you do not specify all three of -c, -zd, and -idd), tapecopy formats the target tape by generating the values that are not already given.

The defaults for Tape Consolidation Jobs (For database query copies), are as follows:

- If you use the -qPreview option, the query options will not execute a tape consolidation session. If you do not use -qPreview, tapecopy consolidates the queried sessions to a tape.
- Destination tapes are never overwritten. Tapecopy first looks for blanks and if none are available, the operation will fail.
- When -c (target tape name) is specified, tapecopy looks for a blank tape and formats it to the specified name. If you do not uniquely identify a target tape (if you do not specify all three of -c, -zd, and -idd), tapecopy formats the target tape by generating the values that are not already given.

- If you uniquely identify a target tape, tapecopy searches for that tape to either append to or overwrite it.
- To overwrite an existing tape, you must use the **-o** option. To overwrite an existing tape or append to it, you must uniquely identify the target tape by using **-c**, **-zd**, and **-idd**.
- Tape Consolidation waits 60 minutes for each session to become available. You can alter that value with the **-ws** switch.

tapecopy Dependencies

Some of the switches in tapecopy cannot be used in conjunction with others. The following rules apply:

- All of the switches that are prefixed with a **-q##** are query switches and do not work in conjunction with options or switches that explicitly specify the location of source sessions, such as **-n**, **-nTotal**, **-t**, **-zs**, **-s** etc.
- The switch **-nTotal** can be used only with **-n**.
- The switch **-qPastTime** cannot be used in conjunction with **-qOnOrBefore** or **-qOnOrAfter**.
- The switch **-ex** can be used only in a changer.
- The switch **-off** can be used only in a changer
- The switch **-entire** can be used only in a changer
- The switch **-o** can be used only if **-c**, **-zd**, and **-idd** are used.

tapecopy Limitations

There are certain limitations when making duplicates of tapes, and when consolidating copies of the sessions you query. The following limitations apply:

- You cannot have your source tapes in the same group as your destination tapes unless it is a tape library.
- You can have either the source or destination as remote, but not both.
- The BrightStor AB Tape Engine Service must be started.
- The BrightStor AB Database Engine must be started for the query options.
- Tapecopy or consolidation is not compatible with RAID tape sets.

tapecopy Switch Compatibility

The following table defines tapecopy switch compatibility.

Switches	Database Specified Source	User Specified Source
-h	*	*
-c	*	*
-d	*	*
-dSerialNum	*	
-entire		*
-ex		*
-fDstMux	*	*
-g	*	*
-idd	*	
-ids		*
-jid	*	*
-k	*	
-m	*	**
-n		*
-nTotal		*
-o	*	*
-off		*
-qExclude	*	
-qIgnoreRep	*	
-qJobNo	*	
-qMediaPool	*	
-qMethod	*	
-qMID	*	
-qNode	*	

Switches	Database Specified Source	User Specified Source
-qOnOrAfter	*	
-qOnOrBefore	*	
-qPastTime	*	
-qPreview	*	
-qType	*	
-rd	*	*
-rs	*	*
-s		*
-t		*
-v	*	
-wd	*	
-ws	*	
-zd	*	
-zs		*

**Only adds to media pool.

tapecopy Troubleshooting and Debugging

If the Tape Copy command does not successfully create a tape for you, perform the following steps:

1. Make sure that you have the BrightStor ARCserve Backup Tape Engine and Database Engine running.
2. Check to see if the command line switches are correct and consistent.
3. Check the Tape Copy log for clues as to the cause for failure.

Tape Copy writes to a log file in the BrightStor ARCserve Backup log directory. This file contains useful information on connections, data transfers, and database queries. The file is named as follows:

tapecopy####.log

Where ##### represents the number of Tape Copy jobs run.

Appendix D: Troubleshooting

This appendix provides troubleshooting information to help you identify and resolve problems that you may encounter when using BrightStor ARCserve Backup. To help you quickly find the information you need, this appendix is divided into the following categories:

- Hardware
- Security
- Open File
- Tape Errors
- Discovery Service

Hardware Does Not Function as Expected

The following sections provide guidance to help you address hardware-related issues when using BrightStor ARCserve Backup.

Possible Problems

If you are having hardware-related issues with BrightStor ARCserve Backup, you may experience the following symptoms:

- E6300 Windows NT SCSI Port Errors in the BrightStor ARCserve Backup Activity Log.
- Slots not showing the proper status or not updating properly.
- Devices not listed properly in BrightStor ARCserve Backup Device screen.
- Critical hardware errors in the BrightStor ARCserve Backup Activity Log.
- Inability to properly configure your tape device.
- Hardware-related inconsistencies in day-to-day BrightStor ARCserve Backup functions.

Possible Resolutions

The following list of resolutions can help you address hardware-related issues:

- Ensure that the operating system is properly recognizing your devices. If the operating system is having a problem seeing the devices, BrightStor ARCserve Backup may not function properly.
- Ensure that the latest Device Patch is installed for BrightStor ARCserve Backup.
- Check the BrightStor ARCserve Backup Certified Device list to ensure compatibility with your device's firmware.
- Ensure that the proper SCSI drivers are loaded for your SCSI adapter.
- Try using different tapes to ensure that the errors are not media-related.
- Ensure that you have run the BrightStor ARCserve Backup Device Configuration (Tape and Optical Library), assigning your devices to your library in the proper SCSI order. You can also use the Autoconfig button in the Device Configuration.
- Check physical connections and SCSI cabling. Errors can occur because of physical problems, such as a bent SCSI pin.
- If you are running BrightStor ARCserve Backup on Windows NT, check Tape Devices in the Control Panel. Your tape devices should be listed, but the manufacturer drivers should not be installed (check the driver tab). BrightStor ARCserve Backup controls the device directly, and manufacturer drivers are not necessary.
- If you are running BrightStor ARCserve Backup on a Windows platform, run the BrightStor ARCserve Backup Device Configuration by selecting Start, Programs, Computer Associates, BrightStor, BrightStor ARCserve Backup, then Device Configuration. Choose Windows Server and click Next. Choose Enable/Disable Devices (For RSM). If you see your devices listed in the Available Devices window, ensure that the check box is selected. Doing so gives BrightStor ARCserve Backup full control over your device, and does not allow the Windows 2000 Removable Storage Manager service to interfere.
- Check if third-party device monitoring or controlling services are running and, if necessary, disable these services, as they may be conflicting with the BrightStor ARCserve Backup ability to control the device.
- If you are using Library Quick Initialization, rerun Device Configuration and disable this option when troubleshooting BrightStor ARCserve Backup hardware or device issues. This option can be reconfigured after troubleshooting has been completed.

Authentication Security Settings

The following section provides guidance to help you address authentication and security-related issues when using BrightStor ARCserve Backup. Because symptoms of security-related issues vary widely, this section includes possible resolutions only.

Possible Resolutions

The following list of resolutions can help you address security-related issues:

- Ensure that BrightStor ARCserve Backup has properly authenticated the BrightStor ARCserve Backup System Account. To perform this authentication, run bconfig.exe from the BrightStor ARCserve Backup folder. Clear the “Select Database” and “Password for Backup Server Logon and Administration” check boxes, leaving only “System Account” selected. The account entered is automatically given local Administrator and Backup Operator rights.
- Ensure that the BrightStor ARCserve Backup folder is shared with:
 - Administrator—Full Control
 - ARCserve Backup System Account—Full Control
 - Backup Operators—Change and Read
- Ensure that the caroot account for BrightStor ARCserve Backup is set properly. To do so, run bcsconfig.exe from the BrightStor ARCserve Backup folder. Clear the “Select Database” and “System Account” check boxes, leaving only “Password for Backup Server Logon and Administration” selected. Click Next and configure the caroot account accordingly.

- If you are having general problems understanding what rights your backup account needs to perform storage functions in your environment, consider the following information.

If you are backing up only your local BrightStor ARCserve Backup server, the BrightStor ARCserve Backup System account configured at installation has sufficient rights (Administrator and Backup Operator).

If you are backing up remote data within your domain (through the Client Agent for Windows or through the network facility of BrightStor ARCserve Backup), your backup account requires additional rights. The following is a general outline of common permissions necessary for a powerful backup account. You can tailor your backup account to match your needs, and some rights may not be required in your environment.

Note: Security requirements for storage-related functions are dependent upon the resources accessed. Windows security rules and requirements should be considered at all times.

The backup account should have the following Group Rights:

- Administrator
- Backup Operator
- Domain Administrator

The backup account should have the following Advanced Rights:

- Act as part of Operating System
- Log on Locally
- Log on as a service

- When prompted by BrightStor ARCserve Backup to enter security within a domain, always use domain\username as the context.
- If you have established a connection between two computers with one login/password session, Session Credential Conflicts can occur if you attempt to establish a second connection with the same login/password session. Consider any existing sessions you may have and how these may affect BrightStor ARCserve Backup ability to access a resource.
- The security entered in BrightStor ARCserve Backup jobs is static and does not update dynamically if the Windows security account information changes at the operating system level. If you change the account information packaged in your BrightStor ARCserve Backup jobs, you must modify the jobs and repackage them with the proper security information.
- You must back up remote Registry and System State information through the BrightStor ARCserve Backup Client Agent for Windows.

- If you manually stopped and restarted the CA Remote Procedure Call service (CATIRPC) without using the cstop and cstart command, the service cannot communicate with its port assignments properly. This can prevent a user account with caroot equivalence from logging in to the BrightStor ARCserve Backup domain.

To remedy the inability to log in to the BrightStor ARCserve Backup domain, run the cstop command and then run the cstart command. This enables the service to communicate properly and lets the user account with caroot equivalence log in to the BrightStor ARCserve Backup domain.

Unable to Change caroot Password

If you use the ca_conf command line utility to change the BrightStor ARCserve Backup domain name to a new domain name, you will encounter the following problems:

- The caroot password is reset to blank.
- Equivalences are reset for all users.
- The caroot password cannot be reset using the bconfig.exe utility.

To correct these problems, do the following after you run the ca_conf utility:

1. Set the password for the caroot user using the authsetup command line utility with the following syntax:

```
authsetup /p <new carootPassword>
```

This command also creates equivalence for the user that is currently logged into BrightStor ARCserve Backup.

2. Recreate the equivalences for all users manually.

For more information, see the section **ca_auth Command** in the appendix "Using Command Line Utilities."

Cannot Back Up Open Files

The following section provides guidance to help you address issues related to open files when using BrightStor ARCserve Backup.

Possible Problems and Resolutions

If a particular resource you are backing up is locked or in use by the operating system, you may receive the following errors. These errors may be preceded by error code W3404.

Note: The BrightStor ARCserve Backup Agent for Open Files reconciles many common open file errors. If you are not using this Agent, you should consider doing so. We also recommend that you perform remote backups using the BrightStor ARCserve Backup Client Agent for Windows.

MS Error Code	Cause and Resolution
SHARING VIOLATION	Cause: File sharing violation error. Another process (such as an application service) was using a target file when BrightStor ARCserve Backup ran a Backup Job. Resolution: Stop all services and applications using the target file and restart the Backup.
ACCESS DENIED	Cause: A target file for the backup job was not accessible, or another process (such as an application service) was using a target file when BrightStor ARCserve Backup ran the backup job. Resolution: Ensure that your user account has sufficient rights to access the target file, and stop all services and applications using the target file before restarting the backup job.
FILE NOT FOUND	Cause: A target file has been deleted or moved between the submission and the execution of a Backup Job. Resolution: Modify and repackage Job and retry.
PATH NOT FOUND	Cause: A target file path has been deleted or changed between the submission and the execution of a Backup Job. Resolution: Modify and repackage Job and retry.
BAD NET PATH	Cause: A Backup Job is submitted to a Remote Machine and a target network path was not detected because of a missing path or network protocol delay. Resolution: Confirm your network environment and retry the Backup Job.

Tape Errors Occur When Backing Up or Restoring Data

The following section provides guidance to help you address issues related to tape errors when using BrightStor ARCserve Backup.

Possible Problems

If you receive an error that suggests that there is something wrong with one of your tapes, you should take corrective action as soon as possible to ensure the security of your data. Before replacing your tape, however, you should make certain that it is the tape that is causing the problem, and not another part of your system. Try these steps to rule out the possibility that the problem is being caused by something other than the tape:

- Check the history of the Activity Log for the task that caused the error. Although you may get a media error, it may only be the consequence of an earlier error.

For example, during a backup job, you may receive a SCSI port error. After receiving this error, you may get errors that indicate a problem with the tape, or even with the drive, but it is possible that these errors are only a consequence of the problems with the SCSI port. Therefore, you should check the Activity Log for all the messages and errors you received prior to receiving the error that indicated a problem with your tape. In this way, you can determine whether there is actually a problem with your tape, or if the tape error was the consequence of another problem.
- Monitor the library robot. If the robot is not functioning properly, you may get tape errors. Make sure that the robot can move tapes in and out of the drives.
- Rule out the possibility of a mechanical problem with the drive. To do so, try one of these options:
 - Clean the drive, then perform the same task again.
 - If the tape still causes errors after the drive has been cleaned, move the tape to a drive that you know is in good working order and try the same task again. If you get the same error, then it is likely that there is a problem with the tape.

Note: If your drives are inside a library, and you want to try your tape in a different drive, the problem drive must be OFF-LINE. If BrightStor ARCserve Backup did not automatically set the drive to OFF-LINE when it detected the media error, follow the instructions in Configuring Library Devices to manually set the drive to OFF-LINE.

- Try the same task on the same drive, but with a different tape. If you get the same error, then it is likely that the tape is fine, but that there is a problem with the drive or some other system component.

Possible Resolutions

After you have determined that there is a problem with the tape--part of the tape is unreadable, the tape is physically damaged in some way, and so on--you should replace the tape as soon as possible. Before you do that, you will need to back up the data on the bad tape to a reliable tape. You have two options at this point:

- Copy the data to a new tape
- Create a new backup tape

Copy the Data to a New Tape

If you can read data from the tape, follow the steps below. If no data can be read, see Create a New Backup Tape in this appendix for steps about creating a new backup tape.

1. Try moving the tape to a drive that you know is in good working order. You can also try cleaning the drive.
2. Use the Tapecopy utility to copy the data from the bad tape to the new tape.

Note: If the bad tape was part of a library, export the tape from the library so that it does not get used again.

Create a New Backup Tape

If you are unable to read any data from the bad tape, follow these steps to create a new backup tape.

1. Remove the bad tape. If the bad tape is part of a library, export it.
2. Insert a new tape and resubmit the backup job.

Discovery Service Does Not Function Properly

The following section provides guidance to help you address issues related to discovery service problems when using BrightStor ARCserve Backup.

Possible Problems

You may experience a problem in discovering BrightStor applications on a specific machine. It is possible that the machine to be discovered is not located on the same subnet as the machine the discovery service is running (the default setting for Discovery Service is the local subnet).

Possible Resolutions

Choose the Subnet sweep option in the Configuration window and restart the Discovery Service. Or, you can add the specific subnet or machine name (IP address) and restart the Discovery Service.

Appendix E: Acknowledgements

Portions of this product include software developed by third-party software providers. The following appendix provides information regarding this third-party software.

RSA Data Security, Inc. Acknowledgement

MD5C.C - RSA Data Security, Inc., MD5 message-digest algorithm.

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