

BrightStor® ARCserve® Backup

Client Agents Guide

r11.1



Computer Associates®

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Introduction

BrightStor® ARCserve® Backup is a comprehensive 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 compatible agents BrightStor ARCserve Backup offers are a specific set of operating-system-based client agents.

The client agents are separate software packages installed on network computers to supply a network interface between the computer and BrightStor ARCserve Backup. In addition to enabling connectivity, the client agents share data storage tasks with the backup servers in your network. You may need multiple client agents, depending on the number and variety of network machines that require regular data backup and restore functionality.

This guide provides information on installing, configuring, and adding client agents for all workstations and servers in your network storage environment.

Centralized Backup Operations

BrightStor ARCserve Backup client agents are designed for organizations that need to preserve network resources by offloading tasks onto centralized backup servers and media. Among other functions, the client agents serve to:

- Minimize the load on your communications network
- Increase the efficiency of your BrightStor ARCserve Backup servers by offloading the preprocessing of archive data to the client machine
- Supply detailed file and directory information about the remote client to the BrightStor ARCserve Backup server
- Communicate with the server and let you browse and select backup components
- Assist with monitoring the progress of backup jobs
- Maintain backup logs of the status of backup and restore activities

Client agents can also augment data protection for all client computers from a single BrightStor ARCserve Backup server in the network.

Supported Client Systems

BrightStor ARCserve Backup offers the following client agents:

- BrightStor® ARCserve® Backup Client Agent for Windows. This client agent supports the following:
 - Windows 98
 - Windows Millennium (Me)
 - Windows NT
 - Windows 2000
 - Windows XP
 - Windows Server 2003
 - Windows Small Business Server (SBS) operating on Windows 2000 and Windows 2003 servers
- BrightStor® ARCserve® Backup Client Agent for NetWare
- BrightStor® ARCserve® Backup Client Agent for UNIX. This client agent supports the following:
 - AIX
 - HP-UX
 - Solaris
 - HP Tru64 UNIX
- BrightStor® ARCserve® Backup Client Agent for Linux. This client agent supports the following:
 - Red Hat
 - SuSE
 - Turbo
 - Debian
 - RedFlag
 - Miracle Linux
- BrightStor® ARCserve® Backup Enterprise Option for AS/400

- **(For use with BrightStor ARCserve Backup for Windows and BrightStor ARCserve Backup for NetWare only)** BrightStor® ARCserve® Backup Client Agent for Mac OS X
- **(For use with BrightStor ARCserve Backup for Windows only)** BrightStor® ARCserve® Backup Enterprise Option for OpenVMS

See the readme file on the installation CD for additional hardware and software requirements for installing and running client agents. Check www.ca.com for any updates to the requirements.

How Client Agents Work

BrightStor ARCserve Backup and the client agents are designed to support data storage activities for companies and organizations with networked computers. In these scenarios, Computer Associates customers use the BrightStor ARCserve Backup base product and its client agents (and any required options). The client agents allow you to back up and restore mission-critical data on your network. They help to:

- Facilitate backup of applications or file systems
- Facilitate monitoring of the backup progress
- Facilitate monitoring for backup log activities

With client agents installed on your network computers, a single BrightStor ARCserve Backup server can perform data backup and restore operations on multiple computers and operating systems.

Features

This section discusses the features and functionality offered by the various BrightStor ARCserve Backup client agents.

Automated Communication Using Push Technology

All client agents use push technology, which automates the backup and restore process. The client agent contains separate internal client engines that help reduce the resource-intensive backup processes for the BrightStor ARCserve Backup server. With this feature, the client agent filters and packages its archive data for reception by the server. This data preparation and transmission method provides real-time directory browsing, offloads system resources from the backup server, improves data transfer through use of packet technology, provides network security, and monitors backup and restore jobs.

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

Proactive Backup (Windows Only)

If your hardware includes alert support (hardware drivers post alert messages in the operating system when a drive status is degraded or is predicted to be degraded), you can configure proactive backup from the Backup Agent Admin so that network clients submit volume level backups to the BrightStor ARCserve Backup server during critical hardware situations. Using proactive backup, you can also initiate node- or volume-level remote backup jobs from a selected BrightStor ARCserve Backup server to the host agent. The BrightStor ARCserve Backup server you select must have a device group configured to accept proactive jobs, and you should dedicate this device group for proactive jobs only. To configure a device group to accept proactive jobs, click Properties during device group configuration and enable the **ProActive Backup Allowed** option. For more information on device group configuration, see the online help.

Note: Proactive backup supports only the default job configuration.

Computer Name Resolution (Windows Only)

Computer name resolution allows the local Windows computer to automatically detect the remote Windows machine's IP address when connecting for backup and restore operations.

Both the backup server and the network clients can use this feature. A local BrightStor ARCserve Backup server can use computer name resolution to connect to and back up data on remote machines. Similarly, remote client computers can use the feature for proactive backup connections.

Security Features

The client agents for BrightStor ARCserve Backup offer several security features, including client agent password security, system logon security, intelligent client-to-server data encryption, and integrated virus scanning with repair of infected files. The following sections offer more information about the BrightStor ARCserve Backup data encryption and virus scanning features.

Intelligent Client-to-Server Data Encryption

With the intelligent client-to-server data encryption feature, you can 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 password protected, and ensures both the privacy of data transmitted over the network and the security of your backup media. Tapes cannot be misused or restored by users who do not have the encryption key.

When you choose this feature, your backup data is encrypted, including data packets that are transported between the client and the server, data that resides on the local server, and data that has been moved to backup media.

Integrated Virus Scanning and Repair (Windows and NetWare Only)

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

Important! *BrightStor ARCserve Backup provides only the scanning and curing components. It does not provide a full install of eTrust Antivirus. For the NetWare client agent, a full install of eTrust Antivirus is required to use virus scanning and repair. For the Windows client agent, a full install of eTrust Antivirus is required to receive automatic virus signature updates.*

When virus scanning is enabled, BrightStor ARCserve Backup scans Windows and NetWare data for viruses during backup and copy operations. This feature ensures that your critical data is protected against all virus threats. The curing component, when selected during configuration, repairs infected files without the need for user intervention. This feature ensures that your critical data is protected against all virus threats.

For more information about eTrust Antivirus integration, see the *BrightStor ARCserve Backup Administrator Guide*.

Auto Discovery of Client Agents (Windows, UNIX, Linux, and Mac OS X Only)

For BrightStor ARCserve Backup installed on a Windows server or a NetWare server that uses the Windows manager interface, you can enable Auto Discovery of all computers in the network that are running client agents for Windows, UNIX, Linux, and Mac OS X. With Auto Discovery, BrightStor ARCserve Backup can detect all Windows, UNIX, Linux, and Mac OS X computers running their respective client agents and automatically create the required list of computers you designate to receive regular backups.

Multiple Network Interface Cards (Windows Only)

The Windows client agent supports multiple network interface cards (NICs). For computers with more than one network card, the client agent checks all enabled NICs to determine which cards are activated and being used for transmission.

Enhanced Network Connectivity (Windows Only)

Machines operating the Windows client agent can recover from **temporary** network failures by using reconnection algorithms (in the case of severe network malfunctions, the Windows client agent may not recover). The BrightStor ARCserve Backup framework further provides the ability to analyze network connectivity.

Real-Time Remote Browsing (Windows and NetWare Only)

This feature enables system administrators to view real-time file and directory information about the remote target machine.

Backup Verification

Client agents support 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.

If you select the Scan Backup Media Contents option, BrightStor ARCserve Backup checks the header of each file on the backup media. If the header is readable, the data is assumed to be reliable. If the header is not readable, the Activity Log is updated with this information.

Note: (Windows and NetWare only) If you select the Scan Backup Media Contents backup verification global option and enable the Calculate and Store CRC Value on Backup Media global option, in addition to checking the header of each file on the backup media, BrightStor ARCserve Backup will perform CRC verification by recalculating the CRC value and comparing it with the one stored on media.

If you select the Compare Backup Media to Disk option, BrightStor ARCserve Backup reads blocks of data from the media and compares the data, byte for byte, against the source files on the source machine, ensuring that all data on the media is exactly as it is on the disk. If a mismatch is found, the Activity Log is updated with this information.

For more information on backup verification options, see the online help.

CRC Verification (Windows and NetWare Only)

The Windows and NetWare client agents generate cyclic redundancy check (CRC) codes for all the files sent to the BrightStor ARCserve Backup server. The CRC is used to verify the integrity of the files to be backed up.

Access Control Lists (Windows, UNIX, Linux, and Mac OS X Only)

Access control lists (ACLs) for Windows, UNIX, Linux, and Mac OS X client agents let you control which BrightStor ARCserve Backup server accesses the workstation through the client agent. The initial configuration setting for these client agents enables all backup servers to back up and restore data through a Windows, UNIX, Linux, or Mac OS X client agent. By creating an ACL, you can restrict data backup and restore operations to a specific group of servers for the particular client agent.

Data Compression (Windows, UNIX, Linux, and Mac OS X Only)

The Windows, UNIX, Linux, and Mac OS X client agents support the compression of data transmitted through the Transmission Control Protocol/Internet Protocol (TCP/IP) network. Compression is the reduction in size of data designed to save space and improve transmission time. When this option is configured, the client agent compresses all data packets before it begins transmission to the backup server.

Multistreaming (Windows, UNIX, and Linux Only)

If you have more than one drive and more than one volume to be backed up, you can configure that system's client agent to use multistreaming. With multistreaming, you can take advantage of all available tape devices on the system. Multistreaming works by splitting a single backup job into multiple jobs that use all tape drives. As a result, multistreaming increases the overall backup throughput compared with single-stream, sequential processing.

On a Windows server, multistreaming is performed at the volume level for regular file systems (two volumes can run simultaneously on two separate devices). For preferred shared folders, remote database servers, and Windows NT, 2000, or XP agents, multistreaming is performed at the node level. On a UNIX or Linux server, you can configure the multistreaming level.

You can have only as many jobs running simultaneously as the number of local and remote devices or groups on the system. With multistreaming, one master job is created, which triggers slave 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 on multistreaming, see the *BrightStor ARCserve Backup Administrator Guide*.

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. For more information on multiplexing, see the *BrightStor ARCserve Backup Administrator Guide*.

The Snapshot and Direct I/O Features (Solaris and HP-UX Systems Only)

You can enhance the performance of certain UNIX file systems (UFS) and Veritas file system (VxFS) volumes by using the Snapshot and Direct I/O (Direct Input/Output) features.

Note: These features are available at the disk volume level only, and only for Solaris and HP-UX systems.

With the Snapshot feature, the client agent allows you to back up your data faster and more efficiently. The BrightStor ARCserve Backup client agent takes a snapshot of a UNIX volume, mounts the snapshot to a temporary directory created in the root volume, and then generates the backup. After the snapshot backup has completed, the file system agent dismounts from the temporary directory and deletes the snapshot. Some network machines can create and mount a snapshot of their backup data to an alternate mount point. Backup applications can then access and back up the data using the alternate mount point.

With the Direct I/O feature, the UNIX client agent remounts the volume using the Direct I/O Mount option. This feature may improve performance during file input/output (I/O) operations and can eliminate double buffering requirements.

Installing the Client Agents

To perform a backup or restore job, you must install and start the appropriate BrightStor ARCserve Backup client agent software. The client agent provides communication between a workstation and the BrightStor ARCserve Backup server. This chapter describes how to install client agents.

System Requirements

See the readme file on the installation CD for hardware and software requirements for installing and running client agents. Check www.ca.com for any updates to the requirements.

Installation Considerations

The following sections include information you should review before installing the client agent for Windows, client agent for NetWare, and enterprise option for OpenVMS.

Client Agent for Windows

Before installing the client agent for Windows, review the following considerations.

- Before you can run the client agent for Windows, your computer must be configured to communicate using one or more of the following network protocols:
 - Transmission Control Protocol/Internet Protocol (TCP/IP)
 - Windows Socket (WinSock) Direct

- There are some limitations when performing a remote setup during a client agent for Windows installation. The limitations are as follows:
 - **Windows XP**—You cannot perform a remote installation on a machine running Windows XP if the computer has been configured with the feature Force Network Logons Using Local Accounts to Authenticate as Guest.
 - **Windows XP (64-bit edition)**—Remote installation is not supported.
 - **Windows 98 and Millennium Edition (ME)**—Remote installation and silent installation are not supported.
 - **Windows 2003 (64-bit edition)**—Remote installation is not supported.

If you encounter any of these situations, you can install the client agent for Windows directly from the BrightStor ARCserve Backup installation CD.

Client Agent for NetWare

Before installing the client agent for NetWare, review the following considerations.

- The client agent for NetWare can be installed on NetWare servers only. Also, to perform a NetWare installation, your local machine must be equipped with the Novell client for Windows.
- The NetWare server must be configured to communicate using one of the following network protocols:
 - TCP/IP
 - Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX)
- You must have supervisor rights on the eDirectory tree of the NetWare computer on which you are installing this client agent. For details, see your Novell NetWare documentation.
- For optimum performance, use the latest NetWare C library (CLIB) and Systems Management Server (SMS) modules.
- The NetWare Loadable Modules (NLMs) are available from the Novell web site, <http://support.novell.com>.

Enterprise Option for OpenVMS

Before installing the enterprise option for OpenVMS, review the following considerations.

- A computer running the supported Alpha and VAX operating systems can use either TCP or User Data Protocol (UDP) with any of the following communications software:
 - Compaq UCX 4.2 eco 3 (on Alpha)
 - Compaq UCX 3.3 eco 13 (on VAX)
 - Compaq TCP/IP Versions 5.0 through 5.3
 - Process Software Multinet Version 4.1B (with patches) through Version 4.4
 - Process Software TCPWARE Versions 5.3 and 5.4

***Important!** If necessary, you can install two or more of these communications packages on the same computer; however, you can run only one package at a time. Do not run two or more of these communications packages simultaneously on the same computer.*

***WARNING!** If you change OpenVMS TCP/IP stacks at any time, you must reinstall the OpenVMS Enterprise Option.*

- You should back up your OpenVMS system disk before installing the OpenVMS Enterprise Option.
- Ensure that you have at least 10 blocks of free space for setup file.

Installation Procedure

Your BrightStor ARCserve Backup installation CD is formatted according to ISO 9660 standards, so that it can be read across multiple platforms. You can, therefore, use the same installation CD to install all the client agents provided with BrightStor ARCserve Backup.

For detailed steps on how to install client agent to work with BrightStor ARCserve Backup for UNIX/Linux, and Mainframe Linux see the *BrightStor ARCserve Backup for UNIX, Linux, and Mainframe Linux Getting Started*. For detailed steps on how to install client agent to work with BrightStor ARCserve Backup for Window, see the *BrightStor ARCserve Backup for Windows Getting Started*. For detailed steps on how to install client agent to work with BrightStor ARCserve Backup for NetWare, see the *BrightStor ARCserve Backup for NetWare Getting Started*.

Post-Installation Information

When you install the client agent for UNIX, Linux, or Mac OS X, the BrightStor ARCserve Backup Common Agent is automatically installed. The following sections include information on the Common Agent.

BrightStor ARCserve Backup Common Agent for UNIX, Linux, and Mac OS X

The Common Agent (caagentd binary) is a standard component for all UNIX, Linux, and Mac OS X client agents that is installed automatically during the first installation of any UNIX, Linux, or Mac OS X client agent.

The Common Agent resides in the `/opt/CA/BABcmagt` directory. The Common Agent keeps track of the client agents that are installed on the system in a configuration file named `agent.cfg`, which also resides in the `/opt/CA/BABcmagt` directory. During the installation of a new client agent, the `agent.cfg` file is updated with the new client agent's information. You will seldom need to modify this configuration file. Manual modification of this file is required only to enable some debugging messages or to change the default TCP/IP port on which the Common Agent runs.

A sample `agent.cfg` file with a client agent installed is shown next:

```
[0]
#[BABagntux]
NAME BABagntux
VERSION nn.nn.nn
HOME /opt/CA/BABuagent
ENV CA_ENV_DEBUG_LEVEL=4:$CA_ENV_DEBUG_LEVEL
ENV LD_LIBRARY_PATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$LD_LIBRARY_PATH
ENV SHLIB_PATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$SHLIB_PATH
ENV LIBPATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$LIBPATH
BROWSER cabr
AGENT uagentd
MERGE umrgd
VERIFY umrgd

[36] DISABLED
#[BABcmagt]
#NAME BABcmagt
#HOME /opt/CA/BABcmagt
#TCP_PORT 6051
#UDP_PORT 6051
```

Common Agent Components

The Common Agent runs at all times as a daemon, listening for requests on behalf of all the UNIX, Linux, and Mac OS X client agents that are installed on the system. During each client agent's installation, the BROWSER, AGENT, MERGE, and VERIFY components are registered with the Common Agent in a separate section.

Not all client agents may have all of these components. For example, in the following sample configuration file, you can see the BROWSER component `cabr`, the AGENT component `uagentd`, and the MERGE and VERIFY component `umrgd` in the section for the UNIX, Linux, or Mac OS X client agent. Similarly, other client agents use other BROWSER and AGENT components.

```
[0]
#[BABagntux]
NAME      BABagntux
VERSION   nn.nn.nn
HOME      /opt/CA/BABuagent
ENV       CA_ENV_DEBUG_LEVEL=4:$CA_ENV_DEBUG_LEVEL
ENV       LD_LIBRARY_PATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$LD_LIBRARY_PATH
ENV       SHLIB_PATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$SHLIB_PATH
ENV       LIBPATH=/opt/CA/CAlib:/opt/CA/BABcmagt:$LIBPATH
BROWSER   cabr
AGENT     uagentd
MERGE     umrgd
VERIFY    umrgd
```

Setting Common Agent Port Numbers

By default, the Common Agent uses port number 6051 for both TCP and user datagram protocol (UDP). To change the default port, you must modify the `BABcmagt` section of the `agent.cfg` file with the new port numbers, and then restart the Common Agent by issuing the `caagent stop` command, followed by the `caagent start` command. Do not use the `caagent update` command after modifying port numbers.

Note: Under normal conditions, this method should **not be used** to start or stop the Common Agent. Instead, you should run the Start and Stop scripts of the individual UNIX, Linux, and Mac OS X client agents installed on the system.

The following sample shows the configuration file before and after the script changes are made.

Before the change:

```
[36] DISABLED
#[BABcmagt]
#NAME      BABcmagt
#HOME      /opt/CA/BABcmagt
#TCP_PORT  6051
#UDP_PORT  6051
```

After the change:

```
[36]
#[BABcmagt]
NAME      BABcmagt
HOME      /opt/CA/BABcmagt
TCP_PORT  9051
UDP_PORT  9051
```

The port changes take effect only after you restart the Common Agent. If you configure the Common Agent to run on a port other than the default port, you should also configure the BrightStor ARCserve Backup server to access this Common Agent. You can do this by making an entry for the client agent in the port.cfg file. This file is in the config subdirectory under the home directory — \$BAB_HOME/config/port.cfg — on the backup server.

By default, the Common Agent uses another UDP port, 0xA234 (41524), to receive BrightStor ARCserve Backup requests for the Auto Discovery of UNIX, Linux, and Mac OS X client agents. This port is not configurable.

Enabling and Disabling User Access

When the Common Agent checks user credentials, it gives preference to host equivalence settings of the system. A UNIX, Linux, or Mac OS X system can be set up to grant access for specific users on specific hosts without requiring the user to provide credentials. You can grant this access by adding the specific user IDs to the /etc/hosts.equiv or .rhosts file. By default, the Common Agent follows these rules, then checks the user's password for authorization. To disable host equivalence checking, define the NO_HOSTS_EQUIV=1 environment variable in the agent.cfg file, as shown in the following example:

```
[36]
#[BABcmagt]
NAME      BABcmagt
HOME      /opt/CA/BABcmagt
ENV       NO_HOSTS_EQUIV=1
```

You can place the Common Agent in No Password mode or Single User mode with a set of access control lists if necessary. For more information about ACLs, see [UNIX, Linux, and Mac OS X Access Control Lists](#) in the chapter “Configuring the Client Agents.”

Access Control List Support for Linux

BrightStor ARCserve Backup Client Agent for UNIX, BrightStor ARCserve Backup Client Agent for Linux, back up and restore the access control list (ACL) for files and directories on a Linux system that have been backed up using the Linux client agent. The extended attributes for Linux are also backed up. ACL gives administrators finer control over files and directory access. The Linux client agent can read and set the ACL for each file and directory.

Checking the ACL Libraries

To enable this feature, certain ACL libraries are required. To check that you have the required ACL libraries installed, run the following command:

```
>rpm -qa |grep libacl
```

If the `libacl-devel-*` or `libacl-*` packages are not listed, install them by using the following procedure.

1. Copy the ACL library packages from the CD image, or download them from the internet to your Linux system:

- libacl package (such as `libacl-2.2.3-1.rpm`)

- libacl-devel package (such as `libacl-devel-2.3.3-1.rpm`)

2. To install the packages, run the following commands:

```
rpm -ivh <libacl-package-name>
```

```
rpm -ivh <libacl-devel-package-name>
```

as in this example:

```
>rpm -ivh libacl-2.3.3-1.rpm
```

```
>rpm -ivh libacl-devel-2.3.3-1.rpm
```

This step installs the `libacl.so` library into your Linux system.

If the Linux client agent is running on a 32-bit Linux system, ACL support is now enabled. If the Linux client agent is running on a 64-bit Linux system, you must ensure that the `libacl.so` library is a 32-bit version. You can check the version and create a link to a 32-bit library if necessary.

Checking the Version

To check the version, go to the directory where libacl.so is installed, and follow these steps:

1. Run `ls -l ./libacl.so` to display the libacl.so linking target library file.
2. Run `file libacl.so<-linking-target-library>` using the library file name.

The result will show whether libacl.so points to a 32-bit or 64-bit version.

Creating a Link

If libacl.so points to a 64-bit library, you must create a link from the 32-bit library to libacl.so. The following example shows how to create the link on a 64-bit Mainframe Linux platform:

```
> cd /lib
```

```
> ln -sf libacl.so.1 libacl.so
```

Use the appropriate link command for your 64-bit Linux system.

Configuring the Client Agents

After installing BrightStor ARCserve Backup and its various client agents, you must add and configure each client agent machine in your network to the backup server. This chapter discusses the procedures for adding and configuring client agents.

Adding Client Agents

If you have BrightStor ARCserve Backup installed on a Windows server or NetWare server that uses the Windows manager interface, you can automatically discover client agents in your network using Auto Discovery or you can add client agents manually. If you have BrightStor ARCserve Backup installed on a UNIX or Linux server, you must add client agents manually. The following sections includes information on each of these methods.

Automatically Discovering Client Agents on a Windows Server or a NetWare Server

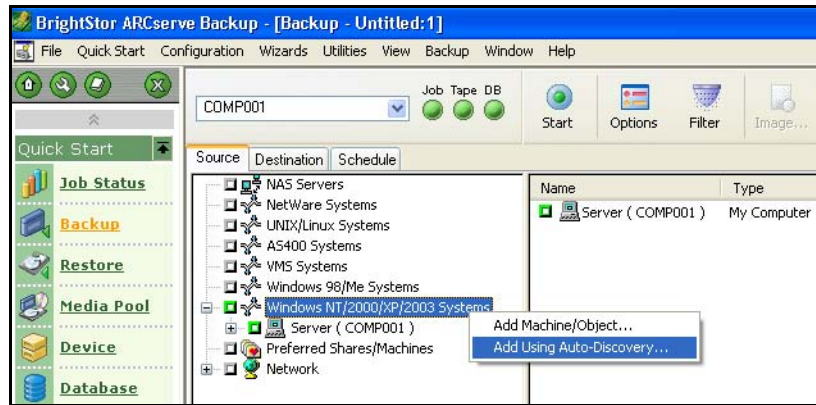
If you have BrightStor ARCserve Backup installed on a Windows server or a NetWare server that uses the Windows manager interface, you can use Auto Discovery to automatically detect Windows, UNIX, Linux, and Mac OS X client agents installed and running in your network. To use Auto Discovery to create your backup and restore list, ensure that the Backup Engine is running. The system default is to automatically start the Backup Engine when BrightStor ARCserve Backup is first started; however, you may need to stop the engine during certain operations.

To identify the client objects in your network, follow these steps:

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

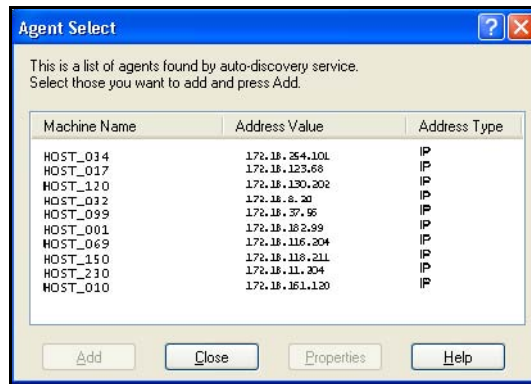
Note: If the Backup Engine is not running, you will be prompted to start it during this procedure.

2. On the Source tab, select and right-click the appropriate client agent object, such as Windows NT/2000/XP/2003 Systems:



3. Choose Add Using Auto-Discovery.

BrightStor ARCserve Backup displays a list of all the machines it finds during Auto Discovery in the Agent Select dialog:



4. From the list, select the client agents you want to add to the backup list.

Tip: Hold the Ctrl key down to select multiple agents.

5. Click Add.
6. Click Close.

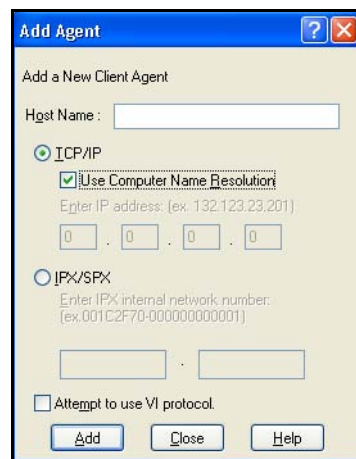
Each client agent you have selected now shows as a member of the corresponding operating system in the Backup Manager.

Manually Adding a Client Agent to a Windows Server or a NetWare Server using

If Auto Discovery does not detect all client agents in your network for some reason or if you want to add a particular client agent, you can manually add a client agent to a Windows server or NetWare server using the Windows manager interface. To manually add a client agent, you must add each client agent machine to the Backup Manager.

To add a client agent, follow these steps.:

1. Open the Backup Manager and click the Source tab.
2. Right-click the appropriate client agent object, such as Windows NT/2000/XP/2003 Systems and select Add Machine/Object.



3. Enter the name of the computer in the Host Name field.

Note: If you are adding a NetWare Client Agent, you MUST use the Novell server name as the host name.

4. Select the protocol you want to use to connect to the computer:
 - **TCP/IP** – Select TCP/IP and, if you are adding a Windows client agent, select Use Computer Name Resolution. Computer name resolution lets the local Windows computer automatically detect the remote Windows machine's IP address when connecting for backup and restore operations. This is the recommended method and works even if you do not know the computer's IP address.

Note: If the target Windows computer has a dynamic IP address, using computer name resolution is preferable.

If you are not adding a Windows client agent, if computer name resolution fails because of various DNS server or network configuration issues, or the target computer has multiple IP addresses and you want to be certain that a specific address is used, ensure that Use Computer Name Resolution is not selected and enter an IP address.

- **IPX/SPX** – Select IPX/SPX and enter the computer's IPX internal network number. This address consists of the IPX internal network number and the node number 000000000001. Select Attempt to use VI protocol if you want BrightStor ARCserve Backup to use the VI protocol for backup and restore.

Note: For NetWare client agents, you can find the IPX internal network number by issuing config at the NetWare server console.

5. Click Add.

Manually Adding a Client Agent to a UNIX or Linux Server

To manually add a client agent to a UNIX or Linux server, you must add each client agent machine using the Database Manager.

To add a client agent, follow these steps:

1. Open the Database Manager and click the Clients tab.
2. Click the Add button.

3. Enter the name and IP address of the machine that has the client agent installed. If you do not know the IP address, enter only the machine name. All other fields are optional and appear only for reference on the Client tab of the Database Manager.
4. Click OK.

Note: As an alternative method for adding client agents to a UNIX or Linux server, you can use the `ca_dbmgr` command line utility using the following syntax:

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

For example:

```
ca_dbmgr -client add UnixName -ip 127.0.0.0 -os UNIX
```

For more information on command line utilities, see the *BrightStor ARCserve Backup Administrator Guide*.

Configuring Windows Client Agents

The following sections discuss the Windows client agent configuration options.

Windows-Related Configuration Notes

General information pertaining to the configuration of the Windows client agent includes:

- **Restoring System State** – The System State supports the Restore to Original Location option.
Note: The System State also supports restoring to an alternate location, but it will not recreate an operational system since the files are placed in default directories created by the agent at the time of restore.
- **Shares Support** – When the use agent option is selected, the client agent backs up shares selected from the Preferred Shares/Machines object in the Backup Manager by converting the share name to the real path.
Note: On Windows platforms, the client agent does not restore shares or support shares as a destination except for administrative shares.
- **Restoration of the System Hive** – The KeysNotToRestore feature is designed to protect sensitive system registry keys during a regular restore of the client agent system hive. However, this feature is unavailable when you use the Client Agent Registry session to restore individual system keys.

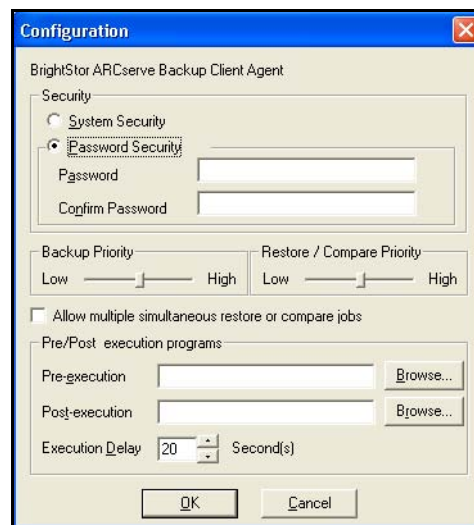
Using the Backup Agent Admin to Set Windows Parameters

To configure the BrightStor ARCserve Backup Client Agent for Windows in the network, follow these steps:

1. Open the Backup Agent Admin. To open the Backup Agent Admin from the Windows Programs menu (All Programs menu on XP machines), select Computer Associates, BrightStor, ARCserve Backup Agents, Backup Agent Admin.

Note: The window contents may differ slightly for each client agent, depending on the specific operating system in use.

2. From the Options menu, select Configuration.



You can define the following settings using the Configuration dialog:

- Security – Select one of the following types of security:
 - **System Security (excludes Windows 98 and Windows Me)** – Select this Security option to use Windows security to perform backup, compare, and restore operations. The client agent impersonates the active network user; that is, the client agent uses the user name and password to log on. This ID and password should identify a valid user in the local user database or in the domain database if the workstation is a member of a domain.
 - **Password Security** – Select this Security option to set individual passwords for security. This setting enables the client agent to run under the local system account. Password Security is disabled by default.

Note: If you are using the Windows 98 client agent, the Password Security option is recommended.

- Process priority – These settings determine the priority given to the processes needed for the backup, restore, or compare operations. Select one of the following setting for Backup Priority and Restore/Compare Priority:
 - **High** – Foreground processing performs client agent functions before other processes.
 - **Normal** – Standard processing performs client agent functions without special status.
 - **Low** – Standard processing performs client agent functions when other processes are idle.
 - Allow multiple simultaneous restore or compare jobs – Enable this if you want the Windows client agent to accept multiple concurrent restore or compare jobs.

Note: By default, this option is disabled to ensure that new backup or restore jobs of the same data set are not accidentally launched during a running restore job. If this does occur, the agent denies the new job's request and reports that the client agent is busy to the BrightStor ARCserve Backup server.
 - Pre-Execution and Post-Execution Programs – Define the following execution options:
 - **Pre-execution** – Enter or select the name of any batch programs (for example, C:\WINAGENT\PRE.CMD) that you want to automatically execute **before** the backup or restore operation.
 - **Post-execution** – Enter or select the name of any batch programs (for example, C:\WINAGENT\POST.CMD) that you want to automatically execute **after** the backup or restore operation.
 - **Execution Delay** – Select the number of seconds that you want the client agent to wait before or after executing the batch job.
3. Click OK to save your changes and exit the dialog.

To change your configuration later, you must return to the Configuration dialog.

Configuring Security Options

The client agent service uses the node (machine) user name and assigned password to log on to the BrightStor ARCserve Backup network. To set password security for the client agent system, follow these steps:

1. Start the Backup Manager, and then right-click the machine name. A pop-up menu appears.
2. Choose Security from the pop-up menu to open the Security dialog. The User Name field should already contain the client agent's assigned user name.
3. Enter the password for the client agent.

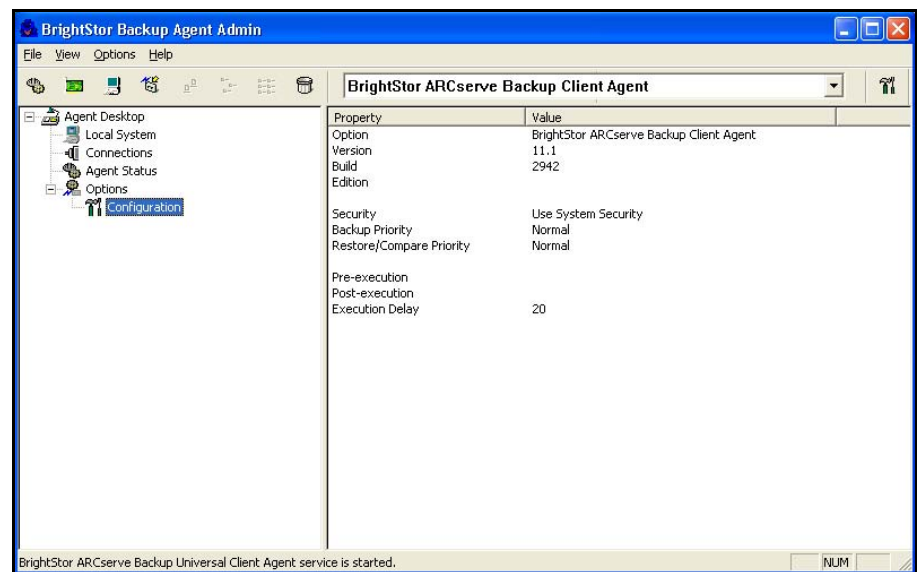
Note: The user name and password should identify a valid user in the local machine's database or in the domain database, if the workstation is a member of a domain.

Also, when you specify the account to use, it may be necessary to distinguish between two accounts that use the same name (such as Administrator) by indicating where Windows can find each account. You can identify the client object's location by using tree name formats when identifying the user name. For example, for a domain named NTDEV containing a workstation named ENGINEER, the respective administrators are:

NTDEV\Administrator
ENGINEER\Administrator

View Configuration Selections

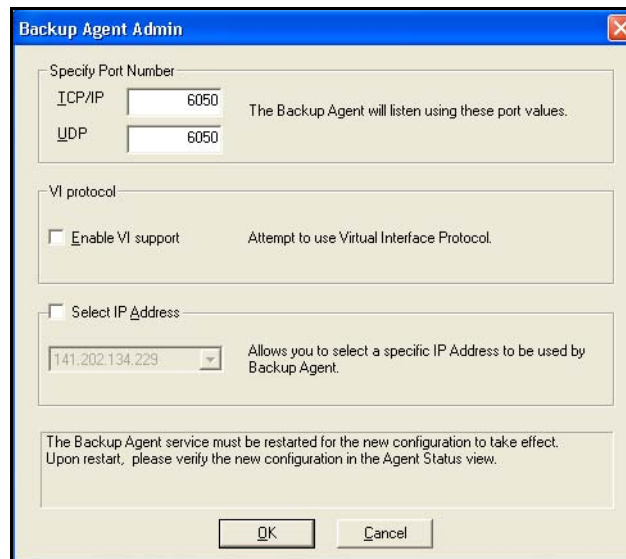
To view your configuration selections, open the Backup Agent Admin, expand Options, and then select Configuration, as shown in the following example:



Configuring Network Communication

BrightStor ARCserve Backup client agent services are shared across all configured client agents. By default, Windows client agents use TCP/UDP port 6050. You can change this behavior by using the Network Configuration menu in the Backup Agent Admin. To configure network communication, follow these steps:

1. Open the Backup Agent Admin.
2. From the Options menu, select Network Configuration:



3. Using this dialog, set the following network parameters for the client agent:
 - Specify Port Number – Accept the defaults or enter the port values you want BrightStor ARCserve Backup to use. If you want to use the original default port, click the Reset button. The updated port information will be saved in the local PortsConfig.cfg file located in \Program Files\CA\SharedComponents\BrightStor.
Note: Updated port information must be registered with the BrightStor ARCserve Backup server component. To do this, you must modify the remote server PortsConfig.cfg file. For more information on port configuration, see the *BrightStor ARCserve Backup Administrator Guide*.
 - Enable VI support – Enables the VI protocol for backup and restore.
 - Select IP Address – The Windows client agent supports the use of multiple network interface cards (NICs). For computers with more than one network card, the agent checks all enabled NICs in the machine. You can manually override this selection by choosing the IP address of the NIC that you want to dedicate for backup purposes. When you define this configuration, the client agent will listen using only this interface card. All other NICs are ignored and you will not be able to use their IP addresses to connect to the client agent.

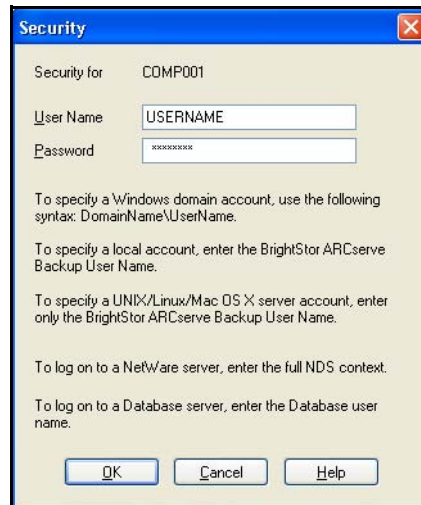
Any updated information also needs to be modified in the Windows CAPortConfig.cfg file and copied to the BrightStor ARCserve Backup home directory. The following example shows a CAPortConfig.cfg file:

#Hostname	IP address (optional)	TCP port	UDP port
#myhost	nnn.nnn.nnn.nnn	6050	6050
mymachine	nnn.nnn.nnn.nnn	7090	7085

Setting a Workstation Password

If you selected password security when configuring the Windows client agent from the Backup Agent Admin, you must specify the same password in BrightStor ARCserve Backup. To specify the client agent password in BrightStor ARCserve Backup, follow these steps:

1. From the Backup Manager, right-click the name of the client agent.
2. Choose Security from the pop-up menu.



3. Enter the local Windows user account name or enter the Windows domain account using the tree format.
4. Enter the password and click OK.

Note: If you use a client agent to perform remote client backups and restores, the password you set for the client agent overrides any shared password set for the workstation. If you do not use client agent software for your backup jobs, you must specify share-level passwords on the Backup Manager window. Make sure that the password on the Backup Manager and the share-level password are the same.

Creating Access Control Lists

You can limit the servers authorized to perform backups on a Windows client agent object by generating an access control list (ACL). This feature is defined through the Backup Manager and the Backup Agent Admin. By creating an access control list and defining its type, you can restrict data backup and restore to a specific group of BrightStor ARCserve Backup servers for the particular client agent. The ACL type can be:

- **No ACL used** – No list is specified; this is the default.
- **Include list** – A list of servers allowed to access the client agent machine for backup and restore options.
- **Exclude list** – A list of servers that are not allowed to access the client agent machine for backup and restore options. All other servers in the network can access the client object.

To create an ACL and define its type, follow these steps:

1. Open the Backup Agent Admin.
2. From the Options menu, select Access Control List.



3. When the Access Control List dialog appears, the default is to **not** use ACL and the setting **All servers will be able to use the agent for backup/restore** is selected. To create an ACL, select **one** of the following choices:
 - Only the listed servers will be able to use the agent for backup/restore
 - All servers will be able to use the agent for backup/restore except the listed ones

4. Click Add to add client agent names to the access control list, including as many names as you need for the ACL. If you want to remove client agents from the list, click Remove for each client agent being removed.
5. Click OK when you are finished adding or removing client agent names.

Virus Scanning Support

Computer Associates' premier antivirus system, eTrust™ Antivirus, is bundled with BrightStor ARCserve Backup and is available through the Backup Manager. The eTrust Antivirus software offers extra protection for your critical data, securing it from virus threats even during backup and restore activities.

Using this option, you can configure the Windows client agent to automatically detect and repair viruses during a backup, copy, count, or restore operation. To enable virus scanning for Windows client agents, follow these steps:

1. Open the Backup Manager or the Restore Manager.
2. From the toolbar, click the Options button to display the Global Options dialog.
3. Click the Virus tab.
4. Select Enable Virus Scanning.
5. Click the virus scanning options that you want to apply to the client agent. Available options include:
 - Skip – Do not back up or restore an infected file.
 - Rename – Rename the infected files with the extension x.AVB (for example, 0.AVB, 1.AVB, 2.AVB). If a file with the same name and the extension AVB exists, the system will name the file with a numeric version of that extension, for example, AV0, AV1, AV2.
 - Delete – Delete the infected file.
 - Cure – eTrust Antivirus cures the files that have been found to be infected. With the Cure option, infected files are automatically repaired during a backup without user intervention.
6. If you want each archive's component files individually verified, enable Scan Compressed Files.

Note: This option may reduce backup or restore performance.

Customizable Local Options

When you explicitly select a parent object (in a parent-child database configuration), you can right-click a client agent object to customize local backup options. See the *BrightStor ARCserve Backup Getting Started* for more information on explicit job packaging, and the *BrightStor ARCserve Backup Administrator Guide* for more information on how to select sources when customizing local options.

Configuring NetWare Client Agents

The following sections discuss the configuration of BrightStor ARCserve Backup NetWare client agents.

Note: Your Windows machine must be configured with the Novell client for Windows to install and run NetWare servers in your network.

Configuration Considerations

Be aware of the following issues when configuring the NetWare client agent:

- Multiple jobs are not supported. The NetWare client agent can service only one job at a time. Trying to submit jobs to the client agent from multiple BrightStor ARCserve Backup servers at the same time may cause the current job to fail.
- BrightStor ARCserve Backup skips open NetWare files during a backup. When backing up NetWare files using the NetWare client agent, in some cases multiple files are detected as open and are skipped during the backup. Should this happen, select the Retry tab in the Backup Options dialog, and then select the Use Lock Mode if Deny Write Fails option in the File Sharing section, and resubmit the job.
- NetWare has a 255 character path name limit; for example, DIR1\DIR2\...DIRx. This restriction applies only to NetWare and not to other client agents, such as those for Windows, UNIX or Linux systems.

Note: If a NetWare path name exceeds 255 characters, backup and restore operations work properly but path entries are truncated when they are displayed during browsing. Also, the Restore to Original or Alternate Location options still work for restores to the same client agent types.

Network Address Configuration

To configure the NetWare client agent for communication, edit the ASCONFIG.INI file to specify the IP address assigned to the client agent by the system administrator. Specifying an IP address is useful in a server with multiple IP addresses. Instead of using only the first bound address, the client agent uses the ASCONFIG.INI file to find the IP address to use.

To edit the ASCONFIG.INI file, follow these steps:

1. From a text editor, open the ASCONFIG.INI file located in the client agent home directory.
2. Add the following line to the NetWare Agent section of the file, specifying the IP address that you want the client agent to use:

```
IPAddress = nnn.nnn.nnn.nnn
```

If a NetWare Agent section does not exist, create one by adding the following line to the end of the ASCONFIG.INI file:

```
[NetWare Agent]
```

3. Save the file and exit from the editor.
4. Unload and restart the client agent. Unloading is required for changes to the ASCONFIG.INI file to take effect. To unload the client agent, use the NetWare client agent's Unload & Exit menu option. Alternatively, you can enter the following command at the server console:

```
unload nwagent
```

5. When the client agent has been unloaded, restart the client agent (that is, reload the agent) at the server prompt by issuing the following command:

```
nwagent
```

A message appears at the server prompt, confirming the use of the IP address specified in the ASCONFIG.INI file:

```
IP Address nnn.nnn.nnn.nnn from ASCONFIG.INI file will be used.
```

A similar message is displayed on the client agent runtime message screen:

```
IP Address nnn.nnn.nnn.nnn is bound for use by NetWare Push Agent.
```

The client agent is now ready to service backup and restore jobs using the IP address specified in the ASCONFIG.INI file.

Backing Up Novell Directory Services

To properly back up Novell Directory Services (NDS), you must enter the full NDS name in the NDS Login name field. For example:

```
.cn=admin.o=organization_name
```

When restoring any NetWare sessions, you must supply the full NDS name when prompted for security information.

Configuring UNIX, Linux, and Mac OS X Client Agents

The UNIX, Linux, and Mac OS X client agent configuration file, `uag.cfg`, is located on the remote client workstation in the client agent home directory. This file, which is scanned for entries whenever a job is submitted to the workstation, can be used to set multiple options associated with the client agent.

***Important!** Do not change any of the variables in the agent configuration unless instructed to do so by a representative of Computer Associates Technical Support.*

Configuration Considerations

The following list describes issues that you should be aware of when configuring the client agent on the UNIX, Linux, and Mac OS X platforms.

- **Session passwords** – Session passwords cannot be longer than 22 bytes for UNIX, Linux, and Mac OS X sessions.
- **Single character directory names** – You may experience display issues in restore views when restoring single character directory names. The data appears correctly in the database view.
- **Traverse Symbolic Links and Traverse NFS** – The options Traverse Symbolic Links and Traverse Network File System (NFS) are not supported for restore operations.

Note: If a configuration discrepancy exists in the BrightStor ARCserve Backup option definitions for these client agents, the options that were set through the Backup Manager always take precedence over the options manually entered in the `uag.cfg` configuration file.

Configuring the Port Address

The default TCP and UDP ports are 6051. The TCP port is used for communication and data transfer between the backup server (cprocess) and the client agent. The Backup Manager user interface uses the UDP port to browse hosts.

If you want to configure either the TCP port or the UDP port, or both, you must modify the configuration files on both the BrightStor ARCserve Backup server and the client agent so that their values match.

The names of the configuration files are as follows:

- **port.cfg**—for BrightStor ARCserve Backup UNIX and Linux servers
- **CAPortConfig.cfg**—for BrightStor ARCserve Backup Windows servers
- **agent.cfg**—for client agents

Note: See [UNIX, Linux, and Mac OS X Client Agent Control Files](#) for important information about the UNIX, Linux, and Mac OS X configuration files.

The following example shows the syntax for the UNIX and Linux server configuration file (port.cfg) and the Windows server configuration file (CAPortConfig.cfg):

```
#Hostname          IP address (optional)  TCP port    UDP port
#myhost            xxx.xxx.xxx.xxx       6051        6051
```

The following example shows the syntax for the client agent configuration file (agent.cfg):

```
[36]
NAME              BABcmagt
HOME              /opt/CA/BABcmagt
TCP_PORT          7090
UDP_PORT          7085
```

UNIX, Linux, and Mac OS X Client Agent Control Files

The UNIX, Linux, and Mac OS X client agent control files specify which directories, file systems, or file system types are to be excluded from backup operations on a specific workstation. In particular, the following packages must be installed with the UNIX, Linux, and Mac OS X client agents:

- The Computer Associates Common Agent
- The Computer Associates UNIX File System Agent (uagent)

Note: You must install the Common Agent before you install the uagent.

The control files installed for both packages include:

- Directory Control file

Use the Directory Control file, `uag.cntl`, to list all directories or file systems (or both) that you want to exclude from backup operations on a workstation. To specify directories and file systems in this file, enter a slash (/) followed by a one line, complete path name. For example:

```
/opt/account1
```

Note: The Directory Control file is stored on the client agent workstation in the `uagent` home directory.

- File System Control file

The File System Control file, `fs.cntl` lists the file system types on a particular workstation that are to be excluded from backup operations. To exclude a particular file system type, enter the type on a separate line in the `fs.cntl` file.

Note: The File System file is stored on the client agent workstation in the `uagent` home directory.

- Browser Configuration File

The Browser Configuration file, `cabr.cfg`, enables raw devices to be viewed with the browser. You must ensure that you have entered the absolute name of the raw device on a separate line in the `cabr.cfg` file.

- Common Agent Configuration File

The Common Agent configuration file, `agent.cfg`, keeps track of each UNIX, Linux, or Mac OS X client agent installed on your system. This script is run automatically after the `uagent` is installed.

Note: Only a system administrator can edit the Directory and File System control files. However, other users may be able to append the files, depending on the file access rights the system administrator has assigned to the file.

The Common Agent Configuration File

The Common Agent configuration file, called `agent.cfg`, tracks each UNIX, Linux, or Mac OS X client agent or application-specific backup agent installed on your system. The `agent.cfg` file is located under the BrightStor ARCserve Backup Common Agent installation directory, `/opt/CA/BABcmagt`, of each UNIX, Linux, and Mac OS X machine. The file is populated with the required client agent information during the setup process, when the `uagentsetup` script is run. This script runs automatically after the `uagent` is installed.

Understanding the Structure of the Common Agent Configuration File

Each section of the agent.cfg file contains groups of fields that directly correspond to an installed client agent on a UNIX, Linux, or Mac OS X device in the backup network. Except for the agent home directory location, all fields in the file are predetermined.

The environment variable field (ENV) contents are also determined during client agent installation and configuration. However, if required, you can enter values for this variable into the file manually. You should modify the agent.cfg only in certain circumstances; for example, if you wanted to associate an additional environment field with a particular database.

Note: Modifications to the agent.cfg file take effect only after the client agent machine is started (or stopped and restarted).

An example of the agent.cfg file is shown in the following table, with a description of each agent field.

File Contents	Field Description
[0]	Object type, a predefined number of a specific client agent in the network for UNIX and Linux
[4]	Object type, a predefined number of a specific client agent in the network for Mac OS X
NAME BABagtux	Name of the client agent
VERSION nn.n	Release and version number of the client agent
HOME /opt/CA/BABuagent	Default home directory for the client agent
#ENV CA_ENV_DEBUG_LEVEL=4	Environment variable passed to the client agent
#ENV CAAGPERF_ENABLE=1	Enables the features Snapshot and Direct I/O on Solaris and HP. For more information, see Configuring Snapshot and Direct I/O
ENV LD_LIBRARY_PATH	Shared library search path for Sun, Linux, Tru64, and Mac OS X
ENV SHLIB_PATH	Shared library search path for HP
ENV LIBPATH	Shared library search path for AIX
BROWSER cabr	Browser module for the client agent

File Contents	Field Description
AGENT uagentd	Backup module for the client agent daemon
MERGE umrgd	Merge daemon
VERIFY umrgd	Scan daemon

Locating the Client Agent Home Directory

The default client agent home directory, `BABuagent`, is automatically defined during installation and setup. If required, however, you can specify a different home directory.

To locate the name of the home directory, look in the `agent.cfg` file under the `BABagntux` section of the file. The name of the client agent home directory is defined by the `HOME` variable.

Connecting to the Common Agent

To initiate a client agent session, the BrightStor ARCserve Backup server requests a connection for a UNIX, Linux, or Mac OS X client agent to use a specific backup component (such as `BROWSER`, `BACKUP`, or `RESTORE`). When it receives the request, the Common Agent accepts the connection and verifies the user's credentials for the system.

Upon user validation, the Common Agent checks the `agent.cfg` file for an entry corresponding to that particular client agent and the specified component. Only after it has validated both the client agent and the requested component does the Common Agent activate the client agent and the component. The Common Agent then returns to a state of waiting for additional requests.

Configurable Options

Options are used to optimize and customize the operation of the client agent. However, none of these options are required for the client agent to run. A complete list of options available for use when starting the UNIX, Linux, or Mac OS X client agent is shown in the following table.

Note: These options should be carefully set by administrators having UNIX, Linux, or Mac OS X knowledge. If you do not understand what an option or parameter means, do not set the feature unless instructed to do so by a Computer Associates Technical Support representative.

Option	Description
-ALLOW <network address> <host address>	Use this option with Single User mode, with the -S or -NOPASSWORD option, to define the IP addresses of computers that are authorized to access the client agents without requiring validation. For example: -ALLOW N:172.16.0.0(255.255.255.0) H:172.31.255.255 In this example, N denotes a network address and H denotes a host IP address. You can set an optional subnet mask.
-b <i>bufsize</i>	Defines the disk I/O buffer size in bytes. Options are 16384 to 65536 bytes; the default is 65536 bytes.
-c <i>n</i>	Specifies the sleep time while waiting, in milliseconds (ms). Options are zero (0) to 1000 ms; the default is 50 ms.
-CAUSER <i>USER</i>	Defines Single User mode. Used with the -S or -NOPASSWORD option to set the Allow or Deny list on a per-user basis. For example: -CAUSER A: USER1 N: USER2 In this example, A means -ALLOW and N corresponds to -DENY.
-DENY <network address> <host address>	Use this option with Single User mode, with the -S or -NOPASSWORD option, to define the IP addresses that are not allowed access to the client agents. For example: -DENY N:172.16.0.0(255.255.255.0) H:172.31.255.255 In this example, N denotes a network address and H denotes a host's IP address. You can set an optional subnet mask.
-l	Causes the client agent to check for advisory locks. The default is mandatory locks only.
-m <i>maxbuf</i>	Sets the number of buffers allocated for I/O. Options are 2 to 1024 buffers; the default is 128.

Option	Description
-NOPASSWORD	Specify this option if you need to use either the -ALLOW, -DENY, or -CAUSER options. This option is the same as the -S option in Single User mode with no password required.
-P <i>n</i>	<p>Specifies the default time out, followed by a variable number (<i>n</i>), which is user-defined and measured in minutes (0 to 10). The default is 5 minutes.</p> <p>For example, the option -P 10 assigns a wait time period for the backup or restore pre-script of 10 minutes.</p> <p>Note: An error occurs if you use the -P option without defining a number <i>n</i>.</p>
-Prebackup <i>filename</i>	<p>Executes the default pre-scripts and post-scripts associated with the type of backup or restore job being run. The filename is optional and if is not specified, uag_pre_backup will be treated as the filename. The default scripts associated with each option are:</p> <ul style="list-style-type: none"> -Prebackup uag_pre_backup -Postbackup uag_post_backup -Prerestore = uag_pre_restore -Postrestore = uag_post_restore <p>The contents of each user-defined pre-script or post-script must conform to the Bourne shell syntax.</p> <p>To substitute a specific default pre-script or post-script with a user-defined script, you must specify its corresponding option followed by the new script name, as shown in the following example:</p> <pre>uagent {status start stop}</pre> <p>In this example, the user-defined pre-script AAA will be substituted for the default backup script with a wait time of 10 minutes.</p> <p>If you do not specify a parent path, all scripts are relative to the Uagent home directory; otherwise, you must list the full path name. All specified options remain in effect until the client agent is stopped and restarted.</p>
-Postbackup <i>filename</i>	
-Prerestore <i>filename</i>	
-Postrestore <i>filename</i>	
-S	Enables the Single User mode option. In Single User mode, user credentials are not checked against valid user IDs and passwords. Instead, access is granted based on the -ALLOW, -DENY, or -CAUSER options. See these options for more details.

Option	Description
-s <i>async</i> <i>nonblocking</i>	Sets socket I/O to asynchronous, nonblocking mode.
-s <i>bufsize</i>	Specifies the size of the socket buffer. Options are 4096 to 65536. The default is system dependent.
-s <i>SocketMode</i>	Specifies to use socket mode for backup operations.
-sparse	Differentiates between sparse file and regular file operations. This option increases the efficiency of sparse file backups and restores. Note: Note: Quota files are always treated as sparse files in backup and restore operations, regardless of whether you specify -sparse.
-verbose or -v	Places the system in verbose mode to enable the entry of detailed debugging messages at the console.

Snapshot and Direct I/O Support (UNIX Only)

UNIX client agents support the Snapshot and Direct I/O features. To take advantage of these features, one of the following environments must exist on the machine running the UNIX client agent:

Feature	Platform	Software Requirements
Snapshot	Solaris	UFS file system with the fssnap package installed (Solaris 8 and 9) or the advanced version of VxFS file system.
Snapshot	HP-UX 11.0	Advanced version of VxFS file system or Online Journaling File System (JFS).
Direct I/O	Solaris	UFS file system or VxFS file system.
Direct I/O	HP-UX 11.0	Advanced version of VxFS file system or Online JFS.

Snapshot and Direct I/O Descriptions

With Direct I/O, the client agent takes a snapshot on advanced versions of VxFS, Online JFS (HP-UX), and UFS with `fssnap` installed on Solaris. The client agent mounts the snapshot to a temporary directory created in the root volume, and then generates the snapshot backup. After the snapshot backup is complete, the client agent dismounts from the temporary directory and deletes the snapshot.

To perform a snapshot backup, you must specify a snapshot buffer. A snapshot buffer is the disk space used to store the original data before it is overwritten in the snapped volume. Remember these considerations when using the snapshot buffer:

- The snapshot buffer needs to be large enough to store all the data that changes in the snapped volume for the duration of the backup. If the snapshot buffer runs out of space, the snapshot becomes invalid and the backup fails.
- The snapped volume and the snapshot buffer should not be on the same file system.
- For better performance, the snapped volume and the snapshot buffer should be on separate physical disks.
- For UFS on the Solaris platform (using `fssnap`), the snapshot buffer can be a file name, a directory name, or a raw partition.

For a Direct I/O backup or restore, you need to check the client environment and edit the `caagperf.cfg` configuration file. You can view Snapshot and Direct I/O on the file systems in the `caagperf.cfg` file by executing the `mount` command at the command line after submitting the backup or restore job.

For Snapshot, the output that appears after executing the `mount` command is a new, read-only file system with the mount point starting with the prefix `SNAP_HOME_`. A Direct I/O user can observe the changes in the mount options on that particular file system. You can also see the detailed messages in the `caagperf.log` file if you enabled the logging flag in the `caagperf.cfg` file.

The following sections describe how to configure a UNIX client agent to use these features.

Configuring Snapshot and Direct I/O

To configure the Snapshot and Direct I/O features, follow these steps:

1. Enable the environment variable `CAAGPERF_ENABLE` by adding the following line in the `agent.cfg` file:

```
ENV CAAGPERF_ENABLE=1
```

Note: The `agent.cfg` file is in the `/opt/CA/BABcmagt` directory.

After you enable this environment variable, the client agent section of the `agent.cfg` file looks like this:

```
[0]
NAME          BABagentux
VERSION       nn.nn.nn
HOME          /opt/uagent
ENV           LD_LIBRARY_PATH=/usr/local/Calib:/opt/CA/BABcmagt
ENV           CAAGPERF_ENABLE=1
...
```

2. Prepare the configuration file named `caagperf.cfg` in the `/opt/CA/BABcmagt` directory. You need to specify the types of operations to be completed on the specified file systems in the `caagperf.cfg` file. See the next section for detailed descriptions.

Configuration Table Parameters and Values

The format of the configuration file is similar to a Windows `.inf` file. It has sections and key value pairs. The section names are the names inside the square brackets, and key value pairs are in `KEY=VALUE` format with one pair on each line. All the entries in the configuration file are case-sensitive.

The key value pairs are under the volumes to which they belong, and the section names are the names of those volumes. Two examples of the syntax of the section name in the `caagperf.cfg` file are `[/]` or `[/export/home]`. If a volume has multiple entries, the behavior of the client agent is undefined.

The key value pairs are used to set parameters for the volume under which they belong. By default, all options are disabled. If no special processing is needed for a volume, that volume should not be in the `caagperf.cfg` file.

The keys and their values are described in the following table:

Key	Value
DOSNAP	Enables the Snapshot feature on a volume. The value should be BACKUP, meaning that a snapshot should be taken during the backup operation.
SNAPSHOTBUFFER	Specifies the buffer used for storing original data before it is overwritten in the snapped volume. The value should be a file name or partition. The file can be a file or a directory from a different volume. The value of this field depends on the file system type. For the advanced version of VxFS or Online JFS, the value is the name of an empty partition. For UFS, the value is a file name, a directory name, or a partition name.
DOUBIO	Enables the Direct I/O feature on a volume. Values are BACKUP, RESTORE, and BACKUP_RESTORE. The value of this field depends on your backup or restore requirements.

You may find the following configuration file samples useful.

Example 1

This is a sample configuration file for a Solaris 8 or Solaris 9 operating system with a UFS file system with fssnap installed. The first line of the file is a debugging flag. The three sections that follow the debug entry correspond to the /opt, /export/home, and / volumes on the disk.

The sections for /opt and /export/home have Snapshot enabled during backup, and the / section has Direct I/O enabled for backup and restore.

```
##DEBUG
[/opt]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/garbage/snapbufferfile_1

[/export/home]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/garbage/snapbufferfile_2

[/]
DOUBIO=BACKUP_RESTORE
```


Example 2

This is a sample configuration file for a Solaris 8 operating system with the advanced version of the VxFS file system installed.

The file contains three sections. The first line of the file is a debugging flag. The three sections in the file are /opt, /export/home, and / volume. Sections for /opt and /export/home have Snapshot enabled during backup, and the / volume has Direct I/O enabled for backup and restore.

```
T##DEBUG
[/opt]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/dev/dsk/c0t0d0s4

[/export/home]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/dev/dsk/c0t0d0s4

[/]
DOUBIO=BACKUP_RESTORE
```

Example 3

This is a sample configuration file for the HP-UX operating system that can have either an advanced version of the VxFS file system or the online JFS file system installed.

The file contains four sections. The first line of the file is a debugging flag. The sections in the file are the /, /var, /usr, and /export volumes. In this file the / volume is enabled for Direct I/O during backup and restore and the other volumes are enabled for Snapshot during backup.

```
##DEBUG
[/]
DOUBIO=BACKUP_RESTORE

[/var]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/dev/vg00/lvol7

[/usr]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/dev/vg00/lvol7

[/export]
DOSNAP=BACKUP
SNAPSHOTBUFFER=/dev/vg00/lvol7
```

UNIX, Linux, and Mac OS X Access Control Lists

For UNIX, Linux, and Mac OS X client agents, ACLs are supported in Single User mode only. This is also known as No Password mode. A UNIX, Linux, and Mac OS X client agent – or database backup agent – can be put into Single User mode by specifying a NOPASSWORD entry in its corresponding section in the Common Agent configuration file, `agent.cfg`, located in `/opt/CA/BABcmagt`. A UNIX, Linux, and Mac OS X client agent can also be put into Single User mode by specifying the `-S` or `-NOPASSWORD` option in the `uag.cfg`. You can use two types of ACLs with the UNIX, Linux, or Mac OS X client agent:

- An access control list that denies or allows specific users to perform backups or restores. For example, a part of the `agent.cfg` file is shown in the following sample. You need to make similar changes for other client agent sections if you want to apply ACLs to those client agents too.

```
[0]
NAME BABagentux
VERSIONnn.n.n
HOME /opt/uagent
NOPASSWORD
CAUSER A:CAUSER1 N:CAUSER2
```

NOPASSWORD enables Single User mode, and CAUSER specifies the users for whom permission is being granted or denied. (A stands for ALLOW and N stands for DENY.) A:CAUSER1 enables CAUSER1 to perform jobs, and N:CAUSER2 denies access to CAUSER2.

Note: For UNIX and Linux client agents, the object type is [0]. For the Mac OS X client agent, the object type is [4].

- An access control list that determines whether specific IP addresses can access the system. For example, a part of the `agent.cfg` file is shown in the following sample. You must make similar changes for other client agent sections of the file if you want to apply ACLs to those client agents too.

```
[0]
NAME BABagentux
VERSIONnn.n.n
HOME /opt/uagent
NOPASSWORD
ALLOW N:172.16.0.0(255.255.255.0) H:172.31.255.255
DENY N:192.168.0.0(255.255.255.0) H:192.168.255.255
```

NOPASSWORD enables the Single User mode, and ALLOW and DENY specify whether a particular network or IP address is allowed to access the system. N denotes a network address and H denotes a host's IP address.

Note: An optional subnet mask can follow a network address; subnet masks are shown in parentheses.

For UNIX, Linux, and Mac OS X client agents, the specific type of ACL can be specified in `uag.cfg`, or you can specify them using the `-S`, `-NOPASSWORD`, `-CAUSER`, `-ALLOW`, and `-DENY` options. For more information about these options, see [Configurable Options](#).

You can apply both types of ACLs concurrently. In each case, DENY takes precedence over ALLOW. In the Single User mode, all operations on the client agent are performed with superuser privileges. The `caagentd.log` contains information about the users, IP addresses, and network addresses denied during Single User mode.

Configuring the AS/400 Enterprise Option

The AS/400 Enterprise Option start and stop preferences are configured using STRASO and ENDASO.

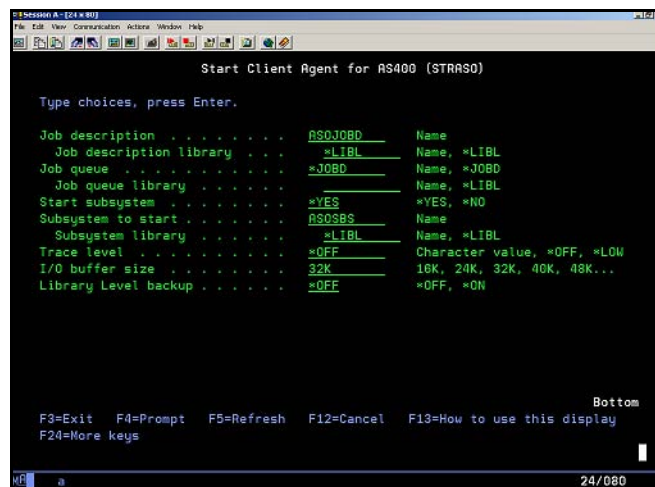
Configuring Start Preferences

To configure start preferences for the AS/400 Enterprise Option, follow these steps:

1. From the command line, issue:


```
straso
```
2. Press F4. The available options display.
3. Type your preferences and press Enter.

Note: One of the preferences you can configure is Library Level Backup. This preference enhances performance. For more information, see the Configuring Performance section that follows.



Configuring Performance

When configuring start preferences, you can enable the Library Level Backup feature by setting its value to *ON. When you enable this feature, the SAVLIB command is applied for library objects instead of the default SAVOBJ command. The SAVLIB command improves performance because it saves both library information and all files inside a library in one backup, whereas the SAVOBJ command backs up each file inside a library separately. The Library Level Backup feature is especially useful when performing multiple library backups.

Note: The Library Level Backup feature does not support incremental and differential backups.

Changing the Trace Level for the AS/400 Enterprise Option

Occasionally, based on instructions from Computer Associates Technical Support, you may need to change the level of activity that is logged for the AS/400 Enterprise Option. Because tracing levels can affect backup performance, do not change the values unless you receive specific instructions from Computer Associates Technical Support.

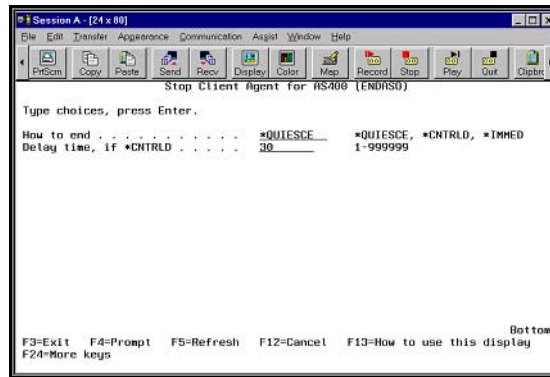
The following table shows all of the AS/400 Enterprise Option trace levels:

Level	Description
ASO\$TRACE	This controls the trace depth of the client agent. Valid values are -1 and 0 to 0xFFFFFFFF. Setting the ASO\$TRACE value to -1 logs the most detail.
ASO\$TRACE_AST	This is a toggle. If defined, Asynchronous System Traps (ASTs) are traced.
ASO\$TRACE_IDENT	This is a formatting parameter. The recommended value is between 0 and 5. The default is 3.
ASO\$TRACE_DATA	This controls the number of bytes in each packet that is logged. The range is unlimited and starts at 0. The default is 300.

Configuring Stop Preferences

To configure stop preferences for the AS/400 Enterprise Option, follow these steps:

1. From the command line, issue:
endaso
2. Press F4. The options display on the configuration screen.
3. Type your preferences and press Enter.



Configuring the OpenVMS Enterprise Option

Other than the port address, the OpenVMS Enterprise Option does not require additional configuration after installation.

Configuring the Port Address

The default TCP and UDP port addresses are both 6050. The TCP port is used for communication and data transfer between the cprocess and the client agent. BrightStor ARCserve Backup uses the UDP port to browse the hosts.

If you want to configure the TCP port or the UDP port, include the following command in the bab\$startup.com file:

```
DEFINE /SYSTEM ASO$PORT_NUMBER nnn
```

In this example, nnnn is the port number of the Backup Manager.

Important! OpenVMS requires that both the UDP and TCP ports be assigned the same port number.

Optimizing the TCP/IP Stack

The configuration of the TCP/IP stack can affect client agent performance. Typically, the TCP Send and Receive quotas are set to 4096. Set these values to the largest value allowed by the specific stack installed on the OpenVMS system.

Changing the Trace Level for the OpenVMS Enterprise Option

Occasionally, based on instructions from Computer Associates Technical Support, you may need to change the level of activity that is logged for the OpenVMS Enterprise Option. Because tracing levels can affect backup performance, do not change the values unless you receive specific instructions from Computer Associates Technical Support.

Level	Description
ASO\$TRACE	This controls the trace depth of the client agent. Valid values are -1 and 0 to 0xFFFFFFFF. Setting the ASO\$TRACE value to -1 logs the most detail.
ASO\$TRACE_AST	This is a toggle. If defined, Asynchronous System Traps (ASTs) are traced.
ASO\$TRACE_IDENT	This is a formatting parameter. The recommended value is between 0 and 5. The default is 3.
ASO\$TRACE_DATA	This controls the number of bytes of each packet that is logged. The range is unlimited and starts at 0. The default is 300.

Using the Client Agents

This chapter describes how to use the client agents in a standard backup environment. It includes:

- Descriptions of the backup and restore statistics that the client agents can obtain and write to online logs, as well as the procedures for accessing this logged data
- Details on how to start and stop the client agents
- Instructions for scheduling and initiating backup and restore jobs and for checking the status of online client agents

Displaying Runtime Statistics

The client agent runtime components for both Windows and NetWare provide real-time statistics and display the progress of backup and restore jobs as they are being processed.

Note: Runtime statistics apply only to Windows and NetWare.

Displaying Runtime Statistics for the Windows Client Agent

To obtain runtime statistics for Windows client agents, follow these steps:

1. From the Windows Programs (or All Programs, on XP machines) menu, select Computer Associates, BrightStor, ARCserve Backup Agents, Backup Agent Admin.
2. Select Connections. The system displays the last ten jobs processed. If the job is still active, you can click the job to display its current runtime statistics. If the job has completed, completed statistics for that job are displayed.

Note: The statistics are kept in memory; therefore, if you close the BrightStor Backup Agent Admin dialog and the Universal Agent service, the connection statistics will be lost. You will, however, still be able to view the results of the job in the activity log.

Displaying Runtime Statistics for NetWare Client Agents

With the NetWare client agent, if the Runtime window is not available, you must switch windows to display it. If you are running Remote Console (RCONSOLE.EXE) to view the server console, press the ALT and F3 keys simultaneously and continue pressing the keys until the Runtime window opens. If you are at the server console, press the ALT and ESC keys simultaneously to switch windows.

Tip: You can press the Ctrl and ESC keys simultaneously to display a list of current windows, and then you can choose the Runtime window.

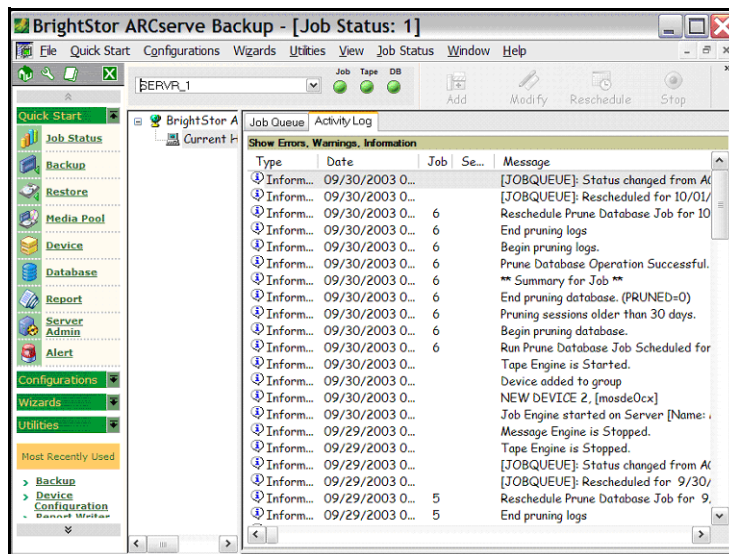
Displaying the Activity Log

The server-based BrightStor ARCserve Backup system generates an activity log, which displays information about all the jobs that the client agent processes. The following sections explain how to display the activity log for each client agent from the server side and from the client agent side.

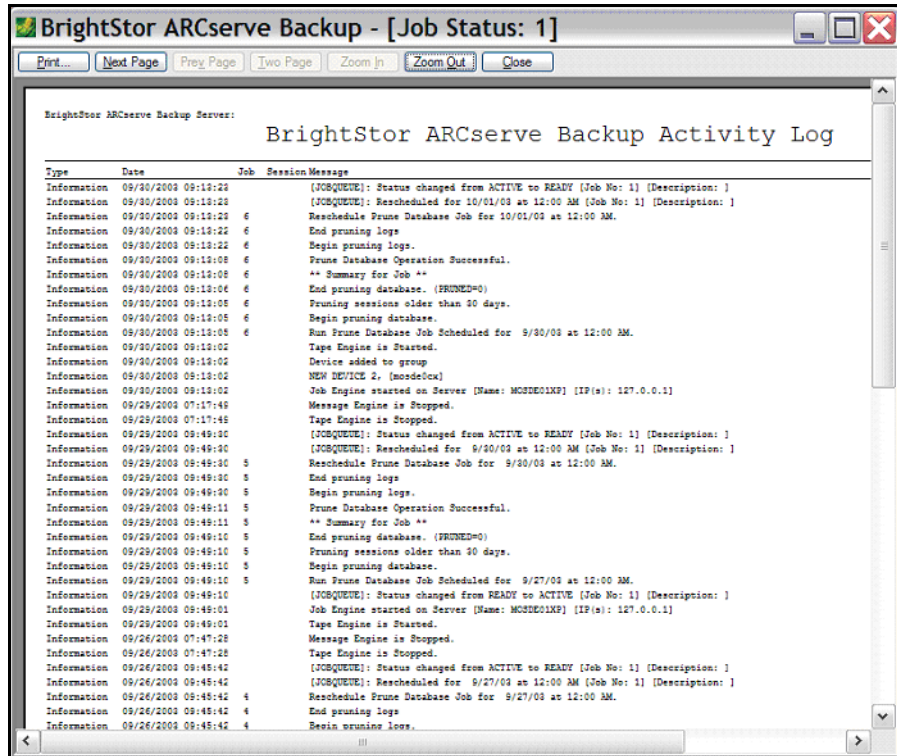
Displaying Client Agent Activity Logs on a Windows Server

To display the activity log on a Windows BrightStor ARCserve Backup server, follow these steps:

1. From the BrightStor ARCserve Backup Home Page, select the Job Status menu to open the Job Status Manager.
2. Click the Activity Log tab to view a list of logs, as shown in the following example:



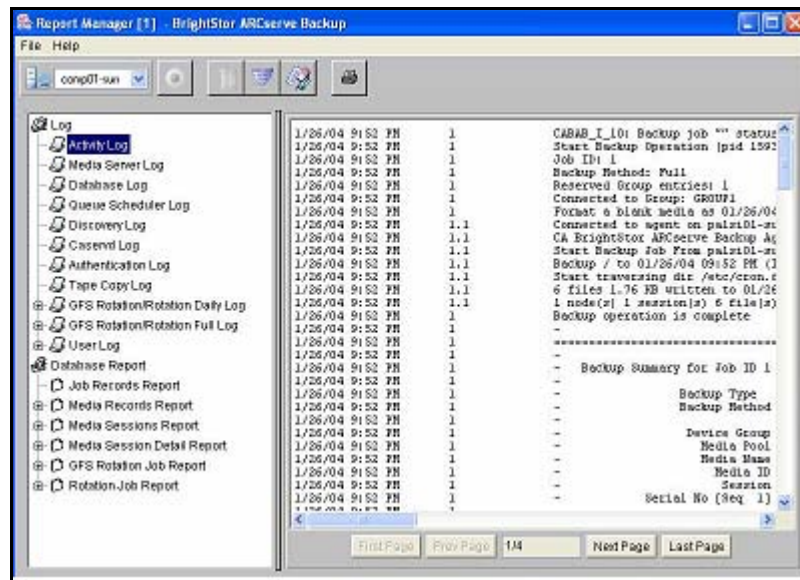
The printer or print-to-file output of a client agent activity log file looks like the one shown in the following sample:



Displaying Client Agent Activity Logs on a UNIX or Linux Server

To display logs for a client agent on a UNIX or Linux BrightStor ARCserve Backup server, follow these steps:

1. From the BrightStor ARCserve Backup Home Page, open the Report Manager.
2. Click Activity Log to view a list of logs, as shown in the following example:



Displaying Client Agent Activity Logs on a NetWare Client Agent Machine

The NetWare client agent writes to the `nwagent.log`, which is created in the client agent home directory. You can view this log using Windows Explorer by opening the file in the client agent home directory. Alternatively, you can view log file contents by selecting `View nwagent.log` at the console.

Displaying Client Agent Activity Logs on a UNIX, Linux, or Mac OS X Client Agent Machine

As soon as the UNIX, Linux, or Mac OS X client agent begins running, an activity log file called `uag.log` is created and stored in the logs directory. The logs directory resides under the client agent home directory.

The `uag.log` file records all activities and errors that occur during machine backup and restore jobs. Each job is identified numerically in sequence, as well as by date and time, in the log display.

On the client agent machine, you can view the contents of these logs using the `print filename` command.

Note: All log messages relating to the Common Agent are located in the `/opt/CA/BABcmagt/logs/caagentd.log` file.

Displaying Client Agent Activity Logs on an AS/400 Enterprise Option Machine

The Enterprise Option for AS/400 creates a log file in the BrightStor ARCserve Backup library. The two file members are:

- `AGENT.MBR`, which records the activities and errors relating to agent operations
- `ASBR.MBR`, which records information on BrightStor ARCserve Backup browsing activities

Displaying Client Agent Activity Logs on an OpenVMS Enterprise Option Machine

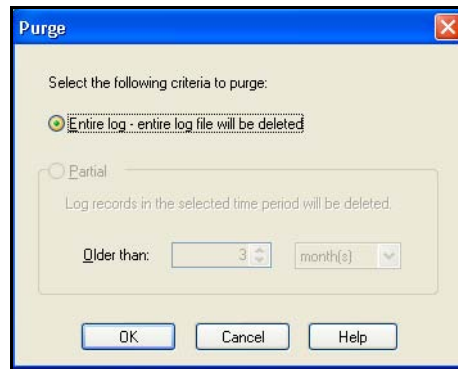
As soon as the agent begins running on the server, BrightStor ARCserve Backup generates an activity log file named `aso$agent_<nodename>.log`, and stores it in the logs directory. A new log file—identified by sequential job number, date, and time—is created for each job and every subsequent startup of the agent. The content of each log file is determined by the level of tracing enabled on the agent.

Deleting Client Agent Log Files

For UNIX, Linux, and Mac OS X client agents, delete log files from the client machine the same way you would delete any file on that machine. For example, run:

```
$>rm uag.log
```

For Windows client agents, use the Backup Agent Admin to delete log files:



Backing Up Windows Network Server Data

If you installed a client agent on a Windows server, you can back up the server data through the client agent by following these steps:

1. Open the Backup Manager.
2. Click the Source tab.
3. Expand the Network object, and then expand the Windows NT/2000/XP/2003 Systems network object until you locate the client machine.
4. Right-click the client machine. Choose Use Agent from the pop-up menu.
5. Check the Use Agent check box.
6. Select a protocol. Either select TCP/IP and enter the address for the client computer or select Use Computer Name Resolution, to specify that the client agent should determine an IP network address using the Dynamic Host Configuration Protocol.
7. Click OK. The client agent is now selected.
8. If you are prompted for security, enter the appropriate security for your environment.

Starting and Stopping the Client Agent

The following sections describe the procedures for starting and stopping the various client agents.

Note: If the client agent is stopped at any time during a backup or restore job, the job will fail and must be restarted.

Starting and Stopping the Windows Client Agent

The Windows client agent uses a common component called the Universal Agent. This component is installed or updated during installation. The Universal Agent is registered as a service that starts automatically and runs under the local system account by default. When the service starts, the Windows client agent is loaded. The Windows client agent is available even when no users are logged into the system.

Use the Backup Agent Admin to start or stop the Windows client agent. The Backup Agent Admin monitors the client agent activity and protects against accidental job failures if the Universal Agent service stops.

To start or stop a Windows client agent, follow these steps:

1. Open the Backup Agent Admin.
2. From the Options menu, select Services.
3. (Optional) If you do not want the client agent to start automatically each time you start the computer, clear the **Autostart Backup Agent when System starts** check box.
4. Click the arrow to start the service or the red dot to stop the service.

Note: Stopping the service affects other components that use the Universal Agent.

5. Close the Backup Agent Service Manager.

Starting and Stopping the NetWare Client Agent

The installation process for the NetWare client agent creates a Network Client Facility file called NWAGENT.NCF. Before starting the client agent, ensure that this file was created and stored properly in the SYSTEM directory on the NetWare server's SYS volume.

Starting the NetWare Client Agent

To start the NetWare client agent, issue the following command at the remote server console prompt:

```
nwagent
```

The NetWare client agent includes a module called CSLOADER.NLM, which performs monitoring functions. When you start the NetWare client agent, CSLOADER.NLM also starts. CSLOADER.NLM displays, and records in log files, the results of this process as a series of informational messages. These messages can be helpful in tracking the source of a problem.

CSLOADER.NLM also works with the Pre-Flight Check (PFC.NLM), which evaluates the environment in which the client agent will be running. If the environment fails to meet its requirements, this checking mechanism signals CSLOADER.NLM to stop the loading sequence.

Stopping the NetWare Client Agent

To stop the NetWare client agent, issue the following command at the NetWare server console prompt:

```
unload nwagent
```

Starting and Stopping UNIX, Linux, and Mac OS X Client Agents

Before starting the client agent, ensure that it has been configured. If the client agent has not been configured, run the following script:

```
#babuagent/uagentsetup
```

In this example, *babuagent* represents the full path name of the agent home directory. The default path is `/opt/CA/BABuagent`.

Starting the UNIX, Linux, or Mac OS X Client Agent

After installing a UNIX, Linux, or Mac OS X client agent, the agent is started automatically. To check the status of the agent, issue the following command at the command line:

```
# uagent status
```

If the agent is not enabled, run the configuration script, `uagentsetup`.

Stopping the UNIX, Linux, or Mac OS X Client Agent

To stop the UNIX, Linux, or Mac OS X client agent, log in as root and issue the following command at the command line:

```
BABuagent/uagentsetup
```

Starting and Stopping the Common Agent

Whenever a client agent is started or stopped, the UNIX, Linux, or Mac OS X system scripts modify the `agent.cfg` file by marking the client agent entry in the file as enabled or disabled. The scripts also notify the Common Agent of the change. The Common Agent then determines whether to continue running, depending on the number of entries in the configuration file that are still enabled.

For example, issuing `uagent stop` for a UNIX client marks the `BABagntux` section disabled. If `BABagntux` is the only section of the file (that is, there is only one BrightStor ARCserve Backup client agent installed), the Common Agent stops. You would then need to issue `uagent start` to enable the `BABagntux` section of the `agent.cfg` file.

When you enter the `uagent start` command, the Common Agent status changes from disabled to enabled. In summary, when a particular client agent is started or stopped, the scripts modify the `agent.cfg` file accordingly, and notify the Common Agent. At that point, the Common Agent decides whether to continue running, depending on the number of sections in the configuration file that are still enabled.

Checking the Status of the UNIX, Linux, and Mac OS X Client Agents

To check the status of a UNIX, Linux, or Mac OS X client agent, log in as root and issue the following command at the command line:

```
# uagent status
```

If this command fails, the client agent may need to be configured. To configure the client agent, run the following script:

```
#babuagent/uagentsetup
```

In this example, *babuagent* represents the full path name of the agent home directory. The default path is `/opt/CA/BABuagent`.

Starting and Stopping the AS/400 Enterprise Option

You must have *JOBCTL (job control) authority to start or stop the client agent.

Starting the AS/400 Enterprise Option

To start the agent, log on to AS/400 and issue the following command at the command line:

```
straso
```

Stopping the AS/400 Enterprise Option

To stop the agent, log on to AS/400 and issue the following command at the command line:

```
endaso
```

Starting and Stopping the OpenVMS Enterprise Option

Ensure that you have the appropriate network credentials to operate the OpenVMS machine on which the client agent resides.

Starting the OpenVMS Enterprise Option

To start the agent, log in as system and issue the following command at the command line:

```
@sys$startup:bab$startup.com
```

Stopping the Agent

To stop the agent, log in as system and issue the following command at the command line:

```
@sys$startup:bab$shutdown.com
```

Checking the Agent Status

To check the status of the agent, log in and issue the following command at the command line:

```
show sys /proc=aso$*
```


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