

BrightStor® ARCserve® Backup for Linux

Agent for Novell Open Enterprise Server Guide r11.5



Computer Associates®

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Chapter 1: Introducing the Agent

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

Among the agents BrightStor ARCserve Backup offers is the BrightStor® ARCserve® Backup for Linux r11.5 Agent for Novell Open Enterprise Server. This agent provides backup and restore capabilities for Novell Open Enterprise Server running on Linux platforms.

The agent handles all communications between BrightStor ARCserve Backup and the Novell Open Enterprise Server during backup and restore jobs, including preparing, retrieving, and processing the data sent between the Open Enterprise Server and BrightStor ARCserve Backup.

Open Enterprise Server from Novell delivers a suite of tightly integrated, enterprise-ready networking services including application, file and storage, high-availability, networking, directory, and security on Linux operating systems.

Data Protection for Open Enterprise Server

Among the services provided by Open Enterprise Server on Linux, the agent supports data protection for Novell Storage Services (NSS), a file system on Open Enterprise Server. The agent uses the Target Service Agent for File System (TSAFS) which lets you browse the object-level view, select objects, and perform the backup and restore operations on NSS.

In addition to NSS, the agent provides data protection for the following:

- Shared volumes in an Open Enterprise Server cluster environment
- GroupWise
- Traditional Linux file systems

Although you cannot see the object-level view of GroupWise, the underlying TSAFS technology lets the agent provide data protection for GroupWise.

Agent Benefits

The Open Enterprise Server is composed of objects such as files, directories, volumes, and metadata. You can back up and restore the Open Enterprise Server using the Graphical User Interface (GUI) or the command line interface. Using the GUI, you can also browse and select Open Enterprise Server objects for backup and restore operations.

The agent provides the following benefits:

- Provides access to the flexible backup creation and management capabilities of BrightStor ARCserve Backup servers to create and manage backups.
For example, you can submit a job for a date you specify and select a repeat method, or select a rotation scheme (a preset weekly backup strategy consisting of full backup jobs).
- Complies with Novell recommended procedure to protect Open Enterprise Server.
- Ensures consistency and integrity of the data being protected.

Agent Features

The Agent for Novell Open Enterprise Server offers a number of features that facilitate your backup and restore operations. The following sections discuss the features and functionality offered by the agent.

Push Technology

The agent uses push technology to automate the backup and restore process. The agent filters and packages its archive data for the BrightStor ARCserve Backup server to provide real-time directory browsing, offload system resources from the backup server, improve data transfer through the use of packet technology, provide network security, and monitor backup and restore jobs.

When the agent is installed and configured, you can use the BrightStor ARCserve Backup server to receive data from each workstation in your data network. The agent browses target directories, prepares the data, and transmits it across the packet network. The backup server prepares the data for storage on the designated backup devices. These simultaneous processes between the agent workstation and the backup server create an efficient and automated backup environment.

Cluster Support

Novell Cluster Services is a multinode clustering product that allows multiple servers with Linux operating systems to connect with one another. This reduces downtime and makes these servers appear as a single, highly available system to network clients. An Open Enterprise Server cluster environment consists of two or more Open Enterprise Servers that share a cluster enabled volume. The active shared volume in a cluster acts as a virtual Open Enterprise Server cluster object and can be viewed in the network.

The agent offers cluster support to back up, protect, and recover the shared volumes in an Open Enterprise Server cluster environment. To perform backup and restore operations on a shared volume, you must add the virtual Open Enterprise Server cluster pool to the BrightStor ARCServe Backup server. You can see the object-level view of the shared volumes in the GUI and perform backup and restore operations.

For more information about adding the virtual Open Enterprise Server cluster pool, see Add Cluster Pools section in the chapter *Installing the Agent*.

Note: The Agent for Open Enterprise Server does not support cluster failover.

Security Features

The agent offer several security features, including agent password security, system logon security, and intelligent client-to-server data encryption.

The agent provides you with two levels of authentication to perform backup and restore operations:

- To view the list of agents on the host you must provide the Linux username and password.
- To protect objects on the Open Enterprise Server, and to browse the object-level view of the Open Enterprise Server objects from the GUI, you must also provide a username and password with appropriate access privileges to the objects. The agent uses the same credentials to connect to the appropriate Target Service Agent (TSA).

For more information about access levels, see section *User Credentials* in the chapter *Best Practices*.

The backup server encrypts the user name and password while communicating with the agent.

Intelligent Client-to-Server Data Encryption

The agent is equipped with intelligent client-to-server data encryption, which allows you to encrypt data packets transported during a backup job with a session password to enhance network security. This feature ensures that transported or archived data is secure and protected. It also ensures both the privacy of data transmitted over the network and the security of your backup media. Users without the encryption key cannot restore or misuse the tapes.

When you enable this feature, the agent encrypts your backup data, including data packets that are transported between the client and the server, and data that has been moved to backup media.

Incremental and Differential Backups

The agent supports incremental and differential backups for NSS and traditional Linux file systems.

- By default, the archive bit is reset for incremental or differential backups of NSS volumes. However, you can use the Do not use Archive Bit for incremental/differential backup option to ignore the archive bit and use time based filters for incremental or differential backups of NSS volumes.
Note: Time based filters are used for incremental or differential backups of non-NSS volumes.
- You can use incremental or differential backups in rotation and custom jobs.
Note: When you submit a custom full backup job and plan to perform custom incremental or differential jobs later, ensure that you set the Clear Archive Bit option.
For more information about incremental or differential backups, see the *Administrator Guide*.

Backup Verification Global Options

The agent supports the Scan Backup Media Contents and Compare Backup Media to Disk backup verification global options, which let you verify that your data was backed up correctly.

For more information about backup verification options, see the *Administrator Guide*.

Multistreaming

The agent supports multistreaming which allows you to backup more than one drive or volume. With multistreaming, you can take advantage of all available tape devices on your system by splitting a single backup job into multiple jobs to use all the available tape drives. As a result, multistreaming increases the overall backup throughput compared with single-stream, sequential processing.

You can configure multistreaming to run as many jobs simultaneously as the number of local and remote devices or groups on the system. With multistreaming, one parent job is created, which triggers child jobs for as many volumes as necessary. When a job is finished on one device, another job is executed until there are no more jobs to run.

For more information about multistreaming, see the *Administrator Guide*.

Multiplexing

Multiplexing writes data from multiple sources to the same media simultaneously. When a job 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.

For more information about multiplexing, see the *Administrator Guide*.

Destination Options

BrightStor ARCserve Backup lets you specify different destination tapes for each day of the week in single stream mode or to specify media pools in multistreaming mode. Using these destination options, you can better organize your backup tapes.

For more information about Destination Options, see the *Administrator Guide*.

How the Agent Works

The Agent for Novell Open Enterprise Server must be installed on the same server as the Open Enterprise Server. When BrightStor ARCserve Backup begins a backup job, it sends a request to the agent. The agent retrieves the data from the Open Enterprise Server and sends it to BrightStor ARCserve Backup, where the data is backed up to media. Similarly, the agent transfers the data when it is restored from the media during restore operations.

During backup and restore operations, the agent acts as a transporting agent. The agent uses the Novell Storage Management Service (SMS) and Target Services Agents (TSA) to connect to the Open Enterprise Server. The agent retrieves the backup data and writes the data to BrightStor ARCserve Backup. BrightStor ARCserve Backup backs up the data to media.

How Data Flows During Backup

The following steps describe the backup process data flow:

1. BrightStor ARCserve Backup forwards a backup request to the Agent for Novell Open Enterprise Server to back up the specified data.
2. The agent reads the specified data in its buffer and forwards the data to BrightStor ARCserve Backup.
3. BrightStor ARCserve Backup writes the data to the selected media device.

This process is repeated until all selected data has been backed up. The agent ensures the consistency and integrity of the backup.

How Data Flows During Restore

The following steps describe the restore process data flow:

1. BrightStor ARCserve Backup forwards a restore request to the Agent for Novell Open Enterprise Server to restore the specified data.
2. BrightStor ARCserve Backup reads appropriate data from the media and forwards it to the agent.
3. The agent restores the data to its original location or to the location specified, depending on the restore option selected.

This process is repeated until all the backed up data has been restored. The agent ensures the consistency and integrity of the data being restored.

Contact Customer Support

For online technical assistance and a complete list of locations, primary service hours, and telephone numbers, contact Customer Support at <http://ca.com/support>.

Chapter 2: Installing the Agent

This chapter describes how to install and configure the Agent for Novell Open Enterprise Server on a Linux platform. The information in this chapter assumes that you are familiar with the characteristics and requirements of the Linux operating system in general.

Prerequisites

Before you install the Agent for Novell Open Enterprise Server, verify the following prerequisites:

- Your system configuration meets the minimum requirements needed to install the agent.
For a list of these requirements, see the Readme file.
- You have the BrightStor ARCserve Backup r11.5 for Linux installed on the backup host.
Note: You must install the agent on the same host as the Open Enterprise Server that you want to back up. This may or may not be the same as the host on which BrightStor ARCserve Backup is installed.
- The latest Novell Storage Management Service (SMS) is installed on each Open Enterprise Server that you want to back up.
For more information about supported versions, see the Readme file.
- BrightStor ARCserve Backup r11.5 for Linux has the OES support patch installed.
This patch allows the BrightStor ARCserve Backup server to support the Agent for Open Enterprise Server.
- You have superuser privileges on the computers on which you want to install the agent.

Licensing

Before you use the agent, you must enter the license for the agent on the backup server you want to use to protect your Open Enterprise Servers. The backup server verifies that the Open Enterprise Server client agents are licensed.

For more information about licensing, see the *Getting Started* guide.

Agent Installation

Install the agent on each Open Enterprise Server you want BrightStor ARCserve Backup to manage.

To install the Agent for Novell Open Enterprise Server, execute the installation script.

The installation script performs the following tasks automatically:

- Installs or upgrades the BrightStor® ARCserve® Backup Common Agent
- Registers the Agent for Open Enterprise Server with the Common Agent
- Enables the Agent for Open Enterprise Server with the Common Agent configuration

Configure the Agent

After installing the agent, you must add and configure each agent host in your network to the BrightStor ARCserve Backup server. The following sections provide procedures to add and configure the agent hosts.

Add the Agent

You must add the agent to the BrightStor ARCserve Backup server before performing backup and restore operations on an Open Enterprise Server.

To add the agent to the BrightStor ARCserve Backup server

1. In the Database Manager, select the Clients tab, and click Add.
The Add Client dialog appears.
2. Enter the name and IP address of the host on which the agent is installed. If you do not know the IP address, enter only the host name. All other fields are optional and appear only for reference on the Client tab of the Database Manager.
3. Click OK.
The agent is added to the BrightStor ARCserve Backup server.

Alternatively, you can execute the following command to add the agent to the BrightStor ARCserve Backup server.

```
ca_dbmgr -client add hostname -ip nnn.nnn.nnn.nnn -os type
```

Example:

```
ca_dbmgr -client add LinuxName -ip 192.168.255.255 -os UNIX
```

For more information about command line utilities, see the *Administrator Guide*.

Add Virtual Cluster Pools

To protect the shared volumes in an Open Enterprise Server cluster environment, you must add the IP address of the virtual cluster pool to the BrightStor ARCserve Backup server.

To add the virtual cluster pool to the BrightStor ARCserve Backup server

1. In the Database Manager, select the Clients tab, and click Add. The Add Client dialog appears.
2. Enter the name and IP address of the virtual Open Enterprise Server cluster pool. All other fields are optional and appear only for reference on the Client tab of the Database Manager.
3. Click OK.

The virtual Open Enterprise Server cluster pool is added to the BrightStor ARCserve Backup server.

Alternatively, you can execute the following command to add the virtual cluster pool to the BrightStor ARCserve Backup server.

```
ca_dbmgr -client add linuxVirtualHostName -ip nnn.nnn.nnn.nnn -os type
```

Example:

```
ca_dbmgr -client add linuxVirtualHostName -ip 172.32.255.255 -os UNIX
```

For more information about command line utilities, see the *Administrator Guide*.

Advanced Agent Options

You must use the `oesagentsetup` script to configure the advanced options associated with the backup and restore operations of the agent. To use the following options, execute the `oesagentsetup` script located in the agent home directory.

-OESProtectNSSOnly

Specifies that the agent should protect only the NSS volumes. This option is set by default. If you clear this option, all file systems, excluding those specified in the `fscntl` file, are protected.

-OESNoExtdAttr

Specifies that the agent should ignore the extended attributes of the backup data being restored. By default, the extended attributes of the backup data are restored.

-OESDelExistTrustees

Specifies that the agent should delete the existing trustees before restoring the backed up data. By default, existing trustees of the backup data are preserved during restore jobs.

-OESIncMigrData

Specifies that the agent should restore the migrated streams of the backup data to the primary storage media. By default, migrated streams are skipped during restore operations.

Agent Configuration File

Use the agent configuration file, oesag.cfg, to set multiple options associated with the agent. The agent configuration file is located in the agent home directory. This file is scanned for entries whenever a job is submitted to the agent.

You can optimize and customize the operation of the agent using the following options in the oesag.cfg file, although none of these options are required for the agent to run. You can use these options to manually customize the operation of the agent.

-b bufsize

Defines the disk I/O buffer size in bytes. Enter a value from 6384 to 65536 bytes.

Default: 65536

-c n

Defines the sleep time in milliseconds (ms), while waiting for a shared memory slot to become completely full or empty. Enter a value from 0 to 1000 ms.

Default: 0

-m maxbuf

Defines the number of buffers allocated for I/O. Specify from 2 to 1024 buffers.

Default: 128

-P n

Defines the default time out in minutes, to execute pre-script or post-script associated with the backup job. Enter a value from 0 to 10.

Default: 10

Note: You cannot use the -P option without defining a number *n*.

-Prebackup filename

Executes the pre-script associated with the backup job being run. The file name is optional.

Default filename: oesag_pre_backup

-Postbackup filename

Executes the post-script associated with the backup job being run. The file name is optional.

Default filename: oesag_post_backup

-Prerestore *filename*

Executes the pre-script associated with the restore job being run. The file name is optional.

Default filename: oesag_pre_restore

-Postrestore *filename*

Executes the post-script associated with the restore job being run. The file name is optional.

Default filename: oesag_post_restore

-s *async|nonblocking*

Specifies the socket I/O to asynchronous or nonblocking mode.

-s *bufsize*

Specifies the size of the socket buffer. Enter a value from 4096 to 65536.

Default: The default setting depends on the system you use.

-s *SocketMode*

Specifies the socket mode for backup operations.

-verbose or -v

Enables verbose mode to enter detailed debugging messages at the console.

Note: These options should be carefully set by system administrators or when instructed to do so by a Computer Associates Customer Support representative.

Agent Control Files

The agent control files specify which directories, file systems, or file system types to exclude from backup operations on a specific Open Enterprise Server host. You must have the Common Agent installed on the Agent for Open Enterprise Server host.

Note: You must be a system administrator to edit the Directory and File System control files although the file access rights can be set to allow all users to append to the files.

The control files installed for the agent include the following:

Directory Control file

Use the Directory Control file, oesag.cntl, to list all directories and file systems you want to exclude from backup operations on a host. To specify directories and file systems to exclude, enter the following:

/complete path name

For example:

/opt/account1

Note: The oesag.cntl file is stored on the agent host in the Agent for Open Enterprise Server home directory.

File System Control file

Use the File System Control file, fs.cntl to list the file system types to exclude from backup operations on a particular host. To exclude a file system type, enter the type on a separate line in the File System Control file. To exclude file systems other than NSS, make an entry for each type of non-NSS file system in this file.

Note: The fs.cntl file is stored on the agent host in the Agent for Open Enterprise Server home directory.

Uninstall the Agent

Use the BrightStor ARCserve Backup uninstallation script in the Common Agent home directory to uninstall the agent. The path to the script is:

/opt/CA/BABcmagt/uninstall

To uninstall the Agent for Novell Open Enterprise Server, run the uninstallation script and specify the agent when prompted.

Chapter 3: Using the Agent

Using the agent, you can back up and restore Open Enterprise Servers using the GUI or the command line interface. The following sections provide information about backup and restore operations using the agent and procedures to enable you to use the GUI and command line interfaces.

Back Up Your Data

Using BrightStor ARCserve Backup Agent for Novell Open Enterprise Server and the Backup Manager, you can configure and submit backup jobs, choosing any volume (local or clustered) on an Open Enterprise Server as your source and an appropriate device on the backup server as your destination.

Backup Manager Overview

The Backup Manager GUI lets you select the objects to back up and the location to which to back them up. The Backup Manager also lets you customize backup jobs using filters, options, and scheduling, and display detailed information about your backup job.

For more information about the Backup Manager, see the *Administrator Guide*.

Backup Manager Tabs

Each backup job requires a source, a destination (media), and schedule or method. The Backup Manager provides the following tabs to set up your backup job:

Source tab

Displays all UNIX/Linux agent hosts defined in the BrightStor ARCserve Backup database. Expand a particular UNIX/Linux agent host to display the subordinate objects on that server. Browse Open Enterprise Server to view a list of objects located on that server. You can browse through the objects of the Open Enterprise Server just as you would any other BrightStor ARCserve Backup supported host or client.

Staging tab

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.

For more information about Staging, see the *Administrator Guide*.

Destination tab

Displays BrightStor ARCserve Backup device groups as defined in the media daemon configuration file (camediad.cfg).

Method/Schedule tab

Allows you to select the schedule and method of the backup job. From this tab you can either select a predefined backup strategy or customize a backup strategy.

Backup Options

Backup options for the agent are displayed in the right pane of the Backup Manager when you log in to the Open Enterprise Server. When you select a Novell OES object and then select OES Option tab on the right pane, the available options are displayed. The OES options are:

User Name and User Password

Allows you to enter the user name and password with access privileges to the objects on the Open Enterprise Server you want to back up. By default, these fields are populated with the username and password provided to browse the Open Enterprise Server objects.

Force Decompression of Compressed Files

Decompresses the compressed files when performing a backup job. This allows originally compressed data to be restored to an uncompressed volume.

Do not use Archive bit for incremental/differential backups of NSS volumes

Allows you to specify that Archive bit should not be used for incremental or differential backup for NSS volumes. The agent performs time based incremental or Differential backups when this option is set.

Note: Time based filters are used for incremental or differential backups of non-NSS volumes.

Back Up Data

A backup job must have a source from which data is extracted and a destination in which to store the extracted data. To back up data from Open Enterprise Server, submit a backup job from the Backup Manager, select the Open Enterprise Server objects as the source, and a device as the destination.

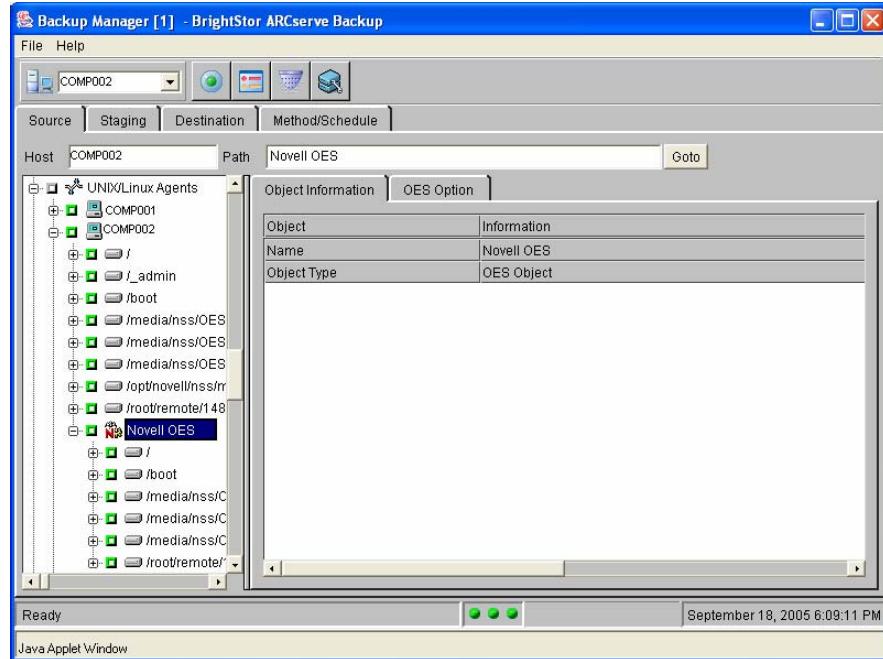
To use the Agent for Novell Open Enterprise Server to back up data

1. On the Source tab in the Backup Manager window, select and expand the UNIX/Linux Agents node.
A list of available UNIX and Linux agent hosts appear.
2. Select the host containing the Open Enterprise Server to be backed up.
The host Login dialog for the selected host appears.
3. Enter valid user credentials to access the Linux host and click OK.
The selected host displays a list of agents.
4. Select Novell OES and click the plus sign (+).
The Instance Login dialog appears.

5. Enter the user name and password with access privileges to the objects on the Open Enterprise Server you want to back up and click OK.

The selected server expands to display a list of Open Enterprise Server objects.

Note: If an object has multiple subordinate objects, you can choose which of these to back up and which to exclude from backup.



6. Select the objects to be backed up and toggle the marker next to the target object to select the type of backup to be performed.

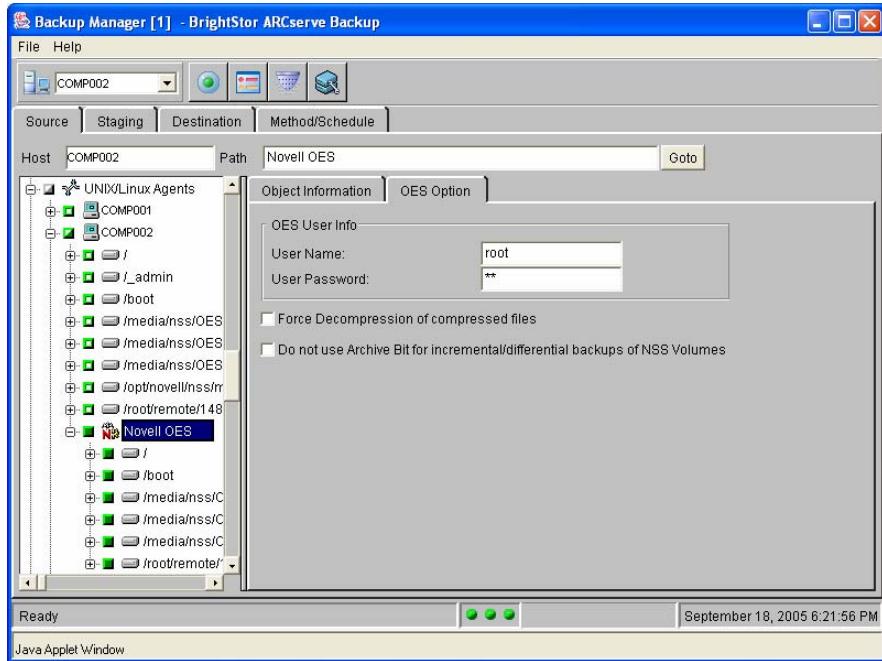
The appearance of the corresponding marker changes to indicate the type of backup selected.

- A solid green marker indicates a full backup.
- A partially green marker indicates a partial backup.

Note: If an object has multiple subordinate objects and the markers for all subordinate objects are completely filled, then the marker for the object is automatically completely filled. If the subordinate object markers are a mix of completely filled and partially filled, then the marker for the object is automatically partially filled. If you toggle an object marker to completely filled, all subordinate object markers are automatically filled completely.

For more information about selecting objects for backup, see the *Administrator Guide*.

7. (Optional) Select the OES Option tab in the right pane to enter user credentials and set OES specific options to perform backup operations.



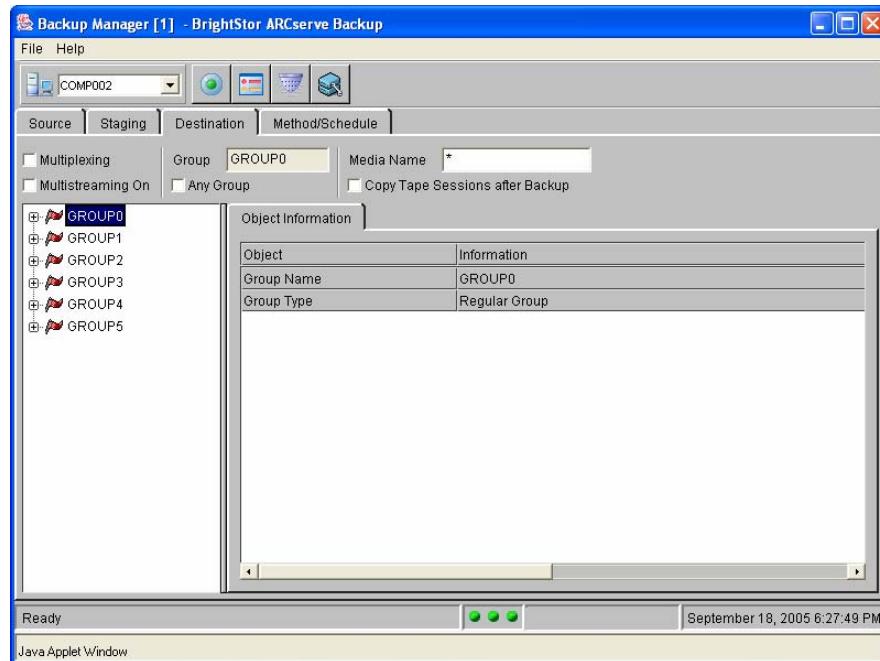
8. (Optional) Select the Staging tab to submit the backup job to a staging group.

The available staging options are displayed.

For more information about Staging, see the *Administrator Guide*.

9. Select the Destination tab to display the destination options, and select the applicable Backup Group to which you want to direct the backup data.

The available destination options are displayed.



10. Select the Method/Schedule tab and define the schedule and method of the backup job.

The available backup methods and schedules are displayed.

For more information about the Method/Schedule tab, see the *Administrator Guide*.

11. (Optional) Click the Option button to customize the backup job.

The Option dialog appears.

For more information about these options, see the *Administrator Guide*.

12. (Optional) Click the Filter button to set filters for the backup job.

The Filter dialog appears.

For more information about filter options, see the *Administrator Guide*.

13. Click Submit.

The backup job is initiated.

Note: You can monitor the progress of your job in the Job Status Manager.

For more information about the Job Status Manager, see the *Administrator Guide*.

Restore Your Data

Using BrightStor ARCserve Backup Agent for Novell Open Enterprise Server and the Restore Manager, you can configure and submit restore jobs.

Restore Manager Overview

The Restore Manager GUI lets you select the backup data to restore and the location to which you want to restore it. The Restore Manager also lets you customize restore jobs using filters, options, and scheduling, and provides detailed information about your restore job.

For more information about the Restore Manager, see the *Administrator Guide*.

Restore Manager Tabs

Each restore job requires a source and a destination. The Restore Manager provides the following tabs to set up your restore job:

Source Tab

You can browse a particular Open Enterprise Server to view a list of objects backed up on that server. You can browse Open Enterprise Server objects just as you would any other BrightStor ARCserve Backup-supported host or client.

Destination Tab

You can expand UNIX/Linux Agents to view the subordinate objects on that host. Data from one Open Enterprise Server can be restored to either the same or another Open Enterprise Server on Linux.

Restore Methods

Select the restore methods for the agent from a drop-down list on the Source tab of the Restore Manager. When an Open Enterprise Server is selected for restore, the following methods are available:

Restore By File System method

Restores specific directories or drives from a list of files and directories backed up using BrightStor ARCserve Backup. This method lets you select objects for restore jobs based on the source host from which the data was backed up. Use this method when you do not know which media contains the data you need, but you have a general idea of what you need to restore and which source host it came from.

This is the default method for the Restore Manager.

Restore By Session method

Displays a list of all media used in backups and the files contained on them. This method lets you select objects for restore jobs based on backup sessions. The file information comes directly from the BrightStor ARCserve Backup database, reducing the time it takes to read information from each media.

Restore By Backup Media method

Displays all the device groups and media currently attached to the host. This method lets you select the device group and media, and specify the sessions on the media to restore. This method restores a complete backup session from a specified media in a storage device. Because this method does not use the BrightStor ARCserve Backup database, you cannot pick individual objects to restore from a directory tree. Use this method if a tape was created by a different version of BrightStor ARCserve Backup.

Note: By default, each method restores data to the original location unless you specify an alternate location. To specify an alternate location, see the section *Restore Data to a Different Location*.

Agent Restore Options

The agent provides you with job level restore options. From the Option dialog, select the Destination tab to see the Open Enterprise Server specific options in the Novell OES Options (Linux only) section. The available options are:

Do not restore trustee information

Allows the agent to discard the trustee information during restore operations.

Do not restore the data set's resource restriction information

Allows the agent to discard the data set resource restriction information during restore operations.

Do not restore the data set's space restrictions

Allows the agent to discard the data set space restriction information during restore operations.

In addition, the agent displays a restore option on the right pane of the Restore Manager when you select the destination tab. The available option is:

User Name and User Password

Allows you to enter the user name and password of the user logging in to the destination Open Enterprise Server. By default, these fields are populated with the username and password provided to browse the Open Enterprise Server objects.

Note: This option is not valid when you select the Restore to original location option for restore operation.

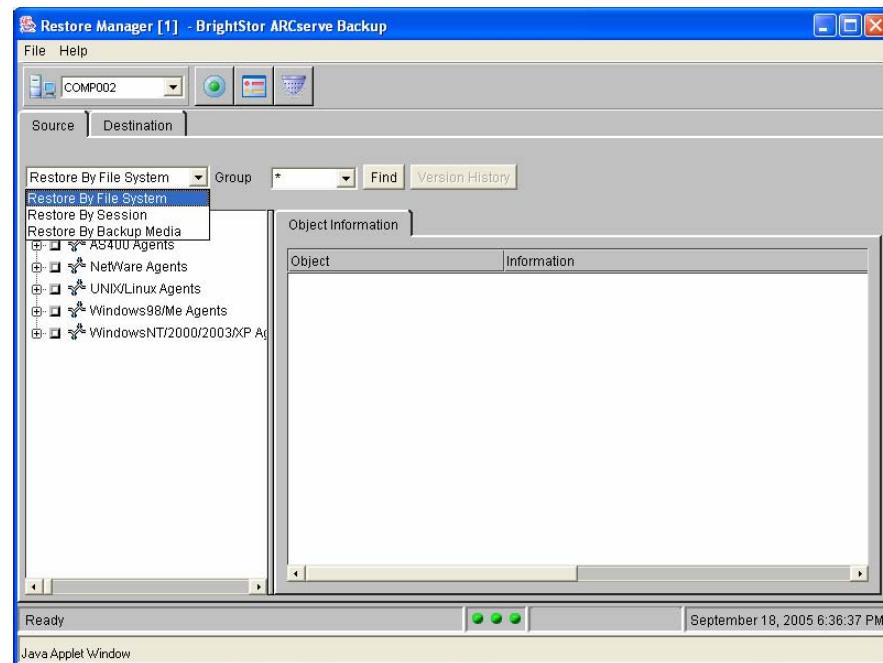
Restore Data

Restore jobs must have a data source, from which objects are extracted, and a destination to which files are restored. To restore data to an Open Enterprise Server, submit a restore job from the Restore Manager and select the Open Enterprise Server as the destination.

To use the Agent for Novell Open Enterprise Server to restore backup data

1. On the Source tab of the Restore Manager window, select a restore method from the drop-down list.

The corresponding restore options are displayed.



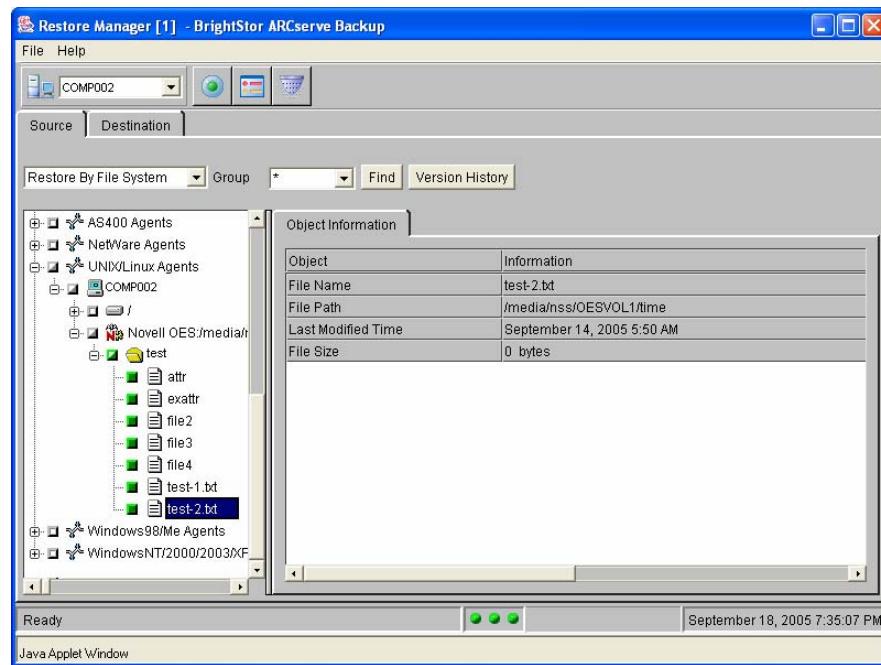
Note: The available fields displayed and the objects listed in source tree will vary depending upon the method you select.

2. Select the objects to be restored from the source tree.

The corresponding Object Information is displayed.

The selection method varies, depending upon the restore method you have selected in the previous step:

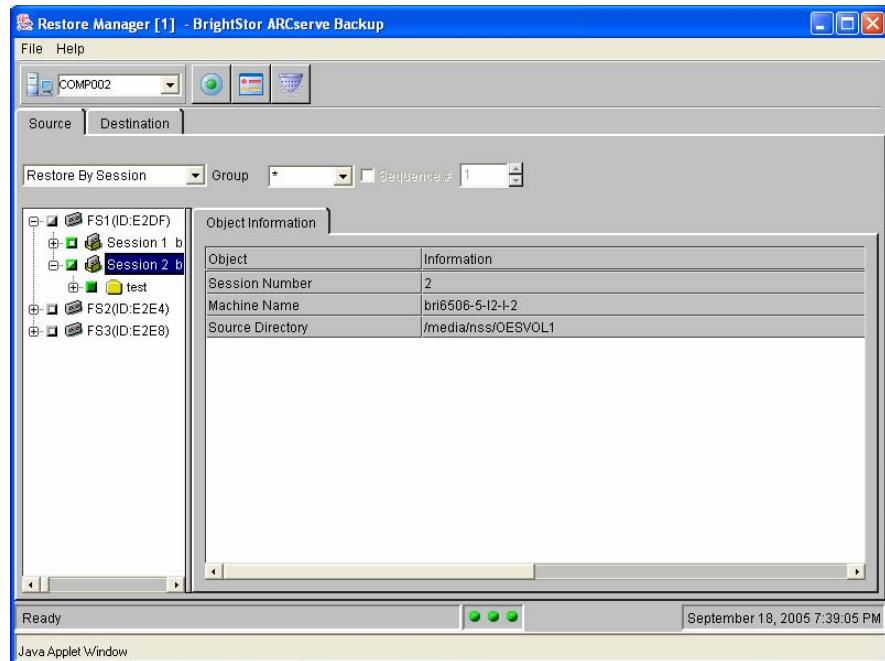
- If you selected the Restore By File System, expand the UNIX/Linux Agents node and continue to expand each level until the Open Enterprise Server objects are displayed. Click the corresponding marker until it is solid green to select the objects to be restored.



- If you selected Restore By Session, expand the applicable media entry and continue to expand each session level until the objects to be restored are displayed. When you select a session, all the objects backed up in that session are displayed.

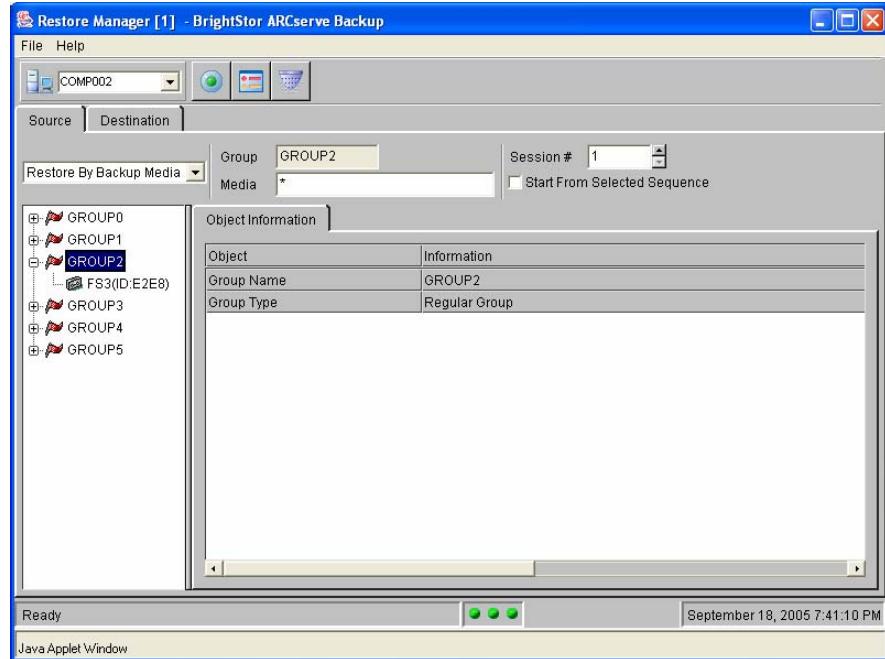
Click the corresponding marker until it is solid green to select the objects to be restored.

Note: If you select an object that was backed up in a different session, BrightStor ARCserve Backup clears all previous selections from the other sessions.



- If you selected Restore By Media, expand the applicable Group entry to view the media objects. Select the media to be restored.

Note: When you select a media, all the objects in the selected backup session on that media are restored.



3. Click the Destination tab.

The available destination options are displayed.

4. Select the destination for the data to be restored.

The Agent for Open Enterprise Server provides two destination options:

- You can restore data to its original location
- You can use the corresponding object tree to restore data to different locations.

For more information about restoring data to its original location, see the section *Restore Data to its Original Location* in this chapter. For more information on restoring data to a different location, see the section *Restore Data to a Different Location* in this chapter.

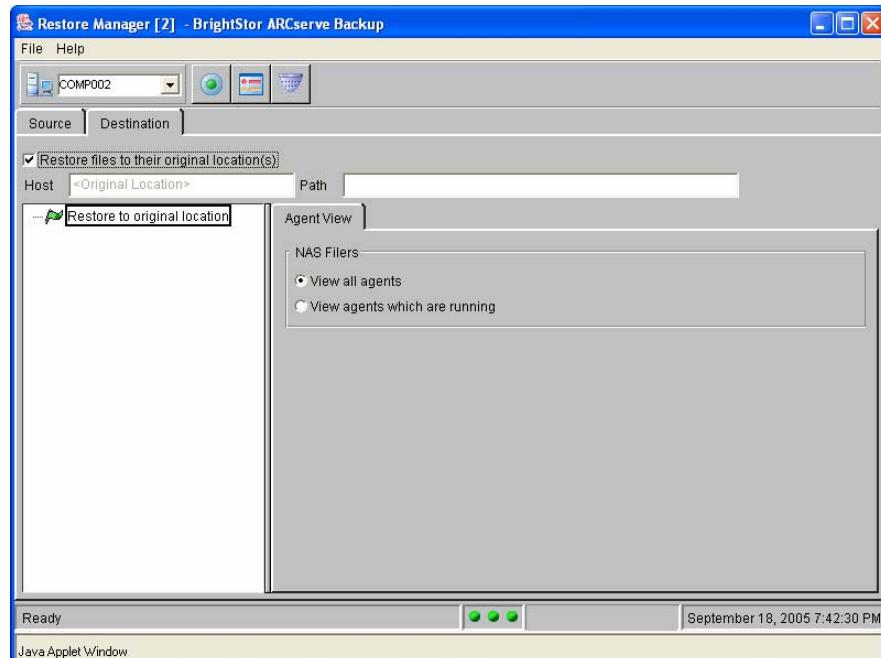
Restore Data to Original Location

You can restore the backed up data to its original location.

To restore backed up data to its original location

1. In the left pane of the Destination tab, click the Restore files to their original location(s) option.

Restore to original location appears in the source tree.



2. Click Submit to start the restore job.

A Login dialog appears for the destination host.

3. Enter the user name and password to access the destination host and click OK.

The Instance Login dialog appears.

4. Enter the user name and password of a user with access privileges to the Open Enterprise Server objects you want to restore.

The Session Password dialog appears.

5. Enter the session password and click OK.

The Submit dialog appears.

Note: A session password is required only if one was specified during the backup job.

6. Select the options for submitting the job, add a brief description of the job, and click OK.

The restore job is initiated.

Note: You can monitor the progress of your job from the Job Status Manager.

For more information about the Job Status Manager, see the *Administrator Guide*.

Restore Data to a Different Location

Use the destination object tree to restore backed up data to a different location.

To restore backed up data to a different location

Note: Ensure the Restore files to their original location(s) option is not checked.

1. On the Restore Manager Destination tab, select and expand the UNIX/Linux Agents node.
A list of available UNIX and Linux agent hosts is displayed.
2. Click the host containing the Open Enterprise Server to which you want to restore the data.
A Login dialog appears for the selected host.
3. Enter the user name and password to access the host and click OK.
The selected host expands to display a list of available agents.
4. Select the Novell OES that you want to restore the data to and click the plus icon (+).
The Instance Login dialog appears.
5. Enter the username and password of a user with access privileges to the objects on the Open Enterprise Server you want to restore and click OK
The OES Option tab appears in the right pane of the Destination tab.
For more information about the OES Option tab, see the section Agent for Open Enterprise Server Restore Options in this chapter.

6. (Optional) Click the Options button.
The Options dialog is displayed. This dialog allows you to customize your job.
For more information about these options, see the *Administrator Guide*.
7. (Optional) Click the Filter button.
The Filter dialog is displayed. This dialog allows you to set filters for your job.
For more information about filter options, see the *Administrator Guide*.
8. Click Submit to start the restore job.
The Session Password dialog appears.
9. Enter the session password and click OK.
The Submit dialog appears.
Note: A session password is required only if one was specified during the backup.
10. Select the options for submitting the job, add a brief description of the job, and click OK.
The restore job is initiated.
Note: You can monitor the progress of your job from the Job Status Manager.
For more information about the Job Status Manager, see the *Administrator Guide*.

Command Line Interface

This section describes how to perform backup and restore operations with the Agent for Open Enterprise Server using the Command Line Interface (CLI).

For more information about the ca_backup and ca_restore command line utilities, see the *Administrator Guide*.

ca_backup Command

You can use the ca_backup command to perform backup operation from the command line.

The command to select Open Enterprise Server objects for backup has the following format:

```
ca_backup -source OES hostname [node options] -filesystem filesystem [relative directory] [-filelist file list] -tsafs -oesusername OES Username -oespassword OES Password [volume options]
```

Where

-source *OES hostname*

Specifies the hostname of the Open Enterprise Server to be backed up.

[node options]

These options allow you to customize the backup operation.

-filesystem *filesystem*

Specifies the file system to be backed up.

[relative directory]

Allows you to specify the relative path of the directory you want to backup.

[-filelist *filelist*]

Specifies the files to be backed up.

-tsafs

Instructs the backup server to use the Agent for Open Enterprise Server installed on the source to back up the data.

-oesusername *OES Username*

Specifies the user login name needed to access the Open Enterprise Server.

-oespassword *OES password*

Specifies the password needed to access the Open Enterprise Server.

[volume options]

These options allow you to customize the volume options.

You can also use the following Open Enterprise Server specific volume options when backing up using the `ca_backup` command.

-noarchivebit

Specifies that the archive bit should not be used for incremental or differential backups. Time based filters are used to perform these backup jobs.

-decompressfiles

Specifies that the backup data should be decompressed during backup. This allows originally compressed data to be restored to an uncompressed volume.

Note: Backup options are applicable only at the file system level. To back up more than one file system using the Agent for Open Enterprise Server, use these options multiple times.

ca_restore Command

You can use the `ca_restore` command to restore the backed up data from the command line.

This command has the following format:

```
ca_restore -dest OES hostname -orglocation/-path [-username username -password password] -tsafs -oesusername OES Username -oespassword OES Password [-notrustees|-nodiskspacerestrictions|-novolrestrictions]
```

Where

-dest *OES hostname*

Specifies the host name of the Open Enterprise Server to which the backup data is to be restored.

-orglocation

Restores the backup data to its original location.

-path

Restores the backup data to the specified location.

[-username *username* -password *password*]

Specifies the username and password of the user performing the restore operation. It should be same as the user credentials when a backup job is submitted.

-tsafs

Allows the common agent to use the Agent for Open Enterprise Server to perform restore operations.

-oesusername *OES Username*

Specifies the user login name needed to access the Open Enterprise Server.

-oespassword *OES password*

Specifies the password needed to access the Open Enterprise Server.

-notrustees

Allows the agent to discard the trustees information during restore operations.

-nodiskspacerestrictions

Allows the agent to discard the data set space restriction information during restore operations.

-novolrestrictions

Allows the agent to discard the data set resource restriction information during restore operations.

Note: Restore options are set at the job level and are effective for the data being restored. These options should be used only once.

Chapter 4: Best Practices

This chapter presents best practices when using the agent to backup and restore Open Enterprise Servers.

Complete Data Protection

We recommend that you use the following agents to completely protect the Open Enterprise Server.

Agent for Novell Open Enterprise Server

To protect the NSS file systems, clustered volumes, GroupWise installations and the associated metadata.

BrightStor ARCserve Backup Client Agent for Linux

To protect non-NSS File Systems (including extended attributes and ACLs), raw partitions, with the associated metadata and perform backups using CPIO or tar.

For more information, see the *Client Agents Guide*.

User Credentials

You must provide valid security credentials to comply with the two levels of authentication performed by the agent.

- The first level of authentication requires you to provide valid Linux user credentials to log in to the BrightStor ARCserve Backup Common Agent and gain access to the agent.
- The second level of authentication requires you to provide valid Linux user or LUM enabled eDirectory user credentials with appropriate access privileges to the objects on the Open Enterprise Server you want to protect.

We recommend that you use the highest access level depending on the Open Enterprise Server objects you want to protect.

Back Up Full Host Nodes

You can perform a full node backup of the Open Enterprise Server host on which BrightStor ARCserve Backup agents are installed. The advantage of this approach is that you do not have to modify a backup job if you add or remove a file system. This is true for both the Client Agent for Linux and the Agent for Open Enterprise Server.

To perform full node backup of the host

1. From the Source tab of the Backup Manager window, select and expand the UNIX/Linux Agents node to display a list of available UNIX and Linux agent hosts.
2. From the list of available UNIX and Linux agent hosts, click the marker corresponding to the host you want to back up until it is solid green.
The host Login dialog for the selected host appears.
3. Enter valid user credentials to access the Linux host and click OK.
4. Click Submit to start the full node backup job.
The Security and Agent Information dialog appears.
5. Select Novell OES and click Security.
The Security dialog appears.
6. Enter the username and password to access the Linux host and click OK.
7. Click OK to submit the full node backup job.
The full node backup of the OES host is initiated.

Note: You can monitor the progress of your job in the Job Status Manager.

Redundant Backups

If you have the Agent for Novell for Open Enterprise Server and the Client Agent for Linux installed on your host and you back up the full node, the backup objects are backed up twice.

To avoid this, you must perform the following tasks:

- Use the agent option OESProtectNSSOnly in the oesag.cfg file
- Exclude NSS file systems from client agent backup operations using the fs.ctrl file

Note: To avoid backing up nssadmin and nsspool file system types, include them in the fs.ctrl file of Client Agent for Linux.

Back Up Full Novell OES Nodes

You can submit backup jobs that include all of the objects accessible to the Agent for Open Enterprise Server at the time of the backup. The advantage of this method is that you do not have to modify a backup job if you add or remove a file system. The agent dynamically enumerates all of the objects available at the time of the backup job and includes them in the backup job.

To perform full node backup of the Novell OES object

1. From the Source tab of the Backup Manager window, select and expand the UNIX/Linux Agents node to display a list of available UNIX and Linux agent hosts.
2. From the list of available UNIX and Linux agent hosts, select the host containing the Open Enterprise Server to be backed up.
The host Login dialog for the selected host appears.
3. Enter valid user credentials to access the Linux host and click OK.
The selected host displays a list of installations.
4. Select Novell OES and click the corresponding marker.
The Instance Login dialog appears.
5. Enter valid user credentials to access the OES objects and click OK.
The corresponding marker turns solid green.
6. Click Submit to start the full node Novell OES backup job.
The full node backup of the OES object is initiated.

Note: You can monitor the progress of your job in the Job Status Manager.

Cluster Environment Data Protection

In cluster environments you must use physical nodes to protect local volumes and virtual cluster pools to protect shared volumes. To effectively protect the data residing on shared volumes in a cluster environment, use the following guidelines:

- Ensure that the agent is installed on all the cluster nodes.
- Use the virtual cluster pool name or address to submit backup jobs to protect shared volumes. Backup jobs are sent to the host on which the virtual cluster pool is active. The agent ensures a successful backup of the shared volume as long as it is reachable on any cluster node.
- Use the virtual cluster pool or physical node to submit a restore job, depending on the destination you want the shared volume to be restored.

For more information on adding virtual cluster pool to the backup server, see the section [Add Virtual Cluster Pools](#) in the chapter [Installing the Agent](#).

eDirectory File Data Protection

Use the following guidelines to ensure consistent data protection for eDirectory files:

- You can use Novell recommended way to backup eDirectory files. You must use BrightStor ARCserve Backup to move the file containing the eDirectory data to a backup destination for archival purposes.
You can also configure a Prebackup script to automate the running of the `ndsbackup` script before performing a backup with BrightStor ARCserve Backup using the agent.
For more information on Prebackup scripts, see the section [Configurable Options](#) in the chapter [Installing the Agent](#).
- You can use BrightStor ARCserve Backup to restore the file containing eDirectory data. Ensure to use Novell recommended way to restore the eDirectory data to its destination host.

GroupWise Data Protection

To ensure consistent backup of GroupWise data, perform the following tasks:

- Use the following command when loading tsafs:
`smsconfig -l tsafs --EnableGW`
- Select the source of the domain and make sure that all the post offices you want to protect are inside the domain. If the post offices are external, you must select them separately.

Domain source example: /opt/novell/groupwise/domain

Note: During restoring GroupWise data, always select the option Restore to original location.

Appendix A: Frequently Asked Questions

This appendix provides answers to frequently asked questions to help you resolve issues that may arise when using the agent.

How do I stop and start the agent manually?

Although, during installation, you can choose the option to start and stop all agents during a system start or stop, you can also start and stop the agent manually using the following commands:

To start or enable the agent in the Common Agent configuration:

```
#caagent -enable 53
```

To stop or disable the agent in the Common Agent configuration:

```
#caagent -disable 53
```

Note: You should start the Common Agent and enable the Agent for Open Enterprise Server before using the Agent for Open Enterprise Server.

How do I start the Common Agent manually?

Use the following command to start the Common Agent:

```
#caagent start
```

On what operating system platforms does BrightStor ARCserve Backup support the Agent for Open Enterprise Server?

The Agent for Open Enterprise Server is supported on the BrightStor ARCserve Backup for Linux, UNIX and Mainframe servers.

When I try to expand the Novell OES node, I am asked to repeatedly to enter the username and password. What should I do?

If you encounter this problem, you should do the following:

- Check if the correct username and password was being provided for login.
- Restart SMDRD using the following command:

```
/etc/init.d/novell-smdrd restart
```

What kind of filters are supported by the agent during backup and restore operations?

The agent supports the following backup and restore filters:

Backup Filters

- Exclude File Pattern
- Include File Pattern
- Exclude Directory Pattern (use absolute path starting with '/')
- Include Directory Pattern (use absolute path starting with '/')
- Exclude Hidden Files
- Exclude System Files
- Include Modification Time Filters
- Include Access Time Filters

Restore Filters

- Exclude File Pattern
- Include File Pattern
- Exclude Directory Pattern (use absolute path starting with '/')
- Include Directory Pattern (use absolute path starting with '/')

For more information about Filters, see the *Administrator Guide*.

What Namespaces does the agent Support?

The agent supports only NFS Namespace for both NSS and non-NSS file systems.

What miscellaneous node options can I use with the agent?

The following miscellaneous node options are supported by the agent:

- Reset File Access Time
- Disable File Estimation
- Traverse NFS

How do I use Directory Filters with the agent?

To use a Directory filter, you must provide the absolute path of the directory, as shown in the following example:

/media/nss/VOL1/dir*

Does the agent support Compare Media to Disk option?

No. The agent does not support Compare Media to Disk option. This option will be ignored for the sessions belonging to Agent for Open Enterprise Server.

When can I use the Clear Archive Bit option?

You must use the Clear Archive Bit option when you submit a full backup job for a NSS file system and perform a custom incremental or differential backup based on the full backup job.

Can I use the BrightStor® ARCserve® Backup for Linux Disaster Recovery Option for bare metal recovery of Linux Open Enterprise Servers?

On Linux, the Disaster Recovery Option does not support EVMS and NSS file systems. You can use the Disaster Recovery Option for bare metal recovery if your Open Enterprise Server on Linux does not use EVMS and NSS file-system.

Important! *We strongly recommend that you test your disaster recovery plan in a test environment before you move to a production system to identify and correct unexpected problems before they occur in a production environment.*

Can I use the agent to provide data protection of remote systems with Open Enterprise Server having Novell Storage Management Service (SMS) installed?

No. The Agent for Open Enterprise Server provides data protection only for the local system where Open Enterprise Server with SMS installed.

Appendix B: Acknowledgements

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Glossary

agent

Agents gathers information and perform services without direct intervention. An agent uses parameters set by you to process information.

archive bit

Archive bits identify files that have been backed up previously on a file system. The bit is set if a file is modified. A backup program can then clear the bit when it does a full backup. This allows the backup program to do an incremental or differential backup that only backs up the changes to the file system since the last time the bit was cleared.

configuration

The *configuration* is the way a system is set up, or the collection of components that make up a system. Configuring your system requires you to define parameter values. These values establish the properties used when performing activities.

eDirectory

Novell eDirectory is a Lightweight Directory Access Protocol (LDAP) enabled, directory-based identity management system that centralizes the management of user identities, access privileges, and other network resources.

file system

A *file system* is a method by which files are named and where they are logically placed for storage and retrieval. File systems specify conventions for naming files such as the maximum name size, allowable characters, and the length of the file.

filters

Filters allow you to include or exclude files and directories from your backup and restore jobs.

GroupWise

GroupWise is a messaging and groupware software from Novell. It provides a collective inbox for calendaring, group scheduling, task management, document sharing, workflow, and threaded discussions.

Non-NSS File systems

Non-NSS File systems are the traditional Linux file systems.

Novell Storage Management Services (SMS)

SMS provides data protection and data migration services allowing the agent to protect targets such as file systems, eDirectory files, and GroupWise files.

Novell Storage Services (NSS)

NSS is a 64-bit file system used by NetWare Operating systems and recently ported to SuSE Linux.

Staging

The *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. Alternatively, you can restore data directly from the staging area.

Target Service Agent (TSA)

A *TSA* helps the agent to back up the data. It is specialized to read, write and scan the backup data.

Target Service Agent File System (TSAFS)

TSAFS includes file system backup enhancements which *TSA* does not provide.

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