Administration Guide - Solaris File System *i*DataAgent

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Walks you through the process of installing and configuring the File System *i*DataAgent for Linux.

AIX
Walks you through the process of installing and configuring the File System *i*DataAgent for AIX

FreeBSD
Walks you through the process of installing and configuring the File System *i*DataAgent for FreeBSD.

HPUX
Walks you through the process of installing and configuring the File System *i*DataAgent for HPUX.

Solaris
Walks you through the process of installing and configuring the File System *i*DataAgent for Solaris.

Tru64
Walks you through the process of installing and configuring the File System *i*DataAgent for Tru64.

INTRODUCTION

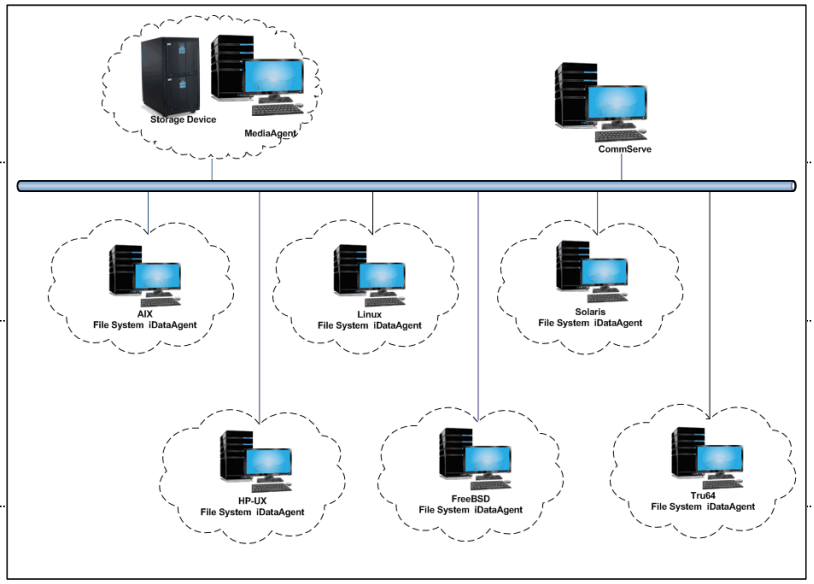
Calypso software provides a simplified end-to-end protection of file system data residing on all the Unix computers in your enterprise. In addition to complete protection of file system data for disaster recovery, it also provides a robust and comprehensive backup and recovery solution with significant speed performance and efficient use of disk and tape drives. It also assists you in full system rebuilds and eliminates recovery failures.

KEY FEATURES

The Unix File System *i*DataAgents offers the following key features:

SIMPLIFIED DATA MANAGEMENT

The Unix File System *i*DataAgents enables easy management of all the UNIX 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 Unix File System *i*DataAgent provides point-in-time recovery of files at any given time.

SNAPPROTECT BACKUP

SnapProtect backup enables you to create a point-in-time snapshot by temporarily quiescing the data, taking a snapshot, and then resuming live operations. SnapProtect backup works in conjunction with hardware snapshot engines.

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.

ADD-ON COMPONENTS

SRM FOR UNIX FILE SYSTEM

SRM is integrated with UNIX File System *i*DataAgent to provide several advanced reporting capabilities for your backups. When enabled, backup jobs collect details on the file systems currently being used or not used, the memory and hardware resources consumed, storage usage, and granular file-level analytics.

SRM reports include detailed information on the state of your file system data, including free space, used space, file count, file sizes, directory structure, and many other useful statistics.

In addition, **SRM summaries** provide a graphical, real-time representation of usage information such as memory and CPU utilization. Optional file-level analytics provides even more granular details at the file-level for optimizing your storage resources.

SRM integration with UNIX File System iDataAgent can be easily enabled with your backups to take advantage of these features.

1-TOUCH

1-Touch recovery helps to recover a crashed system in the least amount of time. By automatically rebuilding the operating system, you can recover systems with defective components such as inaccessible volumes or crashed disks. You don't need to reinstall the individual software packages or operating systems manually.

ONEPASS AGENT

The OnePass Agent is an integrated File System agent which backs up and archives the qualified data. It reclaims backup storage space when files and stubs are deleted on the primary storage.

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.

DESKTOP BROWSE

Desktop Browse enables users to browse and restore data from a Web Browser, which provides the facility to access and restore data from anywhere.

TERMINOLOGY

The Unix File System documentation uses the following terminology:

CLIENT	The computer in which the *i*DataAgent 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 *i*DataAgent.
SUBCLIENT	The Unix file system data to be backed up.

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System Requirements - Solaris File System *i*DataAgent

AIX | HP-UX | FreeBSD | Linux | Solaris | Tru64 | Supported Features

The following are the requirements for Solaris File System *i*DataAgent:

OPERATING SYSTEM		PROCESSOR
SOLARIS	Solaris 9	Sparc5 or higher recommended
	Solaris 11.x	Sparc5 or higher recommended
	Solaris 11.x	x64
	Solaris 10.x with a minimum of SunOS (Sparc) Patch 119963-14	Sparc5 or higher recommended
	Solaris 10.x (OpenSolaris supported)	x64
	Solaris 10.x (Flying Zones supported)	Sparc5 or higher recommended

CLUSTER - SUPPORT

The software can be installed on a Cluster if clustering is supported by the above-mentioned operating systems.

For information on supported cluster types, see Clustering - Support.

HARD DRIVE

750 MB minimum of hard disk space for software

100 MB of additional hard disk space for log file growth

500 MB of reserved hard disk space for the Job Results directory

1 GB of temp space required for install or upgrade (where the temp folder resides)
For information on space requirements to install/upgrade the File System and service pack, see Service Pack - System Requirements.

MEMORY

16 MB RAM minimum required beyond the requirements of the operating system and running applications

Swap space = 2*RAM size

SOLARIS ZONES/CONTAINERS SUPPORT

Data Protection of data residing on global and non-global zones is supported.

For a comprehensive list of supported components, see Unix Virtualization.

PERIPHERALS

DVD-ROM drive

Network Interface Card

MISCELLANEOUS

NETWORK

TCP/IP Services configured on the computer.

SUPPORTED FILE SYSTEMS

Unix File System (UFS)

VERITAS File System (VxFS)

VERITAS Cluster File System (VxCFS)

Zettabyte File System (ZFS)

VOLUME MANAGERS

Veritas Volume Manager (VxVM) 5.0 or higher

Solaris Volume Manager (SVM)

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 - Unix File System *i*DataAgent

AIX | HP-UX | FreeBSD | Linux | Solaris | Tru64 | 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**: • Follow 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	✓	On Demand Backup Set is not supported for SnapProtect Backup.
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	✓	SnapProtect Backup
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	✓	AIX, HP-UX, Linux and Solaris support VERITAS Cluster
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	✓	CommCell Migration is not supported for Unix Tru64 32-bit File System and for SnapProtect backups using Data Replicator storage arrays. CommCell Migration supports Browse and Restore, and recall of stubs but no new backups for OnePass.
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	✓	See Unix File System for more information.
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		
JOB RESTART - DATA RECOVERY	Not Restartable		
	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	✓	Multi Instancing is not supported for SnapProtect Backup.
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 - Linux File System Restore.
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 POLICIES	SubClient Policy	✓	
	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 - Solaris File System - Deploying in a Global Zone or Solaris Server

Previous Next

Use the following steps to install the File System *i*DataAgent on a Global Zone or a Solaris Server.

WHERE TO INSTALL

Install the software directly on the computer that you wish to protect. This can be one of the following:

- Solaris Servers
- Computer hosting the global zone

It is recommended to install the software on the global zone to protect non-changing or static data on non-global zones. If the data is dynamic or contains application data, install the software on the non-global zone.

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.

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.

METHOD 1: INTERACTIVE INSTALL

1. Logon to the client computer as **root** or as a sudo user.

   If you are installing the software using a sudo user account, make sure that sudo user account is configured on this computer. For more information, see FAQ - Install.

2. If you are installing the software from CD, run the following command to mount the CD:

   ```
   mount -r -F hsfs /dev/sr0 /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**.

   ```
   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]
   ```

6. If your computer is 32-bit, press **Enter**.

   If your computer is 64-bit, see Install Unix Agents on 64-bit Platform for step-by-step procedure.

   ```
   32 or 64?

   This machine supports both 32 bit and 64 bit binaries. By
   default, we will install 32 bit binary set that has full
   support for all the modules included in this package.
   Please note that 64 bit binary set currently only support
   limited modules.

   1) 32 bit

   2) 64 bit

   Your choice: [1]
   ```

7. Press **Enter**.

   ```
   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.

You now have a choice of performing a regular Calypso
install on the physical host or installing Calypso on a
virtual machine for operation within a cluster.

Most users should select "Install on a physical machine"
here.

1) Install on a physical machine

2) Install on a virtual machine

3) Exit

Your choice: [1]
```

8. 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.

```
We found one network interface available on your machine.
We will associate it with the physical machine being
installed, and it will also be used by the CommServe to
connect to the physical machine. 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 check the interface name below, and make
connections if necessary:

Physical Machine Host Name: [angel.company.com]
```

9. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

10. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**.

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

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

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

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[X] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

[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
```

12. Press **Enter**.

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

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.

```
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
```

14. Press **Enter**.

    It is recommended to download the latest Service pack(s). Type **Yes** and press **Enter** to automatically install the available updates during installation.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.
```

```
Do you want to download the latest service pack now? [no]
```

15. 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:

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

```
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]
```

16. 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]
```

17. 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.

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]
```

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

Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

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**.

```
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]
```

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**.
- You will come across this prompt when you install the software on the earlier versions of Solaris.

```
We now need to modify the /etc/system 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
the /etc/system file. Otherwise, the installation will
proceed, the changes will be saved to some other file, and
you will have to apply them manually.

set shmsys:shminfo_shmmni=8570 (was 7930)
set shmsys:shminfo_shmseg=8420 (was 7780)
set semsys:seminfo_semmns=10320 (was 9680)
set semsys:seminfo_semmni=8570 (was 7930)
set semsys:seminfo_semmsl=8570(was 7930)
Do you want us to apply these changes now? [no]
```

21. Press **Enter**.

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

```
Changes saved into /etc/system.gal.1744

Press <ENTER> to continue.
```

22. Press **Enter**.

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

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

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**.

```
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]
```

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.

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

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.

```
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
```

26. Press **Enter**.

```
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]
```

27. Enter the number associated with the storage policy you want use and press **Enter**.

```
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]
```

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 29.

```
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
```

28. Type **3** and press **Enter**.

```
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
```

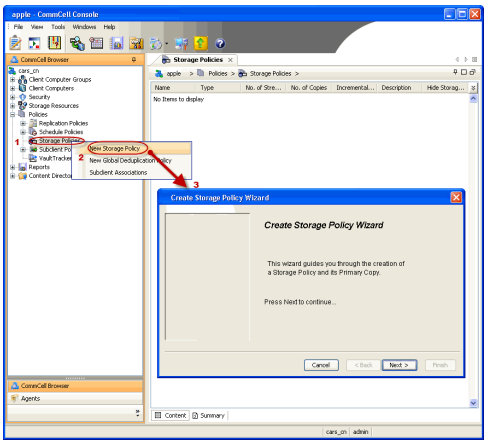
```
3) Exit

Your choice: [3]
```

If you already selected a storage policy in step 27, proceed to the Configuration section.

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

29.



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**.

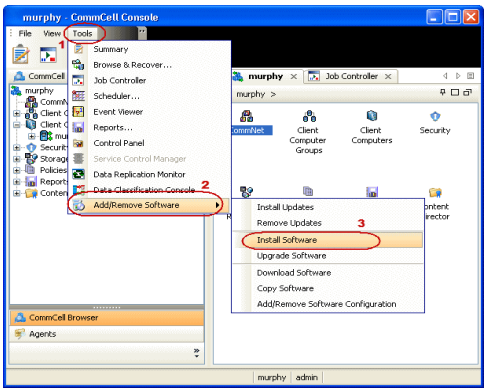
     Ensure that you select a library attached to a MediaAgent operating in the current release.
   - From the **MediaAgent** list, click the name of a MediaAgent that will be used to create the primary copy and then click **Next**.
   - For the device streams and the retention criteria information, click **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.

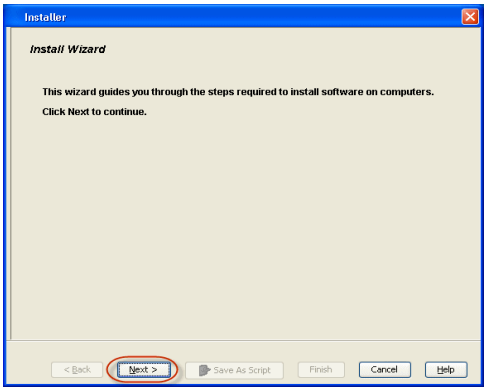
METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

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.

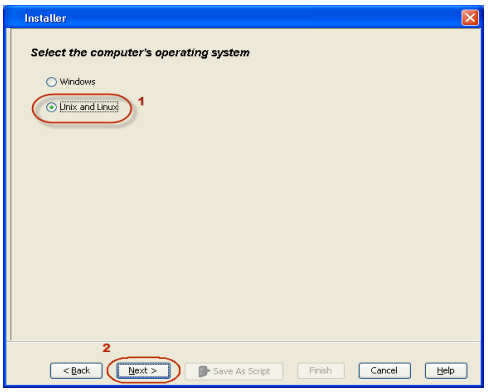
1. From the CommCell Browser, select **Tools** menu, point to **Add/Remove Software**, and then click **Install Software**.



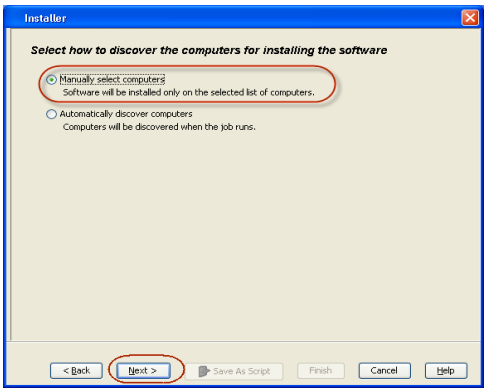
2. Click **Next**.



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



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

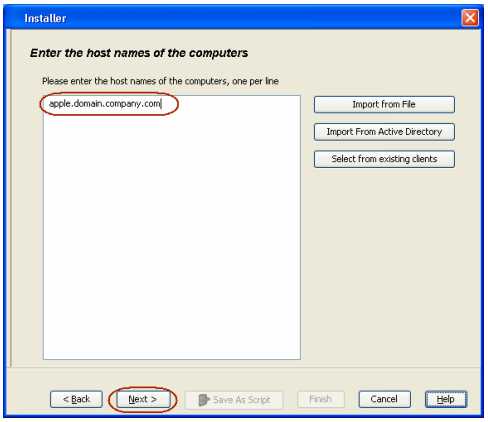


5. Enter the fully qualified domain name of the computer in which you wish to install.

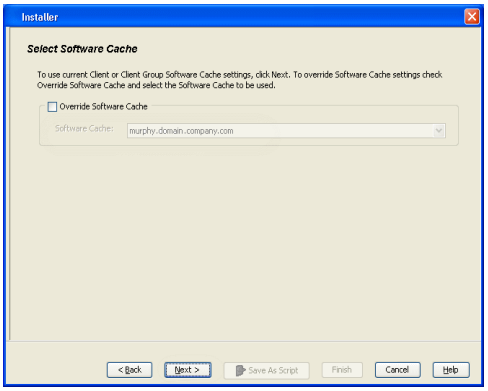
   For example: `apple.domain.company.com`

   The **Unix File System *i*DataAgent** 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.

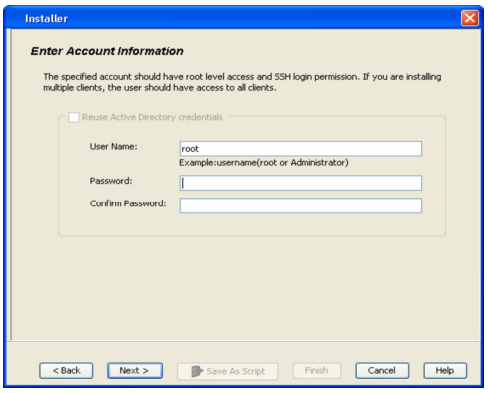
- For Sudo users with restricted privileges, in order to gain privilege to install the software remotely, you need to have **/bin/sh** added to the permission section in the sudoers file.

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'!`

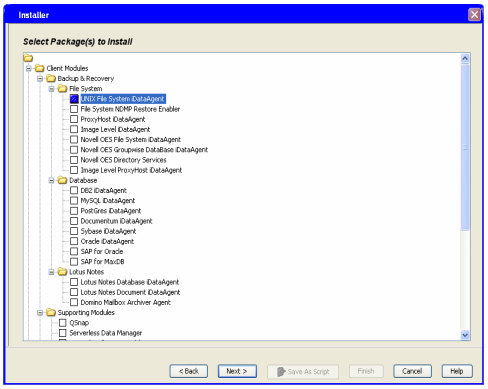
On Red Hat Enterprise Linux/CentOS:

- `Defaults requiretty`



8. Select **Unix File System *i*DataAgent**.

   Click **Next**.



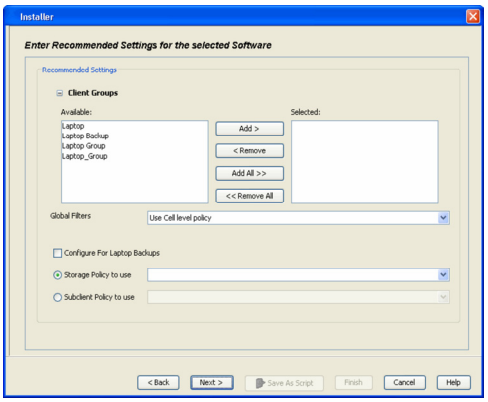
9.

- Select **Client Group** from **Available** and click **Add**.

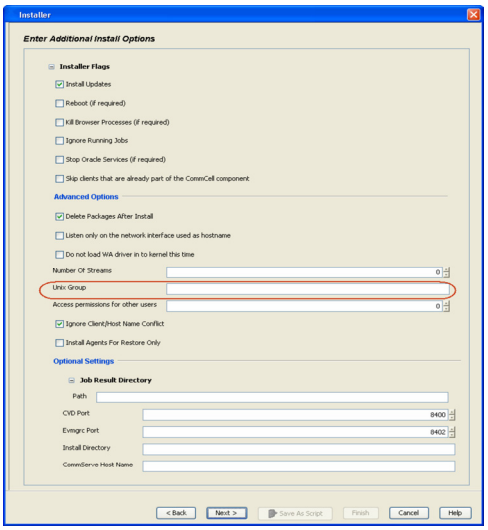
  Do not add more than one Client Group.

- 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.

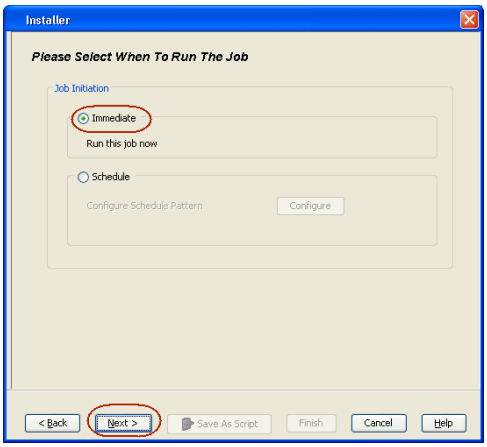


10. Click **Next**.

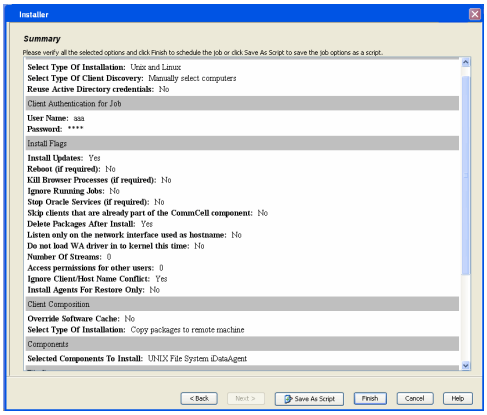


11. Select **Immediate**.

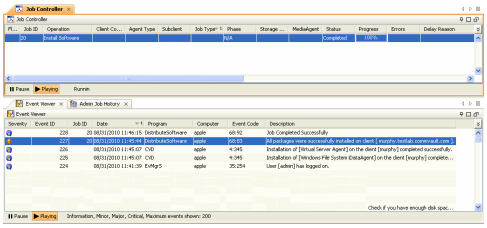
Click **Next**.



12. Click **Finish**.



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



Previous Next

Getting Started - Solaris File System - Deploying in a Non-Global Zone

Previous Next

SKIP THIS PAGE IF YOU ARE NOT INSTALLING THIS AGENT ON A NON-GLOBAL ZONE.

Click Next to continue with the deployment.

Use the following steps to install the File System *i*DataAgent on a Non Global Zone.

WHERE TO INSTALL

Install the software directly on the computer that you wish to protect on a Non-Global Zone.

It is recommended to install the software on the global zone to protect non-changing or static data on non-global zones. If the data is dynamic or contains application data, install the software on the non-global zone.

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.

RELATED TOPICS

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.

Firewall
Provides comprehensive information on firewall.

METHOD 1: INTERACTIVE INSTALL

1. Logon to the client computer as **root** or as a sudo user.

   If you are installing the software using a sudo user account, make sure that sudo user account is configured on this computer. For more information, see FAQ - Install.

2. Mount the installation package on the non-global zone.

   ```
   mkdir <Non-Global Zone root location>/<Non-Global Zone local directory>

   mount -F lofs <Global zone software Install package mount point> <Non-Global Zone root location>/<Non-Global Zone local directory>

   Connect to Non-Global Zone terminal
   ```

   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**.

   ```
   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]
   ```

6. If your computer is 32-bit, press **Enter**.

   If your computer is 64-bit, see Install Unix Agents on 64-bit Platform for step-by-step procedure.

   ```
   32 or 64?

   This machine supports both 32 bit and 64 bit binaries. By default, we will install 32 bit binary set that has full support for all the modules included in this package. Please note that 64 bit binary set currently only support limited modules.

   1) 32 bit
   ```

7. Press **Enter**.

```
2) 64 bit

Your choice: [1]

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.

You now have a choice of performing a regular Calypso
install on the physical host or installing Calypso on a
virtual machine for operation within a cluster.

Most users should select "Install on a physical machine"
here.

1) Install on a physical machine

2) Install on a virtual machine

3) Exit

Your choice: [1]
```

8. 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.

```
We found one network interface available on your machine.
We will associate it with the physical machine being
installed, and it will also be used by the CommServe to
connect to the physical machine. 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 check the interface name below, and make
connections if necessary:

Physical Machine Host Name: [angel.company.com]
```

9. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

10. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**.

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

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

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

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[X] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

[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
```

12. Press **Enter**.

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

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.

```
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
```

14. Press **Enter**.

    It is recommended to download the latest Service pack(s). Type **Yes** and press **Enter** to automatically install the available updates during

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
```

installation.

```
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

15. 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:

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

```
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]
```

16. 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]
```

17. 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**.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

18. Type **Yes** and 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.

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]
```

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

Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

20. 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**.

```
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]
```

21. 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**.
- You will come across this prompt when you install the software on the earlier versions of Solaris.

```
We now need to modify the /etc/system 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
the /etc/system file. Otherwise, the installation will
proceed, the changes will be saved to some other file, and
you will have to apply them manually.

set shmsys:shminfo_shmmni=8570 (was 7930)
set shmsys:shminfo_shmseg=8420 (was 7780)
set semsys:seminfo_semmns=10320 (was 9680)
set semsys:seminfo_semmni=8570 (was 7930)
set semsys:seminfo_semmsl=8570(was 7930)
Do you want us to apply these changes now? [no]
```

22. Press **Enter**.

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

```
Changes saved into /etc/system.gal.1744

Press <ENTER> to continue.
```

23. Press **Enter**.

You will see this message if you have accepted the default answer and pressed **Enter** in step 21.

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

24. 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**.

```
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]
```

25. 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.

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

26. 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.

```
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
```

27. Press **Enter**.

```
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]
```

28. Enter the number associated with the storage policy you want use and press **Enter**.

```
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]
```

If you do not have Storage Policy created, this message will be displayed.

```
There seem to be no Storage Policies configured on the
CommServe. Before you can run any backups of this IDA, you
```

You may not be prompted for user input.

You can create the Storage Policy later in step 30.

```
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
```

29. Type **3** to the **Exit** option and press **Enter**.

The installation is now complete.

```
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]
```

CHOICE If you already have a storage policy selected in step 28, proceed to the Configuration section.

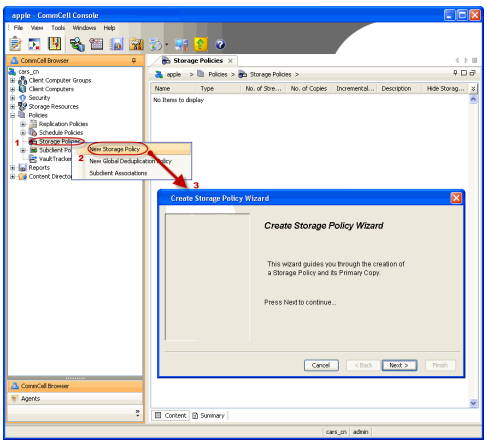
If you do not have Storage Policy created, follow the procedure given below.

30.

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.

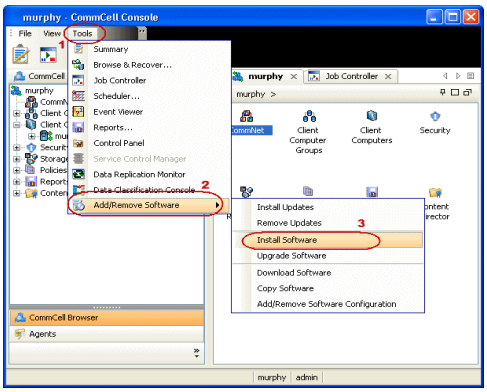
     Type the name of the folder in which the deduplication database must be located in the Deduplication Store Location or click the Browse button to select the folder and then click **Next**.
   - Review the details and click **Finish** to create the Storage Policy.



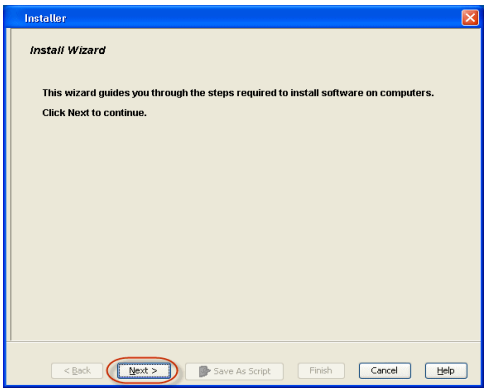
METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

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.

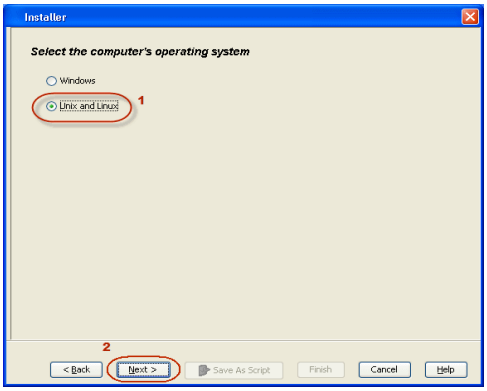
1. From the CommCell Browser, select **Tools** menu, point to **Add/Remove Software**, and then click **Install Software**.



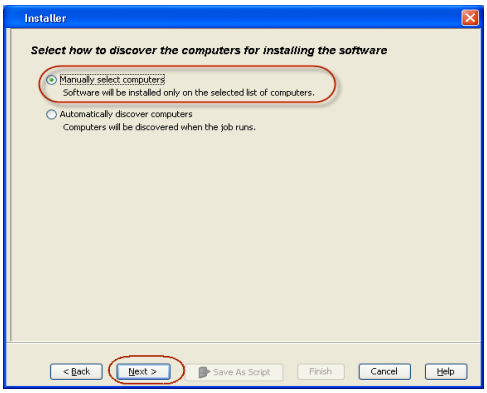
2. Click **Next**.



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



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

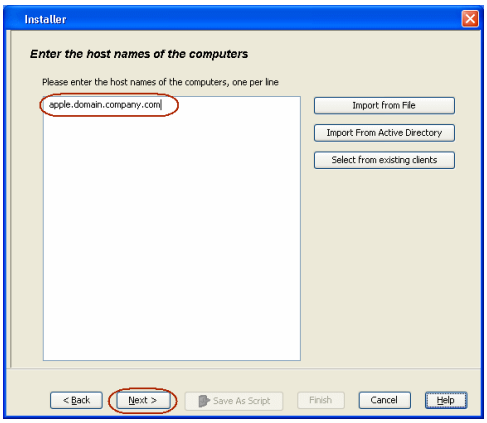


5. Enter the fully qualified domain name of the computer in which you wish to install.

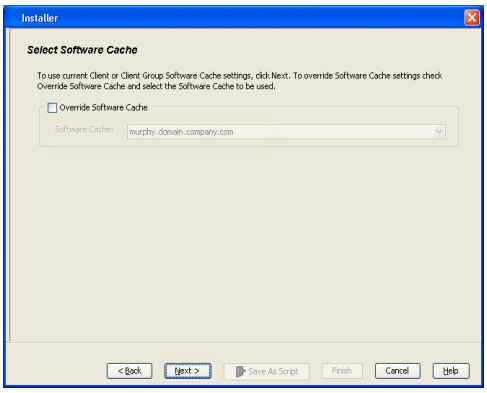
   For example: `apple.domain.company.com`

   The **Unix File System *i*DataAgent** will be installed on this client computer.

   Click **Next**.

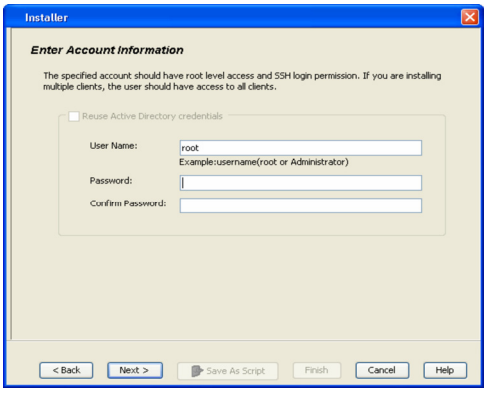


6. Click **Next**.



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:

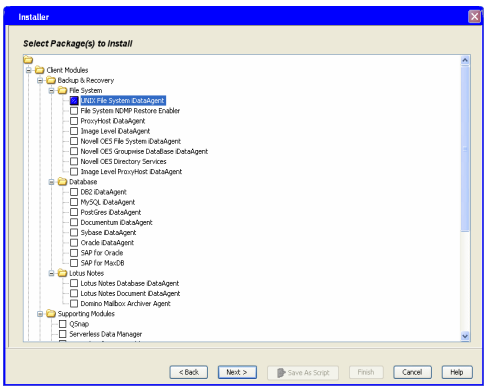
   - `Defaults targetpw # ask for the password of the target user i.e. root`
   - `ALL ALL=(ALL) ALL # WARNING! Only use this together with 'Defaults targetpw'!`

   On Red Hat Enterprise Linux/CentOS:

   - `Defaults requiretty`

8. Select **Unix File System *i*DataAgent**.

   Click **Next**.

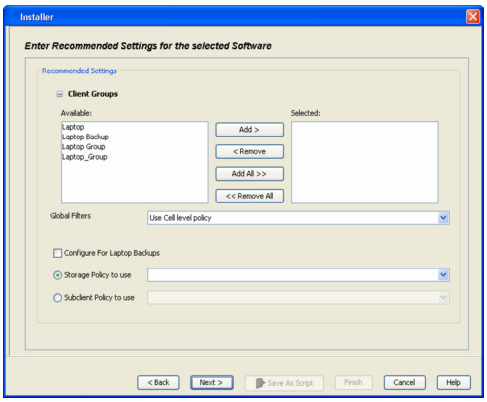


9. - Select **Client Group** from **Available** and click **Add**.

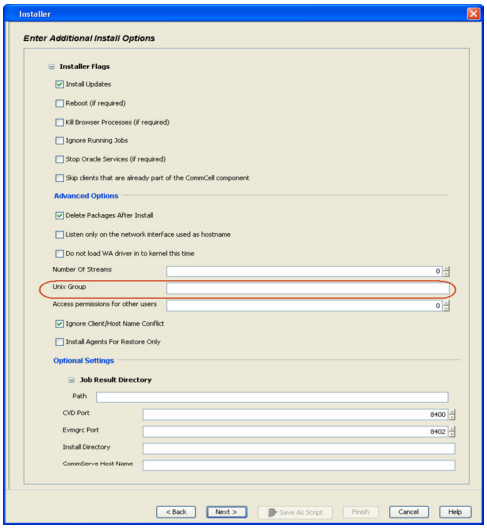
Do not add more than one Client Group.

- 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.

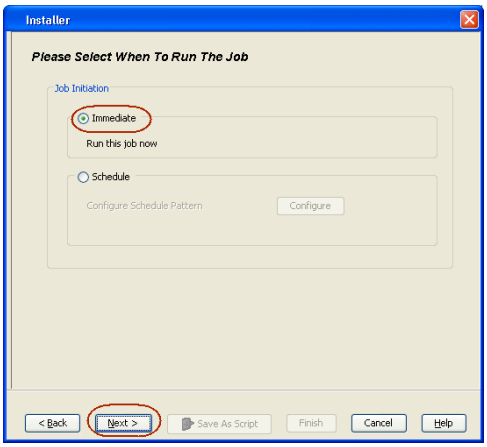


10. Click **Next**.

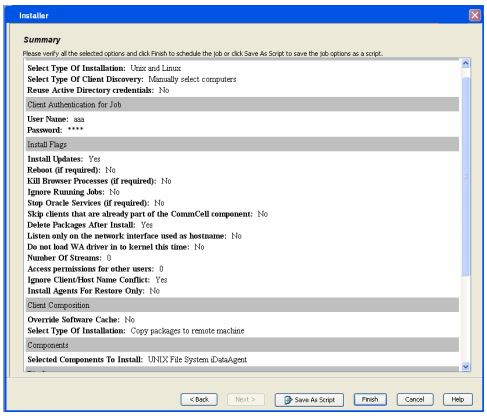


11. Select **Immediate**.

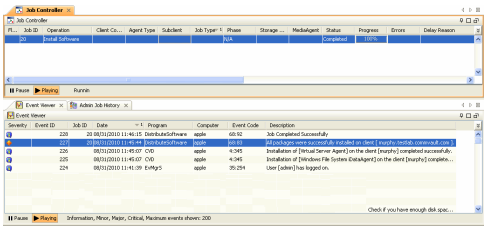
    Click **Next**.



12. Click **Finish**.



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



Previous Next

Getting Started - Solaris File System - Deployment on a Cluster

Previous Next

SKIP THIS PAGE IF YOU ARE NOT INSTALLING THIS AGENT ON A CLUSTER.

Click Next to continue with the deployment.

WHERE TO INSTALL

Install the software from the active node in the cluster group. Make sure the cluster group satisfies the minimum requirements specified in the System Requirements.

Follow the steps given below to install the File System *i*DataAgent in a Clustered Environment.

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.

1. Logon to the client computer as **root** or as a sudo user.

   If you are installing the software using a sudo user account, make sure that sudo user account is configured on this computer. For more information, see FAQ - Install.

2. If you are installing the software from CD, run the following command to mount the CD:

   ```
   mount -r -F hsfs /dev/sr0 /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**.

   ```
   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]
   ```

6. If your computer is 32-bit, press **Enter**.

   If your computer is 64-bit, see Install Unix Agents on 64-bit Platform for step-by-step procedure.

   ```
   32 or 64?

   This machine supports both 32 bit and 64 bit binaries. By
   default, we will install 32 bit binary set that has full
   support for all the modules included in this package.
   Please note that 64 bit binary set currently only support
   limited modules.

   1) All platforms(32 bit)

   2) FS and MS only(64 bit)

   Your choice: [1]
   ```

7. Press **Enter**.

   ```
   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.

   You now have a choice of performing a regular Calypso
   install on the physical host or installing Calypso on a
   virtual machine for operation within a cluster.

   Most users should select "Install on a physical machine"
   here.

   1) Install on a physical machine

   2) Install on a virtual machine

   3) Exit
   ```

8. 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.

```
Your choice: [1]

Physical Machine Host Name

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

Please select the correct network interface below.

 1) angel.company.com

 2) abc.company.com

Interface number: [1]
```

9. Press **Enter**.

```
Physical Machine Host Name

Please verify the physical machine interface name below.
Make it as complete (with fully qualified domain name) as
possible.Physical Machine Host Name: [angel.company.com]
```

10. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

11. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**.

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

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

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

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[X] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

[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
```

13. Press **Enter**.

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

14. 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.

```
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
```

15. Press **Enter**.

    It is recommended to download the latest Service pack(s). Type **Yes** and press **Enter** to automatically install the available updates during installation.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

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

    - If you want to specify a different path, type the path and then press **Enter**.

```
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
```

- 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:

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

```
in a "calypso" subdirectory, so if you enter "/opt", the
files will actually be placed into "/opt/calypso".

Installation Directory: [/opt]
```

17. 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]
```

18. Type **Yes** and 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.

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]
```

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

Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

20. 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**.

```
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]
```

21. 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**.
- You will come across this prompt when you install the software on the earlier versions of Solaris.

```
We now need to modify the /etc/system 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
the /etc/system file. Otherwise, the installation will
proceed, the changes will be saved to some other file, and
you will have to apply them manually.

set shmsys:shminfo_shmmni=8570 (was 7930)
set shmsys:shminfo_shmseg=8420 (was 7780)
set semsys:seminfo_semmns=10320 (was 9680)
set semsys:seminfo_semmni=8570 (was 7930)
set semsys:seminfo_semmsl=8570(was 7930)
Do you want us to apply these changes now? [no]
```

22. Press **Enter**.

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

```
Changes saved into /etc/system.gal.1744

Press <ENTER> to continue.
```

23. Press **Enter**.

You will see this message if you have accepted the default answer and pressed **Enter** in step 21.

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

24. 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**.

```
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]
```

25. 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.

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

26. 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.

```
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
```

27. Press **Enter**.

```
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]
```

28. 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

```
Client Group(s) is currently configured on CommServe
mycommserve.company.com. Please choose the group(s) that
you want to add this client angel.company.com to. The
selected group(s) will be marked (X) and can be deselected
if you enter the same number again. After you are finished
with the selection, select "Done with the Selection".

[ ] 1) Unix

[ ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

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

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

```
Client Group(s) is currently configured on CommServe
cs.company.com. Please choose the group(s) that you want
to add this client client.company.com to. The selected
group(s) will be marked (X) and can be deselected if you
enter the same number again. After you are finished with
the selection, select "Done with the Selection".

[ ] 1) Unix

[X ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

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

30. Enter the number associated with the storage policy you want use and press **Enter**.

```
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
```

If you do not have Storage Policy created, this message will be displayed. You may not be prompted for user input.

You can create the Storage Policy later in step 41.

31. Type **2** to install **Unix File System *i*DataAgent** on a Virtual machine , and press **Enter**.

```
Cluster Support

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: [2]
```

32. 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.

```
Virtual Machine Host Name

Please enter the hostname or IP address of the virtual
machine being installed. It can be either short or long;
the only requirement is that it must be resolvable by the
name services configured on this machine

WARNING: You should follow this path ONLY if this host
participates in a cluster and you really want to install
Calypso on the virtual machine. This is

NOT how most people will use Calypso.

The name to be entered will be used by certain Calypso
CommServe to talk to this

virtual machine. Datapipe Interface Pairs used for the
backup data traffic can be customized later in the Calypso
Java GUI.

If you got into this screen by mistake, hit ^C and restart
cvpkgadd.

Virtual Machine Host Name: docm.company.com
```

33. Type the **Virtual Machine Client Name**, and press **Enter**.

```
Virtual Machine Client Name

Please specify the client name for this machine.

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.

Virtual Machine Client Name: [docm]
```

34. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**.

```
Install Calypso on virtual machine docm

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

>) >>>>>>>>>>>> NEXT PAGE >>>>>>>>>>>>

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

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

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

```
Install Calypso on virtual machine docm

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[x ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

>) >>>>>>>>>>>> NEXT PAGE >>>>>>>>>>>>

[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
```

36. Press **Enter**.

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

37. Specify the path for the **Job Results directory**, and press **Enter**

If Job Results directory does not exist, it prompts you to create it. Type **Yes** to create it.

```
Calypso Job Results Directory Please specify the name for
the JobResults directory.Since you are installing Calypso
on a virtual machine, the JobResults directory must reside
on a shared disk and should have at least 20MB of free
space available. The directory will be used to store
intermediate data that should be passed from one backup
phase to another.

JobResults Directory:
```

38. Enter the number associated with the storage policy you want use and press **Enter**.

```
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]
```

If you do not have Storage Policy created, this message will be displayed. You may not be prompted for user input.

You can create the Storage Policy as shown in step 41.

```
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
```

39. Type **4** to the **Exit** option and press **Enter**.

The installation is now complete.

```
Calypso is currently configured on the following
virtual/physical machines.

Now you have an option of either installing certain
Calypso on another virtual machine

or adding a new package to the existing installations.1)
Add a new package to PM angle(angel.mycompany.com)

2) Add a new package to VM docm (docm.mycompany.com)

3) Install  Calypsopackages on a new virtual machine

4) Exit this menu

Your choice: [1] 4
```

40. Type **3** to the **Exit** option, and press **Enter**.

```
Install a new Instance?

Calypso now supports the concept of instances, each of
which can be installed to a separate CommServe and be
totally independent of others. Instances are not the same
as the virtual machines on a cluster, in fact, you will be
given a choice to configure one or more virtual machines
later. Contrary to previous releases of Calypso (6.1 and
older), all virtual machines installed on the same host
now share the same set of binaries and the same set of
services.

Instances, on the other hand, have unique set of binaries
and services and one situation where it is useful is when
you want to back up the same host to several CommServes.

You already have one instance configured.

1) Add agents to existing Instance001 going to CS
mycommserve.company.com

2) Create a new instance of Calypso

3) Exit this menu

Your choice: 3
```

CHOICE

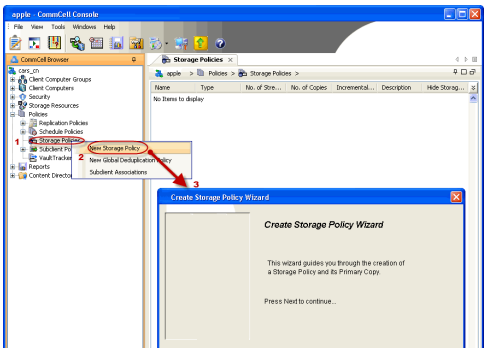
If you already selected a storage policy in step 30, proceed to the Configuration section.

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

41.

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.

Previous Next

Getting Started - Solaris File System - Deployment on a Veritas Cluster

Previous Next

SKIP THIS PAGE IF YOU ARE NOT INSTALLING THIS AGENT ON A VERITAS CLUSTER.

Click Next to begin Configuration

WHERE TO INSTALL

Install the software on the Solaris computer where you have application data and is part of Veritas Cluster.

Follow the steps given below to install the File System *i*DataAgent in a Veritas Clustered Environment.

RELATED TOPICS

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.

Firewall
Provides comprehensive information on firewall.

INSTALLING THE SOLARIS FILE SYSTEM IDATAAGENT - VERITAS CLUSTERED ENVIRONMENT

1. Logon to the client computer as **root** or as a sudo user.

   If you are installing the software using a sudo user account, make sure that sudo user account is configured on this computer. For more information, see FAQ - Install.

2. If you are installing the software from CD, run the following command to mount the CD:

   ```
   mount -r -F hsfs /dev/sr0 /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. Type **2** and press **Enter**.

   ```
   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]
   ```

6. Type the number associated with the **Veritas Cluster Agents** and press **Enter**.

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

   [Record and Play]
   1) Create a recording of user selections (Record Mode
   2) Play a recorded install on this computer
   [Custom Package Creator]
   3) Create a custom install package
   [De-coupled Installer]
   4) Pre-install software Components [De-couple Mode]
   [Integrated File Archiver]
   5) File System iDataAgent with Archiving Enabler
   [Customized Cluster Agents]
   6) Veritas Cluster Agents
   [Third Party Connector]
   7) Symantec NetBackup Agent
   8) NetApp Snap Manager for Oracle
   9) NetApp Snap Manager for SAP/Oracle
   [Done]
   10) Exit this menu

   Your choice: [1] 6
   ```

7. Enter the number corresponding to the binaries that you wish to install.

   - Select 32 bit when installing on a 32-bit computer.
   - When installing on a 64-bit computer, if this is the first package, determine whether you want to install 32-bit binaries or 64 bit

   ```
   This machine supports both 32 bit and 64 bit binaries. By
   default, we will install 32 bit binary set that has full
   support for all the modules included in this package.
   Please note that 64 bit binary set currently only support
   limited modules.

   1) All platforms (32 bit)
   ```

binaries.

You can determine this by verifying whether all the components that you wish to install in this computer are supported in 64-bit in System Requirements.

Note that when the first component is installed using 64-bit binaries, you cannot subsequently install another component using 32-bit. (Or vice-versa.)

```
2) FS and MA only (64 bit)

Your choice: [1] >>> User answer was "1"
```

8. Type the number corresponding to the VCS service group and press **Enter**.

```
Please select one service group from the list below:

1) AIXVCS

2) ClusterService

Service Group: [1]
```

9. Type **2** and press **Enter**.

```
Please select physical or virtual machine to install:

1) Install Calypso on a physical machine ibmaix21

2) Install Calypso on a virtual machine AIXVCS

3) Exit this menu

Your choice: [1] >>> User answer was "2"
```

10. Type appropriate number to select client host name and press **Enter**.

```
Please select the client hostname or IP address below.

1) aix61cluster.mydomain.mycompany.com

Interface number: [1] >>> User answer was "1".
```

11. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**.

```
Install Calypso on physical machine client.company.com

Select the Calypso module that you would like to install

[ ] 1) Media Agent        [1301] [CVGxMA]
[ ] 2) UNIX FileSystem iDataAgent     [1101] [CVGxIDA]
    >) >>>>> NEXT PAGE  >>>>>>

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

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

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

```
Install Calypso on physical machine client.company.com

Select the Calypso module that you would like to install

[ ] 1) Media Agent        [1301] [CVGxMA]
[X] 2) UNIX FileSystem iDataAgent     [1101] [CVGxIDA]
    >) >>>>> NEXT PAGE  >>>>>>

[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
```

13. Press **Enter**.

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

14. 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.

```
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
```

15. Press **Enter**.

It is recommended to download the latest Service pack(s). Type **Yes** and press **Enter** to automatically install the available updates during installation.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

16. 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:

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

```
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]
```

17. 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]
```

18. Type **Yes** and 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.

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]
```

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

Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

20. 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**.

```
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]
```

21. 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**.
- You will come across this prompt when you install the software on the earlier versions of Solaris.

```
We now need to modify the /etc/system 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
the /etc/system file. Otherwise, the installation will
proceed, the changes will be saved to some other file, and
you will have to apply them manually.

set shmsys:shminfo_shmmni=8570 (was 7930)
set shmsys:shminfo_shmseg=8420 (was 7780)
set semsys:seminfo_semmns=10320 (was 9680)
set semsys:seminfo_semmni=8570 (was 7930)
set semsys:seminfo_semmsl=8570(was 7930)
Do you want us to apply these changes now? [no]
```

22. Press **Enter**.

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

```
Changes saved into /etc/system.gal.1744

Press <ENTER> to continue.
```

23. Press **Enter**.

```
Although a 'no' answer can be selected to this question
during install, the user should make sure the min
```

You will see this message if you have accepted the default **no** and pressed **Enter** in step 20.

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

24. 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**.

```
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]
```

25. 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.

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

26. 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.

```
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
```

27. Specify the path for the **Job Results directory**, and press **Enter**

If Job Results directory does not exist, it prompts you to create it. Type **Yes** to create it.

```
Please specify the name for the JobResults directory.

Since you are installing Calypso on a virtual machine, the
JobResults directory must reside on a shared disk and
should have at least 20MB of free space available. The
directory will be used to store intermediate data that
should be passed from one backup phase to another.

JobResults Directory:
```

28. 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

```
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]
```

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

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

This screen will be displayed only if Client Groups are configured for the CommCell.

```
Client Group(s) is currently configured on CommServe
cs.company.com. Please choose the group(s) that you want
to add this client client.company.com to. The selected
group(s) will be marked (X) and can be deselected if you
enter the same number again. After you are finished with
the selection, select "Done with the Selection".

[ ] 1) Unix
[ ] 2) DR
[ ] 3) DKS

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

30. Enter the number corresponding to the storage policy through which you want to back up the File System *i*DataAgent and then press **Enter**.

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

1) SP_StandAloneLibrary2_2
2) SP_Library3_3
3) SP_MagLibrary4_4
4) fornax_fornax_HWCmp
5) ranger_ranger_HWCmp
6) fornax_fornax_ClntCmp
7) fornax_fornax_MACmp
8) fornax_fornax_NoCmp

Storage Policy: [1]
```

If you do not have Storage Policy created, this message will be displayed.

```
There seem to be no Storage Policies configured on the
```

You may not be prompted for user input.

You can create the Storage Policy later in step 32.

```
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
client.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 client.company.com

2) Install Calypso on a virtual machine

3) Exit

Your choice: [1]
```

31. Type **3** to the **Exit** option and press **Enter**.

The installation is now complete.

CHOICE If you already have a storage policy selected in step 30, you can proceed to the Configuration section.

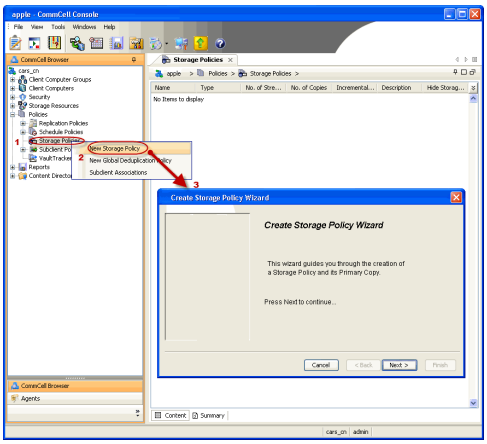
If you do not have Storage Policy created, follow the procedure given below.

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.



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Getting Started - Solaris File System Configuration

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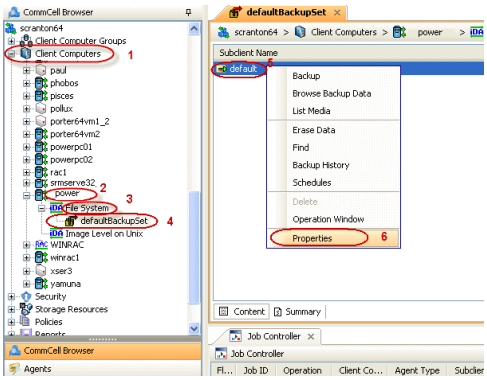
CONFIGURATION

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

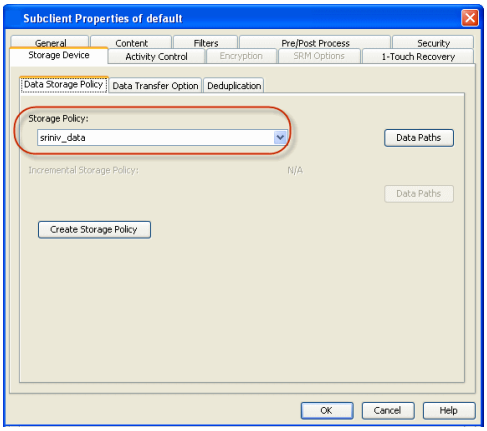
1.
   - From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System | defaultBackupSet**.
   - Right-click the default subclient and then click **Properties**.



2.
   - Click the **Storage Device** tab.
   - In the **Storage Policy** box, select a Storage Policy name.
   - Click **OK**.

   Click Next to continue.

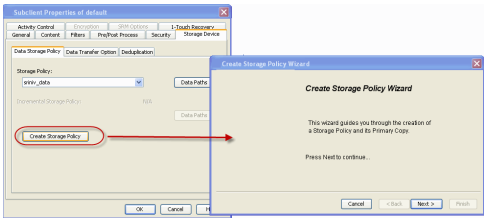
   If you do not have Storage Policy created, follow the step given below to create a storage policy.



3.
   1. Click **Create Storage Policy**.
   2. 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.



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Getting Started - Solaris File System Backup

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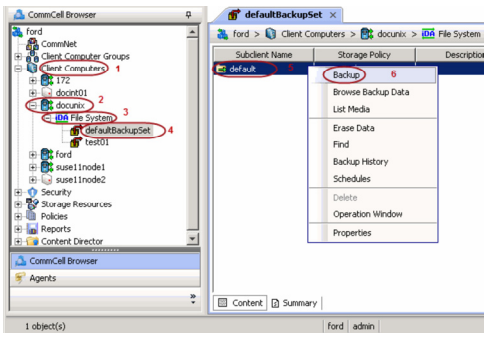
WHAT GETS BACKED UP	WHAT DOES NOT GET BACKED UP
FILE SYSTEMS Unix File System (UFS) VERITAS File System (VxFS) VERITAS Cluster File System (VxCFS) Zettabyte File System (ZFS) Extended attributes in the VxFS, UFS, and ZFS file systems In a zone environment, Loopback File System (LOFS) is backed up by default. If you do not want to backup LOFS file system, you can exclude it by Configuring Filters For Backups. **VOLUME MANAGERS** Veritas Volume Manager (VxVM) 5.0 or higher Solaris Volume Manager (SVM)	By default, the following file systems are automatically skipped during backups: • nfs • hsfs • autofs • mvfs • lofs • tmpfs • proc • ctfs
FILE SYSTEM ELEMENTS Files with holes Files with Advisory Locks 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 Shares with Macintosh File System data	Files with mandatory locks - these files are not backed up by default. See Configuring Backups For Locked Files to backup files with mandatory locks. Files for which the file path or file name contains more than 1024 characters

PERFORM A BACKUP

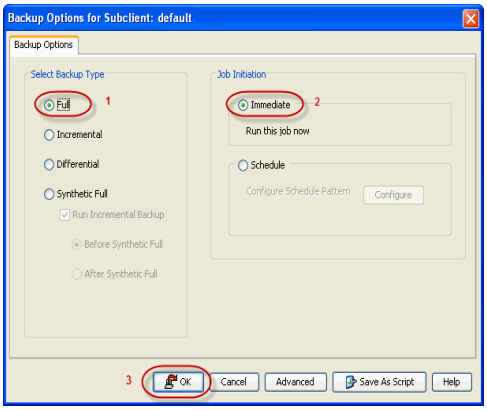
Once the storage policy is configured, you are ready to perform your first backup.

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

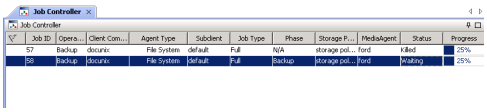
1.
   - From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System | defaultBackupSet**.
   - Right-click the default subclient and click **Backup**.



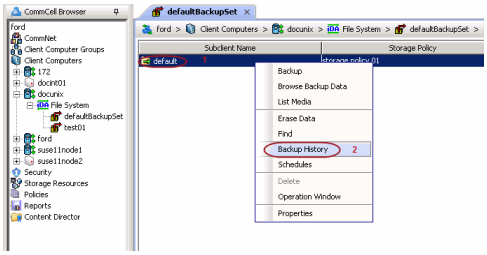
2.
   - Click **Full** as backup type and then click **Immediate**.
   - Click **OK**.



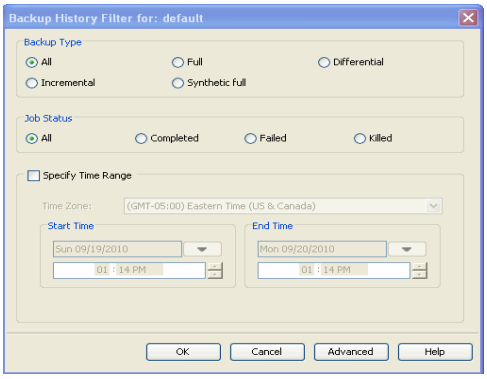
3. You can track the progress of the job from the **Job Controller** window of the CommCell console.



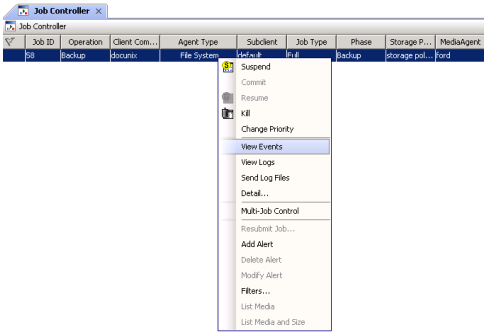
4. Once the job is complete, view the job details from the **Backup History**. Right-click the **Subclient** and select **Backup History**.



5. Click **OK**.



6. 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



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Getting Started - Solaris File System Restore

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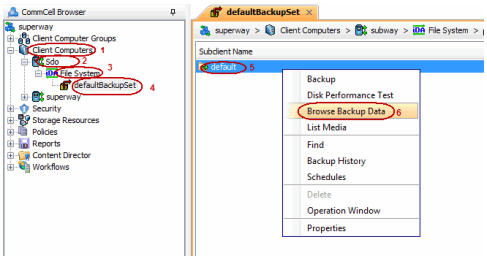
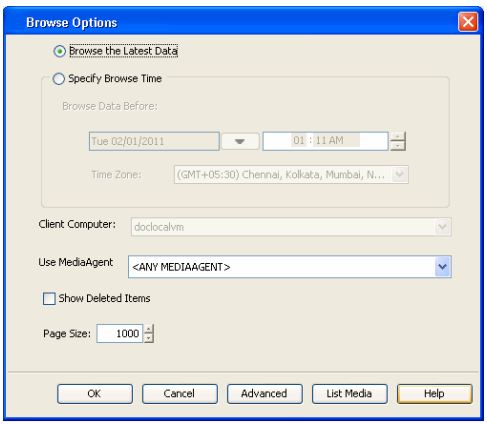
PERFORM A RESTORE

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.

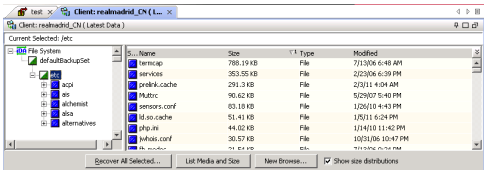
1.
   - From the CommCell Browser, navigate to **Client Computers| <*Client*> | File System | defaultBackupSet**
   - Right-click the default subclient and then click **Browse Backup Data**.



2. Click **OK**.

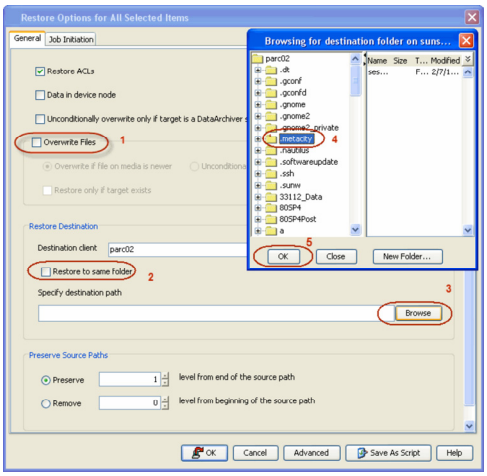


3.
   - Expand the **defaultBackupSet** and navigate to **etc** folder.
   - Select the **etc** folder.
   - Click **Recover All Selected**.

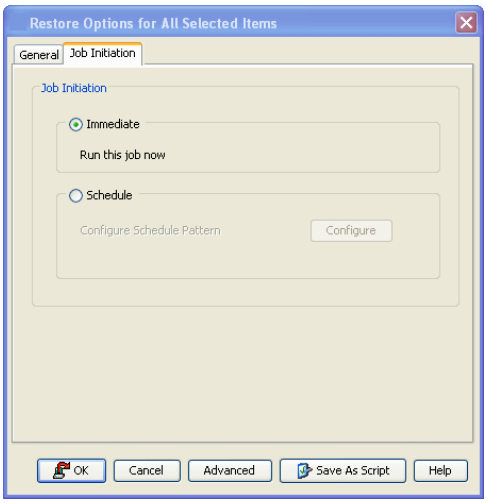


4.
   - Clear the **Overwrite Files** and **Restore to same folder** options.
   - Specify the destination path by clicking **Browse** button.

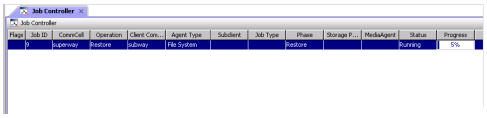
     This will ensure that the existing files are not overwritten.
   - Click **OK**.



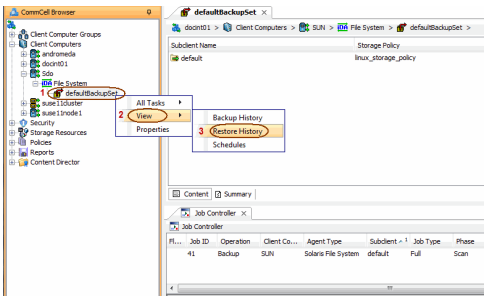
5.
   - Click the **Job Initiation** tab.
   - Select **Immediate** to run the job immediately.
   - Click **OK**.



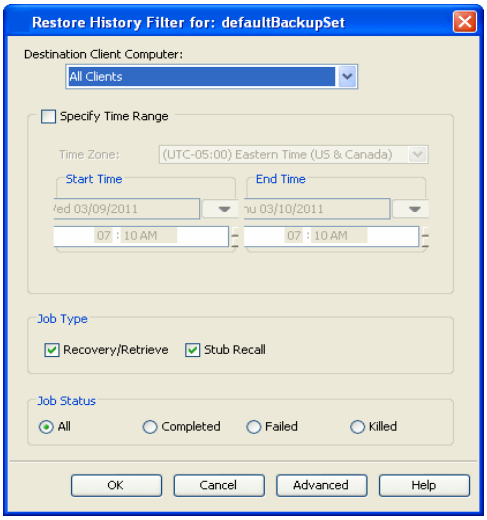
6. You can monitor the progress of the restore job in the **Job Controller** window of the CommCell Console.



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

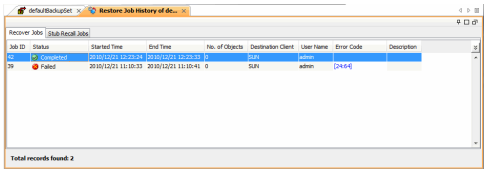


8. Click **OK**.



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.

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Advanced - Solaris File System Configuration

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UNDERSTANDING THE COMMCELL CONSOLE

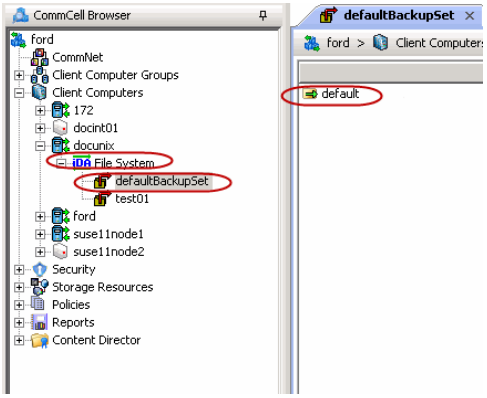
The File System *i*DataAgent uses the following entities to manage backup and restore operations from the CommCell Console.

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 *i*DataAgent.



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
```

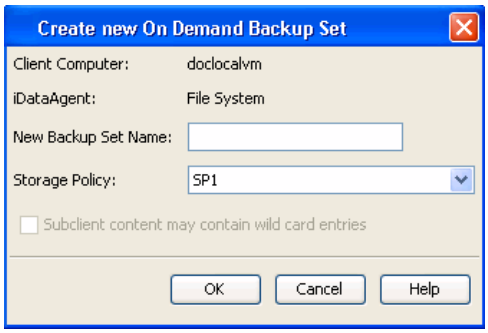
CONFIGURING ON DEMAND BACKUP SETS

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:

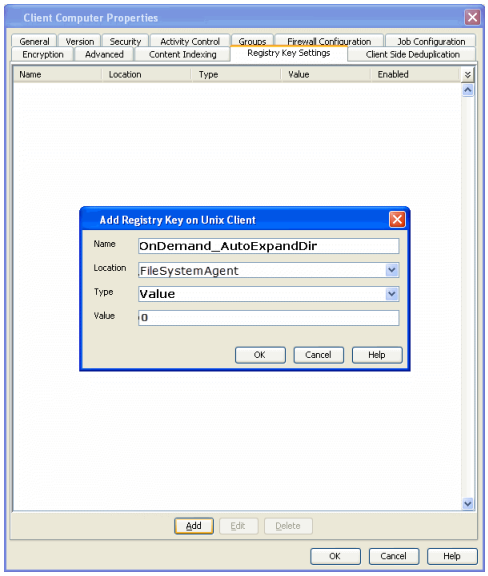
```
/usr/

/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.

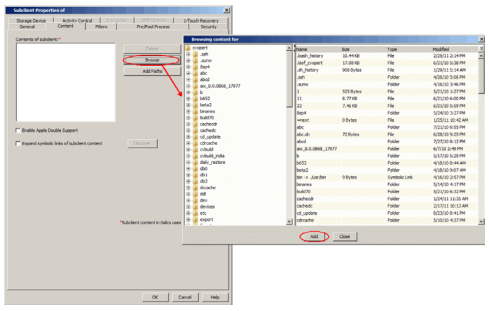
> By default, the content of the Default Subclient contains the entire file system.
>
> When you create a user-defined Subclient, the contents of the user-defined Subclient will be excluded from the Default Subclient.

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**.

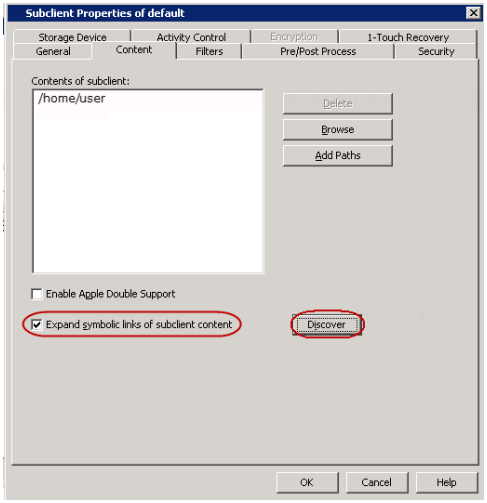


CREATING A SUBCLIENT TO BACKUP SYMBOLIC LINKS

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

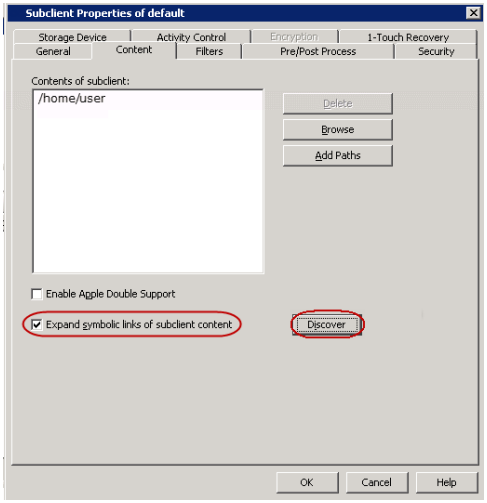
Backup of content pointed by the symbolic links can be enabled at the subclient level.

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 A CLIENT

Symbolic links are backed up by default when they are part of subclient content. In addition to symbolic links, you can enable back up of data pointed by symbolic links that are present under the subclient content path but reside outside the content path.

For example, consider a subclient with content as `/home/user` having symbolic links under this directory:

`/home/user/lib->/usr/lib/`

`/home/user/commonProfile.rc->/etc/commonProfile.rc`

When you enable the option, symbolic links as well as the data they are pointing to will be backed up, i.e., the data content of the directories, `/user/lib` and `/etc/commonProfile.rc` is backed up.

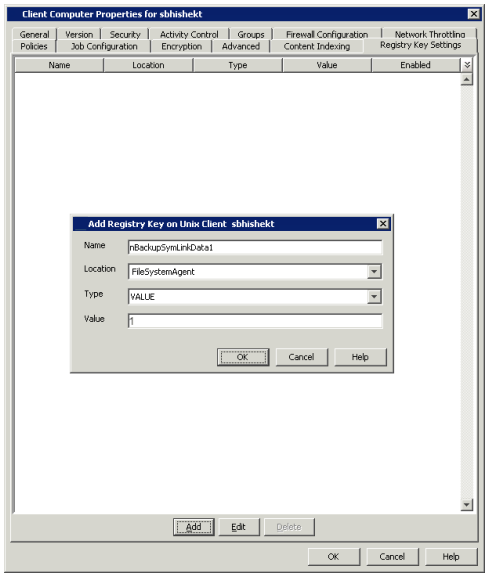
Note that data will be backed up unless there is another subclient with content covering the path the symbolic link is pointing to; if the other subclient is not scheduled for backup, loss of data due to user error will occur.

Use the following steps to enable backup of data pointed by symbolic links:

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 `nBackupSymLinkData`.

6. In the **Location** field, type `FileSystemAgent`.
7. In the **Type** list, select **VALUE**.
8. In the **Value** field, type `1` to enable following symbolic links and back up data.
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.

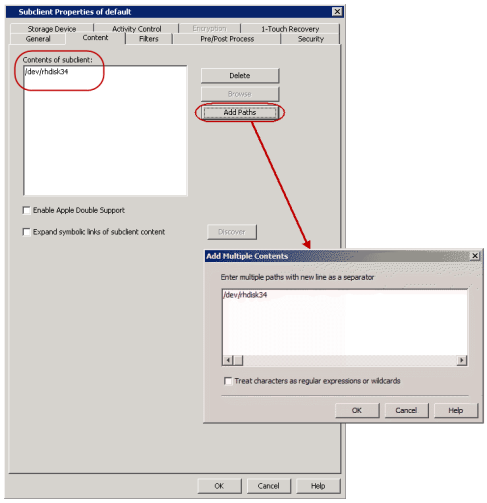


CREATING A SUBCLIENT TO BACKUP RAW DEVICES

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.

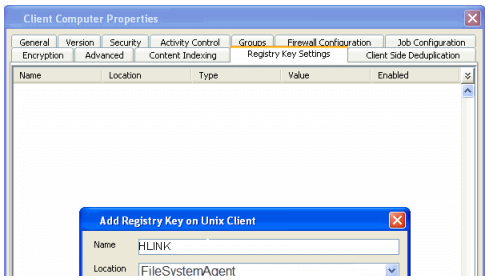
1. From the CommCell Browser, navigate to **Client Computers | <*Client*> | File System**.
2. Right-click the **Backup Set**, point to **All Tasks** and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, 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 HARD LINKS

Data can be linked to two or more files using hard links. By default, the hard links are backed up twice. Use the following steps to prevent duplicate backups of hard links.

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** field, type **`HLINK`**.
6. In the **Location** list, type `FileSystemAgent`.
7. In the **Type** list, select **`Value`**.

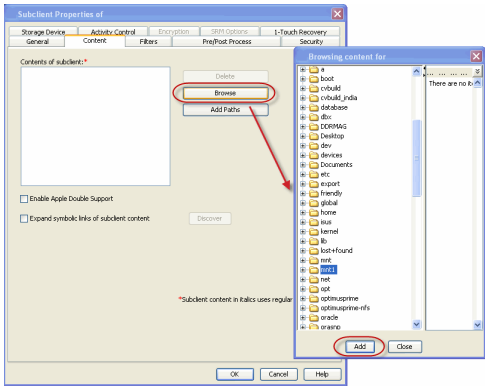


8. In the **Value** field, type `1`.
9. Click **OK**.

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**.



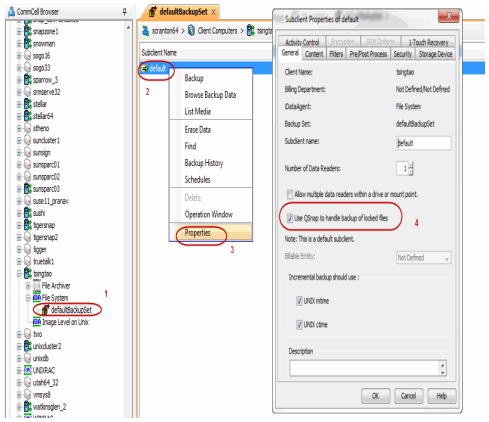
CONFIGURING BACKUPS FOR LOCKED FILES

Files with advisory locks are backed up by default. However, files with mandatory locks are skipped during backups. Use the following methods to configure the backups of files with mandatory locks.

CONFIGURING BACKUPS USING QSNAP

You can use QSnap to enable backup of mandatory locked files. Before you enable this option, install QSnap on the client.

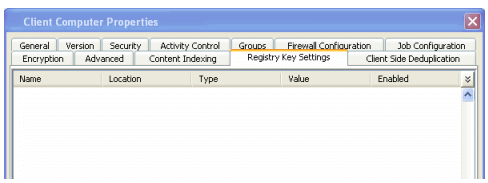
1. From the CommCell Browser, navigate to **Client Computers | <*Client*> | File System | Backupset**.
2. Right-click the **<*Subclient*>** in the right pane and then click **Properties**.
3. Select **Use QSnap to handle backup of locked files.**
4. Click **OK**.



ENABLING BACKUPS OF LOCKED FILES

You can ignore the file lock detection and backup the files with mandatory locks using the following steps:

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**.



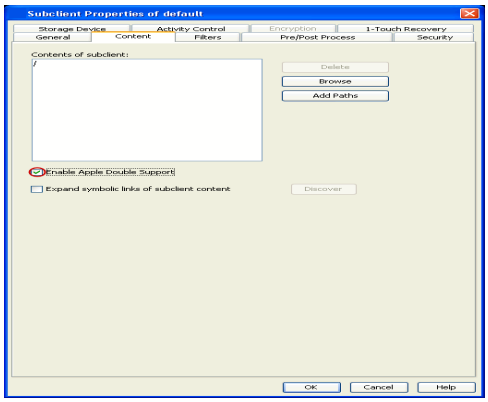
5. In the **Name** field, type **sSKIPLOCKF**.
6. In the **Location** list, type FileSystemAgent.
7. In the **Type** list, select **Value**.
8. In the **Value** field, type Y.
9. Click **OK**.

CONFIGURING BACKUPS FOR MACINTOSH FILES

By default, the File System *i*DataAgent backs up Macintosh files on a shared mount point. During these backups, if the data on the Macintosh file system share are Apple Double formatted files, they are backed up as two separate files.

Use the following steps to backup the Apple Double formatted Macintosh files as a single file:

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. Click the **Content** tab.
4. Select the **Enable Apple Double Support** check box.
5. 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.

   Calypso stop

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.

   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.

3. Use the LC_CTYPE environment variable to set the desired locale.

   Example:

   LC_CTYPE=ru.koi8-r

4. Export the locale.

   export LC_CTYPE

5. Run the **locale** command. A sample output is shown in the example.

   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=
```

6. Start the Services — **Calypso start**

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 *i*DataAgent to start with the correct locale settings.

CONFIGURING LOCALE ON TOTALNET ADVANCED SERVER (TAS)

The locale specific File System partitions can be exported to Macintosh by TotalNET Advanced Server. Use the following steps to export locale specific File System partitions to Macintosh clients.

1. Set the `host character set` in TAS System to `euc-jp`

   To access the character set in the TAS System, navigate to**TAS System | TAS System Administration | TAS System Setup**

   Make sure that the following packages are installed on the File system. The Japanese locales and conversion filters will not be available on the File system until these packages are installed.

   - `SUNWjfpu`
   - `SUNWjiu8`
   - `SUNWjiu8x`
   - `SUNWjeuc`

2. Set File System locale to `ja_JP.eucJP`.
3. Set the client character set in the Macintosh computers to `mac-shift-jis`.

   To access the client character set in Macintosh computer, navigate to **AppleTalk Realm | Manage AppleTalk File Services | Configuration**

CONFIGURING BACKUPS FOR AUTOMATICALLY SKIPPED FILE SYSTEMS

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

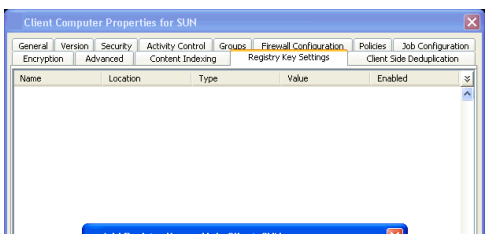
- nfs
- hsfs
- autofs
- mvfs
- lofs
- tmpfs
- proc
- ctfs

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

ENABLING BACKUPS FOR SKIPPED FILE SYSTEMS

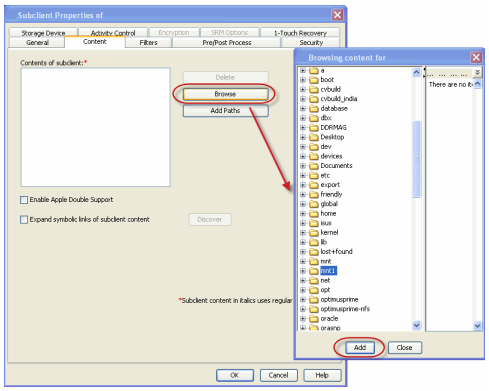
By default, the default subclient includes all the data in the client. However, the above mentioned file systems are not included in the backups. Use the following procedure to include the skipped file systems in the default subclient.

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



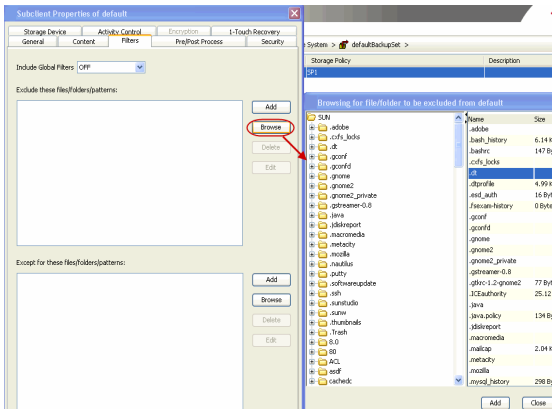
1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System**.
2. Right-click the **Backup Set,** point to **All Tasks,** and then click **New Subclient**.
3. In the **Subclient Name** box, type a name.
4. Click the **Storage Device** tab.
5. In the **Storage Policy** list, 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**.
10. 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:



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,** click **Browse.**
5. Click the file, folder, or directory that you want to exclude from backup operations and click **Add**.
6. 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.

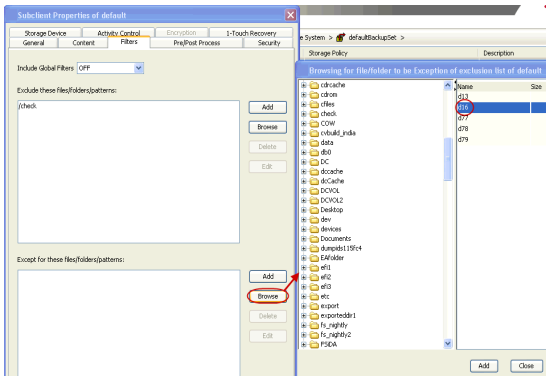
   You cannot enter Escape sequence to specify the path or file name.
7. Click **Close**.
8. Click **OK**.

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.

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

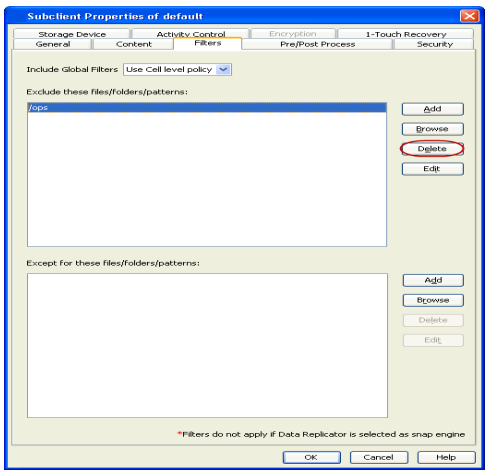
2. Right-click the ***<Subclient>*** in the right pane and click **Properties**.
3. Click the **Filters** tab.
4. Under **Except for these files/folders/patterns,** click **Browse.**
5. Click the file, folder, or directory that you want to include in the backups and then click **Add**.
6. Click **Close.**
7. 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.**

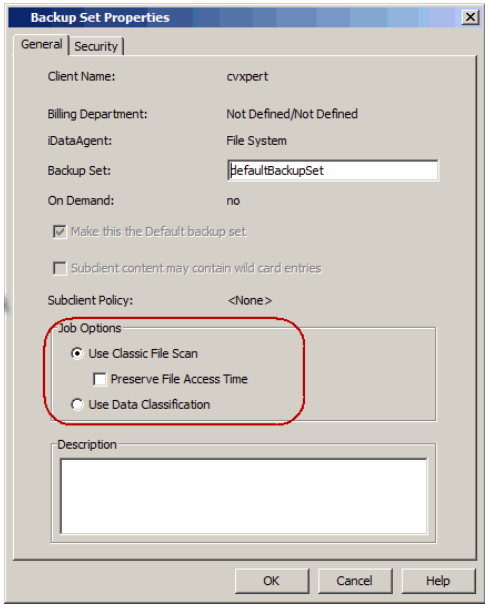


CONFIGURING THE SCAN METHOD FOR DETECTING CHANGED FILES

By default Classic File Scan is selected as the method for scanning files to determine which files have changed and/or have been backed up. However, you can also select Data Classification Enabler as the preferred method of scanning files. If you want to use Data Classification Enabler , see Data Classification.

> Classic File Scan is always used when files or file level wildcards are used in the subclient content.

1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System**.
2. Right-click the **Backup set** in the right pane, and then click **Properties**.
3. Under **Job Options**, select the scan method.
4. Click **OK**.



CONFIGURING THE KERNEL PARAMETERS

The File System *i*DataAgent uses the operating system's kernel resources, such as shared memory, semaphores, etc., to perform data protection and recovery operations. If you are using an earlier version of the Solaris operating system, you can optimize the usage of these resources by setting the kernel parameter values.

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

FOR SOLARIS 9 AND BELOW VERSIONS

The following table displays the possible range of values for each parameter for Solaris 9 and below:

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 (unsigned short)
SEMMNS*	Defines the maximum semaphores in the system.	1 – MAXINT MAXINT = 0x7fffffff (2147483647)
SEMMSL*	Defines the minimum recommended semaphore value.	1 – MAXINT MAXINT = 0x7fffffff (2147483647)
SHMMIN	Defines the minimum allowable size of a single shared memory segment.	0 (Physical Ram) 1 (It is recommended not to change the current value if set. If no value exists, set it to 1.)
SHMMNI*	Defines the maximum number of shared memory segments in the entire system.	0 – MAXINT MAXINT = 0x7fffffff (2147483647)
SHMMAX	Defines the maximum allowable size of one shared memory segment.	0 - MAXINT3264 MAXINT3264 = MAXINT (if 32-bit) or 0x7fffffffffffffff (if 64-bit) (If the current value is less than 4199304, then set it to 4199304.)
SHMSEG*	Defines the maximum number of shared memory segments that one process can attach.	0 - 32767 (signed short)
SEMINFO_SEMMNU	Defines the total number of undo structures supported by the System V semaphore system.	1024

Use the following steps to modify the kernel parameters for Solaris 9 and below:

1. From the unix prompt, create a backup copy of the `/etc/system` file.
   ```
   cp /etc/system /etc/system.copy
   ```
2. Open the `/etc/system` file.
   ```
   vi /etc/system
   ```

3. Change the desired parameter value as per the range given in the above table.

   For example, set the value for `semmni` parameter to 55680

   Use the following formula to calculate the value for the parameter:
   `parameter value = current value + (64 * number of desired streams)`

   - If the client is configured as *i*DataAgent, be sure to allocate 10 streams per each affected parameter. If the client is configured as a MediaAgent, be sure to allocate at least 100 additional streams per each affected parameter.
   - If the system is configured as both an *i*DataAgent and a MediaAgent, be sure to consider the sum of the respective parameter values for this purpose.

   Example:

   ```
   set semsys:seminfo_semmni=55680
   ```

4. Save the /etc/system file.

   - Press the **Esc** key.
   - Type **:wq**

5. Restart the computer to allow the changes to take effect.

FOR SOLARIS 10 AND ABOVE VERSIONS

The following table displays the possible range of values for each parameter for Solaris 10 and above:

`project.max-shm-memory`	Defines the total amount of shared memory allowed for a project.	[Default = 25% of the physical memory] It is recommended not to set this value. However, if you have to set the control to accommodate other resource consumers, ensure that the value is not less than 2MB = [2097152].
`project.max-shm-ids*`	Defines the maximum number of shared memory IDs allowed for a project	16777216 [Default = 128]
`project.max-sem-ids*`	Defines the maximum number of semaphores allowed for a project	16777216 [Default = 128]

For Solaris 10 and above, you can use any of the following commands to modify the kernel parameters:

- `Projmod` command
- `prctl` command

Use the following steps to modify the kernel parameters in Solaris 10 and above versions using the `projmod` command:

1. From the unix prompt, type the `projmod` command.

   ```
   projmod [-n] [-f filename] [-p projid [-o]] [-c comment] [-a|-s|-r] [-U
   user [,user...]] [-G group [,group...]] [[-K name[=value
   [,value...]...]]] [-I new_projectname] project
   ```

   Example:

   ```
   projmod -s -K "project.xxx" user.root
   ```

2. Change the desired parameter value as per the range given in the above table.

   For example, set the value for `project.max-shm-ids` parameter

   Use the following formula to calculate the value for the parameter:
   `parameter value = current value + (64 * number of desired streams)`

   - If the client is configured as *i*DataAgent, be sure to allocate 10 streams per each affected parameter. If the client is configured as a MediaAgent, be sure to allocate at least 100 additional streams per each affected parameter.
   - If the system is configured as both an *i*DataAgent and a MediaAgent, be sure to consider the sum of the respective parameter values for this purpose.

   Example:

   ```
   projmod -s -K "project.max-shm-ids=(priv,1280,deny)"
   user.root
   ```

3. Restart the computer to allow the changes to take effect.

Use the following steps to modify the kernel parameters in Solaris 10 and above versions using the `prctl` command:

1. From the unix prompt, type the `prctl` command.

   ```
   prctl [-P] [-t[basic| privileged| system]] [-n name] [-v value] [-e| d
   action] [-p pid] [-i idtype] id...
   ```

   Example:

   ```
   projmod -n project.xxx -v xxx -r -i project
   user.root
   ```

2. Change the desired parameter value as per the range given in the above table.

   For example, set the value for `project.max-shm-ids` parameter

   Use the following formula to calculate the value for the parameter:
   `parameter value = current value + (64 * number of desired streams)`

   - If the client is configured as *i*DataAgent, be sure to allocate 10 streams per each affected parameter. If the client is configured as a MediaAgent, be sure to allocate at least 100 additional streams per each affected parameter.
   - If the system is configured as both an *i*DataAgent and a MediaAgent, be sure to consider the sum of the respective parameter values for this purpose.

   Example:

   ```
   prctl -n project.max-shm-ids -v 1280 -r -i project
   user.root
   ```

   Output:

   ```
   project: 1: user.root
   project.max-shm-ids privileged 1280 - deny -
   project.max-shm-ids system 16777216 max deny -
   ```

3. 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.

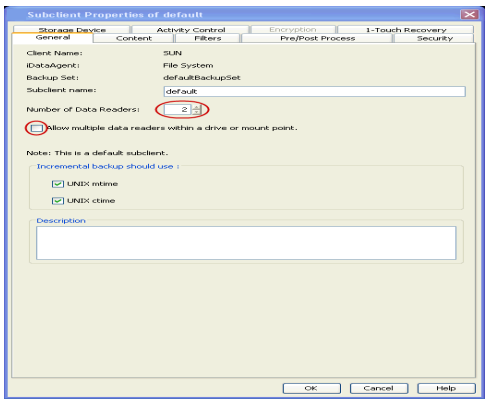
Note that, you do not have to enable multi-streaming if you have multiple mount points pointing to the same physical drive. Do not use multiple streams if you have added UNC paths to the subclient content.

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

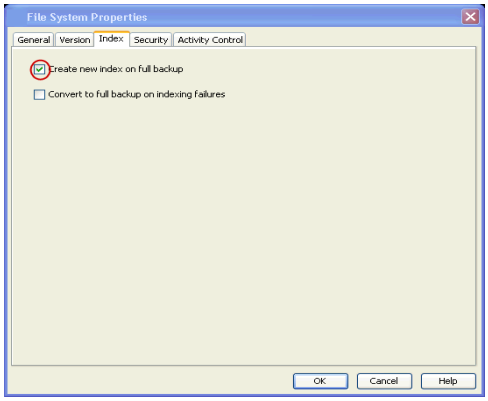
CREATING A NEW INDEX ON A FULL BACKUP

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.

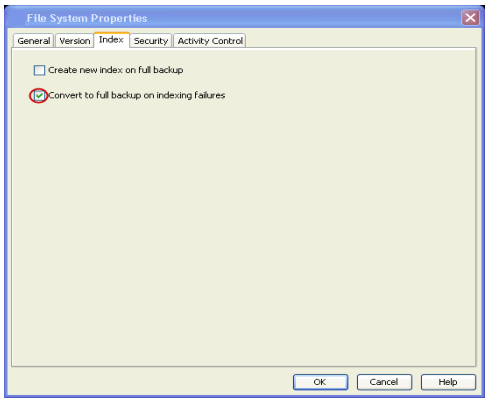
3. Click the **Index** tab.
4. Select the **Create new index on Full Backup** check box.
5. Click **OK**.



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**.



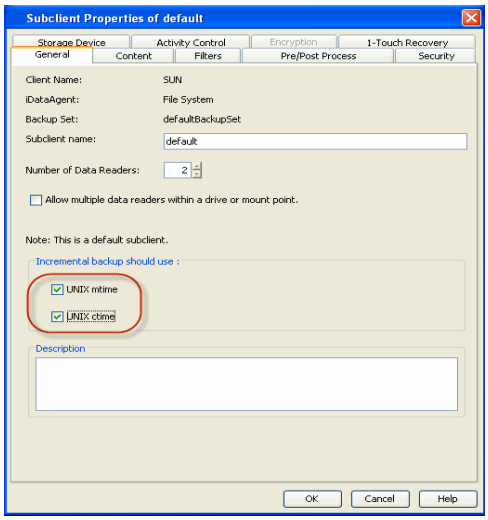
CONFIGURING INCREMENTAL/DIFFERENTIAL BACKUPS USING CTIME AND MTIME

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.

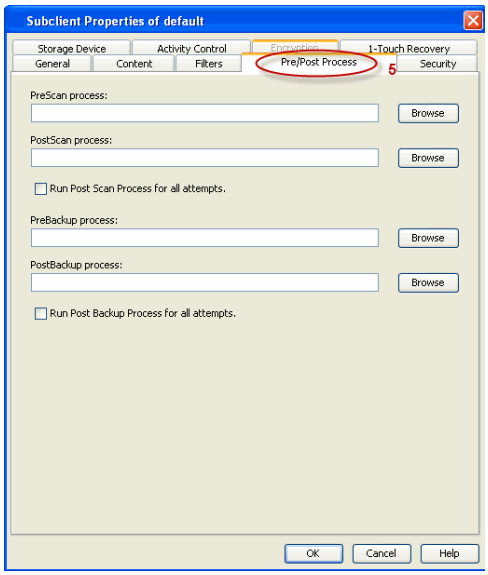
The first line of the script must execute a command that is designed to call in the pre/post program. Ensure that you have included the appropriate command in the first line of the script.

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.

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

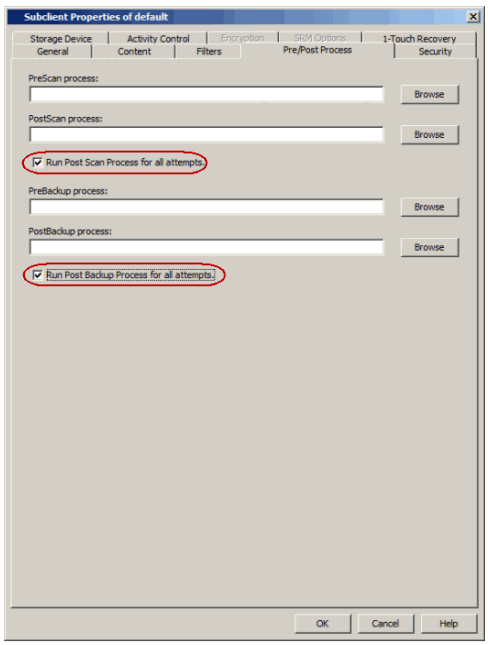


SETTING UP POST PROCESSES TO RUN DURING FAILURES

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.

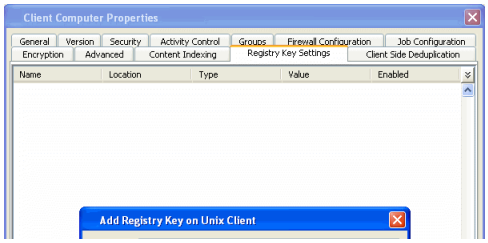
1. From the CommCell Browser, navigate to **Client Computers | <*Client*> | File System | BackupSet.**
2. Right-click the <***Subclient***> in the right pane, and then click **Properties**.
3. Click the **Pre/Post Process** tab.
4. Select the **Run Post Scan Process for all attempts** check box.
5. Select the **Run Post Backup Process for all attempts** check box.
6. 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.

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**.

COMMAND LINE OPERATIONS

You can add, modify or delete several configurable properties for the File System *i*DataAgent from command line.

Command line configuration enables you to:

- configure the same properties across multiple clients simultaneously.
- reuse the same configurations for additional entities.

The following sections describe the available command line configurations:

LOG ON TO THE COMMSERVE

To run command line operations you must first login to the CommServe as follows:

- From Command prompt, navigate to <Software_Installation_Directory>/Base and run the following command:

```
qlogin -cs <commserve name> -u <user name>
```

- For example, to log on to CommServe 'server1' with username 'user1':

```
qlogin -cs server1 -u user1
```

CONFIGURE SUBCLIENTS

CREATE SUBCLIENT

1. Download the create_subclient_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af create_subclient_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -subclientName xxxxx -contentOperationType ADD -content/path 'xxxxx'
```

GET SUBCLIENT PROPERTIES

1. Download the get_subclient_properties_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af get_subclient_properties_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -subclientName xxxxx
```

MODIFY SUBCLIENT

1. Download the update_subclient_add_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af update_subclient_add_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -subclientName xxxxx -contentOperationType xxxxx -content/path 'xxxxx'
```

RENAMING A SUBCLIENT

1. Download the update_subclient_add_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af update_subclient_add_template.xml -appName 'File System' -clientName xxxxx -backupSetName xxxxx -subclientName xxxxx -newName xxxxx
```

DELETE SUBCLIENT

1. Download the delete_subclient_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af delete_subclient_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -subclientName xxxxx
```

AVAILABLE PARAMETERS FOR SUBCLIENTS

The following table displays all the parameters you can use with the commands mentioned in the above sections. To add a parameter to your command, use the following syntax: (Some examples are provided at the end of the table.)

```
qoperation execute -af <template XML file> -<parameter name> <value>
```

PARAMETER	DESCRIPTION OF PARAMETER VALUES
clientName	Name of the client computer.
backupsetname	Name of the backup set. If the backup set name is not specified in the command query, the default backup set is used by default.
appName	Name of the application. In this case it would be 'File System'.
subclientname	Name of the subclient.
newName	New name of the subclient.
enableBackup	Option to enable/disable backup. Valid values are True/False.
encryptionFlag	Option to set the encryption points during backups. Valid values are: ● ENC_MEDIA_ONLY, to encrypt the backup data after transmission and prior to storage on the media. ● ENC_NETWORK_AND_MEDIA, to encrypt the backup data before transmission. The data is stored encrypted on the media. ● ENC_NETWORK_ONLY, to encrypt the backup data for transmission and then decrypt the data prior to storage on the media. ● ENC_NONE, to disable data encryption.
networkAgents	Number of Network Agents.
softwareCompression	Option to enable compression on the Client or MediaAgent computer. Valid values are: ● ON_CLIENT, to enable software compression on the client. ● ON_MEDIAAGENT, to enable software compression on the MediaAgent. ● OFF, to disable software compression.
throttleNetworkBandwidth	Enhancing backup performance by reducing network bandwidth overhead. Valid values are 0/1.
enableDeduplication	Option to enable deduplication on subclient. Valid values are True/False.
generateSignature	A component of deduplication performed on the client or MediaAgent computer. Valid values are: ● ON_CLIENT, to enable signature generation on the client. ● ON_MEDIA_AGENT, to enable signature generation on the MediaAgent. ● OFF, to disable signature generation.
storagePolicyName	Name of the Storage Policy to be associated for backup.
useGlobalFilters	Option to enable the use of global filters. Valid values are: ● ON, to enable global filters for the subclient. ● USE_CELL_LEVEL_POLICY, to enable the use of global filters if the **Use Global Filters on All Subclients** option is enabled on the Control Panel (Global Filters) dialog. If the option is disabled, USE_CELL_LEVEL_POLICY will disable global filters for the subclient. ● OFF, to disable global filters.
useVSS	Option to enable/disable VSS for backing up the file system data. Valid values are True/False.
useVSSForSystemState	Option to enable/disable VSS for backing up the system state. Valid values are True/False.
backupSystemState	Option to enable/disable back up of the system state. Valid values are True/False.
postBackupCommand	Path to the post process script that will be run after the backup.
postScanCommand	Path to the post process script that will be run after the scan phase
preBackupCommand	Path to the pre process script that will be run before the backup.
preScanCommand	Path to the pre process script that will be run before the scan phase
runAs	Option to specify the user name who has permissions to run the pre/post process scripts. Valid values are: ● USE_IMPERSONATION, to specify a user with enough privileges to run the scripts. When using this value, you also need to provide the user credentials: `-prepostUserName/userName <user name> -prepostUserName/password <password>` ● USE_LOCAL_SYS_ADMIN, to use the administrator account to run the scripts.
content/path	Location of the content to be backed up. This parameter must be used along with the contentOperationType parameter, for example:

	-contentOperationType <value> -content/path '<path value>'
content/excludepath	Location of the content to be excluded from backup. This parameter must be used along with the contentOperationType parameter, for example: -contentOperationType <value> -content/excludepath '<path value>'
content/includepath	Location of the content to be included in the backup from the excluded list. This parameter must be used along with the contentOperationType parameter, for example: -contentOperationType <value> -content/includepath '<path value>'
contentOperationType	Modification type. Valid values are • ADD, to add content to the subclient • OVERWRITE, to overwrite contents to the subclient. • DELETE, to delete the contents from the subclient.

The following examples show how to add a parameter for a command:

Adding Content	To update the location for the subclient content, add the 'path' parameter to the following command: qoperation execute -af update_subclient_add_template.xml -appName 'File System' -clientName client1 -backupSetName backupset1 -subclientName subclient1 -contentOperationType ADD -content/path '/etc'
Setting a Storage Policy	To assign a storage policy to a subclient, add the 'storagePolicyName' parameter to the following command: qoperation execute -af update_subclient_add_template.xml -appName 'File System' -clientName client1 -backupSetName backupset1 -subclientName subclient1 -storagePolicyName sp1

For detailed information on the Subclient parameters see Subclient Properties.

LIST SCHEDULE POLICY ASSOCIATION

1. Download the sched_policy_association_template.xml file and save it on the computer from where the command will be executed.
2. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execute -af sched_policy_association_template.xml -taskName mypolicy
```

PARAMETER	DESCRIPTION OF PARAMETER VALUES
taskName	Name of the Schedule Policy to be associated.

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	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. 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	You can modify the storage policies in any of the following situations. • To include a different media for the backup operation. • To use a storage policy with a different retention criteria. You can change the storage policies from the subclient level. 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	You can rename backup sets and subclients. Renaming BackupSet: 1. From the CommCell Bowser, 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**.	

	Renaming subclient: 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	You can efficiently configure the available resources for transferring data secured by data protection operations from the subclient level. This includes the following: • 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**. You can configure the data transfer options. 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. 5. Choose the appropriate software compression option for this subclient. 6. Select the **Throttle Network Bandwidth** check box, and set the required bandwidth. 7. Click **OK.**	Refer to Data Compression and Network Bandwidth Throttling.
View Data Paths	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. 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. In the **Storage Policy** list, click a storage policy name. 5. Click **Data Paths**.	
Configure Activity Control	You can enable backup and restore operations from the agent and subclient level. However, you can enable restore operations only from the agent level. 1. From the CommCell Browser, navigate to **Client Computers** | **<*Client*>** 2. Right-click the <***Client***> or <***Subclient***> in the right pane, and then click **Properties**. 3. Click the **Activity Control** tab and select or clear option(s) as desired. 4. Click **OK.**	Refer to Activity Control.
Configure User Security	You can configure user security from the agent or subclient level. You can perform the following functions: • 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. 1. From the CommCell Browser, right-click the subclient. 2. Click **Properties.** 3. Click the **Security** tab. 4. 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. 5. Click **OK**.	Refer to User Administration and Security.
Enable/Disable Data Encryption	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. 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 **Encryption** tab and select the desired encryption. 4. Click **OK**.	Refer to Data Encryption.
View Software Version	The **Version** tab, at the Agent level displays the software version and post-release service	

and Installed Updates	packs and updates installed for the component. 1. From the CommCell Browser, navigate to **Client Computers** 2. Right-click the <***Client***> for which you want to view the version and the click **Properties**. 3. Click the **Version** tab**.** 4. Click **OK.**	
CommCell Configuration Report	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. 1. From the CommCell Browser, double-click **Reports** icon. 2. Select **CommCell Configuration**. 3. 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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KEYWORDS

Apple Double Encoded Support, Classic Scan, Ctime, Hard Links, Hole, Locale for Non-ASCII character, Locked File, NFS Mount, mount point, Mtime, Raw device, Sparse File, Symbolic Link

Advanced - Solaris File System Backup

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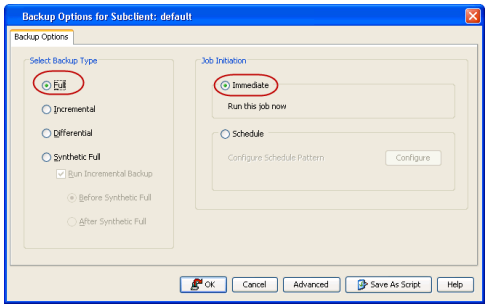
FULL BACKUPS

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**.

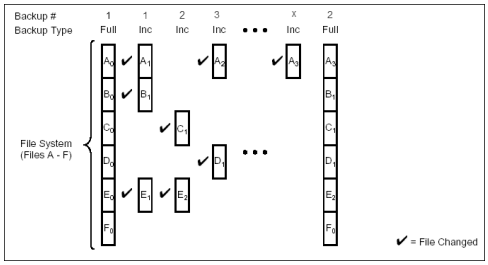


INCREMENTAL BACKUPS

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.

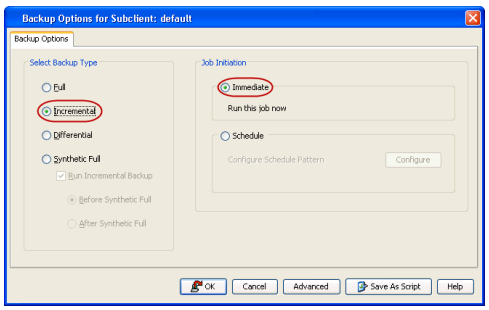
The illustration on the right clarifies the nature of full and incremental backups.

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**.

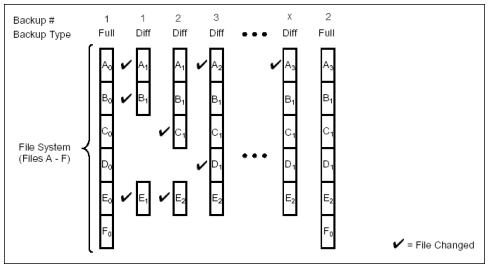
   You can track the progress of the job from the **Job Controller**. When the backup has completed, the **Job Controller** displays **Completed**.



DIFFERENTIAL BACKUPS

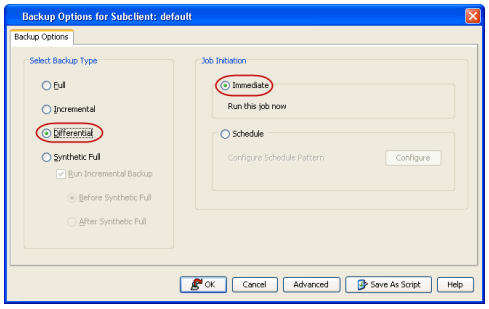
A differential backup contains only the data that is new or has changed since the last full backup. Like incremental backups, differential backups also consume less media and use less resources than full backups. Differential backups are cumulative. This means that each differential backup contains all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

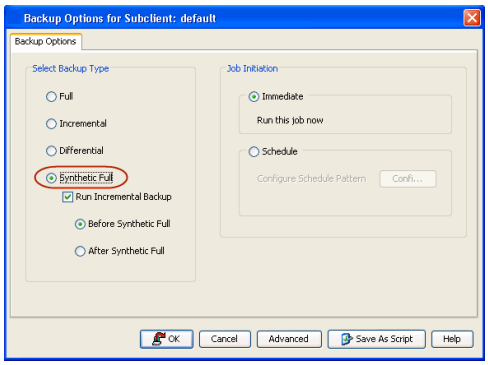
Synthetic full backups are media-based; they read backup data from one media and simultaneously write (restore) the result to the new active media within the same media group. As a result, synthetic full backups require that at least two media drives for the same storage policy be available at the time 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

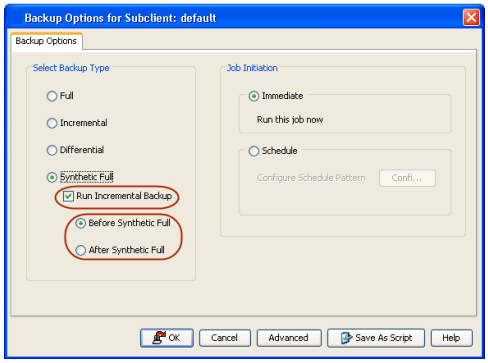
An incremental backup can be run either before or after a synthetic full backup.

- 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**.



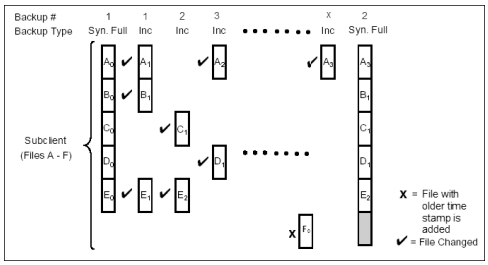
VERIFYING SYNTHETIC FULL BACKUPS

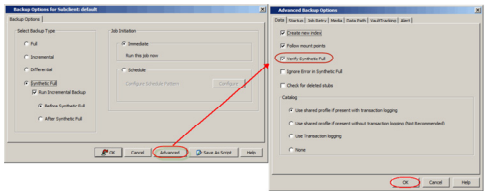
This option ensures that files that have not backed up by incremental jobs since the last full backup are backed up by the next incremental.

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:

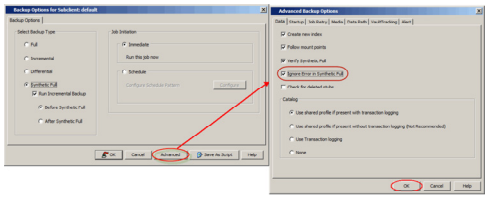




1. From the CommCell Browser, navigate to **<*Client*>** | **File System** | **defaultBackupSet**.
2. Right click the <***Subclient***> and click **Backup**.
3. From the **Backup Options** dialog box, select **Synthetic Full**.
4. Click **Advanced**.
5. In the **Advanced Backup Options** dialog box,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

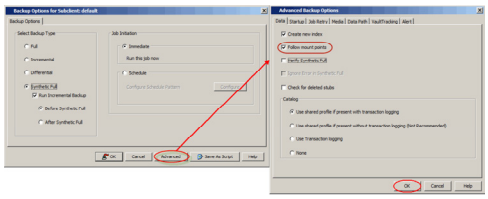
ACCELERATED SYNTHETIC FULL BACKUPS (DASH FULL)

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...

BACKING 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.

   When backups are run from multiple nodes on clustered file systems, the same content is backed up multiple times. Backups should be run on only one node to avoid such duplicate content backups. However, the other nodes can also be configured to run backups but make sure that the clustered file system mount point is added to the file system exclusion list of the physical machine's subclients.

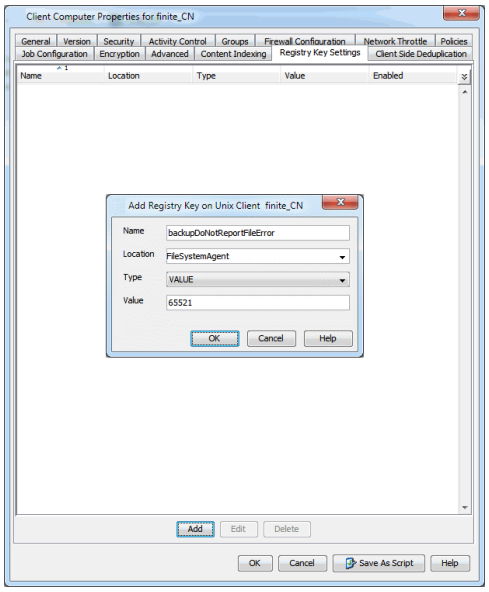
   For VERITAS Cluster File System, the clustered file system mount point is added automatically to the file system exclusion list when backup is run for the first time on the virtual node/s.

DISABLING SYSTEM ERRORS DURING BACKUPS

By default, system errors are displayed during backup operations; for example, `file not found`. Use the following steps to ignore such specific system errors:

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 `backupDoNotReportFileError`.
6. In the **Location** list, type `FileSystemAgent`.
7. In the **Type** list, select **Value.**
8. In the **Value** field, type <***errcode1, errcode2, errcode3...***> where errcode1, errcode2, errcode3 are error codes to ignore.

   For example, `65521`.
9. Click **OK**.



COMMAND LINE BACKUPS

You can perform backups of file system data from the command line interface.

Command line backups enable you to perform backup operation on multiple clients simultaneously. In order to run the backups from command line, you need an input xml file which contains the parameters for configuring the backup options. This input xml file can be obtained from one of the following ways:

- Download the input xml file template and save it on the computer from where the backup will be performed.
- Generate the input xml file from the CommCell Console and save it on the computer from where the backup will be performed.

LOG ON TO THE COMMSERVE

To run command line operations you must first login to the CommServe as follows:

- From Command prompt, navigate to <Software_Installation_Directory>/Base and run the following command:

```
qlogin -cs <commserve name> -u <user name>
```

- For example, to log on to CommServe 'server1' with username 'user1':

```
qlogin -cs server1 -u user1
```

PERFORM THE BACKUP

1. Download the backup_template.xml file and save it on the computer from where the command will be executed.
2. Execute the saved .xml script using qoperation execute command.

   ```
   qoperation execute -af backup_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -subclientName xxxxx -backupLevel FULL
   ```

3. Verify the status of the job using the following command:

   ```
   qlist job -j JOBID
   ```

4. Once the job completes, logout from the CommServe using the qlogout command.

   ```
   qlogout [-cs commserver] [-all] [-tf tokenfile] [-tk token] [-h]
   ```

EXAMPLES

Performing a Full Backup	`qoperation execute -af backup_template.xml -appName 'File System' -clientName client1 -backupsetName backupset1 -subclientName subclient1 -backupLevel FULL`
Performing an Incremental Backup	`qoperation execute -af backup_template.xml -appName 'File System' -clientName client1 -backupsetName backupset1 -subclientName subclient1 -backupLevel INCREMENTAL`

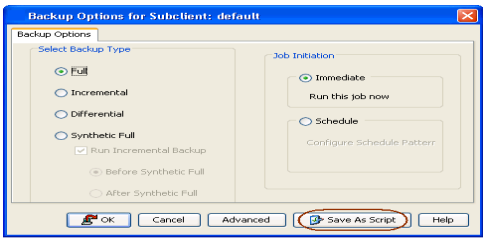
GENERATE THE COMMAND LINE SCRIPT FROM THE COMMCELL CONSOLE

In addition to the parameters provided in the template xml file, if you want to include additional options for the backup, you can do so by selecting the required

options from the CommCell Console and generate the command line xml script for the backup.

Follow the steps given below to generate a script which you can use to perform a backup from the command line interface:

1. From the CommCell Console, navigate to **<*Client*>** | **File System** | **defaultBackupSet**.
2. Right click the default subclient and click **Backup**.
3. Select the required backup options which you want to execute using the script.
4. Click **Save as Script**.

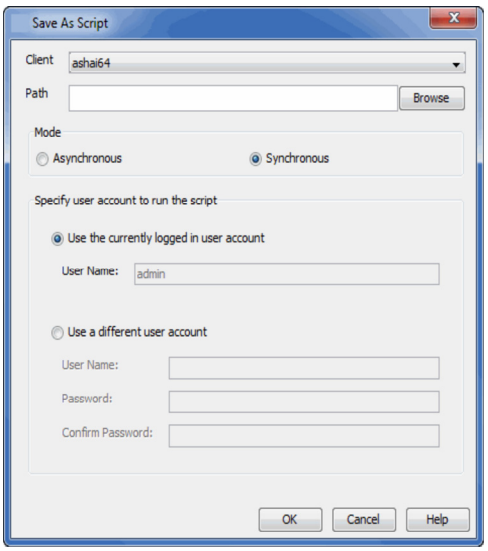


5. Enter the location where you want to save the script or click **Browse** and navigate to the location.

   The script will be saved as a .xml file and a .bat file is created.

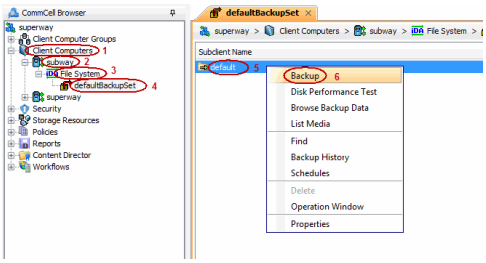
   If a file with the same name already exists in the specified location, the .xml file will be created with a timestamp. However, the .bat file will overwrite the existing file.
6. Enter the username and password for the user account which you want to use to perform the backup.

   By default, the user account which you have used to login to CommCell console is used for performing the backup. However, if the user account does not have access to any application or database, click **Use a different account**.
7. Click **OK**.

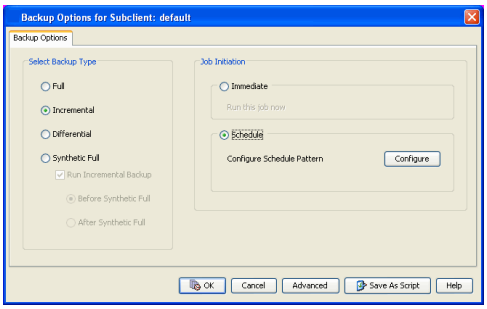


SCHEDULING A BACKUP

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

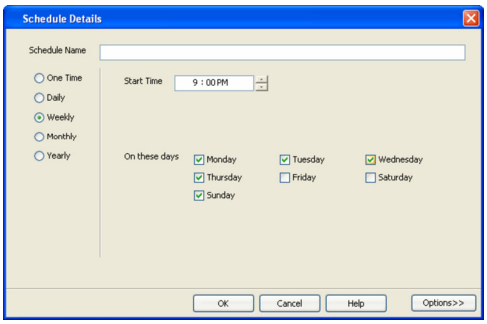


2.
   - Select the **Backup type**.
   - Click **Schedule**.
   - Click the **Configure** button.

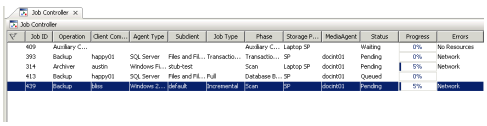


3. Select the appropriate scheduling options.

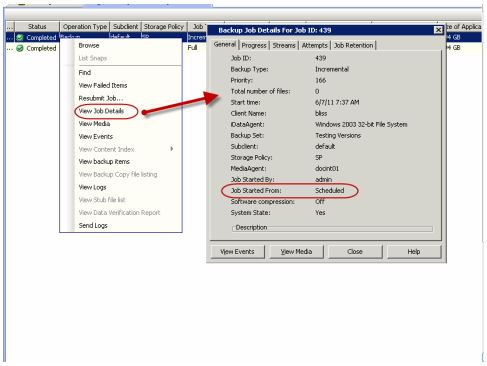
   For example, use the following steps to create a weekly schedule:
   - Type a name for the schedule in the **Schedule Name** box.
   - Click **Weekly**.
   - In the **Start Time** box type or select the schedule start time.
   - Click and select the days to run the schedule.
   - Click **OK**.



4. When the schedule is run, the **Job Controller** window will display the job as shown in the sample image.

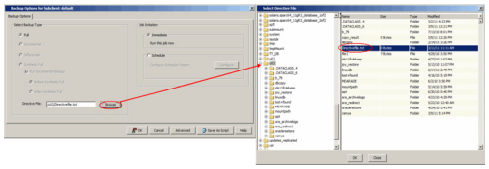


5. Once the job is complete, you can view the job details from the **Backup History**.
   - Right-click the **Subclient** and select **View Job Details**.



See Scheduling for a comprehensive information on scheduling jobs.

PERFORMING AN ON DEMAND BACKUP



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**.

MANAGING JOBS

Jobs can be managed in a number of ways. See Job Management for a comprehensive information on managing jobs.

The following sections provide information on the different job management options available:

RESTARTING JOBS

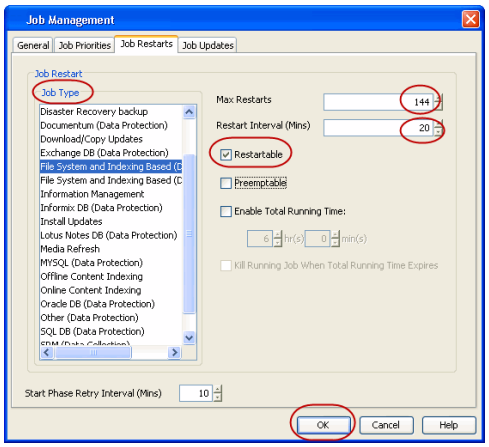
Jobs that fail to complete successfully are automatically restarted based on the job restartability configuration set in the Control Panel. Keep in mind that changes made to this configuration will affect all jobs in the entire CommCell.

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

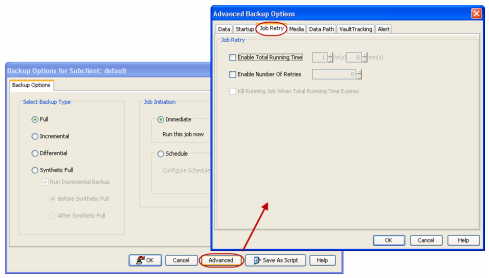
1. From the CommCell Browser, click **Control Panel** icon.
2. Select **Job Management.**
3. Click **Job Restarts** tab and select a **Job Type.**
   - Select **Restartable** to make the job restartable.
   - Change the value for **Max Restarts** to change the maximum number of times the Job Manager will try to restart a job.
   - 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	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: 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	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: 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**. 7. Select the recipients and click **Next**. 8. Click **Finish**. 9. Click **OK**.	Refer to Alerts.
Command Line Backups	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. You can also generate command line scripts for specific operations from the CommCell Browser using the **Save As Script** option.	Refer to Command Line Interface.
Data Path Options	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: 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	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: 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	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. 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 *i*DataAgent level. 1. From the CommCell Browser, navigate to **Client Computers | <Client> | File System |**	Refer to Index.

	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**.	
Start New Media	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: 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	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: 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. 4. Select the **Mark Media Full on Success** check box**.** 5. Click **OK**.	Refer to Export Media.
Allow other Schedules to use Media Set	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. 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	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: 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	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: 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: ○ **Infinite** - Select this option to extend the expiration date by infinite number of days ○ **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	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. 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**.	Refer to VaultTracker or VaultTracker Enterprise.

	3. Click **Advanced** and select the **VaultTracking** tab. 4. Select the required options. 5. Click **OK**.	
CommCell Readiness Report	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: 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**. The generated report is displayed.	Refer to CommCell Readiness Report.
Backup Job Summary Report	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: 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.

KEYWORDS

Mount point, Full backup, Incremental backup, Differential backup, Synthetic full backup, Dash full, On demand backup

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Advanced - Solaris File System Restore

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PERFORMING A DIRECT RESTORE

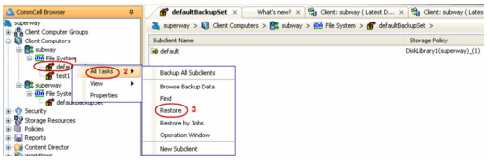
Perform a direct restore in the following scenarios:

- 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.

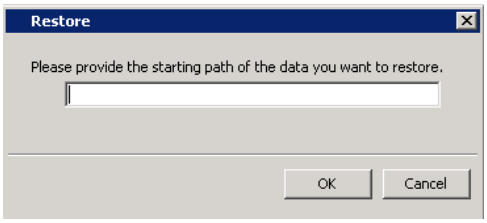
Follow the steps given below to perform a direct restore:

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

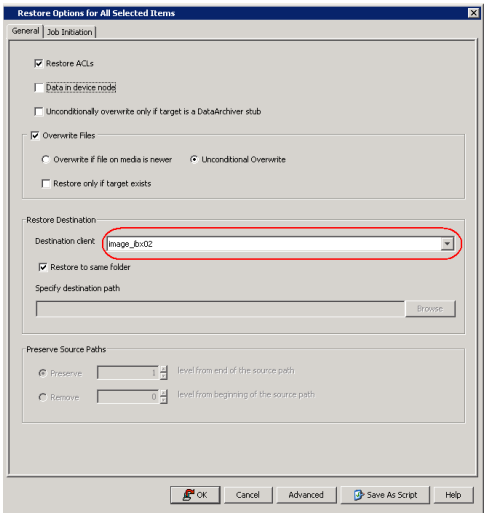


2. Enter the starting path of the data that you want to restore.

   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*.*`



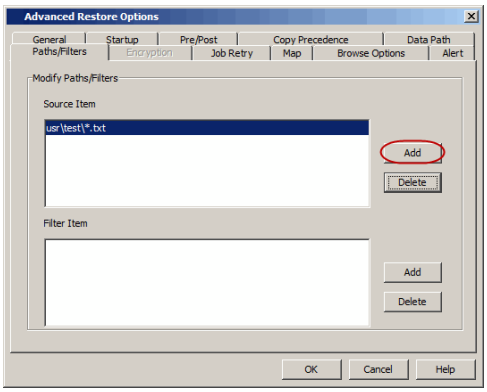
3.
   - In the **Destination Client** list, select the name of the client computer.
   - If you want to add more data for restore, click **Advanced**.



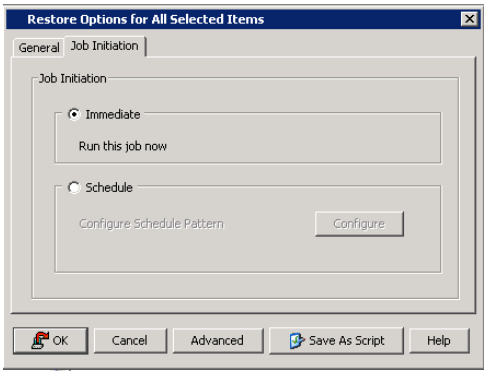
4.
   - Click the **Path/Filters** tab.
   - Click **Add** for **Source Item** list and enter the additional data paths.

     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**.

     During restores, if the complete destination path specified does not exist on the destination computer then the missing directories that are not selected for restore are created automatically with permission set to 0700 and ownership set to the Calypso process.

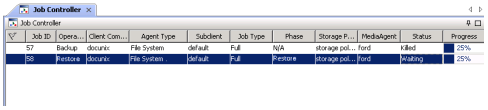


5.
   - Click the **Job Initiation** tab.
   - Select **Immediate** from the **Job Initiation** tab.
   - Click **OK**.



6.

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



RESTORING DATA USING REGULAR EXPRESSIONS

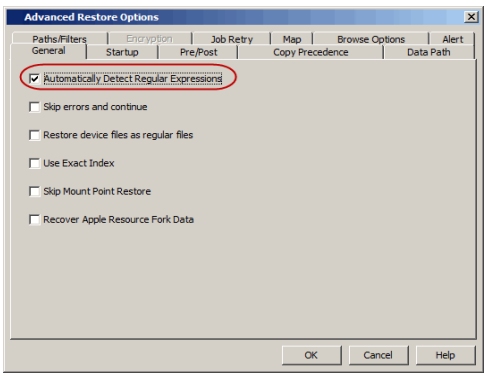
By default you can use wildcard characters to specify the patterns for files and folders to be included in the restore.

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.

During restores, if the complete destination path specified does not exist on the destination computer then the missing directories that are not selected for restore are created automatically with permission set to 0700 and ownership set to the Calypso process.

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:

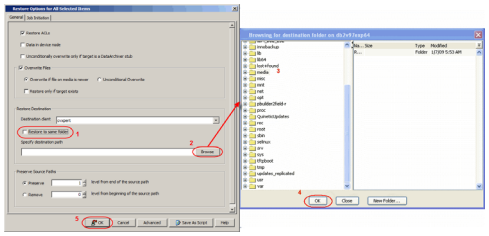
1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System | *<Backup Set>***.

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**.

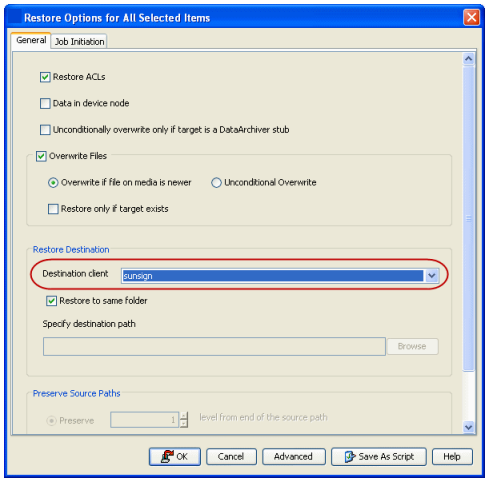


RESTORING DATA TO A DIFFERENT CLIENT

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.



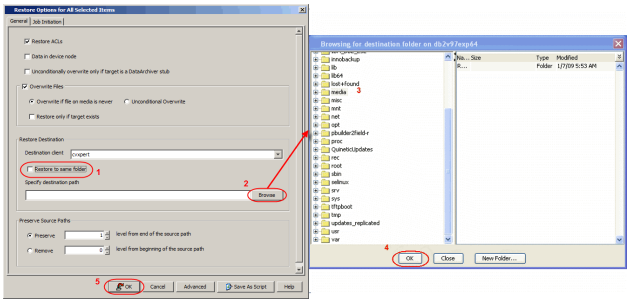
PERFORMING A CROSS-PLATFORM RESTORE

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.

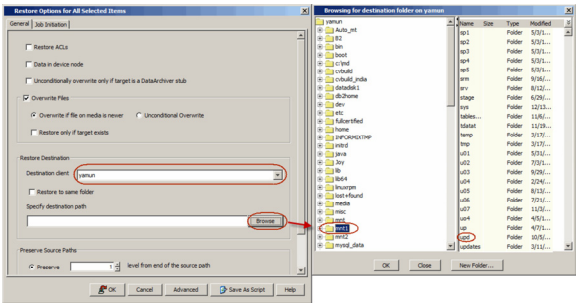
Follow the steps given below to perform a cross-platform restore:

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.



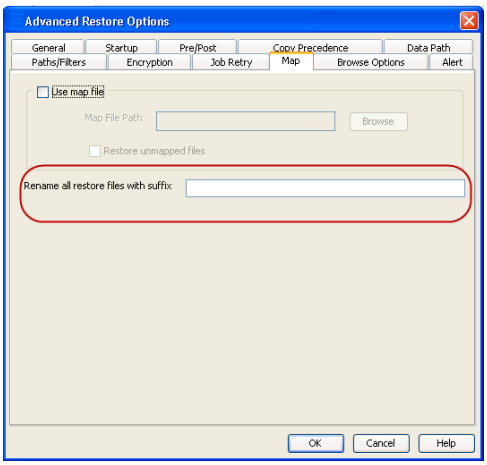
1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System | *<Backup Set>***.
2. Right-click the ***<Subclient>*** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5.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

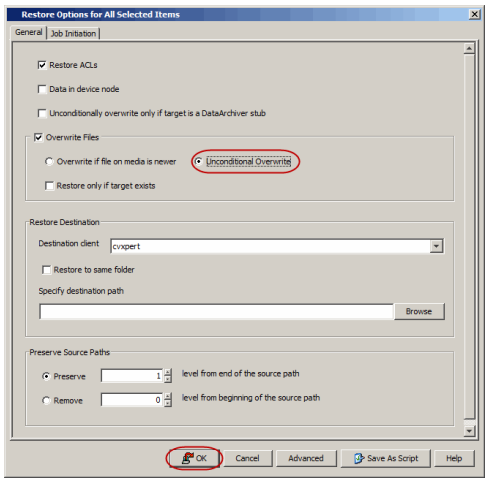
OVERWRITING DATA DURING RESTORES

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**.

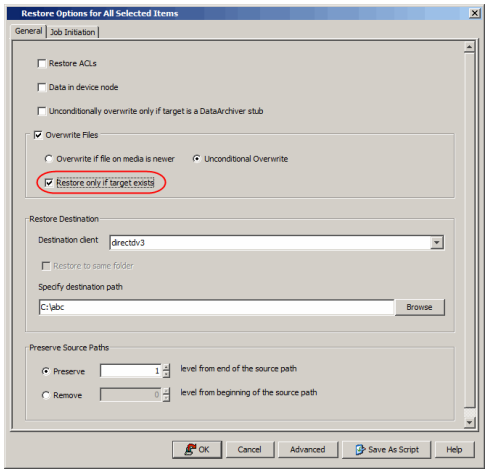
Clear the **Overwrite Files** check box when restoring to a computer that has different hardware and different software device drivers.



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:

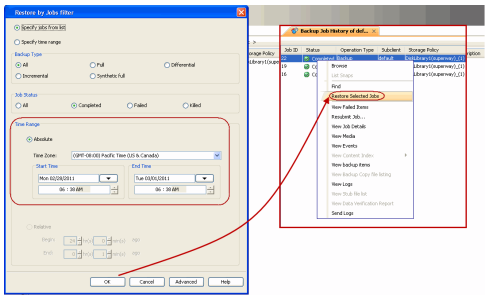
- To restore point-in-time data associated with a specific backup job
- To restore multiplexed data from the same client

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

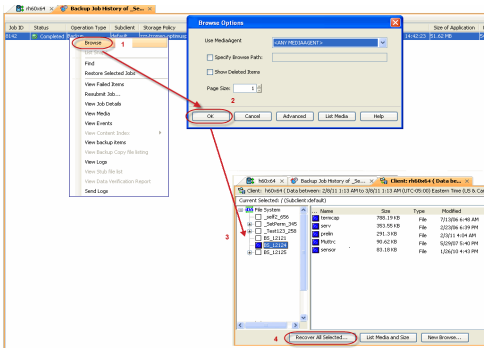
Follow the steps to restore all the data backed up during the selected job:

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:

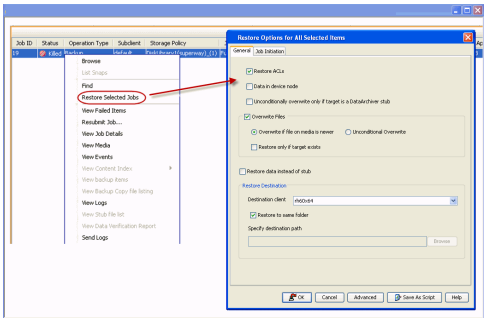


1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System**.
2. Right-click the **<Backup Set>** and select **All Tasks | Restore by Jobs**.
3. Enter the **Start Time** and **End Time** and click **OK**. The list of backup jobs, completed in the specified time period is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

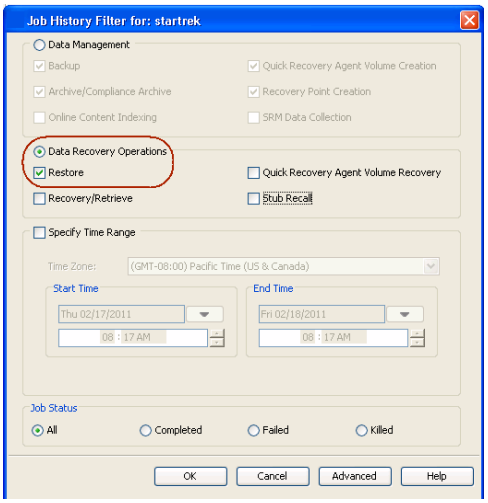


1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System**.
2. Right-click the **<Backup Set>** and select **All Tasks | Restore by Jobs**.
3. Select **Failed** or **Killed** in the **Job Status** area of the **Restore by Jobs Filter** dialog box.
4. Enter the **Start Time** 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:



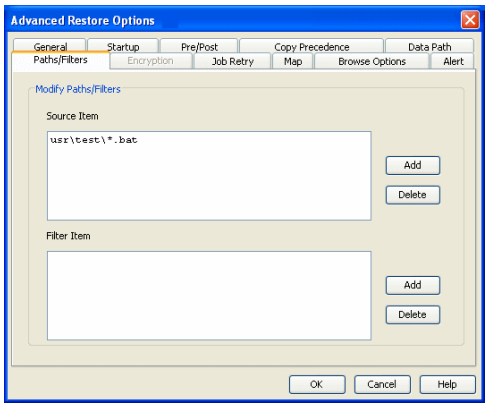
1. From the CommCell Browser, navigate to **Client Computers**.
2. Right-click the **<Client>** and click **View | Job History**.
3. Select **Data Recovery**.
4. Select the **Restore** check box and clear all other check boxes.
5. Right-click the restore job that you want to resubmit from the **Data 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]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*`).

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. If you are restoring hard-linked file backed up with `HLINK` registry key set to `Y`, make sure that all the associated hard links are also included in the map file. This will allow you to preserve the hard links.

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>"

   - 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.

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 Map File to perform the restore.

PARTIAL FILE RESTORE USING A MAP FILE

Files can be restored partially using a Map file. Multiple files can be added in the Map file for partial restores with specific start/ stop offset values. These restores can be run from the CommCell GUI or from the command line. Partial file restores are supported for:

- Index restores
- Index Free Restore – Restore By Job

1. Using a text editor, create a text file on the client computer where you want to restore the data.
2. Add the mapping information in the file using the following syntax:

   "*<source file path>*","*<destination file path>*",*<start offset>*,*<stop offset>*

   Where:

   <start offset> and *<stop offset>* are values in bytes

   For example: "/path1/data1/SRC","/path2/data2/DEST",100,1000

The partial file restore behavior with different mapping options is given below:

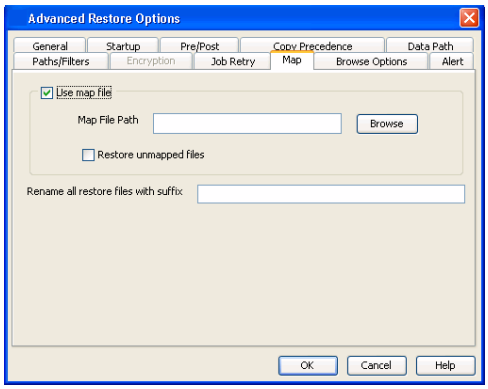
MAPPING	BEHAVIOR
File in map, no start offset and no stop offset	File will be restored fully
File in map, only start offset provided	File will be restored from <*start offset*> till the end of the file
File in map, start and stop offsets provided	File will be restored from <*start offset*> to <*stop offset*>
File in map, start offset provided in invalid format (not a number)	Restore will start from the beginning of the file
File in map, stop offset provided in invalid format (not a number)	Restores till the end of the file
File in map, stop offset value is less than start offset	Restores till the end of the file
Map file having duplicate source file entry with different destination location	Only the first source file entry will be honored
Map file with folder path, start and stop offsets provided	All the files under the folder will honor the start and stop offsets

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.

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. Select the **Map** tab.
7. Select the **Use map file** check box and click **Browse** to navigate to the map file.
8. Clear the **Restore unmapped file** check box.
9. In the **Advanced Recover Options** dialog box, click **OK**.

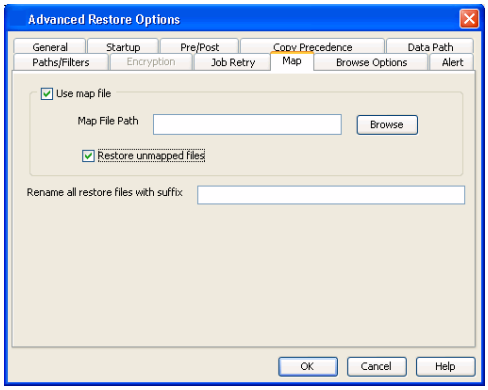
10. Click **OK** to start the restore.



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.

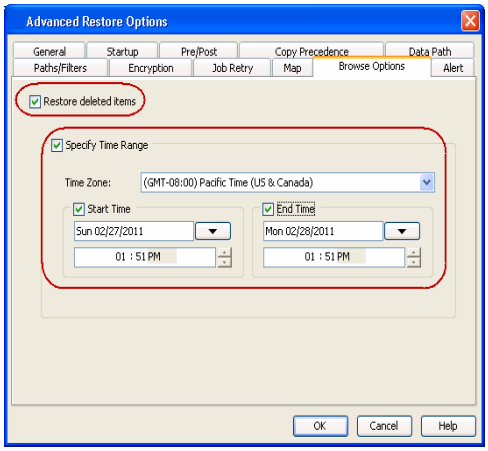
1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System | *<Backup Set>***.
2. Right-click the ***<Subclient>*** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5.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



RESTORING DELETED FILES

Follow the steps given below to restore deleted files:

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. Select the **Browse Options** tab**.**
7. 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**.

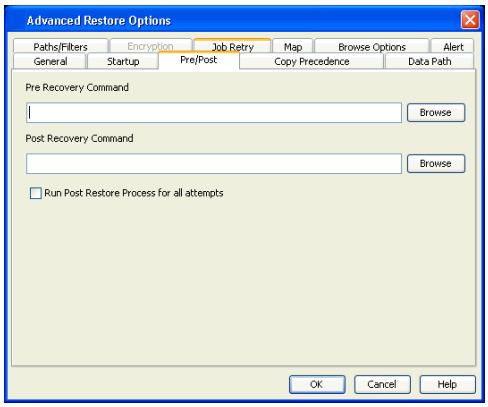


SETTING UP PRE-POST PROCESSES

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.

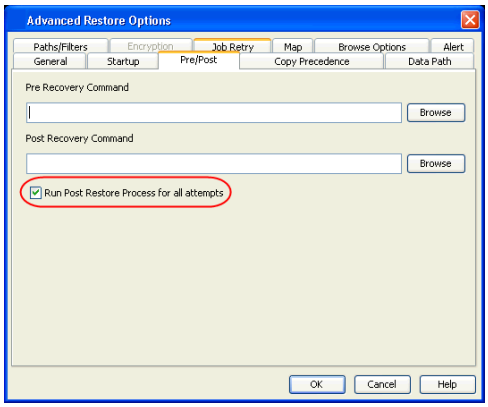


SETTING UP A PRE/POST PROCESS TO RUN AFTER EACH ATTEMPT

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.

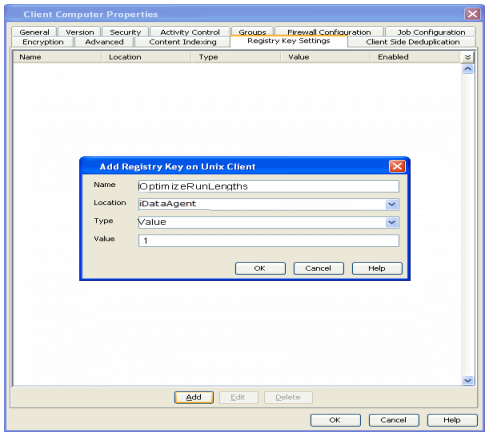
1. From the CommCell Browser, navigate to **Client Computers | <*Client*> | File System | <*Backup Set*>**.
2. Right-click the **<*Subclient*>** in the right pane and then click **Browse Backup Data**.
3. Click **OK**.
4. Select the data that you want to restore and click **Recover All Selected**.
5.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

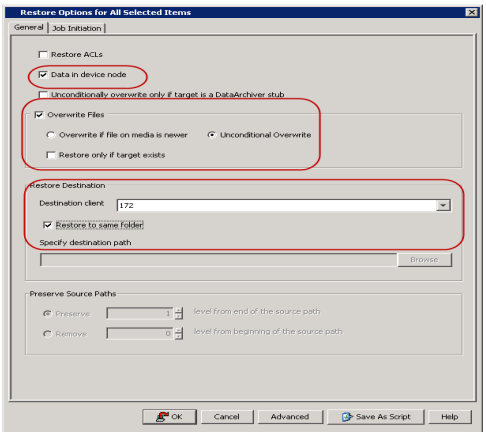


RESTORING RAW DEVICES

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**.

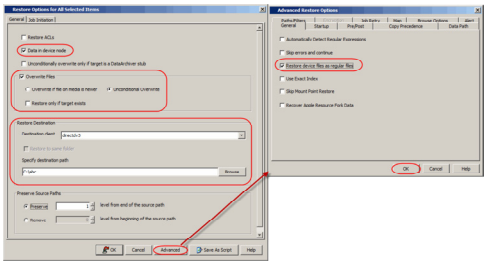
You can track the progress of the job from the **Job Controller**.



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**.

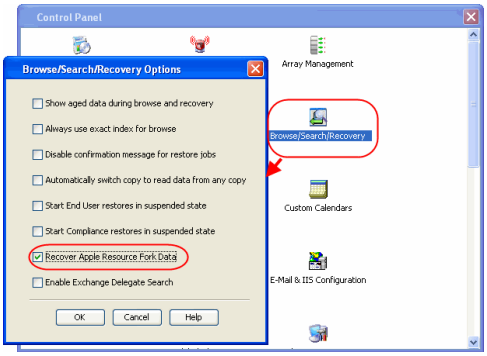


RESTORING MACINTOSH FILES

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**.

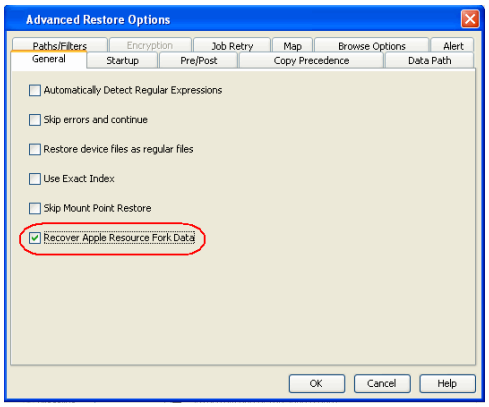


RESTORING RESOURCE FORK DATA FOR A SPECIFIC JOB

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**.

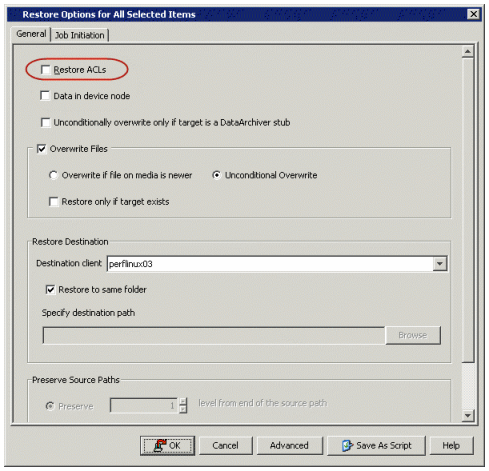
3. Click **OK**.
4. Select the MAC File System data that you want to restore and click **Recover All Selected**.
5. Click **Advanced.**
6. Select **Recover Apple Resource Fork Data** check box.
7. Click **OK**.



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

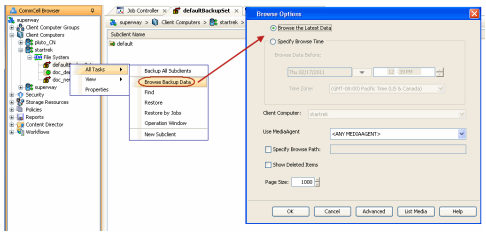
The option to browse the backup data provides the facility to view and selectively restore/recover the data that was backed up. The following sections explain how to browse the backup data.

LATEST DATA

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

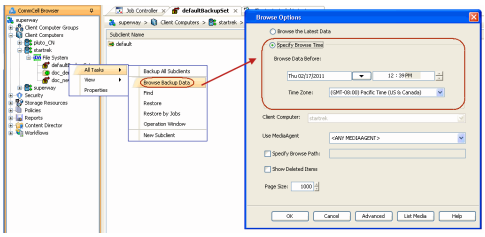
1. From the CommCell Browser, navigate to **Client Computers | *<Client>* | File System**
2. Right-click a Backup Set and click **All Tasks** | **Browse/Browse Backup Data**.
3. Click **OK**.

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

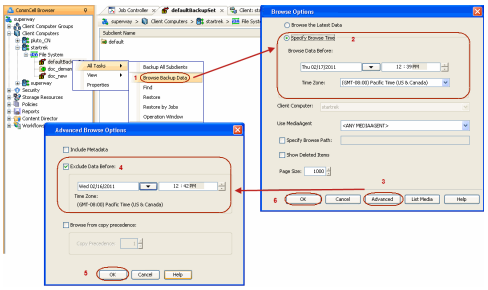


DATA BEFORE A SPECIFIED TIME

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**.



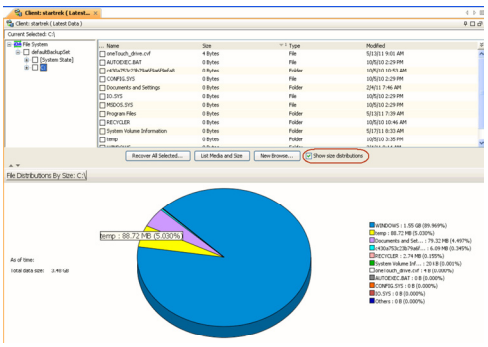
DATA BETWEEN A SPECIFIED TIME



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.

REVIEWING THE SIZE DISTRIBUTION

Before restoring any drive, you can quickly review the data size distribution of various folders on that drive. Follow the steps given below to view the size distribution:



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 the required options on the **Browse Options** dialog box and click **OK**.
4. Select the drive or folder that you want to restore.
5. Ensure that the **Show size distributions** check box is selected.

A pie chart of size distribution is displayed in the right pane of the CommCell Browser. You can also review the size distribution of the data in a subclient.

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:
   - Click **Media For the Latest Data** to list media associated with the most recent data protection cycle.
   - 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.

- 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:
   - Click **Browse the Latest Data** to list media associated with the most recent data protection cycle.
   - 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.
   - 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**.

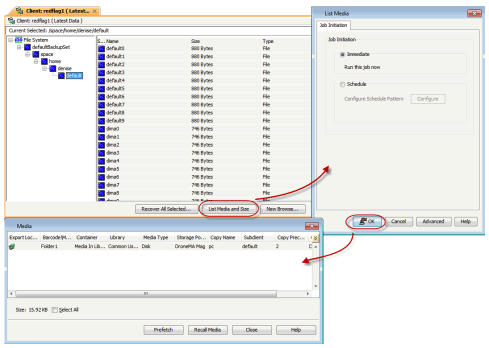
The appropriate media is listed in the **Media** dialog box.

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.



COMMAND LINE RESTORES

You can restore file system data from the command line interface.

Command line restores enable you to perform restore operations on multiple clients at the same time. It also allows you to reuse the command line scripts for additional restores.

When performing command line restores, note that backups taken from the CommCell Console can be restored using Command Line and vice versa. However, backups taken from a previous version of the CommCell Console can be restored only from the Command Line.

In order to run the restores from command line, you need an input xml file which contains the parameters for configuring the restore options. This input xml file can be obtained using one of the following ways:

- Download the input xml file template and save it on the computer from where the restore will be performed.
- Generate the input xml file from the CommCell Console and save it on the computer from where the restore will be performed.

LOG ON TO THE COMMSERVE

To run command line operations you must first login to the CommServe as follows:

- From Command prompt, navigate to <Software_Installation_Directory>/Base and run the following command:

```
qlogin -cs <commserve name> -u <user name>
```

- For example, to log on to CommServe 'server1' with username 'user1':

```
qlogin -cs server1 -u user1
```

PERFORM THE RESTORE

1. Download the restore_template.xml file and save it on the computer from where the command will be executed.
2. Execute the saved xml script using qoperation execute command.

```
qoperation execute -af restore_template.xml -appName 'File System' -clientName xxxxx -backupsetName xxxxx -destPath 'xxxxx' -sourceItem 'xxxxx'
```

3. Verify the status of the job using the following command:

```
qlist job -j JOBID
```

4. Once the job completes, logout from the CommServe using the qlogout command.

```
qlogout [-cs commserver] [-all] [-tf tokenfile] [-tk token] [-h]
```

EXAMPLES

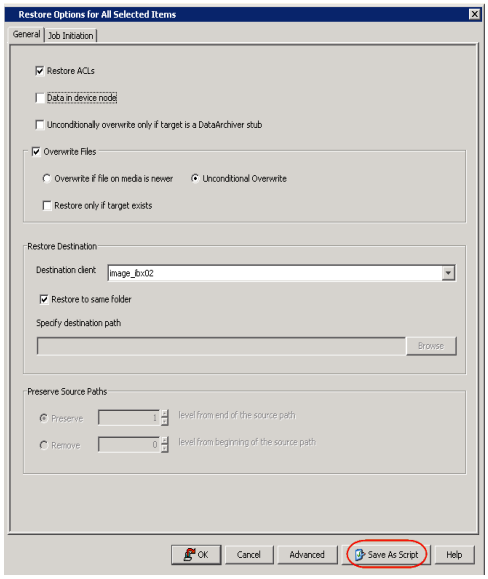
Restoring from a Current Backup	`qoperation execute -af restore_template.xml -appName 'File System' -clientName client1 -backupsetName backupset1 -destPath '/etc' -sourceItem '/etc4'`
Restoring Files to a Point in Time (date)	`qoperation execute -af restore_template.xml -appName 'File System' -clientName client1 -backupsetName backupset1 -destPath '/etc' -sourceItem '/etc4' -toTimeValue 2011-11-28`
Restoring Files to a Point in Time (date and time)	`qoperation execute -af restore_template.xml -appName 'File System' -clientName client1 -backupsetName backupset1 -destPath '/etc' -sourceItem '/etc4' -toTimeValue 2011-11-28 15:40:00`
Restoring by Jobs	`qoperation execute -af restore_by_job_template.xml -jobids 52 -sourceItem 2:52 -striplevel 1` where: • `jobids` is the backup job ID • `sourceItem` is the CommCell D and the backup job ID separated by a colon (':'). By default, the CommCell ID is 2. • `striplevel` is the number of folder levels to exclude from the source path. This parameter is optional. For example, if you have a directory structure (source path) as `/a/b/c` and you select strip level 2, the data will be restored from folder `c`, while folders `a` and `b` are excluded. Ensure that the strip level is always less than the source path level.

GENERATE THE COMMAND LINE SCRIPT FROM THE COMMCELL CONSOLE

In addition to the parameters provided in the template xml file, if you want to include additional options for the restore, you can do so by selecting the required options from the CommCell Console and generate the command line xml script for the restore operation.

Follow the steps given below to generate a script which you can use to perform a restore from the command line interface:

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. In the right pane of the Browse window, select the data that you want to restore and click **Recover All Selected**.
5. Select the required restore options which you want to execute using the script.
6. Click **Save as Script**.



7. Enter the location where you want to save the script or click **Browse** and navigate to the location.

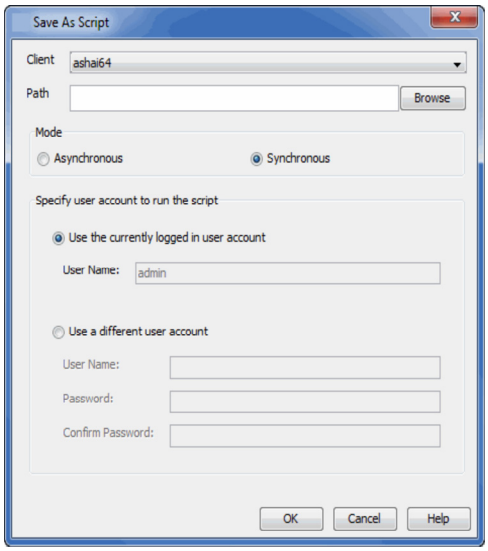
   The script will be saved as a .xml file and a .bat file is created.

   If a file with the same name already exists in the specified location, the .xml file will be created with a timestamp. However, the .bat file will overwrite the existing file.

8. Enter the username and password for the user account which you want to use to perform the restore.

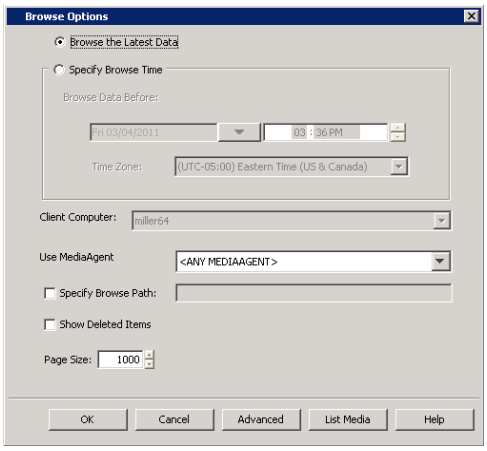
   By default, the user account which you have used to login to CommCell console is used for performing the restore. However, if the user account does not have access to application and database, click **Use a different account**.

9. Click **OK**.

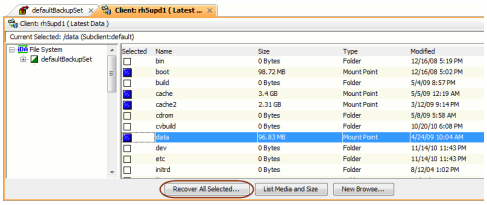


SCHEDULING A RESTORE

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**.

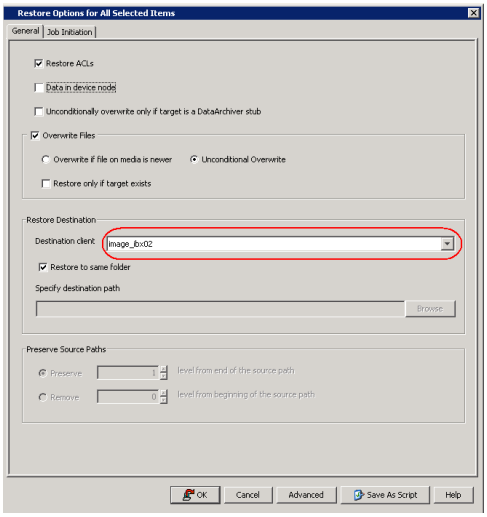


2.
   - Select a file to restore.
   - Click **Recover All Selected**.

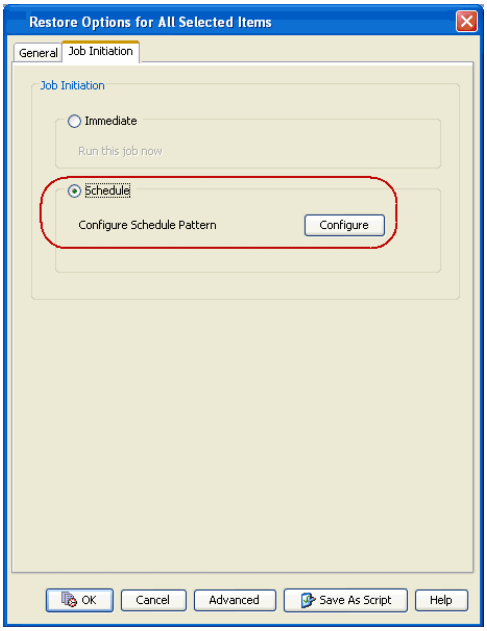


3. Select the name of the client computer from the **Destination Client** list.

   Click **OK**.

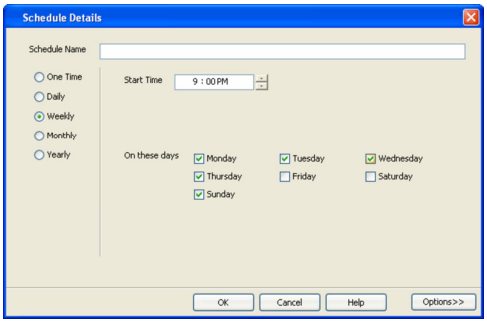


4.
   - Click **Job Initiation** tab and click **Schedule**.
   - Click **Configure**.



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.



See Scheduling for a comprehensive information on scheduling jobs.

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. See Job Management for a comprehensive information on managing jobs.

The following sections provide information on the different job management options available:

RESTARTING JOBS

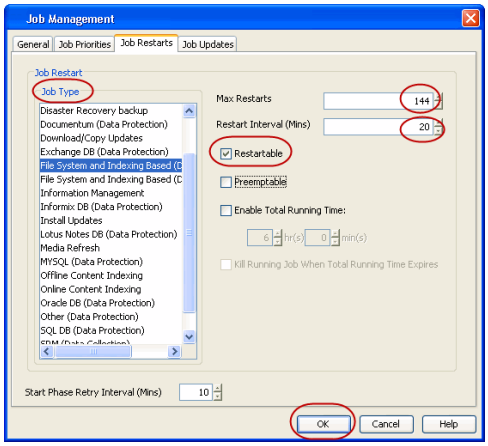
Jobs that fail to complete successfully are automatically restarted based on the job restartability configuration set in the Control Panel. Keep in mind that changes made to this configuration will affect all jobs in the entire CommCell.

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

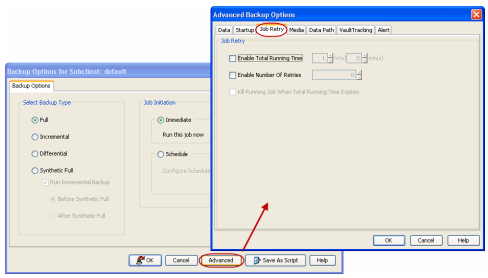
1. From the CommCell Browser, click **Control Panel** icon.
2. Select **Job Management.**
3. Click **Job Restarts** tab and select a **Job Type.**
   - Select **Restartable** to make the job restartable.
   - Change the value for **Max Restarts** to change the maximum number of times the Job Manager will try to restart a job.
   - 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**.
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 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	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. 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, select **Skip errors and continue** check box. 7. Click **OK**	
Use Exact index	This option allows you to associate the media with the most recent index available in the CommCell. 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. From the **Advanced Restore Options** , select **Use Exact Index** check box. 7. Click **OK**.	
Startup Options	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: 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 **Startup**. 7. In the **Startup** tab, select **Change Priority**. 8. Enter a priority number. 0 is the highest priority and 999 is the lowest priority. 9. Select the **Start up in suspended State** check box to start the job in a suspended state. 10. Click **OK**.	Refer to Job Priority and Priority Precedence.
Copy Precedence	By default, the system retrieves data from the storage policy copy with the lowest copy	Refer to Recovering Data From

	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. 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 the data from a a specific storage policy copy: 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**.	Copies.
Data Path Options	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: 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**.	Refer to Change Data Path.
Encryption	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: 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**.	Refer to Data Encryption.
Alerts	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: 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**.	Refer to Alert.

	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**. 10. Select the recipients and click **Next**. 11. Click **Finish**. 12. Click **OK**.	
Command Line Restores	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. You can also generate command line scripts for specific operations from the CommCell Browser using the **Save As Script** option.	Refer to Command Line Interface.
CommCell Readiness Report	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: 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**. The generated report is displayed.	
Restore Job Summary Report	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: 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.

KEYWORDS

MAP file, Raw device, Macintosh files, NFS mount, Sparse files, Holes, ACLS, Resource Fork Data

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Data Aging - Solaris File System

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Getting Started

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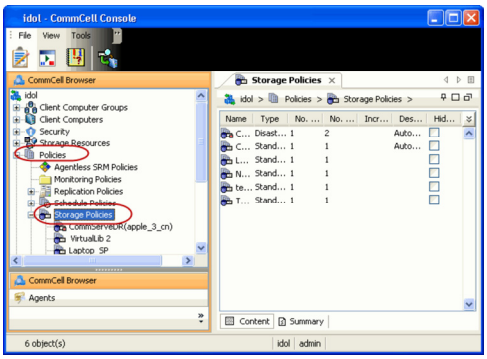
GETTING STARTED

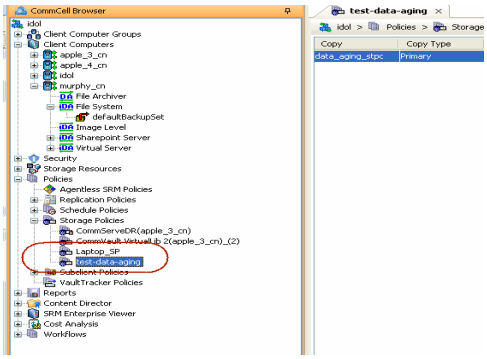
Data Aging is the process of removing old data from secondary storage to allow the associated media to be reused for future backups.

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.

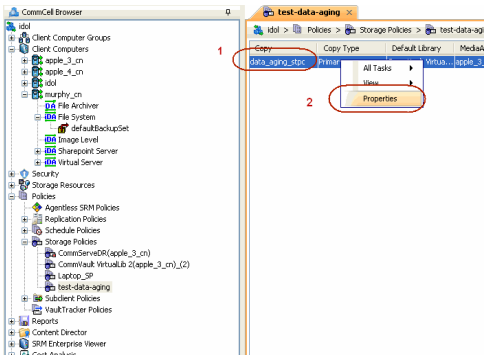
1. From the CommCell Browser, navigate to **Policies | Storage Policies**.



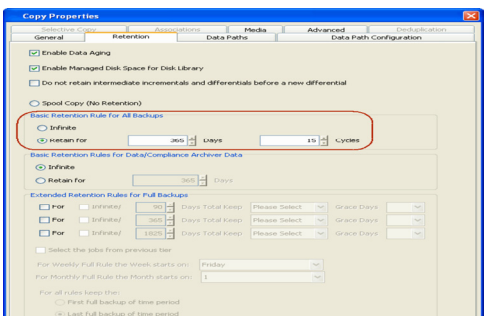
2. Highlight the **Storage Policy**.



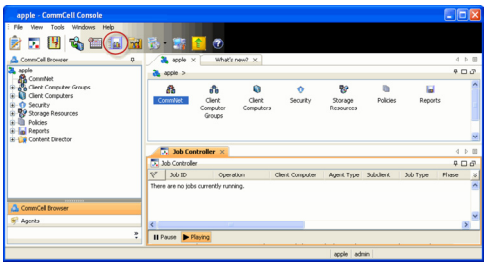
3. From the right pane, right-click the **Storage Policy Copy** and click the **Properties**.



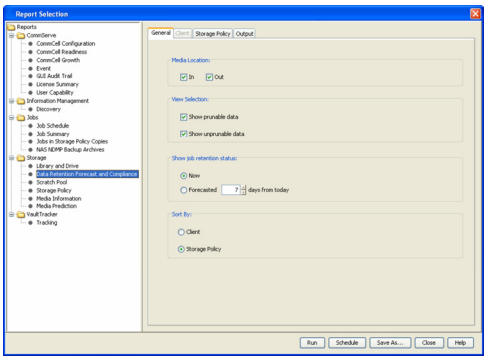
4.
- Click the **Retention** tab.
- Click the **Retain For** in the **Basic Retention Rules for All Backups** area.
- Enter number of days to retain the data.
- Enter number of cycles to retain the data.
- Click **OK**.



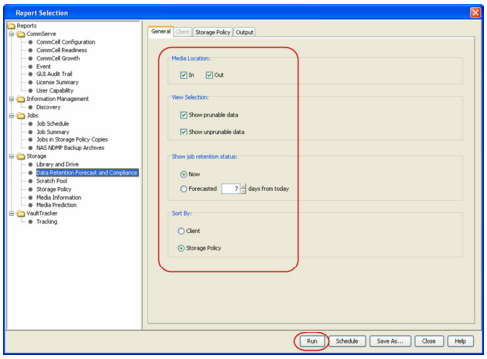
5. From the CommCell Browser, click the **Reports** icon.



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



7. Click **Run**.

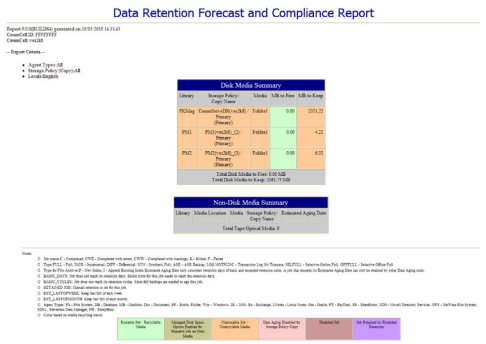


8. The report will display the data to be pruned when a data aging job is run.

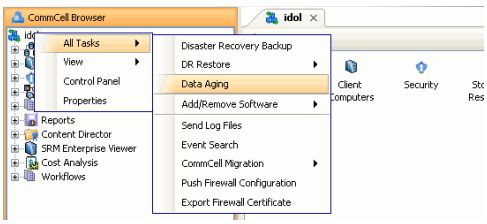
   To ensure only data intended for aging is actually aged, it is important to identify the data that will be aged based on the retention rules you have configured. Hence, ensure this report includes only the data you intend to age.

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

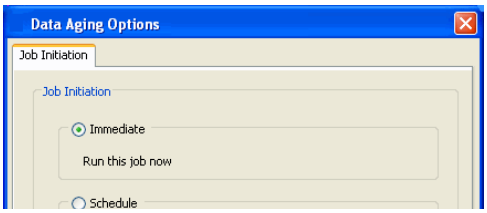
   Once you run a data aging job, the data will be lost.



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

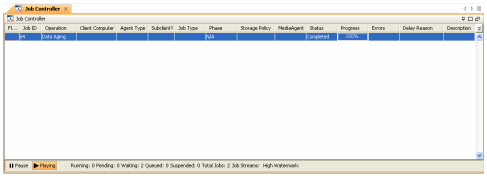


10. Select **Immediate** in the Job Initiation section and click **OK**.



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:

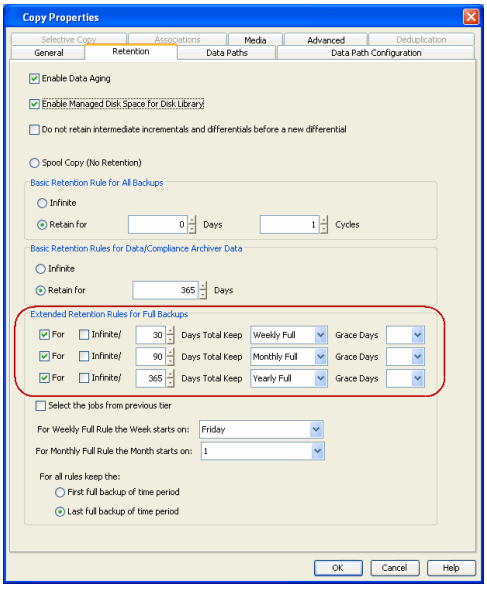
1. Right-click the storage policy copy and click **Properties**.
2. Click the **Retention** tab.
3. Set the basic retention rules by clicking **Retain for** and entering the number of days and cycles appropriate for your organization.
4. Set the extended retention rules as follows:

   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 - Solaris File System

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Planning for a Disaster Recovery

Rebuilding the Operating System

Restoring the Solaris File System

PLANNING FOR A DISASTER RECOVERY

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

- Perform regular backups of the Solaris 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 Solaris 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 a default install partition with the Solaris File System *i*DataAgent 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.
- Create and mount a root file system on the system that you want to restore.

REBUILDING THE OPERATING SYSTEM

1.	From the Solaris Installation disk, navigate to the appropriate Tools directory.	Example: `s0/Solaris_<ver>/Tools directory`
2.	Type the command to copy the jump start software to your machine	`./setup_install_server -b /opt/boot`

3.	Type the appropriate command to add each client that you want to boot off of the jump start server.	Example:
		`./add_* -i 172.19.71.226 -e 8:0:20:7c:89:1a -s pluto8:/jumpstart pluto6 sun4u`
		`./add_* -i 172.19.71.227 -e 8:0:20:7d:e6:33 -s pluto8:/jumpstart pluto7 sun4m`
		`./add_* -i 172.19.71.224 -e 8:0:20:7c:73:f -s pluto8:/jumpstart pluto4 sun4m`

4.	Copy `<mnt_point>/Solaris_<ver>/Tools/Boot` from the disk to a shareable directory	Example: `/jumpstart`
5.	Modify bootparams to reflect the new root directory	`/etc/bootparams`
6.	Modify the hosts to add the hosts needed to communicate with the Solaris File System *i*DataAgent	Example: `<mnt_point>/Solaris_<ver>/Tools/Boot/.tmp_proto/root/etc/inet/hosts`

7.	Add the shared memory information to system	Example:
		`<mnt_point>/Solaris_<ver>/Tools/Boot/etc/system`
		`set shmsys:shminfo_shmmax=4199304`
		`set shmsys:shminfo_shmmin=1`
		`set shmsys:shminfo_shmmni=5824`
		`set shmsys:shminfo_shmseg=5824`
		`set semsys:seminfo_semmns=5824`
		`set semsys:seminfo_semmni=5824`
		`set semsys:seminfo_semmsl=5824`

8.	Add System Services.	Example:
		`<mnt_point>/Solaris_<ver>/Tools/Boot/etc/services`
		`cvd 8400/tcp`
		`EvMgrS 8401/tcp`
		`EvMgrC 8402/tcp`

9.	Create symbolic links for required writeable areas.	Example:
		`ln -s ../tmp/root/etc/inet/Galaxy.pkg Galaxy.pkg`
		`ln -s /tmp/CommVaultRegistry CommVaultRegistry`

10.	Restart the computer.	
11.	Create and mount a `/opt` file system using an open slice.	Example: `swap slice`
12.	Install the Solaris File System *i*DataAgent software. If the installer requests updates and the required updates have not been installed on the jump start server, skip the request to add the additional operating system updates.	

13. Type the command to create partitions/slices on the disk.

    format

14. Type the command to create the root file system.

    newfs /dev/dsk/*<DriveID>*

    where *<DriveID>* is the Drive Identifier of the partition where you want to create the root file system.

    Example:

    newfs /dev/dsk/*<root>*

15. Type the command to mount the new root file system at /mnt.

    mount /dev/dsk/*<DriveID>* /mnt

    where *<DriveID>* is the Drive Identifier of the partition containing the root file system.

    Example:

    mount /dev/dsk/*<root>* /mnt

16. Create an empty directory called "proc" on /mnt

    Example:

    mkdir /mnt/proc

17. If you have recreated any file systems other than root, type the command to mount these as well.

    mkdir /mnt/*<file_system_name>*

    mount /dev/dsk/*<DriveID>* /mnt/*<file_system_name>*

    where *<file_system_name>* is the name of the file system and *<DriveID>* is the Drive Identifier of the partition containing the file system.

    Example:

    mkdir /mnt/*<devfs>*

    mount /dev/dsk/*<root>* /mnt/*<devfs>*

18. Install the jump start server on the Boot server.

    cd <*jumpstart_install_directory*>

19. Type the command to unpack miniroot.

    <miniroot_mnt_dir>=`pwd`/boot

20. Type the following commands if the software is installed at /opt:

    cd <miniroot_mnt_dir>/etc/

    ln -s /tmp/calypso/CommVaultRegistry CommVaultRegistry

    Type the following commands if the software is installed at a different directory:

    cd <miniroot_mnt_dir>

    ln -s /tmp/calypso opt/calypso

    ln -s /tmp/calypso var/log/calypso

21. Pack Miniroot

    /boot/solaris/bin/root_archive pack sparc.miniroot `pwd`/boot

22. Use Network File System protocol to export a directory with RW (Read/Write) permissions for the client to be recovered.

    /export/*<mydir>*

    where *<mydir>* is the name of the directory. Make sure the client gets all required permissions on this directory and its contents.

    Example:

    /export/*<dir1>*

23. From the Commcell console, restore CommVaultRegistry and /opt/**calypso/*** into /export/*<mydir>*

    cd to /export/*<mydir>*

    mkdir Log_Files

    mv Base32 Base

    mv *i*DataAgent32 *i*DataAgent

    If you are using x64 Solaris, then:

    mv Base/calypso Base32

    rm -rf Base *i*DataAgent

24. On the Client side, perform the following steps:
    - Jumpstart the client using the boot server.
    - Follow the prompts and get to a shell. Bring up all the interfaces.

      boot net -s

    - Configure a default route.

      route add default *<172.x.x.x>*

      where *<172.x.x.x>* is the Gateway address

    - Add the client IP address and hostname to:

      /etc/hosts

    - Add the Media Agent and CommServe to:

/etc/hosts

25. Type the command to create partitions/slices on the disk.

    fdisk /dev/rdsk/c1d0p0

26. Type the command to create the root file system.

    newfs /dev/dsk/*<DriveID>*

    where *<DriveID>* is the Drive Identifier of the partition where you want to create the root file system.

    Example:

    newfs /dev/dsk/*<root>*

27. If ZFS file system is on root partition, perform the following steps to create **zpools** and **file systems:**

    zpool **create** –R/a <*pool name*>

    where <*pool name*> is the zpool name created during the initial Solaris install.

    zfs **create** <*pool name*>/FS1

    where <*pool name*> is the zpool name created during the initial Solaris install and FS1 is the file system name

    zfs **set** mountpoint=<*first_mountpoint*><*pool name*>/FS1

    where <*first_mountpoint*> refers to its original mountpoint and FS1 is the file system name

    fs **create** <*pool name*>/FS2

    where <*pool name*> is the zpool name created during the initial Solaris install and FS2 is the file system name

    zfs **set** mountpoint=<first_mountpoint><*pool name*>/FS2

    where <*first_mountpoint*> refers to its original mountpoint and <*pool name*> is the zpool name created during the initial Solaris install.

28. Type the following command to create a dump and swap a file system:

    zfs **create** –V <space required> <*fsname*>

    where <*fsname*> is the filesystem name.

    Example:

    /export/home

29. Type the following commands to start the Recovery services:

    cd /opt/calypso

    mkdir /opt/calypso/Base/Temp/

    . ./galaxy_vm

    . ./Base/cvprofile

    svc_ctrl –**focus** $GALAXY_VM –**start** cvd

    svc_ctrl –**focus** $GALAXY_VM –**start** EvMgrC

    svc_ctrl –**focus** $GALAXY_VM –**start** cvfwd

30. Set the variable

    Example:

    platform=`uname –i`

31. Use the variable as directory, to map it to the correct Boot block.

    Type the following command for Solaris 10 Update 6 or above:

    installboot –F zfs /a/usr/platform/ $platform/lib/fs/zfs/bootblk /dev/rdsk/<*boot_disk*>

    where <*boot_disk*> is the name of the disk to be booted

    Type the following command for Solaris 10 Update 5 or below:

    installboot /a/usr/platform/ $platform/lib/fs/ufs/bootblk /dev/rdsk/<boot_disk>

    where <*boot_disk*> is the name of the disk to be booted

    Type the following command for x86 systems:

    installgrub – fm /a/boot/grub/stage1/a/boot/grub/stage2 /dev/rdsk/<boot disk>

    bootadm **update**-archive –R /a

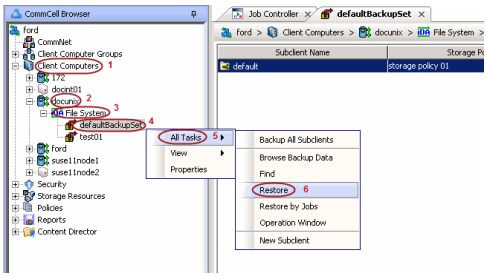
    init 6

32. Restart the computer.

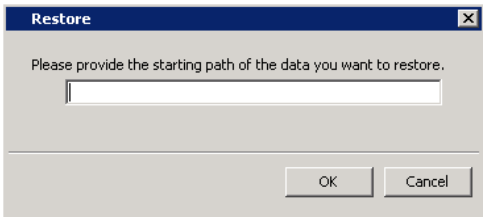
RESTORING THE SOLARIS FILE SYSTEM

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 Solaris file system path to the data you wish to restore. You can type "/" as the path to restore the entire content.

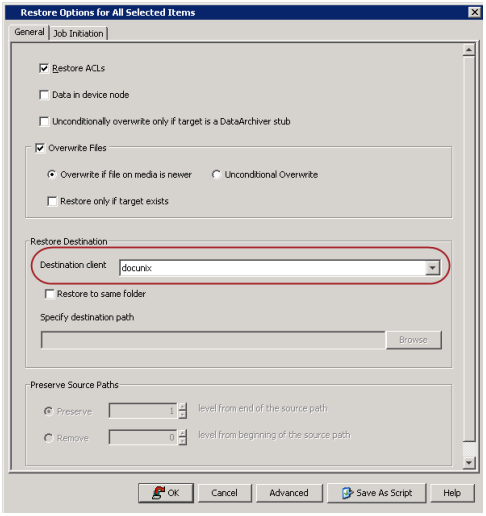


3. Select the name of the client computer from the **Destination Client** list. If you are mounting the new root file system at `/mnt`, type or accept "/mnt" as the restore destination. Do not select **Restore to same folder** checkbox.

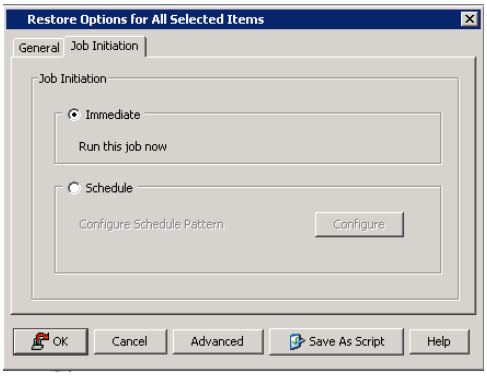
   Click **OK**.

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

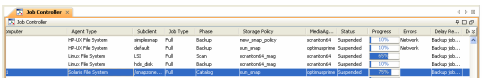
   Restored data retains its original permissions. The ACLs are restored after the permissions are restored.



4.
- Select **Immediate** from the **Job Initiation** tab.
- Click **OK**.



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



6. Restart the computer.

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Additional Operations - Solaris File System

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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**.

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 ***i*DataAgent** 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:
   - Enter the name of the rule in the **Name** field.
   - 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:
   - **ON** to enable Global Filters for this subclient.
   - **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 cvpkgrm 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 *i*DataAgent	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)	
		Agent Properties (Storage device)	
	Subclient	Subclient Properties (General)	
		Subclient Properties (Content)	Add Multiple Contents
		Subclient Properties (Filters)	
		Subclient Properties (Pre/Post Process)	
		Subclient Properties (Encryption)	
		Subclient Properties (Storage Device)	
		Subclient Properties (Activity Control)	

		Subclient Properties (1-Touch Recovery) Subclient Properties (SRM Options) Subclient Properties (Security) Subclient Properties (SnapProtect)	
	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 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 - Solaris File System

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.

AVOIDING DUPLICATE CONTENT BACKUPS ON CLUSTERED FILE SYSTEMS

When backups are run from multiple nodes on clustered file systems, the same content is backed up multiple times. Backups should be run on only one node to avoid such duplicate content backups. However, the other nodes can also be configured to run backups but make sure that the clustered file system mount point is added to the file system exclusion list of the physical machine's subclients.

For VERITAS Cluster File System, the clustered file system mount point is added automatically to the file system exclusion list when backup is run for the first time on the virtual node/s.

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.

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.

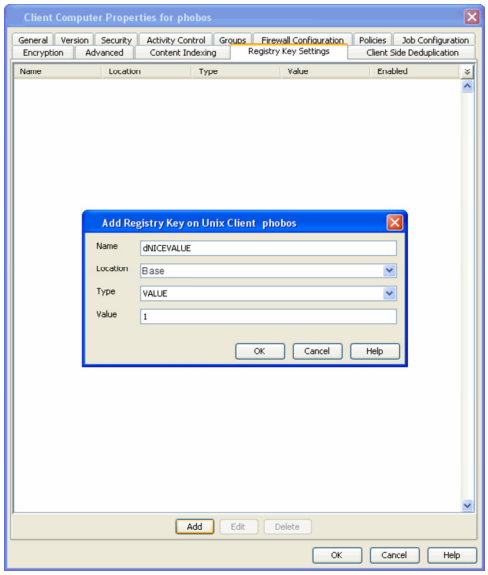
OPTIMIZING THE CPU USAGE ON PRODUCTION SERVERS

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:

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.



- 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 - Solaris File System

CAN WE PROTECT DATA ON NON-GLOBAL ZONES IF THE FILE SYSTEM *i*DATAAGENT IS INSTALLED ONLY ON THE GLOBAL ZONE?

Yes. We can protect file system data on non-global zones if the File System *i*DataAgent is installed only on the global zone. However, in order to enable consistent backups of application specific data on the non-global zones, you will need to install the corresponding application specific *i*DataAgent on the non-global zone.

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 ARE CASE-SENSITIVE FILES RESTORED FROM UNIX TO WINDOWS CLIENTS?

Windows operating system does not maintain case-sensitivity of the file names. Hence, when you perform a cross-platform restore from a Unix client to a Window Client, if there are two case-sensitive files with same name, the case sensitivity of the files are ignored and the files are overwritten. For example, if you are trying to restore files named `SAMPLE` and `sample` from Unix to Windows, the file which is restored last will overwrite the first one that was restored.

HOW ARE FILE NAMES WITH \ CHARACTER HANDLED WHEN RESTORING FROM UNIX TO WINDOWS CLIENTS?

When you restore a file with a `\` character in its name (for example, `file\.dat`) to a Windows client computer, Windows interprets the `\` as a delimiter in the path name and creates a folder on the Windows computer named `file`, which will contain a file named `.dat`. However, the contents of the files `file\.dat` and `.dat` are identical.

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.

WHAT ARE THE TWO TYPES OF FILE LOCKS AND HOW ARE THEY BACKED UP?

The Unix file system uses two types of file locks: Advisory locks and Mandatory locks. Files with an advisory locks are available to multiple users and applications. Files with mandatory locks cannot be used by any other user or application other than the current user.

Files with advisory locks are included in the backups by default. On the other hand, files with mandatory locks are skipped during the backup process and their file names and paths are logged to the Backup Job History log. You can use the CommCell Console to examine this log to determine if any files were skipped. The system automatically attempts to obtain any skipped files in the next backup.

You can backup mandatory locks when you install and enable Qsnap. For comprehensive information on configuring backups for files with mandatory locks, see Configuring Backups for Locked Files for step-by-step instructions.

HOW DO WE IDENTIFY AND EXCLUDE FILE SYSTEM TYPES WITHOUT A NAME FROM BACKUPS?

File system types that do not have a corresponding name can be identified by their numeric value. The numeric value of such file systems can be found printed in the `FileScan.log` log file located in the `/var/log/`calypso`/Log_Files/` directory, as shown below.

For example:

```
Find::GetFsType() - add fstype '391' for '/home' to cache (st_dev:17)

Find::GetFsType() - add fstype 'ext3' for '/testData/uxpermissions' to cache (st_dev:FC08)
```

This numeric value of file system type from above example can be used in conjunction with the `ignoreFStype` registry key to skip the file system type from backups.

For example,

```
ignoreFStype :391:.
```

WHAT ARE THE FOLDERS/FILES CREATED AND CHANGES DONE DURING INSTALL OF THIS AGENT?

PLATFORMS	FOLDERS CREATED	FILES CREATED	OTHER CHANGES
Solaris	/opt/calypso/Base/calypso /usr/bin/calypso /usr/bin/cvpkgrm /usr/bin/cvpkgcheck /usr/sbin/calypso /usr/sbin/cvpkgrm /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	Driver configuration file to /usr/kernel/drv copied /cxbf.conf Driver to /usr/kernel/drv/amd64 for X86 and /usr/kernel/drv/sparcv9 copiert for Sparc File /usr/sbin/cvsnap is created (copied from the installation package) Create file /usr/sbin/cv_vxfreeze. File /usr/sbin/cv_vxunfreeze is created (copied from the installation package) File /usr/sbin/cvsnap32 is created (copied from the installation package) File /usr/sbin/cxbf-bootscript1.rc.example is created File /usr/sbin/cxbf-bootscript2.rc.example is created / Etc /devlink.tab is updated File /usr/sbin/cxbf-bootscript1.rc is created File /etc/rc3.d/S66CVCXBF is created File /etc/rcS.d/S96CVCXBF is created /etc/system (solaris2.8 and 2.9 only when user selected to modify IPC settings) /etc/system.gal.$$ (solaris2.8 and 2.9 only; backup if user selected yes for IPC change OR suggested settings if user selected not to change IPC this time; $$ is pid) The file /etc/rc0 adjusted accordingly (if selected during install)	Startup Scripts: <dir>/S99Galaxy where <dir>=/etc/rc.d/rc<n>.d; /etc/rc<n>.d ; /sbin/rc.d/rc<n>.d ; sbin/rc<n>.d ; /etc/init.d/runlevels/%<n> only if <dir> exists, where <n> is the second field in line "id:2:initdefault:" of /etc/inittab for solaris 10+ if this did not exist in /etc/inittab then we use 3 <dir>/K99Galaxy where <dir>=/etc/rc.d/rc<n>.d; /etc/rc<n>.d ; /sbin/rc.d/rc<n>.d ; sbin/rc<n>.d ; /etc/init.d/runlevels/%<n> only if <dir> exists, where <n> is the second field in line "id:2:initdefault:" of /etc/inittab for solaris 10+ if this did not exist in /etc/inittab then we use 3

Troubleshooting - Solaris File System Backup

Backup | Restore

The following section provides information on some of the troubleshooting scenarios related to backup:

BACKUP FAILURES

Backup fails	The subclient content might have remote scripts with one or more blank lines at the top. Ensure that you delete the blank lines at the top of any remote scripts.
Backup hangs indefinitely	Ensure that there are no stale NFS mounts on the server included in the backup. 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.

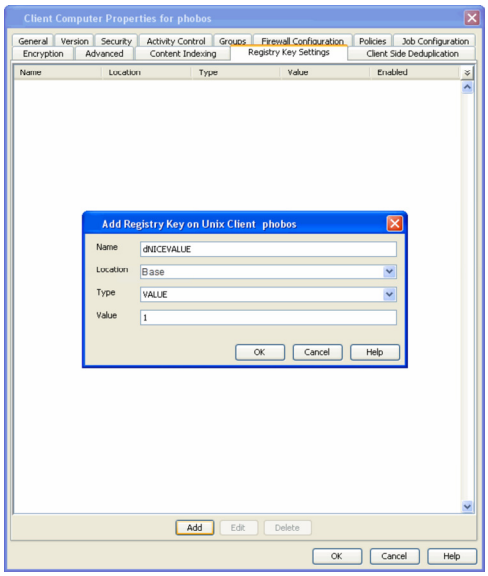
Error while loading shared libraries	On Linux clients, the below error appears when we run any process or service:
	`<process name>: error while loading shared libraries: <lib>.so: cannot enable executable stack as shared object requires: Permission denied`
	For example,
	`#./ifind -getmnt -all`
	`./ifind: 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`

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**.

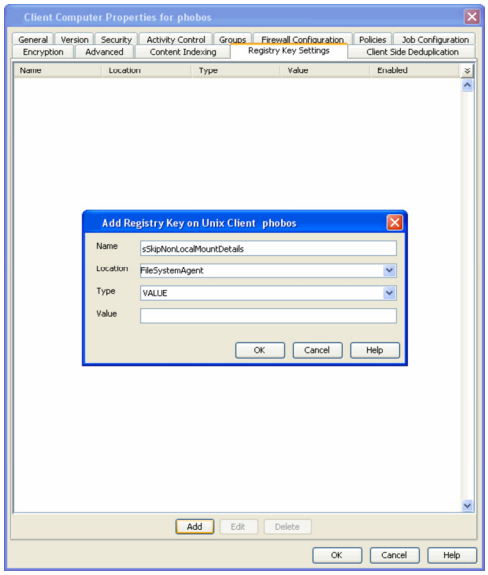
Restart the services on the client after setting this key.



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 Solaris File System *i*DataAgent complete without any error messages.

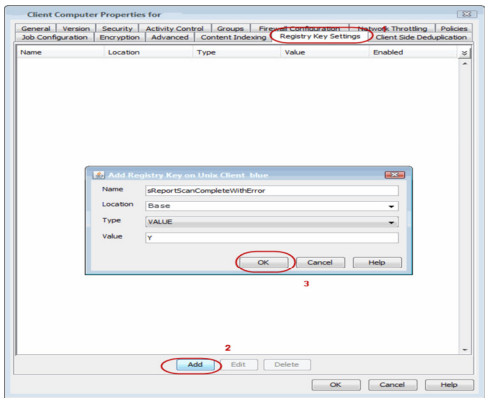
In the Scan phase files that cannot be accessed will be populated in scan_failures.cvf, in the following scenarios:

- 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**.

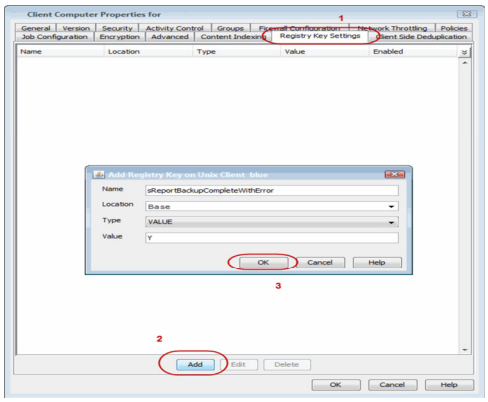


During backups the jobs will be marked partial success and reported into Failures.cvf, in the following scenarios:

- 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:

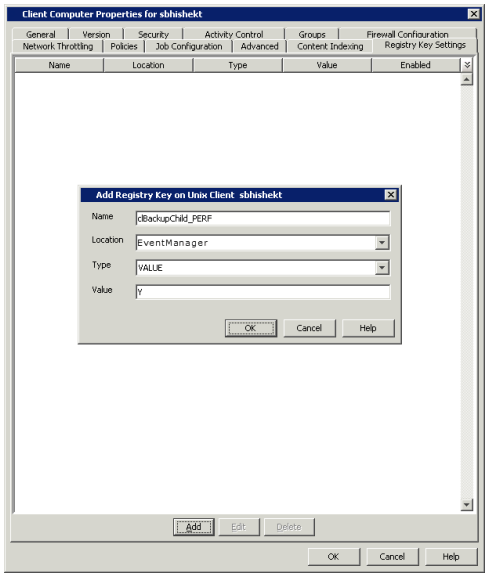
`FileRead`	Average time spent in system call to read the file.
`CheckFileHole`	Average time spent to verify if buffer read from the disk is a hole.
`Close File`	Average time spent in system call to close the file.
`AllocBuffer`	Average time spent waiting for the network buffer.
`WriteBuffer`	Average 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**.



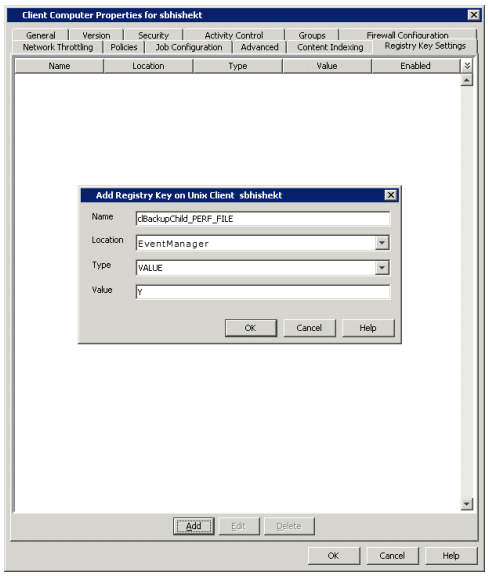
DISPLAYING PERFORMANCE DETAILS FOR EACH FILE IN A BACKUP JOB

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 identity 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 - Solaris File System Restore

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`

Restore fails when trying to restore a running executable file.	Ensure that you are not including any running executable files in the restore operation.

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 license

  See 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.

Erase Backed Up Data - Unix File System *i*DataAgent

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Configuring Erase Data
Assign a Filter Storage Policy
Enable Erase Data in Storage Policy

Running an Erase Data Job

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View Erased Data in an Erased Data Job Summary Report

Viewing Job History

RELATED TOPICS

Support
The list of Agents that support erasing data.

How Do I
The most common procedures for erasing data.

OVERVIEW

The Erase Data feature allows you to permanently erase any data that was backed up. This is useful if you want to erase data so that it cannot be restored again. For example, you may want to erase data for legal purposes or compliance regulations.

Keep in mind that the erase data operation only erases the backup data - the source data will remain on the local hard drive. Therefore, it is recommended to delete the data from the source first so that it will not be backed up again.

The Erase Data operation makes the data inaccessible for browsing and recovery - the data will remain on the media and take up space until it is aged off according to the retention rules set for the data. Data will not be recoverable using any data recovery methods. If the backup job is already content indexed, the data being erased will be removed from the index.

Using Erase Data, you can erase data such as Linux, HP-UX, AIX, Solaris, and IRIX files.

PREREQUISITES

The Erase Data feature requires:

- An Erase Data license to permanently erase data.
- The **Allow Erase Data** option needs to be enabled in the Storage Policy Properties dialog box as explained in the Configuring Erase Data.
- The MediaAgent must be installed on the CommServe.

CONFIGURING ERASE DATA

To erase data, you need to first configure the following:

- Assign a Filter Storage Policy for Erasing Data
- Enable Erase Data in Storage Policy

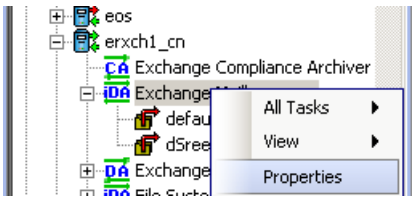
ASSIGN A FILTER STORAGE POLICY

To erase data, a filter storage policy needs to be associated with the Agent. Ensure that the filter storage policy that you associate with the agent has retention criteria that is greater than or equal to the retention criteria of the storage policy for the data to be erased.

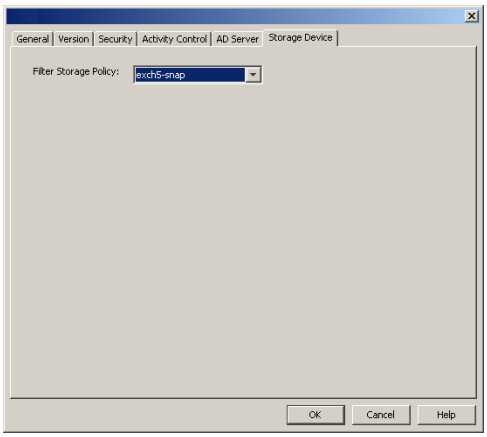
1. From the CommCell Browser, right-click the appropriate agent icon and then click **Properties**.

   NOTES

   - Your screen may look different from the example shown.



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

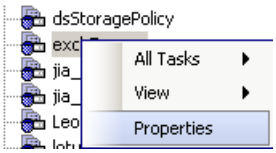


3. Click **OK**.

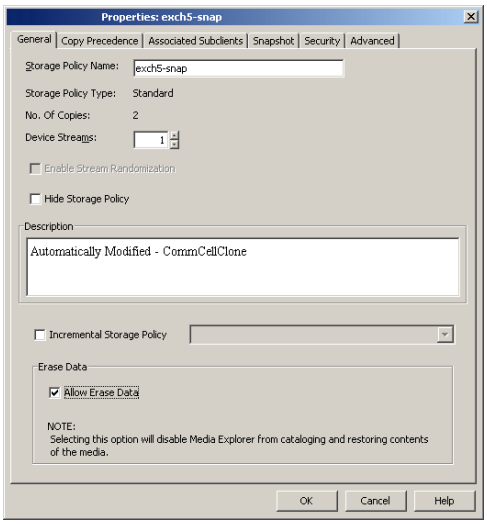
ENABLE ERASE DATA IN STORAGE POLICY

To erase data, the storage policy assigned to the subclient where data will be erased needs permission to allow the erasing of data. Ensure that the retention criteria of the storage policy for the data to be erased is equal or greater to the filter storage policy that is associated with the agent.

1. From the CommCell Browser, right-click the storage policy you want to allow for the erasing of data, 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**.

RUNNING AN ERASE DATA JOB

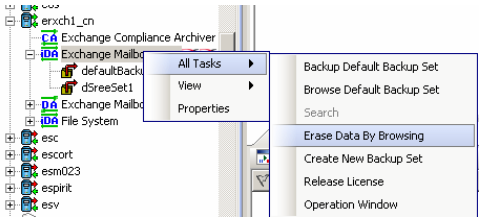
After the configuration has been completed, you can now browse and erase data.

RUN OR SCHEDULE ERASE DATA JOB

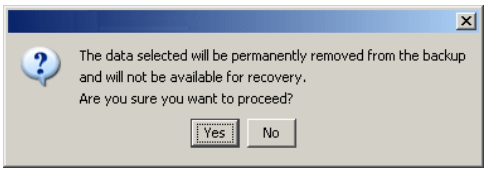
1. From the CommCell Browser, right-click the agent or instance that contains the data which you want to erase, select **All Tasks** and then click **Erase Data By Browsing**.

   NOTES

   - Your screen may look different from the example shown.

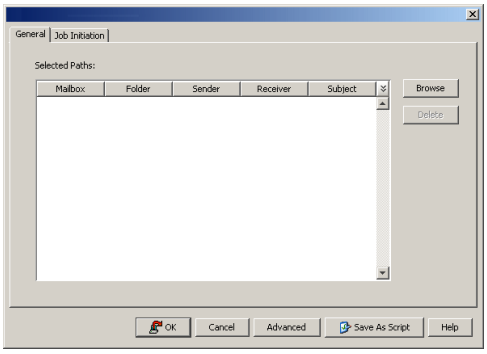


2. You are warned that the data will be permanently removed. Click **Yes** to continue.

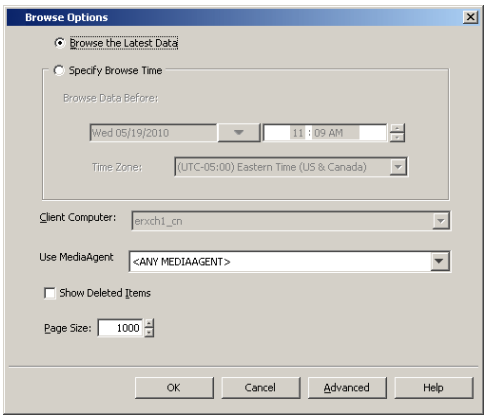


3. From the **Erase Data by Browsing** dialog box, click **Browse**.

   When a path is selected and a browse time is specified, all data that matches the path will be erased even if the data was not backed up in the specified time range.

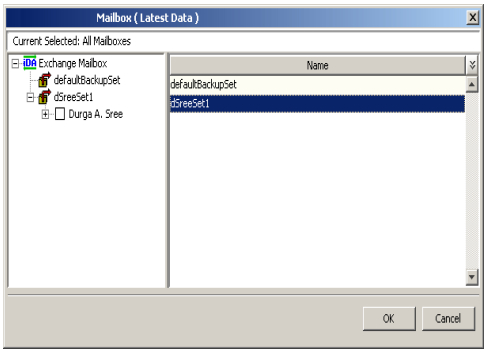


4. In the **Browse Options** dialog box, select a browse time range and any advanced browse options, and click **OK**.



5. From the browse selection window, select the data objects that you want to erase, and click **OK**.

   If you need to erase data from a specific folder that is not visible in the current browse selection, you need to browse to a point in time to a backup that included the folder. Then, you can select the data under that folder to be erased.



6. Optionally, you can click **Advanced** to configure an alert for this job.
7. Click **Job Initiation** if you would like to run this job immediately or schedule it.
   - Click **Immediate** and then **OK** to run the job now. When the job is done, Job Controller displays Completed.
   - If **Schedule** is selected, click **Configure** to create a schedule for this operation. Your Erase Data by Browsing operation will execute according to the specified schedule. See Create a Job Schedule for more information.

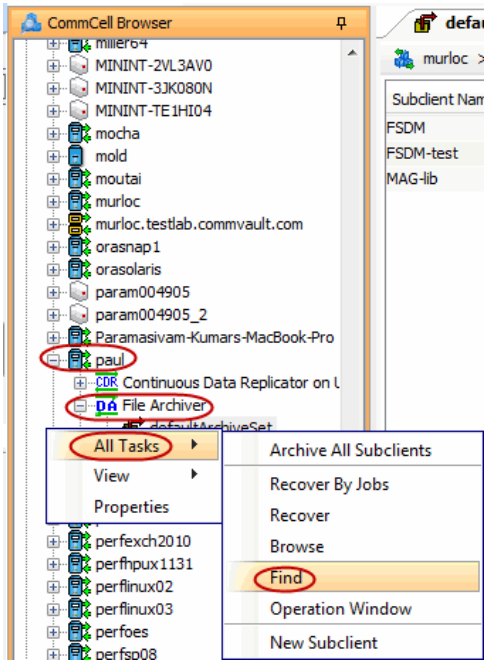
USING FIND TO ERASE DATA

The Find feature allows you to search and locate data such as files, directories, and messages in a backup. Once located, this data can be erased. After erasing the data, it can no longer be browsed or restored. However, the data will remain on the media and take up space until it is aged off according to the retention rules set for the data.

Keep in mind that the erase data operation only erases the backup data - the source data will remain on the local hard drive. Therefore, it is recommended to delete the data from the source first so that it will not be backed up again.

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

Right-click **Backup Set** or **Subclient**, click **All Tasks** | **Find**.

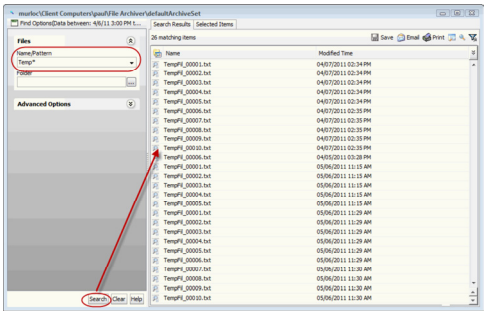


2. Enter search criteria. For example, you can type a file name in **Name/Pattern** to narrow the search. You can search for partial words without the need for wildcard characters at the beginning and/or end of the search string.

   These wildcards, or a combination of these wildcards, are supported:

   - `*` for any number of characters e.g., `Accounting*`.
   - `?` for any one character e.g., `user_group?`.
   - `[]` for a range of characters e.g., `[a-k]Lee`.
   - `[!]` for a negation of a range of characters e.g., `[!a-k] Lee`.

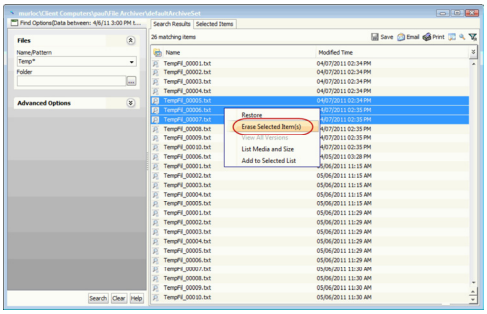
   Click **Search**. The data that matches the criteria are displayed in Search Results.



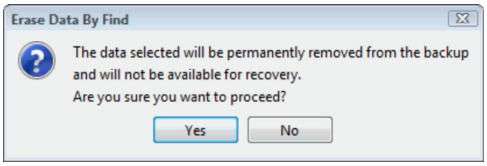
3. Select one or more items.

   Right-click the items and select **Erase Selected Item(s).**

   You can also erase data when it has been moved to Selected Items.

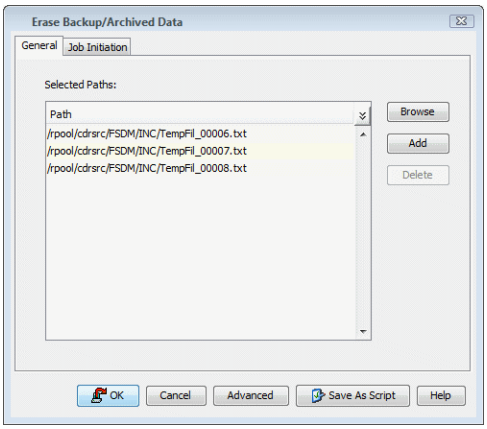


4. Click **Yes**.



5. Optionally, modify what will be erased by selecting either **Browse**, **Add**, or **Delete**.

   Confirm the data to be erased and click **OK**.



VIEWING ERASED DATA

These features are available to view the data erased.

ADMIN JOB HISTORY

You can view detailed, historical information about the Erase Data jobs in the **Admin Job History Filter** dialog box.

To view admin job history:

1. From the CommCell Browser, right-click the CommServe, click **View**, and then click **Admin Job History**.
2. From the Admin Job History Filter dialog box, select the filter options that you want to apply and click **OK**.
3. The Admin Job History dialog box displays with the specified filter options.
4. Click **Close**.

VIEW ERASED DATA IN A LOG FILE

The files have been erased can be viewed in the `SelDelete.log` file. For example, `TempFil_00008.txt` is a file that had been erased:

```
4836 17a4 10/15 14:37:10 1106 ::main() - 1: '/ext3/fsdm/HW_1/erasedata/TempFil_00008.txt'
```

To view the log files of a CommServe, MediaAgent, or client computer.

1. From the CommCell Browser, right-click a CommServe, MediaAgent, or client computer, click **View,** and then click **Log Files**. The **Select the Log File to Open** window displays.
2. To see a specific log file, either select the log file name from the list or type the name of the log file in the field provided. (In the **Files of type** field, **Log Files (*.log)** is displayed by default.) Click **Open**. The contents of the log file are displayed.

VIEW ERASED DATA IN AN ERASED DATA JOB SUMMARY REPORT

An Administrative Job Summary Report provides details of all the Erase Data jobs.

To create an Erase Data Job Summary report:

1. From the CommCell Browser, click the **Reports** icon.
2. Select **Job Summary** from the **Reports** pane of the **Report Selection** dialog box.
3. From the General tab, select **Administrative Jobs** and then select **Erase Backup/Archived Data**.
4. Select the filter criteria to include in the Erase Backup/Archived Data Job Summary Report from the various tabs (e.g., Computers, Selection, Options, Time Range).
5. From the Output tab, select the output format and/or save options for the report.
6. Click one of the following: **Run** to generate the report immediately, **Schedule** to schedule the reports for specific times, **Save Template** to save the report filter options into the My Reports node, or **Close** to exit the window.

See Erase Backup/Archived Data Job Summary Report for details.

VIEWING JOB HISTORY

Once an erase data job has completed, it may be useful to view specific historical information about the job, such as the following:

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

This information can be viewed in the Job History window. The history provided depends on the entity from which the job history is viewed. For example, viewing job history from the subclient level will yield information for the jobs performed for that subclient. Conversely, viewing job history from the instance level will yield information for jobs run from all subclients within that instance.

To view the backup job history:

1. From the CommCell Browser, right-click the entity (client computer, *i*DataAgent, instance, or subclient) whose backup history you want to view, click **View**, and then click **View Job History.**
2. From the Job History filter window select the filter options, if any, that you want to apply, and then click OK. The system displays the Job History window.
3. Once you have chosen your filter options, they are displayed in the **Job History** window.

   To view the additional options discussed above, right-click the desired job choose the appropriate option.
4. Click **OK**.

Back to Top

Deployment - 1-Touch for Solaris

1-Touch Recovery allows you to recover the entire computer system without installing the Operating system or any other software.

INSTALLATION

To perform 1-Touch Recovery you must first install the following:

- **1-TOUCH SERVER**

  Install 1-Touch Server software on the computer that satisfies the minimum system requirements.

  Install the 1-Touch Server Software

- **1-TOUCH CLIENT**

  Install Unix File System *i*DataAgent on the computer that satisfies the minimum system requirements. The computer is referred to as the Client computer in this install procedure.

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

  - Method 1: Interactive Install Unix File System *i*DataAgent - to install directly on client computer.
  - Method 2: Install Software from CommCell Console - to install remotely on a client computer.

BEFORE YOU BEGIN

Download Software Packages
Download the latest software package to perform the install.

System Requirements for 1-Touch Server and Client
Verify that the computer in which you wish to install the 1-Touch Server Software satisfies the System Requirements.

Overview
Provides comprehensive information about 1-Touch feature

1-TOUCH SERVER

INSTALL THE 1-TOUCH SERVER SOFTWARE

1. Place the **Software Installation Disc** on a Solaris computer that satisfies the minimum System Requirements.
2. Run the following command from the Software Installation Disc:

   ./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**.

```
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]
```

6. Press **Enter**.

```
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.

You now have a choice of performing a regular Calypso
install on the physical host or installing Calypso on a
virtual machine for operation within a cluster.

Most users should select "Install on a physical machine"
here.

1) Install on a physical machine

2) Install on a virtual machine

3) Exit

Your choice: [1]
```

7. If you have only one network interface, press **Enter** to accept the default network interface name and continue.

```
We found one network interface available on your machine.
We will associate it with the physical machine being
```

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.

```
installed, and it will also be used by the CommServe to
connect to the physical machine. 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 check the interface name below, and make
connections if necessary:

Physical Machine Host Name: [angel.company.com]
```

8. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

9. Type the appropriate number to select **1-Touch Server**.

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

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

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

10. Press **Enter**.

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

11. 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.

```
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
```

12. Press **Enter**.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

13. 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:

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

```
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]
```

14. 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]
```

15. 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.
```

```
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]
```

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

    Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

17. 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**.

```
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]
```

18. 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.

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

19. 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.

```
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
```

20. Press **Enter**.

```
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]
```

21. 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

```
Client Group(s) is currently configured on CommServe
mycommserve.company.com. Please choose the group(s) that
you want to add this client angel.company.com to. The
selected group(s) will be marked (X) and can be deselected
if you enter the same number again. After you are finished
with the selection, select "Done with the Selection".

[ ] 1) Unix

[ ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

22. Enter the number associated with the storage policy you want use and press **Enter**.

```
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]
```

23. If you want 1-Touch support for Solaris 8, type **Yes**, press **Enter** and go to step 27.

    If you do not want this support, accept the **No** default, press **Enter** and go to the next step.

```
Calypso JumpStart

Do you want 1-Touch support for Solaris 8? [no]
```

24. If you want 1-Touch support for Solaris 9, type **Yes**, press **Enter** and go to step 27.

    If you do not want this support, accept the **No** default, press **Enter** and go to the next step.

```
Do you want 1-Touch support for Solaris 9? [no]
```

25. If you want 1-Touch support for Solaris 10 (Sparc) Update 5 and below, type **Yes**, press **Enter** and go to step 27.

    If you do not want this support, accept the **No** default, press **Enter** and go to the next step.

```
Do you want 1-Touch support for Solaris 10 Update 5 and
below? [no]
```

26. For Solaris 10 64-bit or Solaris 10 (Sparc) Update 6 and above, type **Yes** and press **Enter** for 1-Touch support.

```
Do you want 1-Touch support for Solaris 10 Update 6 and
above? [no]
```

27. If you entered **Yes** in the above step, this screen will be displayed.

    Type the path to the JumpStart boot directory and press Enter.

    If Jumpstart files are not yet installed, quit this install and install JumpStart first.

    If another question requesting 1-Touch support is displayed, go to the previous step; if not, go to the next step.

```
Please specify the absolute path to the Jumpstart 'Boot'
directory.

If JumpStart files are not yet installed on this system,
please quit the installation of this package and install
the JumpStart package before proceeding.

JumpStart Dir:

/export/home/sol10u6/Solairs_10/Tools/Boot/release = 6
```

28. Type **3** to the **Exit** option and press **Enter**.

    The installation is now complete.

```
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]
```

1-TOUCH CLIENT

METHOD 1: INTERACTIVE INSTALL UNIX FILE SYSTEM /DATAAGENT

1. Locate the **Software Installation Disc** and then enter **cvpkgadd**.
2. The product banner and other information is displayed.

   Press **Enter**.
3. Read the license agreement. Type **y** and press **Enter**.
4. Press **Enter**.

```
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]
```

5. Press **Enter**.

```
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.

You now have a choice of performing a regular Calypso
```

```
install on the physical host or installing Calypso on a
virtual machine for operation within a cluster.

Most users should select "Install on a physical machine"
here.

1) Install on a physical machine

2) Install on a virtual machine

3) Exit

Your choice: [1]
```

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.

```
We found one network interface available on your machine.
We will associate it with the physical machine being
installed, and it will also be used by the CommServe to
connect to the physical machine. 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 check the interface name below, and make
connections if necessary:

Physical Machine Host Name: [angel.company.com]
```

7. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

8. Type the number associated with the **Unix File System *i*DataAgent** and press **Enter**. A confirmation screen will mark your choice with an "**X**".

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

```
Install Calypso on physical machine angel

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

[ ] 1) MediaAgent [1301] [CVGxMA]

[ ] 2) UNIX File System iDataAgent [1101] [CVGxIDA]

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

Enter number(s)/one of "a,n,r,q,d,>,<,?" here:2
```

9. Press **Enter**.

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

10. 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.

```
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
```

11. Press **Enter**.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

12. 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:

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

```
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. Press **Enter**.

```
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]
```

14. 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.

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]
```

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

Press **Enter** again.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

16. Press **Enter** to accept the default number of streams and continue, or

Enter the appropriate number of streams, and then press **Enter**.

The number of streams specified ensures that concurrent backup/restore streams would have sufficient system resources. For more information on the subject, see Configuring Kernel Parameters for Solaris.

```
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]
```

17. 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**.

```
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]
```

18. 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.

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

19. 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.

```
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
```

20. Press **Enter**.

```
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]
```

21. Type the appropriate number to select the **Client Group** and press **Enter**.

```
Client Group(s) is currently configured on CommServe
mycommserve.company.com. Please choose the group(s) that
```

This screen will be displayed only if Client Groups are configured for the CommCell

```
you want to add this client angel.company.com to. The
selected group(s) will be marked (X) and can be deselected
if you enter the same number again. After you are finished
with the selection, select "Done with the Selection".

[ ] 1) Unix

[ ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

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

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

```
Client Group(s) is currently configured on CommServe
cs.company.com. Please choose the group(s) that you want
to add this client client.company.com to. The selected
group(s) will be marked (X) and can be deselected if you
enter the same number again. After you are finished with
the selection, select "Done with the Selection".

[ ] 1) Unix

[X ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

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

23. Enter the number associated with the storage policy you want use and press **Enter**.

```
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]
```

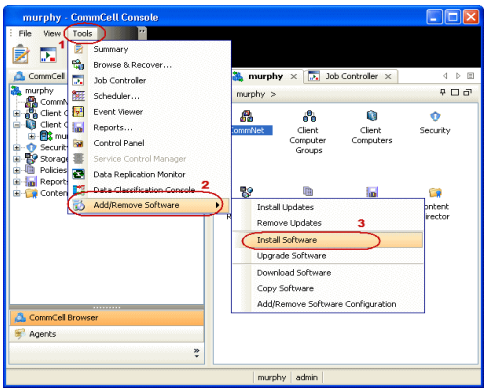
24. Type **3** to the **Exit** option and press **Enter**.

    The installation is now complete.

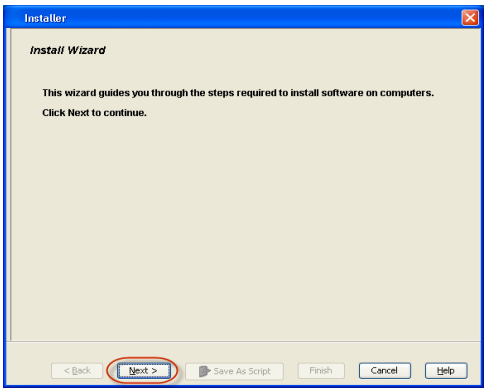
```
Certain Calypso packages can be associated with a virtual
IP, or in other words, installed on a "virtual machine"
belonging to some cluster. At any given time the virtual
machine's services and IP address are active on only one
of the cluster's servers. The virtual machine can "fail-
over" from one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

METHOD 1: INSTALL SOFTWARE FROM COMMCELL CONSOLE

1. From the CommCell Browser, select **Tools** | **Add/Remove Software** | **Install Software.**

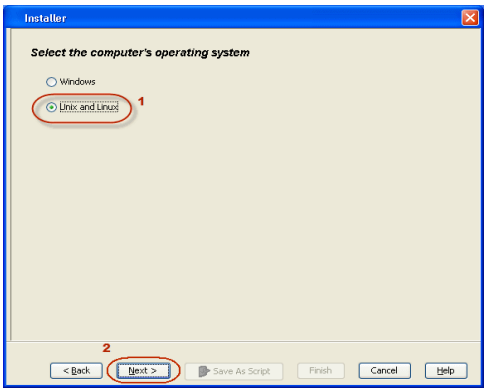


2. Click **Next**.



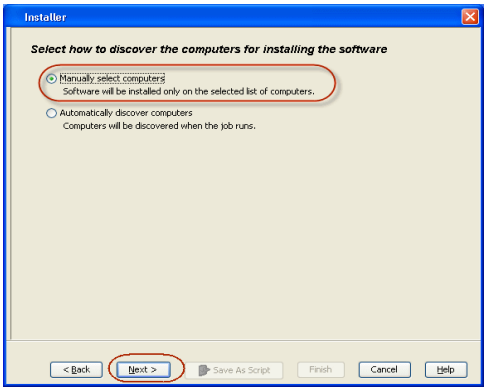
3. Select **Unix and Linux**.

   Click **Next**.



4. Select **Manually Select Computers**.

   Click **Next**.

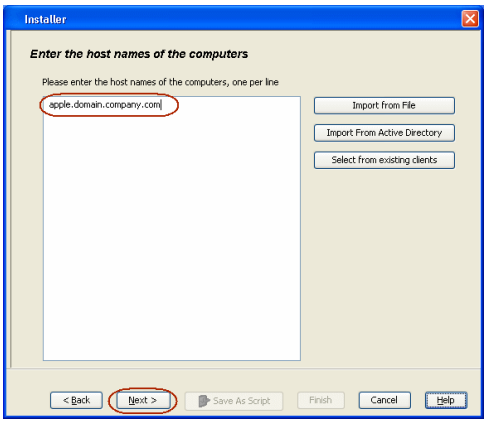


5. Enter the fully qualified domain name of the Linux client computer in which you wish to install.

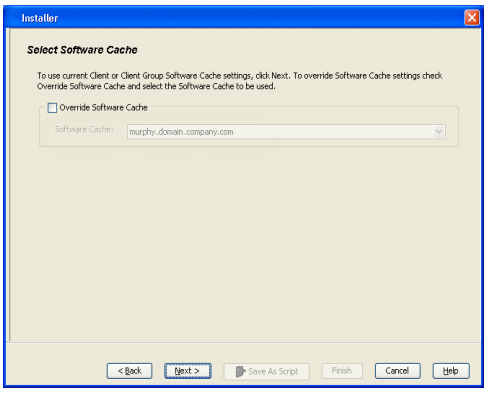
   For example: `apple.domain.company.com`

   The Unix File System *i*DataAgent will be installed on this client computer.

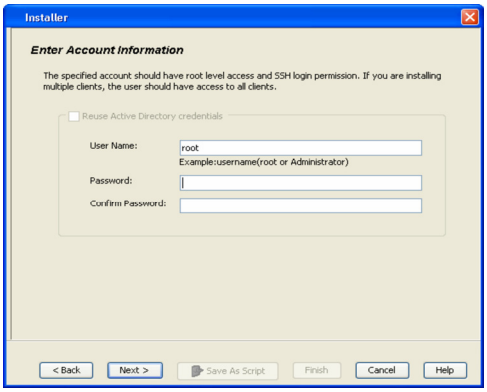
   Click **Next**.



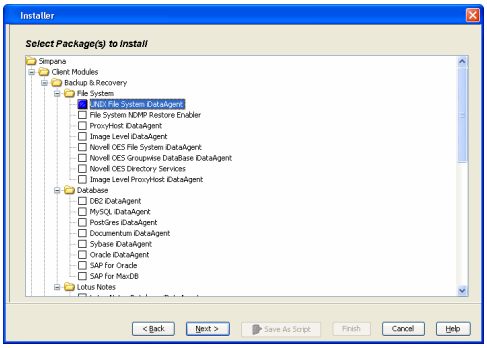
6. Click **Next**.



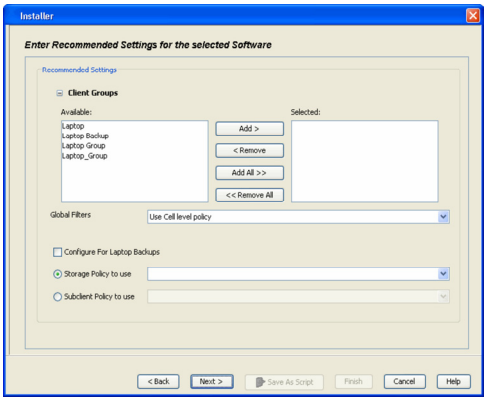
7. Specify **UserName** and **Password** of client computer.
   Click **Next**.



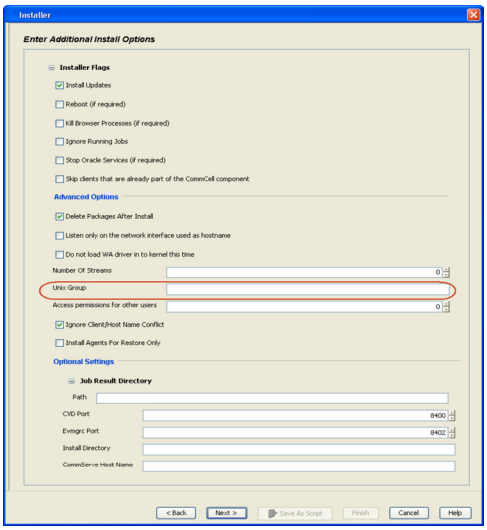
8. Select **Unix File System *i*DataAgent**.
   Click **Next**.



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**.

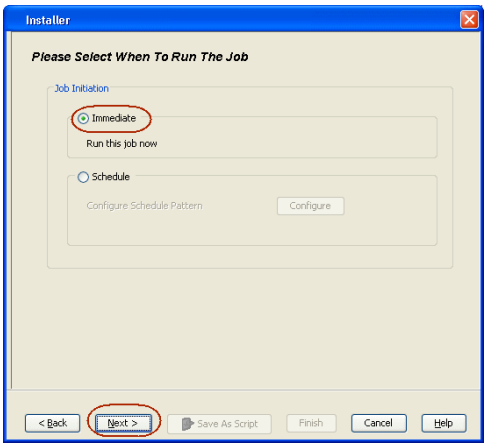


10. Click **Next**.

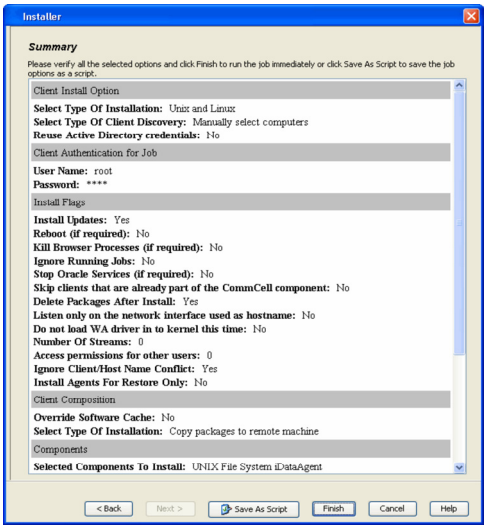


11. Select **Immediate**.

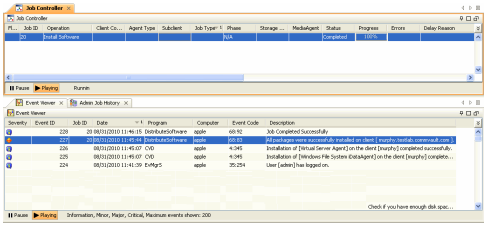
    Click **Next**.



12. Click **Finish**.

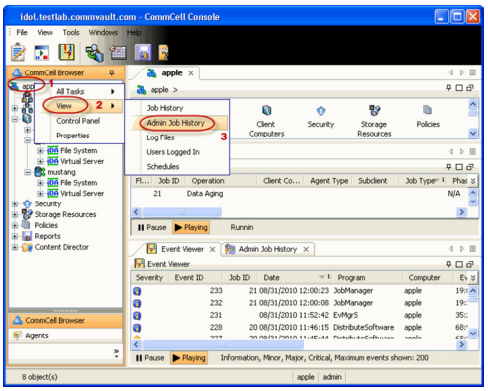


13. You can track the progress of the job from the **Job Controller** or **Event Viewer** window.



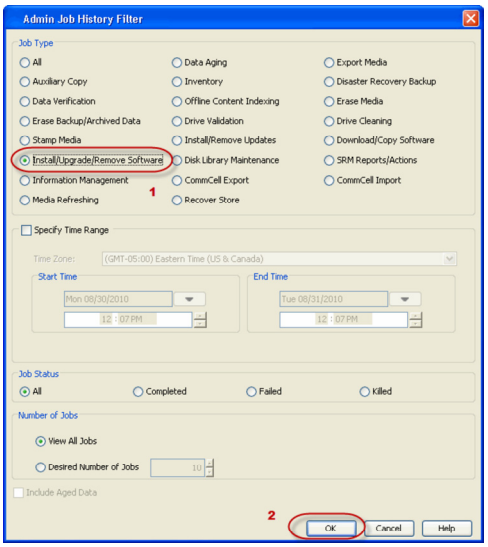
14. Once the job is complete, right-click the **CommServe** computer, click **View** and then

click **Admin Job History**.

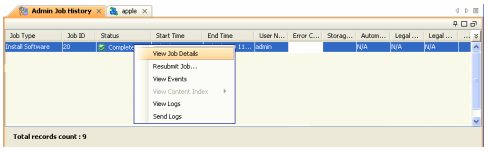


15. Select **Install/Upgrade/Remove Software**.

Click **OK**.



16. You can view the following details about the job by right-clicking the job:
- Items that succeeded during the job
- Items that failed during the job
- Details of the job
- Events of the job
- Log files of the job



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Configuration - 1-Touch for Solaris

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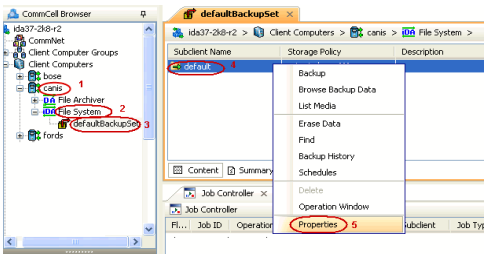
BASIC CONFIGURATION

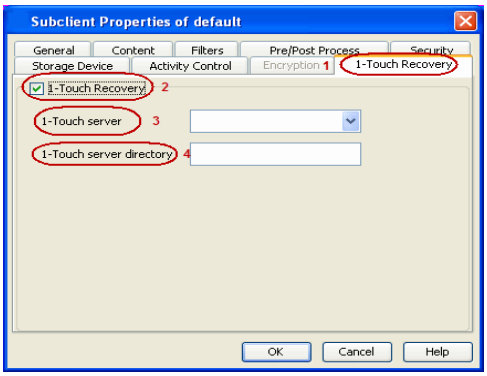
ENABLE 1-TOUCH

After you install the File System *i*DataAgent, follow the steps given below to enable the 1-Touch for the default subclient :

1.
   - From the CommCell Console, navigate to **<Client>** | **File System *i*DataAgent** | **defaultBackupSet**.
   - Right-click the default subclient and click **Properties**.



2.
   - Click **1-Touch Recovery** tab.
   - Select **1-Touch Recovery**.
   - Select the **1-Touch Server** from the list.
   - Enter the path to the **1-Touch server Directory**.
   - Click **OK**.

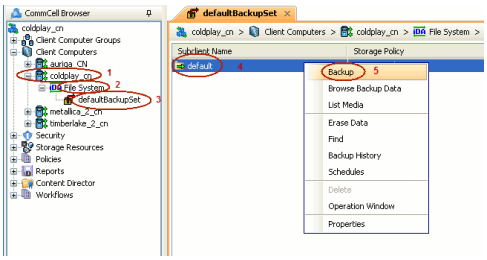


If the 1-Touch client host ID (MAC address) has changed since the most recent 1-Touch backup, be sure to update the client's Ethernet address within the **`/etc/ethers`** file on the 1-Touch server. Otherwise, you will not be able to boot the 1-Touch client.

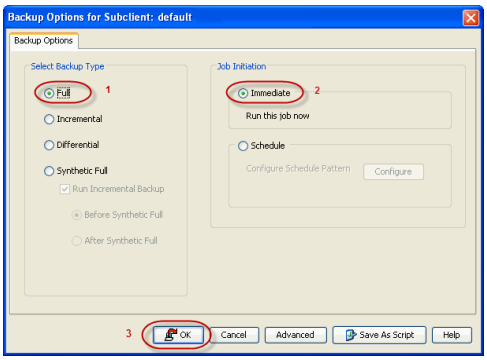
PERFORM A BACKUP

After you enable 1-Touch, perform backups of the default subclient periodically to capture any changes in the client system configuration. Before recovering a client, ensure that you have run at least one full backup of the default subclient.

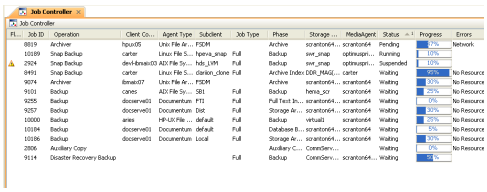
1.
   - From the CommCell Console, navigate to **<Client>** | **File System *i*DataAgent** | **defaultBackupSet**.
   - Right-click the subclient, and click **Backup**.



2.
   - Select **Full**.
   - Select **Immediate**.
   - Click **OK**.



3. You can track the progress of the backup job from the **Job Controller** window. When the backup job has completed, the **Job Controller** displays the status as `Completed`.



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Recovery - 1-Touch for Solaris

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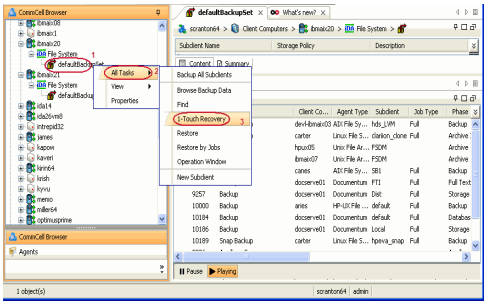
Restoring From a specific Data Path

BASIC RECOVERY

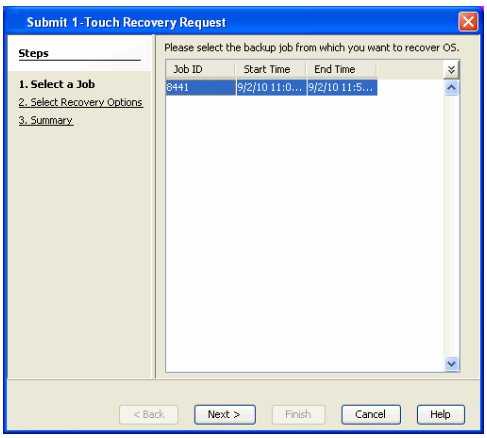
1. Login to CommCell Console using CommCell credentials.

   Do not use domain credentials to login to CommCell. The single sign on is not supported for 1-Touch feature.

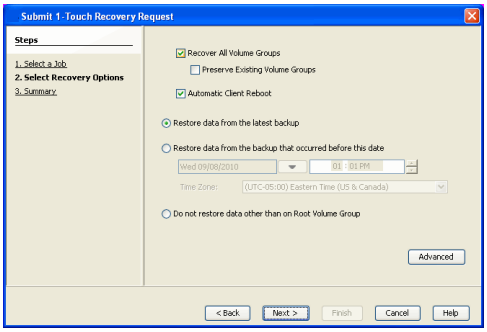
2. - From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet.**
   - Right-click the **Default Backup Set** and click **All Tasks | 1-Touch Recovery**.



3. - Select the backup job for recovering the operating system.
   - Click **Next**.

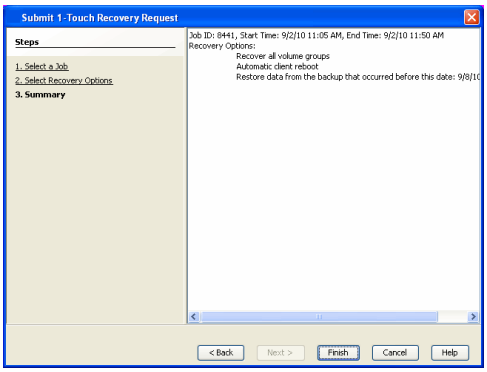


4. Click **Next**.



5. - Review the recovery options.

- Click **Finish**.



5.
- Connect the client to network and switch on the power.
- At the boot prompt of the affected client, enter one of the following commands:
  - Give the following command to start the basic recovery of essential OS file systems. For example: `/, /opt, /usr, /var.`

    `boot net - w recover u=<user_id> p=<passwd>`
  - Give the following command to start recovery of OS and replaced disks:

    `boot net - w recover newfs-changed-drives u=<user_id> p=<passwd>`
  - Give the following command to recover all partitioned disks and created file systems, regardless of their state:

    `boot net - w recover newfs-all u=<user_id> p=<passwd>`

    Here **`<user_id>`** is Commcell console user id and **`<passwd>`** is Commcell console password.

    `w` is optional to Solaris install method to skip starting X window session.

  This step starts the 1-Touch. All logging output for the recovery is redirected to the console and a file under the **`/tmp`** directory.
- Press **Enter** to start the automatic restore. After the restore complete, the system will reboot.

ADVANCED RECOVERY OPTIONS

GLOBAL FILE SYSTEM RECOVERY

The global file system makes all files across a cluster equally accessible and visible to all nodes. The Global File System will not be recovered during the 1-Touch recovery of a single node from the cluster. During the full system recovery, if the Global File System is not available, start the Global File System recovery.

1. Ensure that the file system type is same as the previous global file system.
2. Start the Global File System restore from the node that served as the Global File System controller at the time of the last 1-Touch backup.
3. The 1-Touch restore directory contains the Global File System disk recovery commands. For example:

   - Use the following command to recover the Global File System volume group using VERITAS Volume Manager

     `<jump start directory>/<client>/galaxy/iDataAgent/systemrecovery/disks/vxvm.vxmake.oracle_dg`

   or

   - Use the following command to recover the Global File System volume group using Solaris Volume Manager

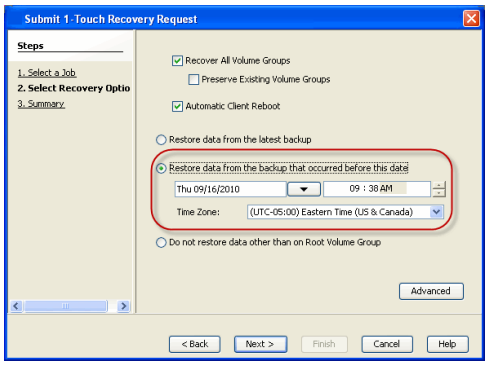
     `<jump start directory>/<client>/galaxy/iDataAgent/systemrecovery/disks/lvm.mk.commands`

RESTORING DATA BACKED UP BEFORE A SPECIFIC DATE

You can perform a point-in-time restore of the system state. You can recover data from a backup that occurred before the specified date and time.

1. From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet.**
2. Right-click the **defaultBackupSet** and click **All Tasks | 1-Touch Recovery**.
3. In the **Submit 1-Touch Recovery Request** dialog box, click **Select Recovery Options**.

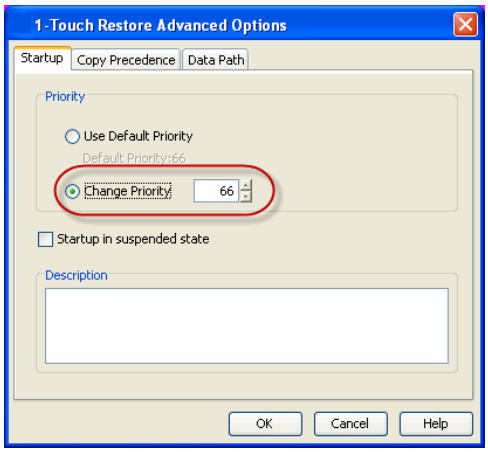
4. Click **Restore data from the backup that occurred before this date**.
5. Enter date and time.
6. Select a **Time Zone**.
7. Click **Next**.
8. Click **Finish**.



CHANGING THE PRIORITY OF THE RESTORE JOB

You can increase the priority of a restore job. If you want to perform the 1-Touch recovery on a high priority, follow the steps given below:

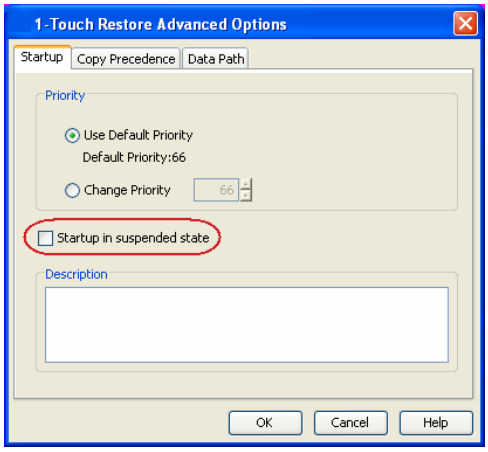
1. From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet.**
2. Right-click the **defaultBackupSet** and click **All Tasks | 1-Touch Recovery**.
3. In the **Submit 1-Touch Recovery Request** dialog box, click **Select Recovery Options**.
4. Click **Advanced**.
5. Click **Change Priority**.
6. Enter the priority number between 0 to 999. Lower the number, higher the priority.
7. Click **Ok**.
8. Click **Next**.
9. Click **Finish**.



STARTING THE RESTORE JOB IN SUSPENDED STATE

If there are multiple jobs running simultaneously on the CommServe, you can hold the restore job on suspended state. Once the CommServe is freed up, you can resume the restore job from the **Job Controller** window.

1. From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet.**
2. Right-click the **defaultBackupSet** and click **All Tasks | 1-Touch Recovery**.
3. In the **Submit 1-Touch Recovery Request** dialog box, click **Select Recovery Options**.
4. Click **Advanced**.
5. Click **Startup in suspended state**
6. Click **Ok**.
7. Click **Next**.
8. Click **Finish**.

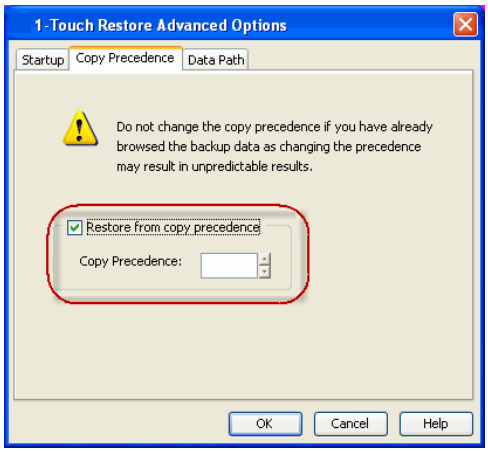


RESTORING DATA FROM A COPY PRECEDENCE

By default, 1-Touch recovery will restore the data from the primary copy. But if you want to restore data from a particular storage policy copy, you can specify the copy precedence.

1. From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet.**
2. Right-click the **defaultBackupSet** and click **All Tasks | 1-Touch Recovery**.

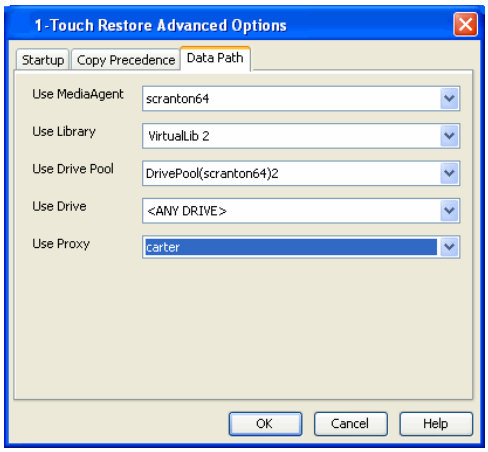
3. In the **Submit 1-Touch Recovery Request** dialog box, click **Select Recovery Options**.
4. Click **Advanced**.
5. Click **Copy Precedence**.
6. Click **Restore from copy precedence**.
7. Enter the copy precedence number.
8. Click **Ok**.
9. Click **Next**.
10. Click **Finish**.



RESTORING DATA FROM A SPECIFIC DATA PATH

If you want to restore the data from a specific location on a MediaAgent, you can specify the data path as follows:

1. From the CommCell Console, navigate to **<Client> | File System *i*DataAgent | defaultBackupSet**.
2. Right-click the **defaultBackupSet** and click **All Tasks | 1-Touch Recovery**.
3. In the **Submit 1-Touch Recovery Request** dialog box, click **Select Recovery Options**.
4. Click **Advanced**.
5. Click **Data Path**.
6. Select the following to specify the data path:
   - **Use MediaAgent**
   - **Use Library**
   - **Use Drive Pool**
   - **Use Drive**
   - **Use Proxy**
7. Click **Ok**.
8. Click **Next**.
9. Click **Finish**.



Previous Next

Troubleshooting - 1-Touch for Solaris

The following section provides information on some of the troubleshooting scenarios related to 1-Touch Recovery:

PROBLEM/ERROR	SOLUTION
The client is unable to boot.	To debug boot problems, use the **snoop** and **truss** commands. The 1-Touch client updates the **sr.log** log files on both the client and the 1-Touch server. If a 1-Touch client backup completed successfully and is somehow failing to boot, be sure to check the **sr.log** on the 1-Touch server for any warning. If you are using a different 1-Touch server than that was used previously, remove the client's name from the database of the previous 1-Touch server. Otherwise, the client will not be able to boot off the network because both servers will respond to the client's RARP request. To do this, from the Tools directory, run the **./rm_install_client *<clientname>*** command. For DHCP clients, run the following commands: • **./rm_install_client *<platform name>*** • **./rm_install_client *<ethernet address>*** • **./rm_install_client -f *<boot file name>*** Sometimes, the RARP, bootparams and tftp daemons fail to re-read network information pertaining to the 1-Touch client. In such cases, you may have to restart the daemons.
Error: execution of 'format -d c0t3d0 -f /tmp/fmtinput -s' failed Exiting to shell... # # format -d c0t3d0 -f /tmp/fmtinput -s Warning: error writing VTOC. DIOCTL_RWCMD: I/O error Warning: error reading backup label. Warning: no backup labels Label failed.	You may get this error during phase 2 of 1-Touch recovery. The error message appears in the recoverlog file. This log file is located in the /tmp directory of the system. You get this error because Operating System does not recognize one of the disk drives. To resolve this issue, add information about the correct disk type of the unrecognized disks in the format.dat file. The format.dat file can be located where jumpstart server is installed. For example, it can be located at: <jumpstart_root>/Solaris*/Tools/Boot/etc/format.dat

Getting Started - OnePass Agent for Unix File System Deployment

The OnePass Agent is an integrated with Unix File System *i*DataAgent as a method to archive files which have been backed up. Only files which meet a predetermined user defined set of rules become candidates for archiving. Follow the steps given below to install the OnePass Agent.

INSTALLATION

The software can be installed using one of the following methods. Ensure you have the following before performing the install:

- Software version Service Pack 12.

METHOD 1: INTERACTIVE INSTALL

Use this procedure to install directly on client computer.

METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

Use this procedure to install remotely on a client computer.

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.

METHOD 1: INTERACTIVE INSTALL

1. Place the **Software Installation Disc** on a client computer that satisfies the minimum requirements specified in the System Requirements.
2. Run the following command from the Software Installation Disc:

   ./cvpkgadd
3. The product banner and other information is displayed.

   Press **Enter**.
4. Read the license agreement. Type **y** and press **Enter** to continue.
5. Type **2** to select **Advanced options**.

```
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]
```

6. Type **5** to select **File System iDataAgent with Archiving Enabler**.

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

[Record and Play]
1) Create a recording of user selections (Record Mode
2) Play a recorded install on this computer
[Custom Package Creator]
3) Create a custom install package
[De-coupled Installer]
4) Pre-install software Components [De-couple Mode]
[Integrated File Archiver]
5) File System iDataAgent with Archiving Enabler
[Customized Cluster Agents]
6) Veritas Cluster Agents
[Third Party Connector]
7) Symantec NetBackup Agent
8) NetApp Snap Manager for Oracle
9) NetApp Snap Manager for SAP/Oracle
[Done]
10) Exit this menu

Your choice: [1]
```

7. Press **Enter**.

```
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.

You now have a choice of performing a regular Calypso
```

```
install on the physical host or installing Calypso on a
virtual machine for operation within a cluster.

Most users should select "Install on a physical machine"
here.

1) Install on a physical machine

2) Install on a virtual machine

3) Exit

Your choice: [1]
```

8. 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.

```
We found one network interface available on your machine.
We will associate it with the physical machine being
installed, and it will also be used by the CommServe to
connect to the physical machine. 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 check the interface name below, and make
connections if necessary:

Physical Machine Host Name: [angel.company.com]
```

9. Press **Enter**.

```
Please specify the client name for this machine.

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.

Physical Machine Client name: [angel]
```

10. Press **Enter**.

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

11. 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.

```
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
```

12. Press **Enter**.

```
Keep Your Install Up to Date - Latest Service Pack

Latest Service Pack provides extra functions and latest
support and fix for the packages you are going to install.
You can download the latest service pack from software
provider website.

If you decide 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.

Do you want to download the latest service pack now? [no]
```

13. 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:

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

```
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]
```

14. 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]
```

15. 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.

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]
```

16. If you indicated **Yes** in the previous step, you will be prompted for the group name that must be used to launch processes.

    Enter the group name and then press **Enter**.

```
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: sky1

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
"sky1".

Press <ENTER> to continue ...
```

17. 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**.

```
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]
```

18. If this computer and the CommServe is separated by a firewall, type **Yes** and then press **Enter** to continue.

    For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.

    If you do not wish to configure the firewall services, type **No** and then press **Enter** to continue.

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

19. 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.

```
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
```

20. Press **Enter**.

```
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]
```

21. 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

```
Client Group(s) is currently configured on CommServe
mycommserve.company.com. Please choose the group(s) that
you want to add this client angel.company.com to. The
selected group(s) will be marked (X) and can be deselected
if you enter the same number again. After you are finished
with the selection, select "Done with the Selection".

[ ] 1) Unix

[ ] 2) DR

[a=all n=none r=reverse q=quit d=done >=next <=previous ?
=help]s

Enter number(s)/one of "a,n,r,q,d,>,<,?" here: 2
```

22. Enter the number corresponding to the storage policy through which you want to back up the File System *i*DataAgent and press **Enter**.

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

1) SP_StandAloneLibrary2_2

2) SP_Library3_3

3) SP_MagLibrary4_4
```

If you do not have Storage Policy created, this message will be displayed.

You may not be prompted for user input.

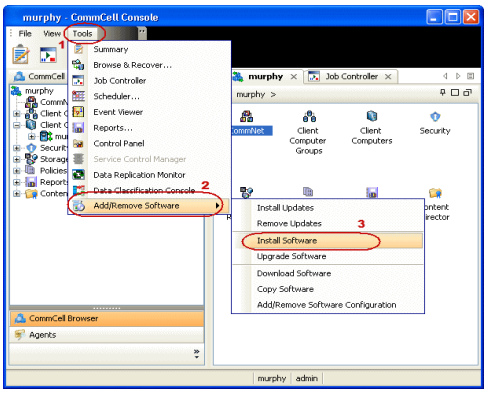
```
Storage Policy: [1]

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]
```

23 Type 3 to the **Exit** option and press **Enter**.

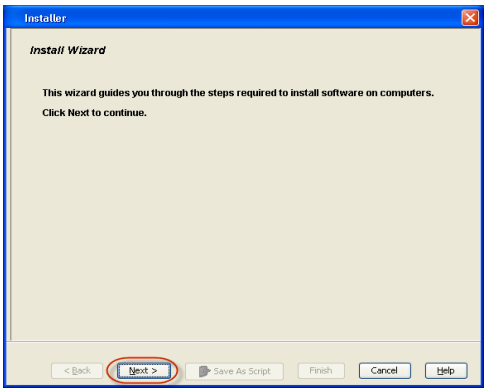
The installation is now complete.

METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

1. From the CommCell Browser, select **Tools** | **Add/Remove Software** | **Install Software.**

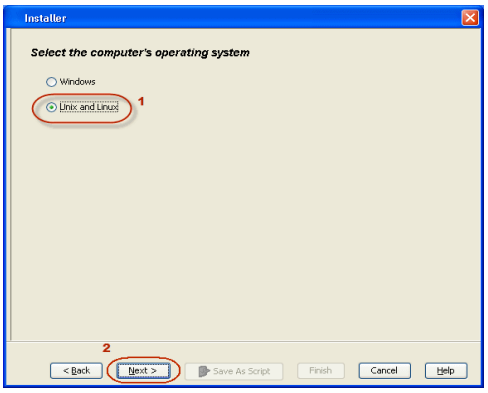


2. Click **Next**.



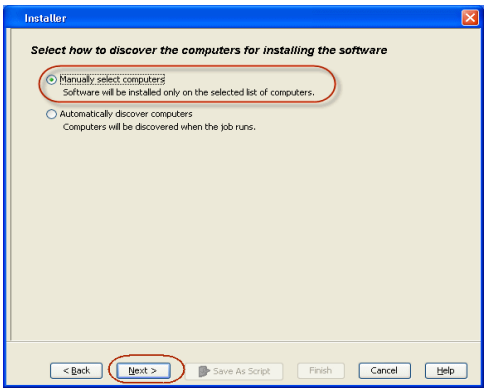
3. Select **Unix and Linux**.

   Click **Next**.



4. Select **Manually Select Computers**.

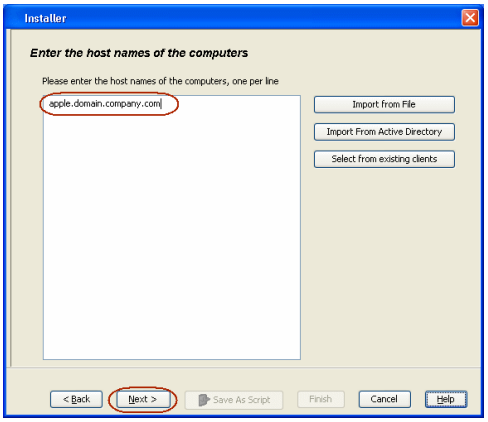
   Click **Next**.



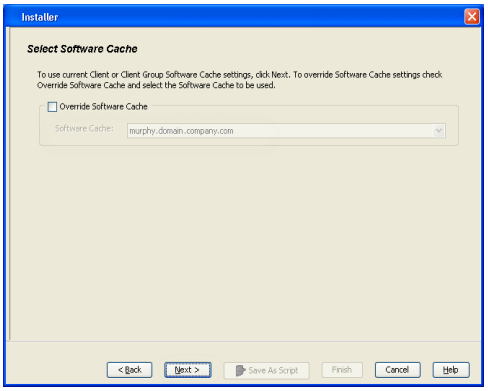
5. Enter the fully qualified domain name of the computer in which you wish to install.

   For example: `apple.domain.company.com`

   Click **Next**.



6. Click **Next**.



7. Specify **UserName** 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 this user can SUDO into ssh without being

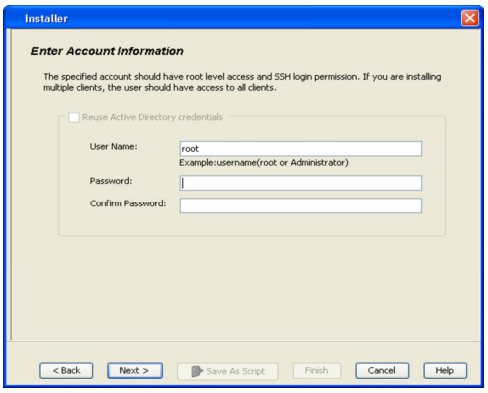
prompted for the password.

For SuSE Linux comment the following lines:

- `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'!`

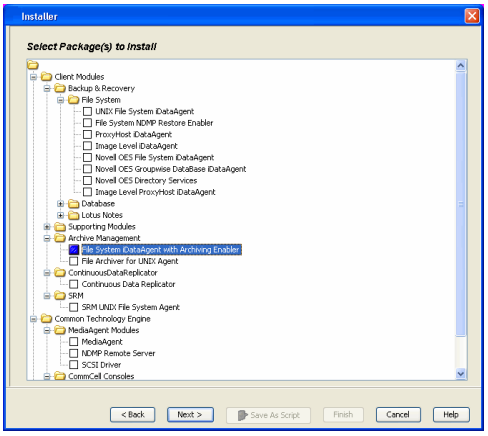
For RHEL/CentOS comment the following line:

- `Defaults requiretty`



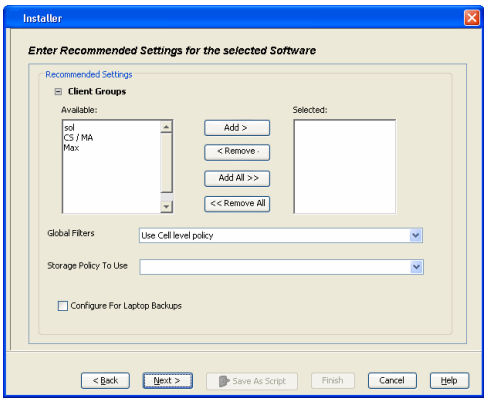
8. Select **File System iDataAgent with Archiving Enabler**.

   Click **Next**.



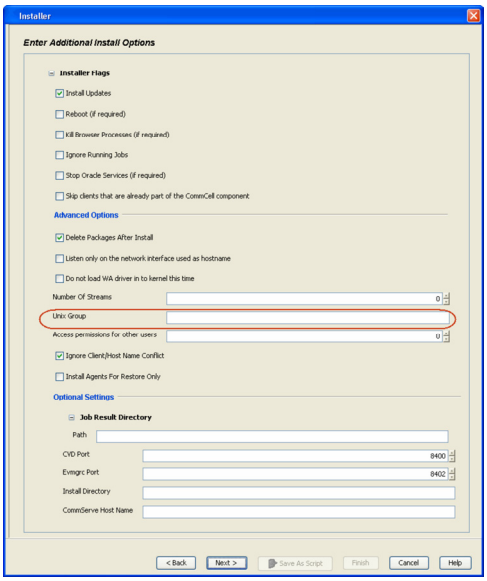
9.
- Select **Client Group** from **Available** and click **Add**.

  Do not add more than one Client Group.
- Select a **Storage Policy** from the drop-down list. Click **Next**.



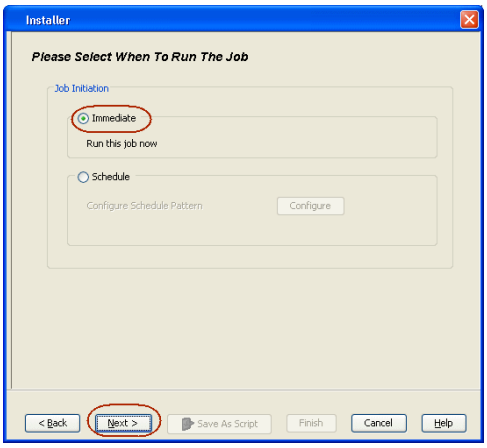
10. Select **Reboot**.

    Click **Next**.

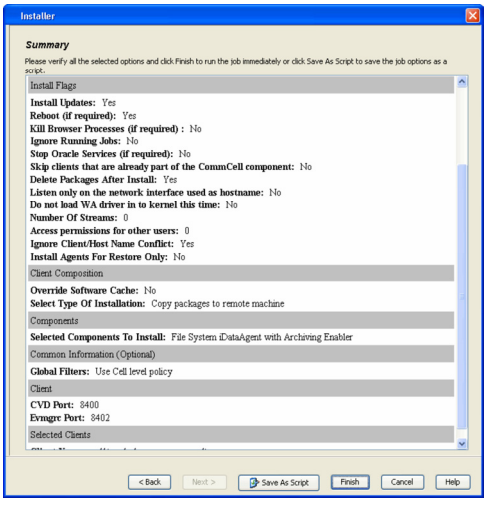


11. Select **Immediate**.

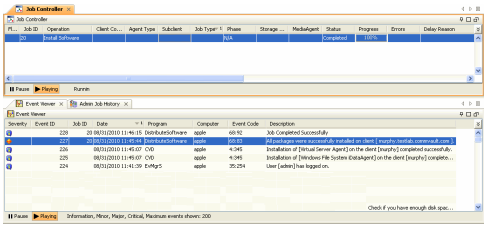
    Click **Next**.



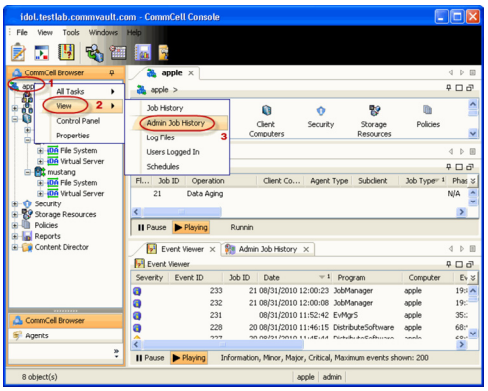
12. Click **Finish**.



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

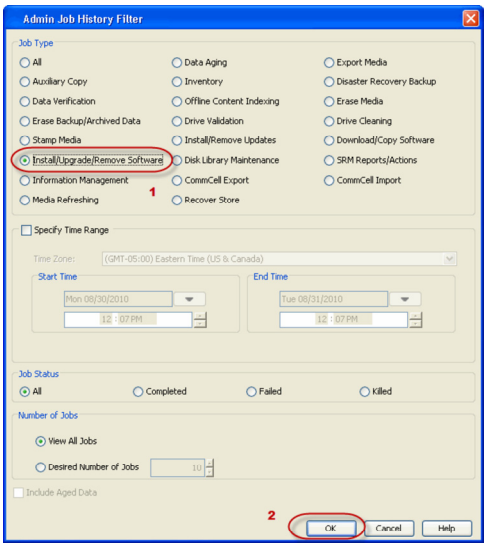


14. Once the job is complete, right-click the **CommServe** computer, click **View** and then click **Admin Job History**.

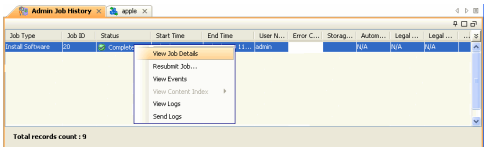


15. Select **Install/Upgrade/Remove Software**.

Click **OK**.



16. You can view the following details about the job by right-clicking the job:
- Items that succeeded during the job
- Items that failed during the job
- Details of the job
- Events of the job
- Log files of the job



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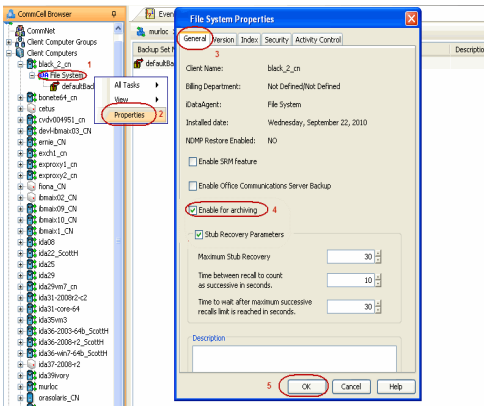
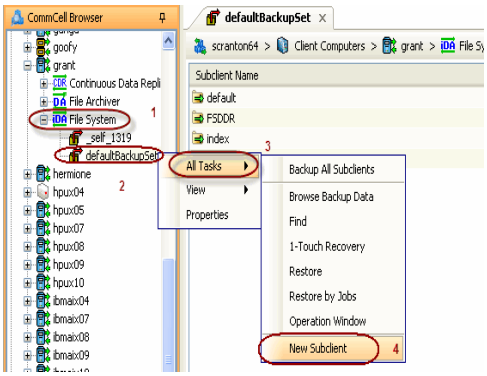
Getting Started - OnePass Agent for Unix File System Configuration

Once the Unix File System *i*DataAgent is installed, the OnePass Agent can be enabled by following the steps given below:

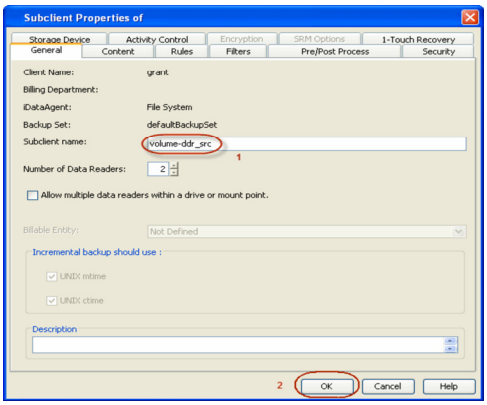
1.
   - From the CommCell Console, navigate to **Client Computers | File System**.
   - Right-click the **File System | Properties**.
   - Select **Enable for Archiving**.
   - Click **OK**.



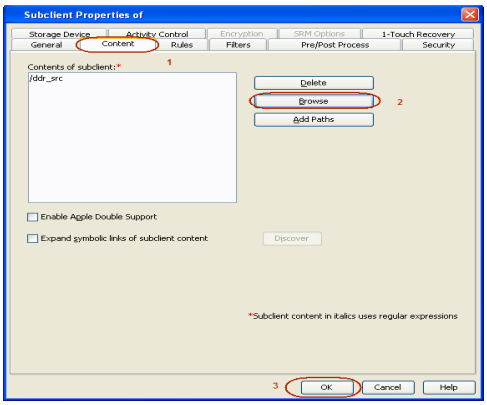
2.
   - From the CommCell Browser, navigate to ***<Client>*** **| File System | DefaultBackupSet**.
   - Right-click **DefaultBackupSet | All Tasks**.
   - Click **New Subclient**.



3. Enter **Subclient Name**.



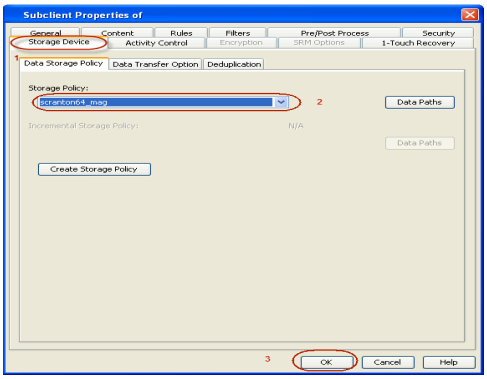
4.
   - Click the **Content** tab.
   - **Browse** to the folder that has files to be backed up.
   - Select the folder and click **Add**.
   - Click **OK**.



5.

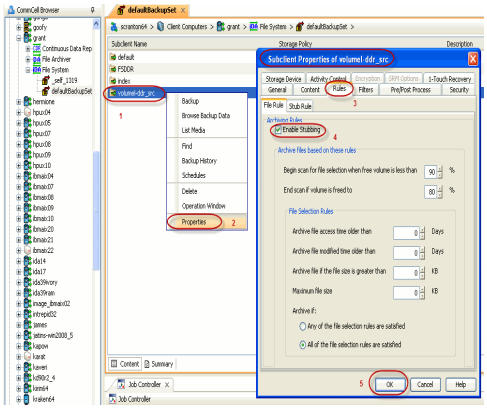
- Click the **Storage Device** tab.
- Select the **Storage Policy** from the drop down list.
- Click **OK**.

If you do not have a Storage Policy already created, follow the steps given in Step 7 to create a Storage Policy.



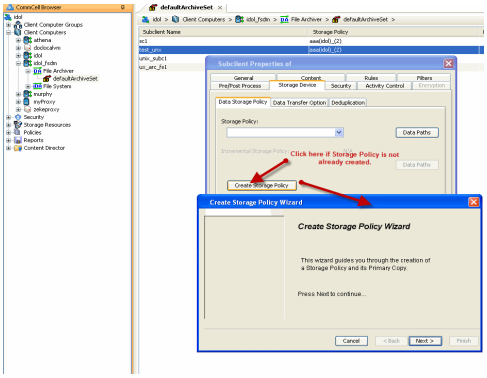
6. Once the **Subclient** is created, enable it for stubbing:

- Right-click the subclient and select **Properties**.
- Click the **Rules** tab and select **Enable Stubbing**.
- To archive files immediately, set the rules accordingly based on the file access time, modified time or file size.
- Click **OK**.



7.

1. Click **Create Storage Policy**.
2. 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`.
   - Select `No` to allow legal hold to use the policy.
   - Specify the name of the Storage Policy.
   - Specify the name of the primary copy. The primary copy is automatically created along with the Storage Policy.
   - Select `No` for use of an existing global deduplication policy.
   - Specify name of the default library to which the Primary Copy should be associated. This must be a disk library. Ensure that you select a library attached to a MediaAgent operating in the current release.
   - Select the MediaAgent.
   - Verify the device streams and the retention criteria information.
   - Select `Yes` to enable deduplication for the primary copy. Select the Enable Client Side Deduplication option.
   - Name of the Deduplication Store, MediaAgent hosting the Deduplication Store, and the location of the Deduplication Store.
   - Review the details and click **Finish** to create the Storage Policy. The primary copy is also created.



3. Return to Step 5 to associate the Storage Policy to the subclient.

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Getting Started - OnePass Agent for Unix File System Data Movement

PERFORM A BACKUP

Once the OnePass Agent is enabled, perform a full backup to archive the backed up files.

WHAT GETS ARCHIVED

The OnePass Agent archives the following file systems:

OPERATING SYSTEM	ARCHIVED FILE SYSTEMS
AIX	Journal File System 2 (JFS2) IBM General Parallel File System (GPFS) VERITAS File System (VxFS) VERITAS Cluster File System (VxCFS)
HP-UX	VERITAS File System (VxFS)
Linux	'X' File System (XFS) B-tree File System (Btrfs) Extended 3 File System (ext3) Extended 4 File System (ext4) IBM General Parallel File System (GPFS) X9000 IBRIX File System (IBRIXFS) 6.x PolyServe Matrix Server VERITAS File System (VxFS) VERITAS Cluster File System (VxCFS) Lustre File System (Clustered File System)
Red Hat Linux 6.x	GFS2 (Clustered File System) The default Extended 2 File System (ext2) gets archived when it is compiled as a module.
Novell OES2 Linux	NSS file system
Solaris	Unix File System (UFS) VERITAS File System (VxFS) Zettabyte File System (ZFS on Solaris 10 6/06)

WHAT DOES NOT GET ARCHIVED

The following file types/objects are automatically filtered out of archive operations by the system, and will not be archived.

- Sparse files (Example: File Archiver stub files)
- Install directory
- Job Results directory
- Log files directory
- `/usr` system directory
- `/kernel` system directory
- `/etc` system directory
- `/tmp` directory
- Extended attributes in the OES Linux data
- Stubs originating from the OES Linux Operating System in a Netware Operating System

Files with extensions *.a, *.ksh, *.csh, *.sh, *.lib, and *.so are automatically filtered out of subclient content by default. Similarly, files in the following directories are also skipped from archiving on all Unix platforms.

- /usr/**
- /bin/**
- /lib/**
- /boot/**

- /dev/**
- /etc/**
- /var/**
- /tmp/**
- /sbin/**
- /lib64/**
- /opt/**
- /sys/**
- /kernel/**
- /devices/**
- /proc/**
- /selinux/**
- /stand/**

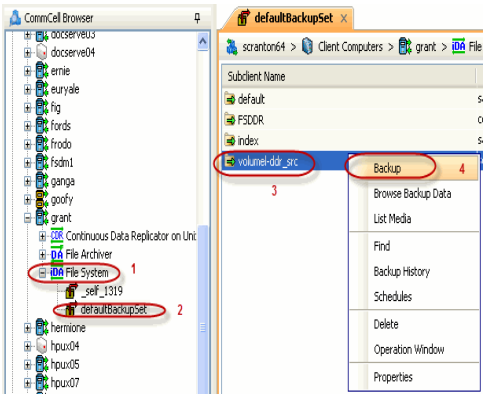
In addition to the above, there are also platform specific files that are automatically filtered from archiving.

- AIX - /**/*.imp, /**/*.exp
- Darwin - /**/*.dylib, /**/*.scpt, /Applications/**, /Developer/**, /Library/**, /Network/**, /System/**, /Volumes/**, /private/**
- Solaris - /platform/**
- FreeBSD - /rescue/**

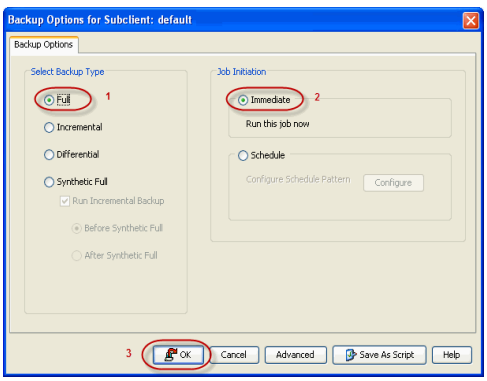
The following section provides step-by-step instructions for performing your first backup.

The default subclient has the root directory as the subclient content. Therefore a backup and archive job run on the default subclient results in backing up the entire root directory. In order to run a backup and archive of selective data files, run the backup on an user defined subclient with specific content.

1.
   - From the CommCell Console, navigate to **Client Computers** | **File System** | **defaultBackupSet**.
   - Right-click the **Subclient** and click **Backup**.



2.
   - Select **Full** as backup type and **Immediate** to run the job immediately.
   - Click **OK**.



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

4. Once the backup process is completed, archiving rules are applied per volume (mount

Files before stubbing

point) level and files that meet the stubbing rules are stubbed.

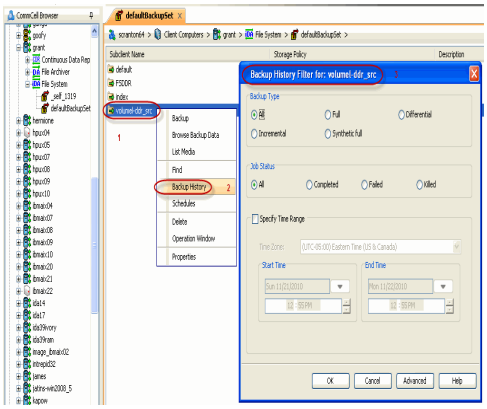
- **Stubs** are placeholders of the original data after it has been migrated to the secondary storage.
- Stubs replace the backed up files in the location selected by the user during backup.
- After stubbing, the block size of the files on the disk reduces to a single block.

```
root@grant.commvault.com # df -h | grep /ddr_src
df: cannot statvfs /90pkg: No such file or directory
ddr_src_pool/MAG      9.8G   4.3G   5.5G    44%    /ddr_src/MAG
ddr_src_pool/turbo    9.8G   9.5M   5.5G     1%    /ddr_src_pool/turbo
ddr_src_pool          9.8G   4.3G   5.5G    44%    /ddr_src
root@grant.commvault.com #
```

Files after stubbing

```
root@grant.commvault.com # df -h | grep ddr_src
df: cannot statvfs /90pkg: No such file or directory
ddr_src_pool/MAG      9.8G   773M   9.0G     8%    /ddr_src/MAG
ddr_src_pool/turbo    9.8G   9.5M   9.0G     1%    /ddr_src_pool/turbo
ddr_src_pool          9.8G   773M   9.0G     8%    /ddr_src
root@grant.commvault.com #
```

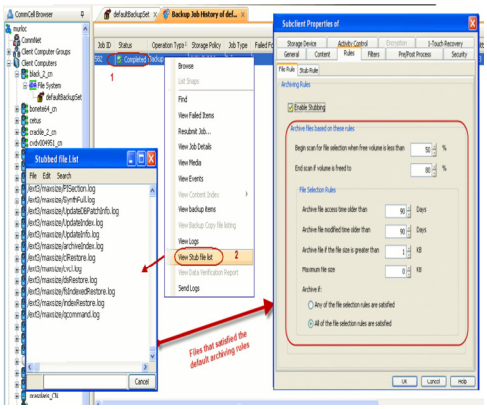
5. Once job is complete, view the details of job from the **Backup History**.
   - Right-click the subclient and select **Backup History**.
   - Click **OK**.



6.
   - Right-click the job and select **View Stub File List** to see the files that got stubbed during the backup process.

By default, files that satisfy the following criteria will be stubbed when a backup is run:

- Archiving starts when the free space on the volume goes below 50%.
- Archiving stops when 80% of the volume space is freed up.
- Files not accessed for 90 days or more will be archived.
- Files not modified in the last 90 days will be archived.
- Files greater than 1 KB will be archived.



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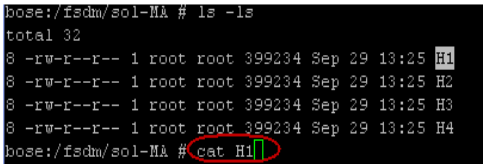
Getting Started OnePass Agent for Unix File System Recover Data

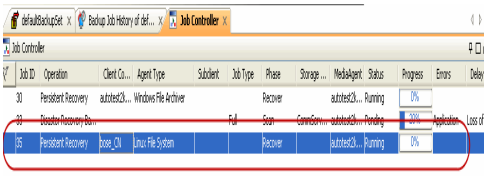
RECOVER STUBS

Use the following method to recover stubs of a file or multiple files from a Unix terminal or console window.

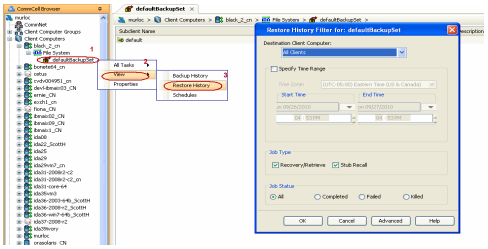
1. Any application accessing (read/write) the migrated data will trigger a recall. In order to manually perform a recall, follow the steps given below:
   - Open a Terminal or Console Window.
   - Perform an action that executes an open and read on an archived file to initiate the recovery operation. For example, you can use the **vi** or **cat** commands to do this:
     - **vi** *<path><filename>*
     - **cat** *<path><filename>*



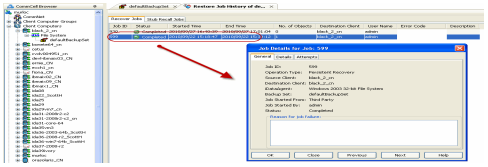
2.
   - You can track the progress of the job from the **Job Controller** or **Event Viewer** window of the CommCell console.
   - Multiple stub recoveries are submitted to the Job Controller as one job called a *Persistent Recovery* job.



3.
   - Once job is complete, view the details of job from the **Restore History**.
   - Right-click the **BackupSet** and select **View | Restore History**.
   - Click **OK**.

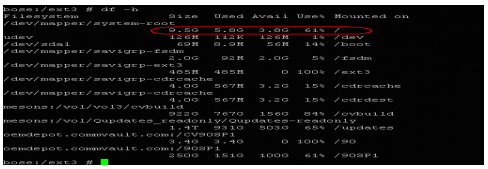


4. Right-click the job and select **View Job Details**.

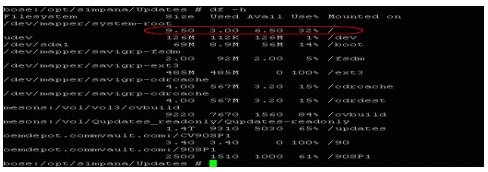


5. After recovery, stubs are replaced by files in the location specified.

Recovered files:



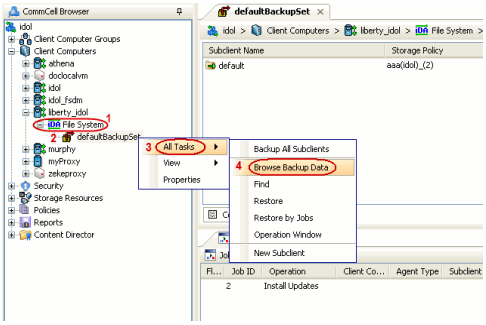
Stubbed files:



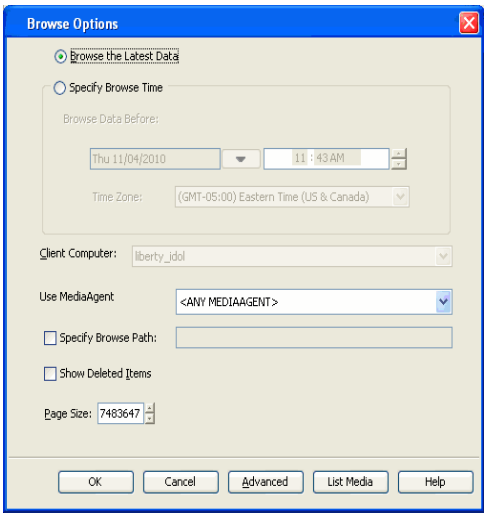
BROWSE AND RESTORE FROM COMMCELL CONSOLE

Use the following method to restore deleted files. Deleted stubs that are not yet aged, can also be recovered by performing a Browse and Restore.

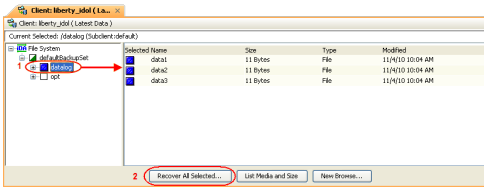
1.
   - From the CommCell Console, navigate to ***<Client>*** | **File System**
   - Right-click the backup set that contains the data you want to restore and click **All Tasks** | **Browse Backup Data**



2. Click **OK**.

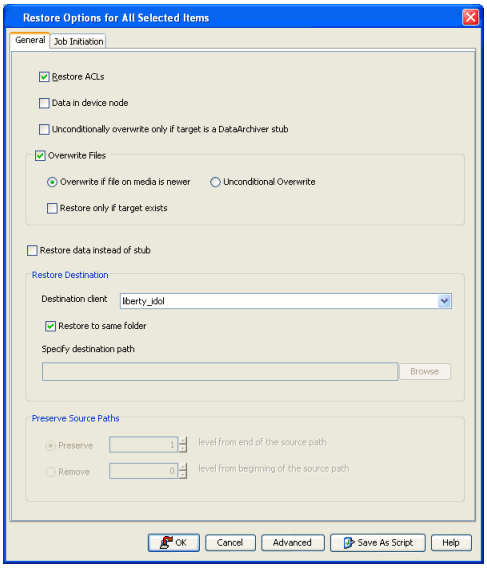


3.
- Select the folder level under the backup set. Its entire contents will be automatically selected in the right pane.
- Click **Recover All Selected**.

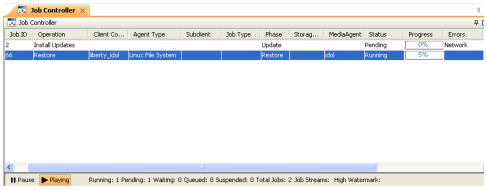


4. Click **OK**.

   If you wish to restore the backed up data which may be stubbed, select **Restore data instead of stub**.

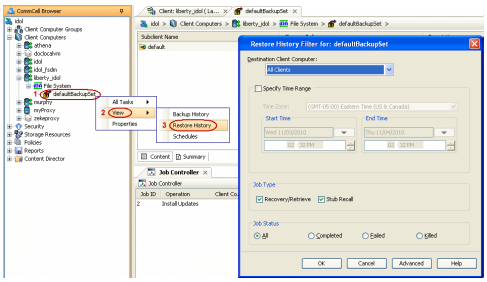


5. You can monitor the progress of the restore job in the **Job Controller** or **Event Viewer** window of the CommCell Console.

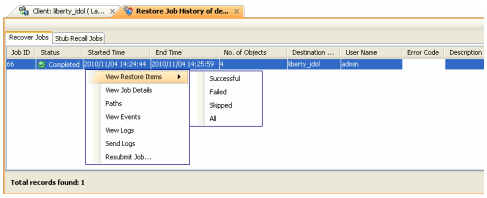


6.

- Once job is complete, view the details of job from the **Restore History**.
- Right-click the **BackupSet** and select **View | Restore History**.
- Click **OK**.



7. Right-click the job and select **View Job Details**.



CONGRATULATIONS - YOU HAVE SUCCESSFULLY COMPLETED YOUR FIRST ARCHIVE AND STUB RECOVERY.

If you want to further explore this feature read the **Advanced Options** section of this documentation.

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OnePass Agent for Unix File System Advanced Configuration

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Manually Filtering Files from Archiving
Manually Including Files for Archiving
Filtering Files Using Registry Key

Configuring Archiving for IBRIX File System

Setting Up Stub Cache

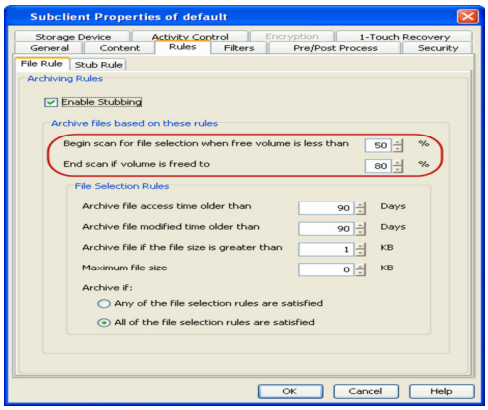
ARCHIVING RULES

Archiving rules specify the criteria for the type of data to be archived. You can configure these rules on a requirement basis.

FILE SYSTEM SIZE

The backed up files can be stubbed based on the available free space on the volume. During a backup job if the free space on the volume is less than this value, files matching the remaining rules will get stubbed.

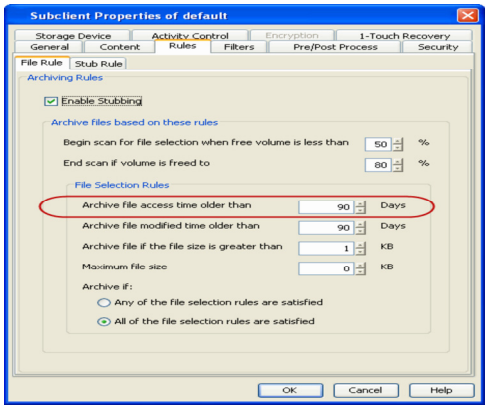
1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. Right-click the **Subclient** and click **Properties.**
3. Select **Rules** tab.
4. Enter the low watermark value for the volume in **Begin scan for file selection when free volume is less than n%**.
5. Enter the high watermark value for the volume in **End scan if volume is freed to n%**.
6. Click **OK**.



FILE ACCESS TIME

This configuration will stub files based on the last accessed date of each file within the volume or folder/directory. In case it is older than the number of days specified, the files will get stubbed.

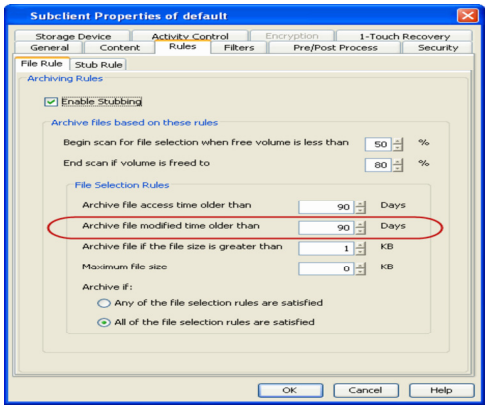
1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. Right-click the **Subclient** and click **Properties**.
3. Select **Rules** tab.
4. Enter the number of days elapsed since the file was last accessed **Archive file access time older than *n* Days**.
5. Select **Any one of the file selection rules are satisfied**.
6. Click **OK**.



FILE MODIFIED TIME

This configuration will stub files based on the last modified date of each file within the volume or folder/directory.

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. Right-click the **Subclient** and click **Properties**.
3. Select **Rules** tab.
4. Enter the number of days elapsed since the file was last modified **Archive file modified time older than *n* Days**.
5. Select **Any one of the file selection rules are satisfied**.
6. Click **OK**.



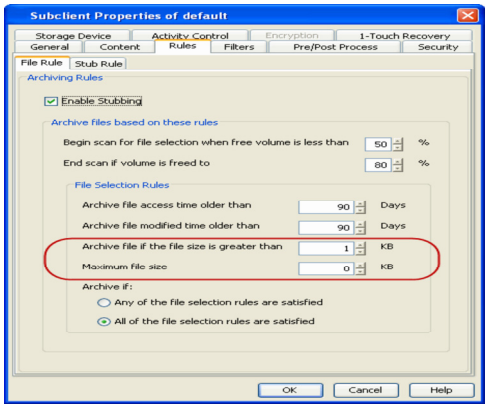
FILE SIZE

This configuration will stub files based on the file size. If a file size within a scanned volume or folder/directory is in between the two limit values set, it will get stubbed.

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. Right-click the **Subclient** and click **Properties**.
3. Select **Rules** tab.
4. Enter the minimum file size in **Archive file if size is greater than *n* KB**.
5. Enter the maximum file size in **Maximum file size**.

   These options can be used individually or in combination to specify a range.

6. Select **All of the file selection rules are satisfied**.
7. Click **OK**.



For Example:

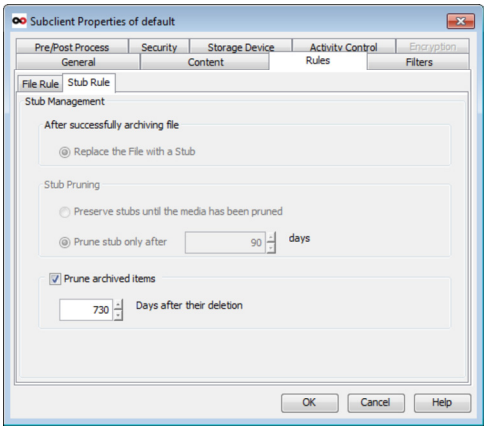
To archive files more than 5KB but less than 20KB:

- Enter 5 KB in **Archive file if size is greater than *n* KB**.
- Enter 20 KB in **Maximum file size**.

CONFIGURING STUB RULES

By default, the stubs are deleted 730 days from the day of stubbing when you enable the **Prune archived items** option. However, you can set the number of days after which the stubs will be pruned using the following steps:

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. In the right pane right-click the **Subclient** and click **Properties**.
3. Click the **Rules** tab.
4. Select the **Stub Rule** tab and make sure that the **Prune archived items** checkbox is enabled.
5. You can enter the number of days after which the stubs will be pruned.
6. Click **OK**.



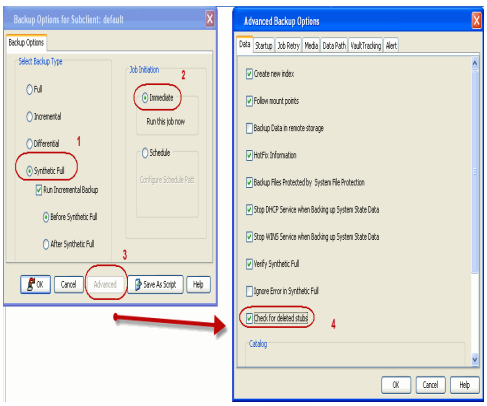
PRUNING ARCHIVED DATA FOR SPACE RECLAMATION

Archived data is pruned and secondary storage space is reclaimed based on the stub retention setting and the storage policy cycle - based retention criteria. Running a synthetic full backup can reduce space on the secondary storage for deleted stubs that meet the expiration criteria. Running data-aging can reclaim space on the secondary storage by pruning the expired backup jobs. The following section describes two scenarios for space reclamation:

EXAMPLE 1

By default stub retention is set to 730 days from the Stub Rules tab and the Storage Policy retention is set for 2 cycles and 15 days. The following procedure demonstrates the reduction in the secondary storage usage:

1.
   - Run a few backup jobs. This will lead to stub generation of the data meeting the defined archiving rules. The subsequent incremental backup will backup these stubs.
   - Delete a few stubs.
   - Perform an incremental backup operation. The time-interval between this incremental backup and the subsequent synthetic full will be calculated as the number of days specified in the retention criteria. The deleted stubs meeting the retention criteria will get expired . For example, if a user has set 20 days for pruning archived items, the deleted stubs will expire after 20 days.
   - Run synthetic full backup with **Check for Deleted Stub** option selected in the advanced tab. The expired stubs and the corresponding data would not get backed up in this operation.
   - From the backup job history, verify the backup file list. Ensure that the deleted stubs and their corresponding data are no longer included in the synthetic full backup image.
   - Note that space on secondary storage has been freed up by pruning of expired stubs and their corresponding data by running a synthetic full backup.



2. The following procedure demonstrates the reclamation of secondary storage space:
   - Run backup jobs to generate 2 backup cycles.
   - Wait for the last job of the first cycle to expire (based on the Storage Policy retention, which is 15 days by default).
   - Run a Synthetic full backup.
   - Running the synthetic full job will start the third backup cycle and will render the first cycle prune-able.
   - Run a data aging job. Notice that the secondary storage space occupied by the first backup cycle has been reclaimed.

EXAMPLE 2

In order to reclaim space on secondary storage by completely removing the archived data and their stubs, follow the steps given below:

Pre-requisites

- Stub retention has been set to n days from Subclient properties Stub Rule tab.
- Storage Policy retention has been set to x cycles and y days.
- A few backup cycles have been completed.

1. Change the stub retention to a minimum of 1 day from Subclient properties **Stub Rule** tab..
2. Change the storage policy retention setting to 2 cycles and 15 days.
3. Delete the unwanted stubs.

4. Perform incremental backup twice to generate two backup cycles.
5. Wait for the deleted stubs pertaining to last backup job in the first backup cycle to expire.
6. Run synthetic full backup with **Check for Deleted Stub** option selected in the advanced tab.

   Note that the synthetic full backup will be considered as the third backup cycle and it will render the stubs in the first cycle prunable.
7. Running the synthetic full backup will start a new backup cycle. Due to the change in storage policy retention all the previous backup have expired.
8. Run a data aging job. All jobs from the first backup cycle will be pruned.

   Note that space on secondary storage has been freed up as all the unwanted stubs and their corresponding data have been pruned.

FILTERING FILES FROM ARCHIVING

Prior to archiving the files, you can set filters to prevent specific type of files from being archived. Filters can also be used to exclude certain system-related files and database application files which consistently fail during a archive operation and are not integral to the operation of the system or application.

The platform specific files that are automatically filtered from archiving are:

- AIX - /**/*.imp, /**/*.exp
- Darwin - /**/*.dylib, /**/*.scpt, /Applications/**, /Developer/**, /Library/**, /Network/**, /System/**, /Volumes/**, /private/**
- Solaris - /platform/**
- FreeBSD - /rescue/**

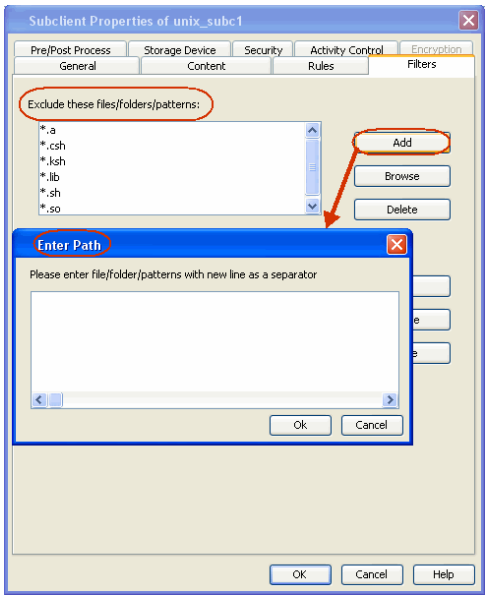
MANUALLY FILTERING FILES FROM ARCHIVING

You can manually set filters on selected file types, folders or files to be excluded from archiving. For example if you specify *.txt in the filters then all the text files will be excluded from being archived.

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. In the right pane right-click the **Subclient** and click **Properties**.
3. Click the **Filters** tab.
4. Click **Add** from the **Exclude these files/folders/patterns** group.
5. Enter the complete path of the file, folder, or directory that you want to exclude from the archiving operations

   or

   Click the **Browse** and expand the file system of the client computer. Click the file, folder, or directory that you want to exclude from the archiving operations and then click **Add**.
6. Click **OK** to save your changes.



MANUALLY INCLUDING FILES FOR ARCHIVING

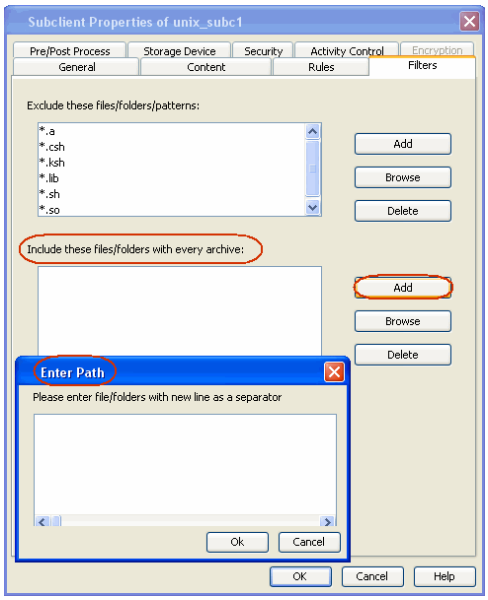
When excluding files from archiving, you can also provide exceptions to the data that you are excluding. For example, if you want to exclude from your migration archive operation all the files in the /Ops directory except the Maintenance file, you can add a subclient filter to exclude the /Ops directory from being archived and also add a corresponding subclient filter to allow the Maintenance file to be archived.

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. In the right pane right-click the **Subclient** and click **Properties**.
3. Click the **Filters** tab.
4. Click **Add** from the **Include these files/folder/patters:** group.
5. Enter the complete path of the file, folder, or directory that you want to be included in the archiving operation.

   or

Click the **Browse** and expand the file system of the client computer. Click the file, folder, or directory that you want to be included in the archiving operation. and then click **Add**.

6. Click **OK**.



FILTERING FILES USING REGISTRY KEY

The following registry keys can be used to set additional filters for an archive operation:

sSTUB_PRUNE_PATTERNS	Use this registry key to specify additional filters. Ex: `sSTUB_PRUNE_PATTERNS *.so *.so.* *.a *.lib *.sh *.ksh *.csh /usr/** /bin/** /lib/** /etc/** /var/**`
sSTUB_PRUNE_EXCEPTIONS	Use this registry key to set any exceptions to the filter list defined in sSTUB_PRUNE_PATTERNS. Ex: `sSTUB_PRUNE_EXCEPTIONS /var/log/abcd/**`

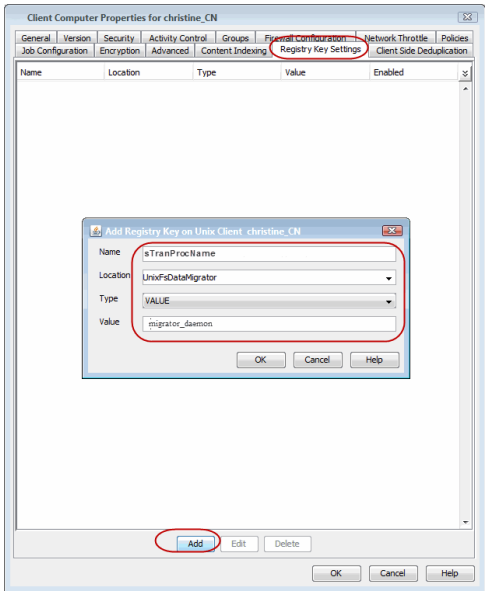
CONFIGURING ARCHIVING FOR IBRIX FILE SYSTEM

For X9000 IBRIX , by default the stubs are recalled during the data tiering process, which moves the files and the data stubs from one storage tier to another based on pre determined parameters. However you can configure the sTranProcName registry key to seamlessly migrate data stubs from one storage tier to another without triggering a stub recall. The steps to configure the key are as follows:

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** field, type sTranProcName
6. In the **Location** list, type or select `UnixFsDataMigrator`.
7. In the **Type** list, select **Value**.
8. In the **Value** field, type the process name used migrate stubs from one storage tier to another.

   Example migrator_daemon

   On specifying this value the stubs will not be recalled during the data tiering process.
9. Click **OK**.



SETTING UP STUB CACHE

After recalling the files, you can re-archive the recalled files by preserving them in a stub cache. The recalled file will be re-archived from the cache if the file meets the archiving rules and has not been modified after the recall. The following registry keys allow you to set the stub cache and re-stub the recalled files from the cache memory.

nUSE_STUB_CACHE	This key allows a file to be re-stubbed after recall by preserving it in cache memory.
dSTUB_CACHE_ROOT	By default the stubs are cached under , /opt/calypso/stubcache folder. Use this key to specify a different location of the root folder for the File Archiver stub cache.

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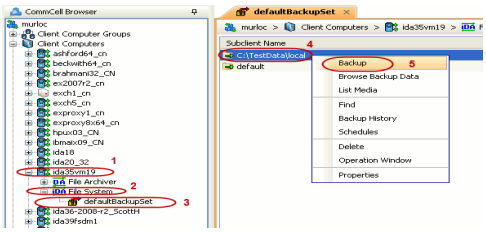
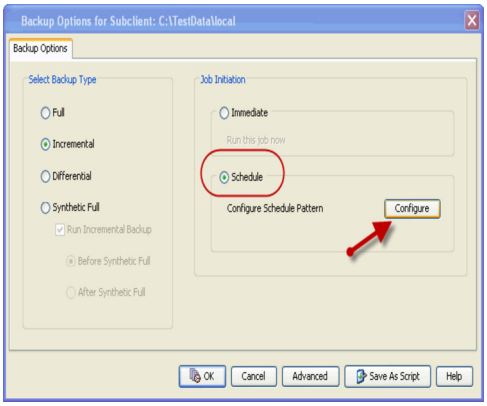
SCHEDULING AN ARCHIVE JOB

1.
   - From the CommCell Console, navigate to **Client Computers** | **File System** | **Backupset**
   - Right-click the **Subclient** in the left pane and click **Backup**.

   The OnePass agent does not support Differential backup and a selection of Differential backup will lead to job failure.

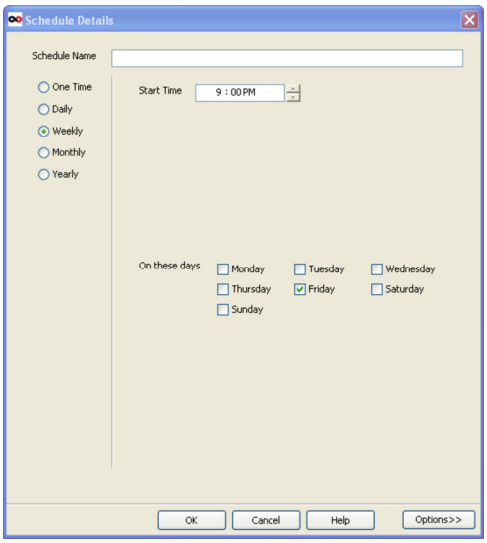


2.
   - Click **Schedule** to schedule the backup job for a specific time.
   - Click Configure to set the schedule for the backup job. The Schedule Details dialog displays.



3. Select the appropriate scheduling options. For example:
   - Click **Weekly**.
   - Check the days you want the run the archive job.
   - Change the Start Time to 9:00 PM
   - Click **OK** to close the Schedule Details dialog
   - Click **OK** to close the Backup Options dialog

   The backup job will execute as per the schedule.



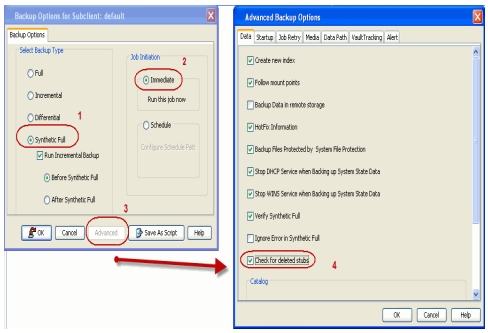
CHECK FOR DELETED/MOVED STUBS

You can run a check for deleted or moved stubs on your client computer. The client computer is scanned for moved/deleted stubs during a synthetic full backup if the **Check for deleted stubs** option is selected in the **advanced** tab.

We recommend you to enable this option only when the stubs are moved from one location to another. Enabling this option makes synthetic full backups slower.

Follow the steps given below to run this scan:

1. From the CommCell Console, navigate to **Client Computers** | **File System**.
2. Right-click the **Subclient** and click **Backup**.
3. From the **Backup Options** dialog box, select **Synthetic Full** as the backup type and **Immediately** as the **Job Initiation** option.
4. Click **Advanced**.
5. Select **Check for deleted stubs**.
6. Click **OK**.
7. You can track the progress of the backup job from the **Job Controller** window.



LONG TERM DATA RETENTION

Once the backed up data has been archived, it can be transferred and retained for an extended period on a cost effective media by using the following methods:

CLOUD STORAGE

- Cloud Storage enables you to configure and use online storage devices — cloud storage devices — as storage targets.
- It reduces the need to maintain hardware resources such as tape or disk storage devices at onsite locations.
- It also provides the ability to easily increase your storage capacity as and when it is required.
- It also provides centralized data access, better failover capabilities and reduces the day-to-day storage administration tasks.

For more details, see Cloud Storage.

AUXILIARY COPY

- An auxiliary copy operation allows you to create secondary copies of data associated with data protection operations, independent of the original copy.
- The auxiliary copy operation can be useful for creating additional standby copies of data.
- The primary and secondary copies use different media and often use different libraries, depending on the configuration.
- In case the primary copy become inoperative, you can promote a synchronous copy to become the primary copy. This allows you to continue data protection and data recovery operations without interruptions.

For details, see Auxiliary Copy.

OnePass Agent for Unix File System- Advanced Recover

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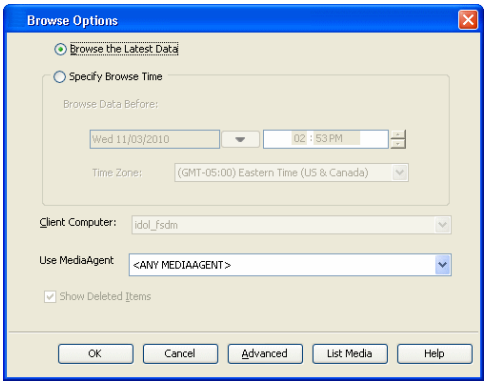
ACCESSING STUBS WITHOUT TRIGGERING A RECALL

If a stub has been moved to a new location, recall operations will restore the data to the new location and not the source.

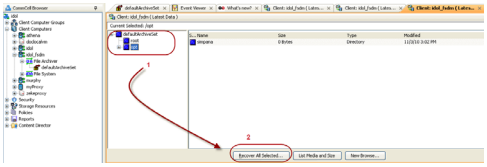
- If stubs are moved within the monitored volume, it does not trigger a stub recall and the file is moved.
- If stubs are moved outside the monitored volume, it triggers a stub recall and the file is moved.
- If stubs are copied within or outside the archived volume, it triggers a stub recall and the file is copied.
- Stubs can be moved or copied without triggering a recall, by using the Registry key sTranProcName. In such cases, the stub will not be accessing actual data.

SCHEDULING A RESTORE

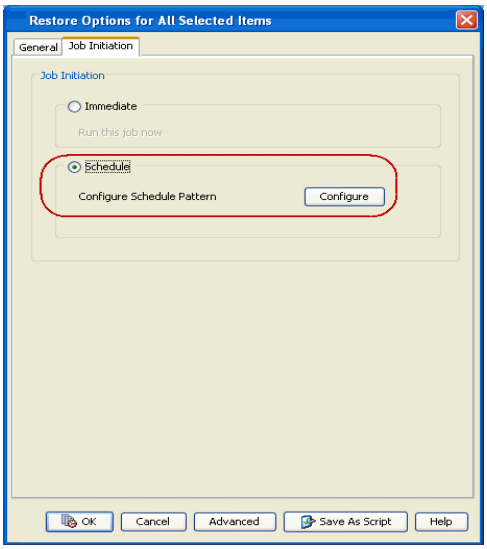
1.
   - From the CommCell Console, navigate to **Client Computers** | **File System**.
   - Right-click the backup set and click **All Tasks** | **Browse**.
   - Click **OK**.



2.
   - Select data to restore.
   - Click **Recover All Selected**.

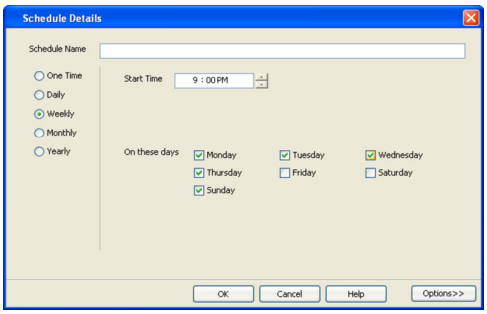


3.
   - Click **Job Initiation** tab and click **Schedule**.
   - Click **Configure**.



4. 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.



RESTORE DESTINATIONS

By default, the OnePass Agent restores data to the client computer from which it originated; this is referred to as an in-place restore. You can also restore the data to another client computer in the CommCell. The following section enumerates the types of restore destinations that are supported by the OnePass Agent.

IN-PLACE RESTORE

When restoring data, the OnePass Agent provides the facility to restore the data to the same path/destination on the client computer from which the data originated; this is referred to as an in-place restore.

1. From the CommCell Console, perform a **Browse and Restore** operation.
2. When browsing the data, select data that was initially backed up and click **Recover All Selected**.
3. Click **OK**.
4. Select the **Destination Client** that was the original computer from which the data originated.
5. Depending on the data selected to restore, choose one of more of the options (e.g., **Restore ACLs**).
6. Click **OK**.

OUT-OF-PLACE RESTORE

All restore levels provide the facility to restore data to a different directory on the client computer from which the data originated; this is referred to as an out-of-place restore to a different path/destination. You can also restore data to a different client computer in the CommCell using the same path/destination.

> When you perform an out-of-place restore, the restored data assumes the rights (i.e., permissions) of the parent directory.

1. From the CommCell Console, perform a **Browse and Restore** operation.
2. When browsing the data, select data that was initially backed up and click **Recover All Selected**.
3. Click **OK**.
4. Select the **Destination Client** that is a different computer from which the data originated.
5. Depending on the data selected to restore, choose one of more of the options (e.g., **Restore ACLs**).

6. Click **OK**.

RESTORE BY JOBS

The Restore By Jobs feature provides the facility to select a specific backup job to be restored. This method of restoring data is considerably faster as it reads continuously on the tape and retrieves the data and does not depend on the indexing subsystem to get the seek offsets on the media.

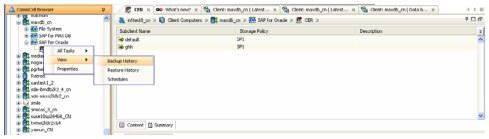
This feature can be used to restore point-in-time data associated with a specific backup job, such as full, incremental, differential, etc.

Consider the following when restoring by jobs:

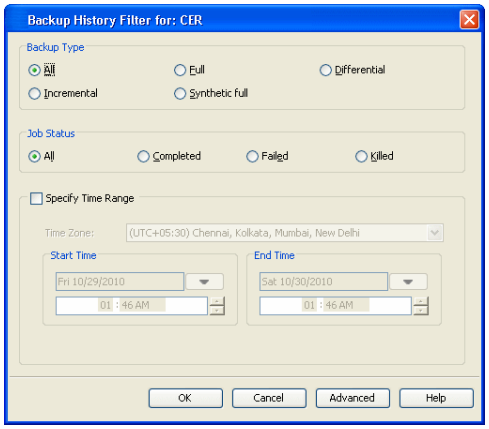
- Run a restore by jobs whenever you want to restore the entire contents of the job.
- Avoid running restores by jobs for jobs associated with the default subclient. If you do this, the entire contents of the machine will be restored. As such, this may cause problems (e.g., the machine might run out of space) or produce undesirable results (e.g., you might end up restoring operating system files or directories that you really do not want to restore).
- Avoid modifying the contents of any associated subclients since this may result in the retrieval of older data.

Use the following steps to restore data by jobs.

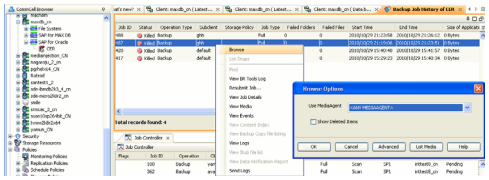
1. From the CommCell Browser, right-click the level whose data you want to browse, click **View** and then click the **Backup History**.



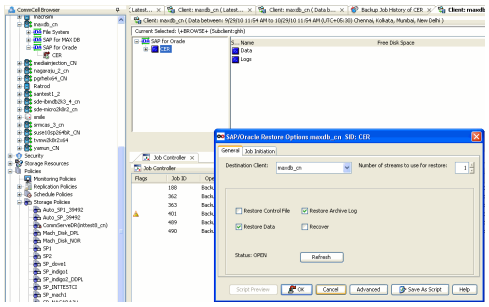
2. From the **Backup History Filter** window, select the filter options, if any, that you want to apply and click **OK**.



3. From the Backup Job History window, right-click the backup job that need to be restored and select **Browse**.
4. From the **Browse Options** dialog box, click **OK** to execute the browse using the **Browse the Latest Data** option.



5. From the **Browse** window, select the instance node in the left pane and then select the required data and logs in the right pane, and click the **Recover All Selected** button at the bottom of the window.
6. Select the desired restore options and click **OK**.



LISTING MEDIA

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

- To restore data associated with a specific backup set, subclient or instance
- 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 operation can be performed for instances, backup sets, and subclients. The following sections describe each of these methods.

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.

LISTING MEDIA FOR A SUBCLIENT

1. From the CommCell Browser, right-click the subclient for which you wish to list media and then click **List Media**.
2. From the **List Media** dialog box choose one of the following options:
   - Click **Media For the Latest Data** to list media associated with the most recent data protection cycle.
   - 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.
   - 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.
3. Click **OK**.

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

LISTING MEDIA FOR A BACKUP SET

1. From the CommCell Browser, right-click the backup set for which you wish to list media, click **All Tasks** and then click **Browse**.
2. From the **Browse Options** dialog box, if required, select the following options:
   - Click **Browse the Latest Data** to list media associated with the most recent data protection cycle.
   - 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.
   - 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.
3. Click **List Media**.
4. From the **List Media** dialog box, click **List Media for restore within specified time range** and click **OK**.

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

Troubleshooting - OnePass Agent for Unix File System

The following section provides information on some of the troubleshooting scenarios

BACKUP OF SUBCLIENTS USING ONEPASS AGENT WILL FAIL IF THE STORAGE POLICY IT WAS USING BEFORE RUNNING A NEW SYNTHETIC FULL BACKUP IS DELETED.

By default the OnePass Agent uses a synthetic full forever incremental design. If you want to change the storage policy being used, you should re-assign the policy, run a new synthetic full (this will get the data from the older policy). The older storage policy should only be deleted after running the new synthetic full.

If the older storage policy is accidentally deleted before running a synthetic full backup, follow the steps given below to allow for new backups to run:

1. Create a new backup set.
2. Configure subclient with the same content path as that of the old subclient.
3. Associate the new subclient to the new storage policy.
4. Run a backup.

   The first backup will be full, but all subsequent backups will be incremental.

INCREMENTAL BACKUPS GOING TO A PENDING STATE WITH THE "NO ARCHIVE DATA" ERROR MESSAGE

This message will be displayed if the full backup associated with the subclient is deleted.

It is recommended to create a new subclient, assign the same content and run full and incremental backups.

SYNTHETIC FULL BACKUPS FAILING WITH "NO INCREMENTAL JOB RAN" ERROR MESSAGE

This message will be displayed if you run a synthetic full backup after deleting the most recent synthetic full with no 'new' incremental backups in-between.

Re-run the synthetic full backup and the error will message will not be displayed again.

Frequently Asked Questions - OnePass Agent for Unix File System

I AM UNABLE TO SEE THE RULES TAB IN THE SUBCLIENT PROPERTIES DIALOG BOX

Select the **Enable for Archiving** option in the File System Agent properties dialog box, the OnePass Agent mode gets enabled. Now right-click the subclient and select properties. The **Rules** tab will be visible with **File Rule** and **Stub Rule** tabs.

ONCE THE ONEPASS AGENT MODE IS ENABLED, CAN I RUN FULL BACKUPS EVEN AFTER THE FIRST FULL BACKUP

No. Once the OnePass Agent mode is enabled, after the first full backup, full backups will be converted into incremental backup followed by a synthetic full backup in these scenarios:

- Full backup job initiated manually by a user
- Full backup job scheduled using a Schedule Policy
- Full backup job scheduled using a Scheduler

WHY ARE THE DIFFERENTIAL BACKUPS FAILING?

The OnePass agent does not support Differential backup. Therefore a selection of differential backup will result in backup job failure.

HOW DO I RECOVER DELETED STUBS?

Deleted stubs can be recovered using the following methods:

Case 1: If the stubs that were deleted have not yet reached the expiration date set at **Prune archived items** from the **Subclient Properties (Rules)** tab, you can recover the stubs by performing a Browse and Restore operation from the latest synthetic full backup. To restore data, navigate to the location the stubs are restored and perform a stub recovery.

Case 2: If stubs are deleted and aged, but data is still available in the media, you can restore them by performing the method described in Recovering Pruned and Deleted data.

HOW DO I EXTEND MY STUB PRUNING SETTING?

Follow the steps given below to extend and reset your stub pruning setting.

- From the CommCell Console, navigate to **Client Computers** | **File System**.
- Right-click the **Subclient** and click **Properties**.
- Select **Rules|Stub Rule**.
- Select **Prune archived items** to extend the retention days.
- Click **OK**.

WHY AM I UNABLE TO ARCHIVE DATA?

Your data will get archived only if the **Enable for Archiving** checkbox is selected and **OnePass Agent** license is available.

- From the CommCell Console, navigate to **Client Computers | File System**.
- Right-click **File System | Properties**.
- Select **Enable for Archiving**, if it is not already selected.

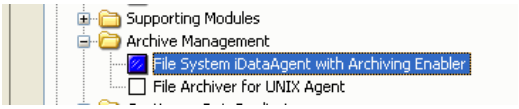
WILL MY SYSTEM FILES GET ARCHIVED IF I BACKUP MY ROOT VOLUME?

No, backing up your root volume will not archive the system files. During backup of your entire client machine, system files are automatically excluded.

For more details on files that will not get archived see, File Excluded from Archiving.

HOW DO I ADD THE ONEPASS AGENT IF I HAVE UNIX FILE SYSTEM *i*DATAAGENT ALREADY INSTALLED?

If the Unix File System *i*DataAgent is already installed, install the Driver for File Archiver. To install the Driver for File Archiver, follow the same steps as with installing the Unix File System *i*DataAgent with Archiving Enabled. Internally, the system will install only the driver.



IS DATA TIERING POSSIBLE FOR X9000 IBRIX WITHOUT TRIGGERING STUB RECALL?

For X9000 IBRIX, data tiering process allows seamless movement of data from one storage tier to another depending upon its relevance, usage and other pre-determined parameters. In case there are data archiver stubs available in any storage tier, the data tiering process triggers a stub recall.

In order to successfully process data tiering, it is recommended to configure sTranProcName key on the computer that has the archiver agent installed. For details, see Configuring Archiving for X9000 IBRIX.

WHY ARE THE RECALLS SLOW?

The recall process may become slow when old data is not aged off. Therefore it is recommended to schedule Synthetic Full backups at regular intervals so that the archived items are aged off based on their retention criteria.

Desktop Browse - Unix File System (User)

This feature/product/platform is deprecated in this release. See Deprecated Features, Products, and Platforms for more information.

It is recommended to use Laptop Backup to browse file system data.

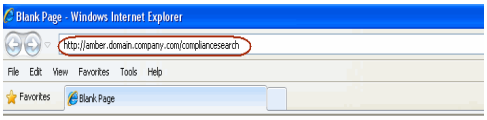
Getting Started | Restore | Advanced Options

Previous Next

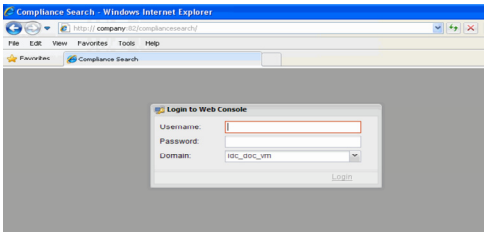
Desktop Browse enables users to browse and restore data using a web browser from any remote location without the need for installing the software.

Logging to Web Console

1. Open the supported Web Browser and type the Web Console URL in the address line. For example, `http://amber.domain.company.com/<web_alias_name>`

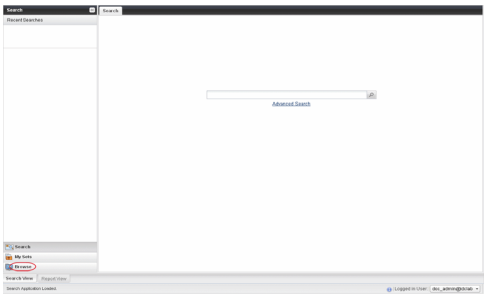


2.
   - Type the login credentials to access the Web Console.
   - Click **Login**.

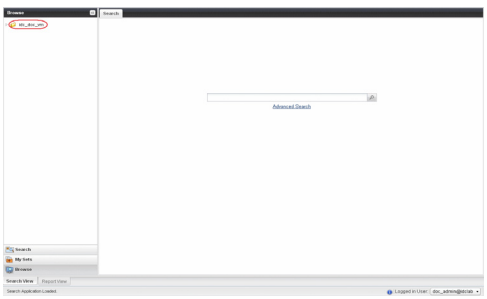


Browsing and Restoring Data

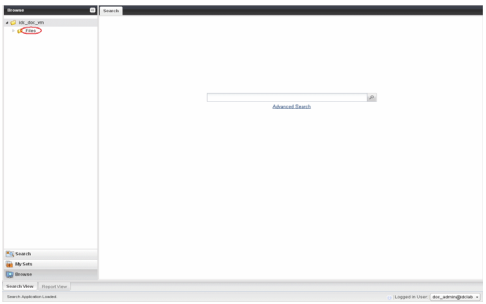
1. From the Web Console, click **Browse** on the left pane.



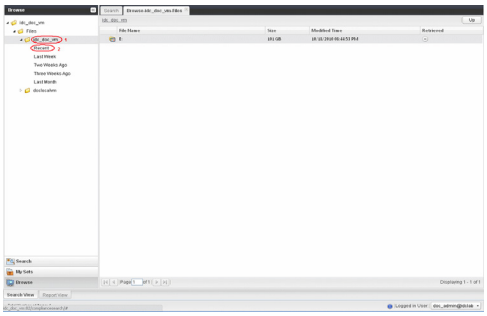
2. Double-click the **<CommServe computer name>**.



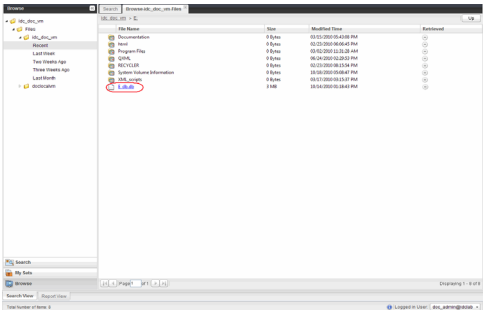
3. Double-click **Files**.



4.
- Double-click the specific <**client computer name>**.
- Select **Recent**.

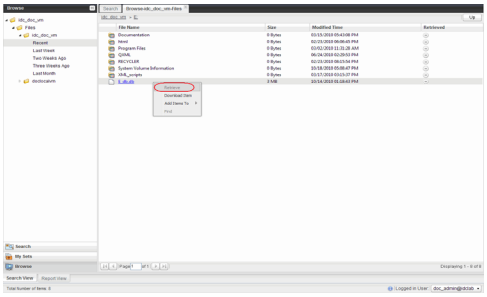


5. Navigate to the file to be restored on the right pane**.**

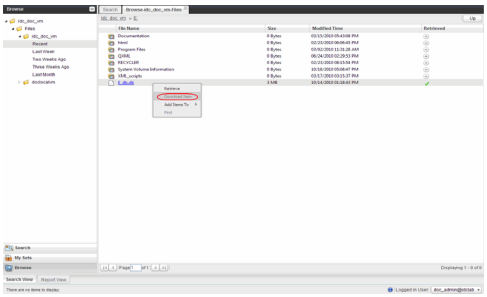


6. Right-click the file and select **Retrieve.**

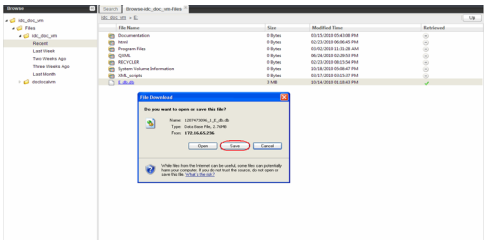
   The file is copied to the **MyReviewSet** folder under **MySets | ReviewSet** node in the Web Console.



7. Right-click the file and select **Download Item**.



8.
- Click **Save** from the **File Download** dialog.
- Specify the location where the file needs to be downloaded in the Web Browser's download dialog box.
- Click **Save**.



Desktop Browse - Unix File System (User)

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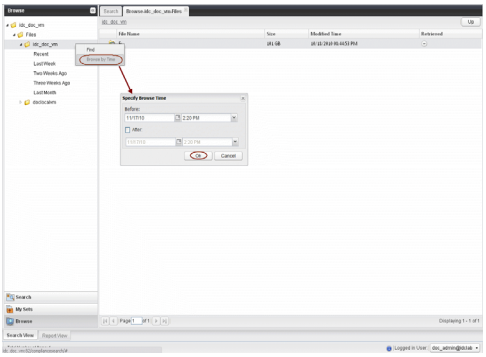
Restoring Data From a Specific Time Range
Restoring Data To a Specific Client Computer
Finding Data with a Specific Pattern
Finding Data within a Specific Folder
Finding Data with a Specific Modified Time

RESTORING DATA FROM A SPECIFIC TIME RANGE

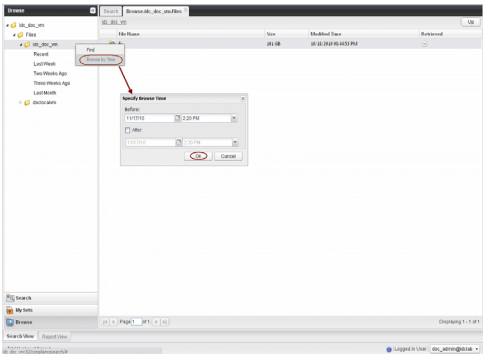
You can also browse and restore data that was backed up some time earlier or within a specific time range.



1. From the Web Console, click **Browse** on the left pane.
2. Double-click the **<CommServe computer name>**.
3. Double-click **Files**.
4. Double-click the specific **<client computer name>** and select one of the following options:
   - **Last Week**
   - **Two Weeks Ago**
   - **Three Weeks Ago**
   - **Last Month**.
5. Right-click the **<client computer name>** and select **Browse By Time**.
6. Select the time range in the **Before** drop down boxes.
7. Click **After** and specify the time range.
8. Click **OK**.
9. Navigate to the file to be restored on the right pane**.**
10. Right-click the file and select **Restore.** The file is copied to the **MyReviewSet** folder under **MySets | ReviewSet** node in the Web Console.
11. Right-click the file and select **Download Item**.
12. Click **Save** from the **File Download** dialog.
13. Specify the location where the file needs to be downloaded in the Web Browser's download dialog box and click **Save**.

RESTORING DATA TO A SPECIFIC CLIENT COMPUTER

You can restore the data to a specific client computer.



1. From the Web Console, click **Browse** on the left pane.
2. Double-click the **<CommServe computer name>**.
3. Double-click **Files**.
4. Double-click the specific **<client computer name>** and select one of the following options:
   - **Last Week**
   - **Two Weeks Ago**
   - **Three Weeks Ago**
   - **Last Month**.
5. Right-click the **<client computer name>** and select **Browse By Time**.
6. Select the time range in the **Before** drop down boxes.
7. Click **After** and specify the time range.
8. Click **OK**.
9. Navigate to the file to be restored on the right pane**.**
10. Right-click the file and select **Restore To Client.**

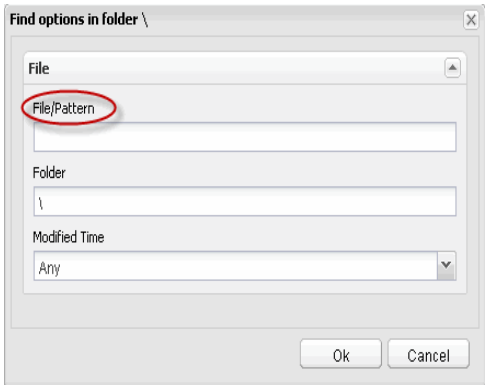
11. Select the **Destination Computer** from the drop-down box.
    - Uncheck the **Restore to the same folder** check box
    - Type the destination path to restore the file to a specific folder in the computer.
12. Click **OK**. The file will be restored to the specified destination computer.

FINDING DATA WITH A SPECIFIC PATTERN

You can use **Find** option to search and locate files with a specific file name or file name pattern.

Follow the steps given below to find and locate files with a specific file name or file name pattern:

1. From the Web Console, click **Browse** on the left pane.
2. Double-click the **<CommServe computer name>**.
3. Double-click **Files**.
4. Right-click the **<Client computer name>** and select **Find**.
5. Type the file name or wildcard pattern criteria in the **File/Pattern** text box from the **Find Options** dialog box.
6. Click **OK**.

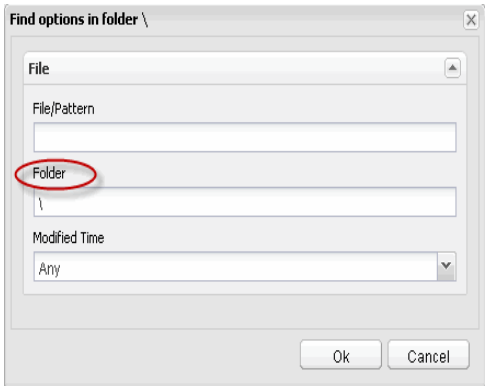


FINDING DATA WITHIN A SPECIFIC FOLDER

You can find and locate a folder with a specific folder name.

Follow the steps given below to find and locate a folder with a specific name.

1. From the Web Console, click **Browse** on the left pane.
2. Double-click the **<CommServe computer name>**.
3. Double-click **Files**.
4. Right-click the **<Client computer name>** and select **Find**.
5. Type the folder name in which the file resides in the **Folder** text box from the **Find Options** dialog box.
6. Click **OK**.

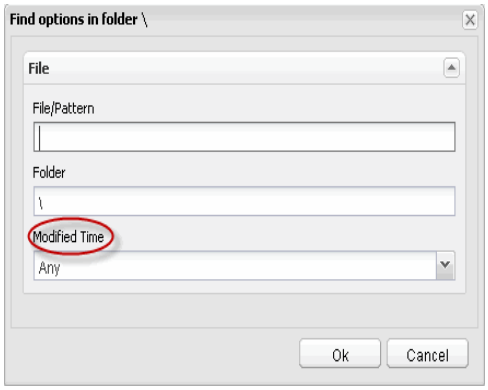


FINDING DATA WITH A SPECIFIC MODIFIED TIME

You can find and locate a file based on the time range (such as any, today, yesterday, etc) when the files were modified.

Follow the steps given below to find and locate files based on the modified time.

1. From the Web Console, click **Browse** on the left pane.
2. Double-click the **<CommServe computer name>**.
3. Double-click **Files**.
4. Right-click the **<Client computer name>** and select **Find**.
5. Click the **Modified Time** drop-down box and select the time range (such as Any, Today, Yesterday, This Week, etc.) when the files were modified.
6. Click **OK**.



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Saving File Properties
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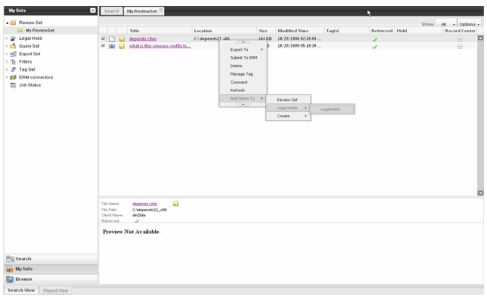
RETAINING A FILE FOR LONG TERM

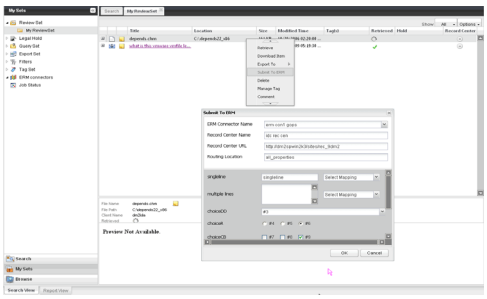
Compliance users can retain specific files for a longer term by moving them to a Legal Hold container.



1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file, navigate to **Add Item To** | **Legal Holds** and select <**Legal Hold Name**>.

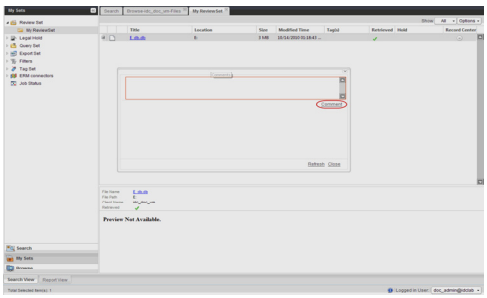
MOVING A FILE TO A RECORDS MANAGEMENT SITE

Compliance users can move files to a Records Management Site (eg., Microsoft SharePoint Site) using an ERM Connector.



1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file, and select **Submit To ERM**.
4. Click **ERM Connector Name** drop-down box and select the <**ERM Connector name**>.
5. Click **OK**.

ADDING COMMENTS TO A FILE



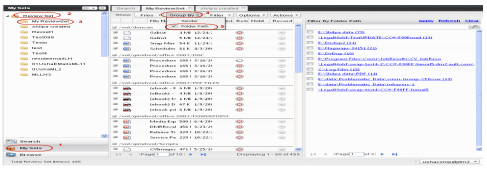
1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file and select **Comment**.
4. Type the statement for comments and click **Comment**.
5. Click **Close** to exit the Comment window.

ADDING SEARCH TAGS TO A FILE

Compliance users can apply review tags to a file to facilitate easy search based on tags at a later point of time.

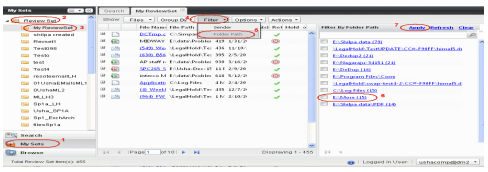
1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file and select **Manage Tags**.
4. On the **Manage Tag(s)** window, select the tag to apply.
5. Click **Apply Tags**.

Grouping Files by Folder Path



1. From the Web Browser, click **My Sets** on the left pane.
2. Double-click **Review Set**, and then click the desired ***<Review Set name>/<Legal Hold Set Name>***.
3. On the **Group By** menu, click **Folder Path**.

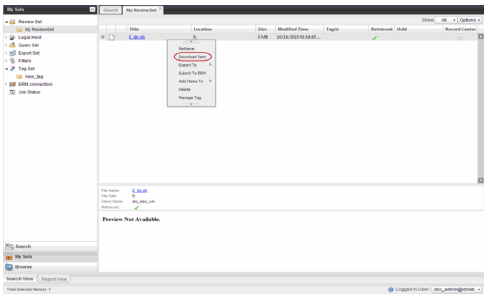
Filtering Files by Folder Path



1. From the Web Browser, click **My Sets** on the left pane.
2. Double-click **Review Set**, and then click the desired ***<Review Set Name>/<Legal Hold Set Name>***
3. On the **Filter** menu, click **Folder Path**.
4. On the right pane, select the folder path.
5. Click **Apply**.

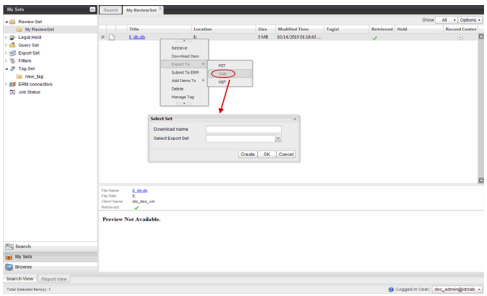
You can click the **Clear** button on the right pane to clear all the selected folder paths. To clear a specific selected folder path, click the cross-mark symbol corresponding to the selected folder path on the right pane.

Downloading a File



1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file and select **Download Item**.
4. Specify the location where the file needs to be downloaded in the Web Browser's download dialog box.

Downloading Multiple Files

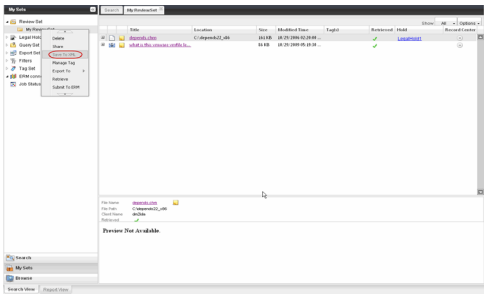


In order to download multiple files, you can export the selected files/folder to a compressed file format (CAB format) and then download the CAB file to your computer.

1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the file and select **Export To | CAB**.
4. Specify the **Download Name.**
5. Select the **Select Export** Set.
6. Click **OK**. The selected file(s) are moved to the selected **Export Set** with the given name.
7. Click **MySets | Export Set**.
8. Click the Export Set which contains the CAB file.
9. Right-click the CAB file and select **Download**.
10. Click **Save** from the **File Download** dialog box.

11. Navigate to the location where you want to download the file.
12. Click **OK**.

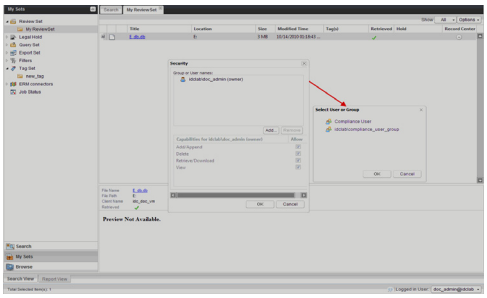
SAVING FILE PROPERTIES



You can save the properties of all the files in a reviewset as an XML file to you local computer.

1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set.**
3. Right-click the <**Review Set Name**> and select **Save to XML**.
4. Click **Save** from the File Download dialog.
5. Navigate to the location where you want to save the file.
6. Click **OK**.

SHARING FILES TO OTHER USERS



You can share and assign access permissions to all the files in your Review Set folder to selected users.

1. From the Web Console, click **MySets** on the left pane.
2. Double-click **Review Set** and click the <**Review Set Name>**.
3. Right-click the review set and select **Shares**.
4. Click **Add**.
5. Select the user/user groups from the **Select User or Group** window.
6. Click **OK.**
7. Select **Allow** check box to assign the respective privileges.
8. Click **OK**.

SHARING BROWSE RESULTS TO OTHER USERS

When browsing data, you can share the browse results with other users.

1. From the Web Console, click **Browse**.
2. Navigate to the client computer to be browsed.
3. Copy the URL of the browse result page from the browser's address bar and email to other users.

When the recipient users open the URL, they can directly view the browse result page as soon as they login to the Web Console.

Previous Next

Desktop Browse - Unix File System (Administrator)

This feature/product/platform is deprecated in this release. See Deprecated Features, Products, and Platforms for more information.

It is recommended to use Laptop Backup to browse file system data.

Install | Setup

Previous Next

Desktop Browse enables users to browse data from an user-friendly Web interface from any remote location. To enable Desktop Browse operations, you need to first install the Web Search Server and the Web Search Client. The Web Search Server and Web Search Client can be installed on the same computer or on different computers.

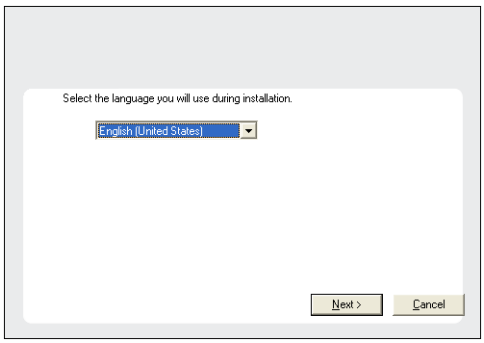
Ensure you have the following before performing the install:

- Software version or higher.

INSTALLING THE WEB SEARCH SERVER AND WEB SEARCH CLIENT

1. Ensure that the IIS is installed on the CommServe computer before installing the Web Search Server and Web Search Client.
2. Run **Setup.exe** from Software Installation Discs on the **CommServe** computer.
3. Select the required language.

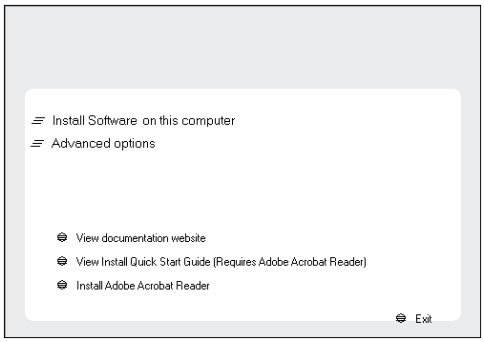
   Click **Next**.



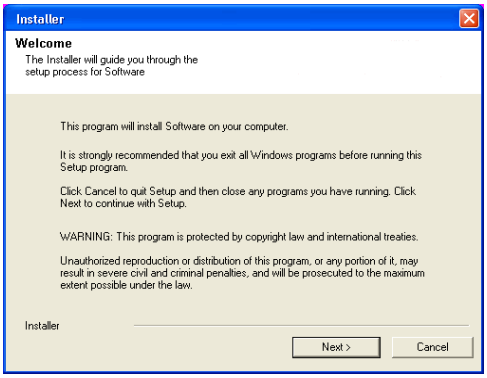
4. Select the option to install software on this computer.

   NOTES

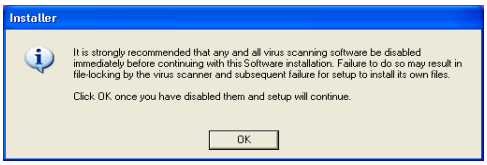
   - The options that appear on this screen depend on the computer in which the software is being installed.



5. Click **Next**.

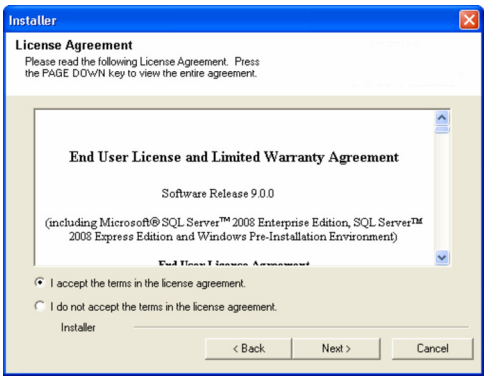


6. Click **OK**.



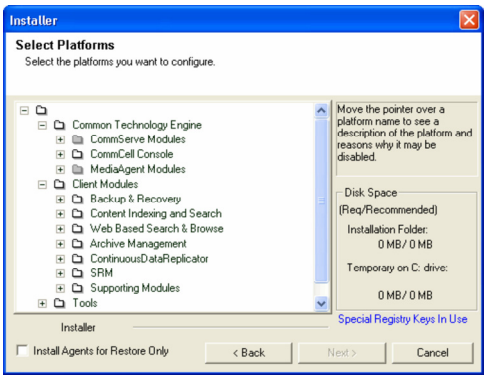
7. Select **I accept the terms in the license agreement**.

   Click **Next**.

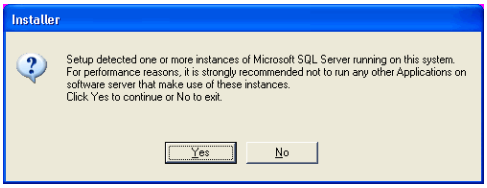


8. Expand **Client Modules** | **Web Search Server & Browse** and select **Web Search Server** and **Web Search Client**.

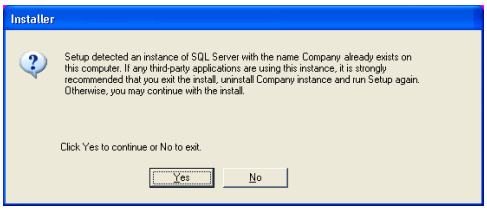
   Click **Next**.



9. Click **Yes**.



10. Click **Yes**.

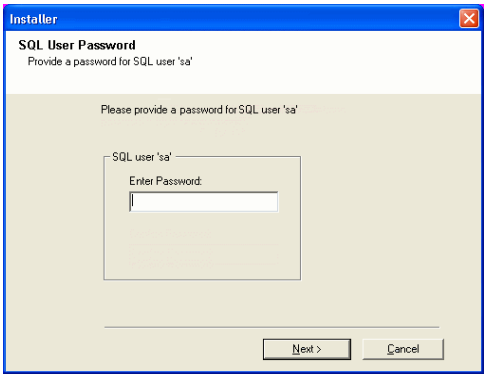


11. Specify the SQL Server System Administrator password.

    NOTES

    - This is the password for the administrator's account created by SQL during the installation.

    Click **Next**.

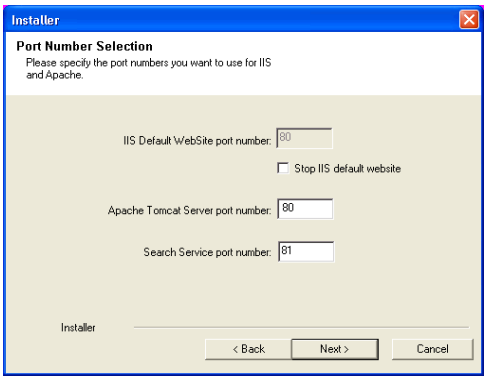


12. Modify **Apache Tomcat Server port number** to **82**.

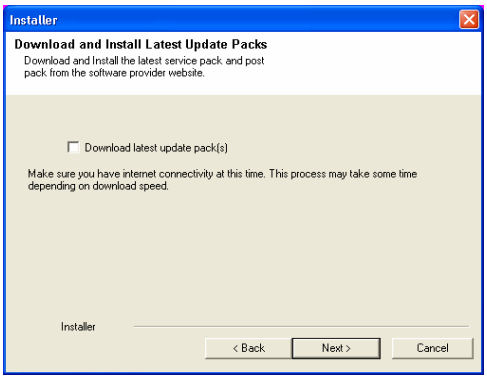
Click **Next**.

NOTES:

- Ensure that these port numbers are different and are not already used by any other services or application.



13. Click **Next**.

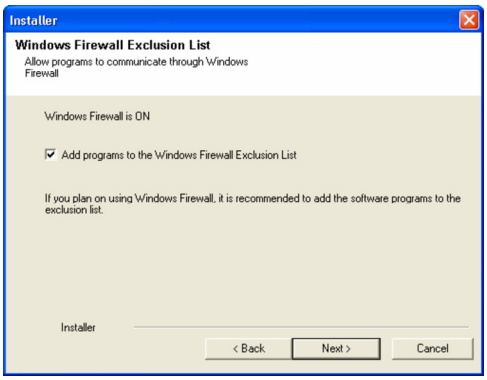


14. Select **Add programs to the Windows Firewall Exclusion List**, to add CommCell programs and services to the Windows Firewall Exclusion List.

    Click **Next**.

    This option enables CommCell operations across Windows firewall by adding CommCell programs and services to Windows firewall exclusion list.

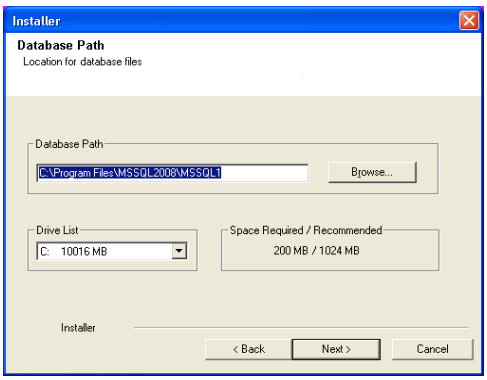
    It is recommended to select this option even if Windows firewall is disabled. This will allow the CommCell programs and services to function if the Windows firewall is enabled at a later time.



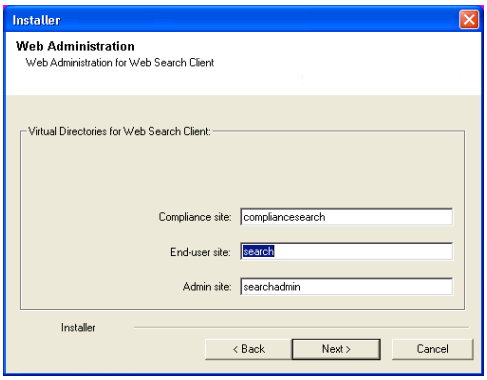
15. Enter the Web Search Server database installation path.

    Click **Browse** to modify the default location.

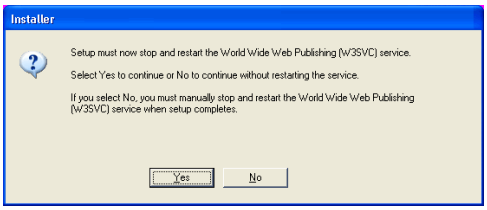
    Click **Next**.



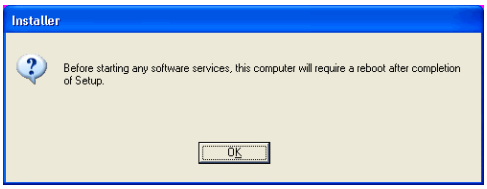
16. Click **Next**.



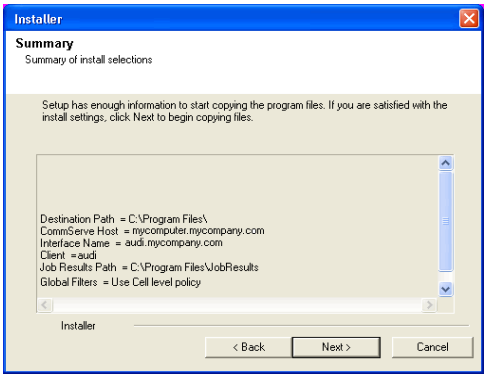
17. Click **Yes**.



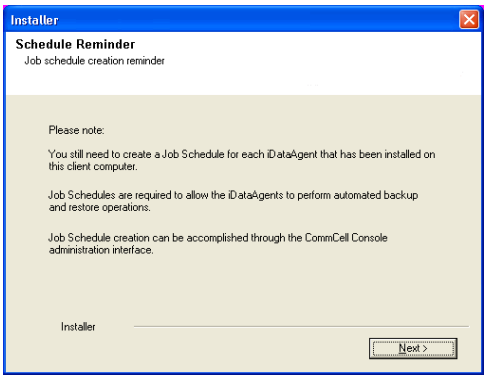
18. Click **OK**.



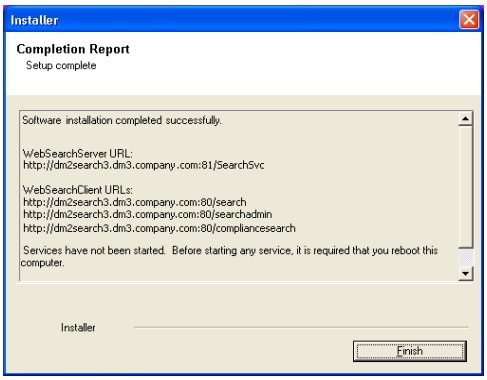
19. Click **Next**.



20. Click **Next**.



21. Click **Reboot** to finish the installation.



Previous Next

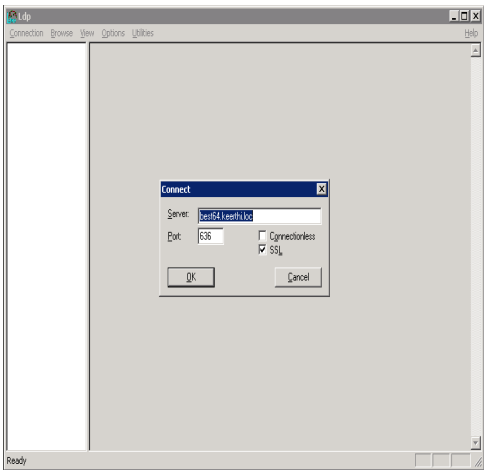
Desktop Browse - Unix File System (Administrator)

Once the Web Search Server and Web Search Client are installed, perform the following configurations:

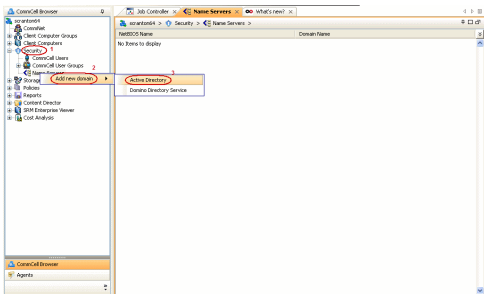
SETTING UP PERMISSIONS FOR END USERS

1. Obtain the domain name and fully qualified domain name of the Active Directory server.

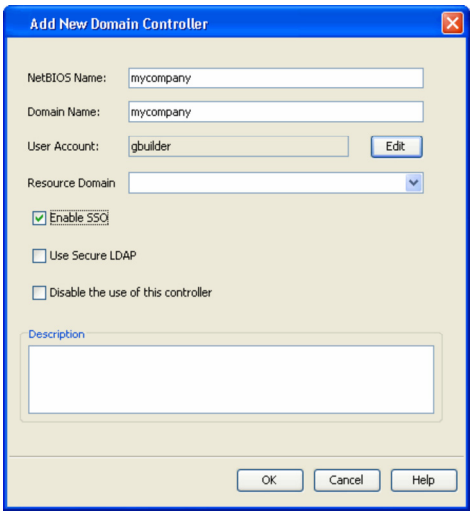
2. Ensure that LDAP is configured on the AD server:
   - From the Active Directory Server, select **Start | Run**.
   - Type **ldp** on the **Run** dialog box and click **OK**.
   - Click the **Connections** menu option, and select **Connect**.
   - From the **Connect** dialog box, enter the following information:
     - **Server**: Enter the name of the external domain server, e.g., `computer.domain.com`.
     - **Port**: Enter 636 as the port number for the external domain server.
     - **SSL**: Mark this checkbox to check for the proper certificate.
   - Click **OK**. If properly configured for LDAP, the external domain server details will be displayed in the LDP windowpane. If not configured for use with LDAP, an error message will appear indicating that a connection cannot be made using this feature.



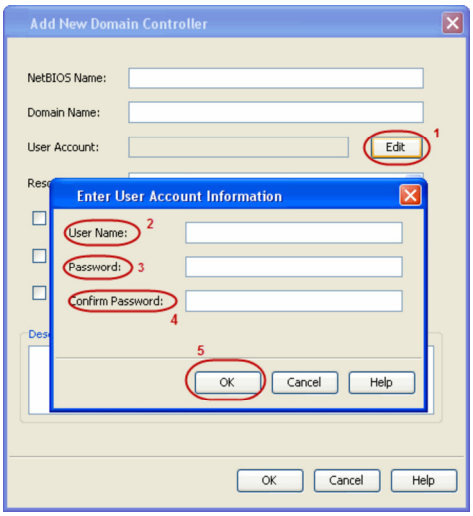
3. From the CommCell Browser, expand the **Security** node, right-click **Name Servers** | **Add New Domain** and click **Active Directory**.



4.
   - Enter the domain name in **NetBIOS Name** text box, e.g., `mydomain`.
   - Enter the Fully Qualified Domain Name (FQDN), e.g., `mydomain.mycompany.com` in the **Domain Name** text box.

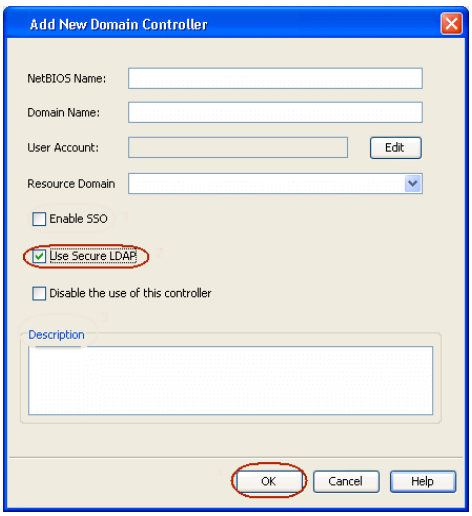


5.
   - Click **Edit** to enter the user account information for the domain.
   - Type **Username** and **Password** in **Enter User Account Information**.
   - Click **OK**.



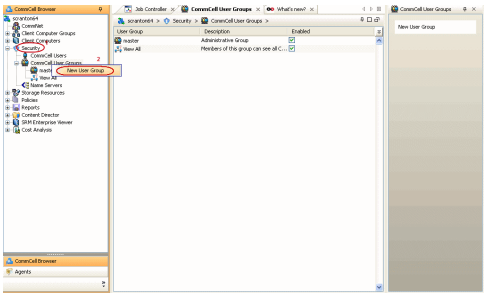
6.

- Select **Use Secure LDAP** to enable the secure Lightweight Directory Access Protocol (LDAP) with the external domain.
- Click **OK**.

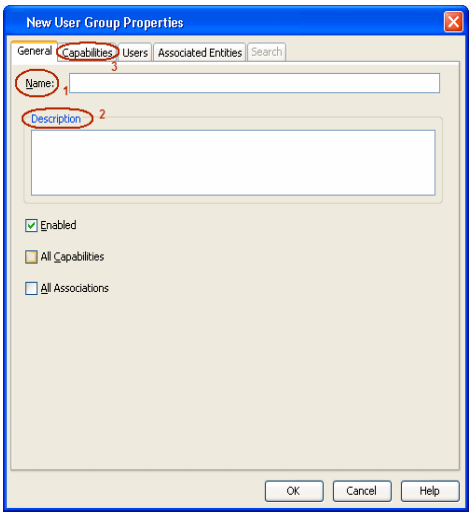


7. Once you have registered the Domain Controller, restart the IIS services on the Web Search Server.
   - From your **CommServe** computer, click the **Start** button on the Windows task bar and then click **Administrative Tools**.
   - Click **Services**.
   - In the **Services** window, select and right-click **IIS Admin Service** and click **Restart**.
   - **Restart Other Services** dialog will be displayed, click **Yes**.

8. From the CommCell Browser, expand the **Security** node, right-click **CommCell User Groups** and select **New User Group.**

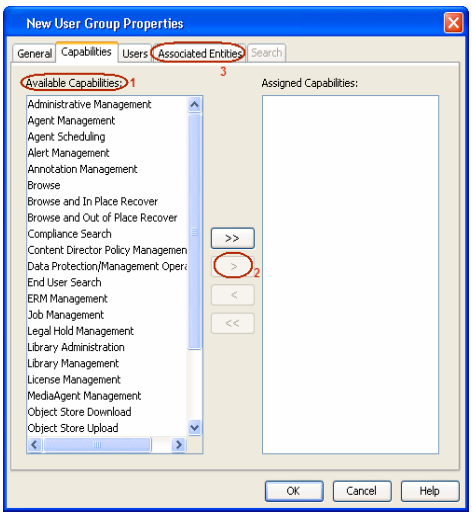


9.
   - Type the user group name in **Name** text box.
   - Type a description on the user group in **Description** box.
   - Click **Capabilities** tab.



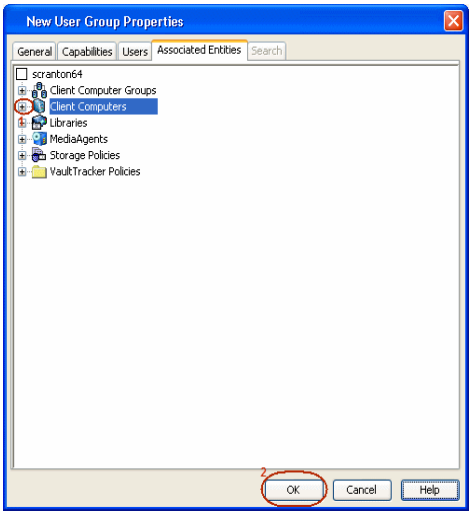
10.

- Press **Ctrl** key and select the following capabilities:
  - Browse
  - End user search
- Click **>** to move the selected capabilities to the **Assigned Capabilities** list box.
- Click **Associated Entities** tab.



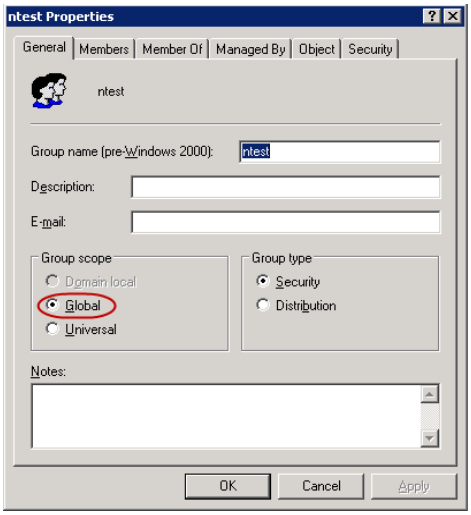
11.

- Expand **Client Computers** node and select the client computers to be browsed.
- Click **OK**.

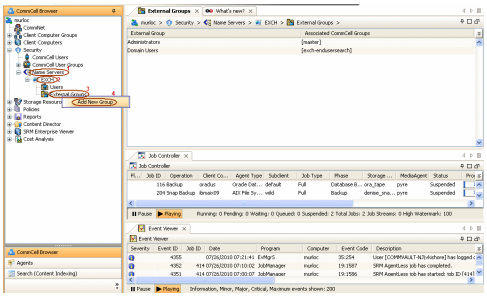


12. Ensure that the specific external user group in which the user belongs has Group Scope defined as `Global`on the Active Directory Domain:

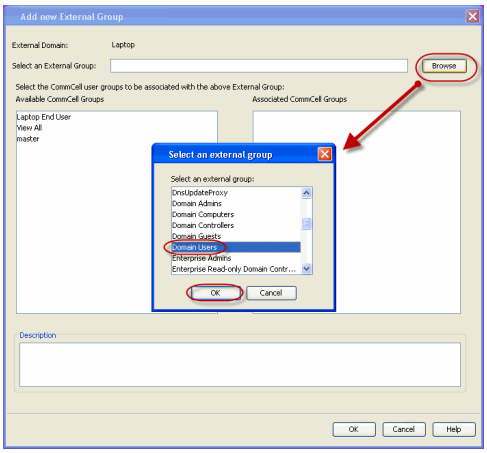
- Navigate to **Start | Administrative Tools | Active Directory Users and Computers**.
- Right-click the external group and select **Properties**.
- Select **Group** from **Group Scope** and click **OK**.



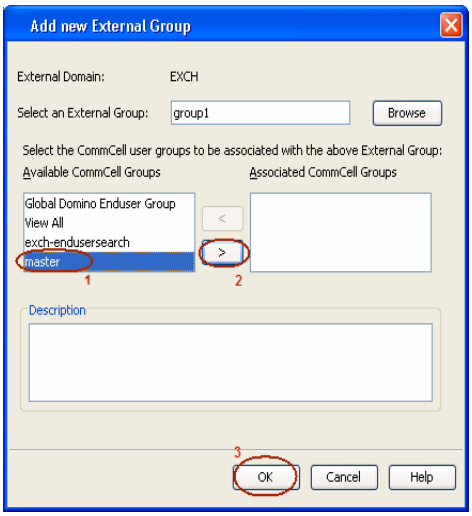
13. From the CommCell Browser, navigate to **Security | Name Server |<Domain Name>**, right-click **External Groups** and select **Add New Group**.



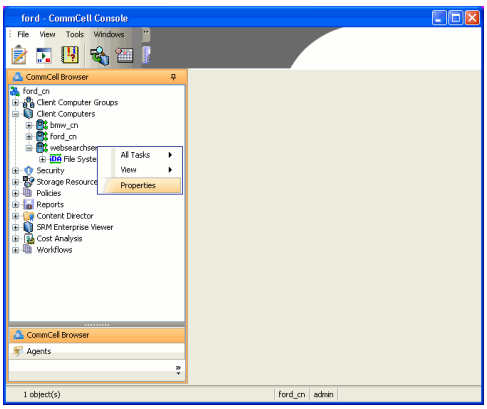
14.
- Click **Browse**.
- Select the <**external user group name**> in which the user belongs.



15.
- Select the **CommCell User Group** to associate with the specified external user group.
- Click **OK**.

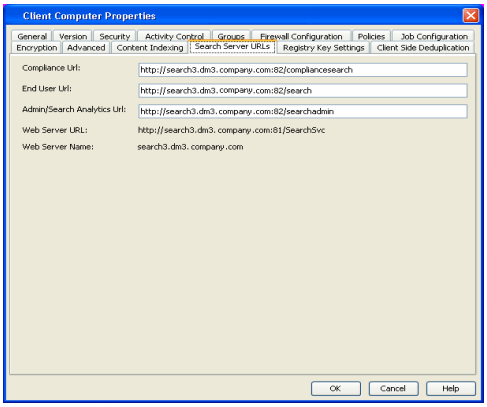


16. From the CommCell Browser, right-click to **<Client Computer>** on which Web Search Server is installed and click **Properties**.



17. Click **Search Server URLs** tab.

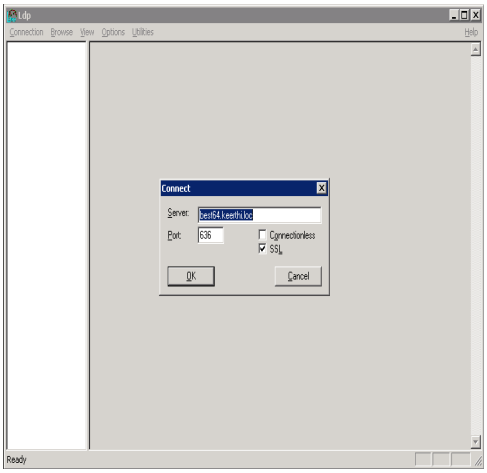
    Make a note of **End User Url** to provide the URL to the user to browse and recover the data.



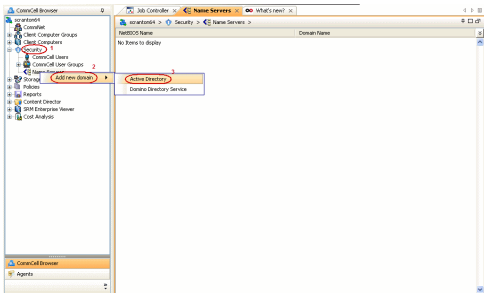
SETTING UP PERMISSIONS FOR COMPLIANCE USERS

1. Obtain the domain name and fully qualified domain name of the Active Directory server.
2. Ensure that LDAP is configured on the AD server:
   - From the Active Directory Server, select **Start | Run**.
   - Type **ldp** on the **Run** dialog box and click **OK**.
   - Click the **Connections** menu option, and select **Connect**.
   - From the **Connect** dialog box, enter the following information:
     - **Server**: Enter the name of the external domain server, e.g., `computer.domain.com`.
     - **Port**: Enter 636 as the port number for the external domain server.
     - **SSL**: Mark this checkbox to check for the proper certificate.
   - Click **OK**. If properly configured for LDAP, the external domain server details will be displayed in the LDP windowpane. If not configured for use with LDAP, an error

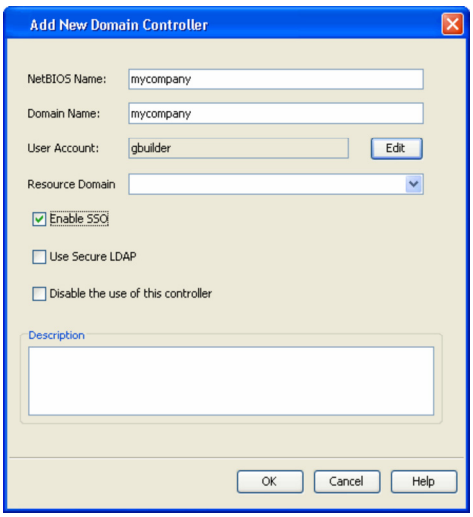
message will appear indicating that a connection cannot be made using this feature.



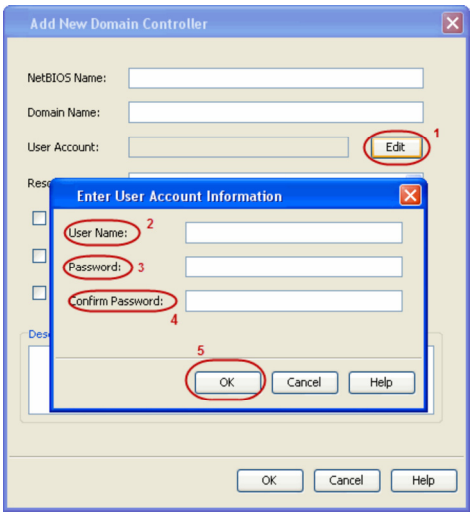
3. From the CommCell Browser, expand the **Security** node, right-click **Name Servers** | **Add New Domain** and click **Active Directory**.



4.
- Enter the domain name in **NetBIOS Name** text box, e.g., `mydomain`.
- Enter the Fully Qualified Domain Name (FQDN), e.g., `mydomain.mycompany.com` in the **Domain Name** text box.

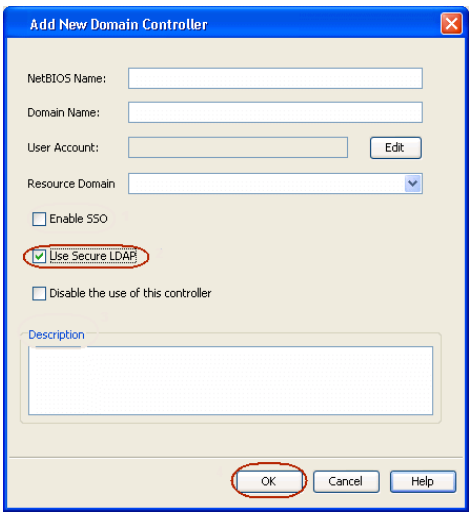


5.
- Click **Edit** to enter the user account information for the domain.
- Type **Username** and **Password** in **Enter User Account Information**.
- Click **OK**.



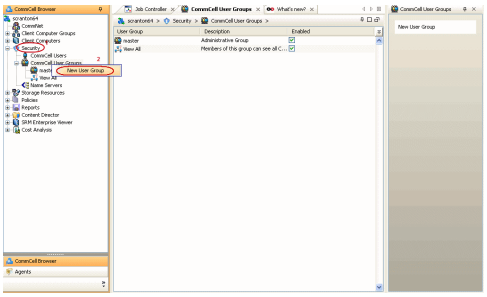
6.

- Select **Use Secure LDAP** to enable the secure Lightweight Directory Access Protocol (LDAP) with the external domain.
- Click **OK**.

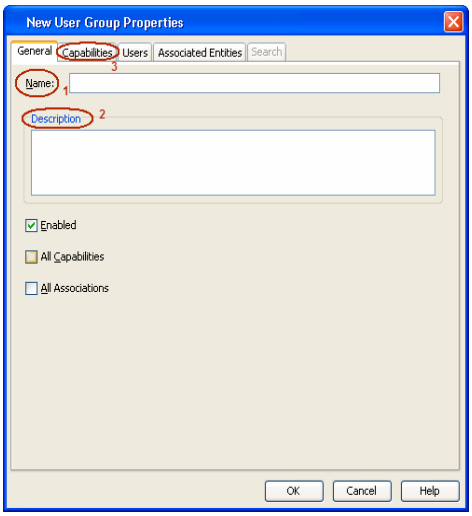


7. Once you have registered the Domain Controller, restart the IIS services on the Web Search Server.
   - From your **CommServe** computer, click the **Start** button on the Windows task bar and then click **Administrative Tools**.
   - Click **Services**.
   - In the **Services** window, select and right-click **IIS Admin Service** and click **Restart**.
   - **Restart Other Services** dialog will be displayed, click **Yes**.

8. From the CommCell Browser, expand the **Security** node, right-click **CommCell User Groups** and select **New User Group.**

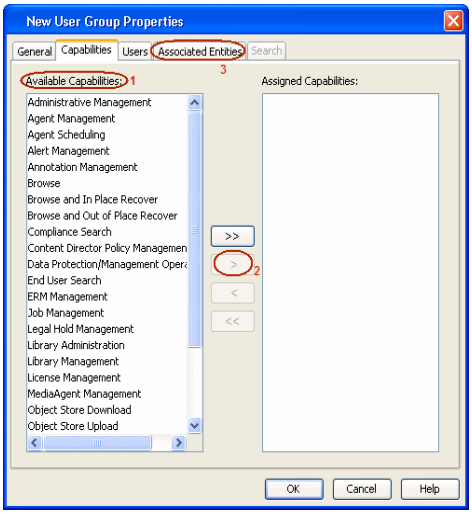


9.
   - Type the user group name in **Name** text box.
   - Type a description on the user group in **Description** box.
   - Click **Capabilities** tab.



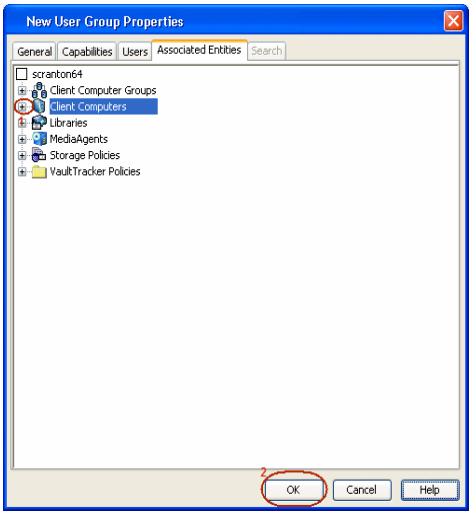
10.

- Press **Ctrl** key and select the following capabilities:
  - Browse
  - Compliance Search
  - Legal Hold Management
  - Annotation Management
  - Tag Management
  - ERM Management
- Click **>** to move the selected capabilities to the **Assigned Capabilities** list box.
- Click **Associated Entities** tab.



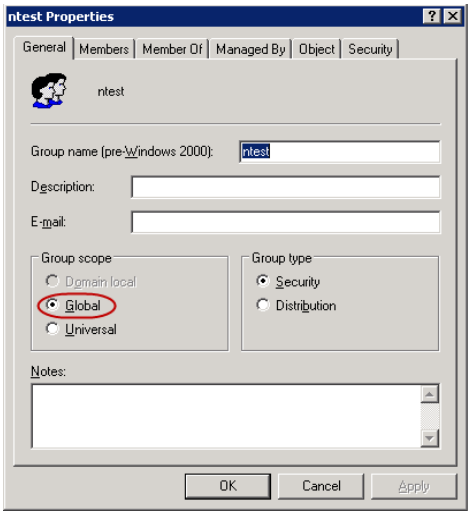
11.

- Expand **Client Computers** node and select the client computers to be browsed.
- Click **OK**.

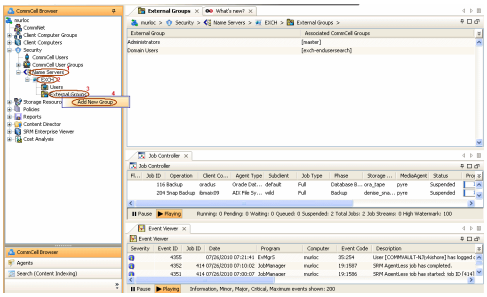


12. Ensure that the specific external user group in which the user belongs has Group Scope defined as `Global`on the Active Directory Domain:

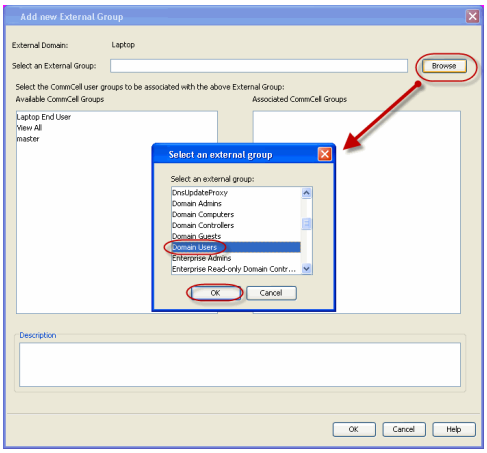
- Navigate to **Start | Administrative Tools | Active Directory Users and Computers**.
- Right-click the external group and select **Properties**.
- Select **Group** from **Group Scope** and click **OK**.



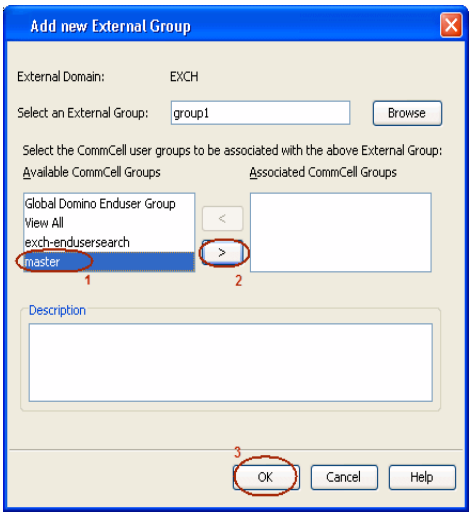
13. From the CommCell Browser, navigate to **Security | Name Server |<Domain Name>**, right-click **External Groups** and select **Add New Group**.



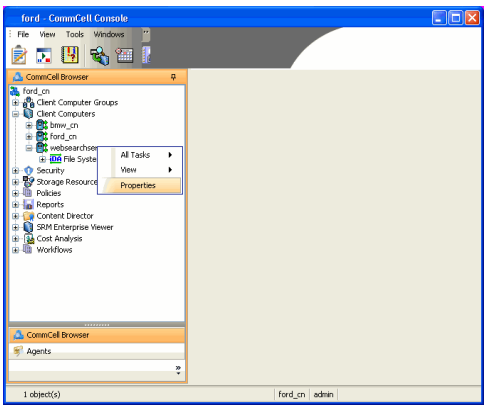
14.
- Click **Browse**.
- Select the <**external user group name**> in which the user belongs.



15.
- Select the **CommCell User Group** to associate with the specified external user group.
- Click **OK**.

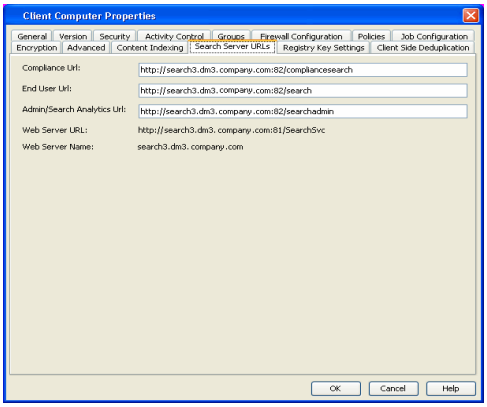


16. From the CommCell Browser, right-click to **<Client Computer>** on which Web Search Server is installed and click **Properties**.



17. Click **Search Server URLs** tab.

    Make a note of **End User Url** to provide the URL to the user to browse and recover the data.



ENABLING SECURED ACCESS FOR WEB SEARCH CLIENT

Use the following steps to enable secured access on the Web search client. This will allow you to access the Web Console using https instead of http.

INSTALL JAVA WITH ALL THE UPDATES

1. Stop the Tomcat services
2. If UAC is enabled, disable it.
3. Download and install the latest version of JAVA with all the updates on the Web client computer.
4. Open the command prompt window on the Web client computer, and execute the following command to verify if JAVA has been properly installed on the Web client computer:

   ```
   C:\java -version
   ```

   If you find that JAVA with the latest updates has not been installed, uninstall JAVA that you have installed and reinstall it again with all the updates.

Navigate to the command prompt on the Web client computer, and run the command specified in step 4 to verify if JAVA has been installed successfully.

Skip this step if the updates are installed successfully.

5. Start Tomcat services. If the Tomcat fails to start, point the JVM manually to Tomcat using the following steps:
   - Open the command prompt window on the Web client computer, navigate to `<PRODUCT_INSTALL_PATH>\Apache\bin` folder and execute the following command:

     `C:\<PRODUCT_INSTALL_PATH>\Apache\bin>tomcat6w.exe //ES//GxTomcatInstance001`

     where, `Instance001` is the instance installed on the WebClient computer.
   - On the Tomcat Services Instance properties dialog box, click the **Java** tab, and clear the **Use default** check box.
   - Restart Tomcat services

CONFIGURE SSL ON THE TOMCAT SERVER

Use the following steps for configuring SSL (Secure Socket layer) on the Tomcat Server:

1. Navigate to command prompt and run the following command:

   ```
   C:\Program Files\Java\jre6\bin>keytool -genkey -alias cvtomcat -keyalg RSA -keystore "C:\Program Files\company\product\Apache\cert\keystore"
   ```

2. Backup the server.xml file located in <product_install_path>\Apache\conf before making any changes to it.
3. In order to setup a JAVA JSSE connector to support SSL, search for the following entry in the server.xml:

   ```
   <Listener className="org.apache.catalina.core.AprLifecycleListener" SSLEngine="on" />
   ```

   Modify the above entry as following:

   ```
   <Listener className="org.apache.catalina.core.AprLifecycleListener" SSLEngine="off" />
   ```

4. Add the following entry to the `server.xml` file:

   ```
   <Connector port="443" protocol="org.apache.coyote.http11.Http11NioProtocol" SSLEnabled="true" maxThreads="150" scheme="https" secure="true" clientAuth="false" keystoreFile="C:/Program Files/CommVault/Simpana/Apache/cert/keystore" keystorePass="mnoettomcat" sslProtocol="TLS" />
   ```

5. Save the `server.xml` file, and restart the Tomcat services.

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Agentless SRM

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OVERVIEW

Agentless SRM is a compact version of Storage Resource Management (SRM) where a Windows Proxy Agent collects data from remote computers (i.e., managed clients) and operates without having to install Agent software on the managed clients.

The Agentless SRM setup allows for the running of Discovery level jobs and the generation of reports. It requires installing a single SRM File System Agent or Windows File System *i*DataAgent (with SRM Enabled) that can manage one or more remote clients (i.e., managed clients). This SRM Windows File System Agent or Windows File System *i*DataAgent (with SRM Enabled) acts a Windows Proxy agent to gather statistics and run discovery level jobs on the Managed Clients. The Agentless SRM setup is easy to configure as only one SRM File System Agent or Windows File System *i*DataAgent (with SRM Enabled) is required to be installed on a computer that acts as a Proxy and Data Collection can be performed on all the client machines managed by this Windows Proxy Agent without requiring to install the actual software on the managed clients.

The reports available for Agentless clients illustrate some of the basic data representation of the usage patterns of file systems, thus helping plan for growth. The reports can be customized by specifying filter criteria like Client Selection, Column selection, Report Options, Filters, Get SQL Query, etc. to generate a variety of charts and graphs.

Specific summaries are displayed for all the clients. When you select an Agentless SRM entity from the CommCell Console, its summary information appears in the main window.

Note the following terminologies used in this feature:

- Windows Proxy Agent is used to refer to a client computer that has the SRM File System Agent or Windows File System *i*DataAgent (with SRM Enabled) installed.
- Managed Client is used for computers managed by the Windows Proxy Agent.

The Windows Proxy Agent will perform Data Collection operations on the managed clients.

PRE-REQUISITES

WMI AND SSH

- On the Managed Clients running Windows, the Windows Management Instrumentation (WMI) service should be running.

  For more information on configuring WMI service across firewall, refer to http://msdn.microsoft.com/en-us/library/aa389286(VS.85).aspx.
- On the Managed Clients running Unix, Secure Shell (SSH) needs to be installed and running.

LICENSING

Agentless SRM does not requires any license. However you would require a license for the SRM Windows File System Agent that acts as the Windows Proxy Agent, this license is consumed when you install the Agent.

CONFIGURATION

Agentless Data Collection is a process that involves the following configuration settings:

INSTALL THE SOFTWARE ON WINDOWS PROXY AGENT

The SRM File System Agent or Windows File System *i*DataAgent (with SRM Enabled) needs to be installed on the Windows Proxy Agent. Deployment provides several methods to deploy SRM File System Agent or Windows File System *i*DataAgent (with SRM Enabled) - choose an appropriate method. See Deployment for step by step instruction on installing the Agent.

SETTING UP AGENTLESS SRM POLICY

Managed clients need to be configured/set up from the Windows Proxy Agent. This can be done automatically or manually using the Agentless SRM Policy. Setting up Client Computers using the Agentless SRM policy also creates a new Agentless Client Group.

For step-by-step instructions, see Create Agentless SRM Policy.

Refer to the sections below to determine which method better suits your requirements.

1. Manually enter client computer names

Setting up managed clients by manually entering the client name indicates that you will identify the computers that should be detected for Data Collection operations. This method is useful when it is required to setup one or two computers or groups of computers that must be managed, as it requires typing in the client names one in each line.

For step-by-step instructions, see Enter client names for Agentless SRM Policies.

2. Manual Setup of Client Computers

Setting up managed clients using the manual method indicates that you will identify the computers that should be detected for Data Collection operations. Using the manual method is useful when it is required to setup small or large number of computers or groups of computers that must be managed. If you need to manage all computers in a domain or multiple domains, use **Auto Setup of Client Computers** method.

Identifying the computers for selection can be done in three ways:

- List them individually

  This can be done using their fully qualified domain name

- Retrieve the list from an existing text file

  This file must list the client names as the fully qualified domain name, one in each line.

- Select the computers using Active Directory

  This can be done by selecting the client computers from within a specified domain by using the Active Directory Import feature. Optionally you could use **LDAP Filters** to perform a wildcard character search within the Active Directory to bring up desired results .

  E.g. he following query string will search for all objects of type "computer" with a name that begins with "dev".

  ```
  &(objectCategory=computer)(name=dev*))
  ```

For step-by-step instructions, see Setup Managed Clients on Windows Manually and Setup Managed Clients on UNIX Manually.

3. Auto Setup of Client Computers

Setting up managed clients using the auto discovery method indicates that you will identify a domain or multiple domains, which comprises the computers that should be detected for Data Collection operations. Using the auto discovery method is useful when it is required to setup all the computers within an entire domain. If you need to manage specific computers, use the **Manual Setup of Client Computers** method. You cannot select specific computers using this method.

For step-by-step instructions, see Setup Managed Clients on Windows Automatically and Setup Managed Clients on UNIX Automatically.

PERFORM DATA COLLECTION

Data Collection must be performed from the Windows Proxy Agent on all the managed clients before generating the reports. For Data Collection, a Managed Client must be attached to one Windows Proxy Agent - a single managed client cannot be attached to more than one Windows Proxy Agent. Data collection jobs can only be run from the Proxy Agent and not from managed clients. The maximum number of data collection jobs that can be run on the Windows Proxy Agent is 50.

Clients that are unreachable or which do not have WMI or SSH enabled at the time of Data Collection will not be available in client selection column at the time of report generation.

The following Data Collection Options are available for each Agentless Policy:

- Process Information
- Services Information
- Storage Information
- Quotas

- Software Information

It is recommended that you schedule the Data Collection operation on all the Managed Clients on a periodic basis in order to generate up-to-date reports. For step-by-step instructions, see Schedule Agentless SRM policies.

REPORTS SUPPORTED BY AGENTLESS SRM

Using SRM Agentless Data Collection, Discovery level jobs can be run and reports can be generated for the managed clients. Reports allow easy viewing and analyzing of data related to various aspects of different entities in an enterprise. Many pre-configured reports are available for the Agentless SRM Data Collection jobs for clients running on Windows and Unix operating systems that provide information about the resources of the client computers, each tailored to a particular aspect of resource management. Filter criteria can be specified to generate to a variety of customized charts and graphs. The following reports are available for clients running on Windows and Unix operating systems:

WINDOWS CLIENTS

For Managed Clients running on Windows operating system, a set of pre-configured reports and customizable reports are available. For the list of reports available for Agentless Data Collection for Windows clients see, SRM Windows File System Agent Reports and SRM for Windows File System - Reports.

UNIX CLIENTS

For Managed Clients running on UNIX operating system, a set of pre-configured reports and customizable reports are available. For the list of reports available for Agentless Data Collection for UNIX clients see, SRM UNIX File System Agent Reports.

SUMMARIES DISPLAYED FOR AGENTLESS SRM

Summaries for Agentless SRM clients displays status information including the resource, memory, and CPU usage, etc. Summary can be available in the images as in bar graphs and pie charts to provide a succinct snapshot of the statistical information or tables showing various columns. While viewing summary, data rows in tables can be sorted by any one of the columns listed in that summary. The following summaries are available at different levels for clients running on Windows and Unix operating systems:

WINDOWS CLIENTS

For Managed Clients running on Windows operating system, the following summaries are available:

CLIENTS

Summary information at the client level shows statistical data for the following:

- **Software Instances**

  The summary information for software instances displays details like Package, version and vendor name of all instances of the installed software.

- **Process Information**

  The summary information for processes displays details like Image Name, PID, Session ID, CPU Time, CPU Usage, Memory Usage, User Name, etc for each process that runs on the client.

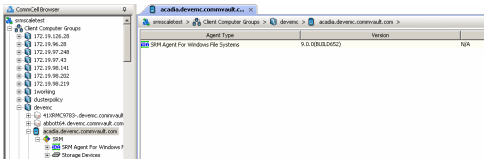
- **Services**

  The summary information for services displays details like Name, State, Startup Type, and Log on information for each service that exists on the client.

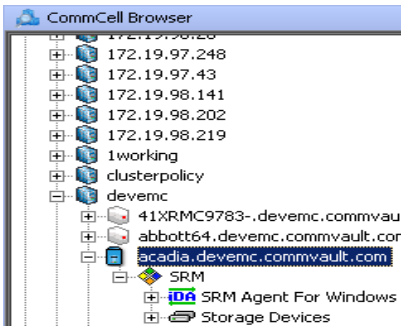
VOLUMES

Summary information at the volumes level display charts for **File Count** and **File System Capacity** along with tables displaying details like Volume, Total Space, Used Space, Free Space, Percent Free, Percent Used, Type for the available volumes. Each Volume also displays Properties like Type, Mount Point, Used Space, Free Space, Capacity, etc. along with any Physical Devices if available.

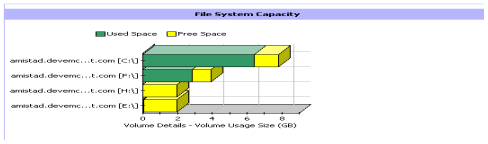
1. From the CommCell Console, select the Client Computer Group with Agentless clients and select the client. Expand **SRM** and select **SRM Agent for Windows File System**.



2. Select **Volume**.



3. The associated **Volume Summary** will appear in the main window.



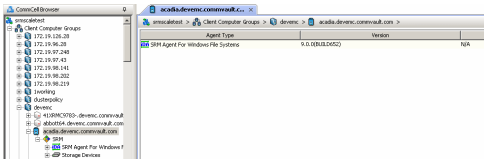
SHARES

Summary information include tables displaying Table Name, Path Name, and Protocol for the selected share.

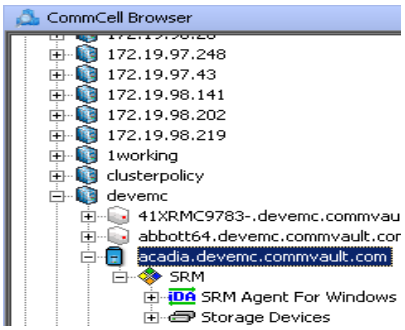
STORAGE DEVICES

Summary information at the storage devices level include charts for **Allocated Vs Unallocated space per disk.** Each Physical Drive in turn displays charts for **Partition Capacity.** Physical properties like Name, Interface, Manufacturer, Block, Count , etc. are also displayed at this level.

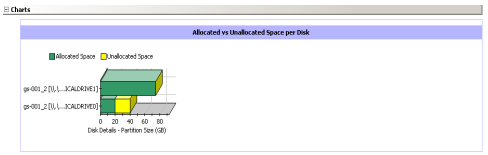
1. From the CommCell Console, select the Client Computer Group with Agentless clients and select the client. Expand **SRM** and select **SRM Agent for Windows File System**.



2. Select **Storage Devices**.



3. The associated **Storage Devices Summary** will appear in the main window.



UNIX CLIENTS

For Managed Clients running on UNIX operating system, the following summaries are available:

CLIENTS

Summary information at the client level shows graphs for the following:

- **CPU Utilization History**
- **Memory Utilization History**

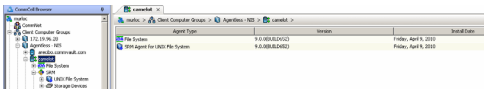
The summary information also displays **Process Information** showing details like CPU Time, CPU Usage, Memory Usage, User Name, etc for each process that runs on the client.

VOLUME GROUP

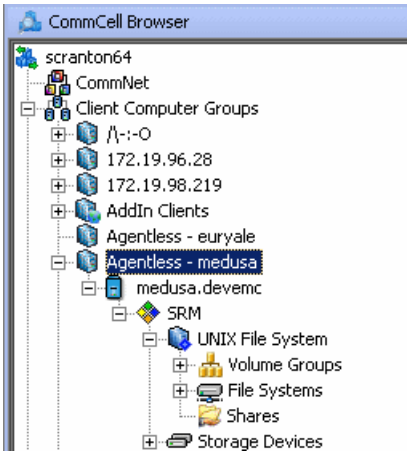
Summary information at the Volume Group level Charts include charts for **Current Capacity by Volume Group.** This chart displays detail like Name, Volume

Group Manager, Capacity, Allocated Space, Unallocated Space, Access Mode, Logical Volume Count, Physical Volume Count, Physical Extent Count for the selected volume group.

1. From the CommCell Console, select the Client Computer Group with Agentless clients and select the client. Expand **SRM** and select **UNIX File System**.



2. Select **Volume Groups**.

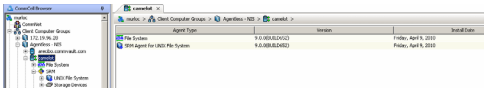


3. The associated **Volume Group Summary** will appear in the main window.

FILE SYSTEMS

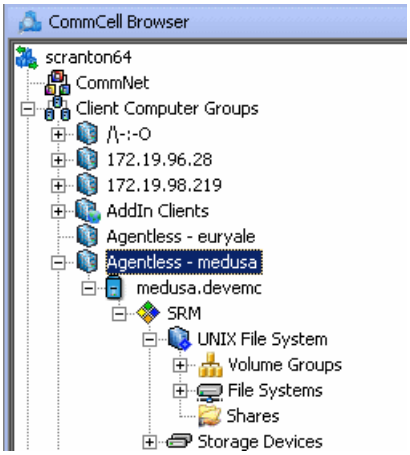
Summary information at the File systems level include charts for **File Count** and **File System Capacity.** The **File System Capacity** chart displays detail like Name, Type, Mount Point, Used Space, Free Space, Capacity, Percent Used and Percent Free for the selected volume group.

1. From the CommCell Console, select the Client Computer Group with Agentless clients and select the client. Expand **SRM** and select **UNIX File System**.

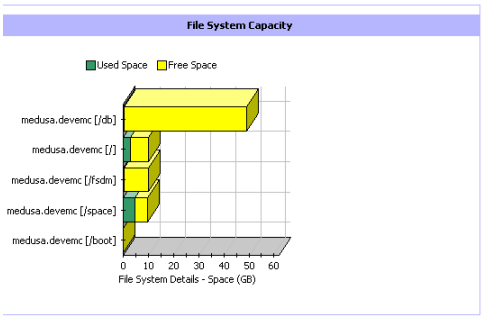


2. Select **File Systems**.

You may also expand File Systems node and alternatively select any File System to view its summary.



3. The associated **File Systems Summary** will appear in the main window.



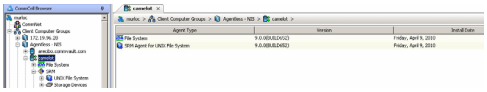
SHARES

Summary information include tables displaying Name, Path, Used Space and Billable Entity for the selected share.

STORAGE DEVICES

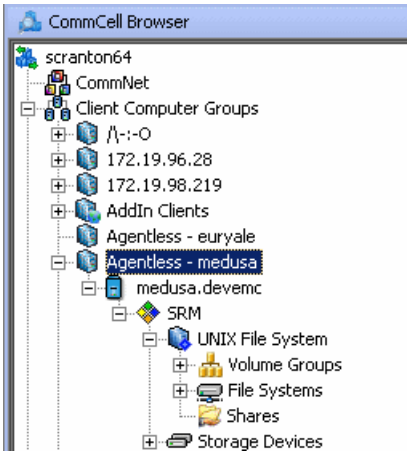
Summary information at the Storage Devices level display charts for **Allocated** vs. **Unallocated space per disk** and **Partition Capacity**. The Charts show details like Name, Interface, Serial Number (S/N), Manufacturer, Block Count, Block Size etc for the selected Storage Device.

1. From the CommCell Console, select the Client Computer Group with Agentless clients and select the client. Expand **SRM** and select **UNIX File System**.

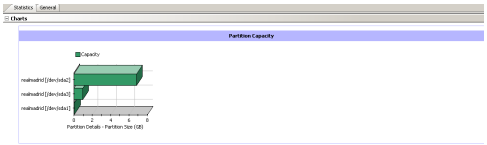


2. Select **Storage Devices**.

You may also expand Storage Devices node and alternatively select any storage device to view its summary.



3. The associated **Storage Devices Summary** will appear in the main window.



CONSIDERATIONS

The following important factors must be considered:

- For Agentless SRM jobs, the job details dialog displays the job completion in phases as Discover, Configure, Scan and Data Collection. The job is said to be complete if all the 4 phases complete successfully else the **Admin Job History (Attempts)** tab displays the completed and pending phases.

REGISTRY KEYS FOR AGENTLESS SRM

The default number of managed clients that can be discovered simultaneously in 10.

You can configure the `nSRMACLDCMaxThreads` registry key to increase the number of simultaneous discoveries of managed clients. Configure this Registry Key under the SRM folder.

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SRM for UNIX File System - Reports

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OVERVIEW

Managing storage resources is a critical job for any organization, which can be challenging because these resources are distributed across the network. SRM UNIX File System reports provide a sleek, versatile, and easy-to-use reporting framework that enables you to easily and effectively choose, view, and analyze vital data. Customized reporting is available through the selection of filter criteria e.g., individual columns, specific clients, specific client computer groups, report options, and SQL Queries, a SRM UNIX File System report helps you to:

- Assess used and free storage space to provide improved capacity planning.
- Track historical storage utilization for performance trending and proactively anticipate future resource needs.

CONFIGURATION

If SRM feature is enabled, SRM reports can be generated for all backup data as soon as the first full backup job has completed. Be sure to perform the following before generating reports:

OPTION	DESCRIPTION
Enable SRM for all backups	SRM can be enabled from the Agent levels for the *i*DataAgent. When Enable SRM is selected at the Agent level, SRM options get enabled for all subclients. 1. From the CommCell Browser, right-click the *i*DataAgent for which you want to enable SRM feature and select **Properties**. 2. **Enable SRM** must be selected from the **General** tab. A Discovery and Analysis Data Collection job is automatically set when you enable SRM. 3. Then confirm your selection by clicking **OK**.
Run a Backup	A full backup contains all the data that comprises a subclient's contents. If a client computer has multiple agents installed, then the subclients of each agent require a full backup in order to secure all of the data on that client. If a new subclient is added, a full backup is required on all subclients in order to maintain file level detail integrity. 1. To perform a full backup, right-click the subclient, and click **Backup** in the CommCell Browser. One of the following options must be selected from the Backup Options dialog box: ○ Backup Type: Select **Full**. ○ Backup Schedule: Select **Immediate** if you want to run the backup now. ○ Granular Recovery: Select **Enable Granular Recovery** if you intend to restore individual files and folders from a disk or volume-level backup. 2. Then confirm your changes by clicking **OK**. You can track the progress of the backup job from the Job Controller window. When the backup has completed, the Job Controller displays Completed. After performing a first full backup you may select any other backup type for performing Data Collection operations.

GENERATE SRM REPORTS

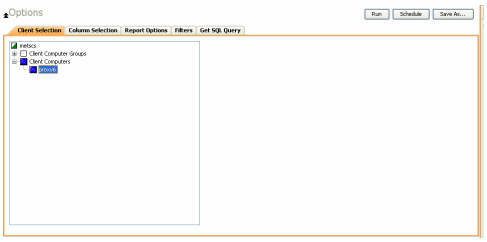
The sections below discuss running, scheduling, and saving a report.

RUNNING A REPORT

You can choose to run a report so that you view it immediately. Alternatively, to view it at a later point in time you can schedule it or save it as a template to a file. When running a report, you can choose an out-of the box template or generate a more customized report by picking and choosing individual columns from a category.

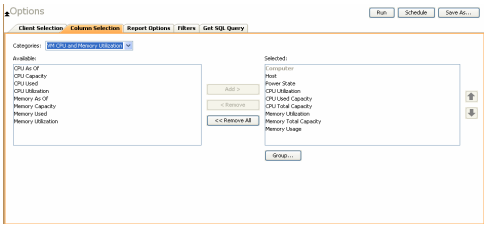
TO RUN A SRM REPORT IMMEDIATELY:

1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then click a template to display the **Options** window.
3. Click the **Client Selection** tab and select the client computers or client computer group. This is a required step.



4. Click **Column Selection** tab.

   For an out-of-the-box template, the columns are displayed here. To change the columns, select a category and click **Add** or **Remove** to move the columns between the **Available** and **Selected** boxes. Clicking **Remove All** will remove all previously selected filters for the reports.



5. Click **Run** to generate the report immediately and view the results.

SCHEDULING A REPORT

Scheduling allows you to run a report on a user-defined schedule, send it in a different language or format, and configure notifications for specified recipients when the report has run. Reports can be scheduled so that they follow a backup schedule in order to guarantee up-to-date reporting. Scheduling a report involves these tasks:

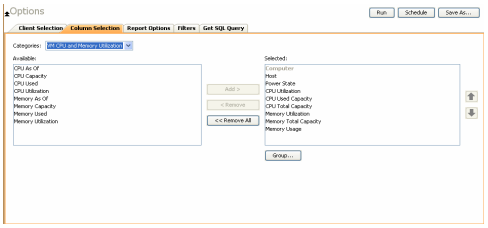
- Specify a daily, weekly, monthly, yearly, or even one time basis schedule. When scheduling, patterns can be applied to the report so it runs on a specific time, repeated every so many days, or run for a particular number of times.
- Scheduled reports support different languages and formats. Default language is English and default output is HTML. You can even save the report to local drive or a network share.
- When scheduled reports are run, notifications can be sent in the form of an email or page, SNMP trap, RSS feed, or Event Viewer message to inform email recipients, computers, or a script that a report has run and is now available.

TO SCHEDULE A SRM REPORT:

1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then click a template to display the **Options** window.
3. Click the **Client Selection** tab and select the client computers or client computer group. This is a required step.

4. Click **Column Selection** tab.

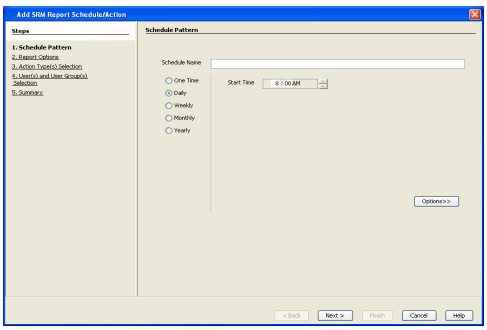
   For an out-of-the-box template, the columns are displayed here. To change the columns, select a category and click **Add** or **Remove** to move the columns between the Available and Selected boxes. Clicking **Remove All** will remove all previously selected filters for the reports.



5. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

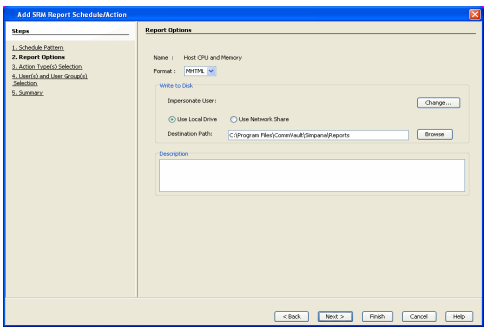
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



6. Select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

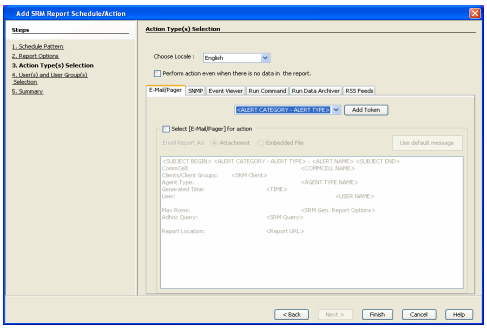
   Click **Next**.



7. Configure the notifications for the scheduled report, such as:
   - Select the **E-Mail/Pager** tab and click **Select [E-Mail/Pager] for notification**. Click either **Use default message** or add more tokens by selecting **Add Token**.
   - Select the **SNMP** tab and click **Select [SNMP] for notification**. Click either **Use default message** or add more tokens by selecting **Add Token**. The SNMP Enabler software must be installed on the CommServe. See SNMP Enablers for more information.
   - Select the **Event Viewer** tab and click **Select [Event Viewer] for notification**. Click either **Use default message** or add more tokens by selecting **Add Token**.
   - Select the **Run Command** tab and click **Select [Run Command] for notification**. Click either **Run on CommCell** or **Run on Client**. Specify a path in **Command Script Location** and optionally specify arguments for the script in **Arguments**.
   - Click **Run Data Archiver** tab to write files and directories of the report to a text file.
   - Click **RSS Feeds** tab and click **Select [RSS Feeds] for notification**. Click either **Use default message** or add more tokens by selecting **Add Token**. Specify a feed location in **Select/Enter the FeedLocation** field.

   Click **Next**.

   Refer to the **Actions** documentation for more comprehensive information.

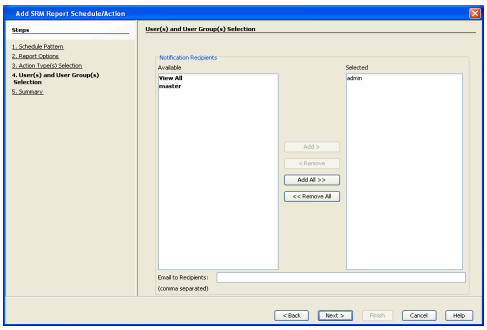


8. In this dialog, select the recipients for the scheduled report.

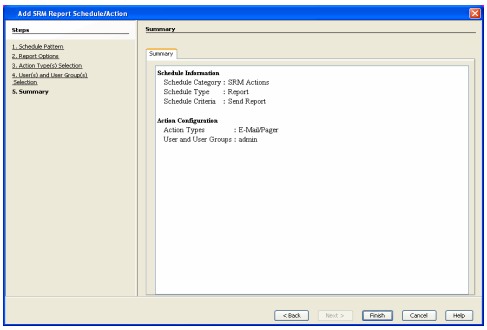
   Use the **Add>** or **<Remove** buttons to specify CommCell users as the notification recipients.

   Or, enter one or more email addresses in the **Email to Recipients** field. Separate multiple addresses with commas.

   Click **Next**.



9. Review the summary and if satisfied, click **Finish**.

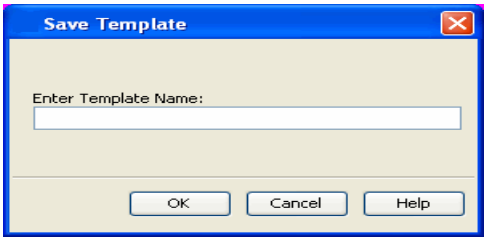


SAVING A REPORT

Saving a report allows you to save the filter criteria and schedule information, including notifications, to a template so it can be used to generate a report at a later date. All report templates are saved under **My Reports**.

TO SAVE A SRM REPORT TO A TEMPLATE:

1. Create a report and optionally specify scheduling criteria as explained in Scheduling a Report. Advanced criteria such as Filters will also be saved in the report template.
2. In the right-hand corner, click **Save As...** and enter a name for the report and click **OK**.



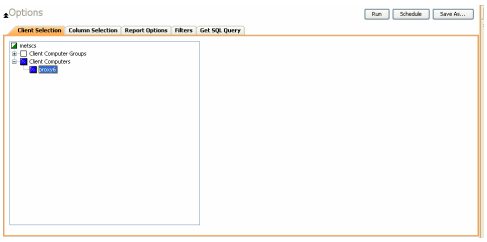
3. The report template is saved under **My Reports**.

SEND A NOTIFICATION WHEN A SRM REPORT HAS RUN

Configuring notifications is a step when scheduling a report. For example, when scheduled reports are run, an email notification can be sent to inform the recipient that a report has run and is now available. The recipient can be either a CommCell user, a CommCell user group, a domain or external user (e.g., yahoo, gmail, etc.), or a pager address. For a comprehensive description of all notification types, refer to Actions.

TO SEND AN EMAIL NOTIFICATION WHEN A SCHEDULED REPORT HAS RUN:

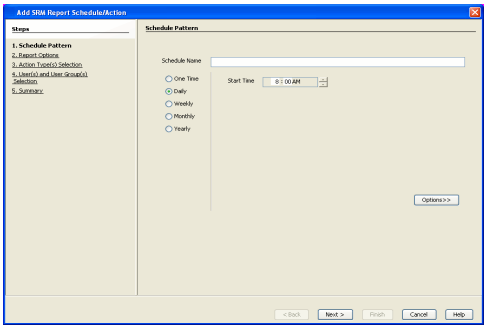
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Click **Applications** or **Enterprise**. Then click a template to display the **Filters** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries. Refer to Options, Report Options, and Filters respectively.



5. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

   Optionally, click **Options** to repeat sending the report every so many days, or run it for a particular number of times.

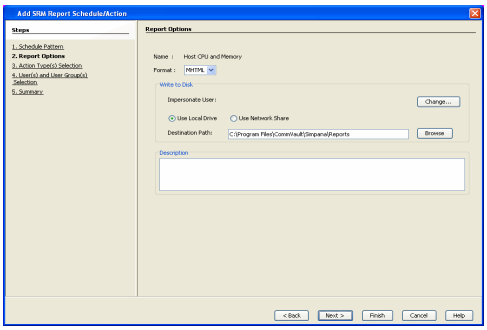
   Click **Next**.



6. In this dialog, select the report output options, such as:
   - **Format** - select **HTML**, **EXCEL**, or **PDF**.
   - In **Locale**, select a report language. See Languages - Support for the list of supported languages.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

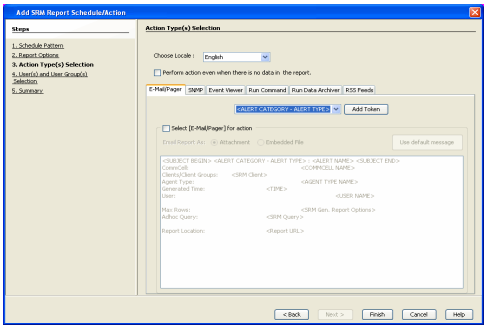
     TIFF is no longer a supported output format. SRM supports saving Reports in these formats: HTML, EXCEL, and PDF.

   Click **Next**.

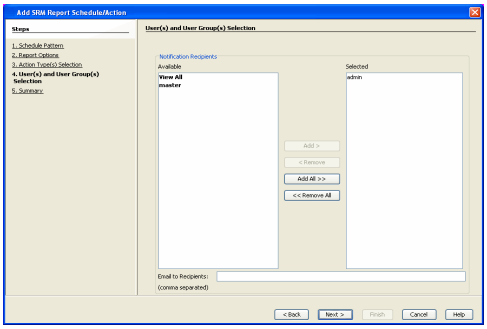


7. In this dialog, configure the **E-Mail/Pager** notification for the scheduled report as follows:
   - Click **Select [E-Mail/Pager] for notification**.
   - Either accept default format or add more tokens by selecting a token from the pulldown menu and clicking **Add Token**. The tokens are explained in Alert Tokens. Click **Use default message** to revert back to original default format.

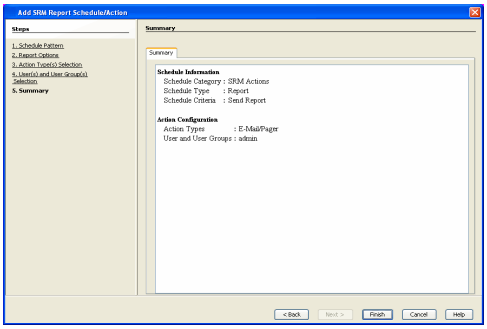
   Click **Next**.



8. In the **User(s) and User Group(s) Selection** dialog, specify the recipients to whom the notification will be sent as follows:
   - To add or remove CommCell users or a CommCell user group, select a user in the **Available** or **Selected** boxes and click **Add>** or **<Remove**.
   - To specify a domain or external user (e.g., yahoo, gmail, etc.) or a pager address, enter the email address in **Email to Recipients** field. Separate multiple addresses with a comma.



9. Review the summary and if satisfied, click **Finish**.



GETTING STARTED WITH UNIX FILE SYSTEM REPORTS

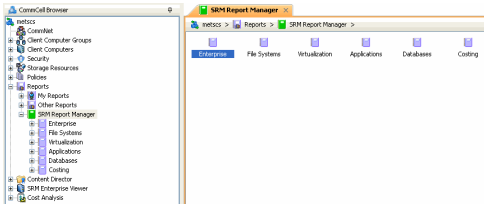
The following illustrates a few possibilities of how UNIX File System reports can be generated and used. For more information that explains the reports comprehensively and how to generate reports using all possible features, refer to Advanced page.

CAPACITY BY FILE SYSTEM

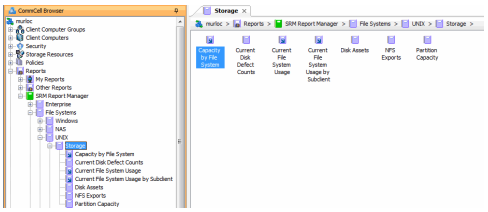
Use this report to display total, free and used space on the basis of File System.

TO VIEW THIS REPORT:

1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.



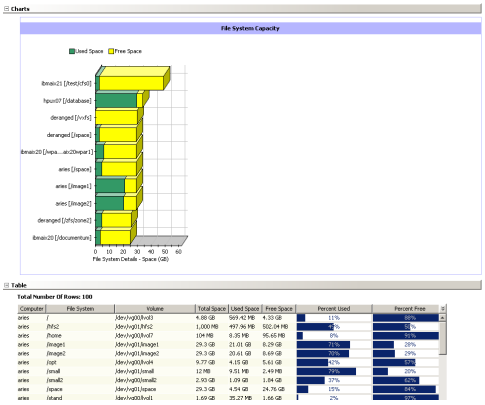
2. Expand **File Systems** | **UNIX** | **Storage**.



3. Click the **Capacity by File System** template and select the client computers in the **Client Selection** tab.

4. Click **Run**.

   A statistics of file system capacity comprising of but not limited to total space, used space, free space, etc. for clients and client computer groups is displayed in chart and table formats.

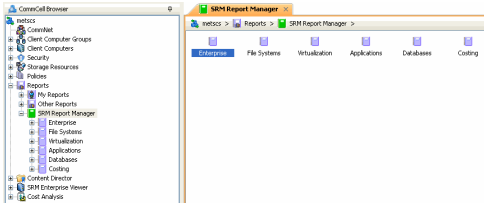


CURRENT FILE SYSTEM USAGE

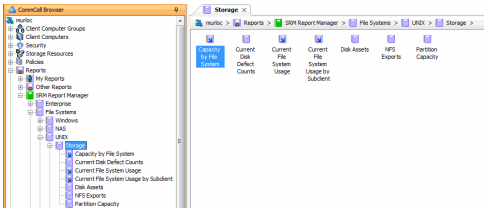
Use this report to display details about files, directories, file size, depth, file count etc. for File System.

TO VIEW THIS REPORT:

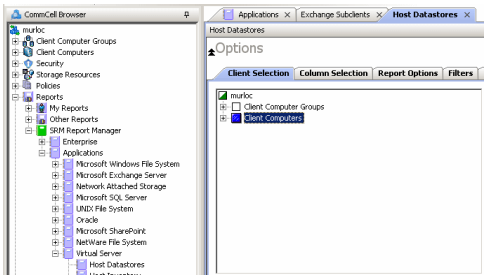
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.



2. Expand **File Systems** | **UNIX** | **Storage**.

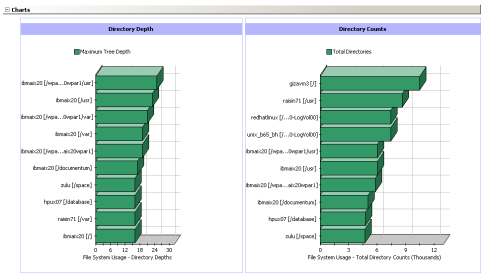


3. Click the **Current File System Usage** template and select the client computers in the **Client Selection** tab.



4. Click **Run**.

   A statistics of Current File System usage on the basis of files, directories, file size, depth, file count etc. is displayed in chart and table formats.

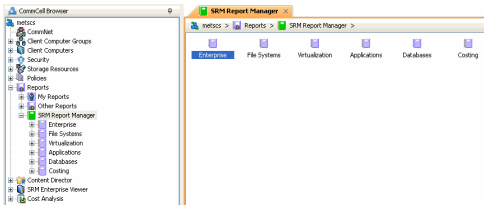


CURRENT FILE SYSTEM USAGE BY SUBCLIENT

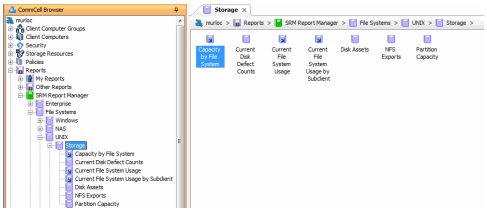
Use this report to view details about files, directories, file size, depth, file count etc. on the basis of subclient of a file system.

TO VIEW THIS REPORT:

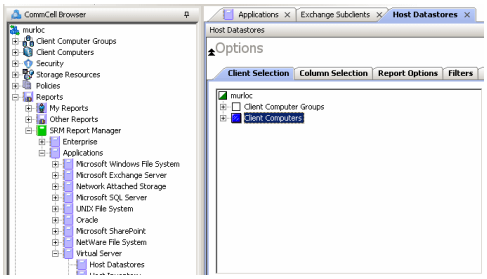
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.



2. Expand **File Systems** | **UNIX** | **Storage**.

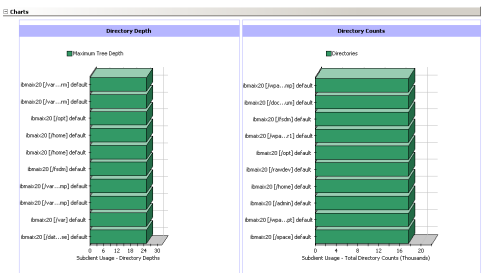


3. Click the **Current File System Usage by Subclient** template and select the client computers in the **Client Selection** tab.



4. Click **Run**.

   Details such as files, directories, file size, depth, file count etc. on the basis of subclient of a file system are displayed in chart and table format.



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SRM for UNIX File System - Reports

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OVERVIEW

SRM reporting provides a sleek, versatile, and easy-to-use reporting framework that enables you to easily and effectively choose, view, and analyze vital data. Enterprise and application-based reports can be rapidly generated with out-of-the-box templates or customized with filter criteria. Reports can be run immediately or scheduled to run daily, weekly, monthly, etc.

In essence, SRM UNIX File System reports provide these features:

- Templates of predefined columns are provided so that a report can be generated quickly. The columns are preselected but can be adjusted as needed.
- Filter criteria. Reports can be customized according to particular criteria, such as client or client group, the columns to display in the report, etc.
- Report options control how the data is displayed in a report or chart. You can control the data size units, number of rows to display in an entire report or before a page break, sorting order, etc.
- Advanced features, such as Ad hoc SQL queries is another type of filter criteria that can also be applied to further refine the report.
- When scheduled, reports can be saved and shared in various formats (HTML, Excel, PDF) or in different languages.
- Notifications. When scheduled reports are run, notifications can be sent in the form of an email or page, SNMP trap, RSS feed, Event Viewer message to inform email recipients, computers, or a script that a report has run and is now available.
- Cost Analysis reports are available to provide Cost History and Usage History information (e.g., Cost History by Application, Usage History by Application). Data for these reports are compiled at regular intervals by a background process on the SRM Server.

The following sections describe the SRM UNIX File System reporting features in more detail.

REPORT FEATURES

The following features are provided by SRM Reports.

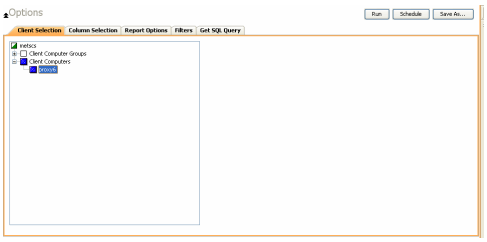
OPTIONS

Out-of-the box templates provide pre-selected columns and can be run immediately after selecting clients or client computer groups. To generate a customized report, you can start with a template and then alter the pre-selected columns by adding or removing the columns. Note that when selecting clients, SRM data collection must be enabled and a full backup needs to have run for the Agent in order to have up-to-date information presented in the report.

> Pay particular attention when specifying filter criteria. Selecting criteria judiciously will aid in generating a useful report. Otherwise, the report may be too cumbersome and cluttered.

TO FILTER A SRM REPORT:

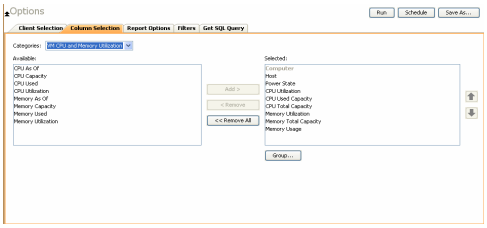
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Click the **Client Selection** tab and select the client computers or client computer group. This is a required step.



4. Click **Column Selection** tab.

   For an out-of-the-box template, the columns are displayed here. To change the columns, select a category and click **Add** or **Remove** to move the columns between the **Available** and **Selected** boxes. Clicking **Remove All** will remove all previously selected filters for the reports.

   The columns that can be selected are listed in **Available Columns**.

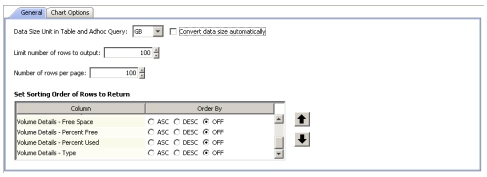


REPORT OPTIONS

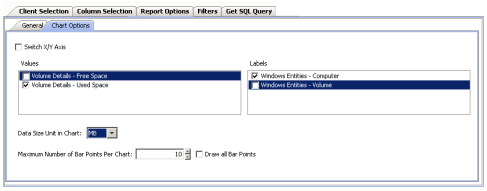
The report options control how data is presented in the report. Either accept the defaults or modify the options as described below.

TO SPECIFY REPORT OPTIONS OF A SRM REPORT:

1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Click the **Report Options** tab and click the **General tab** to modify these options:
   - Determine the **Data Size Unit** in the table section of the report and when building ad hoc queries. You can elect to have them converted for you automatically by selecting **Convert data size automatically** or you can specify the unit (e.g., Bytes, KB, MB, GB, MB, TB, PB). Default is GB.
   - Either accept the default number of 100 rows to display in the entire report or enter a new number in Limit number of rows to output.
   - Specify the number of rows to display in the report before breaking the page. Either accept the default of 100 or enter a new number in Number of rows per page.
   - For the columns selected, use the up and down arrows to move the sorting order of the columns in Set Sorting Order of Rows to Return. Also specify if you want ascending (ASC) or descending (DESC) order. For example, moving a column to the Top of the sorting order will filter the data base on that order first, followed by the rest of the columns. Select OFF to not include the column in the sort.



4. Click the **Report Options** tab and click the **Chart Options tab** to modify these options:
   - If you want to switch the X/Y Axes in the charts, click **Switch X/Y Axis**.
   - Select the columns in **Values** and **Labels** that should be displayed in the chart. To preserve charting space, only the first 25 characters for a label are visible in the report. To see the entire label, hover over the label with the mouse.
   - Specify the **Data Size Units in Chart** (e.g., BYTES, KB, MB, GB, MB, TB, PB) that you want displayed in the charts.
   - Enter the e **Maximum Number of Bar Points Per Chart** you want displayed, or click **Draw all Bar Points** to have all possible bar points drawn. Default is **10**.



FILTERS

For the columns selected, Filters can also be applied to further refine the data in the report.

Selecting the **Get Query** tab will display the SQL query in long notation that will be used to get the data and generate the report. The query that is displayed is Read-only and can be used in a third-party SQL application, such as SQL Server Management Studio.

ACTIONS

Configuring notifications is a step when scheduling a report. When scheduled reports are run, notifications can be sent in the form of an email or page, SNMP trap, RSS feed, Event Viewer message to inform email recipients, computers, or a script that a report has run and is now available. The possible notifications are explained in the sections below.

E-MAIL/PAGER ADDRESS

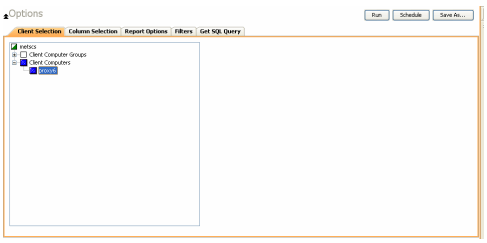
A notification can be sent to email or pager recipients when a scheduled report has run. The recipient can be either a CommCell user, a CommCell user group, a

domain or external user (e.g., yahoo, gmail, etc.), or a pager address.

A notification can be e-mailed or sent to a pager to a selected list of recipients when a scheduled report has run. The recipients can be either a CommCell user, a CommCell user group, a domain or external user (e.g., yahoo, gmail, etc.), or a pager address.

TO CONFIGURE AN EMAIL/PAGER NOTIFICATION WHEN A SCHEDULED REPORT HAS RUN:

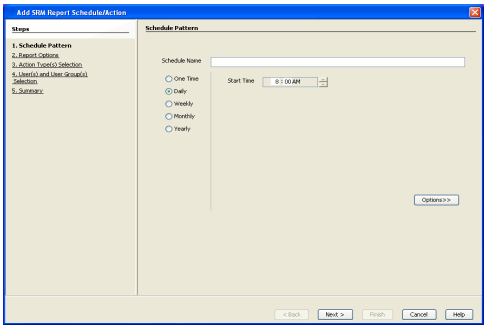
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



5. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

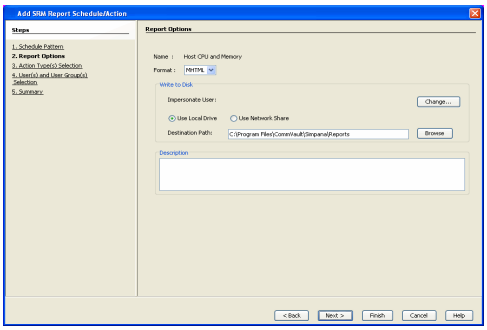
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



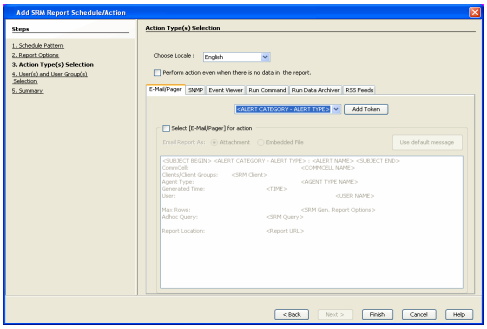
6. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

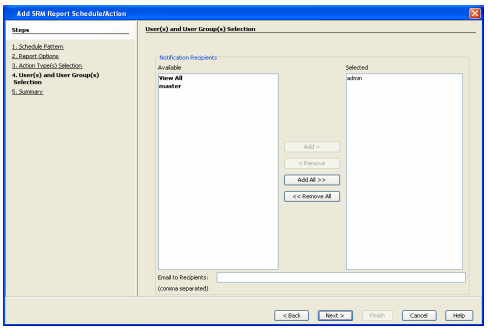


7. In this dialog, configure the **E-Mail/Pager** notification for the scheduled report as follows:
   - Click **Select [E-Mail/Pager] for notification**.
   - Either accept default format or add more tokens by selecting a token from the pulldown menu and clicking **Add Token**. The tokens are explained in Alert Tokens. Click **Use default message** to revert back to original default format.

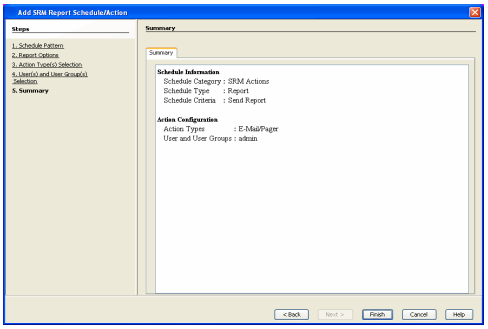
   Click **Next**.



8. In the **User(s) and User Group(s) Selection** dialog, specify the recipients to whom the notification will be sent as follows:
   - To add or remove CommCell users or a CommCell user group, select a user in the **Available** or **Selected** boxes and click **Add>** or **<Remove**.
   - To specify a domain or external user (e.g., yahoo, gmail, etc.) or a pager address, enter the email address in **Email to Recipients** field. Separate multiple addresses with a comma.



9. Review the summary and if satisfied, click **Finish**.

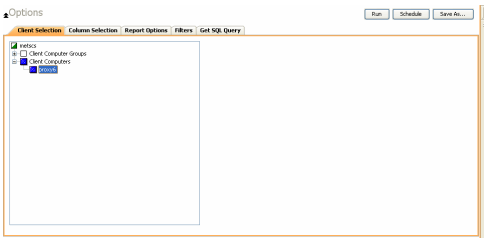


SNMP TRAPS

A notification can be sent by a CommServe, using the SNMP protocol, to other computers in the form of SNMP traps when a scheduled report has run. This notification type requires that the SNMP Enabler software must be installed on the CommServe computer. See SNMP Enablers for more information.

TO CONFIGURE AN SNMP TRAP NOTIFICATION WHEN A SCHEDULED REPORT HAS RUN:

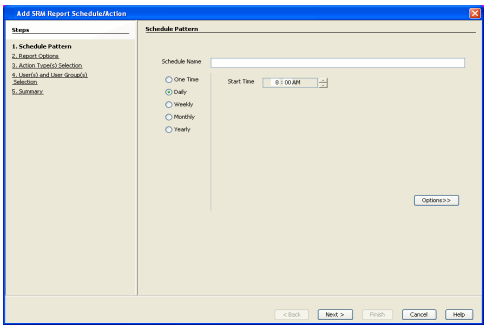
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



4. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

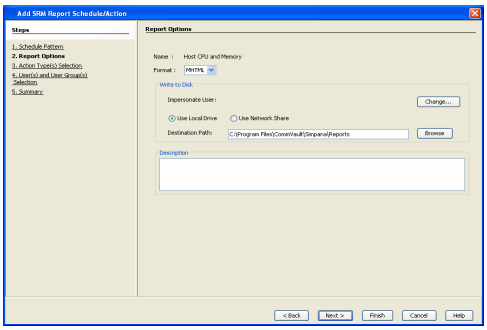
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



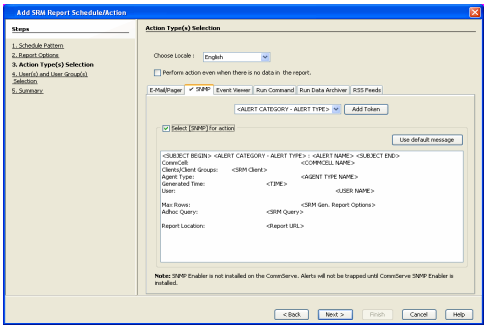
5. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

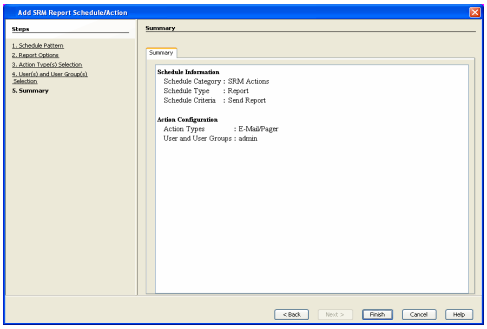


6. Click the **SNMP** tab and configure this notification type as follows:
   - Click **Select [SNMP] for notification**.
   - Either accept default format or add more tokens by selecting a token from the pulldown menu and clicking **Add Token**. The tokens are explained in Alert Tokens. Click **Use default message** to revert back to original default format.

   Click **Next**.



7. Review the summary and if satisfied, click **Finish**.

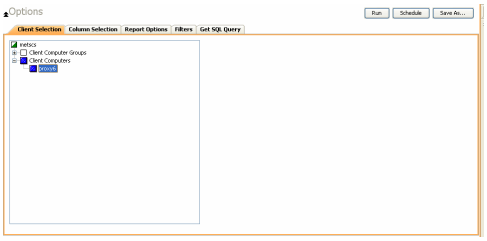


EVENT VIEWER

A message can be sent to the Event Viewer on the CommServe when a report is run or scheduled.

TO CONFIGURE AN EVENT VIEWER NOTIFICATION WHEN A SCHEDULED REPORT HAS RUN:

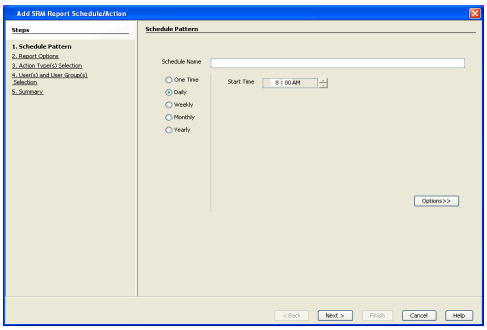
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



4. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

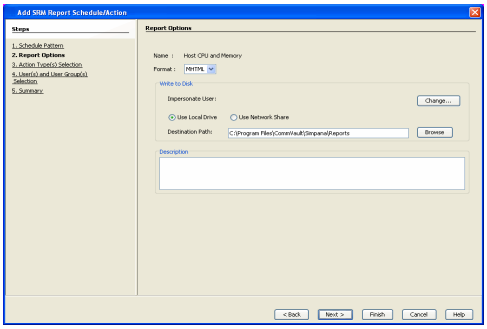
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



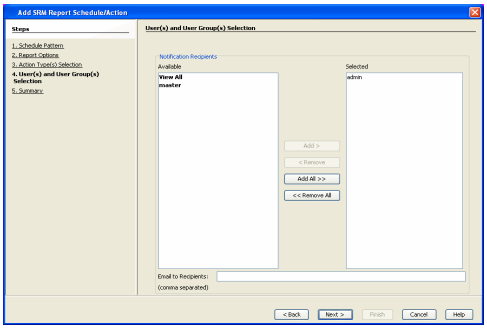
5. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

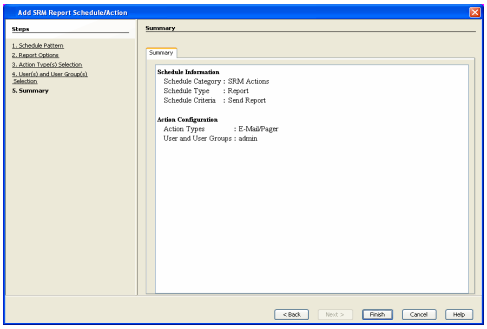


6. Click the **Event Viewer** tab and configure this notification type as follows:
   - Click **Select [Event Viewer] for notification**.
   - Either accept default format or add more tokens by selecting a token from the pulldown menu and clicking **Add Token**. The tokens are explained in Alert Tokens. Click **Use default message** to revert back to original default format.

   Click **Next**.



7. Review the summary and if satisfied, click **Finish**.

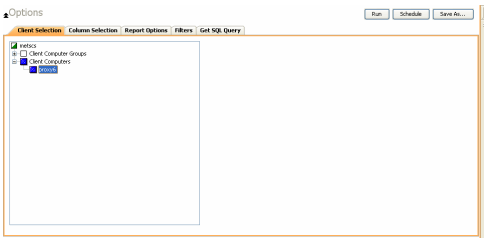


RUNNING A SCRIPT

A notification can be sent to a script when a scheduled report has run. Once receiving the notification, the script can be specified to run on the CommCell or a client computer. Arguments can be specified for the script as well. You can also select an option to read and archive a list of files and directories of a report if a supported Archiver Agent is installed on the client computer and an On Demand Archive Set is configured with SRM enabled.

TO CONFIGURE A NOTIFICATION TO RUN A SCRIPT WHEN A SCHEDULED REPORT HAS RUN:

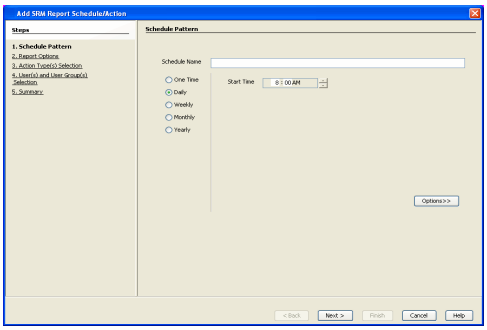
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



4. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

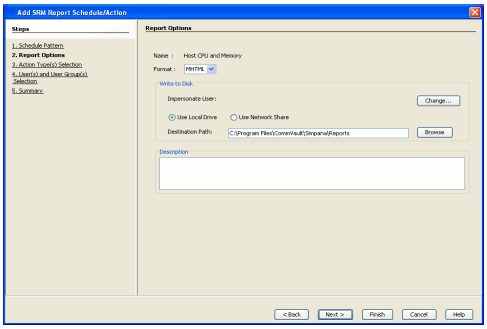
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



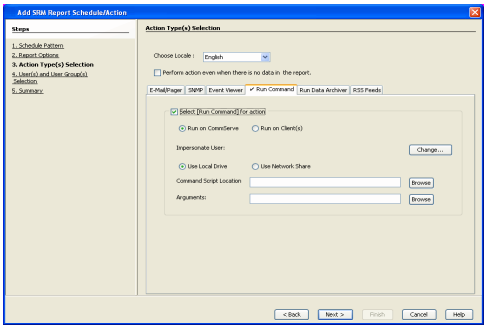
5. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

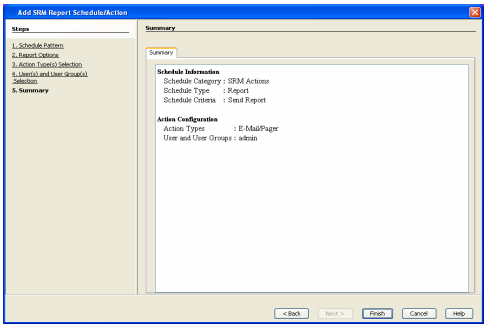


6. Click the **Run Command** tab and configure this notification type as follows:
   - Click **Select [Run Command] for notification**.
   - Select either **Run on CommCell** or **Run on Client** to specify where to run the script.
   - Click either **Use Local Drive** or **Use Network Share** to specify the location of the script.
   - Click **Change...** if you need to provide user account credentials so the script has the correct permissions to run. Specify a Windows User Account with the appropriate privileges to access the scripts directory. User impersonation requires that the specified user have write permissions to the scripts directory; otherwise, the user impersonation account may not take effect. This is especially true if the associated computer is not part of a domain and if the user is not a domain user.
   - Click **Browse** or enter a path where the script is located in **Command Script Location**.
   - Click **Browse** or enter in arguments in **Arguments** to be passed to the script while running.

   Click **Next**.



7. Review the summary and if satisfied, click **Finish**.



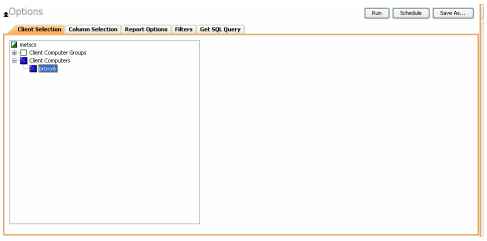
RUN DATA ARCHIVER

A notification can be sent to run a Data Archiver operation when a scheduled report has run. You can select an option to read and archive a list of files and

directories of a report if a supported Archiver Agent is installed on the client computer and an On Demand Archive Set is configured with SRM enabled. For the Data Archiver schedule to run successfully, archive rights on the client computer are required.

TO CONFIGURE A NOTIFICATION TO RUN A DATA ARCHIVER OPERATION WHEN A SCHEDULED REPORT HAS RUN:

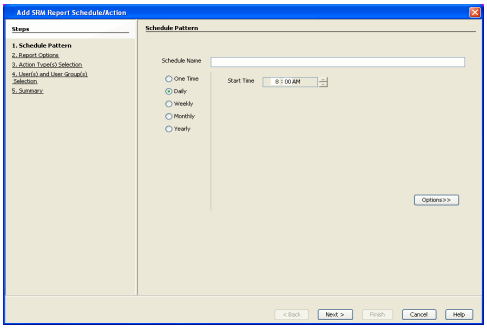
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



4. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

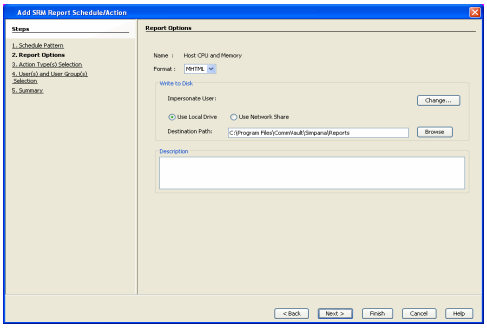
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



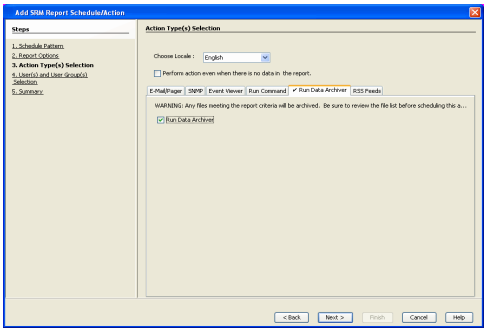
5. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

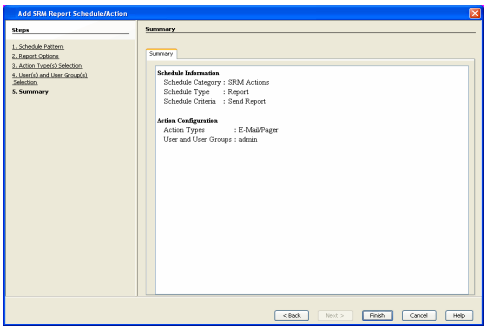


6. Click the **Run Data Archiver** tab and configure this notification type by selecting **Run Data Archiver** if a supported Archiver Agent is installed on the client computer and an On Demand Archive Set is configured with SRM enabled. In this case, the list of files and directories of the report will be read and an archive operation will be performed on the default subclient of the archive set.

   Click **Next**.



7. Review the summary and if satisfied, click **Finish**.

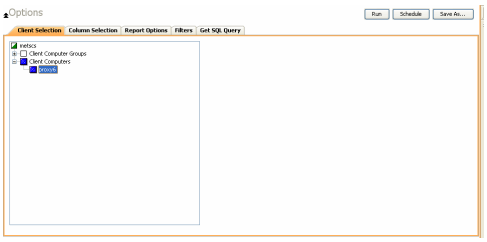


RSS FEEDS

A notification can be sent in a Really Simple Syndication (RSS) feed when a scheduled report has run. The RSS feed can be automatically integrated with your Web Browser.

TO CONFIGURE A RSS FEED NOTIFICATION WHEN A SCHEDULED REPORT HAS RUN:

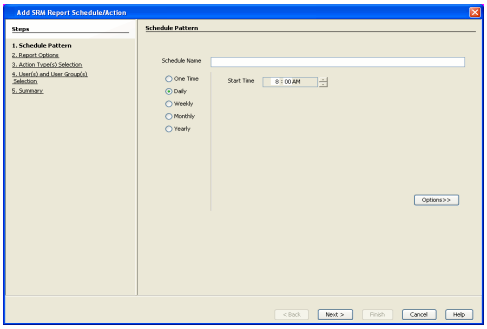
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.



4. Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

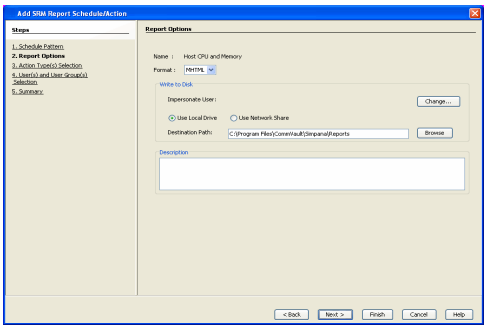
   Optionally, click **Report Options** to repeat sending the report every so many days, or run it for a particular number of times.

   Click **Next**.



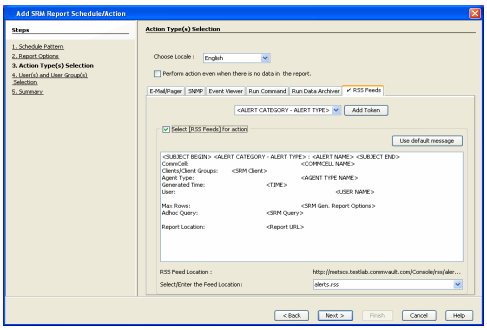
5. In this dialog, select the report output options, such as:
   - **Format** - select **MHTML**, **EXCEL**, or **PDF**.
   - Specify a path in **Destination Path** if you want to save the report to a local drive or network share.

   Click **Next**.

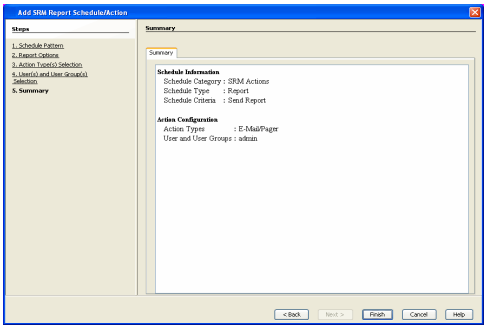


6. Click the **RSS Feeds** tab and configure this notification type as follows:
   - Click **Select [RSS Feeds] for notification**.
   - Either accept default format or add more tokens by selecting a token from the pulldown menu and clicking **Add Token**. The tokens are explained in Alert Tokens. Click **Use default message** to revert back to original default format.
   - Specify the feed location in **Select/Enter the Feed Location** field.

   Click **Next**.



7. Review the summary and if satisfied, click **Finish**.



FORECASTING

Forecasting is prediction of data usage in future, based on the usage pattern in the past. Since Prediction allows visualizing data usage in future, it helps make business decisions accordingly. Prediction is available on history reports and it can be done based on Daily/weekly/Monthly data. In the graphs, prediction lines are shown as thin lines while the actual usage is shown as thick lines.

COPY CHART

When viewing a report in the CommCell Console, you can copy any chart to the clipboard in `.bmp` format by right-clicking the chart and selecting **Copy Chart**. This allows you to easily copy a chart into other applications. Note that the Copy Charts function is not compatible with Microsoft WordPad.

CATEGORIES AND COLUMNS

Reports can be used as initial templates or customized by adding or removing columns in the templates or specifying additional Filter Criteria. The following reports support File level Drill Down:

- Capacity by File System
- Current File System Usage
- Current File System Usage by Subclient

The table below lists the available report templates and the categories and columns that can be selected to configure a customized report. The table also shows the job types that are supported by each report.

Category	Column	Description	SRM Unix File System Agent		
			Discovery Job	Discovery and Analysis Job	Agentless SRM
Client	Client Computer Group Computer Subclient	Displays aspects of each client and their respective subclients on which the SRM Unix File System Agent is installed.	✓	✓	
Client Properties	Hostname Memory Operating System OS Vendor OS Version Processors	Displays aspects of the client computer on which the SRM Unix File System Agent is installed.	✓	✓	

	Service Pack SP Version Time Zone				
Disk Details	Allocated Space Block Size Blocks Capacity Partitions Serial Number Unallocated Space Grown Defects Interface Type Manufacturer Model Primary Defects Total Defects	Displays aspects of physical disks (e.g., capacity, partitions, space, etc.)	✓	✓	
Disk Usage History	As Of Grown Defects Primary Defects Total Defects	Displays how physical disks have been used for a given time period. Useful for trending purposes and to identify disks that are likely to fail soon.		✓	
File Level Analytic Directories		Displays deeper analysis of Directories. Selecting **Discovery and Analysis Job** is required when running File level analytics.		✓	
	Computer	Displays the client computer selected for report generation.			
	Directory	Displays the directory under the file systems which were backed up.			
	Directory Depth	Displays the number of directories away from the root directory.			
	Directory File Count	Displays the number of directories within a directory.			
	Directory Name	Displays actual name of the Directory, e.g., `/usr`.			
	Directory Size	Displays the file size.			
	File System	Displays the file system name, e.g., `/usr`.			
	Group Name	Displays the group name for the particular directory.			
	Sub Directory Count	Displays the level from root directory to the subdirectory.			
	Total Directories	Displays the total number of directories.			
	Total Files	Displays the total number of files.			
	User Name	Displays the owner of the files in the directory			
File Level Analytic Files		Displays deeper analysis of Files. Selecting **Discovery and Analysis Job** is required when running File level analytics.		✓	
	Access Time	Displays last time file was used, e.g., `11/11/2009 17:14`.			
	Computer	Displays name of the local host, e.g., `client1`.			
	Creation Time	Displays the time the file was originated, e.g., `1/19/2008 4:33`.			
	Directory Path	Displays the full path for a directory or file			
	Extension Name	Displays the extension associated with the file, e.g., `TXT`.			
	File	Displays the number of files in a directory, e.g., `32`.			
	File System	Displays the file system name, e.g., `/usr`.			
	Modification Time	Displays the last changed time, e.g., `9/18/2006 17:37`.			
	Size	Displays the file size, e.g., `90.19MB`			

	User Group	Displays the group to which the owner of the file(s) belong, e.g., `bin`.			
	User Name	Displays the owner of the file			
File System Details	Free Inodes Free Space Percent Free Percent Used Total Inodes Total Space Type Used Inodes Used Space	Displays file system statistics such as space capacity and file inodes that store information on files (e.g., user and group ownership, access mode, and type of file).		✓	
File System File Distribution by Access Time	Average File Size Files Total File Size Type	Displays the time at which the file was last accessed, read or written to.		✓	
File System File Distribution by Change Time	Average File Size Files Total File Size Type	Displays time that the inode information (permissions, name, etc., the metadata, as it were) was last modified.		✓	
File System File Distribution by Modification Time	Average File Size Files Total File Size Type	Displays the last time the actual ***contents*** of the file were last modified.		✓	
File System File Distribution by Size	Average File Size Files Total File Size Type	Displays the file distribution of the file system on the basis of size.		✓	
File System File Distribution by Type	Average File Size Files Total File Size Type	Displays the file distribution of the file system on the basis of file type.		✓	
File System Usage	Average File Size Average Files per Directory Average Tree Depth Block Devices Character Devices FIFO Files Max File Size Maximum Tree Depth Sparse File Count Symbolic Link Files Total Directories Total Files	Displays aspects of files per extension and storage requirements.		✓	
File System Usage History	As Of Percent Used Used Space	Displays overall file system statistics. Useful for trending purposes.		✓	
File by Extension	Average File Size	Displays aspects of files per extension and storage requirements.	✓	✓	

	Extension Files Max File Size Total File Size				
Host Files	Accessed Created Group Modified Name Owner Size	Displays aspects of files that provide name resolution of host names with their corresponding IP address.	✓	✓	
Junk Files	Accessed Created Group Modified Name Owner Size	Displays files in each file system that contain "junk" (e.g., core files, HTML files, swap files). Useful for investigation and/or removal.	✓	✓	
Largest Files	Largest Files Accessed Largest Files Created Largest Files Group Largest Files Modified Largest Files Name Largest Files Owner Largest Files Size	Displays the top 10 largest files (by default), as per the category selected. However the value can be changed to any number using the Top 'N' Category for SRM Reports Manager.		✓	
Least Recently Used Files	Least Recently Used File Accessed Least Recently Used File Created Least Recently Used File Group Least Recently Used File Modified Least Recently Used File Name Least Recently Used File Owner Least Recently Used File Size	Displays the top 10 least recently used files (by default), as per the category selected. However the value can be changed to any number using the Top 'N' Category for SRM Reports Manager.		✓	
Logical Volume Details	Access Mode Capacity Cost Category Extent Sizes Free Space Name Status Type Used Space	Displays detail about the Logical volumes as per the category selected.		✓	
NFS Exports	NFS Options NFS Path Name	(Network File System) Specifies the file system that have been made shareable and the machines that will have access to that file system.		✓	✓

Partition Details	Blocks Capacity Type	Summarizes aspects of each partition of the file system.		✓	✓
Prohibited Files	Accessed Created Group Modified Name Owner Size	Displays aspects of files that are not allowed (or forbidden) in the UNIX file system		✓	
SGID Files	Accessed Created Group Modified Name Owner Size	(Set Group ID) Displays aspects of group files in each file system. Useful to manage group permissions on these files for security purposes.		✓	
Subclient File Distribution by Access Time	Average File Size Files Total File Size Type	Displays the time at which the file per subclient was last accessed, read or written to.		✓	
Subclient File Distribution by Change Time	Average File Size Files Total File Size Type	Displays time that the inode information (permissions, name, etc., the metadata, as it were) was last modified.		✓	
Subclient File Distribution by Modification Time	Average File Size Files Total File Size Type	Displays the last time the actual ***contents*** of the file per subclient were last modified.		✓	
Subclient File Distribution by Size	Average File Size Files Total File Size Type	Displays the file distribution of the subclient on the basis of size.		✓	
Subclient File Distribution by Type	Average File Size Files Total File Size Type	Displays the file distribution of the subclient on the basis of file type.		✓	
Subclient Usage	Average File Size Average Files per Directory Average Tree Depth Directories Files Maximum File Size Maximum Tree Depth Sparse File Count Subclient Block Devices Subclient Character Devices	Displays Calypso subclient (the logical entity that uniquely defines a unit of data on a client computer) information.		✓	

	Subclient FIFO Files Subclient Symbolic Link Files				
SUID Files	Accessed Created Group Modified Name Owner Size	(Set User ID) Displays aspects of user files in each file system. Useful to manage group permissions on these files for security purposes.		✓	
UNIX Entities	Disk File System Partition Volume	Displays overall aspects per each computer selected (e.g., partition, volume, etc.)		✓	
User Group Usage	Average File Size Files GID Maximum File Size Total File Size User Group Name	Displays file size details (average, maximum, total) created per user group.		✓	
User Group Violations	Disk Space Hard Limit Disk Space Soft Limit File Count Hard Limit File Count Soft Limit Files Violation User Group Name Violation Used - Space Violation GID	Displays Disk Space (disk space) violations per userto help enforce corporate storage usage policies.		✓	
User Usage	Average File Size Files Maximum File Size Total File Size UID User Name	Displays a summary of files used and their size (average, maximum, total) per user name.		✓	
User Violations	Disk Space Hard Limit Disk Space Soft Limit User File Count Hard Limit User File Count Soft Limit User Files Violation User Name Violation - Used Space Violation UID	Displays quota violations per user to help enforce corporate storage usage policies.		✓	
Volume Group Details	Access Mode Allocated Space Free Physical	Displays details about Volume Groups on the basis of category selected.		✓	

	Extents Free Space Group Name Group Type Logical Volumes Maximum Logical Volumes Maximum Physical Volumes Physical Extent Size Physical Volumes Total Physical Extents Used Physical Extents Volume Group Capacity Volume Group Status				
Writable and Executable Files	Accessed Created Group Modified Name Owner Size	Displays aspects of files that possess write and execute permissions in each file system. Useful to manage group and user permissions on these files for security purposes.		✓	

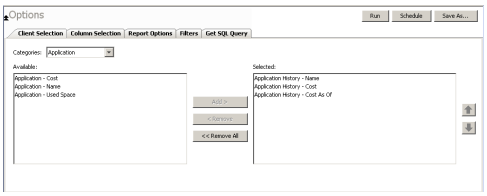
COST HISTORY AND USAGE HISTORY REPORTS

Data for the Cost History and Usage History reports (e.g., Cost History by Application, Usage History by Application) is compiled at regular intervals by a background process on the SRM Server. The default interval is one week, which means the Cost History reports will show one data point per week, no matter how often data collection is scheduled for them; thus, data collection for these reports should be synchronized to the summary interval. You can configure the interval by selecting **SRM Options** in the **Control Panel**.

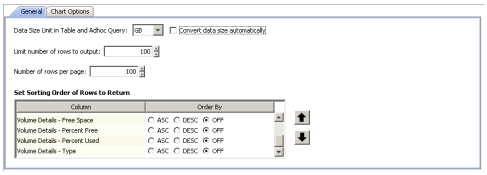
For a newly installed SRM Server, no data will appear in these reports until either the default interval, or a user-specified interval has elapsed from the time of installation, at which time the first summary process will run, and data will be available for these reports.

TO RUN A COST ANALYSIS REPORT:

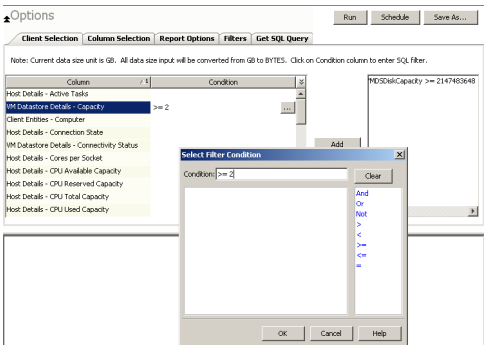
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Click **Enterprise**. Then click **Cost Analysis** to display several out-of-the-box templates. Click on a template to get started.
3. For an out-of-the-box template, the columns are displayed here. To change the columns, select a category and click **Add** or **Remove** to move the columns between the **Available** and **Selected** boxes. Clicking **Remove All** will remove all previously selected filters for the reports.



4. Optionally, click the **Report Options** tab and specify options as explained in Report Options.



5. Optionally, click the **Adhoc Query** tab and configure an ad hoc query as explained in Ad Hoc SQL Query.



6. Click **Run** to generate the report immediately and view the results.

SUPPORT

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SUPPORTED FILE SYSTEM	NOT SUPPORTED FILE SYSTEMS
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Linux	Tru64
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Solaris	

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SRM for UNIX File System - Reports

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OVERVIEW

Customized queries can be applied as additional reporting filters to retrieve specific SRM information from the clients and client groups in your CommCell. These queries are extremely useful if the provided report filters (clients, columns) do not provide the necessary data required for your environment. For example, you could apply SQL query filters to the `Allocated Space` column to display disks of a certain size, such as 2 GB. This ad hoc query further refines and filters the data to facilitate management of your storage infrastructure.

More examples of why you may want to use filters for SQL queries include:

- You wish to generate a list of users who consume more than 10 MB of disk space.
- You want so see how much space is consumed by Exchange mailboxes on particular clients.
- You need to see a list of volumes on a NAS filer that exceed 5 TB of space.

Since the query will run against the CommServe database to retrieve the requested SRM data, which can be easily configured from the CommCell Console when specifying filter criteria of an SRM report. Any SQL query that is supported by a SQL Server can be used in Filters for SRM reporting. If desired, once the conditions have been defined, you can retrieve the full SQL query for use in third-party applications.

GENERATE A REPORT WITH FILTERS

Filters in the form of SQL queries can be defined during the configuration of an SRM report. You can add a SQL query to the report to filter additional data for a specified column. To configure a report with filters, you must complete the following:

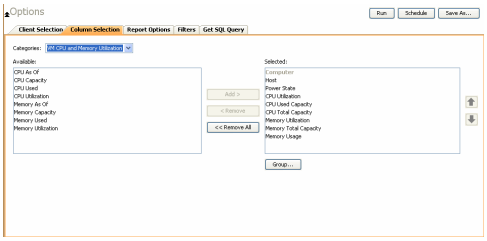
1. Select the type of SRM report you wish to generate. An SRM report can be selected from the SRM Report Manager node.
2. Determine which client(s) and client computer group(s) from which you wish to collect data.
3. Determine and select the type of data to collect for the report (filtering).
4. Define the conditions for the SQL query. Queries that include strings are case-sensitive.
5. Generate the report.

TO GENERATE A REPORT WITH FILTERS:

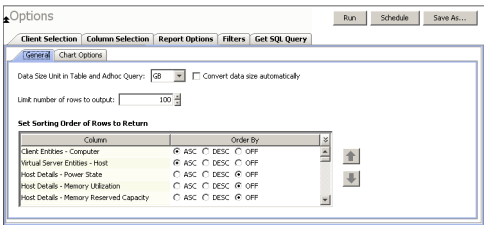
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click a template to display the **Options** window.
3. Click the **Client Selection** tab and select the client computers or client computer group. This is a required step.

4. Click **Column Selection** tab.

   Select a category and **Add** or **Remove** columns between the Available and Selected boxes. The categories and columns differ for each type of report. Clicking **Remove All** will remove all previously selected filters for the reports.



5. Click the **Report Options** tab to configure settings in the report. Click the **General** tab to:

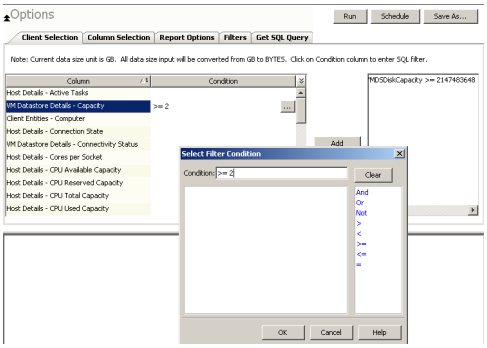


- Set the time range of the report.
- Enable forecasting by clicking **Include Trending** and specifying default trending interval and number of data points on which the trending interval is based.
- Enter the **Maximum number of Bar Points per chart** or select **Draw All Bar Points**.
- Either accept the default of 100 rows or increase or decrease the rows to display in the report by specifying a number in the **Limit number of rows to output** field.

Click the **Advanced** tab to:

- Set the **Data Size Unit** to **GB** for the tables.
- Set the Sorting order of the columns in either ascending or descending order or no sorting order.

6. Select **Filters** tab to run real-time SQL queries can also be applied to the data to provide further filtering.



- Select a column in which you want to specify a condition (e.g., **VM Datastore Details - Capacity**) and click the **Conditions** field of Free Space and then click the ellipsis button.
- In the **Select Filter Condition** dialog box, double-click the operator and in the **Condition** field, enter the values of the condition, such as **>2** and click **OK**.
- Click **Add**.

See Examples of Queries used in filters for an explanation of the operators.

7.

- The full SQL query can be generated if necessary after adding the condition and selecting the **Get SQL Query** tab.
- The query that is displayed is Read-only and can be used in a third-party application, such as SQL Server Management Studio and used there to collect and report data.

8. Generate or save the report with one of these options:

- Click **Run** to generate the report immediately and view the results in the CommCell Console.
- Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis. Specify the report language (see Languages - Support for the list of languages supported in Reports), format (HTML, EXCEL, PDF), and location. Optionally, notifications can be configured so the report can be emailed, sent to an SNMP trap, or RSS feed, etc.

  When scheduling, patterns can also be applied to the report so it runs on a specific time, repeated every so many days, or run for a particular number of times. Some reports allow enabling Forecasting by specifying default trending interval and number of data points on which the trending interval is based.

- Click **Save As...** to save the report filter criteria, schedule information, notifications to a template so it can be used to generate a report at a later date. All report templates are saved under **My Reports**.

EXAMPLES OF QUERIES USED IN FILTERS

The sections below explain the operators than can be used in a SQL query as well as real-world examples describing why and how to specify the condition and build the query.

OPERATORS EXPLAINED

The following explains the operators that can be used in filters using SQL queries. Examples for each are provided. Queries that include strings are case-sensitive.

OPERATOR	DESCRIPTION	EXAMPLE
And	Is a binary operator that operates on two *operands* (data that is manipulated by the operator). Works with both numeric and string queries. Displays a result if both operands are TRUE and no result is displayed if either is FALSE.	Display a computer group that starts with B and ends with M (e.g., Birmingham). 1. Select `Client Computer Group` column. 2. Enter this query: `Starts With B And Ends With M`
Or	Is a binary operator that operates on two *operands* (data that is manipulated by the operator). Works with both numeric and string queries. Displays a result if either operand is TRUE and no result is displayed if both are FALSE.	Display a computer that starts with B or starts with M (e.g., Birmingham, Milwaukee). 1. Select `Computer` column. 2. Enter this query: `Starts With B Or Starts With M`
Not	An operation on logical values that changes true to false, and false to true. The NOT operator inverts the result of a comparison expression or a logical expression. The specified condition must be false in order to view a result. Example: Display a computer that does not have less that < 4 GB of used space. Therefore, only computers with 4 or more GB of used space will be displayed.	Display a computer that does not have less that < 4 GB of used space. 1.Click **Report Options** tab and set data size unit to GB. 2. Select `Used Space` column. 3. Enter this query: `Not < 4`
Like	The LIKE operator is used in character string comparisons with pattern matching. It can contain the special wild-card pattern matching characters percent -- '%' and underscore -- '_'. Underscore matches any *single* character. Percent matches zero or more characters.	Display a computer that contains `eng` characters in its name to identify computers in the engineering department. 1. Select `Computer` column. 2. Enter this query: `%eng%`
Starts With	The Starts With operator is used in character string comparisons with pattern matching.	All names of computers in the engineering department use the convention of `eng_`. Display all computers that start with E to list computers in the engineering department. 1. Select `Computer` column. 2. Enter this query: `Starts With E`
Ends With	The Ends With operator is used in character string comparisons with pattern matching.	All names of computers in the System Test department use the convention of `system_test`. Display a computer that ends with T to list computers in the system_test department. 1. Select `Computer` column. 2. Enter this query: `Ends With T`
> (Greater Than)	A comparison operator that tests whether two expressions are the same. Works with only numeric queries.	Display file sizes that are larger than 2 GB. 1. Click **Report Options** tab and set data size unit to GB. 2. Select `Maximum Size` column. 3. Enter this query: `> 2`
< (Less Than)	A comparison operator that tests whether two expressions are the same. Works with only numeric queries.	Display file sizes that are less than 4 GB. 1. Click **Report Options** tab and set data size unit to GB. 2. Select `Maximum Size` column. 3. Enter this query: `< 4`

>= (Greater Than or Equal To)	A comparison operator that tests whether two expressions are the same. Works with only numeric queries.	Display file sizes that are greater than or equal to 2 TB. 1. Click **Report Options** tab and set data size unit to TB. 2. Select `Maximum Size` column. 3. Enter this query: `>= 2`
<=(Less Than or Equal To)	A comparison operator that tests whether two expressions are the same. Works with only numeric queries.	Display computers with less than or equal to 1 GB free space. 1. Click **Report Options** tab and set data size unit to GB. 2. Select `Free Space` column. 3. Enter this query: `<= 1`
= (Equal)	The equals comparison operator compares two values for equality. Works with both numeric and string queries.	Display files that are located in the /usr/bin directory. 1. Select `Path` column. 2. Enter this query: `=/usr/bin`

RULES TO FOLLOW

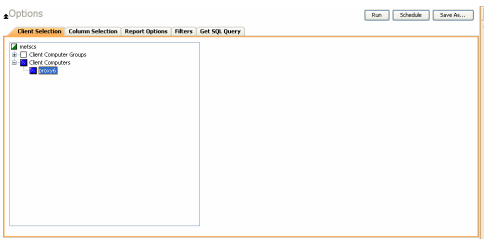
When constructing a filter using SQL query, adhere to these rules:

- Queries that include strings are case-sensitive.
- When a string has a space, enclose it with double quotes. For example, enter `"Program Files"`.

LIST CURRENT CAPACITY BY FILE SYSTEM

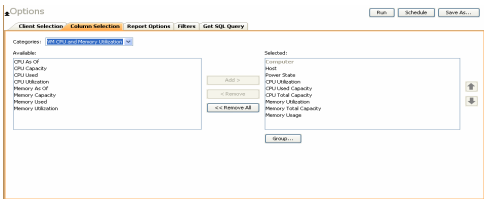
You may want to display specific virtual machines in your virtual storage infrastructure. You can use the following ad hoc query to quickly list and locate the machines.

1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.
2. Expand the applicable tree to view your agent. Then select your agent and click **Capacity by File System** template.
3. Click the **Client Selection** tab and select the client computers or client computer group. This is a required step.



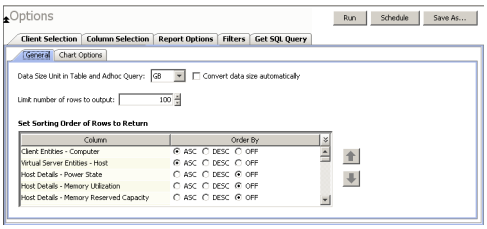
4. Click **Column Selection** tab.

   The **Selected** columns show the **Capacity by File System** columns.



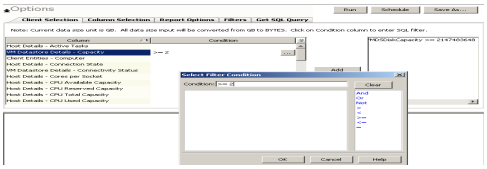
5. Click the **Report Options** tab to configure settings in the report. Click the **General** tab to:
   - Set the **Data Size Units** to **GB** for the tables.
   - Either accept the default of 100 rows or increase or decrease the rows to display in the report by specifying a number in the **Limit number of rows to output** field.
   - Set the Sorting order of the columns in either Ascending or Descending order or no sorting order.

   Click the **Chart Options** tab to:
   - Provide a different orientation and **Switch X/Y Axes** by deselecting **Values** and **Labels** in the chart for the column selected. To reserve charting space, only the first 25 characters for a label are visible in the report. To see the entire label, hover over the label with the mouse.
   - Set the **Data Size Units** (etc. GB, MB) in the chart
   - Enter the **Maximum number of Bar Points per chart** or select **Draw All Bar**



Points if that option is desired.

6. Select **Filters** tab.



   a. Select the **File System Entities**.

   b. Under the **Condition** column, type in the condition directly or click **...** to display the **Select Filter Condition** dialog box.

      ○ Starts with C

   c. After specifying the condition, click **Add**.

7. Generate or save the report with one of these options:

- Click **Run** to generate the report immediately and view the results in the CommCell Console.
- Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis. Specify the report language (see Languages - Support for the list of languages supported in Reports), format (HTML, EXCEL, PDF), and location. Optionally, notifications can be configured so the report can be emailed, sent to an SNMP trap, or RSS feed, etc.

  When scheduling, patterns can also be applied to the report so it runs on a specific time, repeated every so many days, or run for a particular number of times. Some reports allow enabling Forecasting by specifying default trending interval and number of data points on which the trending interval is based. For more information on trending, see Forecasting.

- Click **Save As...** to save the report filter criteria, schedule information, notifications to a template so it can be used to generate a report at a later date. All report templates are saved under **My Reports**.

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SRM for UNIX File System - Summaries

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OVERVIEW

SRM for UNIX File System Summaries provide a concise view of the status of UNIX File System entities with SRM enabled in the CommCell Console. The status information includes the resource, memory, and CPU usage, as well as other resource-related information. Summary information is provided as images in the form of bar graphs and pie charts to provide a succinct snapshot of the statistical information. While viewing summary, data rows in tables can be sorted by any one of the columns listed in that summary.

When you select an UNIX File System entity from the CommCell Console, its summary information appears in the main window. Each section can be expanded or collapsed as desired.

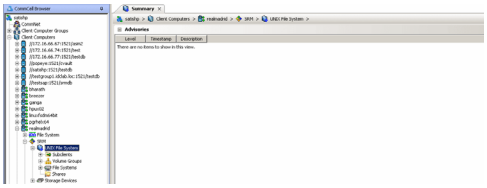
The following section describes the available summary types of SRM UNIX File System Agent at different levels in the CommCell Console:

SUBCLIENT SUMMARIES

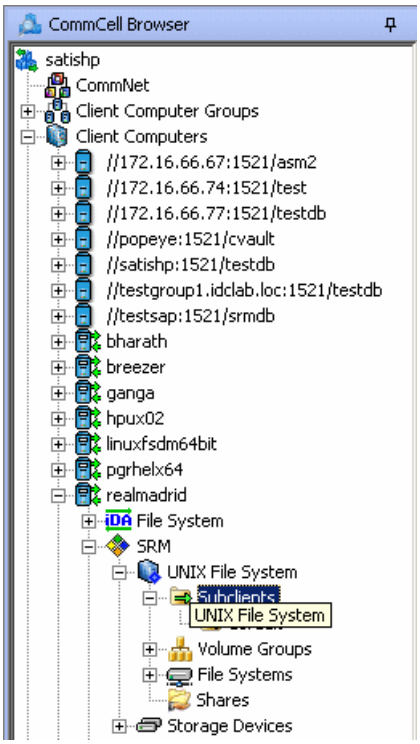
Summary at the subclient level include charts for **File System Usage by Subclient.** This chart displays details like Name, Average Tree Depth, Maximum Tree Depth, File Count, Directory Count, Average File Size, etc for the selected subclient.

However at the user defined or default Subclient level **Properties** showing physical information including name, state (enabled or disabled) last modification time and last analysis times, etc. are displayed along with Charts. The SRM UNIX File System Agent at this level displays charts for **File Distribution by Size**, **File Distribution by Type**, **File Distribution by Access Time** and **File Distribution by Modification Time**.

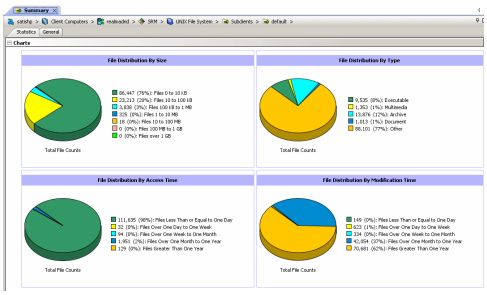
1. From the CommCell Console, select the Client Computer with SRM UNIX File System Agent for which you want to view summaries.



2. Expand **SRM** and select **UNIX File System**.



3. The associated **Subclient Summary** will appear in the main window.

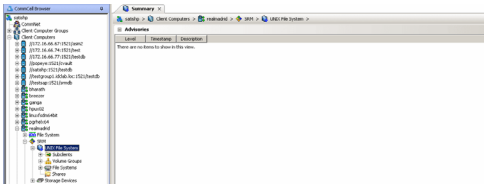


VOLUME GROUP SUMMARIES

Summary information at the Volume Group level Charts include charts for **Current Capacity by Volume Group.** This chart displays detail like Name, Volume Group Manager, Capacity, Allocated Space, Unallocated Space, Access Mode, Logical Volume Count, Physical Volume Count, Physical Extent Count for the selected volume group.

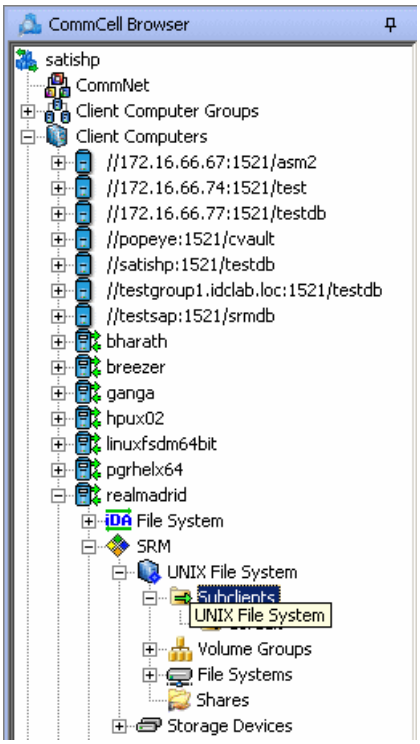
Each volume also displays Properties including physical information like Name, Volume Group Manager, Capacity, Allocated Space, etc. are displayed. Each volume in turn display charts for **Logical Volume Distribution by Size**. The volume level may also display Physical Devices and Logical Volumes if available.

1. From the CommCell Console, select the Client Computer with SRM UNIX File System Agent for which you want to view summaries.

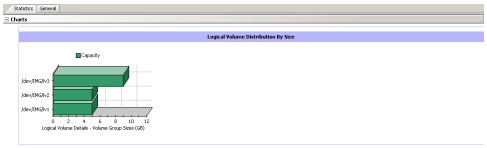


2. Expand **SRM** and select **UNIX File System**, then select **Volume Group**.

   You may also expand subclients node and alternatively select default or user defined subclient to view its summary.



3. The associated **Volume Group Summary** will appear in the main window.

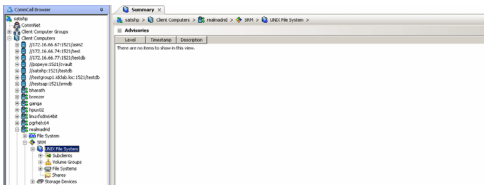


FILE SYSTEMS SUMMARIES

Summary information at the File systems level include charts for **Current File System Usage** and **File System Capacity.** The **Current File System Usage** chart displays detail like Name, Type, Average Tree Depth, Maximum Tree Depth, File Count, Directory Count, Average File Size, Maximum File Size, Average Directory Count and Sparse File Count for the selected volume group. The **File System Capacity** chart displays detail like Name, Type, Mount Point, Used Space, Free Space, Capacity, Percent Used and Percent Free for the selected volume group.

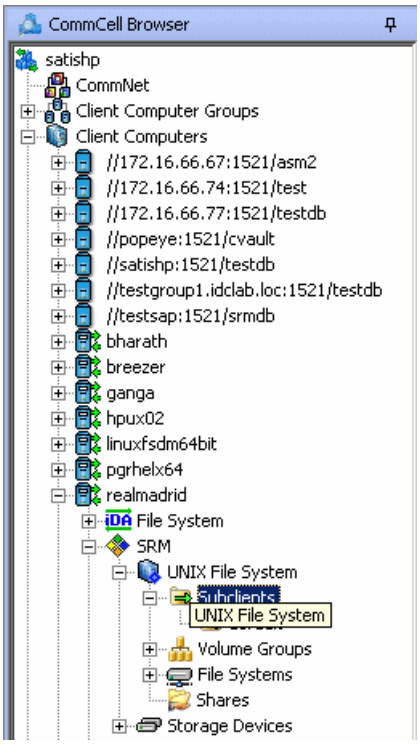
Each File System also displays **Properties** including physical information like Name, Type, Mount Point, Used Space, etc. Charts for **Usage History**, **File Distribution by Size, File Distribution by Type**, **File Distribution by Access Time**, **File Distribution by Modification Time** are available for each file system summary. The file system level may also display Physical Devices if available.

1. From the CommCell Console, select the Client Computer with SRM UNIX File System Agent for which you want to view summaries.

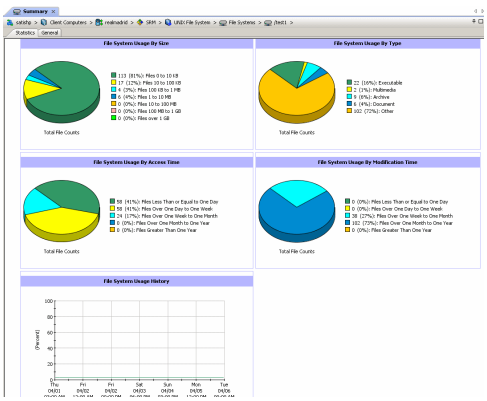


2. Expand **Agent** and select **File Systems**.

   You may also expand File Systems node and alternatively select any File System to view its summary.



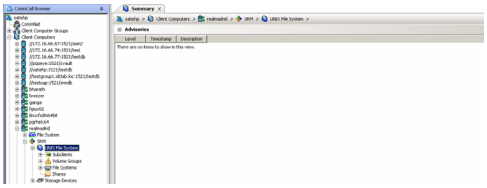
3. The associated **File Systems Summary** will appear in the main window.



STORAGE DEVICES SUMMARIES

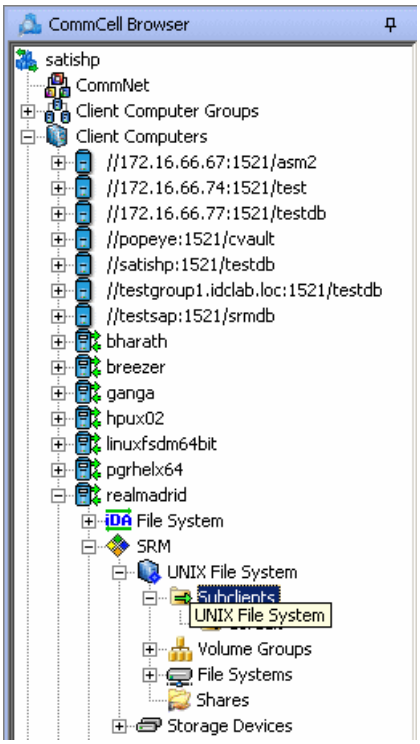
Summary information at the Storage Devices level display charts for **Allocated** vs. **Unallocated space per disk** and **Partition Capacity**. The Charts show details like Name, Interface, Serial Number (S/N), Manufacturer, Block Count, Block Size etc for the selected Storage Device.

1. From the CommCell Console, select the Client Computer with SRM UNIX File System Agent for which you want to view summaries.

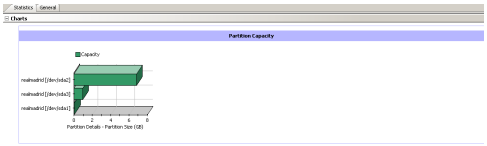


2. Expand **Agent** and select **Storage Devices**.

   You may also expand Storage Devices node and alternatively select any storage device to view its summary.



3. The associated **Storage Devices Summary** will appear in the main window.



Online Help Topics

Agent Properties (General)

Use this dialog box to obtain or provide general and/or user account information for the agent.

Client Name

Displays the name of the client computer on which this Agent is installed.

Billing Department

Displays the name of the billing department, when the Agent is associated with a billing department.

***i*DataAgent**

Displays the identity of the Agent that is installed on the client computer.

Installed date

Displays the date on which the Agent was installed or upgraded on the client computer.

NDMP Restore Enabled

This feature is applicable to Solaris, AIX and Linux *i*DataAgents. This option specifies whether the NDMP Restore Enabler was installed with the *i*DataAgent.

- **YES** indicates that the enabler is installed and the client is an available destination for the restore of data from a Network Attached Storage (NAS) client.
- **NO** indicates that the enabler is not installed and the client is not an available destination for the restore of data from a NAS client.

Enable SRM feature

Select this option to Enable SRM Options.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

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Agent Properties (Version)

Use this dialog box to view the software version.

Version

Displays the Agent software version installed on the computer.

Agent Properties (Index)

Use this tab to establish the parameters for creating new index during backups by the agent.

Create new index on full backup

Specifies whether the system will create a new index with each full backup. If cleared, all backups build upon the index from the previous backup.

Convert to full backup on indexing failures

Specifies whether the system will create a new index if the index is irretrievable and whether, for agents that support non-full backup types, the system will convert the backup to a full backup. If cleared, the backup will fail if the index is irretrievable.

Security

Use this tab to:

- 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.

Available Groups

Displays the names of the user groups that are not associated with this CommCell object.

Associated Groups

Displays the names of user groups that are associated with this CommCell object.

Agent Properties (Activity Control)

Use this dialog box to enable or disable backups and restores on a selected subclient.

If data management and data recovery operations are disabled at the client computer group or client level, then these operations below these levels will be disabled. If data management / data recovery operations are enabled at the client computer group or client level, then these operations below these levels will be enabled.

Enable Backup

Specifies whether Backups will occur from this agent or subclient. .

If cleared:

- Backup operations from this agent or subclient cannot be started and are skipped.
- Running and waiting data management operations for this agent or subclient run to completion.
- Stopped data management operations for this agent or subclient cannot be resumed until this option is enabled.
- Pending data management operations for this agent or subclient do not run until this option is enabled.

Enable Restore

Specifies whether Restores will occur from this agent or subclient. .

If cleared:

- Restore operations from this agent or subclient cannot be started and are skipped.
- Running and waiting data recovery operations for this agent or subclient run to completion.
- Stopped data recovery operations for this agent or subclient cannot be resumed until this option is enabled.
- Pending data recovery operations for this agent or subclient do not run until this option is enabled.

Agent Properties (Storage Device)

Use this tab to view or change the filter storage policy for Erase Data by Browsing.

Filter Storage Policy

Displays the filter storage policy for Erase Data by Browsing that is associated with this agent. To associate a filter storage policy to a new agent or to change the filter storage policy associated with an existing agent, click one in the list.

Subclient Properties (General)

Use this tab to add, modify or view general information on the selected subclient.

Client Name

Displays the name of the Client computer to which this subclient belongs.

Billing Department

Displays the name of the billing department, when the subclient is associated with a billing department. For more information on Billing and Costing See the *CommNet Books Online*.

***i*DataAgent**

Displays the name of the Agent to which this subclient belongs.

Backup Set

Displays the name of the Backup Set to which this subclient belongs.

Subclient Name

Displays the name of this Subclient. You can use this space to enter or modify the name of the subclient.

Number of Data Readers

Use this space to specify the number of simultaneous backup data streams allowed for this subclient. For best performance, this should be set no higher than the number of physical drives that hold this subclient's data, except for specialized hardware such as RAID. For more information, see *Automatic File System Multi-Streaming* in Books Online.

Allow multiple data readers within a drive or mount point

Select this option to specify whether multiple data reads are allowed for Unix mount point during backups on this subclient. This option 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 do not have to enable multi-streaming if you have multiple mount points pointing to the same physical drive.

Billable Entity

Select the name of the Billable Entity assigned to this subclient.

Incremental backup should use

- **UNIX mtime**

  Select this option to determine which files are selected for incremental backup by changes in the mtime timestamp.

- **UNIX ctime**

  Select this option to determine which files are selected for incremental backup by changes in the ctime timestamp.

When you select **Use Data Classification** in Backup Set Properties, it is recommended not to select "UNIX mtime" and "UNIX ctime" options in this properties box as Incremental Backups for Data Classification scan does not support these options.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

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Subclient Properties (Content)

Use this tab to add, modify or view the contents of a selected subclient.

Contents of subclient

Displays a list of paths of data/workspaces/categories/documents/folders included as content for this subclient. Special characters (such as "\" "/" "." ",") represent content of the default subclient, that is not assigned to other subclients within the backup set.

When a symbolic link is included in the subclient content, the target of the symbolic link along with the link itself can be displayed.

- **Delete**

  Click to delete the selected path/data/folder from the Contents list for this subclient.

- **Browse**

  Click to browse for new content that you want to add to this subclient.

- **Add Paths**

  Click to enter new content path(s).

Enable Apple Double Support

The File System *i*DataAgent backs up Apple Double formatted files as two separate files. Selecting this option will allow you to backup the Apple Double formatted Macintosh files as a single file.

Expand symbolic links of subclient content

Select this option to to expand and backup the data paths in the symbolic links of the subclient content.

Discover

Click to display the data paths to which the symbolic links in the subclient content's data are pointing.

	Instead of clicking **Discover**, wait until the backup completes and then refresh the subclient. Then go to **Contents of subclient**. The data contents for the symbolic links should be displayed.

Back to Top

Subclient Properties (Filters)

Use this dialog box to add or edit data paths to be filtered out of the subclient content and to specify exceptions to the exclusion list.

Include Global Filters

Displays a list of options for enabling or disabling Global Filters which can be used in addition to the filters set at the subclient level to exclude data from data protection operations for this subclient. To change the setting, select one of the following values from the list:

- **OFF** - Disables Global Filters for this subclient.
- **ON** - Enables Global Filters for this subclient.
- **Use Cell Level Policy** - Enables or disables Global Filters for this subclient depending on whether the **Use Global Filters on All Subclients** option is enabled or disabled on the Control Panel (Global Filters) dialog. If the **Use Global Filters on All Subclients** option is enabled, then the **Use Cell Level Policy** option will enable Global Filters on this subclient. If the **Use Global Filters on All Subclients** option is disabled, then the **Use Cell Level Policy** option will disable Global Filters on this subclient.

Exclude these files/folders/directories/patterns

Use this space to add specified file extension(s) for attachment(s) that you want to exclude from data protection operations for this subclient.

Except for these files/folders/directories/patterns

Use this space to add specified entries that will be included in data protection operations for this subclient in cases where a parent object is listed in the Exclude filter. Wildcards are supported for exception filters. See Supported Wildcards for more information.

Add

Click to manually add an entry to be included in, or excluded from, data protection operations for this subclient.

Browse

Click to browse for an entry to be included in, or excluded from, data protection operations for this subclient.

Edit

Click to manually edit an entry to be included in, or excluded from, data protection operations for this subclient.

Delete

Click to delete a selected filter entry.

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Subclient Properties (Pre/Post Process)

Use the Pre/Post Process tab to add, modify or view Pre/Post processes for the selected subclient.

PreScan process

Displays the name/path of the scan process that you want to run before the respective phase. You can use this space to add or modify PreScan 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 include a `case` statement within a script to run specific operations based on the level of the backup job. Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

PostScan process

Displays the name/path of the scan process that you want to run after the respective phase. You can use this space to add or modify PostScan processes for a subclient. Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

Run Post Scan Process for all attempts

Specifies whether this process will execute for all attempts to run the phase. Selecting this option will execute the post scan for all attempts to run the phase, including situations where the job phase is interrupted, suspended, or fails. Otherwise, when the checkbox is cleared the post scan process will only execute for successful, killed, or failed jobs.

Pre Backup process

Displays the name/path of the backup that you want to run before the respective phase. You can use this space to enter a path for the backup process that will

execute before this phase on the subclient . Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

Post Backup process

Displays the name/path of the backup process that you want to run after the respective phase. You can use this space to enter a path for the backup process that will execute after this phase on the subclient. Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

Run Post Backup Process for all attempts

Specifies whether this process will execute for all attempts to run the phase. Selecting this option will execute the post backup process for all attempts to run the phase, including situations where the job phase is interrupted, suspended, or fails. Otherwise, when the checkbox is cleared the specified process will only execute for successful, killed, or failed jobs.

PreSnap process

Displays the name/path of the Snap process that you want to run before the respective phase. You can use this space to add or modify PreSnap processes for a subclient. Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

PostSnap process

Displays the name/path of the Snap process that you want to run after the respective phase. You can use this space to add or modify PostSnap processes for a subclient. Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

On Source

Specifies whether the PreSnap/PostSnap process will execute on the source computer.

On Proxy

Specifies whether the PreSnap/PostSnap process will execute on the proxy computer.

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Subclient Properties (Encryption)

Use this dialog box to select the data encryption options for the selected subclient content for operations run from the CommCell Console.

None

When selected, no encryption will take place during a data protection operations.

Media Only (MediaAgent Side)

When selected, for data protection operations, data is transmitted without encryption and then encrypted prior to storage. During data recovery operations, data is decrypted by the client.

Network and Media (Agent Side)

When selected, for data protection operations, data is encrypted before transmission and is stored encrypted on the media. During data recovery operations, data is decrypted by the client.

Network Only (Agent Encrypts, MediaAgent Decrypts)

When selected, for data protection operations, data is encrypted for transmission and then decrypted prior to storage on the media. During data recovery operations, data is encrypted by the MediaAgent and then decrypted in the client.

Storage Device

Use this dialog box to establish the storage device related settings on the selected subclient. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent or enabler for which the information is being displayed.

The following tabs are displayed:

- (Data) Storage Policy
- Data Transfer Option
- Deduplication

STORAGE POLICY

Use this tab to select or view storage policy settings on the selected subclient.

Data/Database/Transaction Log Storage Policy

Displays the storage policy to which this subclient is currently associated. To associate a storage policy to a new subclient or to change the storage policy associated with an existing subclient, click one in the list.

Incremental Storage Policy

Displays the name of the Incremental Storage Policy associated with this subclient, if the storage policy has the Incremental Storage Policy option enabled.

Data Paths

Click to view or modify the data paths associated with the primary storage policy copy of the selected storage policy.

Number of Data/Database/Transaction Log Backup Streams

Displays the number of streams used for backup operations. To change the number of streams, click one in the list. For DB2 DPF, be sure to set the appropriate number of streams for each database partition by double-clicking the appropriate **Stream** space and typing the desired number.

Client/Instance/Status/Stream

Displays the names of the instances according to current backup priority along with other associated information that are included in the Oracle RAC node. To change the backup priority of the instances, click the instance name as appropriate and use the directional arrows provided.

Maximum Backup Streams

For Informix, displays the maximum number of streams used for database backup operations, which is determined from the ONCONFIG file. The number of streams for backups cannot be set currently from the CommCell Console. Instead, you must set the BAR_MAX_BACKUP parameter in the $ONCONFIG file on the Informix client. Also, the number of streams specified by the storage policy must be greater than or equal to the number specified by the BAR_MAX_BACKUP parameter.

Data Threshold Streams

For Oracle RAC, specifies whether to run the backup job immediately when the total number of reserved streams is greater than or equal to the value in this field. If you click this option, use the space provided to change this value if desired.

Create Storage Policy

Click to launch the Create a Storage Policy wizard. Once the storage policy has been created, it will be displayed in the list of storage policies to which the selected subclient can be associated.

Buffer Size

Use this space to specify the size (in 4 KB pages) of each buffer to be used for building the backup image. The minimum value is 8, and the default value is 1024. If you select value 0, the value of the `backbufz` database manager configuration parameter will be used as the buffer allocation size.

DATA TRANSFER OPTION

Use this tab to establish the options for data transfer. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent for which the information is being displayed.

Software Compression

Indicates whether software compression for the subclient or instance is enabled or disabled, and if enabled whether it is performed on the client or MediaAgent computer.

- **On Client**

  Click to enable software compression on the client computer.

- **On MediaAgent**

  Click to enable software compression on the MediaAgent computer.

- **Use Storage Policy Settings**

  Click to use the settings enabled on deduplicated storage policy copy.

  This option applies when subclient is associated with a storage policy copy that is deduplicated. See Copy Properties (Deduplication) - Advanced tab for compression settings on deduplicated storage policy copy.

- **Off**

  Click to disable software compression.

Note that hardware compression has priority over the software compression. Hardware compression is established in the Data Path Properties dialog box. The above software compression option will take effect when the data path is associated with a disk library, or when hardware compression is disabled in the data path associated with tape libraries.

For non-deduplicated storage policy copy, select **On Client** or **On MediaAgent** options to turn on compression, depending upon your environment.

Resource Tuning

Indicates the processes used by the client to transfer data based and whether bandwidth throttling is enabled or not.

- **Network Agents**

  Specifies the number of data pipes/processes that the client uses to transfer data over a network. Increasing this value may provide better throughput if the network and the network configuration in your environment can support it. On non-UNIX computers, the default value is 2 and a maximum of 4 can be established if necessary. On UNIX computers the default value is 1 and a maximum of 2 can be established if necessary.

- **Throttle Network Bandwidth (MB/HR)**

  Specifies whether the backup throughput is controlled or not. (By default this option is not selected and therefore the throughput is not controlled). When selected, use the space to specify a value for the throughput. By default, this is set to 500. The minimum value is 1 and there is no limit to the maximum value. (In this case the backup throughput will be restricted to the maximum bandwidth on the network.)

Use this option to set the backup throughput, based on the network bandwidth in your environment. Use this option to reduce the backup throughput, so that the entire network bandwidth is not consumed, especially in slow links. Increasing this value will end up consuming the bandwidth with the maximum throughput limited to the network bandwidth capability.

Note that throttling is done on a per Network Agent basis.

Application Read Size

This option specifies the amount of application data (such as SQL data, Windows File System data, and virtual machine data) backup jobs will read for each unit transferred to the MediaAgent.

The default value for this options is 64KB; however, this value may be increased to reduce the amount of data read from the given application, which in turn reduces the amount of I/O operations performed against it. As a result, overall backup performance may increase. However, backup memory usage may also increase, which may inadvertently consume additional resources from the application. Thus, it is recommended that this value be set at either the default value or match the block size directed by the application.

DEDUPLICATION

Use this tab to establish the options for deduplication on the subclient. It indicates whether deduplication for the subclient is enabled or disabled, and if enabled whether the signature generation (a component of deduplication) is performed on the client or MediaAgent computer.

Note that deduplication is supported on disk storage devices. So the deduplication options are applicable only if the subclient is associated with a Storage Policy containing disk storage.

On Client

Click to enable signature generation on the client computer.

On MediaAgent

Click to enable signature generation on the MediaAgent computer.

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Subclient Properties (Activity Control)

Use this dialog box to enable or disable backups on a selected subclient.

Enable Backup

Specifies whether backups will occur from this subclient.

If cleared:

- Backups from this subclient cannot be started and are skipped.
- Running and waiting backups for this subclient run to completion.
- Stopped backups for this subclient cannot be resumed until this option is enabled.
- Pending backups for this subclient do not run until this option is enabled.

(Job states are indicated in the Job Controller.)

Subclient Properties (1-Touch Recovery)

Use this tab to establish 1-Touch Recovery items. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent for which the information is being displayed.

1-Touch Recovery

Click to configure this subclient with 1-Touch Recovery options.

- **1-Touch server**

  Displays the name of the server that will be used as the 1-Touch (boot) server for this client. You can use this space to add or modify the name of the 1-Touch server. The server must reside within the same subnet as the client. If the server name is changed, the client's name must be manually removed from the previous 1-Touch server's database.

- **1-Touch server directory**

  Displays the name of the directory on the 1-Touch server where the files required to boot the client in case of a crash are stored. You can use this space to add or modify the 1-Touch server directory.

  - For 1-Touch for AIX, this is the directory where the NIM Master environment is set up and installed.
  - For 1-Touch for HP-UX, this is the directory where the HP-UX Ignite Server files are installed.
  - For 1-Touch for Solaris, this is the directory where the Solaris JumpStart files are installed.

Subclient Properties (SRM Options)

Use this dialog box to specify the Data Collection requirements.

SRM Data Collection

This option will be enabled if **Enable SRM feature** option is selected in the agent's Properties tab.

- **Discovery**

  Select this option for the collection of less detailed information for the client.

Security

Use this dialog box to:

- 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.

Available Groups

Displays the names of the user groups that are not associated with this CommCell object.

Associated Groups

Displays the names of user groups that are associated with this CommCell object.

Automatically add New Users to the "View All" Group (CommServe Level Only)

Specifies that all new users will automatically be added to the `View All` user group. This group allows users to view all CommCell objects, regardless of the associations of the other user groups they belong to.

Require Authentication for Agent Installation (CommServe Level Only)

Enable this option to prompt users for authentication for any agent installation on the CommCell.

Client Owners

Specify a user to allow CommCell user access to this client computer through CommCell Console and allow permission to run Web Console browse and restore operations on this client. Each user must be listed in a separate line.

Subclient Properties (SnapProtect Operations)

SnapProtect Backup with hardware Snap Engines | SnapProtect Backup with Data Replicator

Use this tab to enable SnapProtect backup and to establish the options for SnapProtect backup operation, for the selected subclient.

These options are available if you select a hardware Snap Engine. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent for which the information is being displayed.

SnapProtect

Specifies whether SnapProtect backup for the selected subclient is enabled or disabled.

Available Snap Engines

Lists the available snapshot engine vendors. To select a snapshot engine vendor, click the pull-down arrow and click the one that you want to use.

- **Enter Array Credentials**

Click to access the Array Management dialog box, which enables you to add or modify access information for a array.

Use Proxy

Use this list to specify the name of the proxy server that will be used for performing the SnapProtect backup operations.

Use source if proxy is unreachable

Select to use the source machine for SnapProtect backup if the proxy client is not available.

Use RMAN for Tape Movement

Select to use RMAN for movement to media operations.

Allow multiple data readers within a drive or mount point

Specifies whether multiple data reads are allowed for a single physical drive or mount point during backups on this subclient. It is recommended that this option is selected for specialized hardware such as RAID, or possibly in the case of spanned volumes. For more information, see Automatic File System Multi-Streaming in Books Online.

Number of Data Readers for Backup Copy

Use this space to specify the number of simultaneous backup data streams allowed for this subclient, during the movement to media operation. For best performance, this should be set no higher than the number of physical drives that hold this subclient's data, except for specialized hardware such as RAID.

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Backup Set Properties (General)

Use this dialog box to define a New Backup Set or view and modify the properties of an existing Backup Set.

Client Name

Displays the name of the Client computer to which this Backup Set belongs.

Billing Department

Displays the name of the billing department, when the backup set is associated with a billing department. For more information on Billing and Costing See the *CommNet Books Online*.

***i*DataAgent**

Displays the name of the *i*DataAgent to which this backup set belongs.

Backup Set

When creating a new Backup Set, type the name of the Backup Set.

For an existing Backup Set, the name of the Backup Set is displayed.

On Demand

Displays whether the selected backup set is an On Demand Backup Set.

Make this the Default backup set

Use this option to define the selected backup set as the default or a user-defined backup set. Selecting this option asserts this backup set as the default. The previously designated default backup set is automatically reallocated as a user-defined backup set. Clearing this option, is accomplished by opening the Backup Set Properties dialog box of some other backup set and clicking this option there, thereby designating that backup set as the default.

Subclient Content may contain Wildcard Entries

This option can be enabled or disabled only during backup set creation. This option allows you to select the files with specified extensions that can be backed up during the backup operation.

Subclient Policy

Displays the name of the Subclient Policy associated with this backup set. If no Subclient Policy is associated with this backup set, it will display **<None>**.

Job Options

- **Use Classic File Scan**

  Select to specify that the classic file scan is used to determine whether files have been modified for all subclients within the backup set.

  Preserve File Access Time

  if selected, the file access time is preserved and therefore not modified at the time of backup. Selecting this option may increase the time required to complete a backup.

- **Use Data Classification**

  Select to specify that the Data Classification Enabler is used to determine whether files have been modified for all subclients within the backup set.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

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Security

Use this dialog box to:

- Associate this object with a user group.
- Disassociate this object from a user group.

Available Groups

Displays the names of the user groups that are not associated with this CommCell object.

Associated Groups

Displays the names of user groups that are associated with this CommCell object.

Backup Options

Use this dialog box to schedule or immediately run a backup job.

Select Backup Type

- **Full**

  Specifies the job as a Full backup, which backs up all data for the selected subclient(s).

- **Incremental**

  Specifies the job as an Incremental backup, which backs up only that portion of the data that is new or has changed since the last backup.

- **Differential**

  Specifies the job as a Differential backup, which backs up only that portion of the data that is new or has changed since the last full backup.

- **Synthetic Full**

  Specifies the job as a Synthetic Full backup, which creates a Full backup from existing backup data for the selected subclient or backup set (if applicable). The Synthetic Full backup consolidates the backup data; it does not actually back up data from the client computer.

  Run Incremental Backup

  Specifies the options for running an Incremental backup either immediately before a Synthetic Full backup or immediately after a successfully completed Synthetic Full backup when selected. When cleared, an Incremental backup is not automatically run either immediately before or after the Synthetic Full backup.

  - **Before Synthetic Full**: Specifies the operation will back up any data that is new or changed since the previous backup in order to have it included as part of the Synthetic Full backup.
  - **After Synthetic Full**: Specifies the operation will back up any data that is new or changed since the backup that occurred prior to the Synthetic Full backup.

Job Initiation

- **Run Immediately**

  Specifies this job will run immediately.

- **Schedule**

  Specifies this job will be scheduled. Click **Configure** to specify the schedule details.

Advanced

Click to select advanced backup options, such as follow mount points, catalog, start new media, mark media as full etc.

Save As Script

Click to open the Save As Script dialog, which allows you to save this operation and the selected options as a script file (in XML format). The script can later be executed from the Command Line Interface using `qoperation execute` command.

When you save an operation as a script, each option in the dialog will have a corresponding xml parameter in the script file. When executing the script, you can modify the value for any of these XML parameters as per need.

To view the XML values for each of the options in the dialog, see the following:

- Command Line XML Options for Unix File System *i*DataAgents

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Advanced Backup Options (Data)

Use this tab to select advanced backup data options for the backup operation.

Create new index

Specifies the system will create a new index with a full or On Demand data protection operations. Selecting this option will cause the following to occur for this job only:

- full backup transparent browse capability will be disabled, if it is supported by the agent.
- override the **Create new index on full backup** option on the **Agent Properties (Index)** tab
- for an On Demand Data Protection operation, override the **Set index cycle to every *nn* backup jobs** setting in the **Subclient Properties (General)** tab of the default subclient.

Follow Mount Points

When you select this option, the mount point data from the subclient will be included in the backup. When you clear this option, the mount point data will be excluded from the subclient backup.

Catalog

Use this section to select index cache sharing and granular restartability options for the job. Note that these options are not applicable for the disaster recovery data protection.

- **Use shared profile if present with transaction logging**

  Select this option if you wish to use the shared index cache profile of the MediaAgent (if configured) to save a copy of the job's index cache for index cache sharing *with* transaction logging feature for granular job restartbility.

  Shared profile with transaction logging provides job restartability in failover situations. This is a recommended configuration.

- **Use shared profile if present without transaction logging**

  Select this option if you wish to use the shared index cache profile of the MediaAgent (if configured) to save a copy of the index cache for index cache sharing *without* transaction logging feature for granular job restartbility. This is not a recommended configuration.

- **Use transaction logging**

  Select this option to use transaction logging feature to provide granular job restartbility (without using shared profile for index cache sharing).

- **None**

  Select this option to use neither shared profile nor transaction logging.

Startup

Select from the following options. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the operation for which the information is being displayed.

Priority

- **Use Default Priority**

  If selected, the default priority for this type of job will be used in determining how the Job Manager will allocate resources for this job.

- **Change Priority**

  Use this option to manually specify the priority for the job, between 0 (highest priority) and 999 (lowest priority). The Job Manager will use the priority setting when allocating the required resources. This is useful if you have jobs that are very important and must complete, or jobs that can be moved to a lower priority.

Start up in suspended state

Specifies that this job will start in the Job Controller in a suspended state and cannot run until the job is manually resumed using the **Resume** option. This option can be used to add a level of manual control when a job is started. For example, you could schedule jobs to start in the suspended state and then choose which scheduled jobs complete by resuming the operation started in the suspended state.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

Job Retry

Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent or operation for which the information is being displayed.

Enable Total Running Time

The maximum elapsed time, in hours and minutes, from the time that the job is created. When the specified maximum elapsed time is reached, as long as the job is in the "Running" state, it will continue; if the job is not in the "Running" state when the specified time is reached, Job Manager will kill the job.

Enable Number of Retries

The number of times that Job Manager will attempt to restart the job. Once the maximum number of retry attempts has been reached, if the job has still not restarted successfully, Job Manager will kill the job. Note that this job-based setting will not be valid if restartability has been turned off in the Job Management Control Panel.

Kill Running Jobs When Total Running Time Expires

Option to kill the job when the specified Total Running Time has elapsed, even if its state is "Running". This option is available only if you have specified a Total Running Time.

Advanced Backup Options (Media)

You can select advanced backup media options for the operation.

Start New Media

This option starts the backup/migration/archive operation on a new media, which causes the following to occur:

- If removable media is used, the current active media is marked as Appendable and a new media is used for the backup/migration/archive.
- If disk media is used, a new volume folder is created for the backup/migration/archive.

If cleared, the operation automatically uses the current active media or volume.

Mark Media Full after Successful Operation

This option marks media full, 2 minutes after the completion of the backup/archive operation. If any jobs are initiated within the 2 minutes, they are allowed to write to the media. If the job was associated with the prior media, new media (such as a new tape) will be used for subsequent jobs.

Allow other Schedule to use Media Set

This option allows jobs that are part of a schedule policy or schedule and using a specific storage policy to start a new media and also prevent other jobs from writing to the set of media. It is available only when the **Start New Media** and **Mark Media Full** options are enabled, and can be used in the following situations:

- When one scheduled job initiates several jobs and you only want to start new media on the first job.
- When you want to target specific backups to a media, or a set of media if multiple streams are used.

Reserve Resources Before Scan

Normally, media is reserved for a job before the operation phase (backup or archive). When selected, this option will reserve the media before the scan phase. This reserves the media earlier because the scan phase precedes the operation phase.

Extend Job Retention

- **Infinite**: Select this option to retain this job indefinitely.
- **Number of Days**: Select this option to prune this job after the number of days specified.
- **Storage Policy Default**: Select this option to apply the retention rules of the associated storage policy, which is the default option.

Advanced Backup Options (Data Path)

Select the data path to be used for the backup/archive operation.

Ensure that the Library, MediaAgent, Drive Pool, and Drive selected for this operation is available online and is a part of the associated Storage Policy.

Use MediaAgent

Specifies the name of the MediaAgent that will be used to perform the backup operation. If necessary, you can change the name of the MediaAgent.

For example, if the library is shared and you wish to use a specific MediaAgent (instead of the system selected MediaAgent, or a MediaAgent which may be idle, or less critical) or if you know that the library attached to the specified MediaAgent.

Use Library

Specifies the name of the library that will be used to perform the backup operation. Use this option when you wish to backup to a specific library.

Use Drive Pool

Specifies the name of the Drive Pool that will be used to perform the backup operation. Use this option when you wish to backup using a specific Drive Pool.

Use Drive

Specifies the name of the Drive that will be used to perform the backup operation. Use this option when you wish to backup using a specific Drive from the selected Drive Pool.

Vault Tracking

Select options to export and track media, using Vault Tracker.

Vault Tracking Options will be displayed only when a Vault Tracker license is available in the CommServe.

Vault Tracking options are only applicable for data protection operations using a storage policy associated with a library containing removable media (e.g., tape, optical or stand-alone.)

Export media after the job finishes

Specifies the media used by the data protection operation and media with the specific Media Status (if specified) will be exported and tracked by Vault Tracker.

Exclude Media Not Copied

When selected, allows you to exclude media with jobs that have to be copied.

Media Status

- **All**

  Click to select all media. Clear this option to select media with a specific status.

- **Active**

  Click to select media with its status marked as active.

- **Full**

  Click to select media with its status marked as full.

- **Overwrite Protected**

  Click to select media with its status marked as read-only .

- **Bad**

  Click to select media with its status marked as bad.

Export Location

Specifies the destination location and lists the stationary locations entered using the **Export Location Details** dialog box.

Track Transit

Specifies that transit information must be tracked, and lists the transit locations entered using the **Export Location Details** dialog box.

Use Virtual Mail Slots

Specifies the exported media is stored within the library in the virtual mail slots defined in the **Library Properties (Media)** dialog box.

Filter Media By Retention

Specifies that the system must automatically filter media based on whether the media has extended retention jobs or not.

- **Media with extended retention job(s)**

  Specifies that media with at least one extended retention job will be exported.

- **Media with no extended retention job(s)**

  Specifies that media with no extended retention jobs will be exported.

Alert

Use this tab to configure an alert for a schedule policy.

Configure Alert

- **Alert**

  The currently configured Alert.

- **Add/Modify Alert**

  When clicked, opens the Alert Wizard to configure alerts for this operation.

- **Delete Alert**

  When clicked, deletes any existing alerts that are already configured.

Restore Options (General)

Use this dialog box to control how the specified data is to be restored.

Restore ACLs

Specifies that the data will be restored with the original ACLs and therefore its original security attributes. Clear this option to restore without ACLs and consequently the data assumes the ACLs of the parent directory.

Data in device node

Specifies that Unix raw devices can be restored to either another raw device or a file. When selected, this activates the **Unconditional Overwrite** option, which is required for raw device restores to complete successfully.

Unconditionally overwrite only if target is a DataArchiver stub

If selected, this option will unconditionally overwrite a DataArchiver stub during restore.

Overwrite

- **Overwrite if file on media is newer**

  If selected, this option will overwrite the existing file with the file that was backed up/archived to the media provided the backed up/archived file is newer than the existing file.

- **Unconditional Overwrite**

  Specifies whether the restored data is unconditionally written to the specified location.

  If cleared:

  - Files/directories whose names are the same as those in the restore path and where the backed up data is as old or older are not restored.
  - files/directories whose names are the same as those in the restore path and where the backed up data is newer are restored.
  - Files/directories whose names are different from those in the restore path are restored.

Avoid using this option whenever you run a Restore by Jobs. Otherwise, an older version of the files might be retrieved.

- **Restore only if target exists**

  If selected, this option will only restore files that currently exist in the restore path. Files that exist on the media but not in the restore path will not be restored.

Restore Destination

- **Destination Client/Computer/Server**

  Displays the name of the client computer to which the selected data will be restored. To change the destination computer, select one from the list. The list includes clients:

  - Which are established as clients within the CommCell.
  - Clients with Operating Systems that support the cross-platform restore operation from this client. (Refer to the topic titled **Cross Platform Restore Operations** in Books Online for additional information.)

  By default, data is restored to the same computer from which it was backed up.

Restore to Same Folder

Specifies whether the restore operation will restore data to the same folder from which it was backed up in the **Destination Computer**. (Clear this option to restore to a different path and activate the **Destination folder** box.)

- **Browse**

  Click to select a path for the **Destination folder**.

Preserve Source Paths

Specifies the action taken when the data is restored to another destination. The options are available only when the **Restore to Same Paths** option is cleared.

- **Preserve n levels from end of source path**

  Specifies whether the restore operation must keep the specified number of levels at the end of source path of the selected data. For example, if the selected data is `Documents\Memos\Sales`, this option is set to `1` and the **Destination folder** is `temp`, the data will be restored as `\temp\Sales`.

However, if this option is used to restore a file in a path that contains any valid wildcard expression (e.g., `Documents\**\Sales`), the default value of `1` for the option cannot be changed. Therefore, only the last found occurrence of the file is restored, and the restores for all the other occurrences of the file are overwritten.

Advanced

Click to select additional restore options.

Save As Script

Click to open the Save As Script dialog, which allows you to save this operation and the selected options as a script file (in XML format). The script can later be executed from the Command Line Interface using `qoperation execute` command.

When you save an operation as a script, each option in the dialog will have a corresponding xml parameter in the script file. When executing the script, you can modify the value for any of these XML parameters as per need.

To view the XML values for each of the options in the dialog, see the following:

- Command Line XML Options for Unix File System *i*DataAgents

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Job Initiation

Select from the following options. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the operation for which the information is being displayed.

Immediate

Run This Job Now

Specifies this job will run immediately.

Schedule

Specifies this job will be scheduled. When you click **Configure**, the Schedule Details dialog box will open and allow you to configure the schedule pattern.

Advanced Restore Options (General)

Use this dialog box to access additional restore options.

Automatically Detect Regular Expressions

This option allows you to use wildcard characters to specify the patterns for files and folders to be included in the restore. When selected, the system will recognize supported regular expressions (wildcards) in the specified **Source Path**. When cleared, the system will read the specified **Source Path** as literal.

> 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.

Skip Errors and Continue

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.

Restore device files as regular files

This option allows you to restore the actual data in the device node file of the raw partition to a regular file system file.

Use Exact Index

This option allows you to associate the media with the most recent index available in the CommCell.

Skip MountPoint Restore

Specifies whether to filter out mount points that are part of the backup data during the file system restore. When enabled, the file system restore will filter out the mount points from the backed up data. When disabled, mount points will also be restored during the file system restore.

Recover Apple Resource Fork Data

Specifies whether to restore encoded Apple resource fork data to your non-Macintosh file system.

Enforce Label Checking on Trusted Solaris

This option applies only to Solaris File System *i*DataAgent. This option specifies whether to check the label for the associated Solaris zone during a restore to a Trusted Solaris 10 system and therefore control whether the data will be restored to this system. If this option is enabled, this label is checked, and if the destination for the restored data is a zone other than the zone where the data was originally included, the restore will not complete successfully. If the option is disabled for this scenario, the data will be restored to the specified destination (zone).

This option is enabled by default if the destination client is a Solaris 10 client or higher except for scheduled restores following an upgrade, and it is not displayed if the source client is a non-Solaris client. The option is disabled for all other scenarios.

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Startup

Select from the following options. Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the operation for which the information is being displayed.

Priority

- **Use Default Priority**

  If selected, the default priority for this type of job will be used in determining how the Job Manager will allocate resources for this job.

- **Change Priority**

  Use this option to manually specify the priority for the job, between 0 (highest priority) and 999 (lowest priority). The Job Manager will use the priority setting when allocating the required resources. This is useful if you have jobs that are very important and must complete, or jobs that can be moved to a lower priority.

Start up in suspended state

Specifies that this job will start in the Job Controller in a suspended state and cannot run until the job is manually resumed using the **Resume** option. This option can be used to add a level of manual control when a job is started. For example, you could schedule jobs to start in the suspended state and then choose which scheduled jobs complete by resuming the operation started in the suspended state.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

Advanced Restore Options (Pre/Post)

Use this tab to establish pre/post processes for restore jobs.

Pre Recovery Command:

Displays the name/path of the process to run before the restore. You can use this space to enter a path for the backup process that will execute before this phase on the subclient . Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

Post Recovery Command:

Displays the name/path of the process to run after the restore. You can use this space to enter a path for the backup process that will execute before this phase on the subclient . Click **Browse** to search for and select the name/path of the process. The system allows the use of spaces in the name/path, provided they begin with an opening quotation mark and end with a closing quotation mark.

Run Post Restore Process for all attempts

Specifies whether this process will execute for all attempts to run the phase. Selecting this option will execute the specified process for all attempts to run the phase, including situations where the job phase is interrupted, suspended, or fails. Otherwise, when the checkbox is cleared the specified process will only execute for successful, killed, or failed jobs.

Advanced Restore Options (Copy Precedence)

Choose the copy from which you wish to recover or retrieve. Select from the following options:

Restore from copy precedence

When selected, the system recovers or retrieves data from the selected storage policy copy (**Synchronous Copy** or **Selective Copy**). If data does not exist in the specified copy, the data recovery or retrieve operation fails even if the data exists in another copy of the same storage policy.

When cleared, (or by default) the system recovers or retrieves data from the storage policy copy with the lowest copy precedence. If the data was pruned from the primary copy, the system automatically recovers or retrieves from the other copies of the storage policy in the following order:

1. Lowest copy precedence to highest copy precedence among all synchronous copies.
2. Lowest copy precedence to highest copy precedence among all selective copies (if your agent supports selective copies).

Once the data is found, it is recovered or retrieved, and no further copies are checked.

Copy Precedence

When selected, the system recovers or retrieves data from the copy with the specified precedence number.

Advanced Restore Options (Data Path)

Select the data path for the restore/recovery operation. You can specify the MediaAgent, Library, Drive Pool, and Drive from which the restore operation must be performed.

Use MediaAgent

Specifies the name of the MediaAgent that will be used to perform the restore operation. If necessary, you can change the name of the MediaAgent.

For example, if the library is shared and you wish to use a specific MediaAgent (instead of the system selected MediaAgent, or a MediaAgent which may be idle, or less critical) or if you know that the media containing the data you wish to restore is available in the library attached to the specified MediaAgent.

If the media containing the data is not available in the tape/optical library attached to the MediaAgent, the system will automatically prompt you to insert the appropriate media. In the case of a disk library, the operation will fail if the requested data is not available in the disk library attached to the specified MediaAgent.

Use Library

Specifies the name of the library that will be used to perform the restore operation. Use this option when you wish to restore using a specific library.

For example, if you know that the media containing the data you wish to restore is available in a specific library.

Use Drive Pool

Specifies the name of the Drive Pool that will be used to perform the restore operation. Use this option when you wish to restore using a specific Drive Pool.

To restore NAS data, select the drive pool type that was used to perform the backup, *i.e.*, if a drive pool associated with an NDMP Remote Server was used to

perform the backup, select a drive pool associated with an NDMP Remote Server. Similarly, if an NDMP drive pool was used, specify an NDMP drive pool.

Use Drive

Specifies the name of the drive in the drive pool that will be used to perform the restore operation. Use this option when you wish to restore using a specific Drive in the Drive Pool.

Use Proxy

Specifies the name of the proxy server that will be used to perform the restore operation. Use this option when you wish to restore using a proxy server.

Advanced Restore Options (Paths/Filters)

Modify Paths/Filters

Use this tab to modify the the paths of the selected data.

Source Item

Displays the data that is to be restored. If you previously browsed and selected backed up data for restoration, this pane lists the paths of the selected data. Click the **Add** button to type the path of the data to be restored. Select a listed path and click the **Delete** button to remove the path of data to be restored.

Filter Item

Displays the data that is to be filtered from the restore/recovery. If you previously browsed the backup data and deselected files/folders/directories that are children of **Source Item** directories, then this pane lists the paths of the selected data. You can use this space along with the **Add** button to exclude manually the path of data to be restored/recovered. You can also select an entry in this space and use the **Delete** button to remove a selected entry.

You can also use wildcard characters within this pane to specify file name patterns that you want to exclude from the restore/recover operation. The supported wildcard characters are:

* = any number or characters

? = any one character

[] = any range or set of characters

When wildcard characters are utilized in the filter path, they are automatically detected by the system. In the event that the actual file, folder, or directory name in the filter path contains a character that can be used as a wildcard, you can override wildcard auto-detection by adding an exclamation mark as the first character of your path (e.g., **`!/company/[test]`** for Unix-based systems). In these example, rather than treating the square brackets as a wildcard, the system would look for (and exclude from the restore/recovery) a folder or directory named **`[test]`**.

Advanced Restore Options (Encryption)

Pass-Phrase

Enter the pass-phrase that is currently assigned to the client, whose data you are restoring. Note that if you have changed the pass-phrase since you secured the client data, you need to provide the new pass-phrase here, not the old one.

Re-enter Pass-Phrase

Re-enter the pass-phrase for confirmation.

If you attempt an immediate restore of encrypted data that was pass-phrase protected without entering the pass-phrase here, the restore operation will fail.

If you have an exported pass-phrase set up, and you enter the pass-phrase under **Decryption**, you over-ride (not overwrite) the client properties pass-phrase. Thus, if you enter the pass-phrase incorrectly, the restore does not complete successfully.

Job Retry

Note that all the options described in this help may not be available and only the options displayed in the dialog box are applicable to the agent or operation for which the information is being displayed.

Enable Total Running Time

The maximum elapsed time, in hours and minutes, from the time that the job is created. When the specified maximum elapsed time is reached, as long as the job is in the "Running" state, it will continue; if the job is not in the "Running" state when the specified time is reached, Job Manager will kill the job.

Enable Number of Retries

The number of times that Job Manager will attempt to restart the job. Once the maximum number of retry attempts has been reached, if the job has still not

restarted successfully, Job Manager will kill the job. Note that this job-based setting will not be valid if restartability has been turned off in the Job Management Control Panel.

Kill Running Jobs When Total Running Time Expires

Option to kill the job when the specified Total Running Time has elapsed, even if its state is "Running". This option is available only if you have specified a Total Running Time.

Advanced Restore Options (Map)

Specify the restore of individual files to a specified destination using an external map file. The map file provides the list of files to be restored and the destination to which the files are to be restored. (See **Restore Data Using a Map File** in *Books Online* for detailed information.)

Use map file

Specifies whether the restore operation must be performed using a mapping file. Enable this option to specify the map file.

Map File Path

Specifies the name of the map file. Use the space to enter the path and name of the map file. Use the browse button to browse and select the appropriate map file.

Restore unmapped files

Specifies whether the restore operation must restore the unmapped files that were selected for restore, to the specified restore destination. *i.e.*, in-place restore or out-of-place restore. Clear this option to restore only those files that are included in the specified map file.

Rename all restore files with suffix

Specify a common suffix to be added to each file as it is restored. For Windows platforms, this suffix is appended to the filename (i.e., before the extension); for Unix/Mac platforms, the suffix is appended after the extension.

Advanced Recover Options (Browse Options)

Use this dialog box to specify advanced restore options.

Restore Deleted Items

Specifies that the restore/recovery operation will include data that was secured during all backup/archive operations, including deleted items.

Specify Time Range

Specifies to restore/recover data within a specified time zone and time threshold. Select the checkbox to enable this option. Clearing the checkbox disables this option. If this option is enabled, set the following parameters:

- **Time Zone** - Restores/recovers only those jobs within a specified time zone. Click the pull-down list and click the desired time zone.
- **Start Time** - Displays the start time for the restore/recovery operation. Click the pull-down arrow and click a date; use the up and down arrows to specify a time.
- **End Time** - Displays the end time for the restore/recovery operation. Click the pull-down arrow and click a date; use the up and down arrows to specify a time.

Alert

Use this tab to configure an alert for a schedule policy.

Configure Alert

- **Alert**

  The currently configured Alert.

- **Add/Modify Alert**

  When clicked, opens the Alert Wizard to configure alerts for this operation.

- **Delete Alert**

  When clicked, deletes any existing alerts that are already configured.

Security

Use this dialog box to:

- Associate this object with a user group.
- Disassociate this object from a user group.

Available Groups

Displays the names of the user groups that are not associated with this CommCell object.

Associated Groups

Displays the names of user groups that are associated with this CommCell object.