

User Guide - Macintosh File System *iDataAgent*

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INTRODUCTION

The Macintosh File System iDataAgent provides a simplified end-to-end backup and recovery solution for file system data (i.e., files and directories) residing on Macintosh computer systems. The product can be used to perform both full system rebuilds and granular recovery of the data.

KEY FEATURES

The Macintosh File System iDataAgent offers the following key features:

SIMPLIFIED DATA MANAGEMENT

The Macintosh File System iDataAgent enables easy management of all the Macintosh systems in your environment, by providing a singular approach to manage the data using the same unified console and infrastructure.

POINT-IN-TIME RECOVERY

In the event of a serious system failure, such as the breakdown of hardware, software, or operating systems, the Macintosh File System iDataAgent provides point-in-time recovery of the files at any given time.

BACKUP AND RECOVERY FAILOVERS

In the event that a MediaAgent used for the backup or recovery operation fails, it is automatically resumed on alternate MediaAgents. In such cases, the backup or restore job will not restart from the beginning, but will resume from the point of failure. This is especially useful for backups and restores of large amount of file system data.

In the event, that a network goes down, the backup and recovery jobs are resumed on alternate data paths. Similarly, in the event of a device failure, the jobs are automatically switched to alternate disk and tape drives.

EFFICIENT JOB MANAGEMENT AND REPORTING

You can view and verify the status of backup and recovery operations from the Job Controller and Event Viewer windows within the CommCell Console. You can also track the status of the jobs using Reports, which can be saved and easily distributed. Reports can be generated for different aspects of data management. You also have the flexibility to customize the reports to display only the required data and save them to any specified location in different formats. For example, you can create a backup job summary report to view at-a-glance the completed backup jobs.

In addition, you can also schedule these reports to be generated and send them on email without user intervention.

BLOCK LEVEL DEDUPLICATION

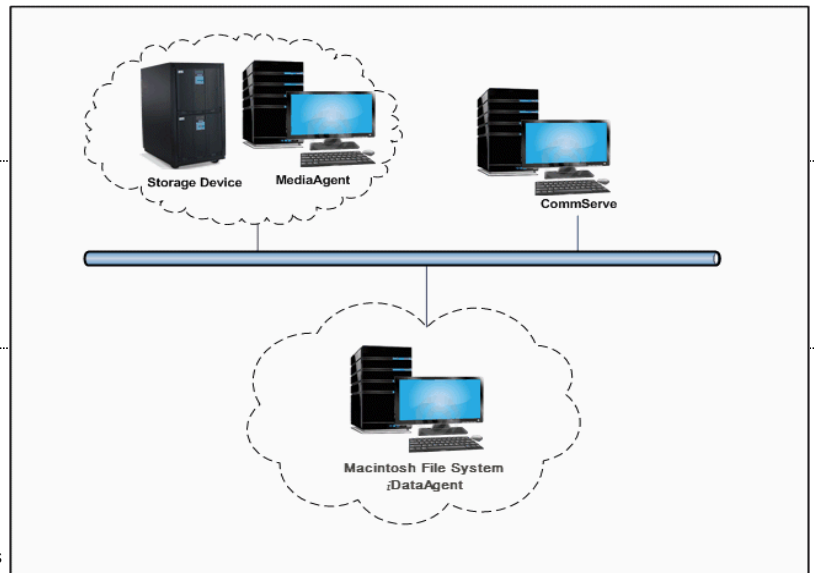
Deduplication provides a smarter way of storing data by identifying and eliminating the duplicate items in a data protection operation.

Deduplication at the data block level compares blocks of data against each other. If an object (file, database, etc.) contains blocks of data that are identical to each other, then block level deduplication eliminates storing the redundant data and reduces the size of the object in storage. This way dramatically reduces the backup data copies on both the disk and tapes.

WHERE TO GO NEXT

Getting Started - Macintosh File System

Walks you through the process of installing and configuring the Macintosh File System iDataAgent.



ADD-ON COMPONENTS

CONTENT INDEXING AND SEARCH

Content Indexing and Search enables users to content index their data and later search the data from a user-friendly web interface. The users can also perform restore operations or other advanced actions on the searched data.

TERMINOLOGY

The Macintosh File System documentation uses the following terminology:

CLIENT	The computer in which the iDataAgent is installed and contains the data to be secured.
BACKUP SET	A group of subclients which includes all of the data backed up by the iDataAgent.
SUBCLIENT	The Macintosh file system data to be backed up.

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New Features - Macintosh File System *iDataAgent*

NEW COMMCELL FEATURES SUPPORTED FOR MACINTOSH FILE SYSTEM IDATAAGENT

DEPLOYMENT

INSTALL FROM THE COMMCELL CONSOLE

The software installation for this component can be initiated and managed from the CommCell Console, which facilitates the building of your CommCell and eliminates the need to manually install the software. Additionally, the installation of this component can be scheduled to occur at a time suitable for your environment. For more information, see [Install Software from the CommCell Console](#).

UNINSTALL FROM THE COMMCELL CONSOLE

This component can be uninstalled using the CommCell Console. The Uninstall Software utility allows you to quickly see a list of the software packages installed on the selected computer, from which you can then select the components to uninstall. With this, you can easily manage removing software components from client computers and MediaAgents in your CommCell without having to directly access each computer. For more information, see [Uninstall Components using the CommCell Console](#).

System Requirements - Macintosh File System *iDataAgent*

[System Requirements](#) | [Supported Features](#)

The following requirements are for the Macintosh File System *iDataAgent*:

OPERATING SYSTEM

MAC OS X

Mac OS X v10.4.x
Mac OS X v10.5.x
Mac OS X v10.6.x
Mac OS X v10.7.x
Mac OS X v10.8.x

HARD DRIVE

95 MB minimum of hard disk space for software
50 MB of additional hard disk space for log file growth
10 MB of temp space required for install or upgrade (where the temp folder resides).

MEMORY

64 MB RAM per stream/driver minimum required beyond the requirements of the operating system and running applications
Swap space = 2*RAM size

PROCESSOR

Intel-based Macintosh computers

MISCELLANEOUS

NETWORK

TCP/IP Services configured on the computer.

DISCLAIMER

Minor revisions and/or service packs that are released by application and operating system vendors are supported by our software but may not be individually listed in our System Requirements. We will provide information on any known caveat for the revisions and/or service packs. In some cases, these revisions and/or service packs affect the working of our software. Changes to the behavior of our software resulting from an application or operating system revision/service pack may be beyond our control. The older releases of our software may not support the platforms supported in the current release. However, we will make every effort to correct the behavior in the current or future releases when necessary. Please contact your Software Provider for any problem with a specific application or operating system.

Additional considerations regarding minimum requirements and End of Life policies from application and operating system vendors are also applicable

Supported Features - Macintosh File System iDataAgent

System Requirements | Supported Features

The following table lists the features that are supported by this Agent.

FEATURE	SUB-FEATURE	SUPPORT	COMMENTS
ADVANCED BACKUP/ARCHIVE OPTIONS	Data tab - Catalog	✓	
	Data tab - Create New Index	✓	
	Data tab - Verify Synthetic Full		
	Job Retry tab	✓	
	Media tab - Allow other Schedule to use Media Set	✓	
	Media tab - Mark Media Full on Success	✓	
	Media tab - Reserve Resources Before Scan	✓	
	Media tab - Start New Media	✓	
	Startup tab	✓	
	VaultTracking tab	✓	
	Comments	✓	Additional option in the Data tab : • Backup Mount Points
ADVANCED FILE SYSTEM IDATAAGENT OPTIONS	Automatic File System Multi-Streaming	✓	
	On Demand Data Protection Operation	✓	
	Restore by Jobs	✓	
	Restore Data Using a Map File	✓	
	Comments		
ALERTS AND MONITORING	Global Alerts	✓	
	Job-Based Alerts*	✓	
	Comments		
AUTOMATIC UPDATES	Automatic Updates	✓	
	Comments		
BACKUP/ARCHIVE OPTIONS	Differential Backup	✓	
	Full Backup	✓	
	Incremental Backup	✓	
	Other Backup Types		
	Synthetic Full Backup	✓	
	Comments		
BACKWARD COMPATIBILITY	Version 7	✓	
	Version 8	✓	
	Version 9		
	Comments		
BROWSE	Browse from Copy Precedence	✓	
	Browse the Latest Data	✓	
	Exclude Data Before	✓	
	Find	✓	
	Full Backup Transparent Browse	✓	
	Image Browse	✓	
	No Image Browse	✓	
	Page Size	✓	
	Specify Browse Path	✓	
	Specify Browse Time	✓	
	Subclient Browse	✓	
	Use MediaAgent	✓	
	View All Versions	✓	
	Comments		
CLUSTERING	Netware cluster		
	Unix Cluster		
	Windows - Microsoft Cluster (MSCS)		

	Windows - Non-Microsoft Cluster		
	Comments		
COMMAND LINE INTERFACE	Command Line Interface	✓	
	Comments		
COMMAND LINE INTERFACE - SPECIFIC COMMANDS	Qcreate - Backup set/SubClient	✓	
	Qcreate - Instance		
	Qdelete - Backup set/Subclient	✓	
	Qdelete - Client/Agent	✓	
	Qlist globalfilter	✓	
	Qmodify - instance		
	Qoperation - Backup	✓	
	Qoperation - move		
	Qoperation - Restore	✓	
	Comments		
COMMCELL MIGRATION	CommCell Migration	✓	
	Comments		
CONTENT INDEXING	Offline Content Indexing	✓	
	Comments		
DATA AGING	Basic Retention Rules	✓	
	Extended Retention Rules	✓	
	Unique Data Aging Rules		
	Comments		
DATA CLASSIFICATION ENABLER	Data Classification Enabler		
	Comments		
DATA COMPRESSION	Client Compression	✓	
	Hardware Compression	✓	
	MediaAgent Compression	✓	
	Comments		
DATA ENCRYPTION	Data Encryption Support	✓	
	Third-party Command Line Encryption Support		
	Comments		
DATA MULTIPLEXING	Multiplexing	✓	
	Comments		
DEDUPLICATION	MediaAgent Deduplication	✓	
	Source Deduplication		
	Comments		
ERASE BACKUP/ARCHIVED DATA	Erase Data by Browsing		
	Erase Stubs		
	Comments		
GLOBAL FILTERS	Global Filters	✓	
	Comments		
INSTALLATION	Custom Package		
	Decoupled Install		
	Remote Install	✓	
	Restore Only Agents		
	Silent Install	✓	
	Comments		
INSTALLING 32-BIT COMPONENTS ON A MICROSOFT WINDOWS X64 PLATFORM	Install 32-bit On x64		
	Comments		
JOB RESTART - DATA PROTECTION	Not Restartable		
	Restarts from the Beginning		
	Restarts from the Beginning of the Database		
	Restarts from the Point-of-Failure	✓	
	Comments		
	Not Restartable		

JOB RESTART - DATA RECOVERY			
	Restarts from the Beginning		
	Restarts from the Beginning of the Database		
	Restarts from the Point-of-Failure	✓	
	Comments		
LIST MEDIA	List Media Associated with a Specific Backup Set or Instance	✓	
	List Media Associated with Index	✓	
	List Media Associated with Specific Files and/or Folders	✓	
	List Media Associated with Specific Jobs	✓	
	Comments		
MULTI INSTANCING	Multi Instance	✓	
	Comments		
PRE/POST PROCESSES	Pre/Post Process with Data Protection and Recovery	✓	
	Comments		
RESTORE/RECOVER/RETRIEVE DESTINATIONS	Cross-Application Restores (Different Application version)		
	Cross-Platform Restores - Different Operating System		
	Cross-Platform Restores - Same Operating System - Different Version	✓	
	In-place Restore - Same path/ destination - Same Client	✓	
	Out-of-place Restore - Different path/ destination	✓	
	Out-of-place Restore - Same path/ destination - Different Client	✓	
	Restore Data Using a Map File	✓	
	Restore to Network Drive /NFS-Mounted File System	✓	
	Comments	✓	See Advanced Restore - Macintosh File System iDataAgent
RESTORE/RECOVER/RETRIEVE OPTIONS	Automatic Detection of Regular Expressions	✓	
	Filter Data From Recover Operations	✓	
	Rename/ Redirect Files on Restore	✓	
	Restore Data Using Wildcard Expressions	✓	
	Restore Data with Pre/Post Processes	✓	
	Restore from Copies	✓	
	Skip Errors and Continue	✓	
	Use Exact Index	✓	
	Use MediaAgent	✓	
	Comments		
RESTORE/RECOVER/RETRIEVE OVERWRITE OPTIONS	Overwrite Files	✓	
	Overwrite if file on media is newer	✓	
	Restore only if target exists	✓	
	Unconditional Overwrite	✓	
	Unconditionally overwrite only if target is a DataArchiver stub		
	Comments		
SCHEDULE POLICY	Agent Specific Data Protection Schedule Policy	✓	
	All Agent Types Schedule Policy	✓	
	Comments		
STORAGE POLICIES	Incremental Storage Policy*	✓	
	Standard Storage Policies	✓	
	Comments		
STORAGE POLICY COPIES	Data Verification	✓	
	Job Based Pruning	✓	
	Manual Retention	✓	
	Mark Job Disabled	✓	
	Selective Copy	✓	
	Comments		
	SubClient Policy	✓	

SUBCLIENT POLICIES			
	Comments		
UPGRADE	Netware - Local		
	Unix - Remote (Push)		
	Unix/Linux/Macintosh - Local	✓	
	Unix/Linux/Macintosh - Silent	✓	
	Upgrade from CommCell Console	✓	
	Windows - Local		
	Windows - Remote (Push)		
	Windows - Silent		
	Comments		
USER ADMINISTRATION AND SECURITY	Backup Set/Archive Set	✓	
	Subclient	✓	
	Comments		

Additional features are listed below:

Activity Control	Auxiliary Copy
CommCell Console	Deconfiguring Agents
GridStor	Languages
Log Files	MediaAgent
Operation window	QR Volume Creation Options
Robust Network Layer	Scheduling
SnapProtect Backup	Snapshot Engines
VaultTracker Enterprise	VaultTracker
Report Output Options	Restore/Recover/Retrieve - Other Options
Cloud Storage	Job Restart - Data Collection

Getting Started Deployment - Macintosh File System iDataAgent



Use the following steps to install the File System iDataAgent on a Macintosh Server.

WHERE TO INSTALL

Install the software directly on the Macintosh computer you wish to protect.

Make sure the computer satisfies the minimum requirements specified in the System Requirements.

INSTALLATION

The software can be installed using one of the following methods:

METHOD 1: INTERACTIVE INSTALL

Use this procedure to directly install the software from the installation package or a network drive.

METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

Use this procedure to remotely install the software on a client computer.

METHOD 1: INTERACTIVE INSTALL

1. Logon to the client computer as **root**.
2. If you are installing the software from CD, run the following command to mount the CD:

```
mount_cd9660 /dev/disk1s1 /cdrom
```

 Run the following command from the Software Installation Package or mount point:

```
./cvpkgadd
```
3. The product banner and other information is displayed.
Press **Enter**.
4. Read the license agreement. Type **y** and press **Enter**.
5. Press **Enter**.
6. If you have only one network interface, press **Enter** to accept the default network interface name and continue.
 If you have multiple network interfaces, enter the interface name that you wish to use as default, and then press **Enter**.

The interface names and IP addresses depend on the computer in which the software is installed and may be different from the example shown.
7. Press **Enter**.
8. Press **Enter**.

BEFORE YOU BEGIN

Download Software Packages

Download the latest software package to perform the install.

System Requirements

Verify that the computer in which you wish to install the software satisfies the System Requirements.

Please select a setup task you want to perform from the list below:

Advance options provide extra setup features such as creating custom package, recording/replaying user selections and installing External Data Connector software.

- 1) Install data protection agents on this computer
- 2) Advance options
- 3) Exit this menu

Your choice: [1]

Network interfaces with the following IPs have been found available on your system. One of these interfaces should be associated with the client being installed. It will also be used by the CommServe to initiate connections to the client. Note that you will be able to additionally customize Datapipe Interface Pairs used for the backup data traffic later in the Calypso Java GUI.

Please select the correct network interface below.

- 1) mcstone.mycompany.com (172.16.60.176)
- 2) cvmcstn2.local (fe80::21e:52ff:fe85:56b4)

Interface number: [1]

Client Host Name

Please verify the client interface name below. Make it as complete (with fully qualified domain name) as possible.

Client Host Name: [mcstone.mycompany.com]

Client Name

Please specify the client name for this machine.

9. Type the number associated with the **Unix File System iDataAgent** and press **Enter**.

It does not have to be the network host name: you can enter any word here without spaces. The only requirement is that it must be unique on the CommServe.

Client Name: [mcstone]

Install Calypso on physical machine mcstone

Please select the Calypso module(s) that you would like to install.

```
[ ] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 3) CommCell Console [1118] [CVGxGUI]
[ ] 4) Resource Pack [1130] [CVGxRP]
[ ] 5) CommNet Browser [1134] [CVGxQGUI]
```

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here:1

Install Calypso on physical machine mcstone

Please select the Calypso module(s) that you would like to install.

```
[X] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 3) CommCell Console [1118] [CVGxGUI]
[ ] 4) Resource Pack [1130] [CVGxRP]
[ ] 5) CommNet Browser [1134] [CVGxQGUI]
```

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here:1

Config for Laptop or Desktop Backups

Do you want to configure the iDataAgent for laptop or desktop backups? [no]

Do you want to use the agents for restore only without consuming licenses? [no]

Installation Scripts Pack provides extra functions and latest support and fix performed during setup time. Please specify how you want to get this pack.

If you choose to download it from the website now, please make sure you have internet connectivity at this time. This process may take some time depending on the internet connectivity.

```
1) Download from the software provider website.
2) Use the one in the installation media
3) Use the copy I already have by entering its unix path
```

Your choice: [1] 2

Please specify where you want us to install Calypso binaries.

It must be a local directory and there should be at least 176MB of free space available. All files will be installed in a "calypso" subdirectory, so if you enter "/opt", the files will actually be placed into "/opt/calypso".

Installation Directory: [/opt]

10. A confirmation screen will mark your choice with an "X".

Type **d** for **Done**, and press **Enter**.

11. Type **Yes** to install **Backup Monitor** utility which allows you to view the backup job summary of your client computer. See Monitor - Laptop User for more information.

Otherwise, accept **no**, press **Enter**.

12. Press **Enter**.

13. Type the appropriate number to install the latest software scripts and press **Enter**.

- Select **Download from the software provider website** to download the latest software scripts. Make sure you have internet access.
- Select **Use the one in the installation media** to install the software scripts from the package or share from which the installation is currently being performed.
- Select **Use the copy I already have by entering its unix path**, to specify the path if you have the software script in an alternate location.

14. Press **Enter** to accept the default path.

- If you want to specify a different path, type the path and then press **Enter**.
- If you want to install the software binaries to an NFS shared drive, specify the directory on which you have mounted the NFS file system and then press **Enter**.

In order to make sure that the client computer has *read/write* access to NFS shared drive, review the steps described in Installing Software Binaries to an NFS Shared Drive.

Do not use the following characters when specifying the path:

!@#%&*():/?\

15. Press **Enter** to accept the default location.

- Enter a path to modify the default location and press **Enter**.
- All the modules installed on the computer will store the log files in this directory.

Please specify where you want to keep Calypso log files.

It must be a local directory and there should be at least 100MB of free space available. All log files will be created in a "calypso/Log_Files" subdirectory, so if you enter "/var/log", the logs will actually be placed into "/var/log/calypso/Log_Files".

Log Directory: [/var/log]

16. Press **Enter**.

Most of Software processes run with root privileges, but some are launched by databases and inherit database access rights. To make sure that registry and log files can be written to by both kinds of processes we can either make such files world-writeable or we can grant write access only to processes belonging to a particular group, e.g. a "calypso" or a "dba" group.

17. Type the **Group name** and press **Enter**.

Press **Enter** again.

18. Type **d** for done with the selection and press **Enter**.

This screen is displayed if you do not assign any group to the software and type **no** in step 16.

19. Press **Enter** to accept the default value for **Number of Streams**.

You can type the **Number of Streams** that you plan to run at the same time and then press **Enter**.

20. Press **Enter** if you do not want to apply the changes now.

- If you want to apply the changes now, type **Yes** and then press **Enter**.

21. Press **Enter**.

You will see this prompt if you have accepted the default **no** and pressed **Enter** in the above step.

22. Press **Enter**.

You will see this message if you have accepted the default answer and pressed **Enter** in step 20.

We highly recommend now that you create a new user group and enter its name in the next setup screen. If you choose not to assign a dedicated group to Software processes, you will need to specify the access permissions later.

If you're planning to backup Oracle DB you should use "dba" group.

Would you like to assign a specific group to Software?
[yes]

Please enter the name of the group which will be assigned to all Software files and on behalf of which all Software processes will run.

In most of the cases it's a good idea to create a dedicated "calypso" group. However, if you're planning to use Oracle iDataAgent or SAP Agent, you should enter Oracle's "dba" group here.

Group name: skyl

REMINDER

If you are planning to install Calypso Informix, DB2, PostgreSQL, Sybase or Lotus Notes iDataAgent, please make sure to include Informix, DB2, etc. users into group "skyl".

Press <ENTER> to continue ...

Access Permissions for Other Users

Installer will assign full access rights to root user and its belonging group for all installed Calypso files and its processes.

For any other users, you can specify the access permissions now. However, since you chose not to assign a dedicated group in previous step, make sure you specify sufficient access rights for other users if you are also planning to install Calypso agents involving third party software protection.

[X] 1) Allow read permission to other users

[X] 2) Allow write permission to other users

[X] 3) Allow execute permission to other users

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here: d

Number of Streams

IMPORTANT : Please read install document "Configure Kernel Parameters - Unix/Macintosh" from "Books Online" before you start configuring kernel parameters. Please enter the total number of streams that you plan to run at the same time. We need to make sure that you have enough semaphores and shared memory segments configured in /etc/system.

Number of streams [10]

Modify System Configuration File

We now need to modify the /etc/sysctl.conf configuration file on this computer. It is done to make sure that there will be enough shared memory and semaphores available for Calypso programs.

Please review the changes below, and answer "yes", if you want us to apply them to /etc/sysctl.conf file. Otherwise the installation will proceed, the changes will saved to some other file, and you will have to apply them manually.

kern.sysv.shmmax=2147479552 (unchanged)

kern.sysv.shmall=524287 (unchanged)

kern.sysv.shmmin=1 (unchanged)

kern.sysv.shmni=1312 (was:672)

kern.sysv.shmseg=1288 (was:648)

kern.sysv.semns=88661 (was:88021)

kern.sysv.semni=87381 (unchanged)

kern.sysv.semmsl=88661 (was:88021)

Do you want us to apply these changes now? [no]

Changes saved into /etc/sysctl.gal.tmp.1744

Press <ENTER> to continue.

Although a 'no' answer can be selected to this question during install, the user should make sure the min requirements (below) for shared memory are met, otherwise the backups may fail (the message in logs is 'could not start the pipeline').

set shmsys:shminfo_shmmax=4199304

set shmsys:shminfo_shmmin=1

set semsys:shminfo_shmni=640

set semsys:shminfo_shmseg=640

set semsys:seminfo_semns=640

23. Type a network TCP port number for the Communications Service (CVD) and press **Enter**.
Type a network TCP port number for the Client Event Manager Service (EvMgrC) and press **Enter**.
24. If you do not wish to configure the firewall services, press **Enter**.

If this computer is separated from the CommServe by firewall(s), type **Yes** and then press **Enter**.

For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.
25. Type the fully qualified CommServe host name and press **Enter**.

Ensure that the CommServe is accessible before typing the name; otherwise the installation will fail.
26. Press **Enter**.
27. Type the appropriate number to select the **Client Group** and press **Enter**.

This screen will be displayed only if Client Groups are configured for the CommCell.
28. Type **d** for **Done**, and press **Enter**.
29. Enter the number associated with the storage policy you want to use and press **Enter**.
30. If you have not created a storage policy, this message will be displayed.
You may not be prompted for user input.

You can create the Storage Policy later in step 32.
31. Type **3** and press **Enter**.
- ```

set semsys:seminfo_semmni=640
set semsys:seminfo_semmsl=640
set maxusers=256
Press <ENTER> to continue.

Every instance of Calypso should use a unique set of network ports to avoid interfering with other instances running on the same machine.

The port numbers selected must be from the reserved port number range and have not been registered by another application on this machine.

Please enter the port numbers.
Port Number for CVD : [8400]
Port Number for EvMgrC: [8402]

Is there a firewall between this client and the CommServe?
[no]

Please specify hostname of the CommServe below. Make sure the hostname is fully qualified, resolvable by the name services configured on this machine.
CommServe Host Name: mycommserve.company.com

Commcell Level Global Filters are set through Calypso GUI's Control Panel in order to filter out certain directories or files from backup Commcell-widely. If you turn on the Global filters, they will be effective to the default subclient. There are three options you can choose to set the filters.

1) Use Cell level policy
2) Always use Global filters
3) Do not use Global filters

Please select how to set the Global Filters for the default subclient? [1]

Selecting Client Computer Groups
Client Group(s) is currently configured on CommServe mycommserve.company.com. Please choose the group(s) that you want to add this client myclient.company.com to.

[] 1) Client Grp1
[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help]

Enter number(s)/one of "a,n,r,q,d,>,<," here: 1

Selecting Client Computer Groups
Client Group(s) is currently configured on CommServe mycommserve.company.com. Please choose the group(s) that you want to add this client myclient.company.com to.

[X] 1) Client Grp1
[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help]

Enter number(s)/one of "a,n,r,q,d,>,<," here: d

Please select one storage policy for this IDA from the list below:

1) SP_StandAloneLibrary2_2
2) SP_Library3_3
3) SP_MagLibrary4_4

Storage Policy: [1]

There seem to be no Storage Policies configured on the CommServe. Before you can run any backups of this IDA, you will need to install a MediaAgent, create a Storage Policy and assign it to all subclients..

Adjusting modes and permissions of files

Successfully installed Calypso

Certain Calypso packages can be associated with a virtual IP, or in other words, installed on a "virtual machine" belonging to some cluster. At any given time the virtual machine's services and IP address are active on only one of the cluster's servers. The virtual machine can "fail-

```

over" from one server to another, which includes stopping services and deactivating IP address on the first server and activating the IP address/services on the other server.

Currently you have Calypso installed on physical node angel.company.com.

Now you have a choice of either adding another package to the existing installation or configure Calypso on a virtual machine for use in a cluster.

- 1) Add another package to angel.company.com
- 2) Install Calypso on a virtual machine
- 3) Exit

Your choice: [3]

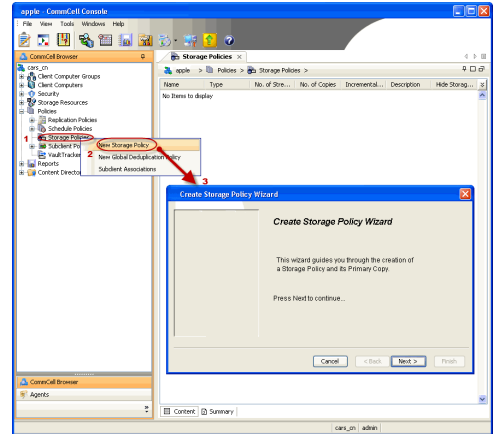


If you already selected a storage policy in step 29, proceed to the Configuration section.

If you do not have Storage Policy created, follow the procedure given below.

32.

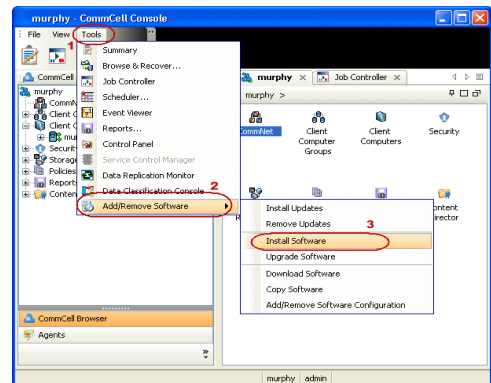
1. From the CommCell Browser, navigate to **Policies**.
2. Right-click the **Storage Policies** and then click **New Storage Policy**.
3. Follow the prompts displayed in the Storage Policy Wizard. The required options are mentioned below:
  - Select the Storage Policy type as **Data Protection and Archiving** and click **Next**.
  - Enter the name in the **Storage Policy Name** box and click **Next**.
  - From the **Library** list, click the name of a disk library to which the primary copy should be associated and then click **Next**.  
Ensure that you select a library attached to a MediaAgent operating in the current release.
  - From the **MediaAgent** list, click the name of a MediaAgent that will be used to create the primary copy and then click **Next**.
  - For the device streams and the retention criteria information, click **Next** to accept default values.
  - Select **Yes** to enable deduplication for the primary copy.
  - From the **MediaAgent** list, click the name of the MediaAgent that will be used to store the Deduplication store.  
Type the name of the folder in which the deduplication database must be located in the Deduplication Store Location or click the Browse button to select the folder and then click **Next**.
  - Review the details and click **Finish** to create the Storage Policy.



## METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

For sudo users, Service Pack 4B (or higher) must be available in the CommServe cache before performing the install. See Configure Download Software for step-by-step instruction on downloading the latest software or updates.

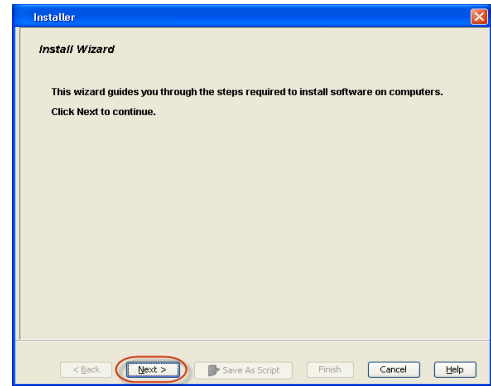
1. From the CommCell Browser, select **Tools** menu, point to **Add/Remove Software**, and then click **Install Software**.



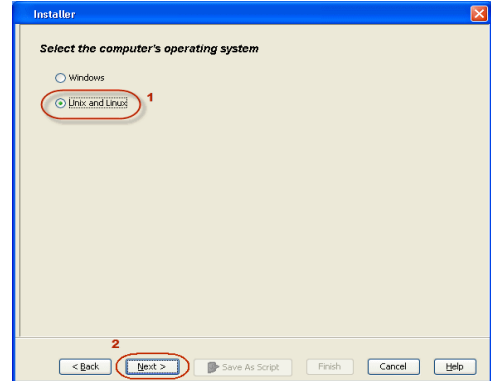
2. Click **Next**.



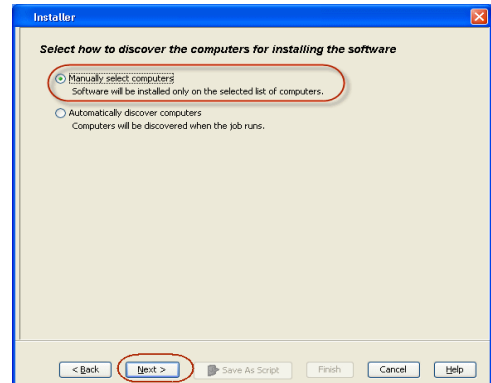
3. Select **Unix and Linux**, and then click **Next**.



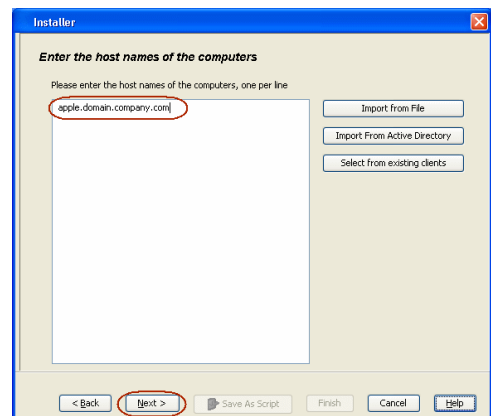
4. Select **Manually Select Computers**, and then click **Next**.



5. Enter the fully qualified domain name of the computer in which you wish to install.  
For example: apple.domain.company.com  
The **Unix File System iDataAgent** will be installed on this client computer.  
Click **Next**.



6. Click **Next**.



7. Type the **User Name** and **Password** of client computer who has administrator or sudo privileges.

Click **Next**.

- If a SUDO user has been created for root access then use **visudo** to change **/etc/sudoers**, so that this user can SUDO into ssh without being prompted for the password. Change the **/etc/sudoers** by commenting the following lines.
- For Sudo users with restricted privileges, in order to gain privilege to install the software remotely, you need to have **/bin/sh** added to the permission section in the sudoers file.

On SuSE Linux:

- Defaults targetpw # ask for the password of the target user i.e. root
- ALL ALL=(ALL) ALL # WARNING! Only use this together with 'Defaults targetpw'!

On Red Hat Enterprise Linux/CentOS:

- Defaults requiretty

8. Select **Unix File System iDataAgent**.

Click **Next**.

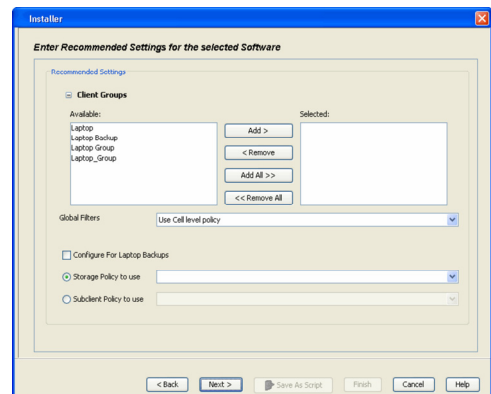
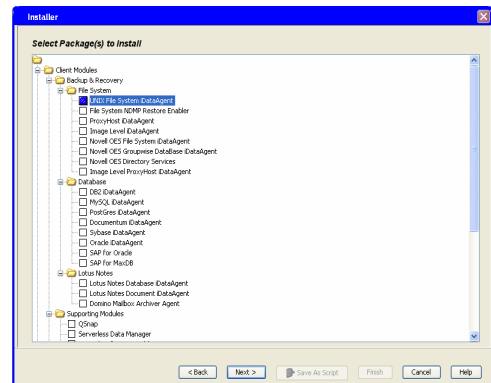
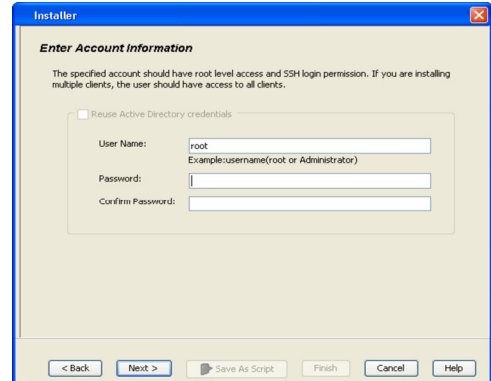
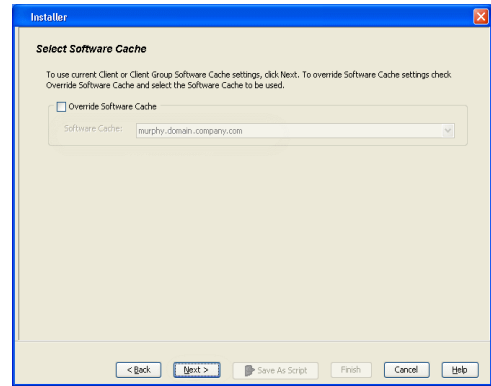
9. • Select **Client Group** from **Available** and click **Add**.

Do not add more than one Client Group.

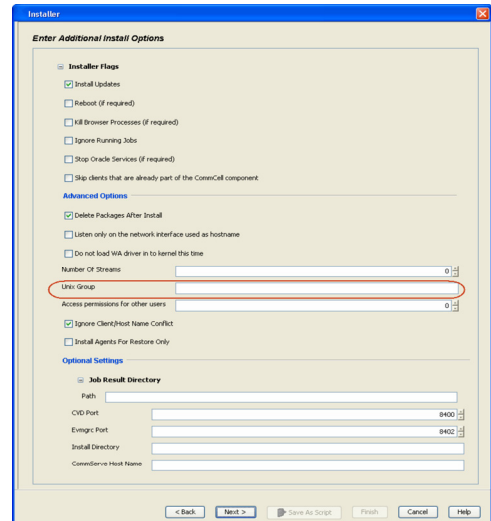
• Select a **Storage Policy** from the drop-down list. Click **Next**.

Select the **Configure for Laptop or Desktop Backup** option to install **Backup Monitor** utility. This utility allows you to view the backup job summary from the client computer without opening the CommCell Console. See Monitor - Laptop User for more information.

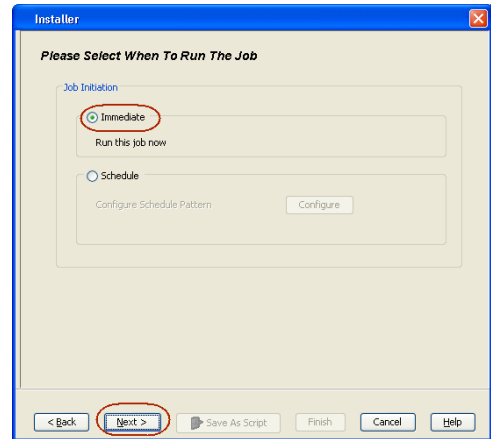
10. Click **Next**.



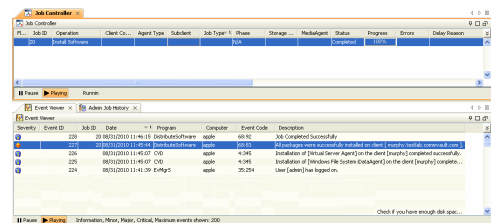
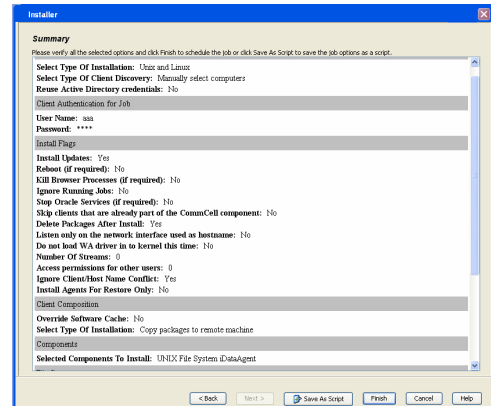
11. Select **Immediate**.  
Click **Next**.



12. Click **Finish**.



13. You can track the progress of the job from the **Job Controller** or **Event Viewer** window.



# Getting Started Deployment - Macintosh File System iDataAgent



Use the following steps to install the File System iDataAgent on a Macintosh Server.

## WHERE TO INSTALL

Install the software directly on the Macintosh computer you wish to protect.

Make sure the computer satisfies the minimum requirements specified in the System Requirements.

## INSTALLATION

The software can be installed using one of the following methods:

### METHOD 1: INTERACTIVE INSTALL

Use this procedure to directly install the software from the installation package or a network drive.

### METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

Use this procedure to remotely install the software on a client computer.

## METHOD 1: INTERACTIVE INSTALL

1. Logon to the client computer as **root**.
2. If you are installing the software from CD, run the following command to mount the CD:  

```
mount_cd9660 /dev/disk1s1 /cdrom
```

 Run the following command from the Software Installation Package or mount point:  

```
./cvpkgadd
```
3. The product banner and other information is displayed.  
Press **Enter**.
4. Read the license agreement. Type **y** and press **Enter**.
5. Press **Enter**.
6. If you have only one network interface, press **Enter** to accept the default network interface name and continue.  
 If you have multiple network interfaces, enter the interface name that you wish to use as default, and then press **Enter**.  

The interface names and IP addresses depend on the computer in which the software is installed and may be different from the example shown.
7. Press **Enter**.
8. Press **Enter**.

## BEFORE YOU BEGIN

### Download Software Packages

Download the latest software package to perform the install.

### System Requirements

Verify that the computer in which you wish to install the software satisfies the System Requirements.

Please select a setup task you want to perform from the list below:

Advance options provide extra setup features such as creating custom package, recording/replaying user selections and installing External Data Connector software.

- 1) Install data protection agents on this computer
- 2) Advance options
- 3) Exit this menu

Your choice: [1]

Network interfaces with the following IPs have been found available on your system. One of these interfaces should be associated with the client being installed. It will also be used by the CommServe to initiate connections to the client. Note that you will be able to additionally customize Datapipe Interface Pairs used for the backup data traffic later in the Calypso Java GUI.

Please select the correct network interface below.

- 1) mcstone.mycompany.com (172.16.60.176)
- 2) cvmcstn2.local (fe80::21e:52ff:fe85:56b4)

Interface number: [1]

Client Host Name

Please verify the client interface name below. Make it as complete (with fully qualified domain name) as possible.

Client Host Name: [mcstone.mycompany.com]

Client Name

Please specify the client name for this machine.

9. Type the number associated with the **Unix File System iDataAgent** and press **Enter**.

It does not have to be the network host name: you can enter any word here without spaces. The only requirement is that it must be unique on the CommServe.

Client Name: [mcstone]

Install Calypso on physical machine mcstone

Please select the Calypso module(s) that you would like to install.

```
[] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[] 2) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[] 3) CommCell Console [1118] [CVGxGUI]
[] 4) Resource Pack [1130] [CVGxRP]
[] 5) CommNet Browser [1134] [CVGxQGUI]
```

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here:1

Install Calypso on physical machine mcstone

Please select the Calypso module(s) that you would like to install.

```
[X] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[] 2) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[] 3) CommCell Console [1118] [CVGxGUI]
[] 4) Resource Pack [1130] [CVGxRP]
[] 5) CommNet Browser [1134] [CVGxQGUI]
```

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here:1

10. A confirmation screen will mark your choice with an "X". Type **d** for **Done**, and press **Enter**.

Config for Laptop or Desktop Backups

Do you want to configure the iDataAgent for laptop or desktop backups? [no]

Do you want to use the agents for restore only without consuming licenses? [no]

11. Type **Yes** to install **Backup Monitor** utility which allows you to view the backup job summary of your client computer. See Monitor - Laptop User for more information.

Otherwise, accept **no**, press **Enter**.

12. Press **Enter**.

Installation Scripts Pack provides extra functions and latest support and fix performed during setup time. Please specify how you want to get this pack.

If you choose to download it from the website now, please make sure you have internet connectivity at this time. This process may take some time depending on the internet connectivity.

- 1) Download from the software provider website.
- 2) Use the one in the installation media
- 3) Use the copy I already have by entering its unix path

Your choice: [1] 2

Please specify where you want us to install Calypso binaries.

It must be a local directory and there should be at least 176MB of free space available. All files will be installed in a "calypso" subdirectory, so if you enter "/opt", the files will actually be placed into "/opt/calypso".

Installation Directory: [/opt]

13. Type the appropriate number to install the latest software scripts and press **Enter**.

- Select **Download from the software provider website** to download the latest software scripts. Make sure you have internet access.
- Select **Use the one in the installation media** to install the software scripts from the package or share from which the installation is currently being performed.
- Select **Use the copy I already have by entering its unix path**, to specify the path if you have the software script in an alternate location.

14. Press **Enter** to accept the default path.

- If you want to specify a different path, type the path and then press **Enter**.
- If you want to install the software binaries to an NFS shared drive, specify the directory on which you have mounted the NFS file system and then press **Enter**.

In order to make sure that the client computer has *read/write* access to NFS shared drive, review the steps described in Installing Software Binaries to an NFS Shared Drive.

Do not use the following characters when specifying the path:

!@#%&\*():/?\

15. Press **Enter** to accept the default location.

- Enter a path to modify the default location and press **Enter**.
- All the modules installed on the computer will store the log files in this directory.

Please specify where you want to keep Calypso log files.

It must be a local directory and there should be at least 100MB of free space available. All log files will be created in a "calypso/Log\_Files" subdirectory, so if you enter "/var/log", the logs will actually be placed into "/var/log/calypso/Log\_Files".

Log Directory: [/var/log]

16. Press **Enter**.

Most of Software processes run with root privileges, but some are launched by databases and inherit database access rights. To make sure that registry and log files can be written to by both kinds of processes we can either make such files world-writeable or we can grant write access only to processes belonging to a particular group, e.g. a "calypso" or a "dba" group.

17. Type the **Group name** and press **Enter**.

Press **Enter** again.

18. Type **d** for done with the selection and press **Enter**.

This screen is displayed if you do not assign any group to the software and type **no** in step 16.

19. Press **Enter** to accept the default value for **Number of Streams**.

You can type the **Number of Streams** that you plan to run at the same time and then press **Enter**.

20. Press **Enter** if you do not want to apply the changes now.

- If you want to apply the changes now, type **Yes** and then press **Enter**.

21. Press **Enter**.

You will see this prompt if you have accepted the default **no** and pressed **Enter** in the above step.

22. Press **Enter**.

You will see this message if you have accepted the default answer and pressed **Enter** in step 20.

We highly recommend now that you create a new user group and enter its name in the next setup screen. If you choose not to assign a dedicated group to Software processes, you will need to specify the access permissions later.

If you're planning to backup Oracle DB you should use "dba" group.

Would you like to assign a specific group to Software?  
[yes]

Please enter the name of the group which will be assigned to all Software files and on behalf of which all Software processes will run.

In most of the cases it's a good idea to create a dedicated "calypso" group. However, if you're planning to use Oracle iDataAgent or SAP Agent, you should enter Oracle's "dba" group here.

Group name: skyl

REMINDER

If you are planning to install Calypso Informix, DB2, PostgreSQL, Sybase or Lotus Notes iDataAgent, please make sure to include Informix, DB2, etc. users into group "skyl".

Press <ENTER> to continue ...

Access Permissions for Other Users

Installer will assign full access rights to root user and its belonging group for all installed Calypso files and its processes.

For any other users, you can specify the access permissions now. However, since you chose not to assign a dedicated group in previous step, make sure you specify sufficient access rights for other users if you are also planning to install Calypso agents involving third party software protection.

[X] 1) Allow read permission to other users

[X] 2) Allow write permission to other users

[X] 3) Allow execute permission to other users

[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help] Enter number(s)/one of "a,n,r,q,d,>,<," here: d

Number of Streams

IMPORTANT : Please read install document "Configure Kernel Parameters - Unix/Macintosh" from "Books Online" before you start configuring kernel parameters. Please enter the total number of streams that you plan to run at the same time. We need to make sure that you have enough semaphores and shared memory segments configured in /etc/system.

Number of streams [10]

Modify System Configuration File

We now need to modify the /etc/sysctl.conf configuration file on this computer. It is done to make sure that there will be enough shared memory and semaphores available for Calypso programs.

Please review the changes below, and answer "yes", if you want us to apply them to /etc/sysctl.conf file. Otherwise the installation will proceed, the changes will saved to some other file, and you will have to apply them manually.

kern.sysv.shmmax=2147479552 (unchanged)

kern.sysv.shmall=524287 (unchanged)

kern.sysv.shmmin=1 (unchanged)

kern.sysv.shmni=1312 (was:672)

kern.sysv.shmseg=1288 (was:648)

kern.sysv.semns=88661 (was:88021)

kern.sysv.semni=87381 (unchanged)

kern.sysv.semmsl=88661 (was:88021)

Do you want us to apply these changes now? [no]

Changes saved into /etc/sysctl.gal.tmp.1744

Press <ENTER> to continue.

Although a 'no' answer can be selected to this question during install, the user should make sure the min requirements (below) for shared memory are met, otherwise the backups may fail (the message in logs is 'could not start the pipeline').

set shmsys:shminfo\_shmmax=4199304

set shmsys:shminfo\_shmmin=1

set semsys:shminfo\_shmni=640

set semsys:shminfo\_shmseg=640

set semsys:seminfo\_semns=640

23. Type a network TCP port number for the Communications Service (CVD) and press **Enter**.  
Type a network TCP port number for the Client Event Manager Service (EvMgrC) and press **Enter**.
24. If you do not wish to configure the firewall services, press **Enter**.  
  
If this computer is separated from the CommServe by firewall(s), type **Yes** and then press **Enter**.  
  
For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.
25. Type the fully qualified CommServe host name and press **Enter**.  
  
Ensure that the CommServe is accessible before typing the name; otherwise the installation will fail.
26. Press **Enter**.
27. Type the appropriate number to select the **Client Group** and press **Enter**.  
  
This screen will be displayed only if Client Groups are configured for the CommCell.
28. Type **d** for **Done**, and press **Enter**.
29. Enter the number associated with the storage policy you want to use and press **Enter**.
30. If you have not created a storage policy, this message will be displayed.  
You may not be prompted for user input.  
  
You can create the Storage Policy later in step 32.
31. Type **3** and press **Enter**.
- ```

set semsys:seminfo_semmni=640
set semsys:seminfo_semmsl=640
set maxusers=256
Press <ENTER> to continue.

Every instance of Calypso should use a unique set of network ports to avoid interfering with other instances running on the same machine.

The port numbers selected must be from the reserved port number range and have not been registered by another application on this machine.

Please enter the port numbers.
Port Number for CVD : [8400]
Port Number for EvMgrC: [8402]

Is there a firewall between this client and the CommServe?
[no]

Please specify hostname of the CommServe below. Make sure the hostname is fully qualified, resolvable by the name services configured on this machine.
CommServe Host Name: mycommserve.company.com

Commcell Level Global Filters are set through Calypso GUI's Control Panel in order to filter out certain directories or files from backup Commcell-widely. If you turn on the Global filters, they will be effective to the default subclient. There are three options you can choose to set the filters.

1) Use Cell level policy
2) Always use Global filters
3) Do not use Global filters

Please select how to set the Global Filters for the default subclient? [1]

Selecting Client Computer Groups
Client Group(s) is currently configured on CommServe mycommserve.company.com. Please choose the group(s) that you want to add this client myclient.company.com to.

[ ] 1) Client Grp1
[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help]

Enter number(s)/one of "a,n,r,q,d,>,<," here: 1

Selecting Client Computer Groups
Client Group(s) is currently configured on CommServe mycommserve.company.com. Please choose the group(s) that you want to add this client myclient.company.com to.

[X] 1) Client Grp1
[a=all n=none r=reverse q=quit d=done >=next <=previous ? =help]

Enter number(s)/one of "a,n,r,q,d,>,<," here: d

Please select one storage policy for this IDA from the list below:

1) SP_StandAloneLibrary2_2
2) SP_Library3_3
3) SP_MagLibrary4_4

Storage Policy: [1]

There seem to be no Storage Policies configured on the CommServe. Before you can run any backups of this IDA, you will need to install a MediaAgent, create a Storage Policy and assign it to all subclients..

Adjusting modes and permissions of files

Successfully installed Calypso

Certain Calypso packages can be associated with a virtual IP, or in other words, installed on a "virtual machine" belonging to some cluster. At any given time the virtual machine's services and IP address are active on only one of the cluster's servers. The virtual machine can "fail-

```

over" from one server to another, which includes stopping services and deactivating IP address on the first server and activating the IP address/services on the other server.

Currently you have Calypso installed on physical node angel.company.com.

Now you have a choice of either adding another package to the existing installation or configure Calypso on a virtual machine for use in a cluster.

- 1) Add another package to angel.company.com
- 2) Install Calypso on a virtual machine
- 3) Exit

Your choice: [3]

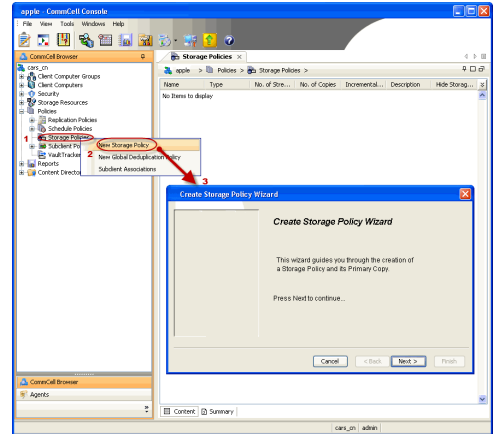


If you already selected a storage policy in step 29, proceed to the Configuration section.

If you do not have Storage Policy created, follow the procedure given below.

32.

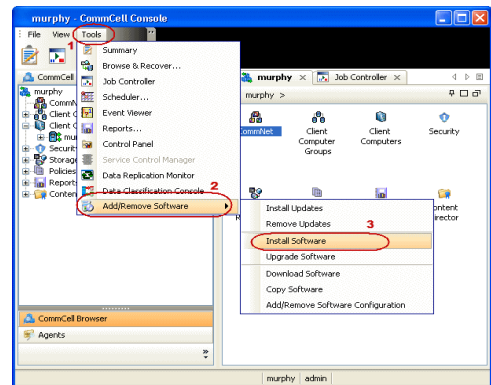
1. From the CommCell Browser, navigate to **Policies**.
2. Right-click the **Storage Policies** and then click **New Storage Policy**.
3. Follow the prompts displayed in the Storage Policy Wizard. The required options are mentioned below:
 - Select the Storage Policy type as **Data Protection and Archiving** and click **Next**.
 - Enter the name in the **Storage Policy Name** box and click **Next**.
 - From the **Library** list, click the name of a disk library to which the primary copy should be associated and then click **Next**.
Ensure that you select a library attached to a MediaAgent operating in the current release.
 - From the **MediaAgent** list, click the name of a MediaAgent that will be used to create the primary copy and then click **Next**.
 - For the device streams and the retention criteria information, click **Next** to accept default values.
 - Select **Yes** to enable deduplication for the primary copy.
 - From the **MediaAgent** list, click the name of the MediaAgent that will be used to store the Deduplication store.
Type the name of the folder in which the deduplication database must be located in the Deduplication Store Location or click the Browse button to select the folder and then click **Next**.
 - Review the details and click **Finish** to create the Storage Policy.



METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

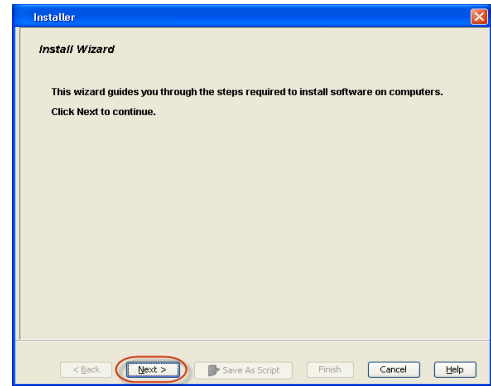
For sudo users, Service Pack 4B (or higher) must be available in the CommServe cache before performing the install. See Configure Download Software for step-by-step instruction on downloading the latest software or updates.

1. From the CommCell Browser, select **Tools** menu, point to **Add/Remove Software**, and then click **Install Software**.

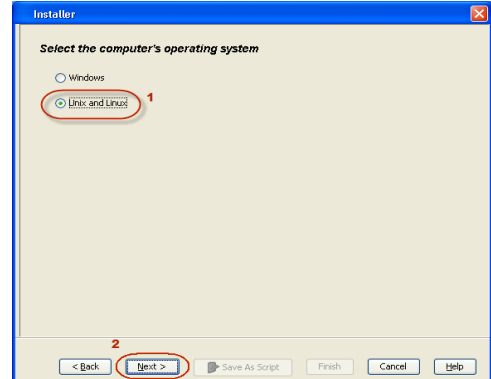


2. Click **Next**.

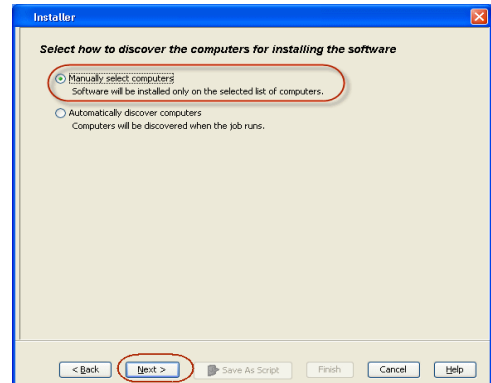
3. Select **Unix and Linux**, and then click **Next**.



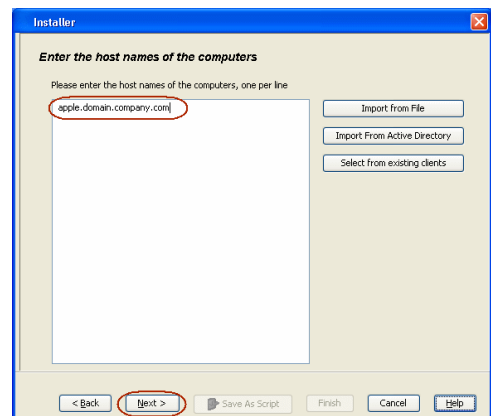
4. Select **Manually Select Computers**, and then click **Next**.



5. Enter the fully qualified domain name of the computer in which you wish to install.
For example: apple.domain.company.com
The **Unix File System iDataAgent** will be installed on this client computer.
Click **Next**.



6. Click **Next**.



7. Type the **User Name** and **Password** of client computer who has administrator or sudo privileges.

Click **Next**.

- If a SUDO user has been created for root access then use **visudo** to change **/etc/sudoers**, so that this user can SUDO into ssh without being prompted for the password. Change the **/etc/sudoers** by commenting the following lines.
- For Sudo users with restricted privileges, in order to gain privilege to install the software remotely, you need to have **/bin/sh** added to the permission section in the sudoers file.

On SuSE Linux:

- Defaults targetpw # ask for the password of the target user i.e. root
- ALL ALL=(ALL) ALL # WARNING! Only use this together with 'Defaults targetpw'!

On Red Hat Enterprise Linux/CentOS:

- Defaults requiretty

8. Select **Unix File System iDataAgent**.

Click **Next**.

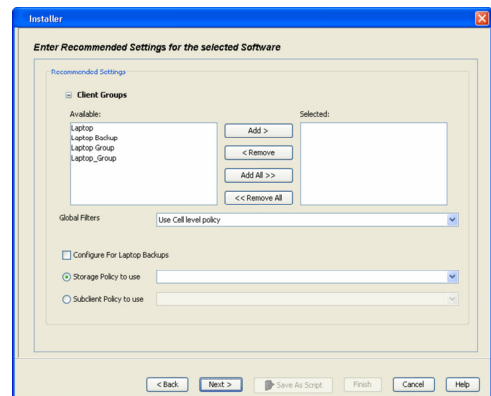
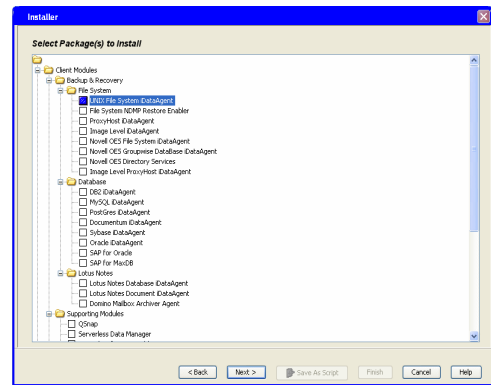
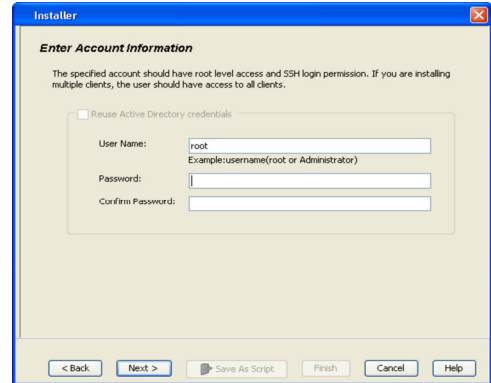
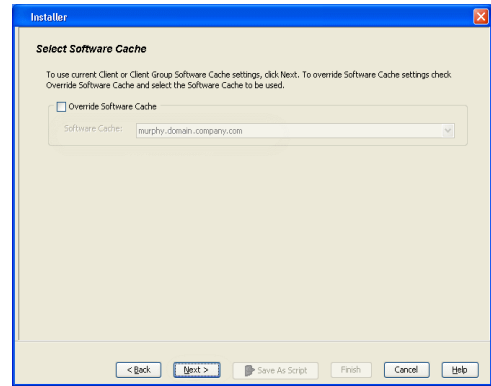
9. • Select **Client Group** from **Available** and click **Add**.

Do not add more than one Client Group.

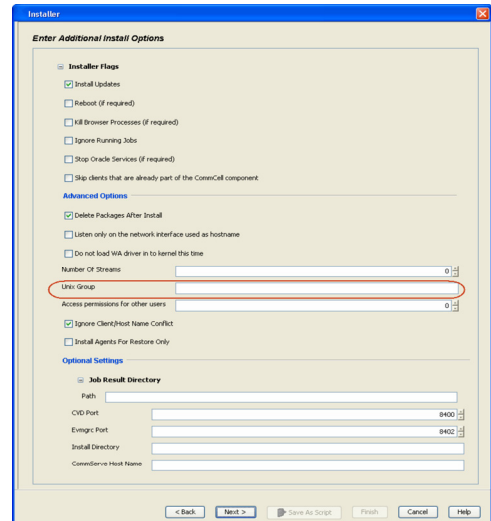
• Select a **Storage Policy** from the drop-down list. Click **Next**.

Select the **Configure for Laptop or Desktop Backup** option to install **Backup Monitor** utility. This utility allows you to view the backup job summary from the client computer without opening the CommCell Console. See Monitor - Laptop User for more information.

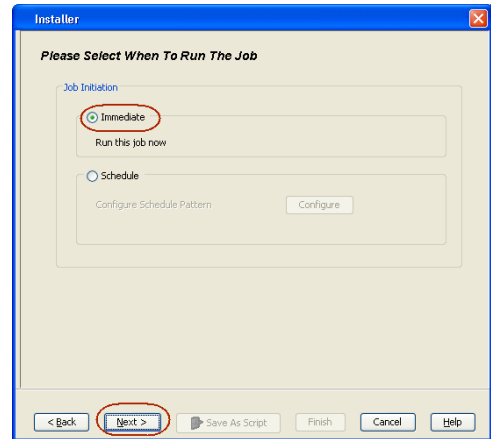
10. Click **Next**.



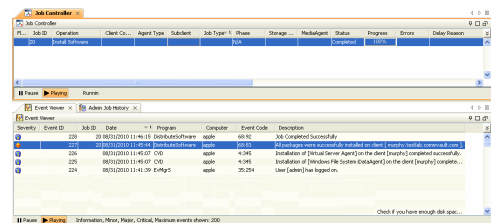
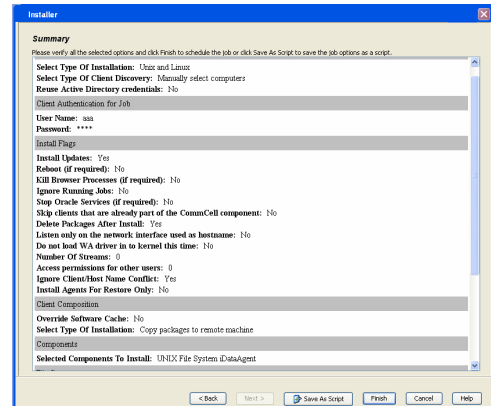
11. Select **Immediate**.
Click **Next**.



12. Click **Finish**.



13. You can track the progress of the job from the **Job Controller** or **Event Viewer** window.



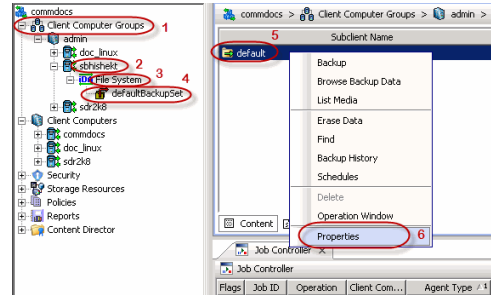
Getting Started Configuration - Macintosh File System iDataAgent



CONFIGURATION

Once installed, follow the steps given below to assign a storage policy with the default subclient.

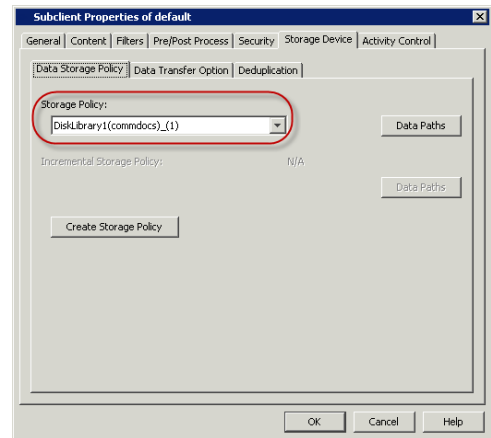
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | defaultBackupSet**.
 - Right-click the default subclient and then click **Properties**.



- Click the **Storage Device** tab.
 - In the **Storage Policy** box, select a Storage Policy name.
 - Click **OK**.

Click **Next** to continue.

If you do not have Storage Policy created, follow the step given below to create a storage policy.



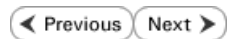
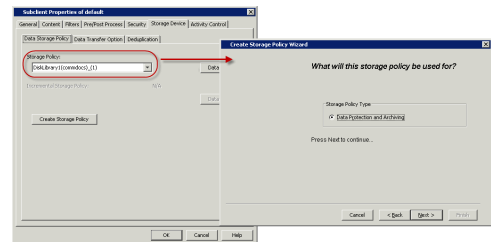
- Click **Create Storage Policy**.
- Follow the prompts displayed in the Storage Policy Wizard. The required options are mentioned below:
 - Select the Storage Policy type as **Data Protection and Archiving** and click **Next**.
 - Enter the name in the **Storage Policy Name** box and click **Next**.
 - From the **Library** list, click the name of a disk library to which the primary copy should be associated and then click **Next**.

Ensure that you select a library attached to a MediaAgent operating in the current release.

- From the **MediaAgent** list, click the name of a MediaAgent that will be used to create the primary copy and then click **Next**.
- For the device streams and the retention criteria information, click **Next** to accept default values.
- Select **Yes** to enable deduplication for the primary copy.
- From the **MediaAgent** list, click the name of the MediaAgent that will be used to store the Deduplication store.

Type the name of the folder in which the deduplication database must be located in the Deduplication Store Location or click the Browse button to select the folder and then click **Next**.

- Review the details and click **Finish** to create the Storage Policy.



Getting Started Backup - Macintosh File System iDataAgent

◀ Previous Next ▶

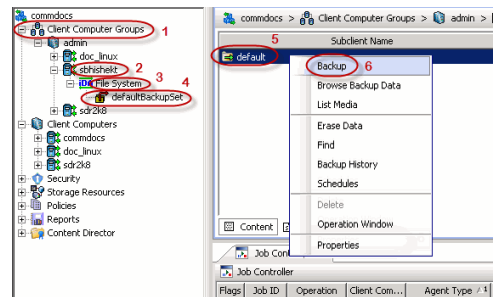
WHAT GETS BACKED UP	WHAT DOES NOT GET BACKED UP
<p>FILE SYSTEMS</p> <p>Apple Filing Protocol (AFP) Hierarchical File System (HFS) HFS+, Universal Disk Format (UDF) MS-DOS Universal File System (UFS)</p>	<p>By default, the following file systems are automatically skipped during backups:</p> <ul style="list-style-type: none"> • nfs • nfs3 • nfs4 • smbfs • afp • msdos • webdav • ftp • synthfs • ISO 9660 • udf • cd • lofs • tmpfs • proc • ctfs • autofs
<p>FILE SYSTEM ELEMENTS</p> <p>Raw device files Symbolic links that are browsed or manually added to the data contents Files with names containing non-ASCII characters as long as the appropriate locales are set</p>	<p>Files for which the file path or file name contains more than 1024 characters.</p>

PERFORM A BACKUP

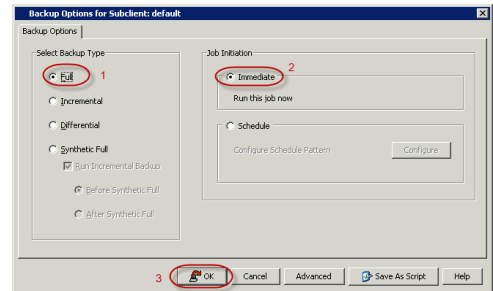
Once the storage policy is configured, you are ready to perform your first backup.

The following section provides step-by-step instructions for performing your first backup:

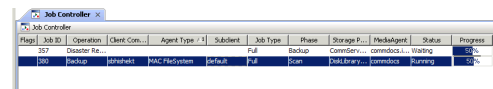
1.
 - From the CommCell Browser, navigate to **Client Computers** | **<Client>** | **File System** | **defaultBackupSet**.
 - Right-click the default subclient and click **Backup**.



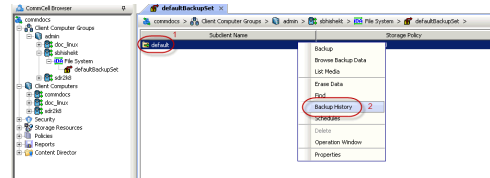
2.
 - Click **Full** as backup type and then click **Immediate**.
 - Click **OK**.



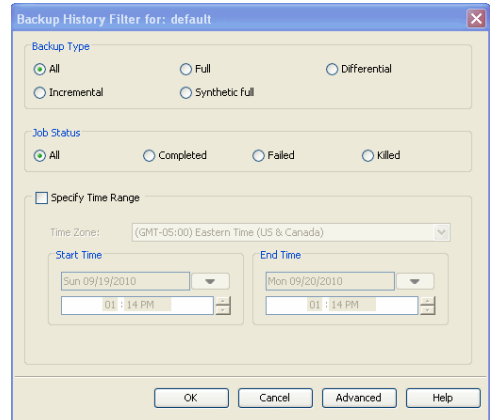
3. You can track the progress of the job from the **Job Controller** window of the CommCell console.



- Once the job is complete, view the job details from the **Backup History**. Right-click the **Subclient** and select **Backup History**.

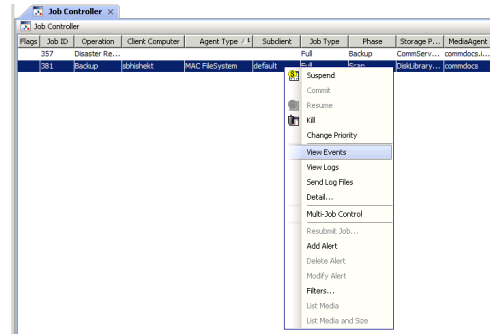


- Click **OK**.



- You can view the following details about the job by right-clicking the job:

- Items that failed during the job
- Items that succeeded during the job
- Details of the job
- Events of the job
- Log files of the job
- Media associated with the job

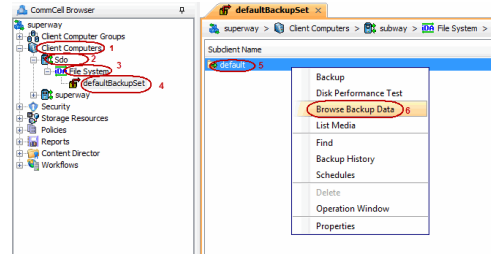


Getting Started Restore - Macintosh File System iDataAgent

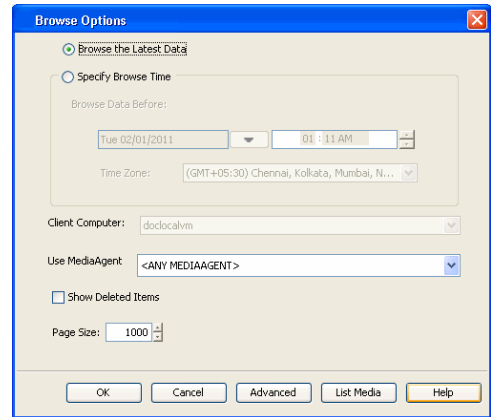
[Previous](#) [Next](#)

As restoring your backup data is very crucial, it is recommended that you perform a restore operation immediately after your first full backup to understand the process. The following section explains how to restore the **etc** folder to a new location.

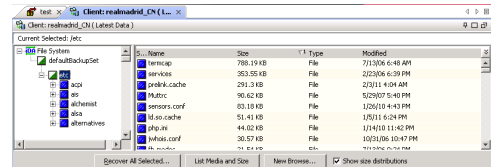
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | defaultBackupSet**
 - Right-click the default subclient and then click **Browse Backup Data**.



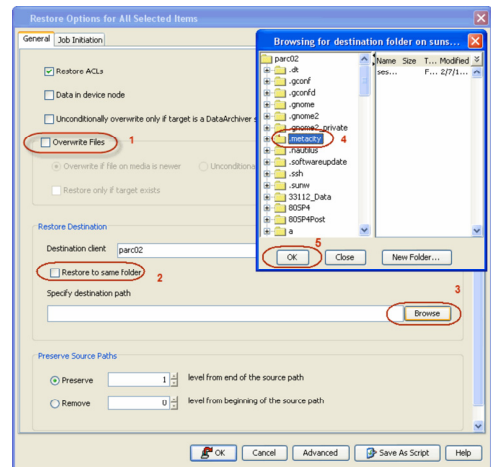
- Click **OK**.



- Expand the **defaultBackupSet** and navigate to **etc** folder.
 - Select the **etc** folder.
 - Click **Recover All Selected**.



- Clear the **Overwrite Files** and **Restore to same folder** options.
 - Specify the destination path by clicking **Browse** button. This will ensure that the existing files are not overwritten.
 - Click **OK**.



- Click the **Job Initiation** tab.
 - Select **Immediate** to run the job immediately.
 - Click **OK**.

6. You can monitor the progress of the restore job in the **Job Controller** window of the CommCell Console.

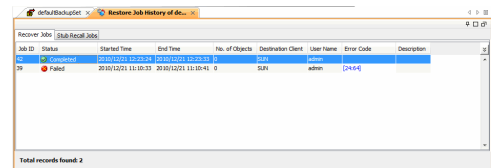
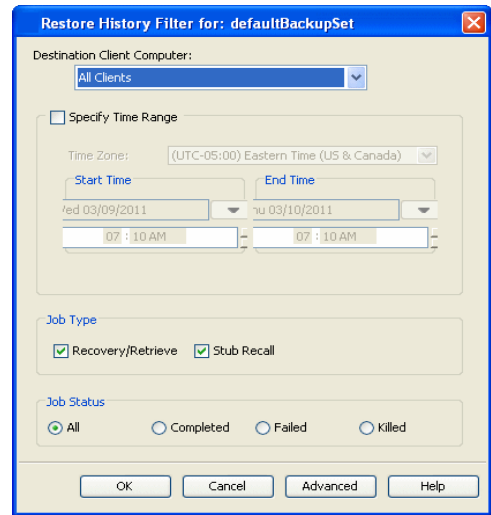
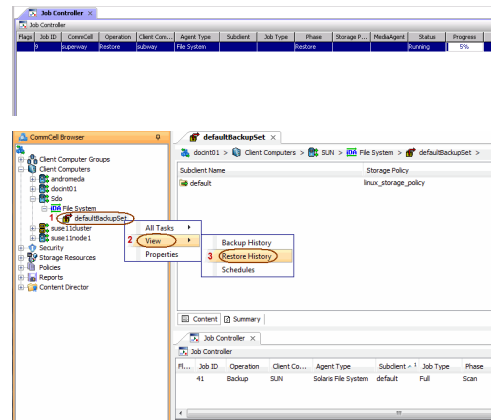
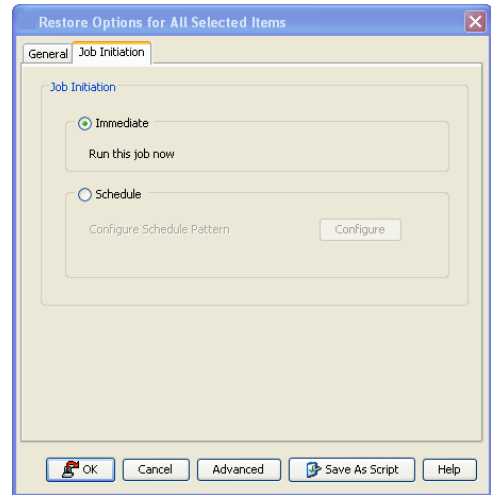
7. Once the restore job has completed, right-click the **defaultBackupSet**, point to **View** and then click **Restore History**.

8. Click **OK**.

9. You can view the following details about the job by right-clicking the job:

- View Restore Items
You can view them as **Successful**, **Failed**, **Skipped** or **All**.
- View Job Details
- View Events of the restore job.
- View Log files of the restore job

10. Once the File System is restored, verify that the restored files/folders are available in the restore destination provided during step 4.



```
[parc02] # ls /.metacity
etc
```

CONGRATULATIONS - YOU HAVE SUCCESSFULLY COMPLETED YOUR FIRST BACKUP AND RESTORE.

If you want to further explore this Agent's features read the **Advanced** sections of this documentation.



Advanced Configuration - Macintosh File System iDataAgent

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Creating a Subclient to Backup Raw Devices

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UNDERSTANDING THE COMMCELL CONSOLE

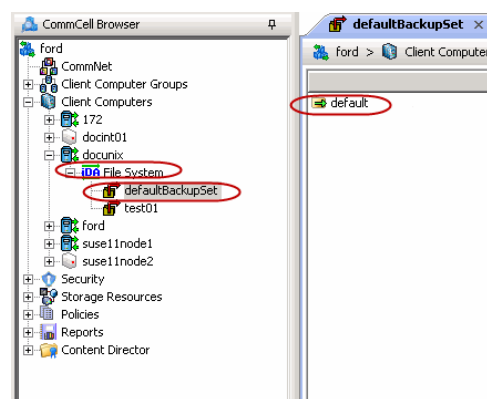
The File System iDataAgent uses the following entities to manage backup and restore operations from the CommCell Console.

Subclient

A logical entity that uniquely defines a unit of data on a client computer.

Backup Set

A group of subclients which includes all the data backed up by the iDataAgent.



CONFIGURING USER DEFINED BACKUP SETS

You can create user defined backup sets to group a set of selected data that you need to backup. A user-defined backup set will contain its own default subclient.

CREATING A BACKUP SET FOR ON DEMAND BACKUPS

On Demand backups allow content to be specified as an external input at the time of initiating a backup. Whereas traditional backups are performed using subclients, which contain fixed content configured prior to performing the operation, On Demand backups allow you to specify content each time you perform a backup.

Content for On Demand backups is defined through two entities:

- a **Content File**, which is a text file that defines the location of the data that you want to protect. Each Content File contains the fully qualified paths from the root directory to files, links, and devices to be backed up.
- a **Directive File**, which is a text file that defines where each Content File is located. The Directive File contains the fully qualified paths from the root directory to one or more Content Files. Only one Directive File is needed for a single On Demand backup.

Once these entities are defined, an On Demand Backup Set is then created. Backups run from this Backup Set will provide the facility to select the Content and Directive Files to be included.

FORMATTING CONTENT AND DIRECTIVE FILES

Content File entries should be in the following format with no filters, wildcards, or regular expressions included:

```
\\client1\shares\ondemand_content\test1.txt
/usr/datafile
/usr/textfile
/etc/docfile
```

Similarly, Directive File entries should be in the following format with no filters, wildcards, regular expressions, or blank lines:

```
/usr/ContentFile1
```

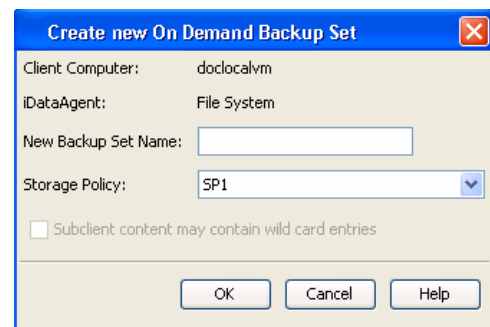
CONFIGURING ON DEMAND BACKUP SETS

Create one or more Content Files defining the content to be backed up.

1. From the CommCell Browser, navigate to **Client Computers | <Client>**.
2. Right-click the **File System**, point to **All Tasks** and then click **New On Demand Backup Set**.
3. In the **New Backup Set Name** box, type a name (up to 32 characters).
4. Click **OK**.

Create a Directive File defining the locations of each Content File.

Once an On Demand Backup Set has been created, it cannot be changed into a traditional backup set.



ADDING FILES AND FOLDERS WITH UNICODE CHARACTERS TO CONTENT FILES

If the path or the filename contains Unicode characters, the Content File must be converted to a format that can be used by the data protection operation. The Unicode Conversion utility must be used to convert the Content File to a format that can be provided as input.

1. Using a text editor, create a file that contains a list of files/folders with Unicode characters. Make sure to save the file as a Unicode text file.
2. From the Command Line, navigate to the `<software install folder>/base` folder and type the following:

```
cvconvertunicode <source file> <destination file>
```

Where:

`<source file>` is the full path and name of the file created in Step 1.

`<destination file>` is the full path and name of the destination file. The file will automatically be created by the utility.

3. Use the destination file as the content file to perform an On-Demand backup.

PREVENTING DUPLICATE BACKUPS OF FILES

On-Demand Backups explicitly backs up the files listed in the Content File. If the Content file has two entries for the file, the file can be backed up twice.

For example, consider a Content File that lists the following entries:

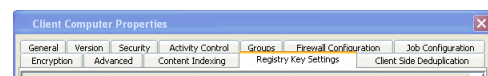
```
/usr/
/usr/textfile
```

In this scenario, a backup operation will back up the contents of all data residing in the textfile folder twice as the Content File already has the entry for the parent folder to be backed up.

It is recommended that Content Files do not include such duplicate entries. If you are not able to avoid duplicate entries, use the following steps to prevent the duplication of data.

CONFIGURING CONTENT FILE TO EXCLUDE DUPLICATE ENTRIES

1. From the CommCell Browser, navigate to **Client Computers**.



2. Right-click the **<Client>** in which you want to add the registry key, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `OnDemand_AutoExpandDir`.
6. In the **Location** list, type `FileSystemAgent`.
7. In the **Type** list, select `value`.
8. In the **Value** field, type `0`.
9. Click **OK**.

CONFIGURING USER DEFINED SUBCLIENTS

You can create user-defined subclients to protect specific portions of the client data. For example, you may need to frequently backup a specific directory or a set of directories. You can create a subclient for such directories and schedule frequent backups for that subclient.

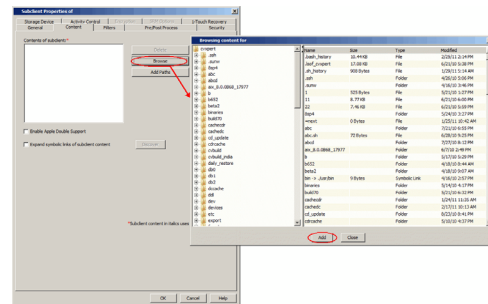
By default, the content of the Default Subclient contains the entire file system.

When you create a user-defined Subclient, the contents of the user-defined Subclient will be excluded from the Default Subclient.

CREATING A SUBCLIENT TO BACKUP SPECIFIC FILES

You can create a user-defined subclient to manage and backup specific data files.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
2. Right-click the **Backup Set**, point to **All Tasks** and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, click a storage policy name.
6. Click the **Content** tab.
7. Click **Browse**.
8. Select the directory or file to be backed up and click **Add**.
Repeat this step to include all the files and directories to be backed up.
9. Click **Close**.
10. Click **OK**.



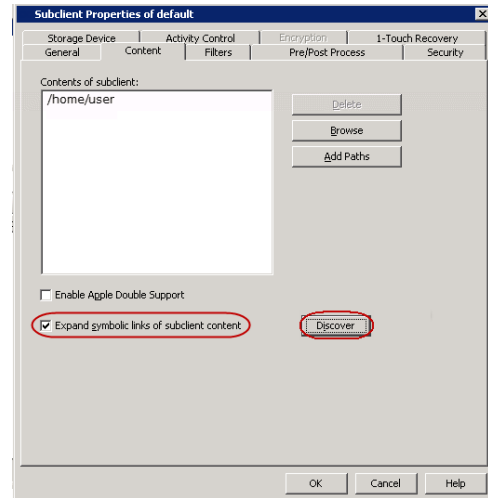
CREATING A SUBCLIENT TO BACKUP SYMBOLIC LINKS

A symbolic link is a file that points to another file. By default, the symbolic link file will be included in the subclient content. However, use the following procedure to expand and backup the path in the symbolic link.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **Backup Set**, point to **All Tasks** and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, click a storage policy name.
6. Click the **Content** tab.
7. Select the **Expand symbolic links of subclient content** check box and then click **Discover**.

The data paths to which the symbolic links in the data contents are pointing will be displayed in contents of subclient.

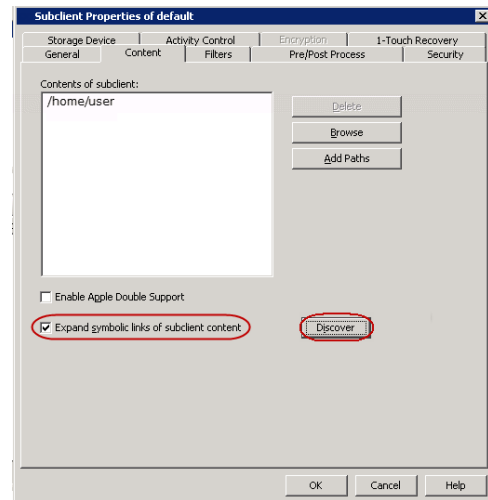
8. Click **OK**.



ENABLING BACKUP OF SYMBOLIC LINK CONTENTS ON A SUBCLIENT

Use the following steps to follow the symbolic links under a subclient and include the content pointed by these links for backup:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
2. Right-click the **<Subclient>** and then click **Properties**.
3. Click the **Content** tab.
4. Click **Browse**.
5. Select the directory or file to be backed up and click **Add**.
Repeat this step to include all the files and directories to be backed up.
6. Click **Close**.
7. Select the **Expand symbolic links of subclient content** check box and then click **Discover**.
The data paths to which the symbolic links in the data contents are pointing will be displayed in contents of subclient.
8. Click **OK**.

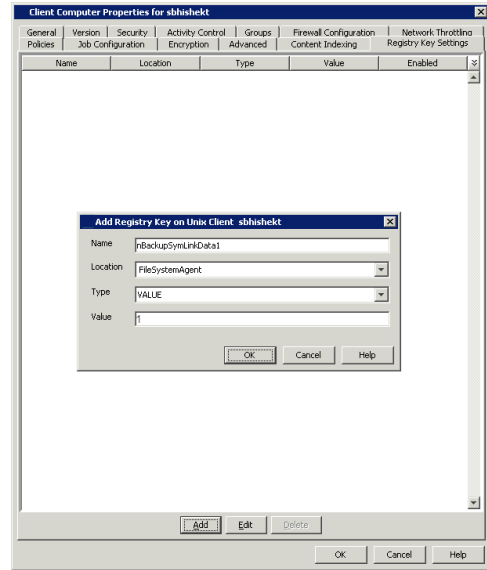


ENABLING BACKUP OF SYMBOLIC LINK CONTENTS ON ALL SUBCLIENTS

Use the following procedure to follow the symbolic links under all the subclients and include the content pointed by these links for backup:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>** and click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `nBackupSymLinkData1`.
6. In the **Location** field, type `FileSystemAgent`.
7. In the **Type** list, select **VALUE**.
8. In the **Value** field, type **'y'** or **'Y'** to enable expanding symbolic links for all the subclients and backup the contents.
9. Click **OK**.

Duplicate links and certain kinds of circular links (e.g., `/a/b/c/d -> /a/b`) are excluded from the subclient content automatically.

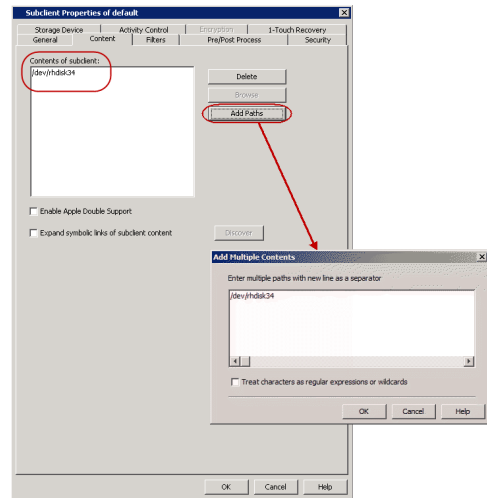


CREATING A SUBCLIENT TO BACKUP RAW DEVICES

You can create subclients to backup block and character raw devices. You can include raw device files referenced by one or more symbolic links in the subclient content. The following should be noted:

- Use character device files instead of block device files for achieving better backup and restore performance.
- Raw devices are backed up using Full Backups.
- Raw device backups are not restartable. Hence, it is recommended to run these backups under high priority.
- Number of bytes backed up is always displayed as 0 on the CommCell Console even for a successful backup. However, the correct number of backed-up bytes is displayed in the Job History.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **Backup Set**, point to **All Tasks** and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, click a storage policy name.
6. Click the **Content** tab.
7. Click **Add Paths**.
8. Type the raw device path (e.g., /dev/rhdisk34).
9. Click **OK**.
10. Click **OK** to close the **Subclient Properties** dialog box.

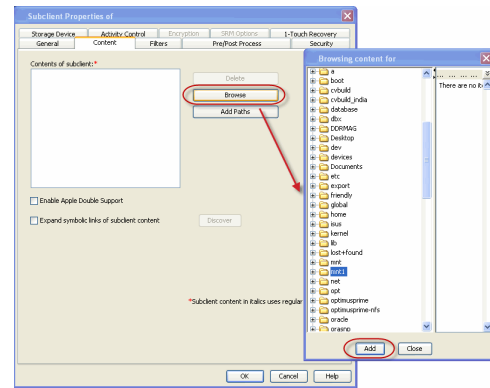


CONFIGURING BACKUPS FOR NFS-MOUNTED FILE SYSTEMS

By default, NFS mounted file systems are not included in the default subclient. You can include NFS mounted file systems to an existing subclient using the following steps:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | BackupSet**.
2. Right-click the **<Subclient>** in the right pane, and then click **Properties**.
3. Click the **Content** tab.
4. Click **Browse**.
5. Select the NFS mount point to be included in the backup.
6. Click **Add**.

7. Click **Close**.
8. Click **OK**.



CONFIGURING THE LOCALE FOR NON-ASCII CHARACTERS

To backup and restore files containing non-ASCII (international) characters appropriate locale has to be configured in the server. Once configured, these settings enable you to:

- Back up files with names containing non-ASCII characters.
- Restore file names containing non-ASCII characters without distortion.
- Properly display files with non-ASCII characters when browsing subclient content or backup data

The following steps use the example of KOI-8R character encoding scheme to store the files with Russian names.

1. Logon to the client as **root** and stop the Services.
2. Run the **locale** command (with no options) to determine which locale is currently set on the server. A sample output is shown in the example.
3. Use the **LC_CTYPE** environment variable to set the desired locale.
4. Export the locale.
5. Run the **locale** command. A sample output is shown in the example.

Calypso stop

```
Example:
LANG=en_US.iso885915
LC_CTYPE="en_US.iso885915"
LC_NUMERIC="en_US.iso885915"
LC_TIME="en_US.iso885915"
LC_COLLATE="en_US.iso885915"
LC_MONETARY="en_US.iso885915"
LC_MESSAGES="en_US.iso885915"
LC_ALL=
```

This output shows that the `en_US.iso885915` locale for the `LANG` environment variable is currently set.

Example:

```
LC_CTYPE=ru.koi8-r
export LC_CTYPE
```

Example:

```
LANG=en_US.iso885915
LC_CTYPE="ru.koi8-r"
LC_NUMERIC="ru.koi8-r"
LC_TIME="ru.koi8-r"
LC_COLLATE="ru.koi8-r"
LC_MONETARY="ru.koi8-r"
LC_MESSAGES="ru.koi8-r"
LC_ALL=
```

Calypso start

6. Start the Services

A properly configured system will have the correct locale set in one of the operating system startup scripts (e.g., `/etc/profile`). In case you do not want to change the locale for the entire system, you may make the changes to the Calypso startup scripts by editing the `/opt/calypso/galaxy_vm` file

Example:

```
LC_CTYPE=ru.koi8-r
export LC_CTYPE
```

To update the CRC consistency checking, include the following command as **root** from the `Base` directory:

```
/updatecrc32 galaxy/Base/Galaxy
```

Restart the server to allow the `iDataAgent` to start with the correct locale settings.

CONFIGURING BACKUPS FOR AUTOMATICALLY SKIPPED FILE SYSTEMS

By default, the following file systems are automatically skipped during backups:

- `nfs`

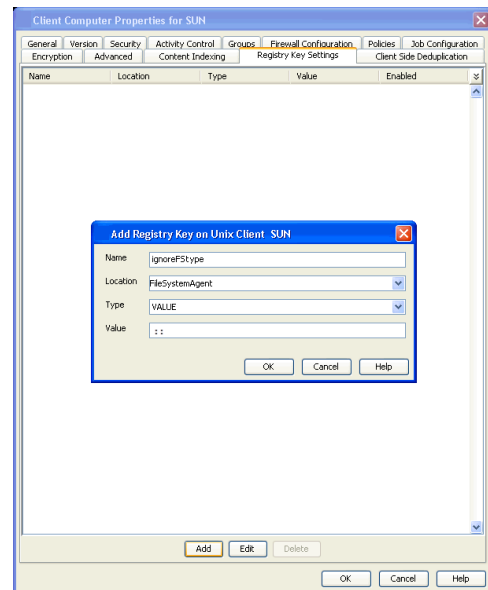
- nfs3
- nfs4
- smbfs
- afp
- msdos
- webdav
- ftp
- synthfs
- ISO 9660
- udf
- cd
- lofs
- tmpfs
- proc
- ctfs
- autofs

However, you can include them in the backups using one of the following methods:

ENABLING BACKUPS FOR SKIPPED FILE SYSTEMS

By default, the default subclient includes all the data in the client. However, the above mentioned file systems are not included in the backups. Use the following procedure to include the skipped file systems in the default subclient.

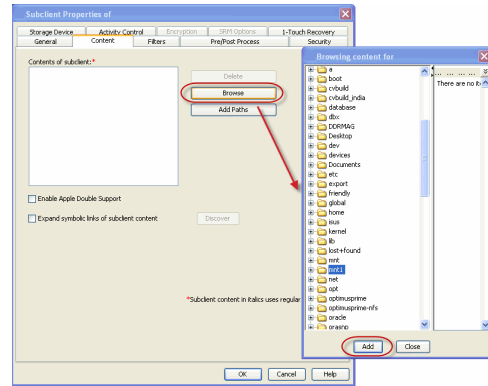
1. From the CommCell Browser, navigate to **Client Computers**.
2. Right-click the **<Client>**, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** box, type `ignoreFStype`.
6. In the **Location** list, type `FileSystemAgent`.
7. In the **Type** list, select `value`.
8. In the **Value** box, type `::`.
9. Click **OK**.



ADDING THE SKIPPED FILE SYSTEM TO SUBCLIENT CONTENT

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **Backup Set**, point to **All Tasks**, and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, select a Storage Policy name.
6. Click the **Content** tab.
7. Click **Browse**.
8. Select the skipped file system data to be backed up and click **Add**.
9. Click **Close**.

- Click **OK**.



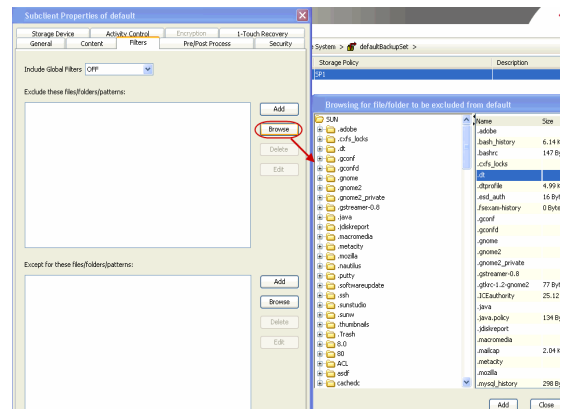
CONFIGURING FILTERS FOR BACKUPS

You can set filters to prevent specific data from being backed up. Typically, you can use filters to exclude certain system-related files and database application files which consistently fail during a backup operation.

FILTERING FILES FROM A BACKUP

Subclient-level backup filters are available for the File System iDataAgent to exclude specified directories and files from being backed up. Follow the steps given below to configure filters on a subclient:

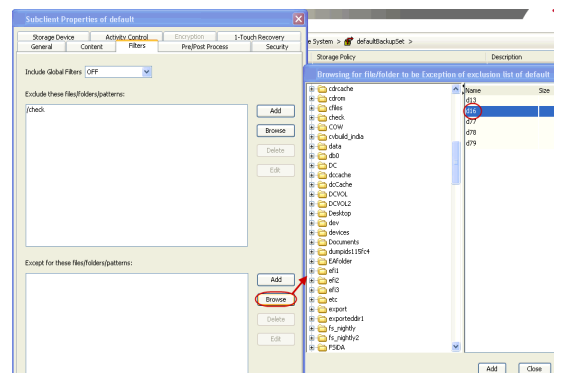
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
- Right-click the **Subclient** in the right pane and then click **Properties**.
- Click the **Filters** tab.
- Under **Exclude these files/folders/patterns**, click **Browse**.
- Click the file, folder, or directory that you want to exclude from backup operations and click **Add**.
- Optionally, click **Add** under **Exclude these files/folders/patterns** and type the path to files and folders that you want to exclude. You can also enter patterns of files or folders using wild cards.
You cannot enter Escape sequence to specify the path or file name.
- Click **Close**.
- Click **OK**.



CONFIGURING EXCLUSIONS TO FILTERS

Once you set the filters, you can also provide exceptions for the filters. The files or folders added to the exception list will be included in the backup operations. For example, if you want to exclude from your back up operation all the files in the /Ops directory except the Maintenance file. You can add a subclient filter to exclude the /Ops directory from being backed up and also provide an exception to allow the Maintenance file to be backed up.

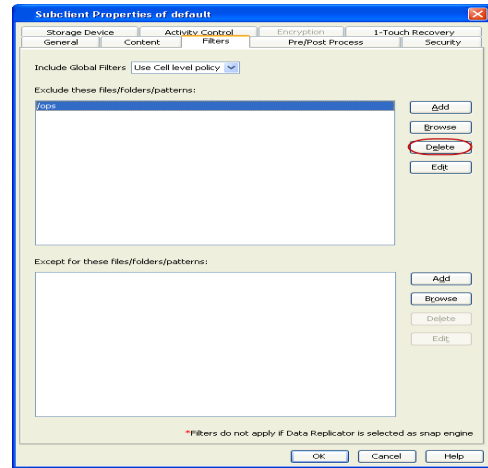
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup set**.
- Right-click the **<Subclient>** in the right pane and click **Properties**.
- Click the **Filters** tab.
- Under **Except for these files/folders/patterns**, click **Browse**.
- Click the file, folder, or directory that you want to include in the backups and then click **Add**.
- Click **Close**.
- Click **OK**.



DELETING A FILTER

You can remove a filter by deleting it from the exclusion list.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup set**.
2. Right-click the **<Subclient>** in the right pane, and then click **Properties**.
3. Click the **Filters** tab.
4. Under **Exclude these files/folders/patterns**, select the filter that you want to delete.
5. Click **Delete**.
6. Click **OK**.



CONFIGURING THE KERNEL PARAMETERS

The File System iDataAgent uses the operating system's kernel resources, such as shared memory, semaphores, etc., to perform backup and restore operations. In order to run the backup and restore operations efficiently, you need to ensure that these kernel parameter settings are sufficient for the specific environment.

By default, the kernel parameters are automatically set during the installation of the Macintosh File System iDataAgent . However, you can also modify the parameters at a later point in time if needed.

The following table displays the recommended values for each kernel parameter. Note that the requirements specified for the resources needed by the CommCell components do not take into consideration any additional resources needed by any other application. Therefore, systems that interact with an application (e.g., Oracle) may require additional resources. These items should be (or should have been) administered by the appropriate application administrator.

If "*" appears after the parameter name, this indicates that you can increment the value of the parameter based on the number of desired streams by using the formula

parameter value = 64 * number of desired streams

as long as the "high-end" value of the range for the parameter is not exceeded.

PARAMETERS	DESCRIPTION	POSSIBLE RANGE OF VALUES
SEMMNI*	Defines the maximum number of semaphore sets in the entire system.	1 - 65535
SEMMNS*	Defines the maximum semaphores in the system.	1 - 2147483647 [MAXINT]
SEMMSL*	Defines the minimum recommended semaphore value.	1 - 2147483647 [MAXINT]
SHMALL	Defines the maximum total shared memory system-wide.	shmmax/hw_pagesize
SHMMIN	Defines the minimum allowable size of a single shared memory segment	1
SHMMNI*	Defines the maximum number of shared memory segments in the entire system.	1 - 2147483647 [MAXINT]
SHMMAX	Defines the maximum allowable size of one shared memory segment.	0 - 2147483648 [2 GB] (the high-end value is the recom
SHMSEG*	Defines the maximum number of shared memory segments that one process can attach.	0 - 32767

Use the following steps to modify the kernel parameters on Macintosh clients:

1. Log in to the client as `root`.
2. Ensure that no jobs are running on the client.
3. Navigate to the `/etc` directory.
4. Edit the required parameter in the `sysctl.conf` file. For example, set the value for `semnmi` parameter to 55680

Example:

```
kern.sysv.shmmni=12288
```

If the `sysctl.conf` file does not exist, edit the `/etc/rc` script instead (in this case, the kernel parameter configurations are located under either the `Start BootCache` section or `System Tuning` section of the `/etc/rc` script).

Use the following formula to calculate the value for the parameters marked with * in the above table:

parameter value = 64 * number of desired streams

as long as the high-end value of the range for the parameter is not exceeded.

5. Save the `sysctl.conf` file or the rc script.
6. Restart the computer to allow the changes to take effect.

CONFIGURING MULTI-STREAMING FOR BACKUPS

File System Multi-Streaming employs multiple data streams per subclient for data protection operations. This enables the subclient's contents to be distributed to all the streams, transmitting them in parallel to the storage media. Hence a subclient whose data is secured using three data streams, utilizes more of the available network resources, and can complete in as little as one third the time that the same data would require using a single stream. You can allocate a maximum of 63 streams for a subclient.

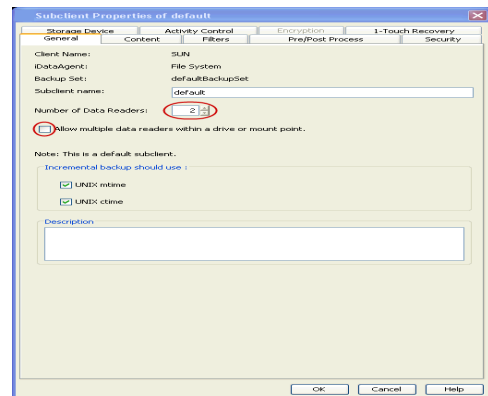
Note that, you do not have to enable multi-streaming if you have multiple mount points pointing to the same physical drive. Do not use multiple streams if you have added UNC paths to the subclient content.

Before enabling multi streaming, ensure that you can use multi-streaming when you restore the data and create an auxiliary copy.

Follow the steps given below to configure multi-streaming.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
2. Right-click the **<Subclient>** in the right pane and click **Properties**.
3. In the **Number of Data Readers** box type or select the number of data streams.
4. Select the **Allow multiple data readers within a drive or mount point** checkbox.
5. Click the **Storage Device** tab.
6. In the **Storage Policy** list, click a storage policy name.
7. Click **OK**.

The number of streams configured in the Storage Policy should be equal to, or greater than the specified **Number of Data Readers**.



CONFIGURING THE INDEX FOR BACKUPS

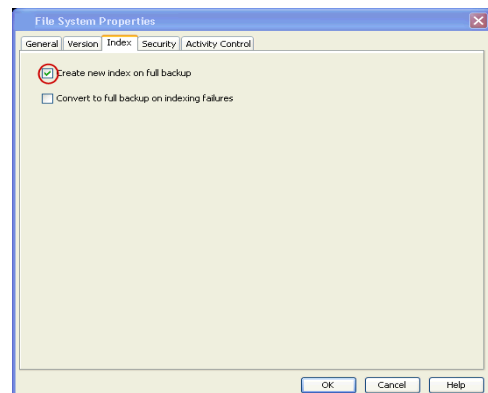
CREATING A NEW INDEX ON A FULL BACKUP

This option accelerates Full or On Demand backups and is enabled by default. Subsequently, when you perform a browse and restore operation, the default browse displays data up to the most recent full backup. To browse and restore older data you have to use the options to browse before or between specific dates.

When disabled, Full or On Demand backups may be slower. However, the default browse displays all data in the entire retention period; not just one full backup cycle.

Use the following steps to configure this option for all subclients. This option can also be set for the individual backups when initiating the job.

3. Click the **Index** tab.
4. Select the **Create new index on Full Backup** check box.
5. Click **OK**.

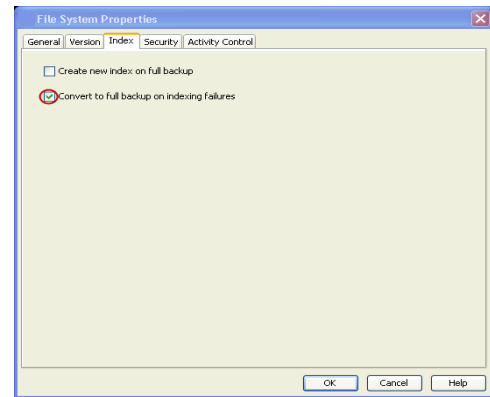


CONVERTING TO A FULL BACKUP ON INDEXING FAILURE

Use this option to ensure that the backup does not fail if the index is irretrievable. When disabled, the backup will fail if the index is irretrievable.

3. Click the **Index** tab.
4. Select the **Convert to full backup on indexing failures** check box.

5. Click **OK**.



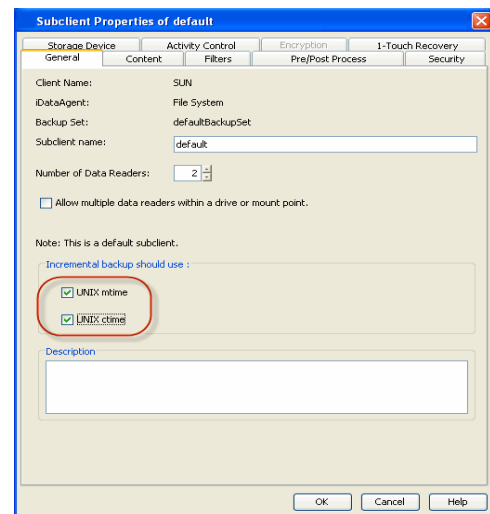
CONFIGURING INCREMENTAL/DIFFERENTIAL BACKUPS USING CTIME AND MTIME

Incremental and differential backups can be configured depending on the changed time. The changed time can include ctime (changes in the file properties) or mtime (changes to the data in the file). You can use ctime to include the files with their properties changed since last backup/last full backup. Similarly, you can use mtime to include the files with their data changed since last backup/last full backup.

The ctime and mtime will be applicable only for the volumes which are scanned by the Classic File Scan. When the Data Classification is used for scanning the volumes, ctime and mtime will not be taken into account.

Follow the steps given below to configure an incremental backup using ctime and mtime options.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
2. Right-click the **<Subclient>** in the right pane, and then click **Properties**.
3. Under **Incremental backups should use**, select the change time (ctime or mtime).
4. Click **OK**.



CONFIGURING PRE/POST PROCESSING FOR BACKUPS

SETTING UP PRE/POST PROCESSES

You can add and modify Pre/Post processes for a subclient. These are batch files or shell scripts that you can run before or after certain job phases. For example, you can use an `echo` command to check the level of a backup. Similarly, you can include a `case` statement within a script to run specific operations based on the level of the backup job.

A **Save As Script** file can also be run as a pre/post process, if you include the absolute path of the associated input file in the script file.

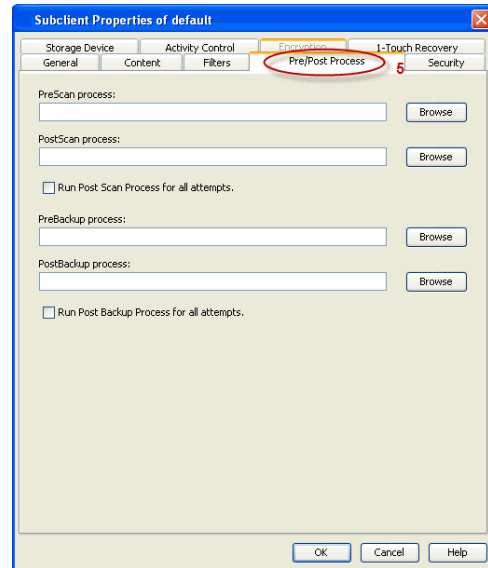
The first line of the script must execute a command that is designed to call in the pre/post program. Ensure that you have included the appropriate command in the first line of the script.

The following is an example of a typical pre/post script:

```
#!/bin/bash base='basename $0' echo $0, 'date' > /extra/aah/RESULTS/$base.out exit 0
```

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | BackupSet**.
2. Right-click the **<Subclient>** in the right pane, and then click **Properties**.
3. Click the **Pre/Post Process** tab.

- Depending on the process you want to set up, click the corresponding **Browse** button.
- Select the process and then click **OK**.

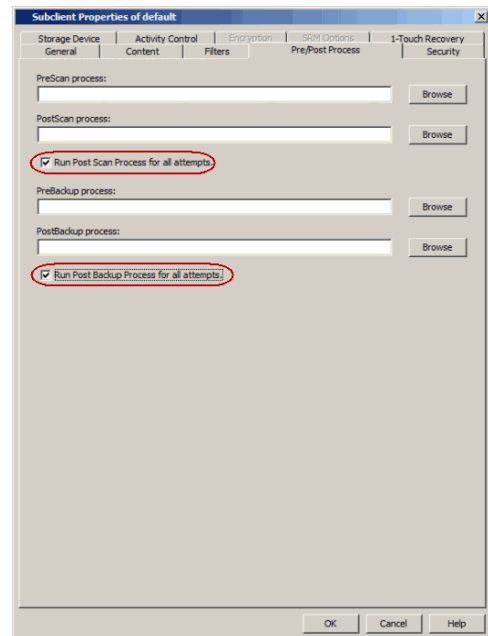


SETTING UP POST PROCESSES TO RUN DURING FAILURES

By default, a specified post process command is executed only on successful completion of the scan or backup operation or if the job is killed.

Use the following steps to run a post process even if the scan or backup operation did not complete successfully. For example, this may be useful to bring a database online or release a snapshot.

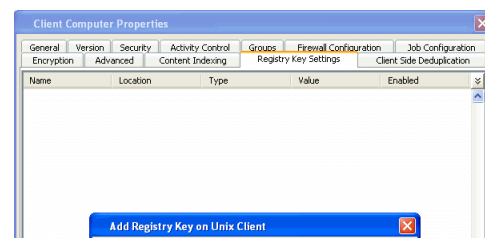
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | BackupSet**.
- Right-click the **<Subclient>** in the right pane, and then click **Properties**.
- Click the **Pre/Post Process** tab.
- Select the **Run Post Scan Process for all attempts** check box.
- Select the **Run Post Backup Process for all attempts** check box.
- Click **OK**.



CONFIGURING SPARSE FILES FOR RESTORES

The sparse files are restored by default as flat files, wherein the holes are restored as data. This will increase the disk usage. Use the following steps to restore the holes as genuine holes which will considerably reduce the disk usage.

- From the CommCell Browser, navigate to **Client Computers**.
- Right-click the **<Client>** in which you wish to perform the restore, and then click **Properties**.
- Click the **Registry Key Settings** tab.
- Click **Add**.
- In the **Name** field, type `OptimizeRunLengths`.



6. In the **Location** list, select or type `iDataAgent`.
7. In the **Type** list, select `value`.
8. In the **Value** field, type the value which should be greater than or equal to `-1`.
9. Click **OK**.

MODIFYING AN AGENT, BACKUP SET OR SUBCLIENT

The following table describes the properties that can be configured from the agent, backup set and subclient levels.

OPTION	DESCRIPTION	RELATED TOPICS
Preserving the File Access Time	<p>This option allows you to prevent the file access time from being changed as a result of running data protection operations on the client. When this option is selected, the file access time will be preserved.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, right-click the backup set, and then click Properties. 2. Select the Preserve File Access Time check box. 3. Click OK. 	
Change Storage Policies	<p>You can modify the storage policies in any of the following situations.</p> <ul style="list-style-type: none"> • To include a different media for the backup operation. • To use a storage policy with a different retention criteria. <p>You can change the storage policies from the subclient level.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System <Backup Set> 2. Right-click the <user-defined Subclient> in the right pane, and then click Properties. 3. Click the Storage Device tab. 4. Select the Storage policy from the drop-down list. 5. Click OK. 	Refer to Storage Policies.
Rename a Backup Set or Subclient	<p>You can rename backup sets and subclients.</p> <p>Renaming BackupSet:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System. 2. Right-click the <Backup Set>, and then click Properties. 3. In the Backup Set box, type a name. 4. Click OK. <p>Renaming subclient:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System <Backup Set>. 2. Right-click the <user-defined Subclient>, and then click Properties. 3. In the Storage Policy list, click a storage policy name. 4. Click OK. 	
Data Transfer Options	<p>You can efficiently configure the available resources for transferring data secured by data protection operations from the subclient level. This includes the following:</p> <ul style="list-style-type: none"> • Enable or disable Data Compression either on the client or the MediaAgent. • Configure the transfer of data in the network using the options for Network Bandwidth Throttling and Network Agents. <p>You can configure the data transfer options.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System BackupSet. 2. Right-click the <Subclient> in the right pane, and then click Properties. 3. Click the Storage Device tab. 4. Click the Data Transfer Option tab. 	Refer to Data Compression and Network Bandwidth Throttling.

	<ol style="list-style-type: none"> Choose the appropriate software compression option for this subclient. Select the Throttle Network Bandwidth check box, and set the required bandwidth. Click OK. 	
View Data Paths	<p>You can view the data paths associated with the primary storage policy copy of the selected storage policy or incremental storage policy. You can also modify the data paths including their priority from the subclient level.</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers <Client> File System BackupSet. Right-click the <Subclient> in the right pane, and then click Properties. Click the Storage Device tab. In the Storage Policy list, click a storage policy name. Click Data Paths. 	
Configure Activity Control	<p>You can enable backup and restore operations from the agent and subclient level. However, you can enable restore operations only from the agent level.</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers <Client> Right-click the <Client> or <Subclient> in the right pane, and then click Properties. Click the Activity Control tab and select or clear option(s) as desired. Click OK. 	Refer to Activity Control.
Configure User Security	<p>You can configure user security from the agent or subclient level.</p> <p>You can perform the following functions:</p> <ul style="list-style-type: none"> Identify the user groups to which this CommCell object is associated. Associate this object with a user group. Disassociate this object from a user group. <ol style="list-style-type: none"> From the CommCell Browser, right-click the subclient. Click Properties. Click the Security tab. Select the appropriate user groups to which you want to associate to the CommCell object from the Available Groups pane, and then move the user group to the Associated Groups pane. Click OK. 	Refer to User Administration and Security.
Enable/Disable Data Encryption	<p>You can enable data encryption from the subclient level. Encryption must be enabled at the client level prior to configuring any instances residing on that client.</p> <ol style="list-style-type: none"> From the CommCell browser, navigate to Client Computers <Client> File System <Backup Set> Right-click the <Subclient> in the right pane, and then click Properties. Click the Encryption tab and select the desired encryption. Click OK. 	Refer to Data Encryption.
View Software Version and Installed Updates	<p>The Version tab, at the Agent level displays the software version and post-release service packs and updates installed for the component.</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers Right-click the <Client> for which you want to view the version and the click Properties. Click the Version tab. Click OK. 	
CommCell Configuration Report	<p>The CommCell Configuration Report provides the properties of the CommServe, MediaAgents, clients, agents, SRM agents, subclients, and storage policies within the CommCell based on the selected filter criteria.</p> <ol style="list-style-type: none"> From the CommCell Browser, double-click Reports icon. Select CommCell Configuration. Click Run. 	Refer to CommCell Configuration.

DELETING AN AGENT, BACKUP SET OR SUBCLIENT

When you delete an instance or backupset, the associated data is logically deleted and you can no longer access the corresponding data from CommCell Console for recovery purposes.

Refer to the troubleshooting article on Recovering Data Associated with Deleted Clients and Storage Policies for information on how to recover data if you accidentally delete an entity.

DELETING AN AGENT

You need to uninstall or DeConfigure the agent software from the client computer before deleting from CommCell Browser. After you delete the client software, you can either leave the corresponding data intact for appropriate action or you can remove the data immediately. If you choose to remove the data immediately, you must delete the agent from the CommCell Browser. If you delete the agent, all of the agent's data is irretrievably lost.

- You cannot delete an agent while operations for that agent are running.

1. From the CommCell Browser, navigate to **Client Computers | <Client>**.
2. Right-click the **<Agent>**, and then click **Delete**.
3. A confirmation message is displayed with the following message:

`This operation will permanently delete the data backed up from this level and it cannot be restored.`

4. Click **OK** to continue with the deletion operation., or click **No** to abort the deletion.

DELETING A BACKUP SET

Consider the following before deleting a Backup Set:

- You cannot delete a default Backup Set.
- Schedules associated with the Backup Set are also automatically deleted.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | <Agent>**.
2. Right-click the **<Backup Set>**, and then click **Delete**.
3. A confirmation message is displayed, asking if you want to delete the Backup Set.

Click **No** to cancel the deletion and retain the Backupset, or click **Yes** to continue the deletion.

DELETING A SUBCLIENT

Consider the following before deleting a subclient:

- You cannot delete a default subclient.
- Schedules associated with the subclient are also automatically deleted.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | <Agent> | <Backup Set>**.
2. Right-click the **<subclient>** that you want to delete, and then click **Delete**.
3. A confirmation message is displayed, asking if you want to delete the subclient.

Click **No** to cancel the deletion and retain the subclient, or click **Yes** to continue the deletion.

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Advanced Backup - Macintosh File System iDataAgent

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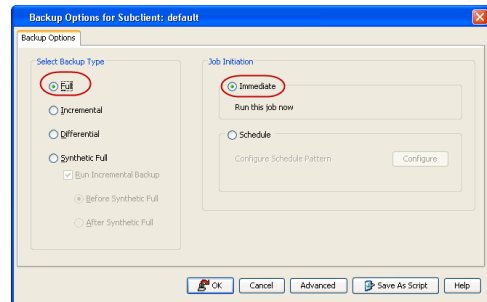
Additional Options

FULL BACKUPS

Full backups provide the most comprehensive protection of data.

1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the **<Subclient>** and click **Backup**.
3. Select **Full** as backup type and **Immediate** to run the job immediately.
4. Click **OK**.

You can track the progress of the job from the **Job Controller** or **Event Viewer** window. When the backup has completed, the Job Controller displays **Completed**.

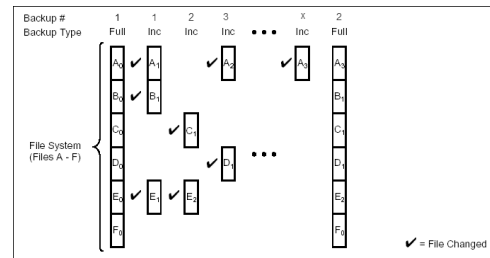


INCREMENTAL BACKUPS

An incremental backup contains only data that is new or has changed since the last backup, regardless of the type. On average, incremental backups consume less media and use less resources than full backups.

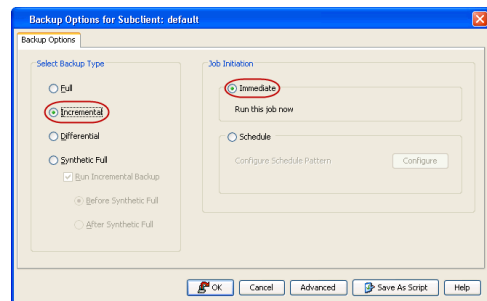
The illustration on the right clarifies the nature of full and incremental backups.

Follow steps given below to perform an incremental backup:



1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the **<Subclient>** and click **Backup**.
3. Select **Incremental** as backup type and **Immediate** to run the job immediately.
4. Click **OK**.

You can track the progress of the job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.



RELATED TOPICS

Scheduling

Provides comprehensive information on scheduling jobs.

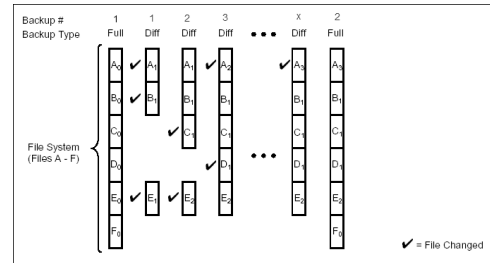
Job Management

Provides comprehensive information on managing jobs.

DIFFERENTIAL BACKUPS

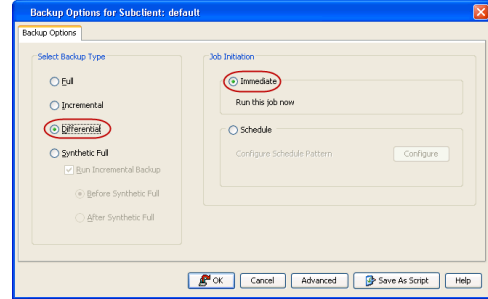
A differential backup contains only the data that is new or has changed since the last full backup. Like incremental backups, differential backups also consume less media and use less resources than full backups. Differential backups are cumulative. This means that each differential backup contains all changes accumulated since the last full backup. Each successive differential backup contains all the changes from the previous differential backup.

The illustration on the right demonstrates the nature of differential backups. For simplicity, assume there is a file system that contains six files as represented in the figure.



1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the **<Subclient>** and click **Backup**.
3. Select **Differential** as a backup type and **Immediate** to run the job immediately.
4. Click **OK**.

You can track the progress of the backup job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.



SYNTHETIC FULL BACKUPS

A synthetic full backup is a synthesized backup, created from the most recent full backup and subsequent incremental and/or differential backups. The resulting synthetic full backup is identical to a full backup for the subclient.

Unlike full, incremental, and differential backups, a synthetic full backup does not actually transfer data from a client computer to the backup media. Therefore, they do not use any resources on the client computer.

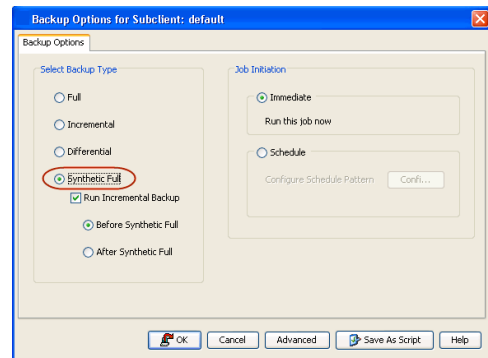
Synthetic full backups are media-based; they read backup data from one media and simultaneously write (restore) the result to the new active media within the same media group. As a result, synthetic full backups require that at least two media drives for the same storage policy be available at the time the job is started. Synthetic full backups cannot be performed on subclients where the storage policy is associated with a stand-alone drive.

RUNNING SYNTHETIC FULL BACKUPS

Synthetic full backups can either be started manually or scheduled to occur at regular intervals. Do not concurrently run more than one synthetic full backup, especially synthetic full backups with multiple streams.

1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the **<Subclient>** and click **Backup**.
3. From the **Backup Options** window, select **Synthetic Full** for **Backup Type**.
4. Select **Immediate** for **Job Initiation**.
5. Click **OK**.

You can track the progress of the backup job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.



RUNNING AN INCREMENTAL BACKUP BEFORE OR AFTER A SYNTHETIC FULL BACKUP

An incremental backup can be run either before or after a synthetic full backup.

- Running an incremental backup before the synthetic full ensures that any new or recently changed data is included in the synthetic full.
- Running an incremental backup after the synthetic full ensures that any new or recently changed data since the backup that occurred prior to the synthetic full, but was not included in the synthetic full, is backed up by the incremental.

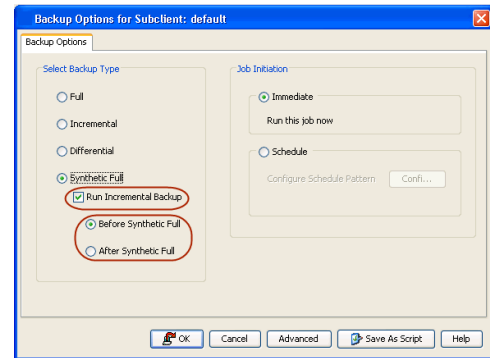
The sections below describe the steps to run an incremental backup before or after a synthetic full backup:

1. From the CommCell Browser, navigate to **<Client> | File System |**

defaultBackupSet.

2. Right click the **<Subclient>** and click **Backup**.
3. From the **Backup Options** window, select **Synthetic Full** for **Backup Type**.
4. Select **Run Incremental Backup** and then select **Before Synthetic Full** or **After Synthetic Full** options.
5. Select **Immediate** for **Job Initiation**.
6. Click **OK**.

You can track the progress of the backup job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.



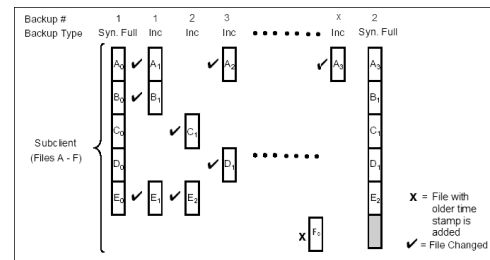
VERIFYING SYNTHETIC FULL BACKUPS

This option ensures that files that have not backed up by incremental jobs since the last full backup are backed up by the next incremental.

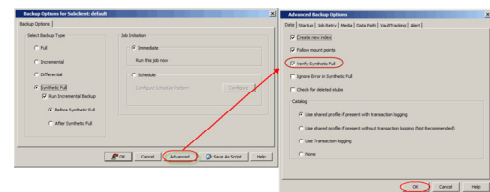
For example: If you perform the conventional full backup only once for a given subclient and then perform incremental (or differential) backups and periodic synthetic full backups. After the conventional full backup, a file is added to the subclient and the file has a time stamp older than the time of full backup. In such scenario, the file will never get backed up. Eventually, such files may be pruned and no backup of such files will be available.

The illustration on the right explains the necessity of verifying synthetic full backups.

In order to overcome this problem, it is recommended to verify the synthetic full backups job periodically as follows:



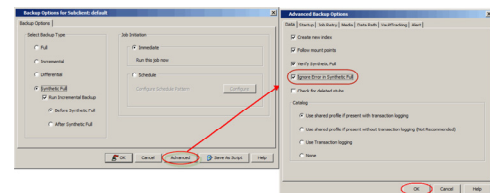
1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the **<Subclient>** and click **Backup**.
3. From the **Backup Options** dialog box, select **Synthetic Full**.
4. Click **Advanced**.
5. In the **Advanced Backup Options** dialog box, click the **Data** tab.
6. Select **Verify Synthetic Full**. Click **OK** to continue.
7. Click **OK**.



IGNORING ERRORS IN SYNTHETIC FULL BACKUPS

Errors encountered in synthetic full backups can be ignored, even if backup media is partially corrupted. Errors such as inability to read data (bad tape, files missing on disk media, etc.) will be ignored when this option is enabled.

1. From the CommCell Browser, navigate to **<Client> | File System | defaultBackupSet**.
2. Right click the subclient and click **Backup**.
3. From the **Backup Options** dialog box, select **Synthetic Full**.
4. Click **Advanced**.
5. In the **Advanced Backup Options** dialog box, click the **Data** tab.
6. Select **Verify Synthetic Full** and then select **Ignore Error in Synthetic Full**.
7. Click **OK** to close the **Advanced Backup Options** dialog box.
8. Click **OK**.



ACCELERATED SYNTHETIC FULL BACKUPS (DASH FULL)

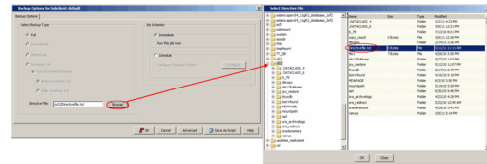
When a storage policy copy is deduplicated, synthetic full backups can be created in an accelerated mode to significantly reduce the copy duration. This is done by identifying and transferring the data signatures (instead of the data itself) to the target wherever possible.

Learn more...

ON DEMAND BACKUPS

1. From the CommCell Browser, navigate to **<Client> | File System | <On Demand Backup Set>**.

2. Right click the <Subclient> and click **Backup**.
3. Click **Browse**.
4. Navigate to the Directive file or Content file that you want to use.
5. Click **OK**.
6. Select **Immediate** to run the job immediately.
7. Click **OK**.

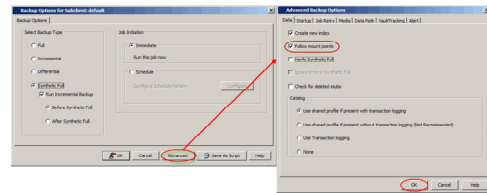


You can track the progress of the backup job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.

BACK UP MOUNT POINTS

Backups follow mount points by default, backing up both the configuration and the data on the mounted volume. You can use another subclient to backup the data on the mounted volume. In such case, you can exclude the data on the mounted volume from the default backup.

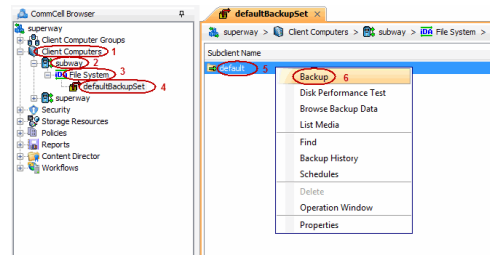
1. From the CommCell Browser, navigate to <Client> | **File System** | **defaultBackupSet**.
2. Right click the default <Subclient> and click **Backup**.
3. Select **Full** as backup type and **Immediate** to run the job immediately.
4. Click **Advanced** and select the **Advanced Backup Options** dialog box.
5. In the **Advanced Backup Options** dialog box, click the **Data** tab.
6. Select (or clear) **Follow Mount Points** to include (or exclude) mount point data from the subclient.
7. Click **OK**.



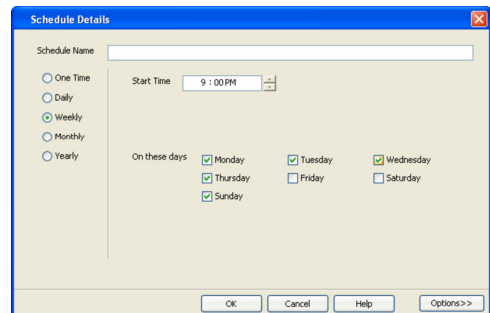
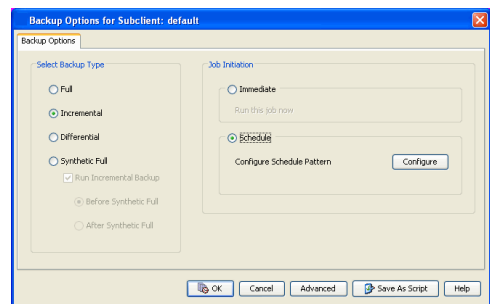
Depending upon your selection, the mount point data will be included or excluded from the default subclient backup.

SCHEDULING A BACKUP

1.
 - From the CommCell Browser, navigate to <Client> | **File System** | **defaultBackupSet**.
 - Right-click the **Subclient** and click **Backup**.
2.
 - Select the **Backup type**.
 - Click **Schedule**.
 - Click the **Configure** button.

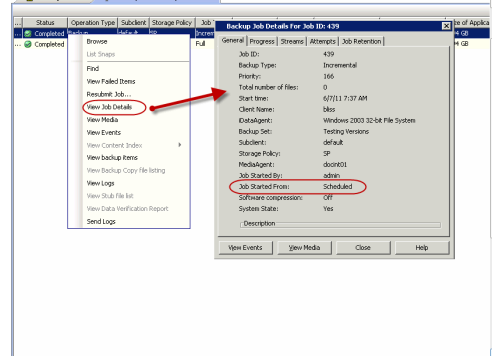


3. Select the appropriate scheduling options.
For example, use the following steps to create a weekly schedule:
 - Type a name for the schedule in the **Schedule Name** box.
 - Click **Weekly**.
 - In the **Start Time** box type or select the schedule start time.
 - Click and select the days to run the schedule.
 - Click **OK**.



4. When the schedule is run, the **Job Controller** window will display the job as shown in the sample image.
5. Once the job is complete, you can view the job details from the **Backup History**.
 - Right-click the **Subclient** and select **View Job Details**.

Job ID	Operation	Client Conn.	Agent Type	Subclient	Job Type	Phase	Storage P.	MediaAgent	Status	Progress	Error
409	Auxiliary C...								Waiting	0%	No Resources
393	Backup	hadoop1	SQL Server	Files and Fil...	Tranacdo...	Auxiliary C...	Laptop SP	doce001	Pending	0%	Network
314	Archive	adwin	Windows S...	adwin	Scan	Laptop SP	doce001	doce001	Pending	0%	Network
413	Backup	hadoop1	SQL Server	Files and Fil...	Full	Database B...	SP	doce001	Queued	0%	
400	Backup	hadoop1	SQL Server	Files and Fil...	Full	Database B...	SP	doce001	Pending	0%	Network



MANAGING JOBS

Jobs can be managed in a number of ways. The following sections provide information on the different job management options available:

RESTARTING JOBS

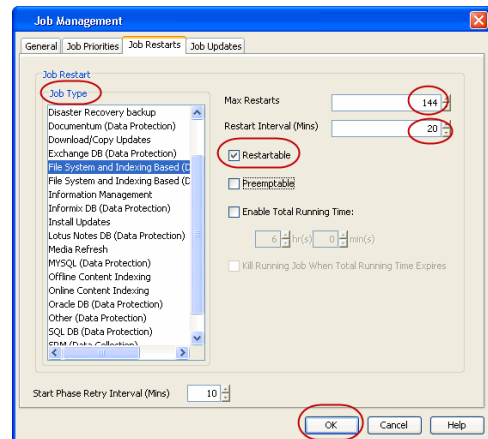
Jobs that fail to complete successfully are automatically restarted based on the job restartability configuration set in the Control Panel. Keep in mind that changes made to this configuration will affect all jobs in the entire CommCell.

To Configure the job restartability for a specific job, you can modify the retry settings for the job. This will override the setting in the Control Panel. It is also possible to override the default CommServe configuration for individual jobs by configuring retry settings when initiating the job. This configuration, however, will apply only to the specific job.

Backup jobs for this Agent are resumed from the point-of-failure.

CONFIGURE JOB RESTARTABILITY AT THE COMMSERVE LEVEL

1. From the CommCell Browser, click **Control Panel** icon.
2. Select **Job Management**.
3. Click **Job Restarts** tab and select a **Job Type**.
 - o Select **Restartable** to make the job restartable.
 - o Change the value for **Max Restarts** to change the maximum number of times the Job Manager will try to restart a job.
 - o Change the value for **Restart Interval (Mins)** to change the time interval between attempts for the Job Manager to restart the job.
4. Click **OK**.

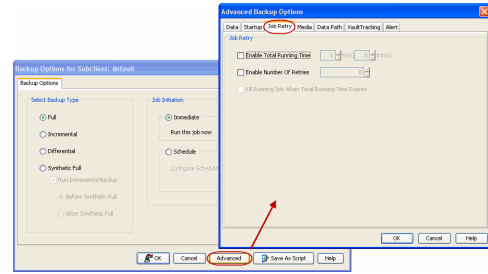


CONFIGURE JOB RESTARTABILITY FOR AN INDIVIDUAL JOB

1. From the CommCell Browser, navigate to **<Client> | File System**.
2. Right-click the **<Subclient>** and select **Backup**.
3. Click **Advanced**.
4. In the **Advanced Backup Options** dialog box, click the **Job Retry** tab.
5. Select **Enable Total Running Time** and specify the maximum elapsed time before a job can be restarted or killed.

Select **Kill Running Jobs When Total Running Time Expires** to kill the job after reaching the maximum elapsed time.

6. Select **Enable Number Of Retries** and specify the number of retries.
7. Click **OK**.



CONTROLLING JOBS

The following controls are available for running jobs in the Job Controller window:

SUSPEND	Temporarily stops a job. A suspended job is not terminated; it can be restarted at a later time.
RESUME	Resumes a job and returns the status to Waiting, Pending, Queued, or Running. The status depends on the availability of resources, the state of the Operation Windows, or the Activity Control setting.
KILL	Terminates a job.

SUSPENDING A JOB

1. From the Job Controller of the CommCell Console, right-click the job and select **Suspend**.
2. The job status may change to **Suspend Pending** for a few moments while the operation completes. The job status then changes to **Suspended**.

RESUMING A JOB

1. From the Job Controller of the CommCell Console, right-click the job and select **Resume**.
2. As the Job Manager attempts to restart the job, the job status changes to **Waiting, Pending, or Running**.

KILLING A JOB

1. From the Job Controller of the CommCell Console, right-click the job and select **Kill**.
2. Click **Yes** when the confirmation prompt appears if you are sure you want to kill the job. The job status may change to **Kill Pending** for a few moments while the operation completes. Once completed, the job status will change to **Killed** and it will be removed from the Job Controller window after five minutes.

ADDITIONAL OPTIONS

The following table describes the available additional options to further refine your backup operations:

OPTION	DESCRIPTION	RELATED TOPICS
Startup Options	<p>The Startup Options are used by the Job Manager to set priority for resource allocation. This is useful to give higher priority to certain jobs. You can set the priority as follows:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and click Startup tab. 4. Select the Change Priority checkbox. 5. Enter a priority number - 0 is the highest priority and 999 is the lowest priority. 6. Select the Start up in suspended State check box to start the job in a suspended state. 7. Click OK. 	Refer to Job Priority and Priority Precedence.
Alerts	<p>This option enables users or user groups to get automatic notification on the status of the data protection job. Follow the steps given below to set up the criteria to raise notifications/alerts:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Alert tab. 4. Click Add Alert. 5. From the Add Alert Wizard dialog box, select the required threshold and notification criteria and click Next. 6. Select the required notification types and click Next. 	Refer to Alerts.

	<ol style="list-style-type: none"> 7. Select the recipients and click Next. 8. Click Finish. 9. Click OK. 	
Command Line Backups	<p>Command Line Interface enables you to perform backups or restore from the command line. The commands can be executed from the command line or can be integrated into scripts.</p> <p>You can also generate command line scripts for specific operations from the CommCell Browser using the Save As Script option.</p>	Refer to Command Line Interface.
Data Path Options	<p>Data Protection operations use a default Library, MediaAgent, Drive Pool, and Drive as the Data Path. You can use this option to change the data path if the default data path is not available. Follow the steps given below to change the default data path:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Data Path tab. 4. Select the MediaAgent and Library. 5. Select the Drive Pool and Drive for optical and tape libraries. 6. Click OK. 	Refer Change Data Path.
Index Cache Server	<p>Index Cache Server provides the facility to automatically continue data protection operations when there are job failures due to loss of connectivity to the index. You can configure the Index Cache Server as follows:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Storage Resources MediaAgent. 2. Right-click the <MediaAgent> and click Properties. 3. Click the Catalog tab and ensure that the Index Cache Server is configured. 4. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 5. Right-click the Subclient in the right pane and click Backup. 6. Click Advanced. 7. Make sure that the Use shared profile if present with transaction logging option is selected. 8. Click OK. 	Refer to Index Cache Server for more information.
Create New Index	<p>This option accelerates Full or On Demand backups and is enabled by default. When you perform a browse and restore operation, the default browse displays data up to the most recent full backup. To browse and restore older data you have to use the options to browse before or between specific dates.</p> <p>When disabled, Full or On Demand backups may be slower. However the default browse displays all data in the entire retention period; not just one full backup cycle. Use the following steps to configure this option for specific Full or On Demand backups. This option can also be configured for all subclients at the iDataAgent level.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Select Full as a backup type and click Advanced. 4. Select the Create new index check box. 5. Click OK. 	Refer to Index.
Start New Media	<p>The Start New Media option enables you to start the data protection operation on a new media. This feature provides control over where the data physically resides. Use the following steps to start the data protection operation on a new media:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Media tab. 4. Select the Start New Media check box. 5. Click OK. 	Refer to Start New Media.
Mark Media Full	<p>This option marks the media as full, two minutes after the successful completion of the data protection job. This option prevents another job from writing to this media. Follow the steps given below:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select Media tab. 	Refer to Export Media.

	<ol style="list-style-type: none"> 4. Select the Mark Media Full on Success check box. 5. Click OK. 	
Allow other Schedules to use Media Set	<p>The Allow Other Schedules to use Media Set option allows jobs that are part of the schedule or schedule policy and using the specific storage policy to start a new media. It also prevents other jobs from writing to the same set of media.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Media tab. 4. Select the Allow Other Schedules To Use Media Set check box. 5. Click OK. 	Refer to Creating an Exportable Media Set.
Reserve Resources Before Scan	<p>Media is reserved for a job when the job is ready to write data. You can use this option to reserve the media during the initial phase of the job. Follow the steps given below to reserve media:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Media tab. 4. Select the Reserve Resources before Scan check box. 5. Click OK. 	
Extended Data Retention	<p>This option allows you to extend the expiration date of a specific job. This will override the default retention set at the corresponding storage policy copy. Follow the steps given below to extend the expiration date:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the Media tab. 4. Select one of the following options: <ul style="list-style-type: none"> o Infinite - Select this option to extend the expiration date by infinite number of days o Number of day - Select this option to specify the number of days to extend the expiration date and then enter the number of days. 5. Click OK. 	Refer to Extended Retention Rules.
Vault Tracker	<p>This feature provides the facility to manage media that is removed from a library and stored in offsite locations. Depending on your VaultTracker setup, select the required options. Use the following steps to access and select the VaultTracker options.</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers <Client> File System Backup Set. 2. Right-click the Subclient in the right pane and click Backup. 3. Click Advanced and select the VaultTracking tab. 4. Select the required options. 5. Click OK. 	Refer to VaultTracker or VaultTracker Enterprise.
CommCell Readiness Report	<p>The CommCell Readiness Report provides you with vital information, such as connectivity and readiness of the Client, MediaAgent and CommServe. It is useful to run this report before performing the data protection or recovery job. Follow the steps given below to generate the report:</p> <ol style="list-style-type: none"> 1. From the Tools menu in the CommCell Console, click Reports. 2. Navigate to Reports CommServe CommCell Readiness. 3. Click the Client tab and click the Modify button. 4. In the Select Computers dialog box, clear the Include All Client Computers and All Client Groups check box. 5. Select the client from the Exclude list. 6. Click the Include > button. 7. Click OK. 8. Click the MediaAgent tab. 9. Clear the Include All MediaAgents checkbox. 10. Select the MediaAgent from the Exclude list. 11. Click Include >. 12. Click Run. 	Refer to CommCell Readiness Report.

	The generated report is displayed.	
Backup Job Summary Report	<p>The Backup Job Summary Report provides you with information about all the backup jobs that are run in last 24 hrs for a specific subclient. You can get information such as status, time, data size etc. for each backup job. It is useful to run this report after performing the backup. Follow the steps given below to generate the report:</p> <ol style="list-style-type: none"> 1. From the Tools menu in the CommCell Console, click Reports. 2. Navigate to Reports Jobs Job Summary. 3. Click Data Management on the General tab in the right pane. 4. Select the Computers tab. 5. Click Subclient and select the Edit tab. 6. Navigate to Client Computers <Client> File System Backup Set Subclient. 7. Click Run. 	Refer to Backup Job Summary Report.

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Browse Data - Macintosh File System

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Browse Using Media Agent

UNDERSTANDING THE BROWSE WINDOW

Browse provides an easy-to-use convenience to search and restore data.

You can open the browse window from client, agent, backup-set or subclient level. The sub levels displayed in the browse window is based on where you start the browse operation.

SELECTING OBJECTS FROM THE BROWSE WINDOW FOR RESTORE

The browse window displays objects and consists of two parts:

- The left pane displays the object tree at the selected level.
- The right pane displays the contents of the selected object.

Note that the window displays only the data that was obtained by a backup. Data that is excluded by a filter, or data which did not exist as of the specified browse time does not appear in the window.

Selections follow these rules:

- All selections are recursive.
- Clicking a box again causes the selection to be cleared.
- If you select an object in the left pane, then all of its contents are selected.
- You can select a specific object in the right pane.

Selection status is revealed by the selection icons as follows:

<input type="checkbox"/>	Indicates that the object is not selected for restoration.
<input checked="" type="checkbox"/>	Indicates that a portion of the object is selected for restoration. i.e., only some of the child object(s) within the selected object.
<input checked="" type="checkbox"/>	Indicates that the entire object, including all of its child objects, are selected for restoration.

BROWSE DATA

The option to browse the backup data provides the facility to view and restore the data that was backed up. The following sections explain how to browse the backup data.

LATEST DATA

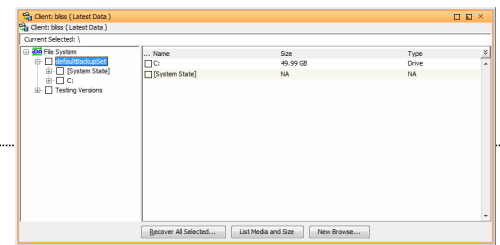
Follow the steps given below to view the latest data backed up by a backup set:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Click **OK**.

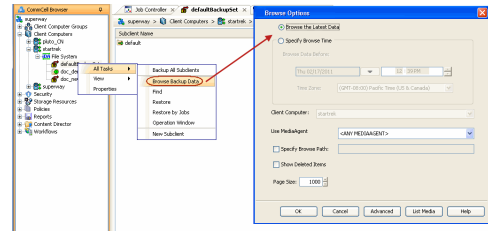
RELATED TOPICS

List Media

Provides comprehensive information on media management and prediction.



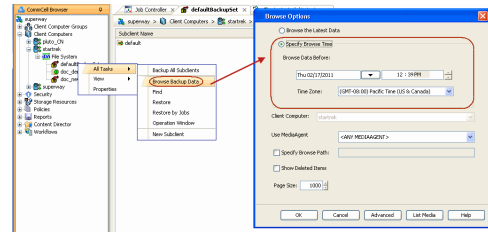
The latest data backed up by all the subclients is displayed in the **Client Browse** tab.



DATA BEFORE A SPECIFIED TIME

Follow the steps given below to browse the data backed up before specified time:

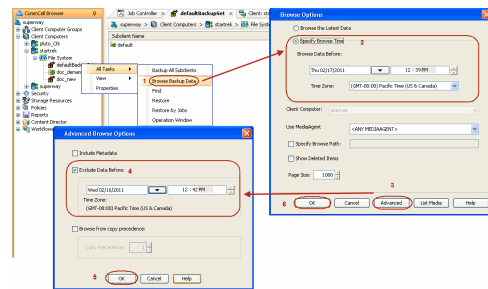
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Select **Specify Browse Time**.
4. Select a date and time to **Browse Data Before** it.
5. Click **OK**.



DATA BETWEEN A SPECIFIED TIME

Follow the steps given below to browse data between specified time:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Select **Specify Browse Time**.
4. Select a date and time to **Browse Data Before** it.
5. Click **Advanced**.
6. In the **Advanced Browse Options** dialog box, select **Exclude Data Before**.
7. Select the date and time to exclude the data before it from the browse operation.
8. Click **OK** in the **Advanced Browse Options** dialog box .
9. Click **OK** in the **Browse Options** dialog box.



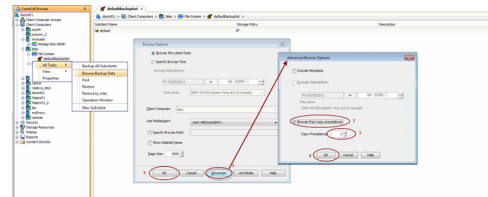
BROWSE FROM COPIES

By default, when a browse operation is requested, the software attempts to browse from the storage policy copy with the lowest copy precedence. If the data that you want to browse was already pruned from the primary copy, the software searches the other copies of the storage policy, starting from the copy with the lowest copy precedence to a copy with the highest copy precedence.

This feature is useful in the following conditions:

- The media containing protected data for a particular copy has been removed from the storage library, you can choose to browse from a copy whose media are inside the library.
- Allows browsing from a copy that accesses faster disk media rather than slower tape media.
- When media drives used by a particular copy are busy with another operation, this helps in browsing from a different copy to avoid resource conflicts.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. From the **Browse Options** dialog box, click **Advanced**.
4. In the **Advanced Browse Options** dialog box select the **Browse from copy precedence** option.



If you specify a copy precedence number for a browse operation, the software searches only the storage policy copy with that precedence number in all storage policies used for securing the data. If data does not exist in the specified copy, the browse operation fails even if the data exists in another copy of the same storage policy.

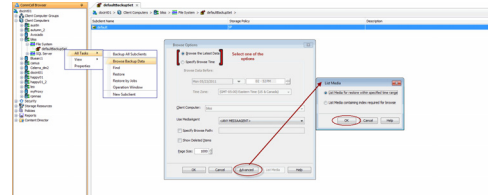
5. Specify the precedence number in **Copy Precedence**.
6. Click **OK** in the **Advanced Browse Options** dialog box .
7. Click **OK** in the **Browse Options** dialog box.

LIST MEDIA

List media option is useful to predict media required to restore the index required to browse data. This is useful when the index is not available in the index cache.

The following section describes how to perform this operation.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the backup set for which you wish to list media, point to **All Tasks** and then click **Browse**.
3. From the **Browse Options** dialog box, if required, select the following options:
 - o Click **Browse the Latest Data** to list media associated with the most recent data protection cycle.
 - o Click **Specify Browse Time** to list media associated with data protection operations up to the specified date and time range. Use the **Browse Data Before** box to specify the end date and time.
 - o Click **Advanced** and then click **Exclude Data Before** and then select the date and time from which you wish to list media associated with data protection operations.



Note that you can use the **Specify Browse Time** and **Exclude Data Before** options to list media between a specified date and time range.

4. Click **List Media**.
5. From the **List Media** dialog box, click **List Media for restore within specified time range**.
6. Click **OK**.

The appropriate media is listed in the **Media** dialog box.

FULL BACKUP TRANSPARENT BROWSE

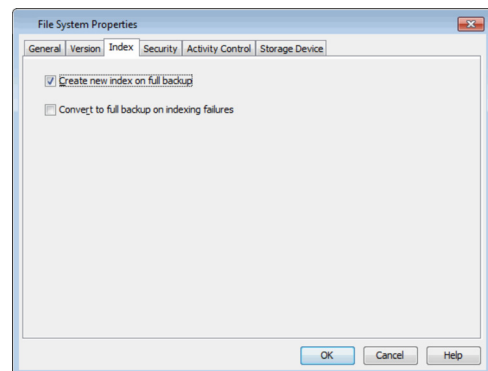
The browse searches described so far are confined to one full backup cycle, either the most recent (by default) or some previous cycle. Usually, this provides the desired results because generally you may want to restore either the latest version or the latest version as of some specified date.

If, however, you want to view all available versions that has not yet been pruned, then the browse cannot access data beyond it in a single operation.

Full backup transparent browses enable you to browse all the data within the entire retention period, not just one full backup cycle. When you use the **View All Versions** option, the browse operation displays all versions available in the backup.

By default, the Full Backup Transparent Browse is not enabled. Use the following steps to enable this option on a client before performing a backup:

1. From the CommCell Browser, navigate to **Client Computers | <Client>**.
2. Right-click the Agent and click **Properties**.
3. Click **Index** and then clear **Create new index on Full Backup**.
4. Click **OK**.

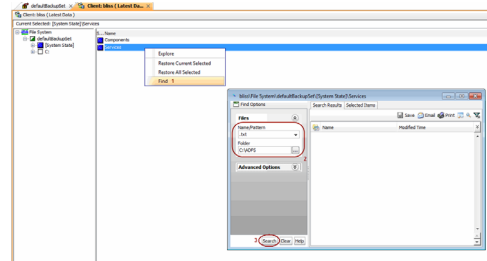


FIND A FILE OR DIRECTORY

Use Find to find a file or directory name or a name pattern. Find has the capability to browse multiple indexes which allows you to find beyond the last full backup (or new index) as long as the data resides on an index that exists within the retention period.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**

2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Click **OK**. The latest data backed up by all the subclients is displayed in the **Client Browse** tab.
4. Right-click the selected content and click **Find**.
5. Enter the file name and the location of the file to be searched in the **Name/Pattern** and **Folder** fields and click **Search**.

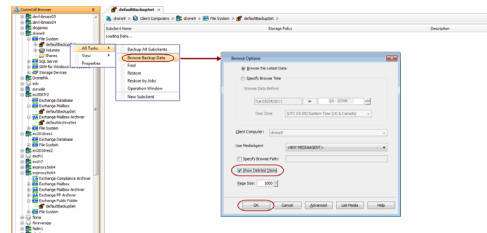


IMAGE/NO-IMAGE BROWSE

Image browse displays the structure of the entity as it existed as of some specified time. When you browse data in the image mode, the system by default returns the requested data based on the latest image available. The image browse can only restore the latest version. If the requested version was deleted before the most recent full backup, the default browse will not find the data.

The no-image browse is useful for retrieving data that may have been deleted at some unknown time. It is also useful to retrieve a previous backup version.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. From the **Browse Options** dialog box, select one of the following options:
 - o Click and select the **Show Deleted Items** option to perform a no-image browse of the data.
 - o Clear the **Show Deleted Items** option to perform an image browse of the data.
4. Click **OK**.

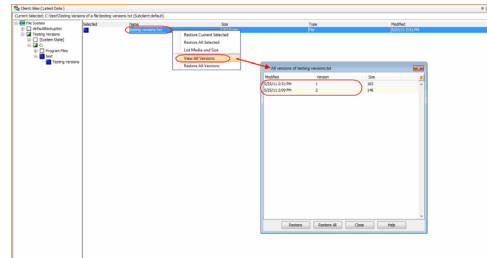


BROWSE MULTIPLE VERSIONS OF A FILE

By default, the system allows you to browse and recover previously backed up versions of data. This feature allows you to restore more than one version of the same file by restoring each version individually.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Click **OK**.
4. From the **Browse Window**, right-click the file with multiple versions and then click **View All Versions**.

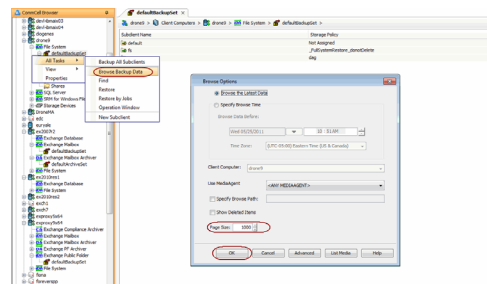
The **All Version** dialog box displays the available versions for the file.



ESTABLISH THE PAGE SIZE FOR A BROWSE

The Page Size option allows you to specify the number of objects to be displayed in the browse window. You can browse through each page list by selecting the appropriate page number in the Browse window. This field reverts back to the default setting after use.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. From the **Browse Options** dialog box, enter a value for **Page Size**.
4. Click **OK**.



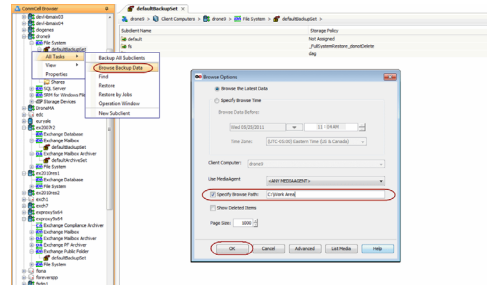
BROWSE USING A SPECIFIED PATH

The Browse Path option allows you to specify the starting point for the browse operation.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File**

System

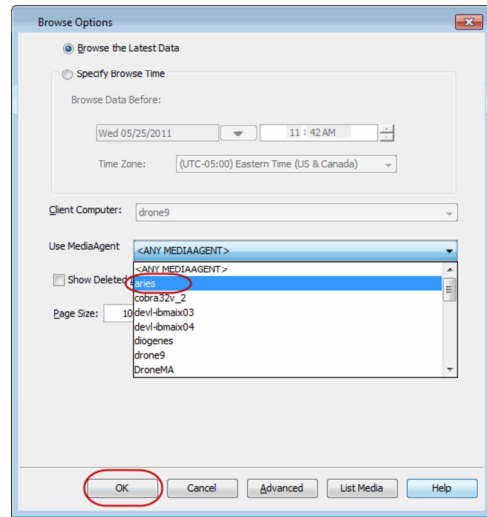
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. From the **Browse Options** dialog box, enter the browse path in **Specify Browse Path**.
4. Click **OK**.



BROWSE USING MEDIA AGENT

Data can be restored from any compatible library and drive type in the CommCell. By default, the system automatically identifies and restores data from any configured library in the CommCell, even if the media is not available in the original library in which the data protection operation was performed. Use this procedure to Browse using a specific MediaAgent.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. From the **Browse Options** dialog box, choose the **MediaAgent** that must be used to perform the browse.
4. Click **OK**.



Advanced Restore - Macintosh File System iDataAgent

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PERFORMING A DIRECT RESTORE

Perform a direct restore in the following scenarios:

- You know the path to the data that you want to restore
- The data that you want to restore is from a single volume

If you want to restore data from multiple volumes, perform a browse and restore.

Follow the steps given below to perform a direct restore:

RELATED TOPICS

Scheduling

Provides comprehensive information on scheduling jobs.

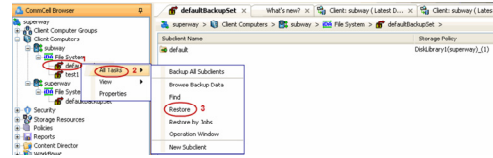
Job Management

Provides comprehensive information on managing jobs.

List Media

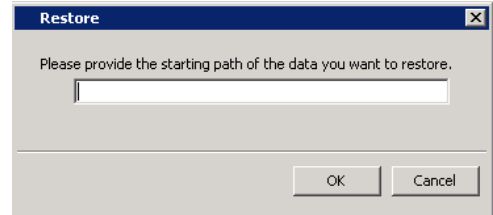
Provides comprehensive information on media management and prediction.

1.
 - From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
 - Right-click the **defaultBackupSet** and then click **All Tasks | Restore**.

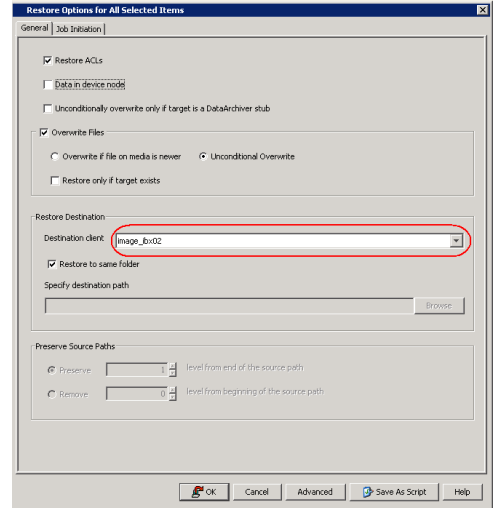


2. Enter the starting path of the data that you want to restore.

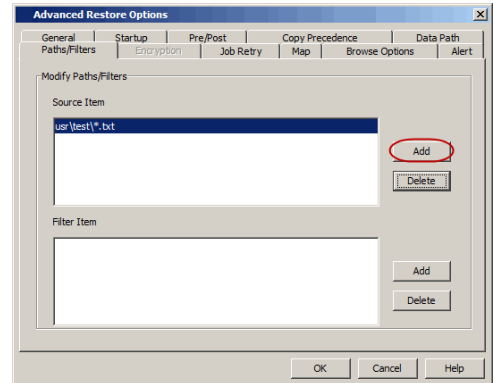
You can use wildcard characters to specify the patterns for files and folders to be included in the restore. For example: If you want to restore all the files starting with the word file, then specify `file*.*`



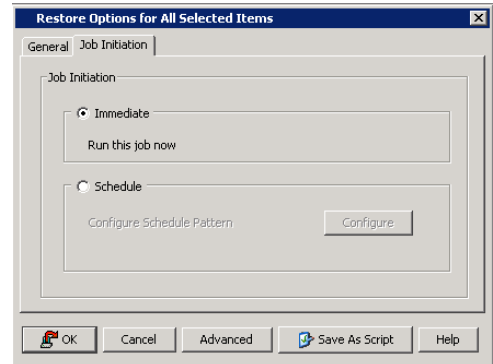
3.
 - In the **Destination Client** list, select the name of the client computer.
 - If you want to add more data for restore, click **Advanced**.



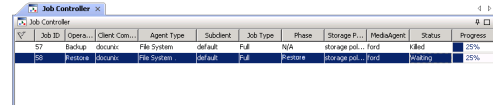
4.
 - Click the **Path/Filters** tab.
 - Click **Add** for **Source Item** list and enter the additional data paths.
If you want to use wildcard characters to specify a file name pattern, you must express complete paths (e.g. `usr\test*.txt`).
 - Click **OK**.



5.
 - Click the **Job Initiation** tab.
 - Select **Immediate** from the **Job Initiation** tab.
 - Click **OK**.



6. You can track the progress of the job from the **Job Controller**.



RESTORING DATA USING REGULAR EXPRESSIONS

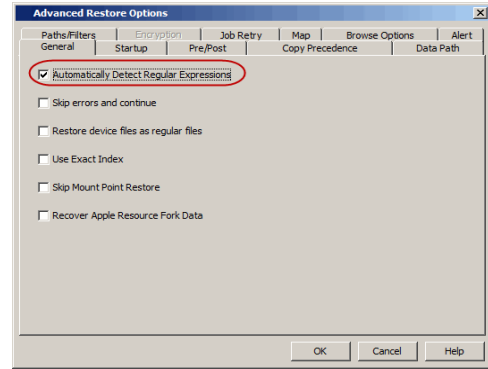
By default you can use wildcard characters to specify the patterns for files and folders to be included in the restore.

Use the following steps to define wildcard characters as regular expressions:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **defaultBackupSet** and then click **All Tasks | Restore**.
3. Enter the source path that contains regular expressions and/or wild cards.
4. In the **Restore Options for All Selected Items** dialog box, click **Advanced**.
5. Clear **Automatically Detect Regular Expressions** and click **OK**.

This option is selected by default for direct restore operations. For Browse and Restore operations, the option cannot be enabled as you are selecting definitive paths to restore.

6. Click **OK**.



SUPPORTED WILDCARDS IN REGULAR EXPRESSIONS

If enabled, the following wildcards can be automatically detected in regular expressions when restoring data.

WILDCARD	DEFINITION	EXAMPLE
*	Any number of characters.	doc* will find any directory or file name that begins with "doc" (e.g., document, documentation)
**	Any number of characters across any number of path levels.	/**/move will find the directory or file named move located at any level under the c: drive (e.g., /info/com/move)
?	Any one character.	access? will find any directory or file name that begins with "access" followed by any one character (e.g., access1, access5)
[]	Any range of characters.	[ei]nsure will find any directory or file name that ends with "nsure" and begins either "e" or "i". (e.g., ensure, insure)
		[a-z]nsure will find any directory or file name that ends with "nsure" and begins with any letter from "a" through "z". (e.g., ansure, bnsure, cnsure, etc.)
![] or ^[]	Any range of characters.	![a] or ^[a] will exclude any directory or file name that begins with "a". (e.g., applications)

You can use a combination of wildcards in a single expression (e.g., access?.h*).

PERFORMING AN OUT-OF-PLACE RESTORE

You can restore the data to following locations:

- Different folder on the same computer from which the data was backed up
- Different computer

Keep in mind that the destination computer must reside in the same CommCell as the client whose data was backed up.

RESTORING TO DIFFERENT FOLDER ON THE SAME CLIENT

Follow the steps given below to restore data to a different folder on the same client from which data is backed up:

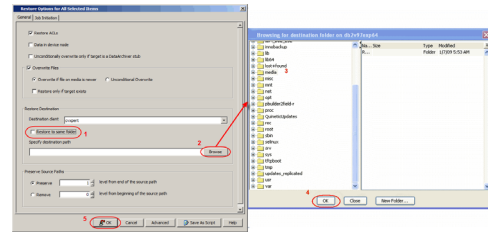
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.

4. Select the data that you want to restore and click **Recover All Selected**.
5. Clear the **Restore to same folder** check box and click **Browse**.
6. Click **OK**.
7. Use the options in the **Preserve Source Paths** area to exclude folders (and its contents) from the source path.

For Example: If the selected data is `/Documents/Memos/Sales`, and you want to restore data only from the `Sales` folder, set the **Preserve <n> level from end of source path** option to 1.

If the selected data is `/Documents/Memos/Sales`, and you want to restore the data from `Memos` and `Sales` folders, set the **Remove <n> level from beginning of source path** option to 2.

8. Click **OK**.

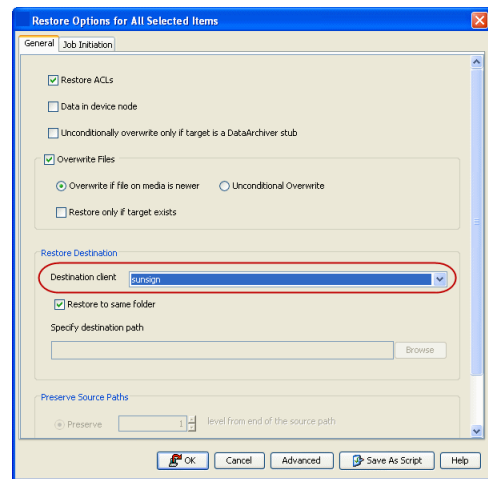


RESTORING DATA TO A DIFFERENT CLIENT

Follow the steps given below to restore data to a different client:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. In the **Destination Client** list, select the client. You can select any client that is in the same CommCell as that of the client from which the data was backed up.
6. Click **OK**.

If you do not clear **Restore to same folder** check box, the data will be restored to the same folder on the destination client. All the existing data in that folder will be overwritten during the restore operation.



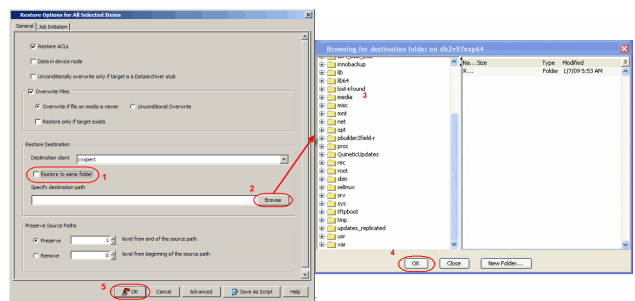
PERFORMING A CROSS-PLATFORM RESTORE

You can perform the following cross-platform restores :

- Restores across all the supported versions of Unix.
- Restores from Unix to all the supported versions of Windows.

Follow the steps given below to perform a cross-platform restore:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. In the **Destination Client** list, select the client. You can select any client that is in the same CommCell as that of the client from which the data was backed up.
6. Clear the **Restore to same folder** check box and click **Browse**.
7. Select the destination folder and click **OK**.
8. Click **OK**.



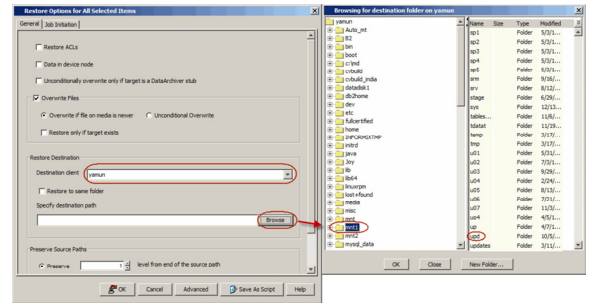
RESTORING TO NFS-MOUNTED FILE SYSTEM

You can restore data to an NFS-mounted file system.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File**

System | <Backup Set>

2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
 3. Click **OK**.
 4. Select the data that you want to restore and click **Recover All Selected**.
 5. In the **Destination Client** list, click the client computer that hosts the mounted file system.
 6. Clear the **Restore to same folder** check box.
 7. In the **Specify Destination Path**, enter the network share or click **Browse**.
 8. In the **Browsing for destination folder on <client>** dialog box, select the destination folder and click **OK**.
- For example: /yamun/mnt1/upd
9. Click **OK**.

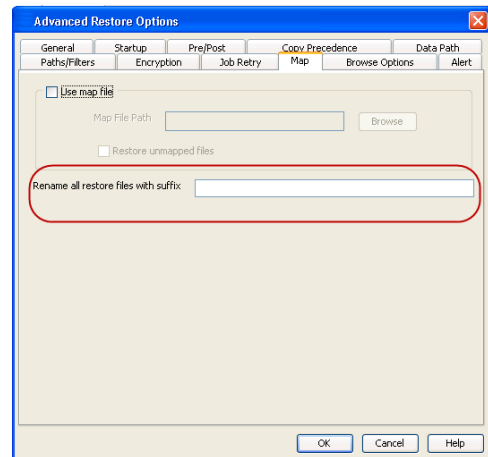


RENAMING FILES ON RESTORE

If you do not want to overwrite the existing files during restores, you can append a suffix to the filenames and restore them as new files. (This suffix is appended to the filename before the extension.)

Follow the steps given below to rename files during the restore:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. In the **Destination Client** list, select the client.
6. Click **Advanced**.
7. In the **Advanced Restore Options** dialog box, select the **Map** tab.
8. Enter the desired string that you want to append as a suffix to the filenames in **Rename all restore files with suffix** and click **OK**. For Example: Enter the string temp will rename file.txt to filetemp.txt.
9. Click **OK**.
10. Click **OK** to start the restore.



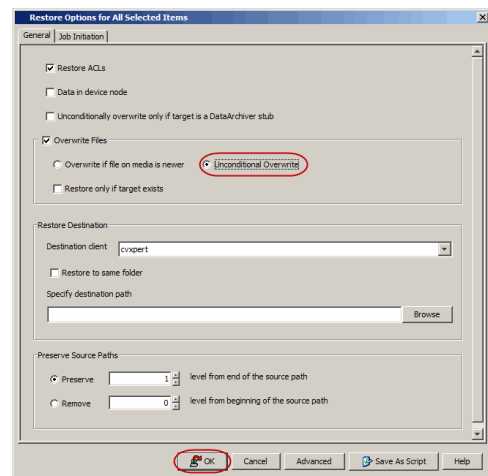
OVERWRITING DATA DURING RESTORES

By default, the data in the destination is overwritten when the restored version is newer than the one in the destination.

Use the following steps to overwrite data irrespective of the destination version:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. Ensure that the **Overwrite Files** check box is selected.
6. Click **Unconditional Overwrite**.
7. Click **OK**.

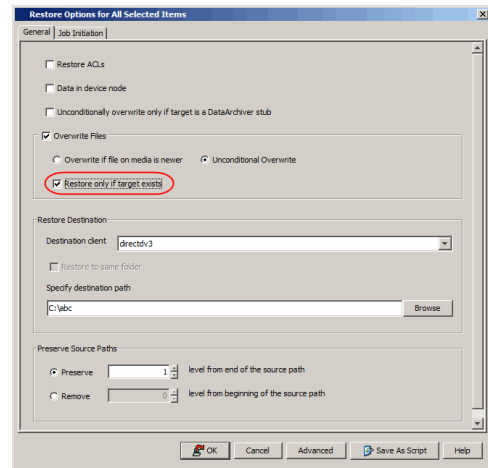
Clear the **Overwrite Files** check box when restoring to a computer that has different hardware and different software device drivers.



RESTORING ONLY WHEN DATA EXISTS ON THE DESTINATION

Follow the steps given below to restore the only data that already exists in the destination computer. This ensures any data removed from the destination computer is not reintroduced by the data recovery.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. Ensure that the **Overwrite Files** check box is selected. (If it is not selected, only those files that do not exist on the destination will be restored.)
6. Select the **Restore only if target exists** check box.
7. Click **OK**.



RESTORING BY JOBS

You can select a specific backup job for a restore. This method of restoring data is faster and useful in the following scenarios:

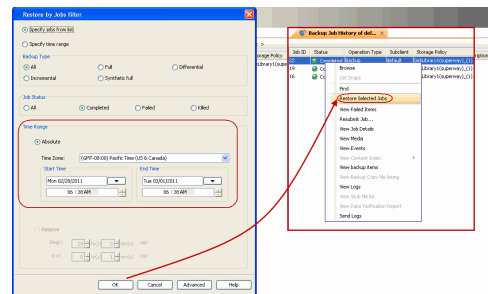
- To restore point-in-time data associated with a specific backup job
- To restore multiplexed data from the same client

Avoid running restores by jobs for jobs associated with the default backup set, if you do not want to restore the operating system files or directories. The entire content of the backed up client will be restored and the client where you are restoring might run out of space.

RESTORING ALL THE DATA BACKED UP DURING A JOB

Follow the steps to restore all the data backed up during the selected job:

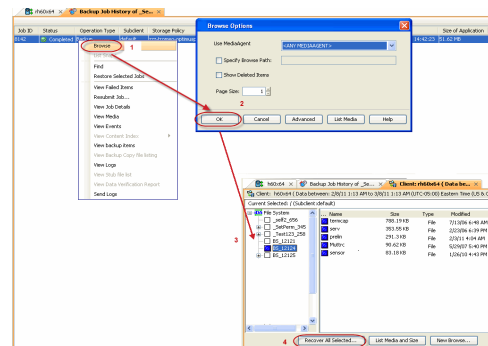
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>** and select **All Tasks | Restore by Jobs**.
3. Enter the **Start Time** and **End Time** and click **OK**. The list of backup jobs, completed in the specified time period is displayed.
4. Right click the job you wish to restore and select **Restore Selected Jobs**.
5. Click **OK**.



RESTORING SPECIFIC DATA BACKED UP DURING A JOB

You can restore specific files and folders from the data backed up during the selected job. Follow the steps given below to restore specific files and folders from the selected backup job:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>** and select **All Tasks | Restore by Jobs**.
3. Enter the **Start Time** and **End Time** and click **OK**. The list of backup jobs, completed in the specified time period is displayed.
4. Right click the job you wish to restore and select **Browse**.
5. Click **OK** in the **Browse Options** dialog box.
6. Select data that you want to restore and click **Recover All Selected**.
7. Click **OK**.

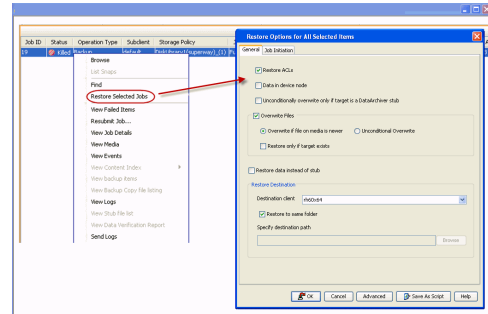


RESTORING FROM A FAILED OR KILLED JOB

You can restore from a failed or killed job. When restoring from a failed or killed job, the data backed up to the point of failure will be restored.

Failed or killed backup jobs are immediately aged regardless of their defined retention rules, therefore, these jobs can only be restored if the media is not yet overwritten. You can restore aged data from tape media but cannot restore from disk libraries.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>** and select **All Tasks | Restore by Jobs**.
3. Select **Failed** or **Killed** in the **Job Status** area of the **Restore by Jobs Filter** dialog box.
4. Enter the **Start Time** and **End Time** to specify the time period in which the job was failed or killed.
5. Click **Advanced**.
6. Select the **Include Aged Data** check box and click **OK**.
7. Click **OK** on the **Restore Jobs Filter** dialog box. The list of backup jobs, completed in the specified time period is displayed. The list also includes Failed or Killed jobs.
8. Right click the job you wish to restore and click **Restore Selected Jobs**.
9. Click **OK**.

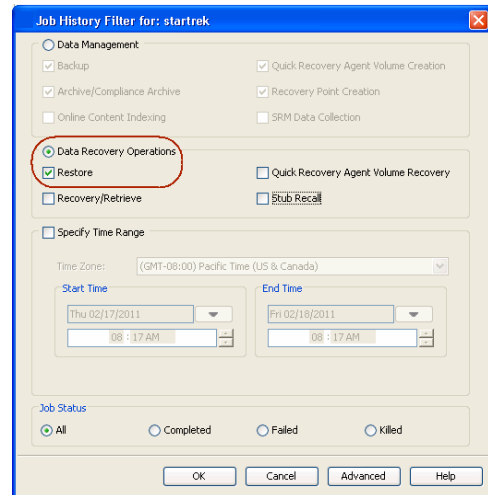


RESUBMITTING A RESTORE JOB

You can rerun a failed or completed restore job. This is useful when you want to use all the options and settings configured for the original job.

Follow the steps given below to rerun a restore job:

1. From the CommCell Browser, navigate to **Client Computers**.
2. Right-click the **<Client>** and click **View | Job History**.
3. Select **Data Recovery**.
4. Select the **Restore** check box and clear all other check boxes.
5. Right-click the restore job that you want to resubmit from the **Data Recovery Job History** tab and click **Resubmit Job**.
6. Click **OK** in the **Restore Options for All Selected Items** dialog box.



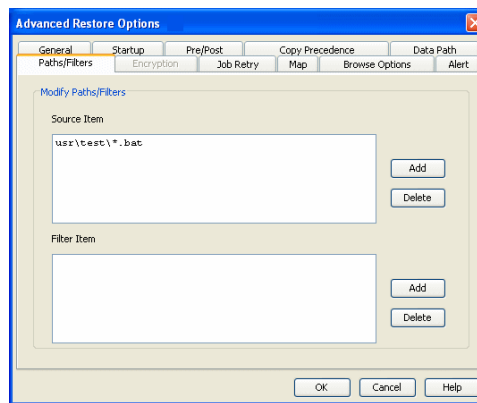
FILTERING DATA FROM RESTORES

During a restore operation, you can specify the files, directories, and file name patterns that you want to filter and exclude from restoring.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. In the **Recover Options for All Selected Items** dialog box, click **Advanced**.
6. Select the **Paths/Filters** tab.
7. If you want to remove any files or folders from restore operation, click **Add for Filter Item** list and enter the path of the data. Wildcard entries must be expressed as complete paths.

You can also click **Delete** to remove existing source or filter items.

8. In the **Advanced Recover Options** dialog box, click **OK**.
9. In the **Recover Options for All Selected Items** dialog box, click **OK**.



SUPPORTED WILDCARDS IN FILTERS

The following wildcards can be used in filters to include or exclude data when restoring data.

WILDCARD	DEFINITION	EXAMPLE
*	Any number of characters.	doc* will find any directory or file name that begins with "doc" (e.g., document, documentation)
**	Any number of characters across any number of path levels.	/**/move will find the directory or file named move located at any level under the c: drive (e.g., /info/com/move)
?	Any one character.	access? will find any directory or file name that begins with "access" followed by any one character (e.g., access1, access5)
[]	Any range of characters.	[ei]nsure will find any directory or file name that ends with "nsure" and begins either "e" or "i". (e.g., ensure, insure)
[a-z]	Any range of characters.	[a-z]nsure will find any directory or file name that ends with "nsure" and begins with any letter from "a" through "z". (e.g., ansure, bnsure, cnsure, etc.)
![a] or ^[a]	Any range of characters.	![a] or ^[a] will exclude any directory or file name that begins with "a". (e.g., applications)

You can use a combination of wildcards in a single expression (e.g., access?.h*).

RESTORING DATA USING A MAP FILE

You can restore individual files and folders to different locations using a map file containing a list of files to be restored, with their corresponding restore paths.

CREATING A MAP FILE

The map file is a text file in the CSV (Command Separated Value) format. Follow the steps given below to create a map file:

1. Create a text file on the client computer where you want to restore the data.
2. Add the mapping information in the file in the following format:

"<source path>","<destination path>"

- o If the specified destination folder is not available, the necessary destination folder will be created during the restore.

The specified paths for both the source and destination should be absolute paths within the same client computer.

You can provide following information in a map file:

INFORMATION	EXAMPLE
File to File Mapping	"/dir1/file1.txt","/dir2/file1.txt"
Folder to folder mappings	"/dir2/info/","/dir4/info/"
Drive to drive mappings	"/"(root),"/mnt","/usr"
Rename files/folder during restore	"/dir4/file2.txt","/dir5/file3.txt"
Filter certain files	"/dir5",""

ADDING FILES AND FOLDERS WITH UNICODE CHARACTERS TO A MAP FILE

If the path or the filename contains Unicode characters, the Map File must be converted to a format that can be used by the data protection operation. The

Unicode Conversion utility must be used to convert the Map File to a format that can be provided as input.

- Using a text editor, create a file that contains a list of files/folders with Unicode characters. Make sure to save the file as a Unicode text file.
- From the Command Line, navigate to the `<software install folder>/base` folder and type the following:

```
cvconvertunicode <source file> <destination file>
```

Where:

`<source file>` is the full path and name of the file created in Step 1.

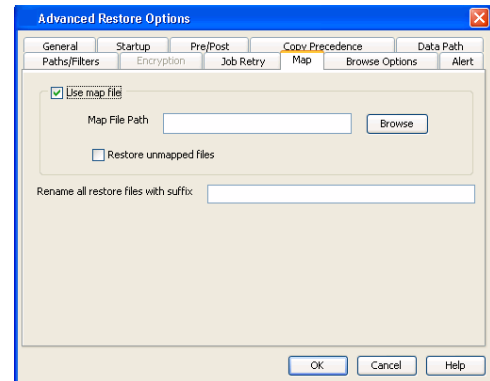
`<destination file>` is the full path and name of the destination file. The file will automatically be created by the utility.

- Use the destination file as the Map File to perform the restore.

RESTORING USING A MAP FILE

Use the following procedure to restore a list of files and folders from a computer and each of these files have a different destination.

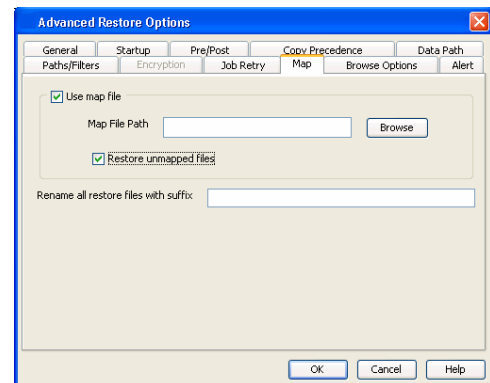
- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
- Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
- Click **OK**.
- Select the data that you want to restore and click **Recover All Selected**.
- Click **Advanced**.
- Select the **Map** tab.
- Select the **Use map file** check box and click **Browse** to navigate to the map file.
- Clear the **Restore unmapped file** check box.
- In the **Advanced Recover Options** dialog box, click **OK**.
- Click **OK** to start the restore.



COMBINING BROWSE AND RESTORE WITH THE MAP FILE RESTORE

Use the following procedure to restore a set of files to a specified location with some files within that set to different destinations.

- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
- Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
- Click **OK**.
- Select the data that you want to restore and click **Recover All Selected**.
- Click **Advanced**.
- Select the **Map** tab.
- Select the **Use map file** check box and click **Browse** to navigate to the map file.
- Select the **Restore unmapped file** check box.
- In the **Advanced Recover Options** dialog box, click **OK**.
- In the **Recover Options for All Selected Items** dialog box, click **OK**.

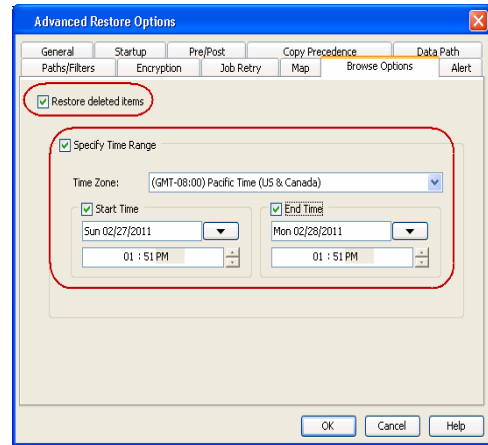


RESTORING DELETED FILES

Follow the steps given below to restore deleted files:

- From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
- Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
- Click **OK**.
- Select the data that you want to restore and click **Recover All Selected**.
- Click **Advanced**.
- Select the **Browse Options** tab.
- Select the **Restore deleted items** check box and then select the **Specify Time Range** check box.

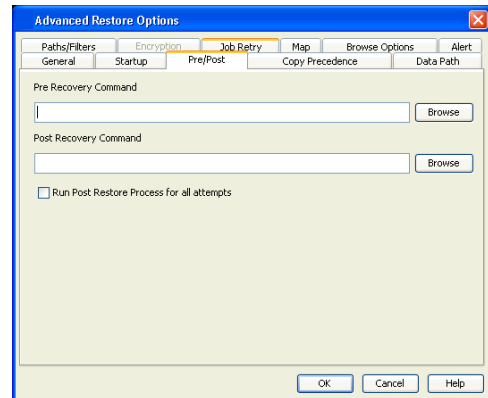
8. Select the time range to restore the files, deleted in that period of time.
9. In the **Advanced Recover Options** dialog box, click **OK**.
10. In the **Recover Options for All Selected Items** dialog box, click **OK**.



SETTING UP PRE-POST PROCESSES

You can run batch files or shell scripts before and/or after restore jobs. Follow the steps given below to setup a process before or after the restore job

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. Click **Advanced**.
6. Click the **Pre/Post** tab.
7. If you want perform a process before the restore job, enter the path for the batch file in the **Pre Recovery Command** box or click **Browse** to select the batch file.
8. If you want perform a process after the restore job, enter the path for the batch file in the **Post Recovery Command** box or click **Browse** to select the batch file.
9. Click **OK**.
10. Click **OK** to start the restore.

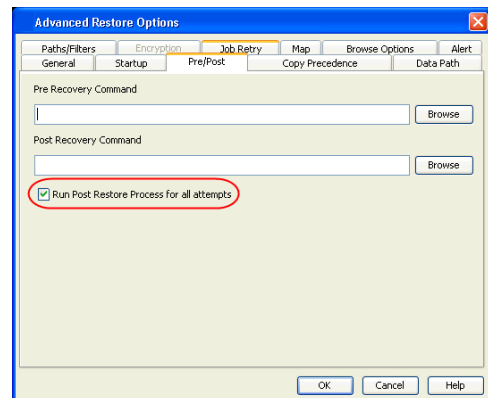


SETTING UP A PRE/POST PROCESS TO RUN AFTER EACH ATTEMPT

By default, a specified post process command is executed only on successful completion of the restore operation.

Use the following steps to run a post process even if the restore operation did not complete successfully. For example, this may be useful to bring a database online or release a snapshot.

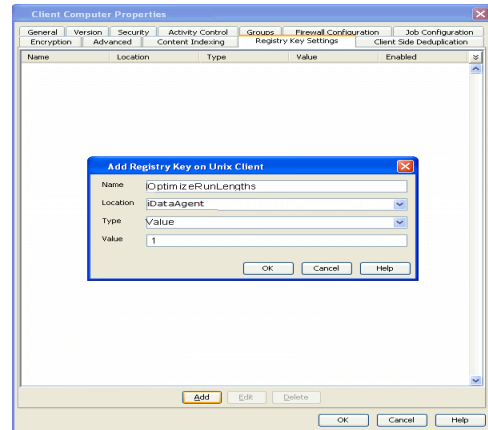
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | <Backup Set>**.
2. Right-click the **<Subclient>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. Click **Advanced** and then click the **Pre/Post** tab.
6. Enter the path for the batch file in the **Post Recovery Command** box or click **Browse** to select the batch file.
7. Select the **Run Post Process for all attempts** check box.
8. Click **OK**.
9. Click **OK** to start the restore.



RESTORING SPARSE FILES

The sparse files are restored by default as flat files, wherein the holes are restored as data. This will increase the disk usage. Use the following steps to restore the holes as genuine holes which will considerably reduce the disk usage.

1. From the CommCell Browser, navigate to **Client Computers**.
2. Right-click the **<Client>** in which you wish to perform the restore, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `OptimizeRunLengths`.
6. In the **Location** list, select or type `iDataAgent`.
7. In the **Type** list, select **Value**.
8. In the **Value** field, type the value which should be greater than or equal to `-1`.
9. Click **OK**.

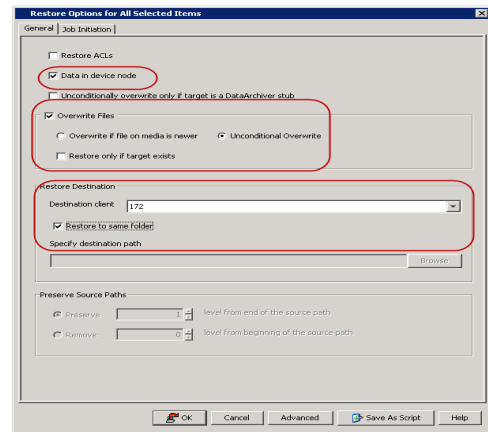


RESTORING RAW DEVICES

Raw device files, including block and character, can be restored either in-place or out-of-place. The entire raw device or individual files can be restored. Use character device files instead of block device files for achieving better restore performance.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>**, point to **All Tasks** and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the raw device data that you want to restore and click **Recover All Selected**.
5. Select **Data in device node**.
6. Select **Overwrite files** and then click **Unconditional Overwrite**.
7. Select the name of the client computer from the **Destination Client** list and click **OK**.
8. Click the **Job Initiation** tab and click **Immediate**.
9. Click **OK**.

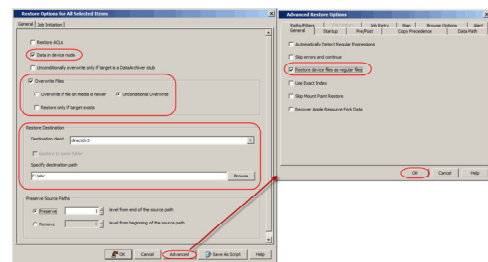
You can track the progress of the job from the **Job Controller**.



RESTORING RAW DEVICE FILES AS REGULAR FILES

You can restore the actual data in the device node file of the raw partition as a regular file system file.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>**, point to **All Tasks** and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the raw device data that you want to restore and click **Recover All Selected**.
5. Click **Data in device node**.
6. Select **Overwrite files** and then click **Unconditional Overwrite**.
7. Select the name of the client computer from the **Destination Client** list and click **OK**.
8. Click **Advanced**.
9. Select **Restore device files as regular files** check box.
10. Click **OK**.

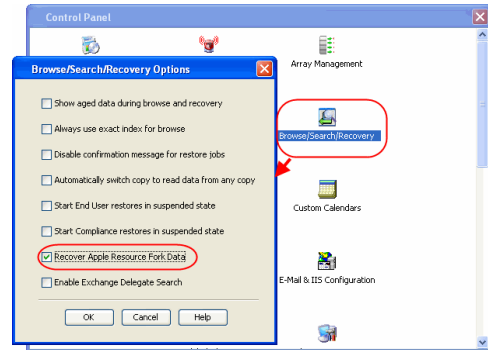


RESTORING APPLE DOUBLE ENCODED FILES

You can restore Apple Double formatted Macintosh files that contain resource fork data.

ENABLING A GLOBAL OPTION TO RESTORE RESOURCE FORK DATA

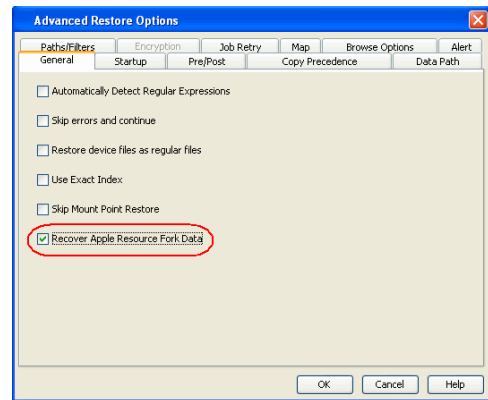
1. From the CommCell Console, click **Control Panel** button in the toolbar.
2. Double-click the **Browse/Search/Recovery** icon.
3. Select **Recover Apple Resource Fork Data** check box.
4. Click **OK**.



RESTORING RESOURCE FORK DATA FOR A SPECIFIC JOB

Use the following steps to recover Apple resource fork data of selective Macintosh files.

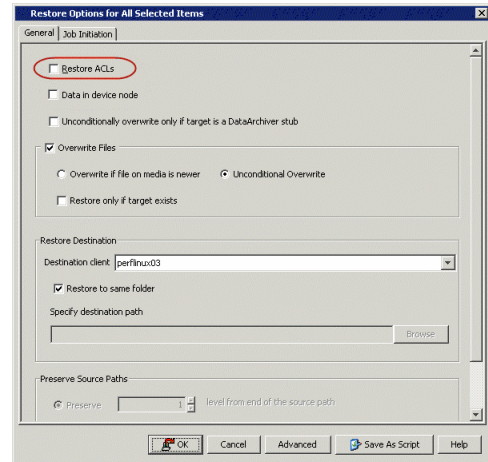
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the **<Backup Set>**, point to **All Tasks** and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the MAC File System data that you want to restore and click **Recover All Selected**.
5. Click **Advanced**.
6. Select **Recover Apple Resource Fork Data** check box.
7. Click **OK**.



EXCLUDING ACLS FROM RESTORES

The ACLs and the data are restored by default when you restore the data . Use the following procedure to exclude the ACLs from the restore.

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**
2. Right-click the subclient in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5. Click to clear the **Restore ACLs** check box.
6. Click **OK**.



BROWSING DATA

The option to browse the backup data provides the facility to view and selectively restore/recover the data that was backed up. The following sections explain how to browse the backup data.

LATEST DATA

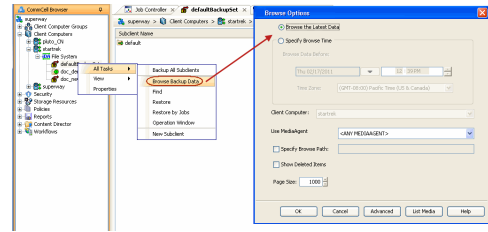
Follow the steps given below to view the latest data backed up by a backup set:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File**

System

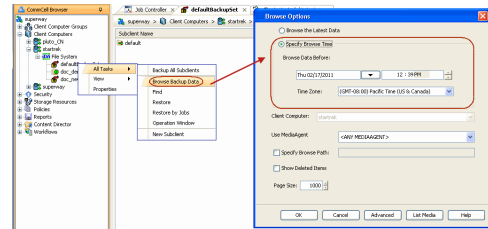
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Click **OK**.

The latest data backed up by all the subclients is displayed in the **Client Browse** tab.



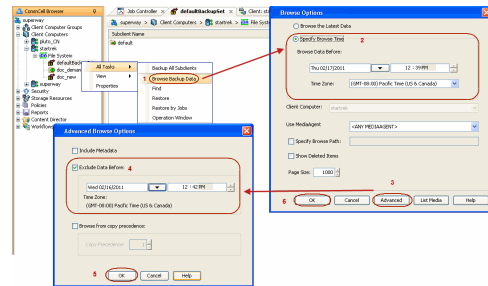
DATA BEFORE A SPECIFIED TIME

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Select **Specify Browse Time**.
4. Select a date and time to **Browse Data Before** it.
5. Click **OK**.



DATA BETWEEN A SPECIFIED TIME

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**
2. Right-click a Backup Set and click **All Tasks | Browse/Browse Backup Data**.
3. Select **Specify Browse Time**.
4. Select a date and time to **Browse Data Before** it.
5. Click **Advanced**.
6. In the **Advanced Browse Options** dialog box, select **Exclude Data Before**.
7. Select the date and time to exclude the data before it from the browse operation.
8. Click **OK** in the **Advanced Browse Options** dialog box .
9. Click **OK** in the **Browse Options** dialog box.



LISTING MEDIA

List media option is useful to predict media required for the following operations:

- To restore data associated with a specific backup set or subclient.
- To restore the index required to browse data associated with a specific backup set or subclient.
- To restore a specific file (or specific files and folders).
- To restore data associated with a specific job.

The List Media feature can also be used in a number of other capacities. Refer to the List Media documentation for a complete overview of this feature.

The list media operation can be performed for backup sets and subclients. The following sections describe each of these methods.

LISTING MEDIA FOR A SUBCLIENT

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System | Backup Set**.
2. Right-click the subclient for which you wish to list media in the right pane and then click **List Media**.
3. From the **List Media** dialog box choose one of the following options:
 - o Click **Media For the Latest Data** to list media associated with the most recent data protection cycle.
 - o Click **Specify Time Range** to list media associated with data protection operations up to the specified date and time range. Use the **Data Before** box to specify the end date and time.
 - o Click **Advanced** and then click **Exclude Data Before** to list media associated with data protection operations after the specified date and time.

Note that you can use the **Specify Browse Time** and **Exclude Data Before** options to list media between a specified date and time range.

4. Click **OK**.

The appropriate media is listed in the **Media** dialog box.

LISTING MEDIA FOR A BACKUP SET

1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click the backup set for which you wish to list media, point to **All Tasks** and then click **Browse**.
3. From the **Browse Options** dialog box, if required, select the following options:
 - o Click **Browse the Latest Data** to list media associated with the most recent data protection cycle.
 - o Click **Specify Browse Time** to list media associated with data protection operations up to the specified date and time range. Use the **Browse Data Before** box to specify the end date and time.
 - o Click **Advanced** and then click **Exclude Data Before** and then select the date and time from which you wish to list media associated with data protection operations.

Note that you can use the **Specify Browse Time** and **Exclude Data Before** options to list media between a specified date and time range.

4. Click **List Media**.
5. From the **List Media** dialog box, click **List Media for restore within specified time range**.
6. Click **OK**.

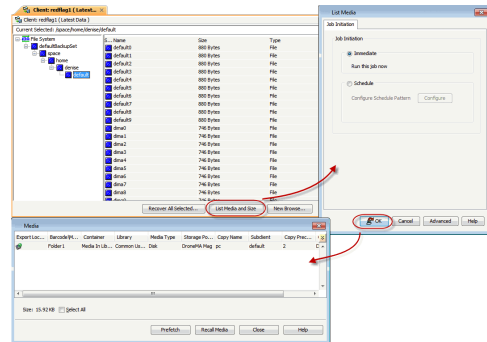
The appropriate media is listed in the **Media** dialog box.

LISTING MEDIA AND SIZE FOR A BACKUP SET

Before restoring any file or folder, you can review all the media that is associated with the selected data. Use this option to ensure that the media required to restore the selected data is available. You can also predict the total size of the data that you want to restore. Follow the steps given below to display the media and the size:

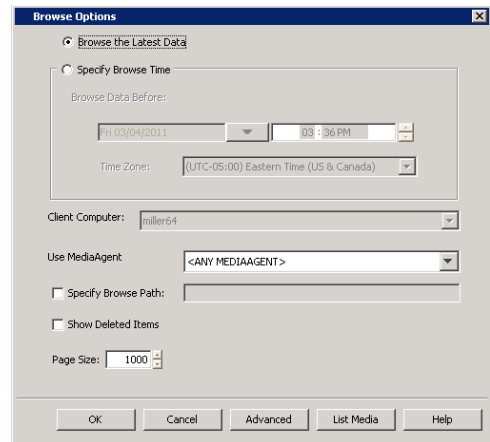
1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
2. Right-click a Backup Set and click **All Tasks | Browse Backup Data**.
3. From the **Browse Options** dialog box, if required, click **Browse the Latest Data**.
4. Click **OK**.
5. Select the data that you want to restore and click **List Media and Size**.
6. Click **OK**.

The media associated with the selected data is displayed. If required, you can recall the required media from the export location.



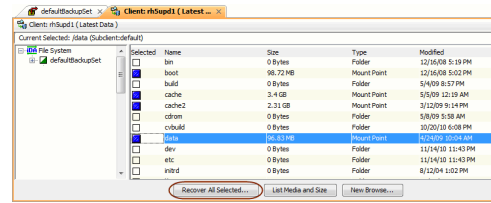
SCHEDULING A RESTORE

1.
 - From the CommCell Console, navigate to **Client Computers | <client> | File System**.
 - Right-click an backupset and click **All Tasks | Browse Backup Data**.
 - Click **OK**.

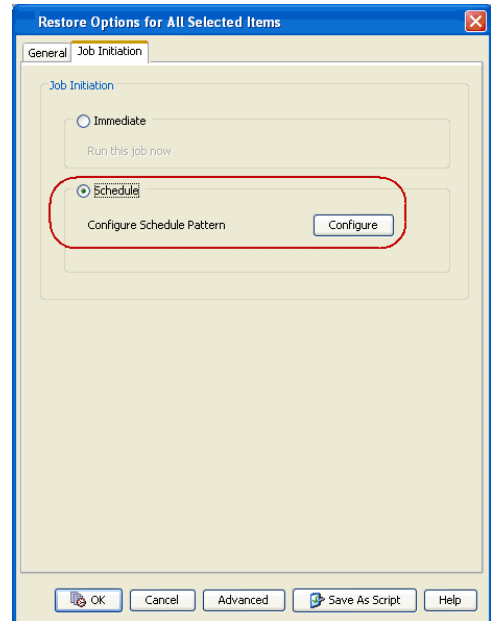
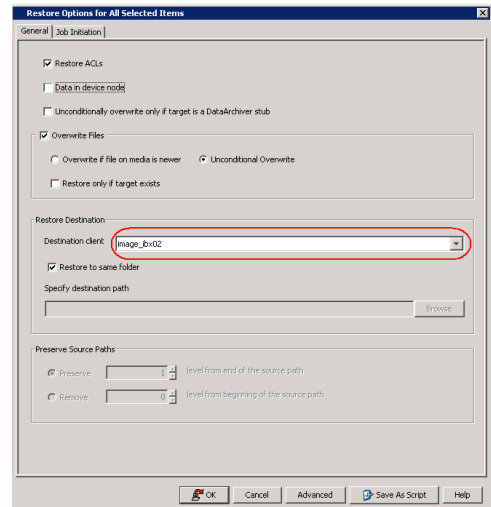


2.
 - Select a file to restore.
 - Click **Recover All Selected**.

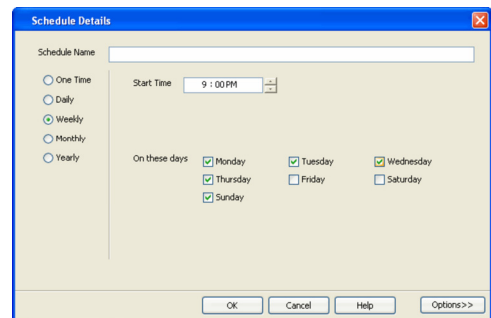
3. Select the name of the client computer from the **Destination Client** list. Click **OK**.



4.
 - Click **Job Initiation** tab and click **Schedule**.
 - Click **Configure**.



5. Select the appropriate scheduling options. For example:
 - Click **Weekly**.
 - Check the days you want the run the restore job.
 - Change the Start Time to 9:00 PM
 - Click **OK** to close the Schedule Details dialog
 - Click **OK** to close the Restore Options dialog
 The restore job will execute as per the schedule.



MANAGING RESTORE JOBS

Once you initiate the restore operation, a restore job is generated in the Job Controller. Jobs can be managed in a number of ways. The following sections provide information on the different job management options available:

RESTARTING JOBS

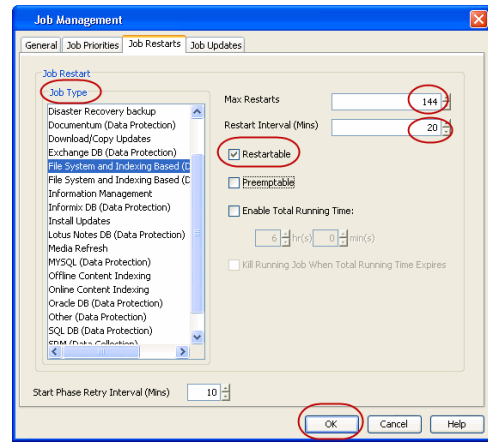
Jobs that fail to complete successfully are automatically restarted based on the job restartability configuration set in the Control Panel. Keep in mind that changes made to this configuration will affect all jobs in the entire CommCell.

To Configure the job restartability for a specific job, you can modify the retry settings for the job. This will override the setting in the Control Panel. It is also possible to override the default CommServe configuration for individual jobs by configuring retry settings when initiating the job. This configuration, however, will apply only to the specific job.

Backup jobs for this Agent are resumed from the point-of-failure.

CONFIGURE JOB RESTARTABILITY AT THE COMMSERVE LEVEL

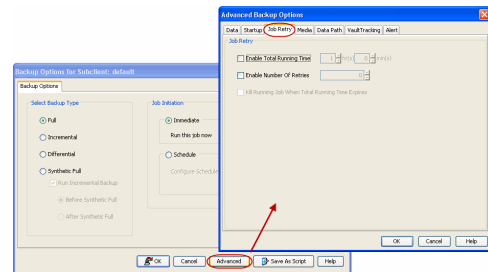
1. From the CommCell Browser, click **Control Panel** icon.
2. Select **Job Management**.
3. Click **Job Restarts** tab and select a **Job Type**.
 - o Select **Restartable** to make the job restartable.
 - o Change the value for **Max Restarts** to change the maximum number of times the Job Manager will try to restart a job.
 - o Change the value for **Restart Interval (Mins)** to change the time interval between attempts for the Job Manager to restart the job.
4. Click **OK**.



CONFIGURE JOB RESTARTABILITY FOR AN INDIVIDUAL JOB

1. From the CommCell Browser, navigate to **<Client> | File System | Backup Set**.
2. Right-click the **Subclient** and select **Backup**.
3. Click **Advanced**.
4. In the **Advanced Backup Options** dialog box, click the **Job Retry** tab.
5. Select **Enable Total Running Time** and specify the maximum elapsed time before a job can be restarted or killed.

Select **Kill Running Jobs When Total Running Time Expires** to kill the job after reaching the maximum elapsed time.
6. Select **Enable Number Of Retries** and specify the number of retries.
7. Click **OK**.



CONTROLLING JOBS

The following controls are available for running jobs in the Job Controller window:

SUSPEND	Temporarily stops a job. A suspended job is not terminated; it can be restarted at a later time.
RESUME	Resumes a job and returns the status to Waiting, Pending, Queued, or Running. The status depends on the availability of resources, the state of the Operation Windows, or the Activity Control setting.
KILL	Terminates a job.

SUSPENDING A JOB

1. From the Job Controller of the CommCell Console, right-click the job and select **Suspend**.
2. The job status may change to **Suspend Pending** for a few moments while the operation completes. The job status then changes to **Suspended**.

RESUMING A JOB

1. From the Job Controller of the CommCell Console, right-click the job and select **Resume**.

- As the Job Manager attempts to restart the job, the job status changes to **Waiting**, **Pending**, or **Running**.

KILLING A JOB

- From the Job Controller of the CommCell Console, right-click the job and select **Kill**.
- Click **Yes** when the confirmation prompt appears if you are sure you want to kill the job. The job status may change to **Kill Pending** for a few moments while the operation completes. Once completed, the job status will change to **Killed** and it will be removed from the Job Controller window after five minutes.

ADDITIONAL RESTORE OPTIONS

Several additional options are available to further refine your restore operations. The following table describes these options, as well as the steps to implement them.

Be sure to read the overview material referenced for each feature prior to using them.

OPTION	DESCRIPTION	RELATED TOPIC
Skip Errors and Continue	<p>This option allows a restore job to continue regardless of media errors and outputs a file that lists the full path names of the files that failed to get restored.</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers File System. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. In the Browse Options dialog box, click OK. In the Client Browse tab, select the data to be restored and click Recover all Selected. In the Restore Options for All Selected Items dialog box, click Advanced. In the Advanced Restore Options dialog box, select Skip errors and continue check box. Click OK. 	
Use Exact index	<p>This option allows you to associate the media with the most recent index available in the CommCell.</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers File System. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. In the Browse Options dialog box, click OK. In the Client Browse tab, select the data to be restored and click Recover all Selected. In the Restore Options for All Selected Items dialog box, click Advanced. From the Advanced Restore Options, select Use Exact Index check box. Click OK. 	
Startup Options	<p>The Startup Options are used by the Job Manager to set priority for resource allocation. This is useful to give higher priority to certain jobs. You can set the priority as follows:</p> <ol style="list-style-type: none"> From the CommCell Browser, navigate to Client Computers File System. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. In the Browse Options dialog box, click OK. In the Client Browse tab, select the data to be restored and click Recover all Selected. In the Restore Options for All Selected Items dialog box, click Advanced. In the Advanced Restore Options dialog box, click Startup. In the Startup tab, select Change Priority. Enter a priority number. 0 is the highest priority and 999 is the lowest priority. Select the Start up in suspended State check box to start the job in a suspended state. Click OK. 	Refer to Job Priority and Priority Precedence.
Copy Precedence	<p>By default, the system retrieves data from the storage policy copy with the lowest copy precedence. If the data was pruned from the primary copy, the system automatically retrieves data from the other copies of the storage policy in the lowest copy precedence to highest copy precedence order. Once the data is found, it is retrieved, and no further copies are checked.</p> <p>You can retrieve data from a specific storage policy copy (Synchronous Copy or Selective Copy). If data does not exist in the specified copy, the data retrieve operation fails even if the data exists in another copy of the same storage policy. Follow the steps given below to retrieve</p>	Refer to Recovering Data From Copies.

	<p>the data from a a specific storage policy copy:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers File System. 2. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. 3. In the Browse Options dialog box, click OK. 4. In the Client Browse tab, select the data to be restored and click Recover all Selected. 5. In the Restore Options for All Selected Items dialog box, click Advanced. 6. In the Advanced Restore Options dialog box, click Copy Precedence. 7. On the Copy Precedence tab, select the Restore from copy precedence check box. 8. Enter the copy precedence number. 9. Click OK. 	
<p>Data Path Options</p>	<p>The data recovery operations use a default Library, MediaAgent, Drive Pool, and Drive as the Data Path. You can use this option to change the data path if the default data path is not available. Follow the steps given below to change the default data path:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, navigate to Client Computers File System. 2. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. 3. In the Browse Options dialog box, click OK. 4. In the Client Browse tab, select the data to be restored and click Recover all Selected. 5. In the Restore Options for All Selected Items dialog box, click Advanced. 6. In the Advanced Restore Options dialog box, click Data Path. 7. On the Data Path tab, select the MediaAgent and Library. 8. Select the Drive Pool and Drive for optical and tape libraries. 9. Select the name of the Proxy server if you wish to restore using a proxy server. You can select the Proxy server only when you are restoring from a snapshot. This option is not available for a regular restore. 10. Click OK. 	<p>Refer to Change Data Path.</p>
<p>Encryption</p>	<p>If the client's data is encrypted with a pass phrase, you must enter the pass-phrase to start the data recovery operation. Follow the steps given below to enter the pass-phrase:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, click Client Computers File System. 2. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. 3. In the Browse Options dialog box, click OK. 4. In the Client Browse tab, select the data to be restored and click Recover all Selected. 5. In the Restore Options for All Selected Items dialog box, click Advanced. 6. In the Advanced Restore Options dialog box, click Encryption. 7. Enter the Pass Phrase. 8. Click OK. 	<p>Refer to Data Encryption.</p>
<p>Alerts</p>	<p>This option enables users or user groups to get automatic notification on the status of the data recovery job. Follow the steps given below to set up the criteria to raise notifications/alerts:</p> <ol style="list-style-type: none"> 1. From the CommCell Browser, click Client Computers File System. 2. Right-click the <Backup set> that contains the data you want to restore, point to All Tasks and then click Browse Backup Data. 3. In the Browse Options dialog box, click OK. 4. In the Client Browse tab, select the data to be restored and click Recover all Selected. 5. In the Restore Options for All Selected Items dialog box, click Advanced. 6. In the Advanced Restore Options dialog box, click Alerts. 7. Click Add Alert. 8. From the Add Alert Wizard dialog box, select the required threshold and notification criteria and click Next. 9. Select the required notification types and click Next. 	<p>Refer to Alert.</p>

	<ol style="list-style-type: none"> 10. Select the recipients and click Next. 11. Click Finish. 12. Click OK. 	
Command Line Restores	<p>Command Line Interface enables you to perform backups or restore from the command line. The commands can be executed from the command line or can be integrated into scripts.</p> <p>You can also generate command line scripts for specific operations from the CommCell Browser using the Save As Script option.</p>	Refer to Command Line Interface.
CommCell Readiness Report	<p>The CommCell Readiness Report provides you with vital information, such as connectivity and readiness of the Client, MediaAgent and CommServe. It is useful to run this report before performing the data protection or recovery job. Follow the steps given below to generate the report:</p> <ol style="list-style-type: none"> 1. From the Tools menu in the CommCell Console, click Reports. 2. Navigate to Reports CommServe CommCell Readiness. 3. Click the Client tab and click the Modify button. 4. In the Select Computers dialog box, clear the Include All Client Computers and All Client Groups check box. 5. Select the client from the Exclude list. 6. Click the Include > button. 7. Click OK. 8. Click the MediaAgent tab. 9. Clear the Include All MediaAgents checkbox. 10. Select the MediaAgent from the Exclude list. 11. Click Include >. 12. Click Run. <p>The generated report is displayed.</p>	
Restore Job Summary Report	<p>The Restore Job Summary Report provides you with information about all the data recovery jobs that are run in last 24 hours for a specific client and agent. You can get information such as failure reason, failed objects, job options etc. It is useful to run this report after performing the restore. Follow the steps given below to generate the report:</p> <ol style="list-style-type: none"> 1. From the Tools menu in the CommCell Console, click Reports. 2. Navigate to Reports Jobs Job Summary. 3. Click Data Recovery on the General tab in the right pane. 4. On the Computers tab, select the client and the agent for which you want to run the report. 5. Click Run. 	Refer to Restore Job Summary Report.

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Data Aging - Macintosh File System iDataAgent

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Getting Started

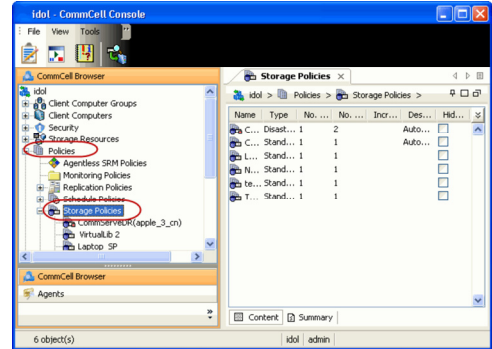
Extended Retention Rules

GETTING STARTED

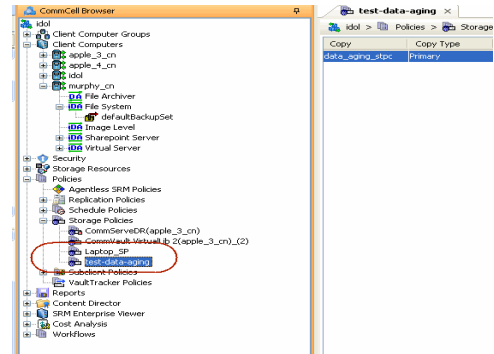
Data Aging is the process of removing old data from secondary storage to allow the associated media to be reused for future backups.

By default, all backup data is retained infinitely. However, you should change the retention of your data based on your needs. Note that if you continue to have infinite retention, you will also need infinite storage capacity.

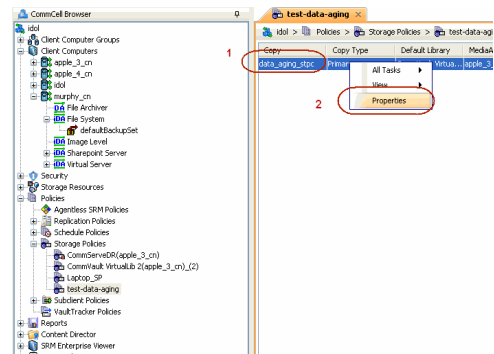
1. From the CommCell Browser, navigate to **Policies | Storage Policies**.



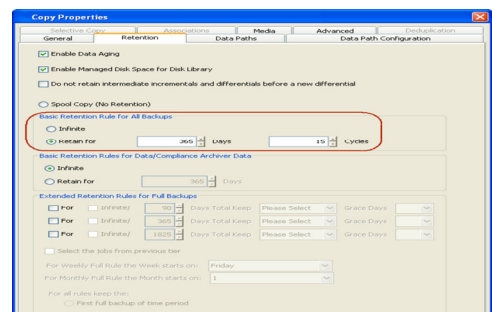
2. Highlight the **Storage Policy**.



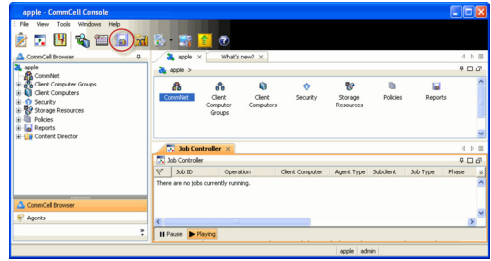
3. From the right pane, right-click the **Storage Policy Copy** and click the **Properties**.



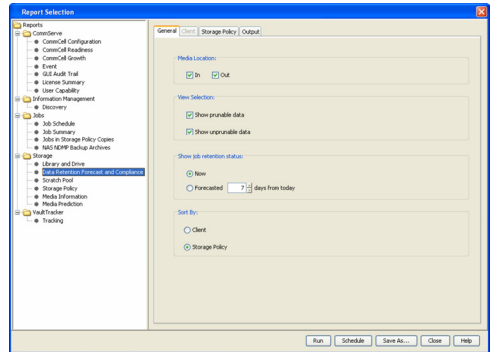
4.
 - Click the **Retention** tab.
 - Click the **Retain For** in the **Basic Retention Rules for All Backups** area.
 - Enter number of days to retain the data.
 - Enter number of cycles to retain the data.
 - Click **OK**.



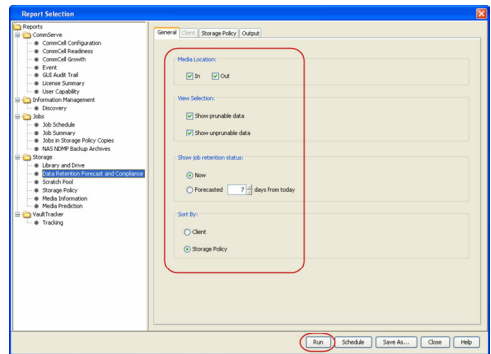
5. From the CommCell Browser, click the **Reports** icon.



6. Expand Reports and select **Data Retention Forecast and Compliance**.



7. Click **Run**.

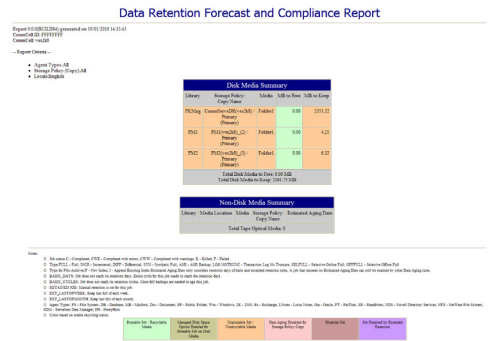


8. The report will display the data to be pruned when a data aging job is run.

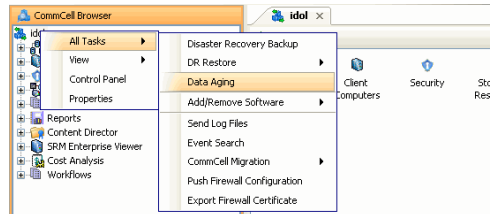
To ensure only data intended for aging is actually aged, it is important to identify the data that will be aged based on the retention rules you have configured. Hence, ensure this report includes only the data you intend to age.

If necessary, fine-tune your rules so that only the intended data is aged.

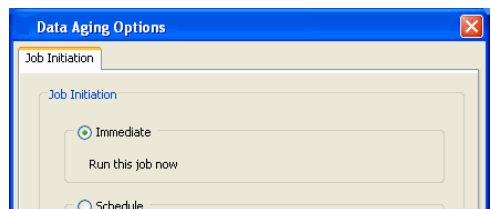
Once you run a data aging job, the data will be lost.



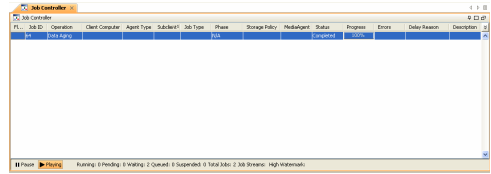
9. From the CommCell Console, right click the CommServe icon and click **All Tasks | Data Aging**.



10. Select **Immediate** in the Job Initiation section and click **OK**.



11. You can track the progress of the job from the **Job Controller** window. When the job has completed, the Job Controller displays **Completed**.
Make sure that the job completes successfully. If the job did not complete successfully, re-run the job.



EXTENDED RETENTION RULES

Extended retention rules allow you to keep specific full (or synthetic full) backups for longer periods of time.

Extended retention rules can be used in the following circumstances:

- If you have a single drive tape library
- If you want to create a hierarchical retention scheme (grandfather-father-son tape rotation)

In all other cases, it is recommended that the Auxiliary Copy feature be used for extended storage as it actually creates another physical copy of the data, thereby reducing the risk of data loss due to media failure.

UNDERSTANDING EXTENDED RETENTION RULES

Extended retention allows you to retain a specific full (or synthetic full) backup for an additional period of time. For example, you may want to retain your monthly full backups for 90 days.

Extended retention rules allow you to define three additional "extended" retention periods for full (or synthetic full) backups. For example:

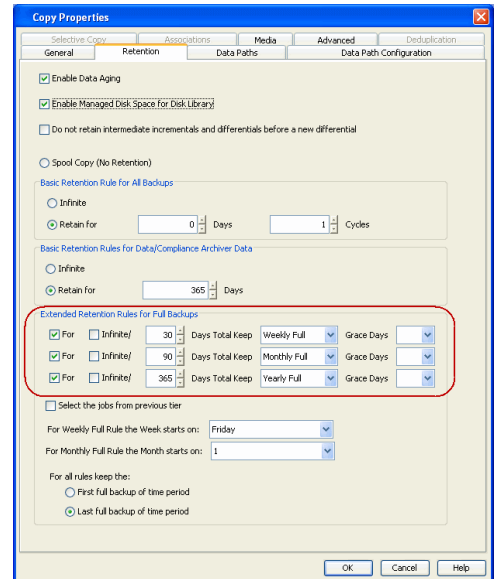
- You may want to retain your weekly full backups for 30 days.
- You may want to retain your monthly full backup for 90 days.
- You may want to retain your yearly full backup for 365 days.

A backup job will be selected for extended retention based on its start time. For example: If a backup job starts at 11:55 pm on August 31st and ends at 1 am on September 1st, then it will be selected as the last full backup for the month of August and will be picked up for extended retention.

SETTING UP EXTENDED RETENTION RULES

Use the following steps for setting up the extended retention rules:

1. Right-click the storage policy copy and click **Properties**.
2. Click the **Retention** tab.
3. Set the basic retention rules by clicking **Retain for** and entering the number of days and cycles appropriate for your organization.
4. Set the extended retention rules as follows:
Click the **For** button.
Enter the number of **Days Total** to retain the backup.
Click the **Keep** drop-down list, and select the desired backup criteria (e.g., Monthly Full).
Click the **Grace Days** drop-down list and select the number of days (e.g., 2).
5. Repeat Step 4 to configure additional extended retention.
6. Click **OK**.



ADVANCED TOPICS

Data Aging - Advanced

Provides comprehensive information on additional Data Aging capabilities.

Disaster Recovery - Macintosh File System iDataAgent

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Planning for a Disaster Recovery

Rebuilding the Operating System

Restoring the Macintosh File System

PLANNING FOR A DISASTER RECOVERY

Before you begin a disaster recovery, make sure to do the following:

- Perform regular backups of the Macintosh file system. These backups can be scheduled to run at convenient intervals.
- Ensure that the destination client is same as source client while performing a disaster recovery.
- Make sure to Install the Macintosh Operating System on the system that you want to restore. Make sure to install the Operating System exactly as it existed prior to a hardware or software corruption problem.
- The client computer must have an install partition with the Macintosh File System iDataAgent installed on it. Make sure to enable the Networking option. The TCP/IP, hostname, and domain name settings of the default install must match those of the system that you are restoring.

REBUILDING THE OPERATING SYSTEM

1. Place the Macintosh installation CD into the drive.

To boot the system from the CD, press the power-on button while holding down the `c` key. When the Apple logo displays you can release the `c` key.

2. From the **Installer** menu, select **Open Disk Utility...**

3. Partition a drive using the Disk Utility.

- Select a disk.
- In the **Partition** tab, click **Split** and then select the desired partition.
- In the **Volume Information** box, enter a Name for the partition (which we will refer to as `mini_root` in this procedure)
- In the **Format** box, select Mac OS Extended.
- In the **Size** box, enter a number that is at least 2 GB greater than the minimum space requirements for the version of Mac OS X that you are trying to install
- Press **Return**.

Repeat these steps for each remaining disk/partition

- Click **Partition**
- Click **Partition** on the confirmation message.
- After the partition has been created, quit the Disk Utility.

4. In the **Select Destination** screen, select the `mini_root` partition created in step 3 above and then click **Continue**.

5. Click **Install**.

The install program starts copying the software. This step may take a while to complete. After the OS software installation has completed, the system will restart automatically.

6. After the system has restarted, enter registration information, then assign the computer name and IP address using the same settings that were used in the original installation.

If you are prompted to update your system software, select **Quit Software Update**.

7. Open a Terminal window, then enter `sudo passwd root`

When prompted, provide a password for `root`.

8. Switch to the `root` user.

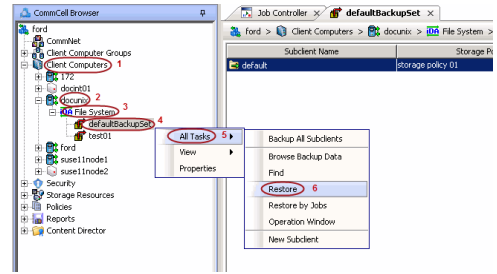
```
su - root
```

9. Install the Macintosh File System iDataAgent to the same CommServe using the same Client name that was used during the previous installation.

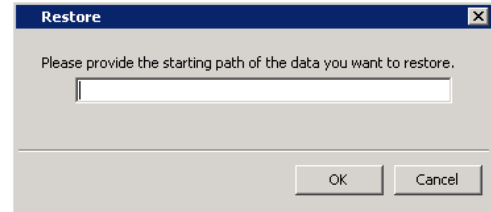
We recommend that you adjust your Energy Saver settings before restoring the system so that the computer, display and hard disk will not be put to sleep during the restore.

RESTORING THE MACINTOSH FILE SYSTEM

1.
 - From the CommCell Browser, navigate to **Client Computers | <Client> | File System**.
 - Right-click the backup set that contains the backup data of the root file system, point to **All Tasks**, and then click **Restore**.



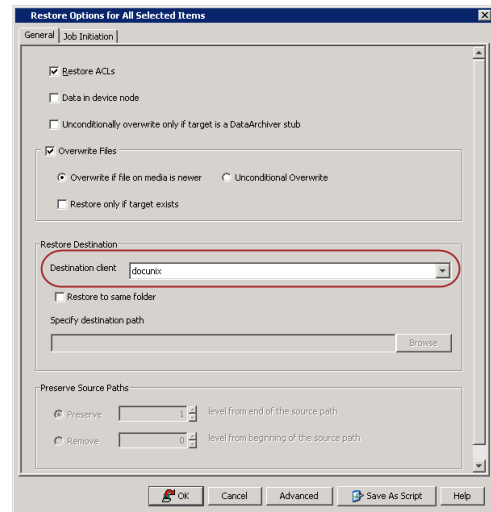
2. Enter the path to restore the lost data. You can type "/" as the path to restore the entire content.



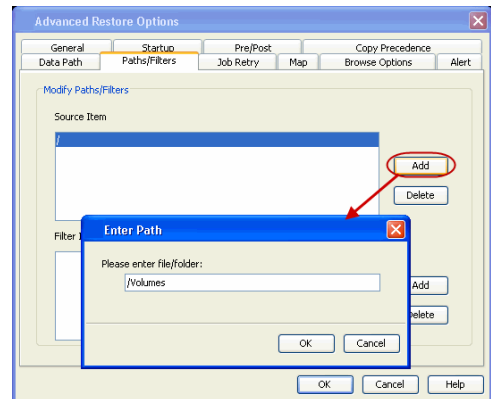
3.
 - Select the name of the client computer from the **Destination Client** list.
 - Clear the **Restore to same folder** checkbox.
 - Click Browse and select the original root partition (which is currently mounted under the Volumes directory).
 - Click **OK**.

Do not select **Unconditional Overwrite** from the Advanced Options.

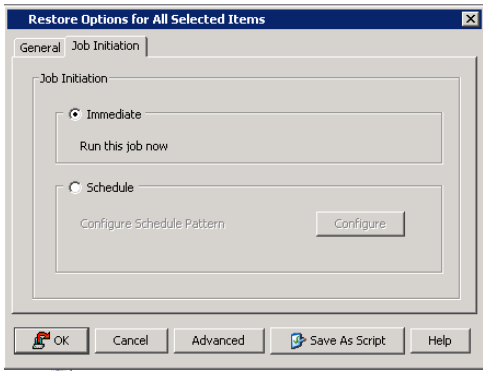
Restored data retains its original permissions. The ACLs are restored after the permissions are restored.



4.
 - Click **Advanced**.
 - Click the **Paths/Filters** tab.
 - Under **Source Item**, click **Add** and type `/Volumes`.
 - Click **OK**.



5.
 - Select **Immediate** from the **Job Initiation** tab.
 - Click **OK**.



6. You can monitor the progress of the restore job in the **Job Controller** or **Event Viewer** window of the CommCell Console.

- 7.
 - Open a Terminal window on the client and navigate to the original root partition which is currently mounted under the Volumes directory.
 - Re-create the `Volumes` directory

8. Make the newly restored root bootable using the `blesst` command

9. Restart the computer.
The system boots to the newly restored root.

Job Name	Agent Type	Subagent	Job Type	Phase	Storage Policy	Media	Status	Progress	Error	Delay (hr.)	h	m	s	
IP-10 File System	Windows	Full	Backup	new_image_p2disk	archive	Suspended				Network	Backup	00	00	00
IP-10 File System	Windows	Full	Backup	new_image	archive	Suspended				Network	Backup	00	00	00
Linux File System	Linux	Full	Scan	archive_scan	archive	Suspended				Network	Backup	00	00	00
Linux File System	Linux	Full	Backup	archive_img	archive	Suspended				Network	Backup	00	00	00
Linux File System	Linux	Full	Backup	archive_img	archive	Suspended				Network	Backup	00	00	00

`mkdir Volumes`

`blesst -folder "/Volumes/<original root partition>/System/Library/CoreServices" -setOF`

Additional Operations - Macintosh File System iDataAgent

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Enabling Laptop Backup for a Desktop Client

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Operating System and Application Upgrades

Global Filters

Erase Backup Data

Uninstalling Components

Online Help Links

AUDIT TRAIL

The Audit Trail feature allows you to track the operations of users who have access to the CommCell. This capability is useful if a detrimental operation was performed in the CommCell and the source of that operation needs to be determined.

Audit Trail tracks operations according to four severity levels:

- **Critical:** This level records operations that will result in imminent loss of data.
- **High:** This level records operations that may result in loss of data.
- **Medium:** This level records changes to the general configuration of one or more entities. Such changes may produce unintended results when operations are performed.
- **Low:** This level records changes to status, addition of entities, and other operations that have minimal impact on existing CommCell functions.

To set Audit Trail retention periods:

1. From the **Tools** menu in the CommCell Console, click **Control Panel**, and then select **Audit Trail**.
2. From the **Audit Trail** dialog box, select the desired retention time (in days) for each severity level.
3. Click **OK**.

ENABLING LAPTOP BACKUP FOR A DESKTOP CLIENT

The Laptop Backup feature provides access to a webconsole which you can use to manage data protection and data recovery operations for a desktop client. Follow the steps given below to use the webconsole:

1. Ensure that the File System iDataAgent is installed on a client computer.
2. Open the Command prompt and navigate to the following location:
Windows: <Software_Installation_Directory>\calypso\Base\
Linux: /<install_path>/calypso/Base/
3. Login to the CommServe using the qlogin command and commcell credentials.
Windows: C:\Company\Software\Base\> qlogin -cs commserve_name -u user_name
Linux or Macintosh: [root@localhost Base]# ./qlogin -cs commserve_name -u user_name
4. Run the following **execscript** operation using **qoperation**:

USAGE:

Windows:

```
qoperation execscript -sn enableLaptopBackup -si ON -si <client name>
```

Linux:

```
./qoperation execscript -sn enableLaptopBackup -si ON -si <client name>
```

```
Administrator: C:\Windows\system32\cmd.exe
root@localhost Base]# ./qlogin -cs happy01 -u admin
qlogin:
User logged in successfully.
root@localhost Base]#qoperation execscript -sn enableLaptopBa
ckup -si ON -si xyz
[Script [enableLaptopBackup] CS[obeliak] DB[CommServe] SPIQS_enableLaptopBackup]
qscript Output:
qscript Execution Succeeded!
root@localhost Base]#
```


Where:

<client>: Specify the client name for which you want to enable laptop backup.

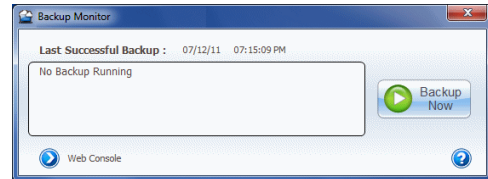
EXAMPLE:

Enable Laptop Backup for desktop client xyz.

Windows: qoperation execscript -sn enableLaptopBackup -si ON -si xyz

Linux: ./qoperation execscript -sn enableLaptopBackup -si ON -si xyz

5. Navigate to following location:
<Software_Installation_Directory>\calypso\Base\
6. Run the Laptop2Taskbaricon.exe to launch the **Backup Monitor**.
7. Click **Web Console** and enter CommCell credentials.
8. Use the web console to manage data recovery and data protection operations for the desktop client. For more information about the operations which you can perform, refer to Restore -Laptop Users and Advanced Options - Laptop Users.

**DISABLING LAPTOP BACKUP FOR A DESKTOP CLIENT**

Follow the steps given below to disable the Laptop Backup feature for a desktop client:

1. Open the Command prompt and navigate to the following location:
Windows: <Software_Installation_Directory>\Base\
Linux or Macintosh: /<install_path>/calypso/Base/
2. Login to the CommServe using the qlogin command and commcell credentials.
Windows: C:\Company\Software\Base\> qlogin -cs commserve_name -u user_name
Linux or Macintosh: [root@localhost Base]# ./qlogin -cs commserve_name -u user_name
3. Run the following **execscript** operation using **qoperation**:

USAGE:

Windows:

```
qoperation execscript -sn enableLaptopBackup -si OFF -si <client name>
```

Linux or Macintosh:

```
./qoperation execscript -sn enableLaptopBackup -si OFF -si <client name>
```

Where:

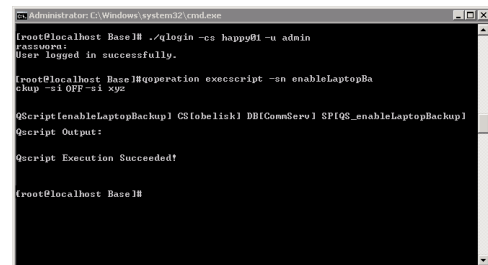
<client>: Specify the client name for which you want to enable laptop backup.

EXAMPLE:

Disable Laptop Backup for desktop client xyz.

Windows: qoperation execscript -sn enableLaptopBackup -si OFF -si xyz

Linux or Macintosh: ./qoperation execscript -sn enableLaptopBackup -si OFF -si xyz

**STORAGE POLICY**

A Storage policy defines the data lifecycle management rules for protected data. Storage policies map data from its original location to a physical storage media and determine its retention period.

1. Expand the **Policies** node, right-click **Storage Policies**, and select **New Storage Policy**.
2. Click **Next**.
3. Select **Data Protection and Archiving** to create a regular storage policy or **CommServe Disaster Recovery Backup** to backup the CommServe database and click **Next**.
4. Click **Next**.
5. Enter the name of storage policy and click **Next**.
6. Enter the name of the primary copy and click **Next**.
7. From the drop down box, select the default library for the primary copy and click **Next**.

8. From the drop down box, select the MediaAgent and click **Next**.
9. Enter number of data streams and set the retention period for the policy and click **Next**.
10. Click **Next**.
11. Click **Browse**, browse to your designated deduplication store location and click **Next**.
12. Confirm your selections and click **Finish**.

SUBCLIENT POLICY

Subclient policies allow you to configure multiple subclients within a CommCell from a centralized template. This alleviates the need to manually configure each subclient that shares a similar configuration.

1. Expand the **Policies** node, right-click **Subclient Policies** and click **New Subclient Policy**.
2. Enter policy name in the **Name** entry field, then select the appropriate file system type from the **iDataAgent** drop-down list.
3. In the Subclient pane, assign a storage policy for each subclient template by clicking in the drop down box under the **Storage Policy** column.
4. Click **OK**.

SCHEDULE POLICY

A schedule policy is a defined schedule or group of schedules for specific operations to be performed on associated objects within the CommCell. When the schedules from a policy are run, the specified operations, (e.g., auxiliary copy, backup, etc.,) will be performed on the associated CommCell objects.

1. Expand the **Policies** node, right-click **Schedule Policies** and click **Add**.
2. Type the **Name** of the schedule policy.
3. Select the **Type** of schedule policy.
4. Select the **Agent Type**.
5. Type a description of the schedule policy.
6. Click **Add**.
7. Enter a Schedule Name in the **Schedule Pattern** tab.
8. Click **OK**.
9. On the **Associations** tab, select the objects to be associated with the schedule policy.
10. Click **OK**.

AUXILIARY COPY

An auxiliary copy operation allows you to create secondary copies of data associated with data protection operations, independent of the original copy.

1. Expand the **Policies** node, right-click storage policy for which you want to perform an auxiliary copy, click **All Tasks**, and then click **Run Auxiliary Copy**.
2. If you are starting the auxiliary copy operation from the CommServe level, select the storage policy for which you wish to perform the auxiliary copy.

If you are starting the auxiliary copy operation from the Storage Policy level, the Storage Policy field is already populated with the name of the Storage Policy you selected.

3. If the source copy is configured with a shared library, select the **Source MediaAgent** for the auxiliary copy.
4. Click **OK** to start the auxiliary copy operation. A progress bar displays the progress of the operation.

OPERATION WINDOW

By default, all operations in the CommCell can run for 24 hours. To prevent certain operations from running during certain periods of the day, you can define operation rules so that these operations are disabled during those times.

When operation rules are configured, operations that are started within the time window specified will go to a queued (as opposed to pending) state. Once the time window specified in the operation rule has elapsed, these queued or running operations will resume automatically.

1. In the CommCell Browser, right-click the appropriate entity, click **All Tasks**, and then click **Operation Window**.
2. Click **Add**.
3. From the **Operation Window** dialog box:
 - o Enter the name of the rule in the **Name** field.

- o Select either an administration, data protection (either full or non-full), and/or a data recovery operation from the **Operations** pane.
4. Click **OK**.

OPERATING SYSTEM AND APPLICATION UPGRADES

Operating system upgrades are only supported when upgrading from one version of an OS to a different version of the same OS (e.g., Win2003 to Win2008). The two methods of upgrading are:

- **Seamless Upgrade** - This involves uninstalling the Agent software, upgrading the operating system, and then re-installing the Agent software.
- **Full OS Replacement** - This involves performing a clean install of a new version of the OS, re-installing any application software, then re-installing the CommServe, MediaAgent, and/or Agent software.

For Full OS Replacement, the client computer must be configured to have the CommServe, MediaAgent, and/or Client software re-installed to the same location, the same Fully Qualified Domain Name or short domain name, the same partitions, disk drive format (FAT, NTFS, et. al.), and IP configuration as previously.

If it is necessary to remove Agent software to facilitate an operating system or application upgrade, do not delete the icon for the Agent from the CommCell Console, or all associated backed up data will be lost.

Use the following strategy to upgrade the operating system software:

- Identify the computers you want to upgrade and the CommCell components installed on each of these computers.
- Choose the type of upgrade procedure you want to use on each computer: seamless or full replacement.
- CommServe, MediaAgent, and Client computers can be upgraded in any order.

GLOBAL FILTERS

Global Filters are exclusions that filter data from backups across all Agents in a CommCell that support the feature. Global Filters serve as a template for files, folders, and entities that should always be excluded from all (or most) backups in a CommCell, such as temporary data a computer does not retain or data that is recoverable by means other than a restore. This saves space on media and enhances backup performance.

By default, filters configured for a particular subclient override any Global Filters configured for the CommCell. You can, however, configure subclients to include global filters along with any filters already configured for the subclient.

CONFIGURE GLOBAL FILTERS

1. From the CommCell Browser, right-click the CommServe, click **Control Panel**, and then click **Global Filters**.
2. Select **Use Global Filters on All Subclients**.
3. Click **Browse** to locate the files or folders to be excluded from backups and click **OK**.
4. Click **OK** to save your changes.

ENABLE/DISABLE GLOBAL FILTERS FOR A SUBCLIENT

1. From the CommCell Browser, right-click the subclient for which you want to enable Global Filters and click **Properties**.
2. Click the **Filters** tab.
3. Select one of the following values from the **Include Global Filters** list:
 - o **ON** to enable Global Filters for this subclient.
 - o **OFF** to disable Global Filters for this subclient.
4. Click **OK**.

ERASE BACKUP DATA

The Erase Data feature allows you to permanently erase any data that can be backed up.

CONFIGURING ERASE DATA

To erase data, you need to first assign a Filter Storage Policy for Erasing Data. Follow the steps given below to assign a Filter Storage Policy:

1. From the CommCell Browser, right-click the storage policy that you want to use as a filter storage policy, then click **Properties**.
2. From the **General** tab of the **Storage Policy Properties** dialog box, select the **Allow Erase Data** check box.
3. Click **OK**.
4. From the CommCell Browser, right-click the **File System** agent icon and then click **Properties**.

5. From the **Storage Device** tab of the agent **Properties** dialog box, select a filter storage policy from the **Filter Storage Policy** list.
6. Click **OK**.

RUNNING AN ERASE DATA JOB

After the configuration has been completed, you can now browse and erase data.

1. From the CommCell Browser, right-click the **File System** agent, select **All Tasks** and then click **Erase Data By Browsing**.
2. You are warned that the data will be permanently removed. Click **Yes** to continue.
3. From the **Erase Data by Browsing** dialog box, click **Browse**.
4. In the **Browse Options** dialog box, select a browse time range and any advanced browse options, and click **OK**.
5. From the browse selection window, select the data objects that you want to erase, and click **OK**.
6. In the **Job Initiation** tab, select **Immediate** to run the job immediately.

You can track the progress of the job from the **Job Controller** or **Event Viewer**.

UNINSTALLING COMPONENTS

You can uninstall the components using one of the following methods:

Method 1: Uninstall Components Using the CommCell Console

Method 2: Uninstall Components at the Client

METHOD 1: UNINSTALL COMPONENTS USING THE COMMCELL CONSOLE

1. From the CommCell Browser, right-click the desired Client Computer and click **All Tasks -> Add/Remove Programs** and click **Uninstall Software**.
2. **Uninstall Software Options** dialog will appear.
3. In the **Uninstall Software** tab, select **Uninstall All** to uninstall all the software packages.
4. In the **Job Initiation** tab, select **Immediate** to run the job immediately.

You can track the progress of the job from the **Job Controller** or **Event Viewer**.

METHOD 2: UNINSTALL COMPONENTS AT THE CLIENT

You can uninstall the unix components using the cvpkgm utility.

The following table lists the File System components and their corresponding titles within the uninstall program's selection menu:

COMPONENT	COMPONENT TITLE IN UNINSTALL PROGRAM'S SELECTION MENU
File System iDataAgent	CVGxIDA
MediaAgent	CVGxMA
Base Module	CVGxBase

When uninstalling a component on a client computer, the following sequence must be used:

1. Uninstall all application components and updates.
2. Uninstall the MediaAgent (if one exists).
3. Uninstall the Base software.

ONLINE HELP LINKS

Use the following links to view the online help for the corresponding tabs in the CommCell Console:

OPERATIONS	ENTITY	ONLINE HELP LINKS	SUB LINKS
CONFIGURATION	Agent	Agent Properties (General) Agent Properties (Version) Agent Properties (Index) Agent Properties (Security) Agent Properties (Activity Control)	
	Subclient	Subclient Properties (General)	

		Subclient Properties (Content) Subclient Properties (Filters) Subclient Properties (Pre/Post Process) Subclient Properties (Encryption) Subclient Properties (Storage Device) Subclient Properties (Activity Control) Subclient Properties (Security)	Add Multiple Contents
	Backup Set	Backup Set (General) Backup Set (Security)	
BACKUP	Backup Options	Backup Options	Save As Script Command Line XML Options
	Advanced Backup Options	Advanced Backup Options (Data) Advanced Backup Options (Startup) Advanced Backup Options (Job Retry) Advanced Backup Options (Media) Advanced Backup Options (Data Path) Advanced Backup Options (VaultTracking) Advanced Backup Options (Alert)	
RESTORE	Restore Options	Restore Options (General) Restore Options (Job Initiation)	Save As Script Command Line XML Options
	Advanced Restore Options	Advanced Restore Options (General) Advanced Restore Options (Startup) Advanced Restore Options (Pre/Post) Advanced Restore Options (Copy Precedence) Advanced Restore Options (Data Path) Advanced Restore Options (Paths/Filters) Advanced Restore Options (Encryption) Advanced Restore Options (Job Retry) Advanced Restore Options (Map) Advanced Restore Options (Browse Options) Advanced Restore Options (Alert)	

ADVANCED TOPICS

Provides comprehensive information on additional capabilities for the following features:

- Audit Trail
- Storage Policies
- Storage Policy Copies
- Subclient Policies
- Schedule Policy
- Auxiliary Copy
- Operation Window
- Erase Backup Data
- Uninstalling Components

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Best Practices - Macintosh File System iDataAgent

RE-CONFIGURING DEFAULT SUBCLIENT CONTENT

We recommend that you do not re-configure the content of a default subclient because this would disable its capability to serve as a catch-all entity for client data. As a result, some data will not get backed up or scanned.

ELIMINATING BACKUP FAILURES

You can use filters to exclude items which consistently fail and that are not integral to the operation of the system or applications. Some items fail because they are locked by the operating system or application and cannot be opened at the time of the data protection operation. This often occurs with certain system-related files and database application files. Also, keep in mind that you will need to run a full backup after adding failed files to the filter in order to remove them.

ELIMINATING RESTORE FAILURES

When restoring data, do not set a quota for an object (such as a volume, directory, or user) that is lower than the amount already used. Doing so may cause improper results for data recovery operations.

Do not configure the content of a subclient while the parent node or any sibling subclient has a data backup or restore operation currently running on it.

RESTORE BY JOB

Avoid running restores by jobs for jobs associated with the default backup set, if you do not want to restore the operating system files or directories. The entire content of the backed up client will be restored and the client where you are restoring might run out of space.

ON DEMAND OPERATIONS

Perform On Demand operation when the contents change dynamically. Perform subclient-based operation when the contents do not change.

To perform On Demand Backups with multiple streams, create multiple content files. As each content file directly translates into a stream, it is recommended that each stream is reading off a different disk. However, to ensure that concurrent read operations on the same disk do not cause performance degradation, multiple content files should be used with care. For more information, refer Streams and Data Readers.

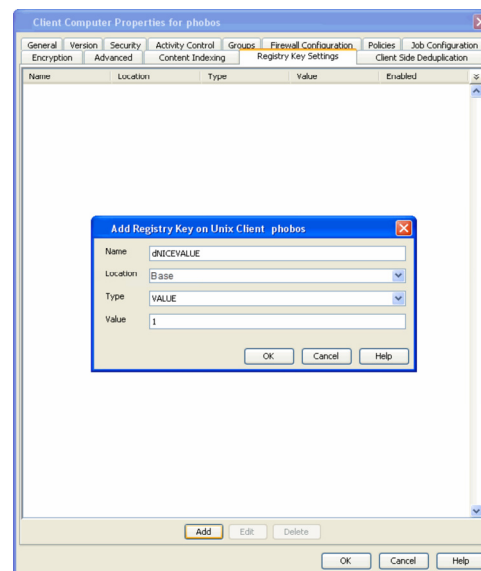
OPTIMIZING THE CPU USAGE ON PRODUCTION SERVERS

In virtualized environments (e.g., LPAR, WPAR, Solaris Zones etc.,) where dedicated CPUs are not allocated, backup jobs may result in high CPU usage on production servers. The following measures can be taken to optimize the CPU usage:

- Set the appropriate priority for the backup jobs using the `dNICEVALUE` registry key to restrict allocation of all the available CPU resources to a specific backup job. Use the following steps to set the registry key:

- From the CommCell Console, navigate to **Client Computers**.
- Right-click the **<Client>**, and then click **Properties**.
- Click the **Registry Key Settings** tab.
- Click **Add**.
- In the **Name** field, type `dNICEVALUE`.
- In the **Location** list, type `Base`.
- In the **Type** list, select **Value**.
- In the **Value** field, type `<NICE value>`.
- Click **OK**.

Restart the services on the client after setting this key.



- Client side compression, encryption, and deduplication operations also consume considerable CPU resources. Moving these operations from the client to the MediaAgent will help reduce the additional CPU load.

- Using a proxy server for SnapProtect operations will move the CPU load onto the proxy thereby decreasing the overhead on the production servers further.

Frequently Asked Questions - Macintosh File System iDataAgent

WHEN DOES A NON-FULL BACKUP AUTOMATICALLY GET CONVERTED TO A FULL BACKUP?

A non-full backup is automatically converted to a full backup in the following situations:

- First backup of the subclient.
- Re-associating a subclient to another storage policy.
- Promote a secondary storage policy copy that is not synchronized with a primary copy (for all the subclients of a storage policy).
- If a backup job within the most recent backup cycle is pruned or disabled from a primary copy.
- Adding a new content path to the subclient.
- If you switch from a SnapProtect backup to a traditional backup or vice versa.
- CommCell Migration operation.

HOW LONG IS THE BACKUP DATA RETAINED?

Each subclient is associated to a storage policy. How long the backup data will be retained on the backup media is determined by the retention rules set in the **Storage Policy Copy Properties** dialog box. This will affect media usage, and is an important consideration when planning your backups. A longer retention period, for example, could use more media for securing the data over time.

If a retention period other than infinite is selected, the data will be pruned according to backup cycles in relation to the retention rules you set in the **Storage Policy Copy Properties** dialog box. Pruned data can be overwritten on the backup media.

The backup data from a subclient will be retained according to the rules set for the storage policy associated with it. The ability to define data in subclients, and then associate them to specific storage policies allows you to prioritize exactly what data is retained and for how long.

For example, a client is being backed up with the Windows File System iDataAgent using the default subclient (which backs up the entire file system). It is associated to a storage policy that regularly ages the data. There is a critical folder on that client that you would like retained longer than the rest of the file system. You could create a new subclient with that critical folder as its content, and associate the new subclient with a storage policy that has the desired retention period.

When a user changes the storage policy association of a subclient, a subclient is deleted, or a client or an agent is deleted, only the retention days must be exceeded for data to be aged. In these cases, retention cycles are set to zero (0). However, when a client or an agent is deconfigured, the associated data will be aged according to the associated storage policy copy's defined retention time and cycle rules. In this case, retention cycles are honored. If necessary, you can enable the **Ignore Cycles Retention on De-Configured Clients** option from the **Control Panel | Media Management Configuration (Service Configuration)** dialog box so that the defined retention cycle rules are ignored for the data associated with deconfigured clients.

See Data Aging for detailed information and advanced concepts on Data Aging and retention. See Subclients for information on assigning a storage policy to a subclient.

WHAT PERMISSIONS DOES THE RESTORED DATA ACQUIRE AFTER THE RESTORES?

When performing restore operations (other than in-place restores), the restored data assumes the rights (i.e., permissions) of the parent directory.

HOW TO RUN PARALLEL BACKUPS USING SUBCLIENTS?

You can back up an entire instance more quickly by scheduling multiple subclients for simultaneous backup. This way, the backups proceed in parallel and take less time than if the instance were not divided into separate subclients.

Note, however, that in order for the subclient backups to run in parallel, they must be configured to use different storage policies or a storage policy that is configured to have at least as many data streams as the total required for all subclients you want to back up in parallel. If any of the subclients are configured to use the same storage policy, and if that storage policy is not configured for enough data streams, then a media group resource contention will arise, and the competing subclients will back up one after the other in a serial manner. For more information see Storage Policies and Media Groups.

WHAT ARE THE FOLDERS/FILES CREATED AND CHANGES DONE DURING INSTALL OF THIS AGENT?

PLATFORMS	FOLDERS CREATED	FILES CREATED	OTHER CHANGES
Macintosh	/opt/calypso/Base/calypso /usr/bin/calypso /usr/bin/cvpkgm /usr/bin/cvpkgcheck /usr/sbin/calypso /usr/sbin/cvpkgm	/etc/sysctl.conf (Darwin and FreeBSD when user selected to change IPC) etc/sysctl.conf.gal.bak (Darwin and FreeBSD only; backup if user selected yes for IPC change OR suggested settings if user selected not to change IPC this time) /etc/rc (Darwin only when user selected to	Startup Scripts: /Library/StartupItems/Galaxy/StartupParameters.plist /Library/StartupItems/Galaxy/Galaxy

<p>/usr/sbin/cvpkgcheck /usr/bin/cvpkgchg /usr/sbin/cvpkgchg /etc/galaxy /dev/cxbf /usr/bin/LaunchBrowser \$INSDIR/ \$INSSUBDIR/GUI/LaunchBrowser (only when CVGxGUI is installed) /usr/bin/console (only when CVGxGUI is installed) /usr/sbin/console (only when CVGxGUI is installed) /tmp/.gxsetup directory (during install and after install if failed) /var/log/.gxsetup directory (after install) /etc/gxsetup_guid</p>	<p>change IPC) /etc/rc.bak<n> where <n>="" , 1, 2, (backup if user selected yes for IPC change)</p>	
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Troubleshooting Backup - Macintosh File System iDataAgent

Backup | **Restore**

The following section provides information on some of the troubleshooting scenarios related to backup:

BACKUP FAILURES

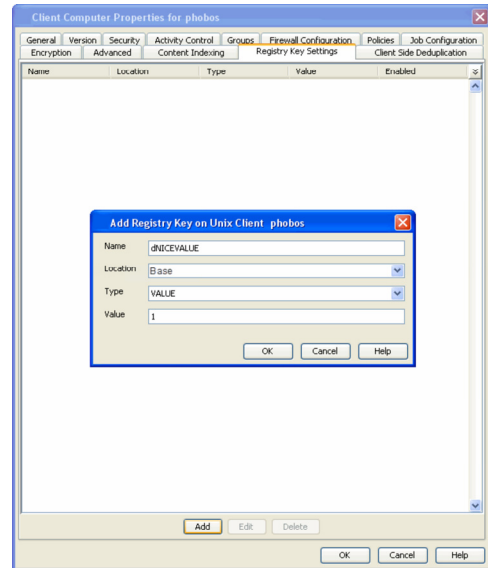
Backup fails	<p>The subclient content might have remote scripts with one or more blank lines at the top.</p> <p>Ensure that you delete the blank lines at the top of any remote scripts.</p>
Backup hangs indefinitely	<p>Ensure that there are no stale NFS mounts on the server included in the backup.</p> <p>If there are stale NFS mounts on the server, backups hang indefinitely. This can be avoided by either adding the mounted directory to the exclusion filter of the subclient or ensuring that the NFS mount points are available for backups.</p>
Error while loading shared libraries	<p>On Linux clients, the below error appears when we run any process or service:</p> <pre><process name>: error while loading shared libraries: <lib>.so: cannot enable executable stack as shared object requires: Permission denied</pre> <p>For example,</p> <pre>#!/ifind -getmnt -all ./ifind: error while loading shared libraries: libCvOnTap.so: cannot enable executable stack as shared object requires: Permission denied</pre> <p>As a workaround, do the following steps:</p> <ol style="list-style-type: none"> 1. Check if ASL (Atomic Secured Linux) is configured on client. <pre>#uname -r 2.6.32.59-17.art.i686.PAE</pre> <p>.art indicates that ASL is configured on the client.</p> 2. Check for the presence of the below logs in <code>/var/log/messages</code> file. <pre>May 24 22:01:08 rhel6 kernel: Aborting core May 24 22:01:08 rhel6 kernel: PAX: execution attempt in: <anonymous mapping>, bfc46000-bfc5b000 bffeb000 May 24 22:01:08 rhel6 kernel: PAX: terminating task: /usr/libexec/paxtest/mprotstack (mprotstack):13201, uid/euid: 0/0, PC: bfc5acf4, SP: bfc5acdc May 24 22:01:08 rhel6 kernel: PAX: bytes at PC: c3 1a a3 ae 2b ac 9f ae f4 0f 9f ae 00 00 00 00 f4 0f 9f ae</pre> 3. Run the following command. <pre>chpax -ps ../iDataAgent/<process/service></pre> <p>E.g.:</p> <pre>#chpax -ps /opt/calypso/iDataAgent/ifind</pre>

PRIORITY OF CALYPSO PROCESSES

By default, Calypso processes runs at default priority on the client computers. If there are available CPU cycles, then Calypso processes will use the available CPU for backup and restore operations. If the CPU is being used by other application or system processes, Calypso processes will not preempt them. In such cases, if you want to give higher priority to other application or system processes, which are running at the default priority, you can modify the priority of Calypso process using the following steps:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>**, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `dNICEVALUE`.
6. In the **Location** list, type `Base`.
7. In the **Type** list, select **Value**.
8. In the **Value** field, type `<NICE value>`.
9. Click **OK**.

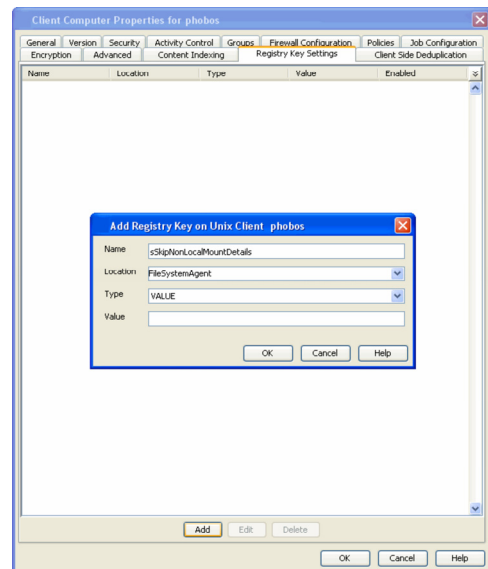
Restart the services on the client after setting this key.



EXCLUDING THE SCAN PHASE OF NON-LOCAL MOUNT POINTS

During default backups, the scan phase determines the size of all mount points even though they are not backed up by default. However, if some of the non-local mount points become unavailable, the scan phase stops processing. Use the following steps to skip the scan phase of all non-local mount points.

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>**, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `sSkipNonLocalMountDetails`.
6. In the **Location** list, type `FileSystemAgent`.
7. In the **Type** list, select **Value**.
8. Click **OK**.



COMPLETED WITH ONE OR MORE ERRORS

By default the backup jobs from Macintosh File System iDataAgent complete without any error messages.

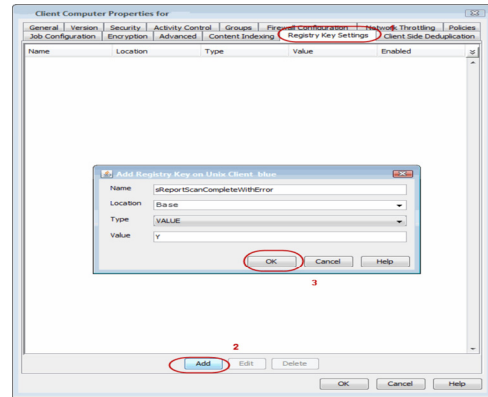
In the Scan phase files that cannot be accessed will be populated in scan_failures.cvf, in the following scenarios:

- Stat failed.
- If a file is deleted or renamed.
- Unable to open a directory during scan

To view the "Completed w/ one or more errors" message in the Job History in the Scan phase, follow the steps given below:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>** and click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `sReportScanCompleteWithError`.

6. In the **Location** field, type `FileSystemAgent`.
7. In the **Type** list, select **VALUE**.
8. In the **Value** field, type **'y'** or **'Y'** to enable the error message display or **'n'** or **'N'** to disable the error message display.
9. Click **OK**.

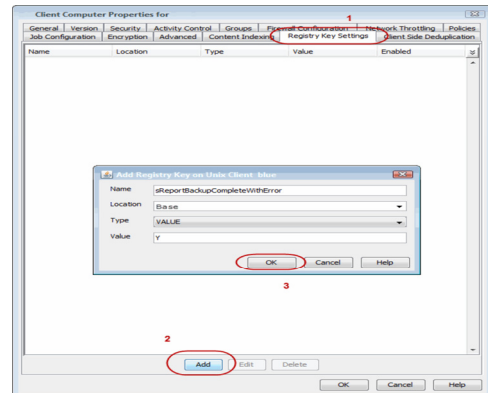


During backups the jobs will be marked partial success and reported into Failures.cvf, in the following scenarios:

- Stat failure on a backup file (moved/accessed, etc).
- Unable to open a directory.
- Error to get the file attributes.
- If File is locked.
- Path is a symbolic link and you are unable to read the symbolic link path.
- Critical error while reading extended attributes or ACLs of the file or directory.
- Size of the extended attributes or ACLs buffer exceeded the backup buffer size (default pipeline buffer size is 63kb).

To view the "Completed w/ one or more errors" message in the Job History after a backup, follow the steps given below:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>** and click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `sReportBackupCompleteWithError`.
6. In the **Location** field, type `FileSystemAgent`.
7. In the **Type** list, select **VALUE**.
8. In the **Value** field, type **'y'** or **'Y'** to enable the error message display or **'n'** or **'N'** to disable the error message display.
9. Click **OK**.



TROUBLESHOOTING PERFORMANCE ISSUES

If you are experiencing performance issues during backup, you can troubleshoot them by enabling logging of performance details in the log files. These performance counters contain information that help in resolving the performance related issues during backups.

The performance counters printed in the log files include:

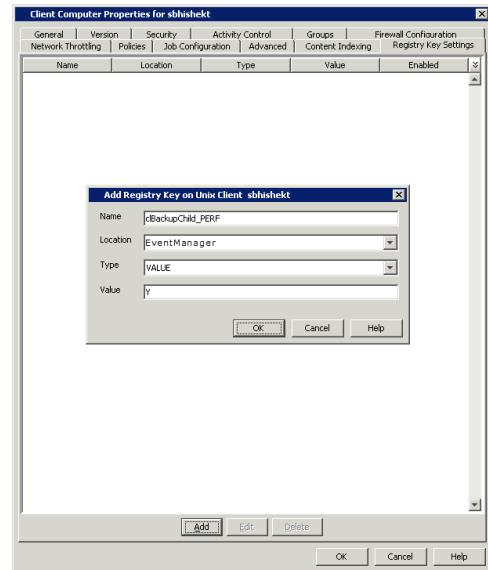
FileRead	Average time spent in system call to read the file.
CheckFileHole	Average time spent to verify if buffer read from the disk is a hole.
Close File	Average time spent in system call to close the file.
AllocBuffer	Average time spent waiting for the network buffer.
WriteBuffer	Average time spent in sending the network buffer to the network.
Disk Read	Average speed of reading from the disk.
Write	Average speed of writing to the network.

DISPLAYING PERFORMANCE DETAILS OF A BACKUP JOB

Use the following steps to display the performance details for a specific backup job:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>**, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.

5. In the **Name** field, type `clBackupChild_PERF`.
6. In the **Location** list, select or type `EventManager`.
7. In the **Type** list, select `Value`.
8. In the **Value** field, type `Y`.
9. Click **OK**.



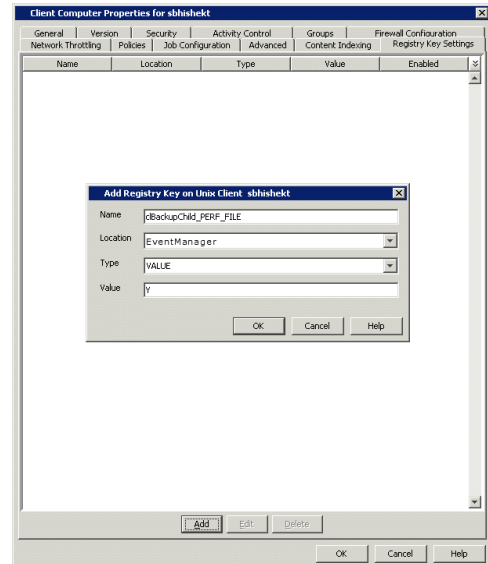
DISPLAYING PERFORMANCE DETAILS FOR EACH FILE IN A BACKUP JOB

In addition to viewing the performance details for a backup job, you can also view the performance details of each file in the backup job. This enables you to identify the specific file causing the performance issues.

Use the following steps to display performance details for each file in a backup job:

1. From the CommCell Console, navigate to **Client Computers**.
2. Right-click the **<Client>**, and then click **Properties**.
3. Click the **Registry Key Settings** tab.
4. Click **Add**.
5. In the **Name** field, type `clBackupChild_PERF_FILE`.
6. In the **Location** list, select or type `EventManager`.
7. In the **Type** list, select `Value`.
8. In the **Value** field, type `Y`.
9. Click **OK**.

This key should be used in conjunction with the `clBackupChild_PERF` registry key.



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Troubleshooting Restore - Macintosh File System iDataAgent

Backup | **Restore**

The following section provides information on some of the troubleshooting scenarios related to restore:

RESTORE FAILURES

Some of the files included in the user-defined subclient are not restored.	You may be performing the restore of user-defined subclient along with the restore of default subclient. When you are recovering data backed up by the default subclient, you cannot recover the data backed up by a user-defined subclient.
Browse from default subclient displays No Backup at Time error	Ensure that you do not include the root directory (/) as the subclient content. When performing point-in-time restore from the default subclient, include the data/folders under the root directory as the subclient content.
Restore fails when trying to perform an out-of-place restore.	Ensure that the file name along with the directory path to which the file is restored does not exceed 1024 characters.
Restore fails when trying to restore to a Unix FAT32 directory	You may be restoring the full contents of a Unix directory that contains more than 32,767 files to a single Unix FAT32 directory. The number of entries in a single FAT32 directory cannot exceed 32,767.
Error while loading shared libraries	On Linux clients, the below error appears when we run any process or service: <process name>: error while loading shared libraries: <lib>.so: cannot enable executable stack as shared object requires: Permission denied For example, #./ifind -getmnt -all ./ifind: error while loading shared libraries: libCvOnTap.so: cannot enable executable stack as shared object requires: Permission denied As a workaround, do the following steps: 1. Check if ASL (Atomic Secured Linux) is configured on client. #uname -r 2.6.32.59-17.art.i686.PAE .art indicates that ASL is configured on the client. 2. Check for the presence of the below logs in /var/log/messages file. May 24 22:01:08 rhel6 kernel: Aborting core May 24 22:01:08 rhel6 kernel: PAX: execution attempt in: <anonymous mapping>, bfc46000-bfc5b000 bffeb000 May 24 22:01:08 rhel6 kernel: PAX: terminating task: /usr/libexec/paxtest/mprotstack (mprotstack):13201, uid/euid: 0/0, PC: bfc5acf4, SP: bfc5acdc May 24 22:01:08 rhel6 kernel: PAX: bytes at PC: c3 1a a3 ae 2b ac 9f ae f4 0f 9f ae 00 00 00 00 f4 0f 9f ae 3. Run the following command. chpax -ps ../iDataAgent/<process/service> E.g.: #chpax -ps /opt/calypso/iDataAgent/ifind
ACLs are not restored	Sometimes, when you restore data to a NFS-mounted file system, ACLs and other extended attributes may not be restored.
Restore fails when trying to restore a running executable file.	Ensure that you are not including any running executable files in the restore operation.
Restore operation fails when special characters are included in the data	Restore operations on files containing [], /or the \ characters fail when restored without browsing. In order to restore these files using a browse operation, the directory that contains these files, or a higher level directory, must be selected in the browse window as content to restore. For example, if there is a file named file[]name in the /opt directory, then you must select the /opt directory or any directory that contains /opt for restore. If you select only the file, the restore will fail.
Browse and Restore Failure	<ul style="list-style-type: none"> When you browse the latest data on the default subclient after a full backup, the browse window will incorrectly display the top-level directories of any user-defined subclients that have not been backed up. Attempts to restore data from user-defined subclients that have not been backed up will fail. If you do a framed browse (i.e., select both a begin and end date/time for the browse) and select the entire resulting data tree for restore by selecting the top-most (or root) node, an erroneous error message is displayed stating that the restore operation failed. Restores under these circumstances are successful regardless of the error message. To avoid this error message, select the data to be restored from the next-to-highest level in the tree.

RECOVERING DATA ASSOCIATED WITH DELETED CLIENTS AND STORAGE POLICIES

The following procedure describes the steps involved in recovering data associated with the following entities:

- Deleted Storage Policy
- Deleted Client, Agent, Backup Set or Instance

BEFORE YOU BEGIN

This procedure can be performed when the following are available:

- You have a Disaster Recovery Backup which contains information on the entity that you are trying to restore. For example, if you wish to recover a storage policy (and the data associated with the storage policy) that was accidentally deleted, you must have a copy of the disaster recovery backup which was performed before deleting the storage policy.
- Media containing the data you wish to recover is available and not overwritten.
- If a CommCell Migration license was available in the CommServe when the disaster recovery backup was performed, no additional licenses are required. If not, obtain the following licenses:
 - IP Address Change license
 - CommCell Migration licenseSee License Administration for more details.
- A standby computer, which will be used temporarily to build a CommServe.

RECOVERING DELETED DATA

1. Locate the latest Disaster Recovery Backup which contains the information on the entity (Storage Policy, Client, Agent, Backup Set or Instance) that you are trying to restore.
 - You can check the Phase 1 destination for the DR Set or use Restore by Jobs for CommServe DR Data to restore the data.
 - If the job was pruned and you know the media containing the Disaster Recovery Backup, you can move the media in the **Overwrite Protect Media** Pool. See Accessing Aged Data for more information. You can then restore the appropriate DR Set associated with the job as described in Restore by Jobs for CommServe DR Data.
 - If the job is pruned and you do not know the media containing the Disaster Recovery Backup, you can do one of the following:
 - If you regularly run and have copies of the Data on Media and Aging Forecast report you can check them to see if the appropriate media is available.
2. On a standby computer, install the CommServe software. For more information on installing the CommServe, see CommServe Deployment.
3. Restore the CommServe database using the CommServe Disaster Recovery Tool from the Disaster Recovery Backup described in Step 1. (See Restore a Disaster Recovery Backup for step-by-step instructions.)
4. Verify and ensure that the **Bull Calypso Client Event Manager Bull Calypso Communications Service (EvMgrS)** is running.
5. If you did not have a CommCell Migration license available in the CommServe when the disaster recovery backup was performed, apply the IP Address Change license and the CommCell Migration license on the standby CommServe. See Activate Licenses for step-by-step instructions.
6. Export the data associated with the affected clients from the standby CommServe as described in Export Data from the Source CommCell.

When you start the Command Line Interface to capture data, use the name of the standby CommServe in the -
`commcell` argument.

7. Import the exported data to the main CommServe as described in Import Data on the Destination CommCell.

This will bring back the entity in the CommServe database and the entity will now be visible in the CommCell Browser. (Press F5 to refresh the CommCell Browser if the entity is not displayed after a successful merge.)
8. If you have additional data that was backed up after the disaster recovery backup and before the deletion of the entity, use the procedure described in Import Metadata from a Tape or Optical Media to obtain the necessary information.
9. You can now browse and restore the data from the appropriate entity.

As a precaution, mark media (tape and optical media) associated with the source CommCell as READ ONLY before performing a data recovery operation in the destination CommCell.

MACINTOSH OS SYSTEM RESTORE FAILED DUE TO KERNEL PANIC

During disaster recovery, when rebuilding the operating system, the computer does not restart correctly due to kernel panic. In such cases, refer Apple documentation to recover the system from kernel panic and resume the disaster recovery operation.