User Guide - NAS *i*DataAgent

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Overview - NAS *i*DataAgent

WHERE TO GO NEXT

Getting Started - NAS
Walks you through the process of installing and configuring the NAS *i*DataAgent.

INTRODUCTION

The NAS *i*DataAgent provides a simplified end-to-end backup and recovery solution for the data residing on a NAS File Server. In addition to complete protection of file system data for disaster recovery, the NAS *i*DataAgent also provides more granular backup and recovery options that operate seamlessly with your data protection.

KEY FEATURES

The NAS *i*DataAgent offers the following key features:

COMPREHENSIVE BACKUP AND RESTORE CAPABILITIES

The NAS *i*DataAgent provides the flexibility to backup and restore the data residing on various file servers. You can perform a full, incremental, or differential backup of the entire data at any point of time. The backup data can be restored to different environments such as file servers or client computers.

Backup and restore options include the following:

- NDMP 2-way: backup and restore using tape drives on the file server client.
- NDMP 3-way: backup and restore using tape drives on other file server clients.
- NDMP 3-way: backup and restore to media attached to a MediaAgent. This method is also sometimes referred to as NDMP Remote.

POINT-IN-TIME RECOVERY

In the event of a serious system failure, such as the breakdown of hardware, software, or operating systems, the NAS *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 of the data to be used for various data protection operations. SnapProtect backup works in conjunction with software and hardware snapshot engines to provide snapshot functionality for data protection operations.

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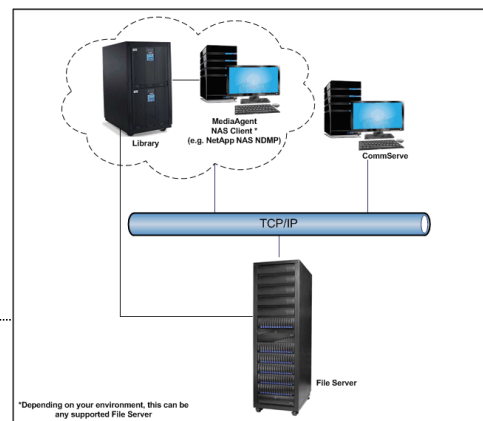
In addition, you can also schedule these reports to be generated and send them on email without user intervention.

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 NAS

SRM is integrated with NAS *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 NAS *i*DataAgent can be easily enabled with your backups to take advantage of these features.

FILE SYSTEM RESTORE ENABLER

The File System Restore Enabler allows NAS NDMP data that was backed up from a NetApp or EMC Celerra file server to be restored to a Windows or Unix computer. A file system restore is a cross-platform restore, where the data is restored to a computer with a different operating system e.g., data from a NetApp file server running ONTAP can be restored to a Windows computer.

TERMINOLOGY

The NAS documentation uses the following terminology:

CLIENT	The computer in which the *i*DataAgent is installed and contains the data to be secured.
BACKUPSET	A group of subclients which includes all of the data backed up by the *i*DataAgent.
SUBCLIENT	The NAS file system data within the backupset used for backup and restore operations.
FILE SERVER	A device used for backup or archival purposes.

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System Requirements - NAS *i*DataAgent

System Requirements | **Supported Features** | **Supported Vendors**

The following requirements are for the NAS *i*DataAgent:

MEMORY AND HARD DISK

See System Requirements - MediaAgent

> It is recommended that the MediaAgent computer also have additional physical memory available equaling 0.1% of the total backup size for the largest amount of data being backup up at any given time. (As an example, for 1 terabyte of backup data, you should have an additional 1 gigabyte of physical memory available.)

PERIPHERALS

DVD-ROM drive

Network Interface Card

MISCELLANEOUS

NETWORK

TCP/IP Services configured on the computer.

FILE SERVER

If media changers and/or tape drives are attached to the file server, all hardware (including the SAN networking hardware) must be of a type supported by the file server.

NAS CLIENTS

There is no separate software to install for the NAS Clients; all required components are installed automatically with the MediaAgent software. See System Requirements - MediaAgent for information on install information specific to the MediaAgent.

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 - NAS *i*DataAgent

| System Requirements | Supported Features | Supported Vendors |

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	✔	Includes several additional options in the **NAS Options** tab.
ADVANCED FILE SYSTEM IDATAAGENT OPTIONS	Automatic File System Multi-Streaming	✔	
	On Demand Data Protection Operation	✔	
	Restore by Jobs		
	Restore Data Using a Map File	✔	
	Comments		
ALERTS AND MONITORING	Global Alerts	✔	
	Job-Based Alerts*	✔	
	Comments		
AUTOMATIC UPDATES	Automatic Updates	✔	
	Comments		
BACKUP/ARCHIVE OPTIONS	Differential Backup	✔	
	Full Backup	✔	
	Incremental Backup	✔	
	Other Backup Types		
	Synthetic Full Backup		
	Comments	✔	Getting Started - NAS iDataAgent Backup
BACKWARD COMPATIBILITY	Version 7	✔	
	Version 8	✔	
	Version 9		
	Comments	✔	Automatically upgraded with the MediaAgent software. See Getting Started - NAS *i*DataAgent Deployment for more information.
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	✔	Subclient browse is not supported for NetApp C-mode clients.
	Use MediaAgent		
	View All Versions	✔	

	Comments	✔	See Supported Vendors Restoring all versions of the backup data is not supported.
CLUSTERING	Netware cluster		
	Unix Cluster		
	Windows - Microsoft Cluster (MSCS)		
	Windows - Non-Microsoft Cluster		
	Comments		
COMMAND LINE INTERFACE	Command Line Interface	✔	
	Comments		
COMMAND LINE INTERFACE - SPECIFIC COMMANDS	Qcreate - Backup set/SubClient	✔	
	Qcreate - Instance		
	Qdelete - Backup set/Subclient	✔	
	Qdelete - Client/Agent		
	Qlist globalfilter		
	Qmodify - instance		
	Qoperation - Backup	✔	
	Qoperation - move		
	Qoperation - Restore	✔	
	Comments		
COMMCELL MIGRATION	CommCell Migration	✔	
	Comments		
CONTENT INDEXING	Offline Content Indexing	✔	
	Comments	✔	Content indexing jobs of NAS NDMP data do not support multi streams and End User Search. **Offline Content Indexing** is supported on NetApp and Celerra file servers. BlueArc is not supported.
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 encryption is supported when backup operations are configured to utilize a MediaAgent with NDMP Remote Server.
DATA MULTIPLEXING	Multiplexing	✔	
	Comments	✔	**Data Multiplexing** is supported for non-NAS data when using file server or MediaAgent attached data paths. **Data Multiplexing** is supported for NAS *i*DataAgent when backup operations are configured to use a MediaAgent attached data path.
DEDUPLICATION	MediaAgent Deduplication	✔	
	Source Deduplication		
	Comments	✔	See FAQ - Deduplication to Disk for deduplication of NAS backups.
ERASE BACKUP/ARCHIVED DATA	Erase Data by Browsing		
	Erase Stubs		
	Comments		
GLOBAL FILTERS	Global Filters		
	Comments		
	Custom Package		

INSTALLATION			
	Decoupled Install		
	Remote Install	✔	
	Restore Only Agents		
	Silent Install		
	Comments	✔	Automatically installed with the MediaAgent software. See Getting Started - NAS *i*DataAgent Deployment for more information. The NDMP Remote Server software can be installed from the CommCell Console.
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	✔	Support for job restart or resume from point-of-failure is vendor based. Currently, only NetApp supports resume from Point-of-Failure.
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	✔	Media for the files to restore are detected, but additional media that the file server may request during restore may not be detected. For example, the first media for a job will likely be needed.
MULTI INSTANCING	Multi Instance		
	Comments		
PRE/POST PROCESSES	Pre/Post Process with Data Protection and Recovery	✔	
	Comments		
RESTORE/RECOVER/RETRIEVE DESTINATIONS	Cross-Application Restores (Different Application version)		
	Cross-Platform Restores - Different Operating System	✔	
	Cross-Platform Restores - Same Operating System - Different Version	✔	
	In-place Restore - Same path/ destination - Same Client	✔	
	Out-of-place Restore - Different path/ destination	✔	
	Out-of-place Restore - Same path/ destination - Different Client	✔	
	Restore Data Using a Map File	✔	
	Restore to Network Drive /NFS-Mounted File System		
	Comments	✔	See Advanced - NAS iDataAgent Restore for this *i*DataAgent.
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	✔	**Data Verification** is supported for NetApp clients.
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	✔	The NAS *i*DataAgent is automatically upgraded with the MediaAgent software.
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

Supported Vendors - NAS *i*DataAgent

System Requirements | Supported Features | Supported Vendors

The following table lists NAS features and any exceptions per vendor.

FEATURE	BLUEARC	DELL	EMC CELERRA	EMC VNX/VNXE	HEWLETT PACKARD	HITACHI	IBM SONAS/ STORWIZE	ISILON	NETAPP	ONSTOR	PILLAR DATA SYSTEMS	SUN
LIBRARIES AND POOLS												
NAS-ATTACHED LIBRARIES	√		√	√	√	√*		√	√	√	√	√
NAS-ATTACHED DRIVE POOLS	√		√	√	√	√*		√	√	√	√	√
BACKUP												
BACK UP FROM SNAPSHOT	√		√	√		√		√				
BACK UP QUOTAS	√					√						
BACKUP UP OFFLINE DATA	√		√	√								
VOLUME BASED BACK UP			√	√								
EXCLUSIVE BACK UP						√						
BLOCK BACK UP						√					√	
READAHEAD PROCESSES	√											
SNAPSHOT TO BACK-UP							√		√			
SNAPSHOT EXPIRATION							√					
BROWSE												
BROWSE FROM COPIES	√	√	√	√	√	√	√	√	√	√	√	√
BROWSE THE LATEST DATA	√	√	√	√	√	√	√	√	√	√	√	√
EXCLUDE DATA BEFORE	√	√	√	√	√	√	√	√	√	√	√	√
IMAGE BROWSE						√			√	√		
NO IMAGE BROWSE	√	√	√	√	√	√	√	√		√	√	√
PAGE SIZE	√	√	√	√	√	√	√	√	√	√	√	√
SPECIFY BROWSE PATH	√	√	√	√	√	√	√	√	√	√	√	√
SPECIFY BROWSE TIME	√	√	√	√	√	√	√	√	√	√	√	√
USE MEDIAAGENT	√	√	√	√	√	√	√	√	√	√	√	√

RESTORE												
DIRECT ACCESS RESTORE	√	√	√**	√	√	√	√	√	√	√	√	√
OVERWRITE	√	√			√		√			√		
TWO-WAY RESTORE	√		√	√	√	√	√		√	√	√	√
THREE-WAY RESTORE	√	√	√	√	√	√	√	√	√	√		√
RECURSIVE RESTORE			√	√		√				√		
EXCLUSIVE RESTORE						√						
FILE SYSTEM RESTORE			√	√					√			
RESTORE USER AND GROUP QUOTAS										√		
RESTORE ENABLE 8.3 NAMES										√		
RESTORE SUBTREE QUOTAS										√		
RESTORE QTREE CONFIGURATION AND USAGE										√		
SUBCLIENT												
SUBCLIENT CONTENT	√	√	√	√	√	√	√	√	√	√	√	√

*Supported for Hitachi 06-0x Operating Systems (or greater)

**EMC's Celerra enhanced Direct Access restore of a directory (DDAR) is supported on DARTOS 5.5 and later. Prior to DARTOS 5.5, direct access restore of a directory was supported but not the enhanced version.

Getting Started - NAS *i*DataAgent Deployment on Windows

WHERE TO INSTALL

Install the software on a client computer that is connected to a NAS file server that you want to protect and satisfies the minimum requirements specified in the System Requirements.

To backup the NAS data, you need to install the MediaAgent software which includes the NAS *i*DataAgent. If the library is attached to the MediaAgent, you need to install the NDMP Remote Server software.

The following procedures describe the steps for installing both the MediaAgent and the NDMP Remote Server. You can skip this installation step if you have already installed the MediaAgent.

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 install remotely on a client computer.

BEFORE YOU BEGIN

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

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

METHOD 1: INTERACTIVE INSTALL

1. Log on to the client computer as Administrator or as a member of the Administrator group on that computer.

2. Run **Setup.exe** from the **Software Installation Package**.

3. Select the required language.

    Click **Next**.

4. Select the option to install software on this computer.

    The options that appear on this screen depend on the computer in which the software is being installed.

5. Select **I accept the terms in the license agreement**.
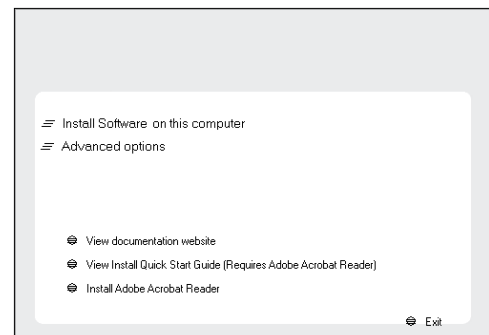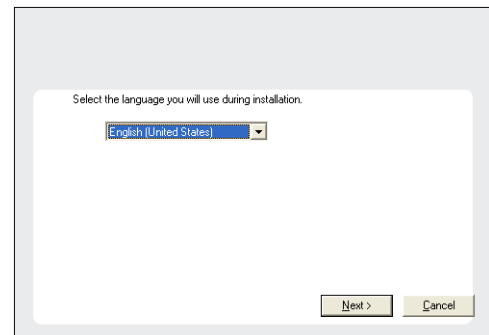
    Click **Next**.

6. Expand **MediaAgent Modules** and select **MediaAgent**.

> If the library is attached to the MediaAgent, expand **MediaAgent Modules** and select **NDMP Remote Server**.

Expand **Client Modules** | **Backup & Recovery** | **File System** and select **Windows File System** *i*DataAgent.

Click **Next**.

7. If this computer and the CommServe is separated by a firewall, select the **Configure firewall services** option and then click **Next**.

For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.

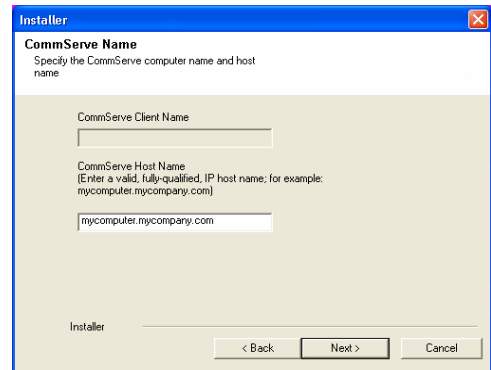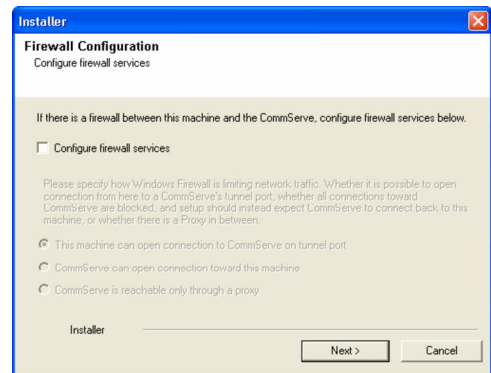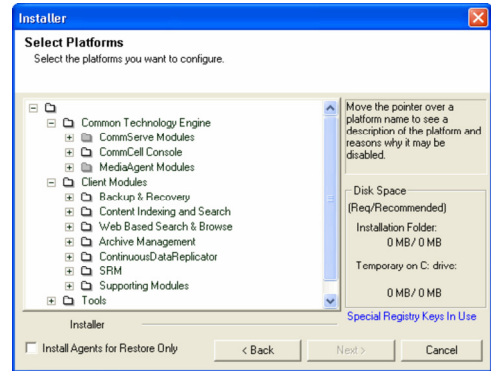If firewall configuration is not required, click **Next**.

8. Enter the fully qualified domain name of the **CommServe Host Name**.

Click **Next**.

> Do not use space and the following characters when specifying a new name for the CommServe Host Name:
>
> \|`~!@#$%^&*()+=<>/?,[]{}:;'"

9. Click **Next**.

10. 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.

11. Verify the default location for software installation.

Click **Browse** to change the default location.
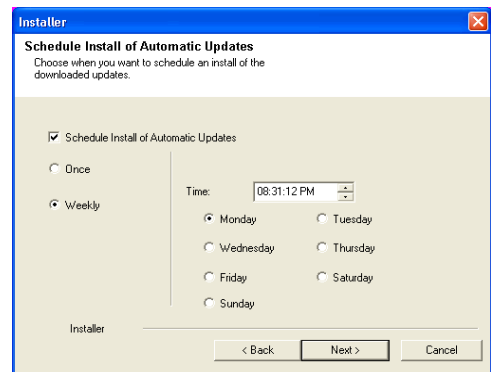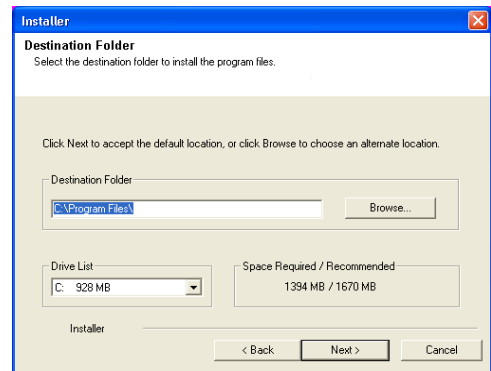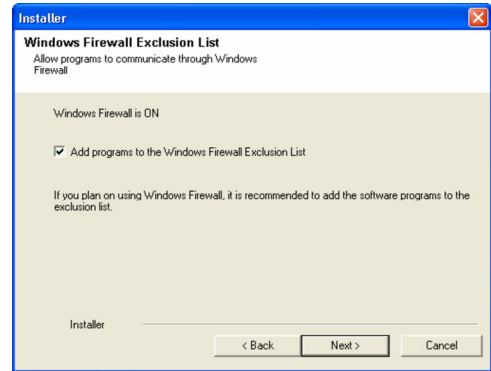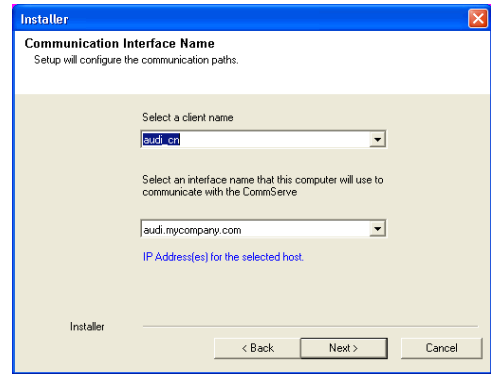
Click **Next**.

● Do not install the software to a mapped network drive.
● Do not use the following characters when specifying the destination path:

/ : * ? " < > | #

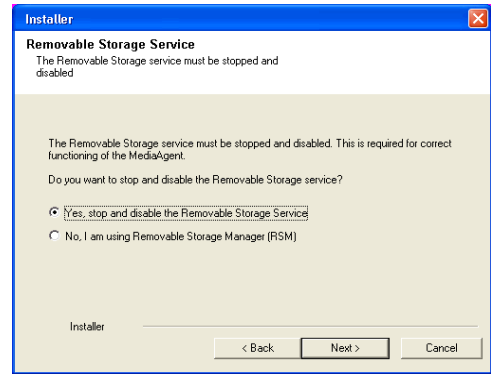It is recommended that you use alphanumeric characters only.

12. Click **Next**.

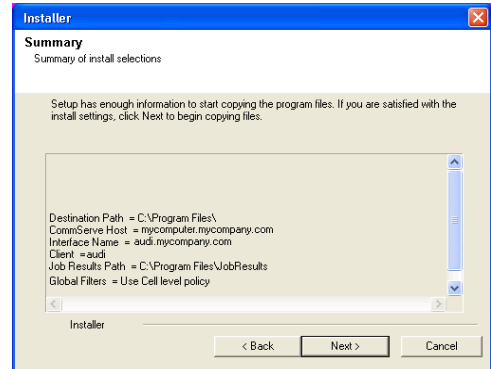13. Click **Next**.

14. Click **Next**.

15. Click **Next**.

16. Click **Finish**.
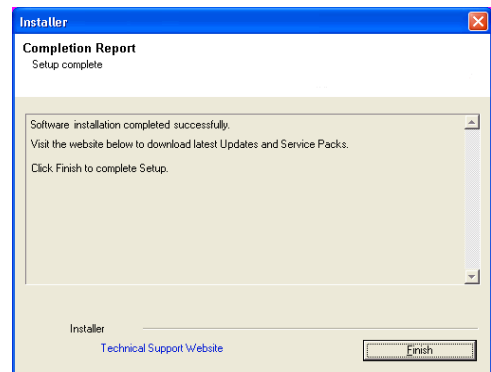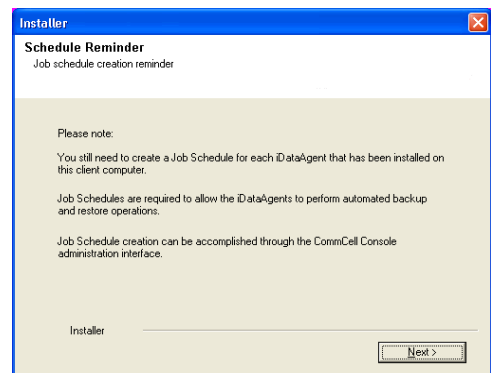
METHOD 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

1. From the CommCell Browser, select **Tools** | **Add/Remove Software** | **Install Software.**
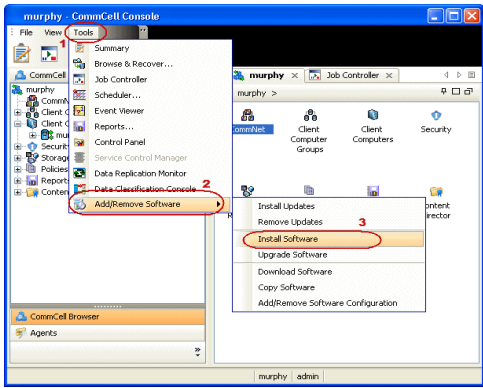
2. Click **Next**.

3. Select **Windows**.

    Click **Next**.
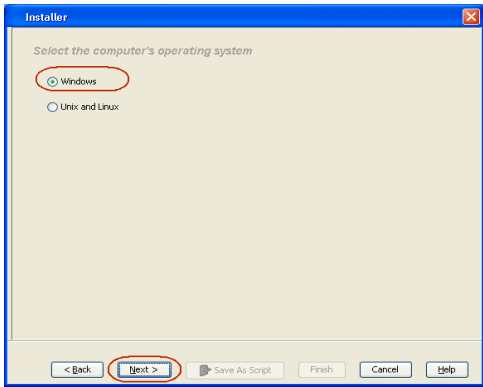
4. Select **Manually Select Computers**.

    Click **Next**.
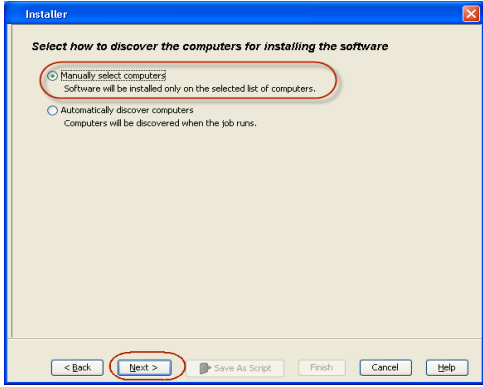
5. Enter the fully qualified domain name of the computer.

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

    Click **Next**.
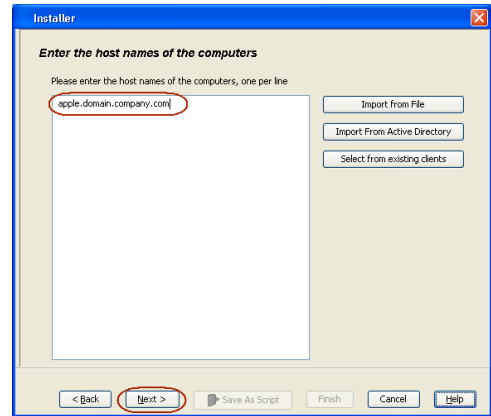
6. Click **Next**.

7. Specify **User Name** and **Password** that must be used to access the client computer. Click **Next**.

    The user must be an Administrator or a member of the Administrator group on that computer.
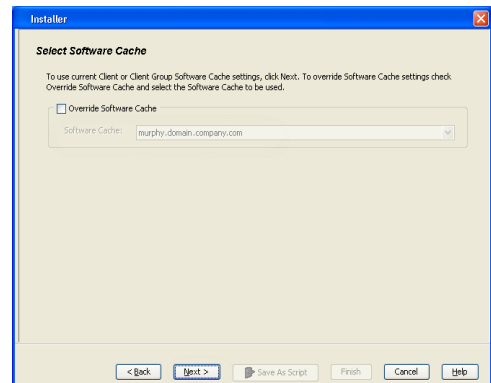
8. Expand **Client Modules** | **Backup & Recovery** | **File System** and select **Windows File System** *i***DataAgent**.

    Expand **MediaAgent Modules** and select **MediaAgent**.

    If library is attached to the MediaAgent, expand **MediaAgent Modules** and select **NDMP Remote Server**.
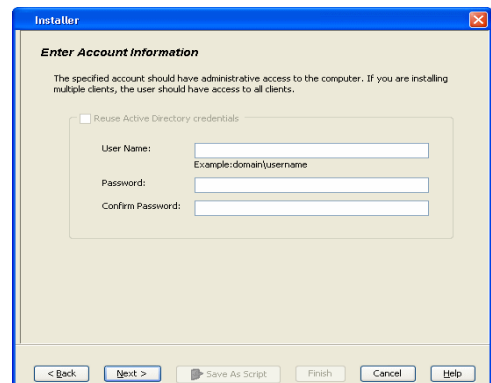
    Click **Next**.

9. ● Select **Client Group** from **Available** and click **Add**.
    ● From **Storage Policy to use** list, click storage policy.
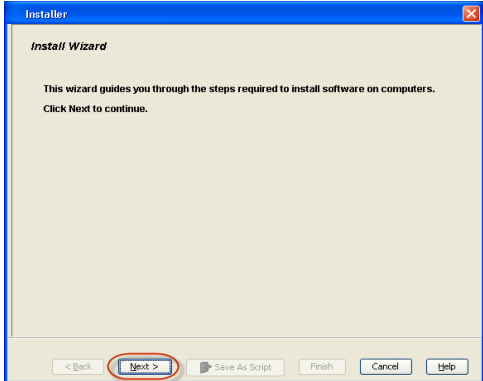   ● Click **Next**.
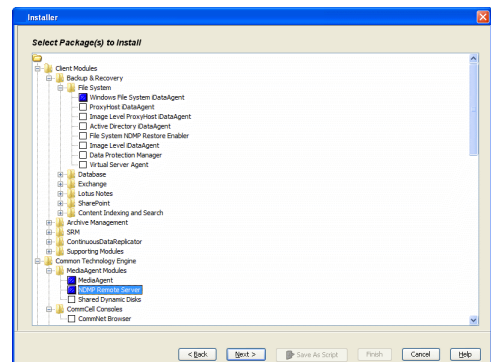
10. Click **Next**.

11. Click **Immediate**.

Click **Next**.

12. Click **Finish**.

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

Getting Started - NAS *i*DataAgent Deployment on UNIX

SKIP THIS PAGE IF YOU ARE NOT INSTALLING THIS AGENT ON UNIX.

Click Next ► to continue with the deployment.

WHERE TO INSTALL

Install the software on a client computer that is connected to a NAS file server that you want to protect and satisfies the minimum requirements specified in the System Requirements.

To backup the NAS data, you need to install the MediaAgent software which includes the NAS *i*DataAgent. If the library is attached to the MediaAgent, you need to install the NDMP Remote Server software.

The following procedures describe the steps for installing both the MediaAgent and the NDMP Remote Server. You can skip this installation step if you have already installed the MediaAgent.

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 install remotely on a client computer.

BEFORE YOU BEGIN

Download Software Packages
Download the latest software package to perform the install.
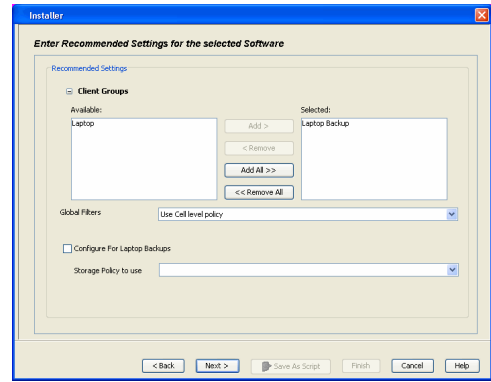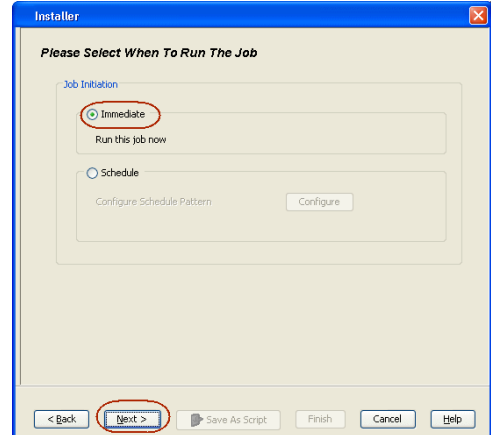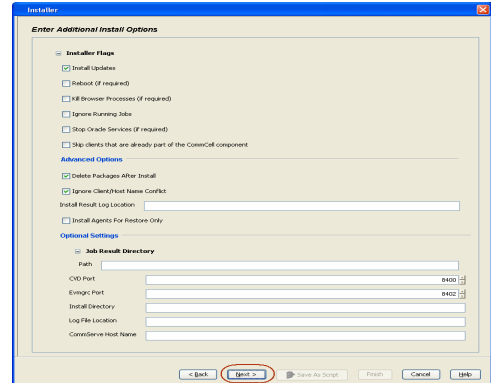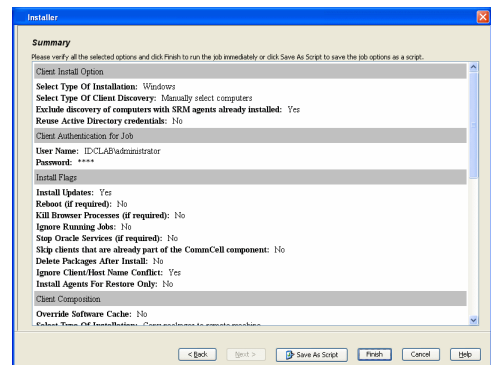
Verify System Requirements
Make sure that the computer in which you wish to install the software satisfies the System Requirements.

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 your are installing the software from CD, run the following command to mount the CD:

   ```
   mount -t iso9660,udf /dev/cdrom /mnt/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. 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.

   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]
```

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 number associated with the **Unix File System** *i***DataAgent**, **MediaAgent** and press **Enter**.

   > If the library is attached to the MediaAgent, type number associated with the **NDMP Remote Server**.

```
Install Calypso on physical machine angel

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

[ ] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) MediaAgent [1301] [CVGxMA]
[ ] 3) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 4) Documentum iDataAgent [1126] [CVGxDctmIDA]
[ ] 5) Oracle iDataAgent [1204] [CVGxOrIDA]
[ ] 6) SAP for Oracle [1205] [CVGxOrSAP]
[ ] 7) SAP for MaxDB [1206] [CVGxSAPMAXDB]
[ ] 8) Informix iDataAgent [1201] [CVGxIfIDA]
[ ] 9) Sybase iDataAgent [1202] [CVGxSybIDA]
[ ] 10) DB2 iDataAgent [1207] [CVGxDB2]
[ ] 11) MySQL iDataAgent [1208] [CVGxMySQL]
[ ] 12) PostGres iDataAgent [1209] [CVGxPostGres]
[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
>) >>>>>>>>>>>> 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: 1 20
```

10. 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.

[X] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[X] 2) MediaAgent [1301] [CVGxMA]
[ ] 3) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 4) Documentum iDataAgent [1126] [CVGxDctmIDA]
[ ] 5) Oracle iDataAgent [1204] [CVGxOrIDA]
[ ] 6) SAP for Oracle [1205] [CVGxOrSAP]
[ ] 7) SAP for MaxDB [1206] [CVGxSAPMAXDB]
[ ] 8) Informix iDataAgent [1201] [CVGxIfIDA]
[ ] 9) Sybase iDataAgent [1202] [CVGxSybIDA]
[ ] 10) DB2 iDataAgent [1207] [CVGxDB2]
[ ] 11) MySQL iDataAgent [1208] [CVGxMySQL]
[ ] 12) PostGres iDataAgent [1209] [CVGxPostGres]
[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
>) >>>>>>>>>>>> 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
```

11. Press **Enter**.

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

12. 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
```

13. Press **Enter**.

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

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

> 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]

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

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

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

  Do not use the following characters when specifying the path:

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

> 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]

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

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

> Please specify where you want to keep Calypso log files.
>
> It must be a local directory and there should be at least 100MB of free space available. All log files will be created in a "calypso/Log_Files" subdirectory, so if you enter "/var/log", the logs will actually be placed into "/var/log/calypso/Log_Files".
>
> Log Directory: [/var/log]

16. Press **Enter**.

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

17. 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 ...

18. 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]

19. 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]

20.   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.

21.   Type **3** and press **Enter**.

```
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

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 2: INSTALL SOFTWARE FROM COMMCELL CONSOLE

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**.
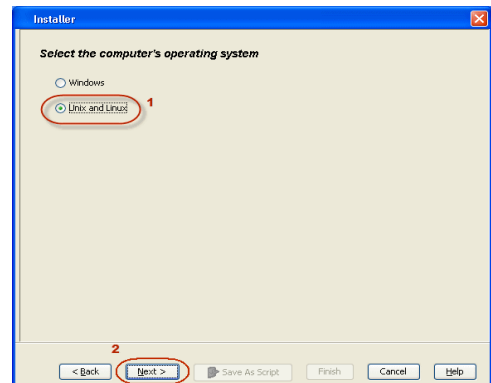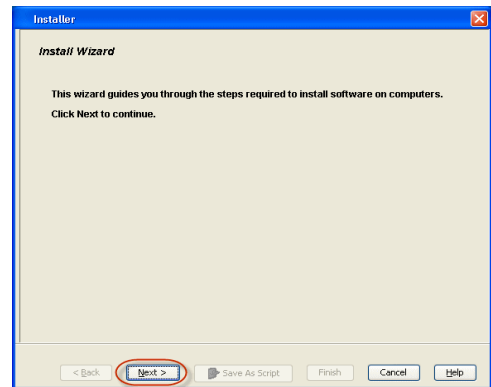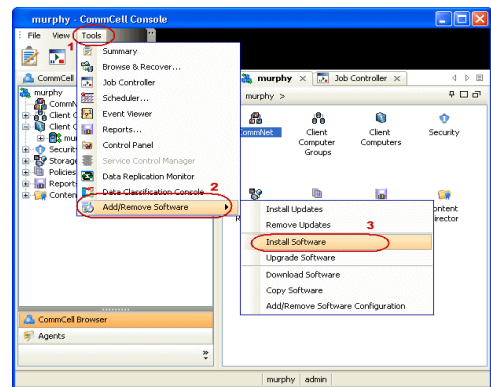
4.   Select **Manually Select Computers** ,and then click **Next**.
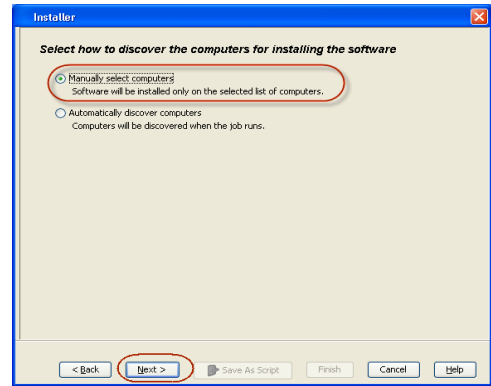
5.   Enter the fully qualified domain name of the computer in which you wish to install.

For example: `apple.domain.company.com`
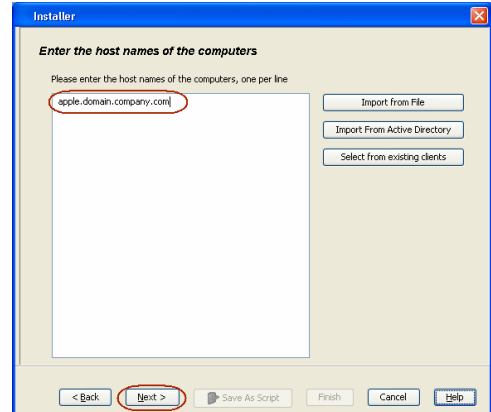
Click **Next**.
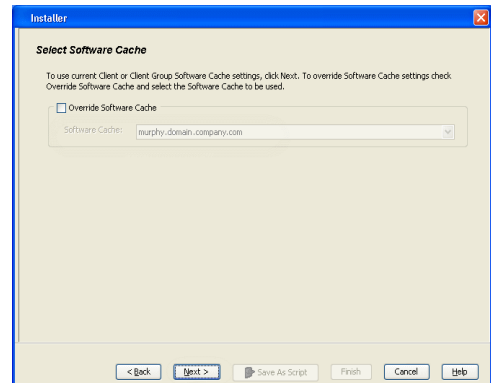
6.   Click **Next**.

7.   Type **User Name** and **Password** that must be used to access the client computer.

Click **Next**.
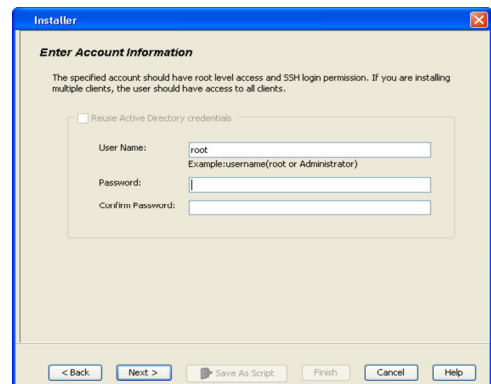
8.   Expand **Client Modules** | **Backup & Recovery** | **File System** and select **Unix File System** *i***DataAgent**.

Expand **MediaAgent Modules** and select **MediaAgent**.

> If the library is attached to the MediaAgent, expand **MediaAgent Modules** and select **NDMP Remote Server**.

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**.
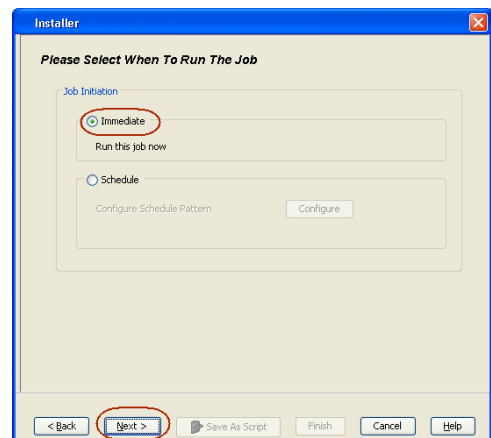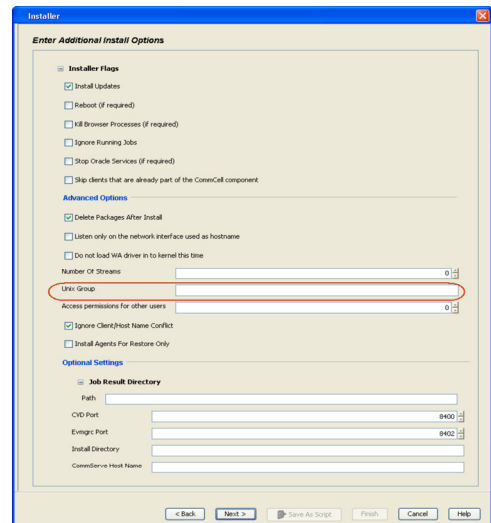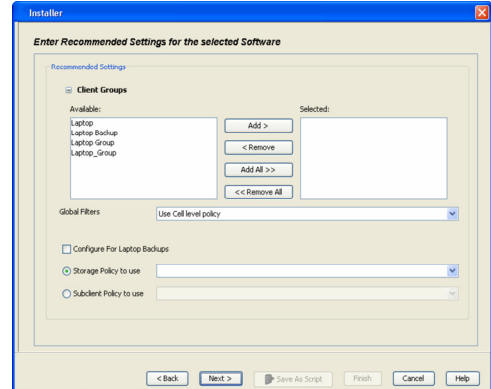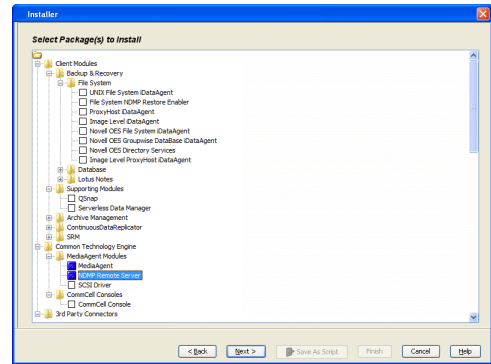
12. Click **Finish**.
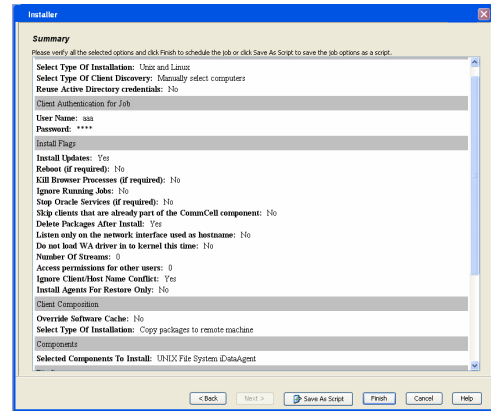
13. You can track the progress of the job from the **Job Controller** or **Event Viewer** window.
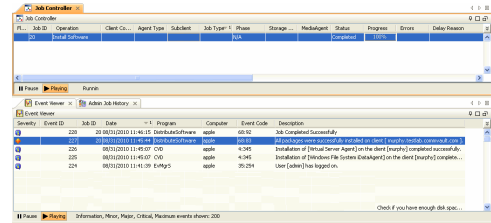
14. Once the job is complete, right-click the **<CommServe>**, point to **View**, and then click **Admin Job History**.
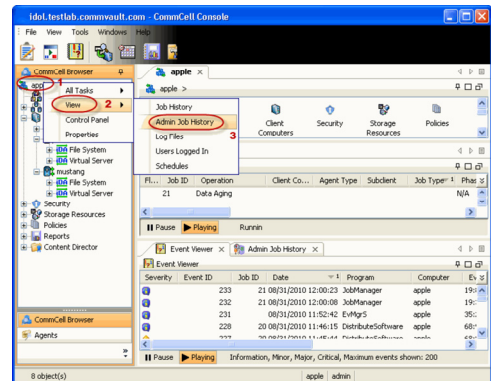
15. Select **Install/Upgrade/Remove Software**.

Click **OK**.
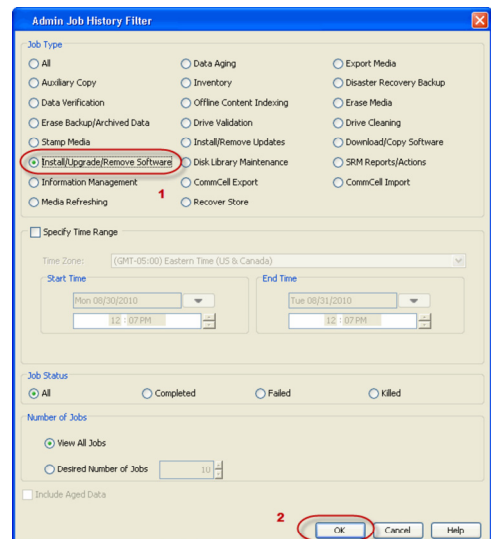
16. You can view the following details about the job by right-clicking the job:
- Items that succeeded during the job
- Items that failed during the job
- Details of the job
- Events of the job
- Log files of the job
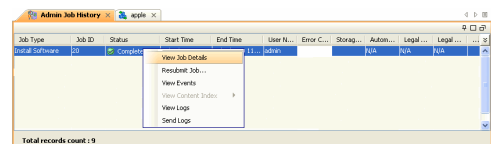
Getting Started - NAS *i*DataAgent Configuration

ADD A NAS CLIENT

1.
- From the CommCell Browser, right-click **Client Computers**.
- Select **New Client**.

2.
- Select **NAS Client** from the list.
- Click **OK**.

3.
- Enter the NAS file server in the **NDMP Server Hostname** field.
- Enter the user account used to access the storage device in the **NDMP Login** field.
  - For NetApp, type **root**.
  - For EMC Celerra, type **ndmp**.
  - For all other file servers, use any valid login.
- In the **NDMP Password** field, enter the password for the login account.
- Click **Detect**. The system automatically populates the **Vendor**, **Hardware OS Revision**, and **Listen Port** information.

4. Click **OK**.

Depending on the File Server you are using, your screen may look different from the example shown.

5. In the CommCell Browser, confirm that the NAS client was added under **Client Computers**.
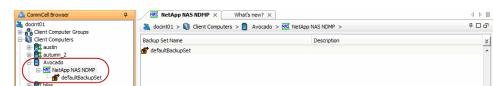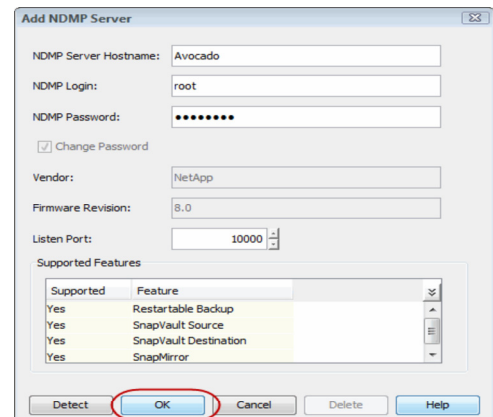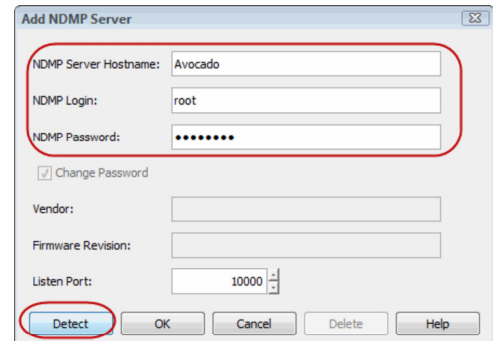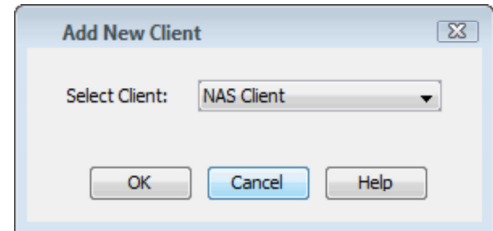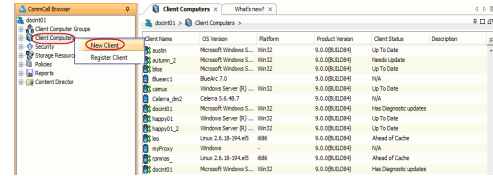
CONFIGURE LIBRARIES AND DRIVES ATTACHED TO NAS FILE SERVER USING AUTOMATIC DETECTION

These steps are required only if the file server has tape drives attached to it. Backups can be performed to tape drives on other file servers or to data paths on the MediaAgent.

6. From the **Tools** menu in the CommCell Console, click **Control Panel**.

7. Double click **Library & Drive Configuration**.
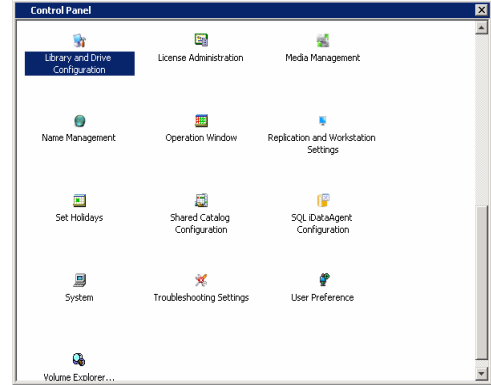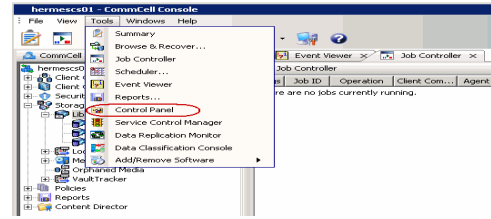
8.
- Under **Available MediaAgents**, select the MediaAgent and click **Add**.
- Click **OK**.
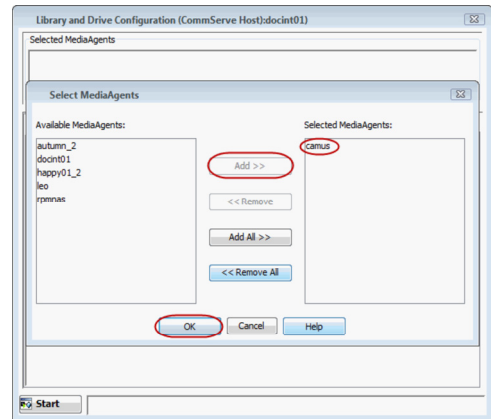
9.
- Click **Start**.
- Select **Detect/Configure Devices...**
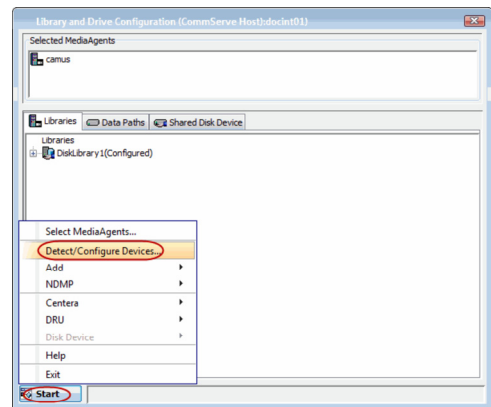
10.
- Click **NDMP Devices**. The **MediaAgent** that controls the library is displayed.
- Click **OK**.

11.
- Under **Available NDMP Servers**, select the name of the file server added in step 3 and click **Add**.
- Click **OK**.
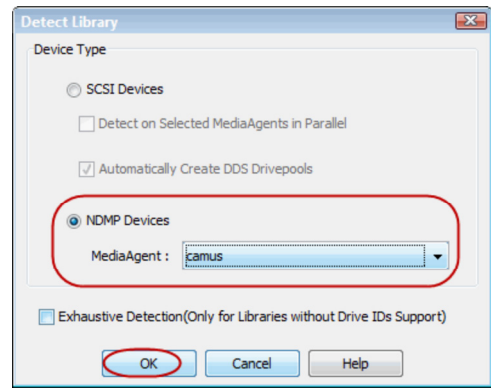
12. Click **Yes**. The system will detect the devices and mount the media in the drives to verify the correct drive-to-library mapping.
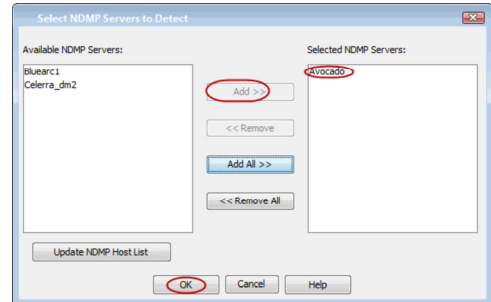
13. Click **Close**.
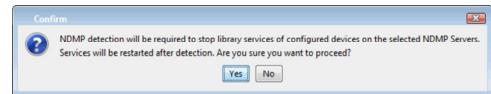
14. Click **OK**.
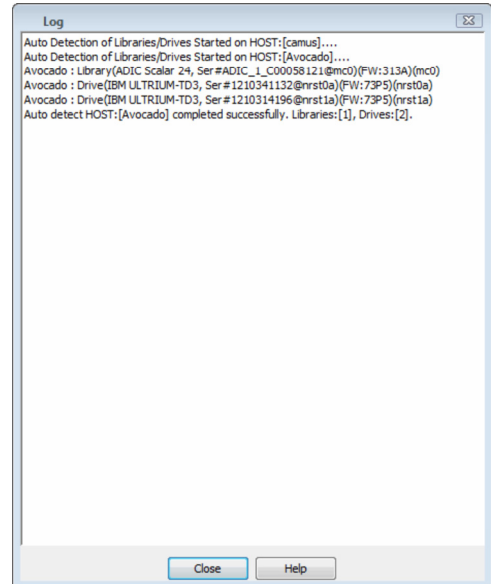
15. Right-click the library and select **Configure**.

16.
- Click **Library and all drives** to configure all the drives within the library.
- Click **OK**.
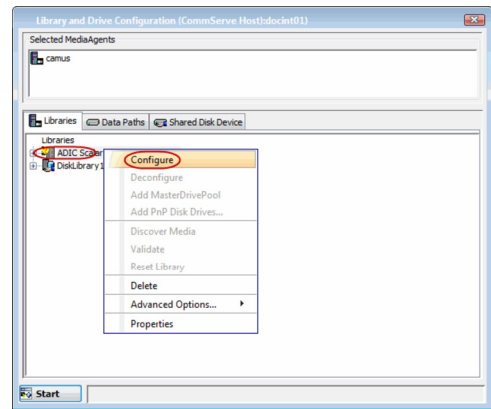
17. Click **Yes**.
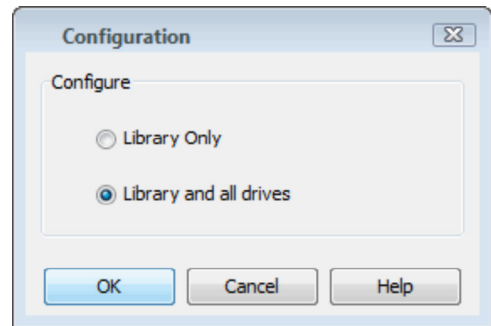
18. Select **Default Media Type** from the list and click **Yes**.
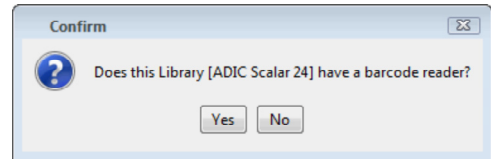
19. The status of the library changes to **Configured**.

If you chose to configure all associated drives, the status of the drives also changes to **Configured**.

The **Libraries** tab provides the physical view of the devices (library and drives).
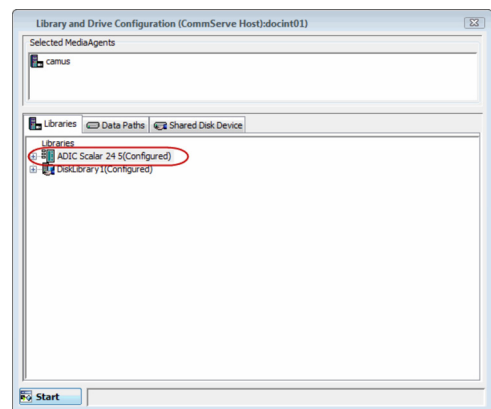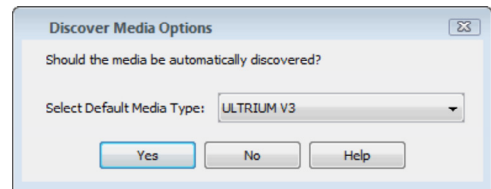
The **Data Paths** tab provides a logical view of the data path used to access the devices - library, master drive pool, drive pool, drive.
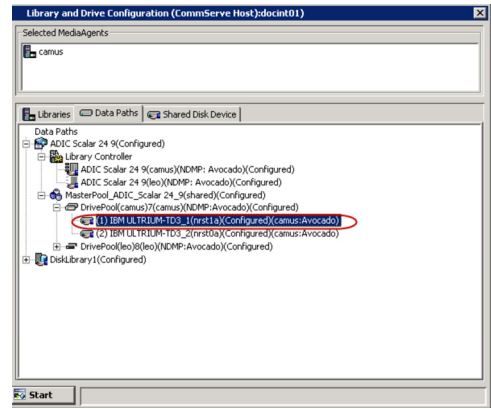
CREATE STORAGE POLICY AND ASSIGN TO SUBCLIENT

You can either use an existing storage policy or create a new one. If you create a new storage policy, you can select the library where you want the data to be written, including libraries for tapes that are attached to file servers, or libraries for media that are attached to MediaAgents.

20.
- If you want to use an existing storage policy, skip to step 21.
- From the CommCell Browser, select **Policies**.
- Right-click **Storage Policies** and select **New Storage Policy**.
- Follow the prompts displayed in the Storage Policy Wizard. The required options are mentioned below:
  - Select the Storage Policy type as **Data Protection and Archiving** and click **Next**.
  - Enter the name in the **Storage Policy Name** box and click **Next**.
  - From the **Library** list, select the name of a library and click **Next**.
  - From the **Drive Pool**, select the drive pool that for the MediaAgent as shown in step 19 and click **Next**.
  - Click **Next**.
  - Click **Next**.
  - Click **Next**.
  - Review the details and click **Finish** to create the Storage Policy.
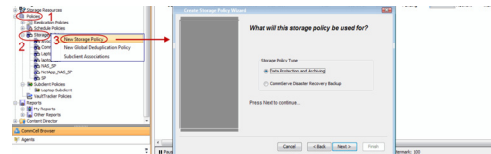
21.
- From the CommCell Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP | defaultBackupSet**.
- Right-click the **default** subclient and then click **Properties**.
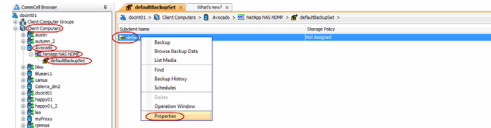
22.
- Click the **Storage Device** tab.
- In the **Storage Policy** box, select the Storage Policy created in step 20.
- Click **OK**.
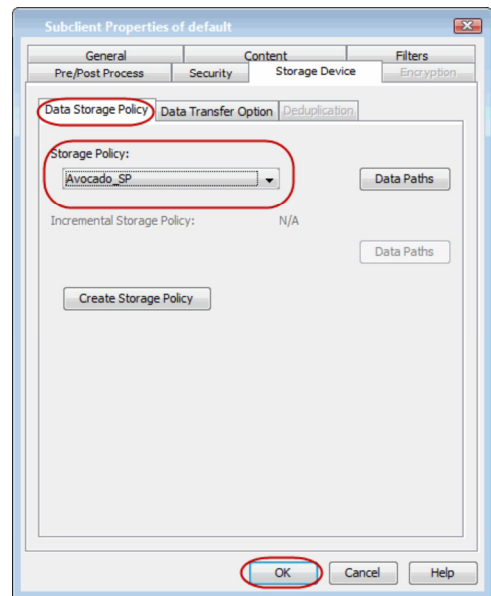
◀ Previous   Next ▶

Getting Started - NAS *i*DataAgent Backup

◀ Previous   Next ▶

WHAT GETS BACKED UP	WHAT DOES NOT GET BACKED UP
All contents on a file server	

1. ● From the CommCell Console, navigate to **<Client>** | **<File Server>** **NAS NDMP** | **defaultBackupSet**.
   ● Right-click the **Subclient** and click **Backup**.
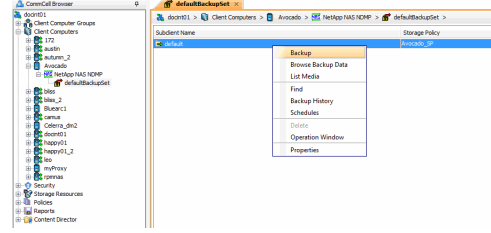
2. ● Select **Full** as backup type.
   ● Click **OK**.
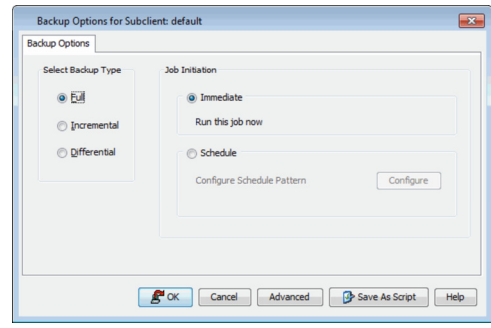
3. You can track the progress of the job from the **Job Controller** window.
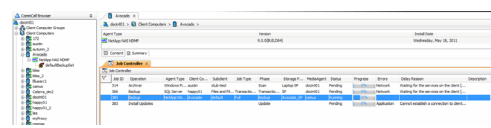
4. Once job is complete, view the details of job from the **Job History**.
   Right-click the client computer, click **View** | **Job History**.
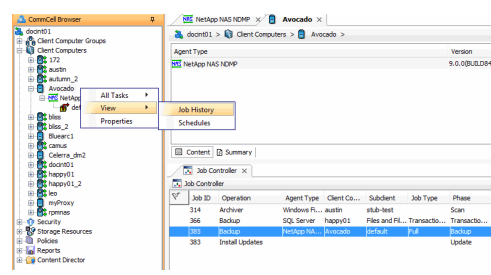
5. Click **OK**.
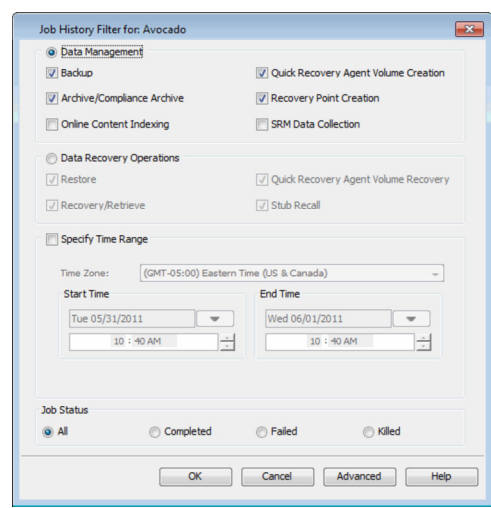
6. Right-click the job to:
   ● Browse the NAS data that was backed up.
   ● Resubmit the job.

- View the job details.
- View media associated with the job.
- View events associated with the job.
- View backup items (displays the NAS data that was backed up).
- View or send the log file associated with the job.

Getting Started - NAS *i*DataAgent Restore

PERFORM A RESTORE

As restoring your backup data is very crucial, it is recommended that you perform a restore operation immediately after your first full backup to understand the process.

The following sections describe the steps for restoring the data of a volume to a different location in the file server.

1.
   - From the CommCell Console, navigate to *<Client>* | *<File Server>* **NAS NDMP**.
   - Right-click the default backup set and click **All Tasks** | **Browse Backup Data**.
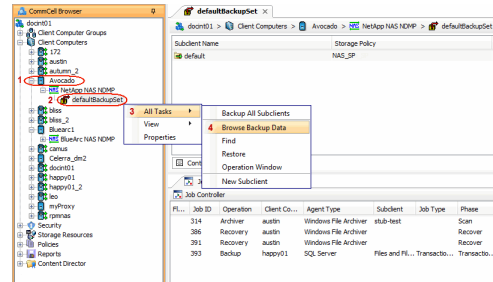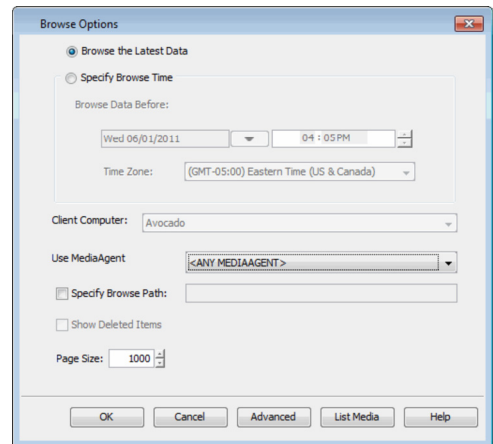
2. Click **OK**.

3.
   - Expand the default backup set node in the left pane. Select the volume containing the data you want to restore.
   - Click **Recover All Selected**.
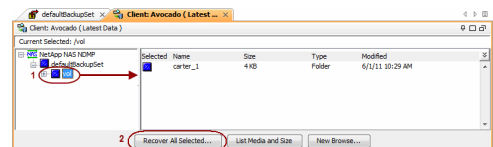
4.
   - Clear the **Restore to same folder** checkbox.
   - Specify the destination path by clicking **Browse**.
   - Click **OK**.

   Depending on the File Server you are using, your screen may look different from the example shown.
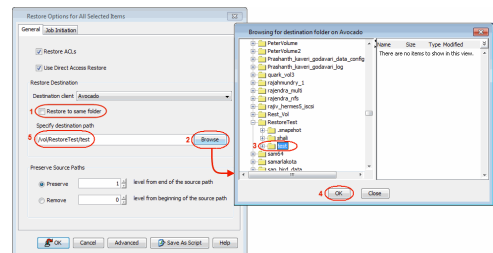
5. You can track the progress of the job from the **Job Controller** window.
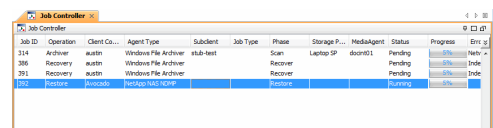
6. Once the restore job has completed, right-click the backup set and click **View** | **Restore History**.

7. Click **OK**.
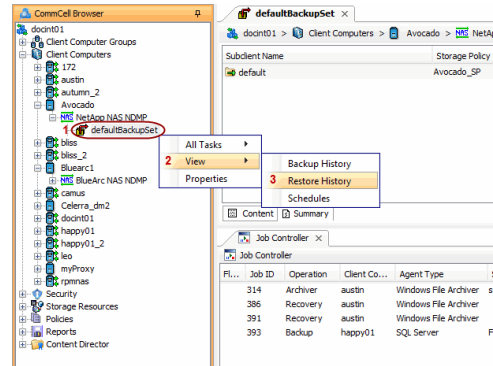
8. You can view the following details about the job by right-clicking the job:
   - View Restore Items

     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
   - View Job Path
   - Send Logs
   - Resubmit Job

9. Verify that the restored files/folders of the volume are available in the restore destination specified during step 4.
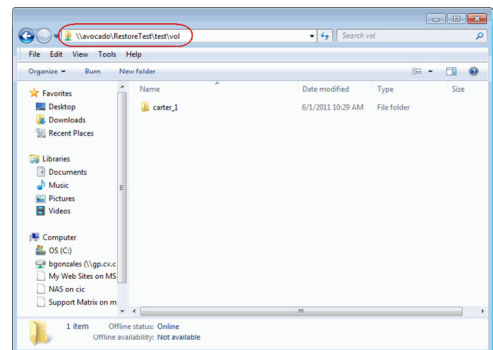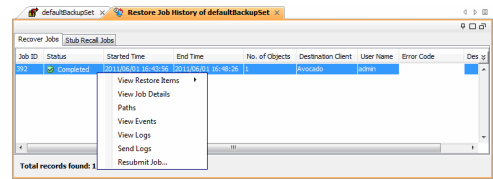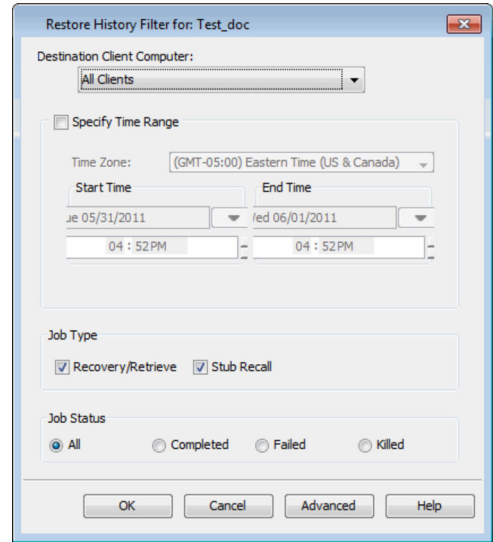
CONGRATULATIONS - YOU HAVE SUCCESSFULLY COMPLETED YOUR FIRST BACKUP AND RESTORE.

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

Advanced Configuration - NAS *i*DataAgent

TABLE OF CONTENTS

UNDERSTANDING THE COMMCELL CONSOLE

NAS *i*DataAgent uses the following main components to perform backup and restore operations from the CommCell Console.

Backup Set - collective information of all the data that needs to be backed up for the client.

Subclient - defines the data to be backed up.
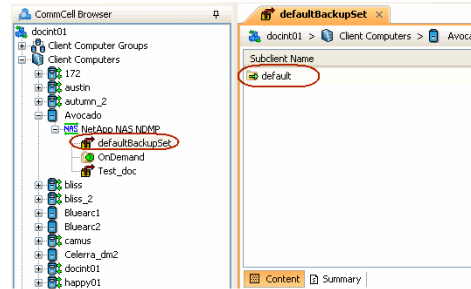
CONFIGURING USER DEFINED BACKUP SETS

A default backup set is created as soon as the NAS client is added. The default backup set includes a default subclient which will backup all the data in the file server.

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

CREATING A USER DEFINED BACKUP SET

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

2. Right-click the **<*File Server*> NAS NDMP** and select **All Tasks** | **Create New Backup Set**.

   If you create a user defined backup set, you cannot perform incremental or differential backups for any backup set. However, for **NetApp NAS NDMP** clients, there are no limitations on the type of backups that can be performed for the default backup set.
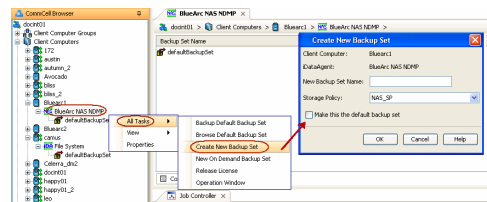
3. In the **New Backup Set Name** box, type a name.

4. Click **OK**.

CREATING AN ON DEMAND BACKUP SET

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.

CREATING A CONTENT FILE

Content for On Demand backups is defined through a **Content File**, which is a text file that defines the location of the data that you want to protect. The Content File contains the fully qualified paths from the root directory to the directories and devices which you want to back up. The Content File must be placed on the CommServe or the MediaAgent.

The following examples demonstrate the specific format for entries in the Content File for NetApp File Server:

`/vol/vol0/Dir1`

`/vol/vol0/Dir2`

The following examples demonstrate the specific format for entries in the Content File for Celerra File Server

`/fs1/Dir1`

`/fs1/Dir2`

Do not use filters, wildcards, or regular expressions in the Content File.

USING THE CONTENT FILE STORED ON A MEDIAAGENT

If you want to use the content file stored on a MediaAgent, create the following registry key on the MediaAgent:

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

2. Right-click the *<MediaAgent>* 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** box, type `OnDemandLocalFilePath`.

6. In the **Location** list, type `HKEY_LOCAL_MACHINE\SOFTWARE\CommVault Systems\Galaxy\Instance<xxx>\`

   If you are creating this registry key on a Unix client, in the **Location** list, type `/etc/CommVaultRegistry/Galaxy/Instance<xxx>/NAS/.properties`
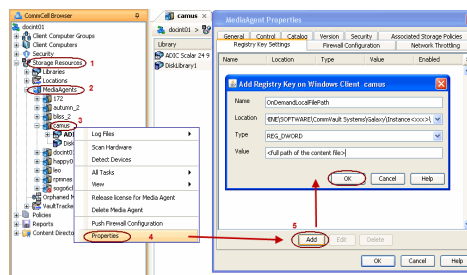
5. In the **Type** list, select `REG_DWORD`.

6. In the **Value** field, type the full path of the content file.

7. Click **OK**.

CREATING ON DEMAND BACKUP SET

After creating the Content File defining the content to be backed up, create an On Demand Backup Set.

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

2. Right-click the *<File Server>* **NAS NDMP** and select **All Tasks** | **New On Demand Backup Set**.

3. In the **New Backup Set Name** box, type a name (up to 32 characters).

4. Click **OK**.

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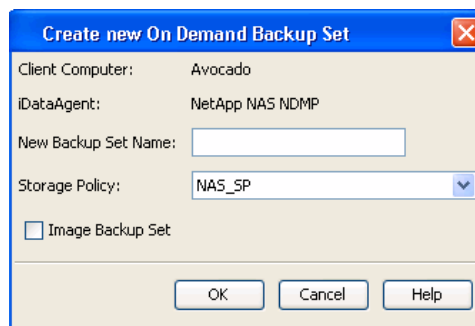
CREATING USER DEFINED SUBCLIENTS

As file servers may contain large amounts of data, you can create user defined subclients to manage your backups, such as the following:

● To backup specific file systems or a portion of a file system.

● If you want to back up different directories on a file server.

For example, a file server has two directories that you want to back up. Create a user-defined subclient that consists of /fs1/dir1 and another user-defined subclient that consists of /fs1/dir2.

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

2. Right-click the **Backup Set** and select **All Tasks** | **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. Select a root volume or file system from the **Backup Content Path** list and enter the path of the directory.

8. Click **Add**.

If the selected data is already included in any other subclient in the same backup set, it will be excluded automatically from that subclient. However, if it is included in any other backup set, it will not be excluded and will get backed up twice.

9. Repeat steps 7 and 8 to include all the volumes, files, and directories to be backed up.

10. Click **Close**.

11. Click **OK**.
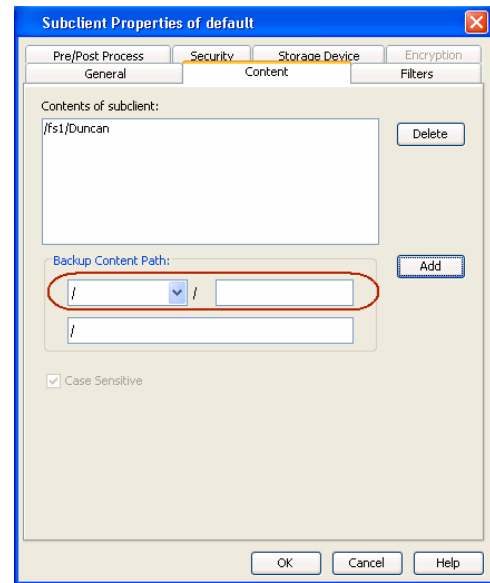
Use the following guidelines while specifying the content for a subclient:

BLUEARC	You can include CIFS shares or NFS exports in the subclient content in the following format:
	`/__VOLUME__/<File System Name>/<path in the file system>`
	For example:
	`/__VOLUME__/FS1/share1`
	`/__VOLUME__/FS1/share2`

EMC CELERRA/ HITACHI	Use the following format to define the subclient content:
	`/<File System Name>/<directory name>`
	For example:
	`/fs001/dir1`
	`/fs001/dir2`

NETAPP	Use the following format to define the subclient content: the following format:
	`/<File System Name>/<directory name>`
	A maximum data size of 50-80G per subclient is recommended.
	For example:
	`/vol/vol0`
	`/vol/vol1`

CONFIGURING MULTIPLE STREAMS FOR BACKUPS

The Multi-Streaming feature enables multiple data streams per subclient for data protection operations. This allows backups of multiple paths in a subclient to run concurrently, as part of the same job, thus reducing the total number of running jobs. This feature is dependant on the number of available resources (drives) and can be useful in the following scenarios:

● A subclient contains multiple data paths.

● A subclient is configured to back up the entire file server.

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

The actual number of concurrent backup streams employed during a backup job is limited by the number of resources available to the Storage Policy. The number of available resources will be limited if other subclients are also using the same Storage Policy or a specific content path requires more time for backup.

4. Click the **Storage Device** tab.

5. In the **Storage Policy** list, click a storage policy name.

6. Click **OK**.

The number of streams configured in the Storage Policy should be equal to, or greater than the specified **Number of Data Readers**.
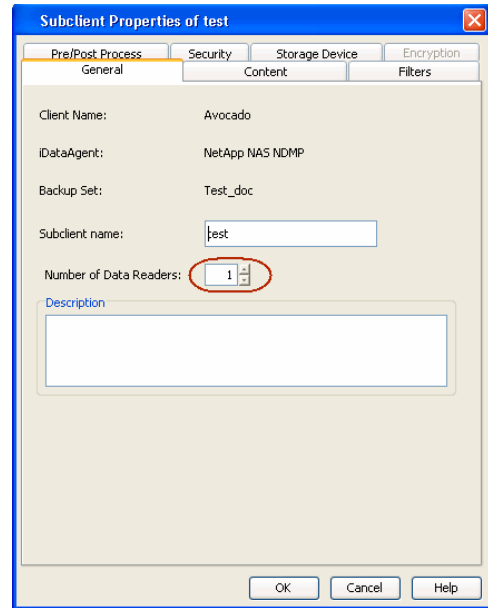
MODIFYING USER ACCOUNTS FOR A FILE SERVER

If the file server access information has been modified, follow the steps given below to change the user account settings.

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

2. Right-click the **<File Server> NAS NDMP** and click **Properties**.

3. Click **NDMP Properties**.

4. Select the **Change Password** check box.

5. Enter the user name in the **NDMP Login** box.
   ○ For NetApp, type **root**.
   ○ For EMC Celerra, type **ndmp**.
   ○ For all other file servers, use any value.

6. Enter the password in the **NDMP Password** box.

7. Click **OK**.
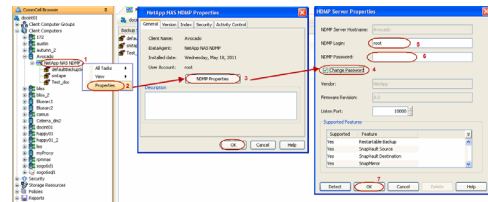
CONFIGURING PRE/POST PROCESSING FOR BACKUPS

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.

CONFIGURING A SUBCLIENT FOR PRE/POST PROCESSING

The Pre/Post Process commands are executed on the MediaAgent associated with the active drive pool of the storage policy that is assigned to the subclient. Ensure that the required batch files or shell scripts are available on the MediaAgent where the Pre/Post commands are executed.

Follow the steps given below to specify the Pre/Post commands for a subclient:

1. From the CommCell Browser, navigate to **Client Computers | <Client> | <File Server> NAS NDMP | 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, enter the path of the batch file or the shell script in one of the following boxes:
   ○ **PreBackup Process**
   ○ **PostBackup Process**

5. Click **OK**.
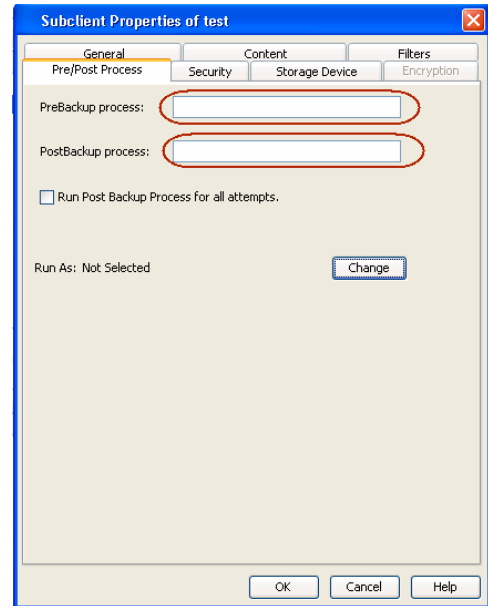
SETTING UP POST PROCESSES TO RUN DURING FAILURES

By default, a specified post process command is executed when a backup job is completed or killed.

Use the following steps to run a post process when the backup operation does not complete.

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

2. Right-click the <*Subclient*> in the right pane, and then click **Properties**.

3. Click the **Pre/Post Process** tab.

4. Enter the path of the batch file or the shell script in the **PostBackup Process** box.

5. Select the **Run PostBackup Process for all attempts** check box.

6. Click **OK**.
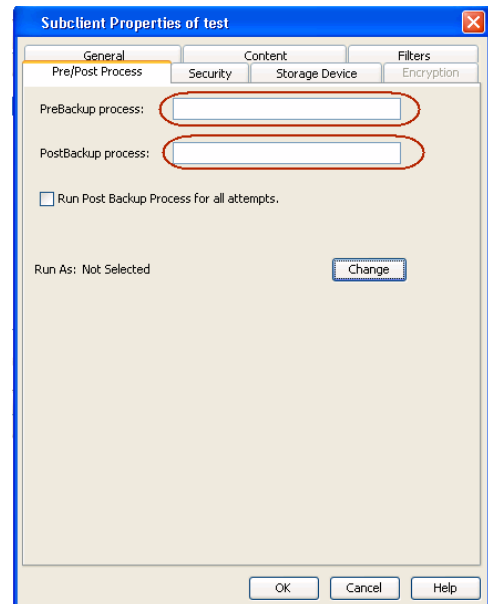
CHANGING USER ACCOUNTS FOR EXECUTING PRE/POST COMMANDS

For a Windows MediaAgent you must specify the user account and password required for executing the Pre/Post commands.

1. From the CommCell Browser, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP | 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, enter the path of the batch file or the shell script in one of the following boxes:
   ○ **PreBackup Process**
   ○ **PostBackup Process**

5. Click **Change**.

6. Select one of the following user accounts:

   ○ **Use Local System Account** - Select this option to use the local system account on the MediaAgent for executing the Pre/Post Process commands.

   ○ **Impersonate User** - Select this option to use an authenticated user account for executing Pre/Post commands. However, if the specified user account is not available on the MediaAgent, backup jobs using Pre/Post commands will fail.

7. Click **OK**.
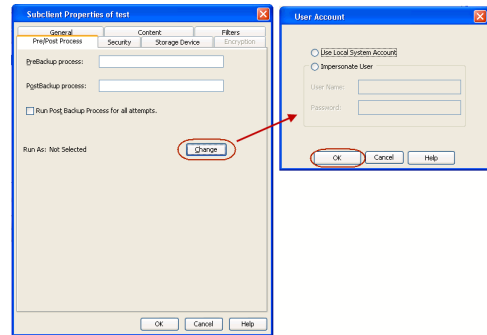
CONFIGURING FILTERS FOR BACKUPS

You can set filters to exclude certain files and directories from backups. Filters can also be used to exclude system-related files which consistently fail during a backup operation. See Content, Filters, and Regular Expressions for comprehensive information on filtering data from backup.

Follow the steps given below to configure filters for a subclient:

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

5. In the **Enter Path** box, type the paths or names of files and directories that you want to exclude.
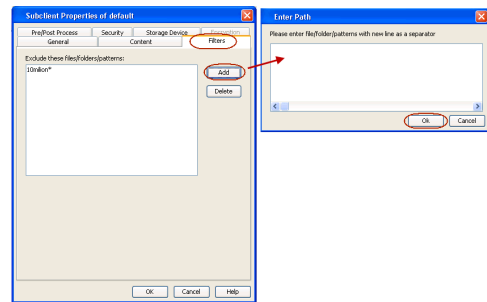
   If you want to specify a file name pattern, you can use wildcards in the filter strings. The filter strings are case-sensitive.

   For example: If you want to filter all the filenames starting with LICENSE, specify LICENSE*. However, filenames starting with license (in lowercase) will not be filtered.

6. Click **OK**.

You can modify or delete existing filter strings. Any modification to the filter configuration is effective during the following backup.

Use the following guidelines while entering the filters:

EMC CELERRA	• By default, you can specify a maximum of 5 directory and 5 file filters. The number of filters can be increased to 50 for each filter type by using the PAX.filter.numDirFilter or PAX.filter.numFileFilter parameters. Please consult the vendor documentation for information on configuring these parameters. • Filters are supported for DART OS 5.5 or higher.
HITACHI	Filters are not supported.
NETAPP	• You can specify a maximum of 32 filters for a subclient. • Path filters are not supported. • When you specify a file or directory name and there are multiple files (and/or directories) with the same name in different locations, all of them will be excluded from the backup.

MANAGING FILE SERVERS

MODIFYING FILE SERVER DETAILS

1. From the **Tools** menu in the CommCell Console, click **Control Panel**.

2. Double-click **Library & Drive Configuration**.

3. Under **Available MediaAgents**, select the MediaAgent and click **Add**.

4. Click **OK**.

5. Click **Start** and select **NDMP| Servers**.

6. Select the required NAS file server and click **Edit**.

7. Modify the required properties of the NAS file server.

8. Click **OK**.

9. Click **Close**.
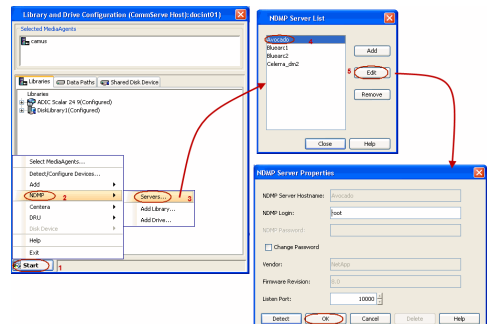
DELETING A FILE SERVER

1. From the **Tools** menu in the CommCell Console, click **Control Panel**.

2. Double-click **Library & Drive Configuration**.

3. Under **Available MediaAgents**, select the MediaAgent and click **Add**.

4. Click **OK**.

5. Click **Start** and select **NDMP| Servers**.

6. Select the file server that you want to delete and click **Remove**.

7. Click **Yes**.

8. Click **Close**.
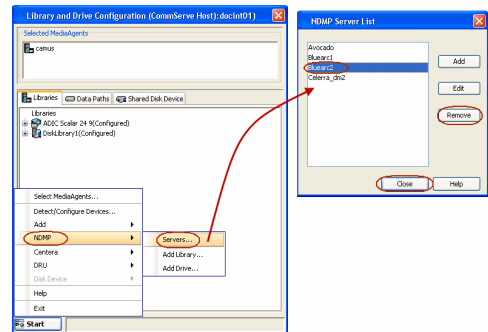
CONFIGURING LIBRARIES AND DRIVES ATTACHED TO A FILE SERVER

Auto-detection is the recommended method of configuring library and drives attached to a file server. The auto-detection method is explained in Getting Started. However, you can manually configure the library and drives if the automatic detection fails or you want to configure a specific drive for the file server.

MANUALLY CONFIGURING LIBRARY AND DRIVES ATTACHED TO A FILE SERVER

1. Ensure that the tape drive and media changer are detected by the file server. For information on verifying tape drive(s) and media changer, refer to your vendor documentation.

2. From the **Tools** menu in the CommCell Console, click **Control Panel**.

3. Double click **Library & Drive Configuration**.
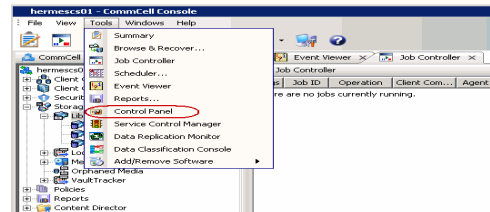
4.
   - Under **Available MediaAgents**, select the MediaAgent and click **Add**.
   - Click **OK**.
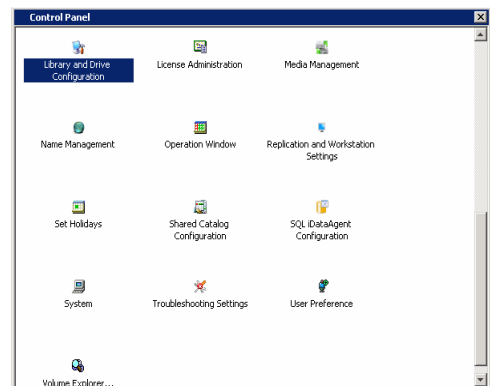
5. Click **Start** | **NDMP** and then select **Add Library...** .
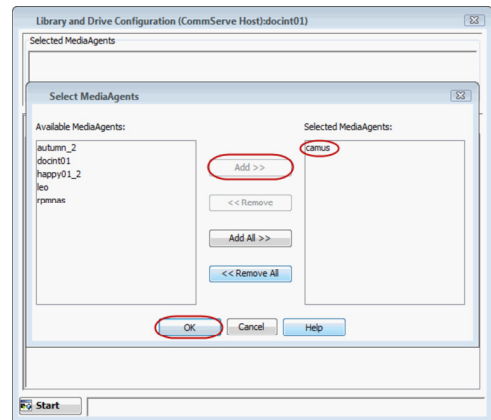
6.
- Select the name of the MediaAgent that will control the library attached to the NAS file server from the **MediaAgent list**.
- Select the name of the file server from the **NDMP Server Hostname** list.
- Enter the access path through which the file sever communicates with the media changer in the library in the **NDMP Server Device Name** box. A typical value for the first device (media changer) is `mc0`.
- Click **Detect Library Data**. The system automatically populates the Library Data (Vendor, Model, Firmware, Base Address and Drive Count).

  If the library is not supported by the NAS device, an error message is displayed when you click the **Detect Library Data** button. Contact your software provider for a list of supported storage devices.
- Click **OK**.
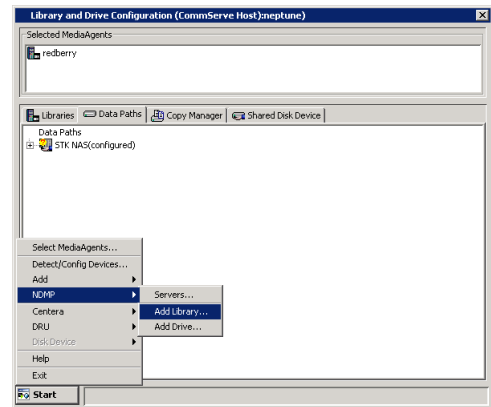
7. The library information is displayed, with "not configured" status, and place holders for the drives in the library.

Click **Start** | **NDMP** and then select **Add Drive...**.
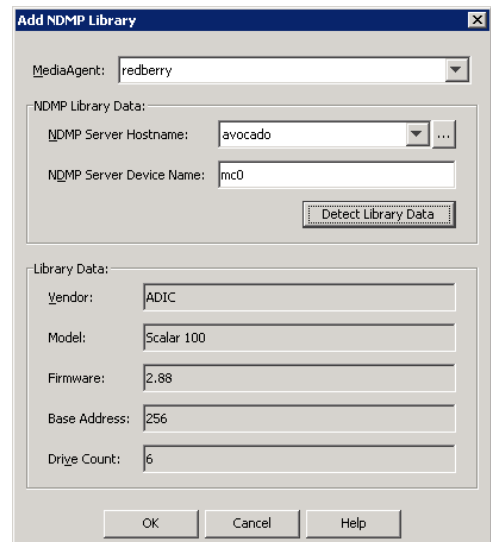
8.
- Enter the name of the library containing the drive in the **Library** list.
- Enter the physical location of the drive in the **Drive Number** box.
- Select the name of the **Drive Pool** from the list.
- Select the name of the MediaAgent that controls the library's media changer from the **MediaAgent** list.
- Select the name of the file server from the **NDMP Server Host Name** list.
- Enter the access path through which the NAS file server communicates with the drive in the **NDMP Server Drive Path** box.
- Click **Populate Serial Number and Model**. This automatically populates the Drive Serial Number and Drive Vendor/Model fields. If they do not display automatically, you have to add the information manually.
- Click **OK**.

Repeat Steps 6 and 7 until all drives are added.

9. Right-click the library and select **Configure**.

10.
- Click **Library and all drives** to configure all the drives within the library.
- Click **OK**.
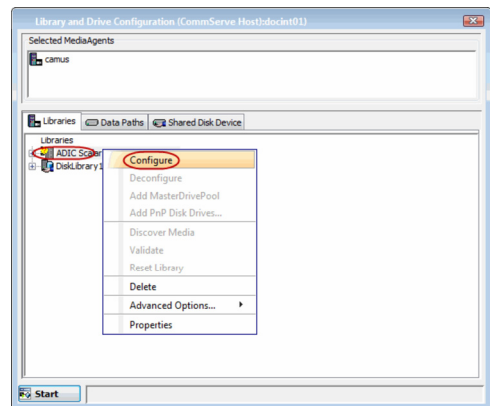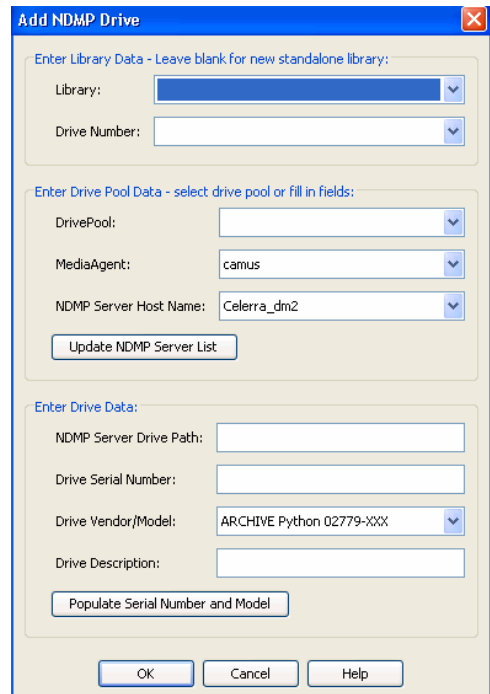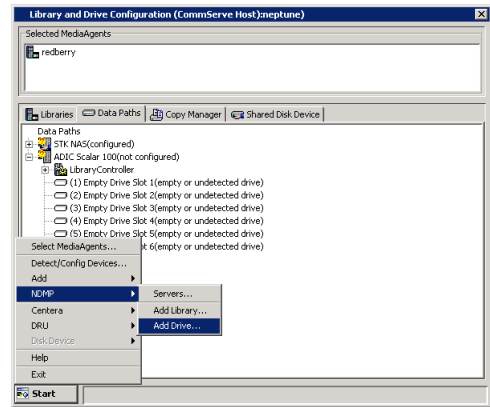
11. Click **Yes**.

12. Select **Default Media Type** from the list and click **Yes**.

13. The status of the library changes to **Configured**.

If you chose to configure all associated drives, the status of the drives also changes to **Configured**.

The **Libraries** tab provides the physical view of the devices (library and drives).
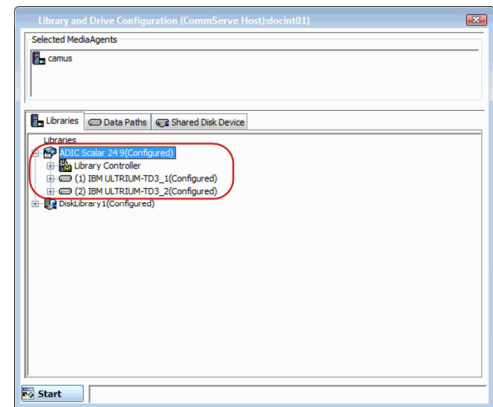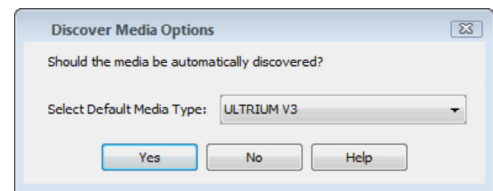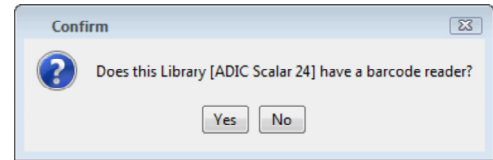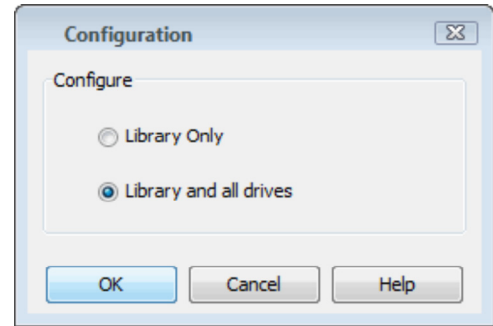
CONFIGURING A LIBRARY SHARED ACROSS A SAN ENVIRONMENT

In a SAN environment, the drives in a library can be dynamically shared between the file servers and MediaAgents. When you share a library between two file servers, the file server configured first will control the media changer. The same rule applies for a library shared between a MediaAgent(s) and file server(s).

1. Configure the shared library using a file server. For more information refer to Configure a library and drives attached to NAS file server using automatic detection.

2. From the **Tools** menu in the CommCell Console, click **Control Panel**.
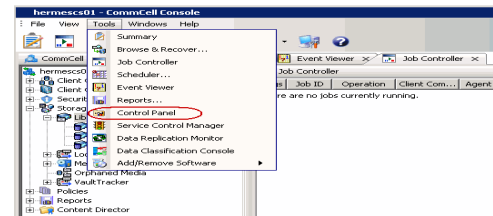
3.
- Under **Available MediaAgents**, select the MediaAgent and click **Add**.
- Click **OK**.

4.
- Click **NDMP Devices**. The **MediaAgent** that controls the library is displayed.
- Select the **Exhaustive Detection** check box.
- Click **OK**.
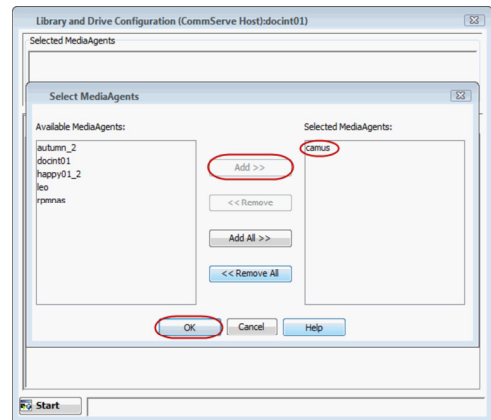
5. A prompt appears informing you that the exhaustive detection will unload all drives and hence may interfere with backup/restore jobs.

Click **Yes**.

6. Select the file server from which you wish to detect the library and click **OK**.
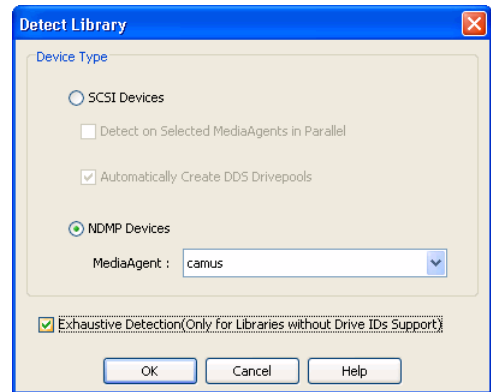
7. Click **Yes** to start the device detection process.
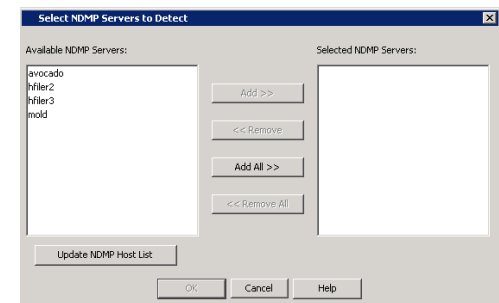
8. When the exhaustive detection process is completed, the log file is displayed. Note the log file contents and click **Close** to proceed.
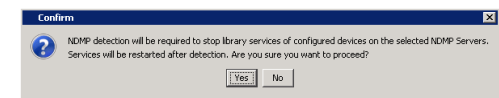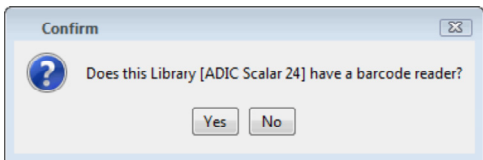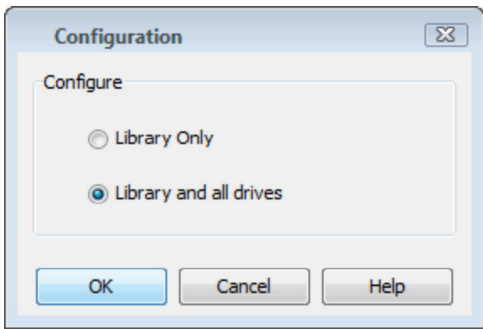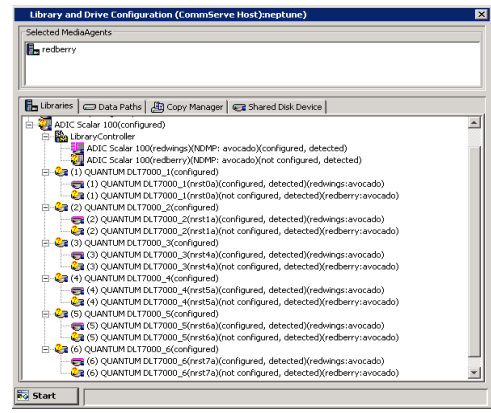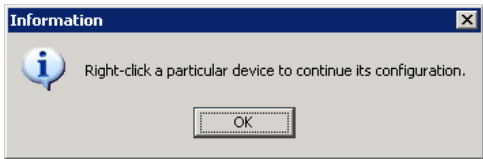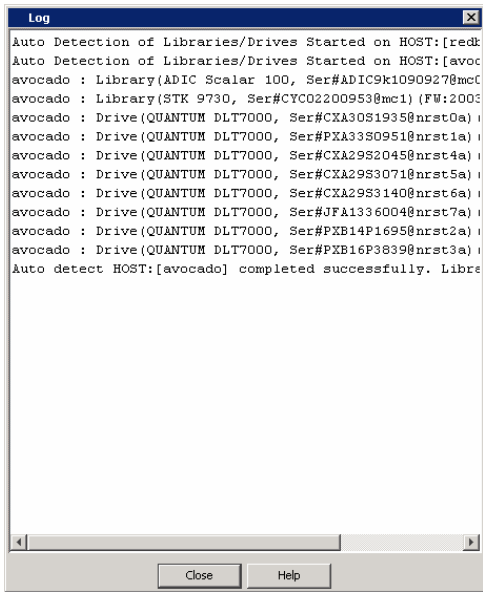
9.   Click **OK**.

10.   When the Exhaustive Detection is completed, the system displays the devices in the **Library and Drive Configuration** window.

      New detected devices are not configured at this point, and the configuration information will not be saved if you exit from the **Library and Drive Configuration** window.

11.   Right-click the library and then click **Configure**.

12.   ● Click **Library and all drives** to configure all the drives within the library.
      ● Click **OK**.

13.   Click **Yes**.

14.   Select **Default Media Type** from the list and click **Yes**.

16. The status of the library changes to **Configured**.

    If you chose to configure all associated drives, the status of the drives also changes to **Configured**.

    The **Libraries** tab provides the physical view of the devices (library and drives).
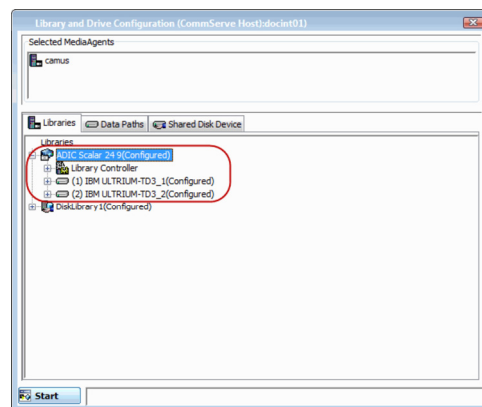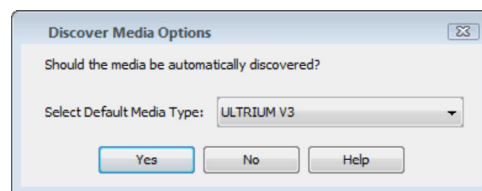
ADDITIONAL NAS FEATURES

CONFIGURING SUBCLIENT FOR TAPE SILVERING

FEATURE	DESCRIPTION	APPLIES TO
Tape Silvering	Tape silvering is the process of shipping a physical copy of the source data to a destination site. This is useful for large file systems as it saves time and resources and also avoids transferring the file system over the network. Refer to the EMC Celerra documentation for more information.	EMC Celerra running version 5.6 or higher.

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

2. Right-click the **Subclient** in the right pane and then click **Properties**.

3. Click the **Content** tab.

4. Specify the source path of the replication that was created from the Celerra Management Console or command line. Append .ts to the path name. For example, /sourcefs/.ts.

5. Click **Add**.

6. Click **OK**.
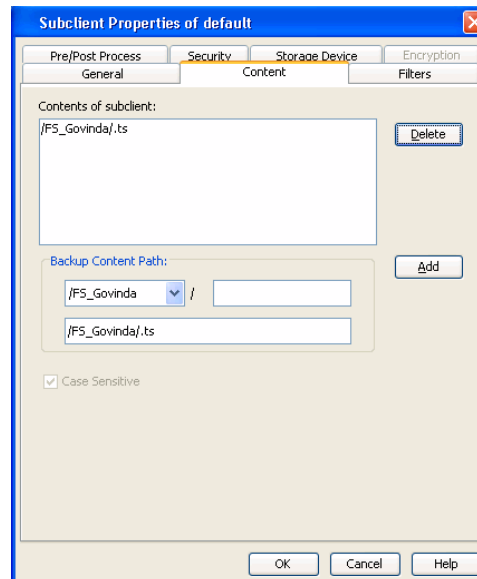
CONFIGURING BLOCK BASED BACKUPS (SNAPMIRROR TO TAPE)

FEATURE	DESCRIPTION	APPLIES TO
Block Based Backup	The block based backup allows you to backup an entire volume to media. Snapshots on the volume will be included in the backup. Restoring from a block based backup provides fast volume recovery as opposed to a file based restore. When you configure a backup set for block backup, you cannot change this configuration and use the backup set for regular (non-block) backups. Follow the steps given below to create a backup set for block based backups:	NetApp running ONTAP 8.0 or higher

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

2. Right-click a ***<File Server>* NAS NDMP** and select **All Tasks | Create New Backup Set**.

3. Enter the name of the backup set in the **New Backup Set Name** box.

4. Select the **Image Backup Set** check box**.**

5. Click **OK**.

6. Right-click the **Backup Set** and select **All Tasks** | **New Subclient**.

7. In the **Subclient Name** box, type a name.

8. Click the **Storage Device** tab.

9. In the **Storage Policy** list, select a storage policy name.

10. Click the **Content** tab.

11. Click **Browse**.

12. Select an entire volume.

13. Click **OK**.

14. Click **OK** on the **Subclient Properties** dialog box.
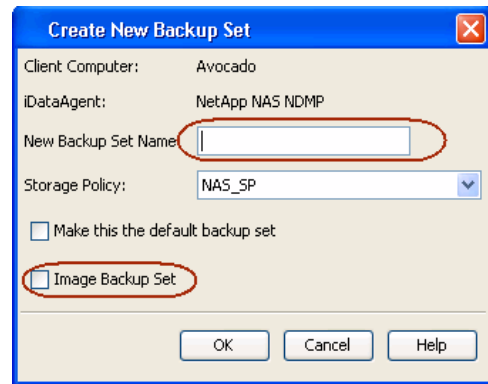
COMMAND LINE OPERATIONS

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

Command line configuration enables you to:

● create NAS clients

● 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
```

CREATE NAS CLIENTS

1. Download the create_NAS_Client.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_NAS_client.xml -ndmpServerHostName XXXXX -userName xxxxx -password xxxxx
```

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 -clientName xxxxx -subclientName xxxxx -numberOfBackupStreams 2
-description 'xxxxx' -enableBackup true -storagePolicyName xxxxx -contentOperationType ADD -content/path 'xxxxx' -
content/excludePath '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 -clientName 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 -clientName xxxxx -subclientName xxxxx -contentOperationType
ADD -description 'xxxxx' -numberOfBackupStreams 4 -enableBackup true -storagePolicyName xxxxx -content/path '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 -clientName 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.
appName	Name of the application. In this case it would be 'NAS NDMP'.
subclientName	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.
numberOfBackupStreams	Option to set the number of backup streams.
description	A general description of the subclient if needed.
networkAgents	Number of Network Agents.
storagePolicyName	Name of the Storage Policy to be associated for backup.
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>'`
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 -clientName client1 -subclientName subclient1 -description 'add content' -contentOperationType ADD -content/path '/vol/vol1/vol123'`
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 -clientName client1 -subclientName subclient1 -storagePolicyName sp1`

For detailed information on the Subclient parameters see Subclient Properties.

MODIFY USERNAME AND PASSWORD FOR NAS CLIENT

You can modify the username and password for a NAS client. Execute the following command from the <Software_Installation_Directory>/Base folder after substituting the parameter values.

```
qoperation execscript -sn SetNasIDAProp -si @clientName='client1' -si @userName='domain\user1' -p2 @password='password'
```

Where:

ClientName is the NAS client name.

UserName and **Password** are the user credentials that you want to define for the client.

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.

CONFIGURING FOLDER SIZE FOR BACKUPS

You can use the **Show Folder Size** option to get a graphical representation of the space used by backed up data on a client. This can be done for each subclient for a given client. The graph gets refreshed every time a backup is run for the change in data. To use this option, you must enable SRM for a given client and run a Full Backup.

1. Enable SRM
   ○ From the CommCell Browser, right-click the File System *i*DataAgent and select **Properties**.
   ○ Click **Enable SRM Feature** from the **General** tab.
   ○ Click **OK**.

2. Run a Backup
   ○ Right-click the subclient, and click **Backup** in the CommCell Browser.
   ○ Click **Full** as backup type and then click **Immediate**.
   ○ Click **OK**.

3. Show Folder Size
   ○ From the CommCell Browser, navigate to **Client Computers | <Client> | File System | defaultBackupSet**.
   ○ Right-click the subclient for which you want to display folder size information and click **Show Folder Size**.
   ○ Chart displaying the folder size of the backed up data will be displayed.
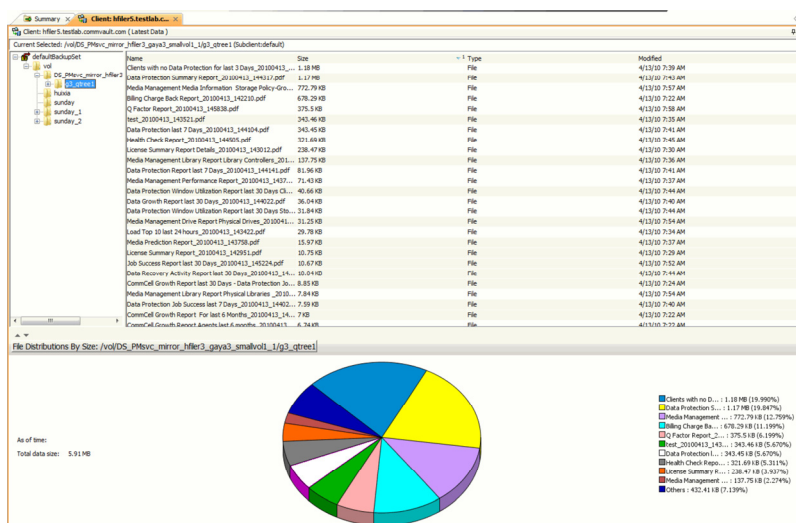
CONFIGURING ACCESS TIME COLLECTION FOR NAS

Add the `sAddFileLevelAnalyticsMeta` key to turn on collection of file level access time as index metadata for NDMP backups.

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

2. Right-click the *<MediaAgent>* 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** box, type `sAddFileLevelAnalyticsMeta`.

6. In the **Location** list, type `NAS`

7. In the **Type** list, select `REG_SZ`.

8. In the **Value** field, type **Y**.

9. Click **OK**.
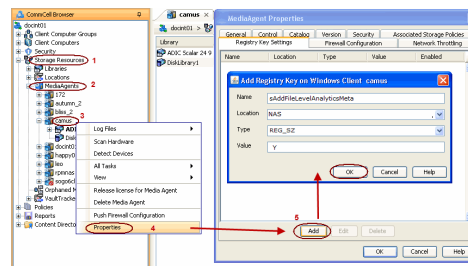
MODIFYING AN AGENT, BACKUP SET OR SUBCLIENT

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

OPTION	DESCRIPTION	RELATED TOPICS
Create New Index on 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. 1. From the CommCell Browser, navigate to **Client Computers	<Client>.** 2. Right-click the **<File Server> NAS NDMP** and click **Properties**. 3. Click the **Index** tab. 4. Select the **Create new index on Full Backup** check box. 5. Click **OK**.	
Convert to 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. 1. From the CommCell Browser, navigate to **Client Computers	<Client>.** 2. Right-click the **<File Server> NAS NDMP** and click **Properties**. 3. Click the **Index** tab. 4. Select the **Convert to full backup on indexing failures** check box. 5. 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, right-click the subclient. 2. Click **Properties**. 3. Click **Storage Device**. 4. Select the **Storage policy** from the drop-down menu. 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 Browser, navigate to **Client Computers	<Client>	<File Server> NAS NDMP.** 2. Right-click the <**Backup Set**> in the right pane, 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 Server> NAS NDMP	BackupSet.** 2. Right-click the <**User Defined Subclient**> in the right pane, 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 Server> NAS NDMP	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. Click **OK.**	Refer to Data Compression.
View Data Paths	3. Click the **Storage Device** tab**.** 4. In the **Storage Policy** list, click a storage policy name.	

	5. Click **Data Paths**. 1. From the CommCell Browser, navigate to **Client Computers	<Client>	<File Server> NAS NDMP	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 **Security**. 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 suclient level.Encryption must be enabled at the client level prior to configuring any instances residing on that client. 1. From the CommCell browser, right-click the subclient. 2. Click **Properties.** 3. Click **Encryption.** 4. Select the desired encryption. 5. Click **OK**.	Refer to Data Encryption.
View Software Version and Installed Updates	The **Version** tab, at the Agent level displays the software version and post-release service packs and updates installed for the component. 1. From the CommCell browser, right-click the agent. 2. Click **Properties**. 3. Click **Version.** 4. Click **OK.**	

DELETING AN AGENT, BACKUP SET OR SUBCLIENT

The following sections describe the steps involved in deleting an agent, archive 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 BACKUPSET

Consider the following before deleting a Backup Set:

- You cannot delete a default Backup Set.

- Schedules associated with the Backup Set are also automatically deleted.

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

2. Right-click the **<Backup Set>**, and then click **Delete**.

3. A confirmation message is displayed, asking if you want to delete the Backup Set.

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

DELETING A SUBCLIENT

Consider the following before deleting a subclient:

- You cannot delete a default subclient.

- Schedules associated with the subclient are also automatically deleted.

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

2. Right-click the **<subclient>** that you want to delete, and then click **Delete**.

3. A confirmation message is displayed, asking if you want to delete the subclient.

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

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Advanced Backup - NAS *i*DataAgent

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FULL BACKUP

Full backups provide the most comprehensive protection of data.

1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **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**. When the backup has completed, the Job Controller displays **Completed**.
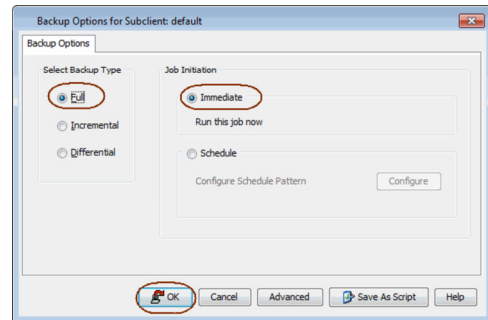
INCREMENTAL BACKUP

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:
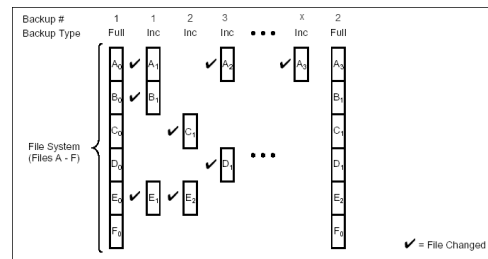
1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.

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**.
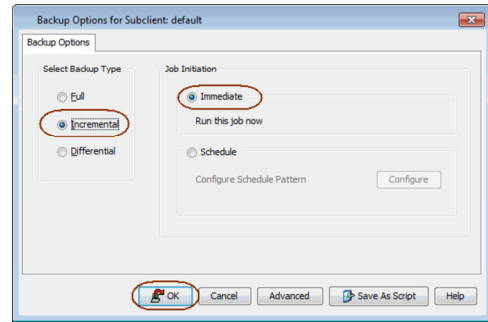
DIFFERENTIAL BACKUP

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.
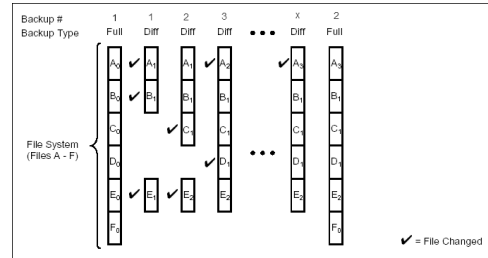
1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.

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**.
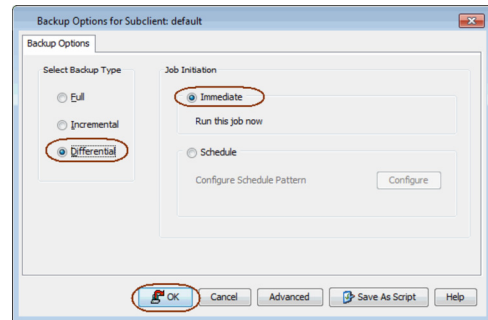
PERFORMING AN ON-DEMAND BACKUP

An On-Demand backup provides the flexibility of specifying content each time you perform a backup operation.

Follow the steps given below to perform an On-Demand backup:

1. From the CommCell Console, navigate to *<Client>* | *<File Server>* **NAS NDMP** | *<On Demand Backup Set>*.

2. Right click the subclient and click **Backup**.

3. Click **Browse**.

4. Navigate to the **Content file** (created while configuring the Agent) you want to use.

   See Creating a Content File.

5. Click **OK**.

6. Select **Immediate** to run the job immediately.

7. Click **OK**.

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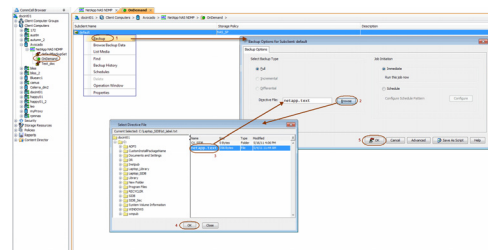
COMMAND LINE BACKUPS

You can perform backups of NAS 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 -policyType DATA_PROTECTION -subclientName xxxxx -clientName 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 -policyType DATA_PROTECTION -subclientName subclient1 -clientName client1 -backupLevel FULL
Performing an Incremental Backup	qoperation execute -af backup_template.xml -policyType DATA_PROTECTION -subclientName subclient1 -clientName client1 -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 Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.

2. Right click the *<Subclient>* and click **Backup**.

3. Select the required backup options which you want to execute using the script.
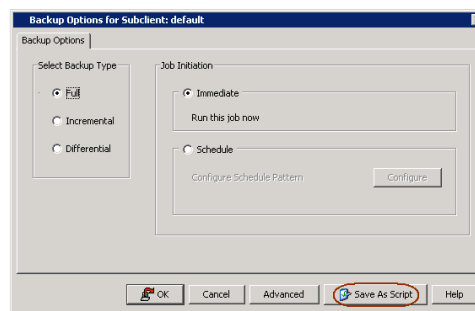
4. Click **Save as Script**.

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**.
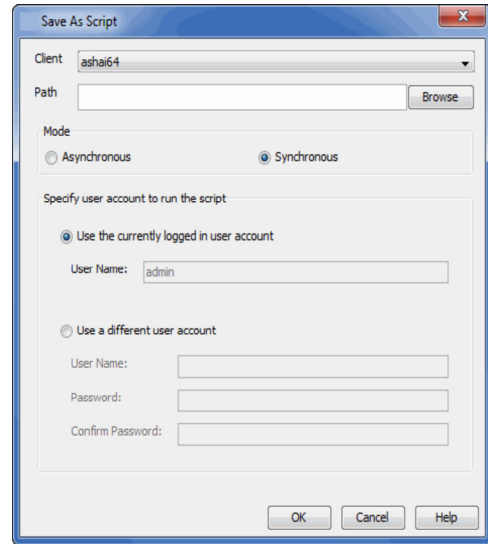
SCHEDULING A BACKUP

Follow the steps given below to schedule a data protection operation:

1.
- From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP | defaultBackupSet**
- Right-click the *<Subclient>* and click **Backup.**
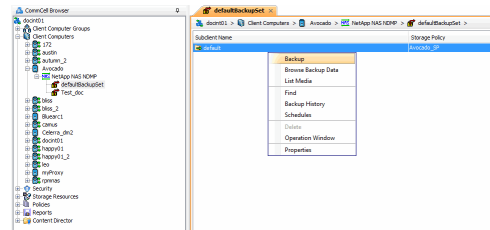
2.
- Select the **Backup type**.
- Click **Schedule** to schedule the backup for a specific time.
- Click **Configure** to set the schedule for the backup job. The Schedule Details dialog displays.
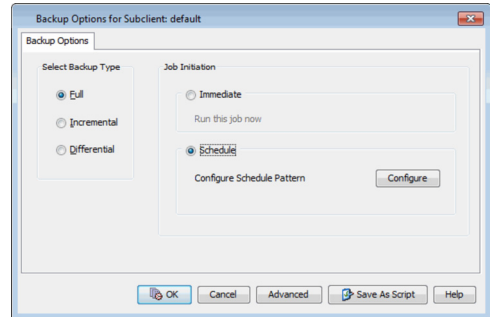
3. Select the appropriate scheduling options. For example:
- Click **Weekly**.
- Check the days you want the run the backup job.
- Change the **Start Time** to 9:00 PM.
- Click **OK** to close the Schedule Details dialog.
- Click **OK** to close the Backup Options dialog.
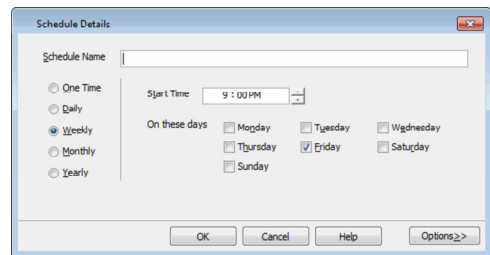
The backup job will execute as per the schedule.

See Scheduling for a comprehensive information on scheduling jobs.

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 Server>* **NAS NDMP** | **defaultBackupSet**.

2. Right click the *<Subclient>* and click **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 NAS FEATURES

The following sections describe the additional NAS features available for different file servers.

BACKING QUOTAS

FEATURE	DESCRIPTION	APPLIES TO
Back up Quotas	Use this option to backup user and group quota information. This is useful for monitoring and controlling the disk usage. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Back up Quotas** checkbox and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	BlueArc, Hitachi

BACKUP OFFLINE DATA

FEATURE	DESCRIPTION	APPLIES TO
Back up Offline Data	Use this option to include the original archived files in the backup, rather than the stubs created during the archive operation. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Back up offline data** checkbox and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	BlueArc, Celerra FileMover

BACKUP VOLUMES

FEATURE	DESCRIPTION	APPLIES TO
Volume Based Backup	Use this option to perform block level backup of an entire volume. This can be used to facilitate faster full and incremental backups. When using this option, the entire volume will be backed up ignoring any filters specified in the subclient content. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Volume-based backup** checkbox and click **OK**. When backing up volumes that are not in read-only mode, ensure you also select the **Back up from Snapshot** checkbox. 5. Select the backup type and schedule. 6. Click **OK**. You can perform a granular restore of individual files and folders from a volume based back up. Files that were de-duplicated using the Celerra file system and were later backed up using the **Volume-based backup** option may fail to be restored individually. To restore these files, you must perform a full destructive restore. See VBB Full Destructive Restore for more information.	Celerra

PERFORMING EXCLUSIVE BACKUPS

FEATURE	DESCRIPTION	APPLIES TO
Exclusive Backups	Use this option to prevent simultaneous execution of multiple backup or restore operations on the same volume. This is useful as it avoids possible data inconsistency which can be caused by the following operations on the same volume: ● running a backup operation during restore processing ● running a restore operation during backup processing 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Exclusive backup** checkbox and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	Hitachi

PERFORMING BLOCK BACKUPS

FEATURE	DESCRIPTION	APPLIES TO
Block Backup	Use this option to read and backup data blocks directly from the disk or volume rather than the directory tree. Using this option improves performance during backup, however the restore operations may become slower. Direct Access Restore operations will be converted to non-Direct Access Restore operation when this is enabled. For Pillar Data Systems, full backups and restores are supported with this option. The restore operations will overwrite the existing data on the file system. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Block backup** checkbox and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	Hitachi, Pillar

BACKUP FROM A SNAPSHOT

FEATURE	DESCRIPTION	APPLIES TO
Back up from Snapshot	Use this option to create a snapshot of the the file server data and then perform a backup from the snapshot. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Select **Back up from Snapshot** checkbox and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	BlueArc, Celerra, Hitachi

BACKUP SNAPSHOTS

FEATURE	DESCRIPTION	APPLIES TO
Snapshots to Back-up	Use this option to backup a snapshot. If the snapshot exists, use NDMP_EXISTING_*<snapname>* format to specify the name of the snapshot. If the snapshot does not exist or the specified name does not start with NDMP_EXISTING_ then a new snapshot will be created during backup. 1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the subclient in the right pane and click **Backup**. 3. Click **Advanced** and click **NAS Options** tab. 4. Enter the snapshot name in **Snapshots to Back-up** field and click **OK**. 5. Select the backup type and schedule. 6. Click **OK**.	IBM

Snapshots to Back-up	Use this option to backup an existing snapshot.	NetApp
	1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.	
	2. Right-click the subclient in the right pane and click **Backup**.	
	3. Click **Advanced** and click **NAS Options** tab.	
	4. Enter the snapshot name in **Snapshots to Back-up** field and click **OK**.	
	5. Select the backup type and schedule.	
	6. Click **OK**.	

SETTING SNAPSHOT EXPIRATION

FEATURE	DESCRIPTION	APPLIES TO
Snapshot Expiration	Use this option to specify the retention period for the snapshot created during **Snapshot to Back-up** operation. This setting applies to snapshots created during the backup and not the existing snapshots.	IBM
	If the snapshot expiration time is reached while the backup is running, the snapshot will not be deleted until the backup completes.	
	1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.	
	2. Right-click the subclient in the right pane and click **Backup**.	
	3. Click **Advanced** and click **NAS Options** tab.	
	4. Enter the retention time in the **Snapshots Expiration** field and click **OK**.	
	Use the following format to specify the values:	
	○ 60_SEC	
	○ 60_MIN	
	○ 12_HOUR	
	○ 31_DAY	
	○ 6_MONTH	
	5. Select the backup type and schedule.	
	6. Click **OK**.	

OPTIMIZING BACKUPS USING READAHEAD PROCESS

FEATURE	DESCRIPTION	APPLIES TO
Readahead Process	Use this option to specify the number of disk blocks to read ahead during the backup operations.	BlueArc
	If you do not specify a value for this option, the default value from the file server will be used.	
	1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.	
	2. Right-click the subclient in the right pane and click **Backup**.	
	3. Click **Advanced** and click **NAS Options** tab.	
	4. Select a value from **Readahead Process** list and click **OK**.	
	5. Select the backup type and schedule.	
	6. Click **OK**.	

ADDITIONAL BACKUP 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:	Refer to Job Priority and Priority Precedence.
	1. From the CommCell Browser, navigate to *<Client>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.	
	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**.	
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>*	*<File Server>* **NAS NDMP**	**defaultBackupSet**. 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.
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>*	*<File Server>* **NAS NDMP**	**BackupSet	Subclient**. 7. Click **Run**.	Refer to Backup Job Summary Report.
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.
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.
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.	Refer to Index.

	1. From the CommCell Browser, navigate to ***<Client>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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**.	
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>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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 to 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>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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.
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>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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>***	***<File Server>*** **NAS NDMP**	**defaultBackupSet**. 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.

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>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**.
	
	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>* | *<File Server>* **NAS NDMP** | **defaultBackupSet**. 2. Right-click the **Subclient** in the right pane and click **Backup**. 3. Click **Advanced** and select the **VaultTracking** tab. 4. Select the required options. 5. Click **OK**.	Refer to VaultTracker or VaultTracker Enterprise.

Browse Data - NAS *i*DataAgent

UNDERSTANDING THE BROWSE WINDOW

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

You can open the browse window from client, agent, backup set or subclient level. The sub levels that are displayed in the browse window are based upon where you start the browse operation.
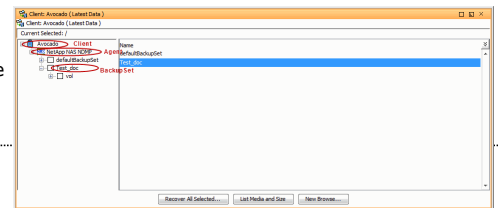
SELECTING OBJECTS FROM THE BROWSE WINDOW FOR RESTORE

The browse window displays objects and consists of two parts:

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

- The right pane displays the contents of the selected object.

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

Selections follow these rules:

- All selections are recursive.

- Clicking a box again causes the selection to be cleared.

- If you select an object in the left pane, then all of its contents are selected.

- You can select a specific object in the right pane.

Selection status is revealed by the selection icons as follows:

☐	Indicates that the object is not selected for restoration.
◨	Indicates that a portion of the object is selected for restoration. i.e., only some of the child object(s) within the selected object.
▨	Indicates that the entire object, including all of its child objects, are selected for restoration.

Browse and Restore from the CommCell Console allows you browse and restore NAS data that was backed up. The browse option can be invoked from the client, agent, backup set, or subclient level.

BROWSE DATA

The option to browse the backup data provides the facility to view and restore the data that was backed up. The browse operation supports data paths up to 1028 characters; the browse window will not display data with paths longer than 1028 characters.

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 Console, navigate to **Client Computers | *<Client>* | *<File*

Server> **NAS NDMP.**

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

3. Click **OK**.
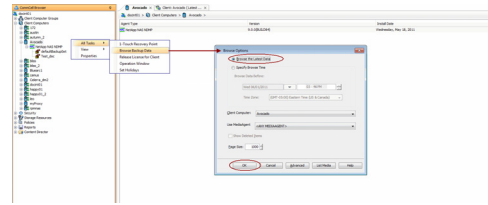
DATA BEFORE A SPECIFIED TIME

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

1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP.**

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

3. Select **Specify Browse Time**.

4. Select a date and time to **Browse Data Before** it.

5. Click **OK**.
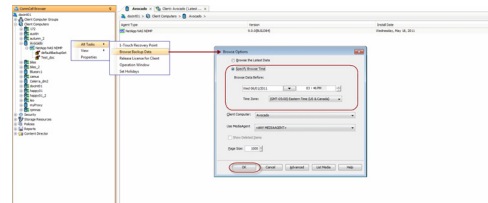
DATA BETWEEN A SPECIFIED TIME

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

1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP.**

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

3. Select **Specify Browse Time**.

4. Select a date and time to **Browse Data Before** it.

5. Click **Advanced**.

6. In the **Advanced Browse Options** dialog box, select **Exclude Data Before.**

7. Select the date and time to exclude the data before it from the browse operation.

8. Click **OK** in the **Advanced Browse Options** dialog box .

9. Click **OK** in the **Browse Options** dialog box.
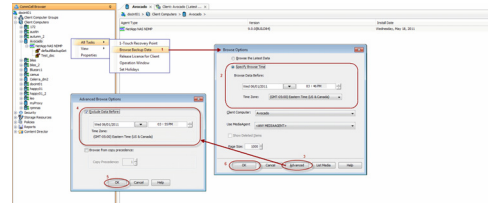
BROWSE FROM COPIES

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

This feature is useful in the following conditions:

● The media containing protected data for a particular copy has been removed from the storage library, you can choose to browse from a copy whose media are inside the library.

● Allows browsing from a copy that accesses faster disk media rather than slower tape media.

● When media drives used by a particular copy are busy with another operation, this helps in browsing from a different copy to avoid resource conflicts.

1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP.**

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

3. From the **Browse Options** dialog box, click **Advanced**.

4. In the **Advanced Browse Options** dialog box select the **Browse from copy precedence** option.
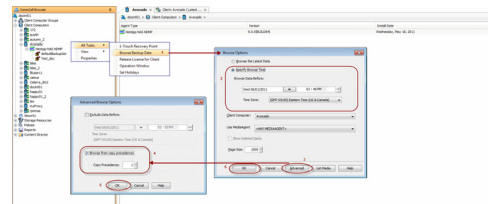
> If you specify a copy precedence number for a browse operation, the software searches only the storage policy copy with that precedence number in all storage policies used for securing the data. If data does not exist in the specified copy, the browse operation fails even if the data exists in another copy of the same storage policy.

5. Specify the precedence number in **Copy Precedence**.

6. Click **OK** in the **Advanced Browse Options** dialog box .

7. Click **OK** in the **Browse Options** dialog box.

LIST MEDIA

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

The following section describes how to perform this operation.

1. From the CommCell Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP.**

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

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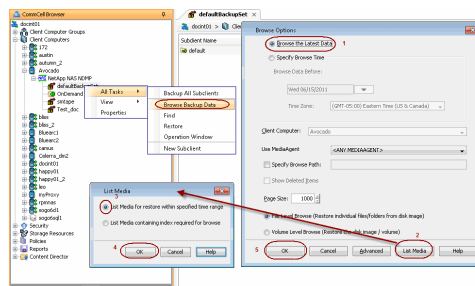
   Note that you can use the **Specify Browse Time** and **Exclude Data Before** options to list media between a specified date and time range.

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.

FULL BACKUP TRANSPARENT BROWSE

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

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

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

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

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

2. Right-click the Agent and click **Properties**.

3. Click **Index** and then clear **Create new index on Full Backup**.

4. Click **OK**.
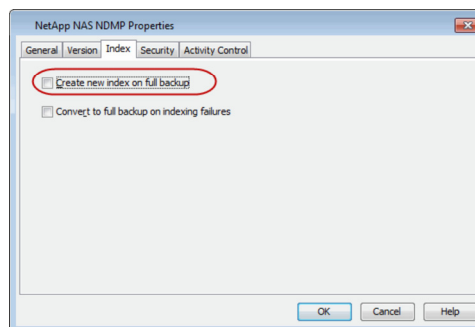
FIND A FILE OR DIRECTORY

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

1. From the CommCell Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP.**

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

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

4. Right-click the selected content and click **Find**.

5. Enter the file name and the location of the file to be searched in the **Name/Pattern** and **Folder** fields and click **Search**.
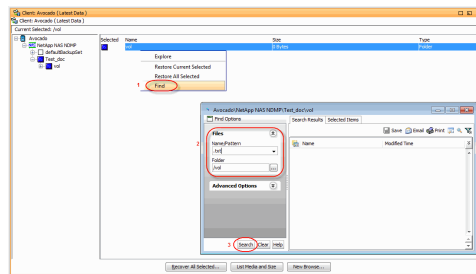
IMAGE/NO-IMAGE BROWSE

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

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

1. From the CommCell Console, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP.**

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

3. From the **Browse Options** dialog box, select one of the following options:
   - Click and select the **Show Deleted Items** option to perform a no-image browse of the data.
   - Clear the **Show Deleted Items** option to perform an image browse of the data.

4. Click **OK**.
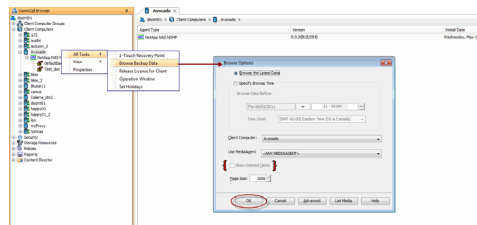
> If the **Show Deleted Items** option is disabled and not selected, then by default an image browse option is enabled, and the no-image browse option is unavailable for the file server being used by the client.
>
> When the **Show Deleted Items** option is disabled, and selected, or if the option is not displayed in the Browse Options dialog box, then the image browse/no-image browse options are not supported by the file server being used by the client.

BROWSE MULTIPLE VERSIONS OF A FILE

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

1. From the CommCell Console, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP.**

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

3. Click **OK**.

4. From the **Browse Window**, right-click the file with multiple versions and then click **View All Versions**.

The **All Version** dialog box displays the available versions for the file.
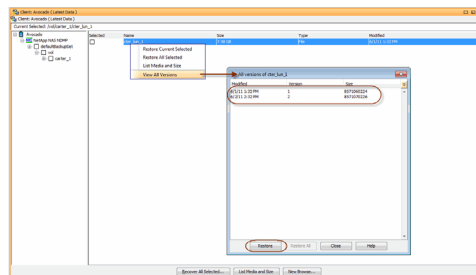
ESTABLISH THE PAGE SIZE FOR A BROWSE

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

1. From the CommCell Console, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP.**

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

3. From the **Browse Options** dialog box, enter a value for **Page Size**.

4. Click **OK**.
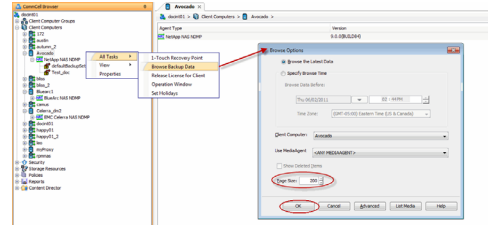
BROWSE USING A SPECIFIED PATH

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

1. From the CommCell Console, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP.**

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

3. From the **Browse Options** dialog box, enter the browse path in **Specify Browse Path**.

4. Click **OK**.
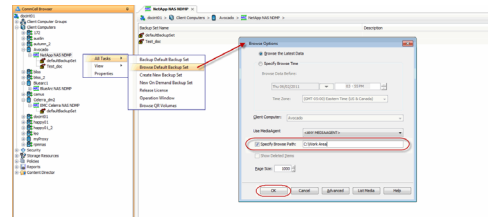
BROWSE USING MEDIA AGENT

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

1. From the CommCell Console, navigate to **Client Computers | <*Client*> | <*File Server*> NAS NDMP.**

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

3. From the **Browse Options** dialog box, choose the **MediaAgent** that must be used to perform the browse.

4. Click **OK**.

Advanced Restore - NAS *i*DataAgent

TABLE OF CONTENTS

PERFORMING A DIRECT RESTORE

Perform a direct restore in the following scenarios:

● You know the path to the data that you want to restore e.g., `/vol/folder/data`

● The data that you want to restore is from a single volume e.g., `/vol`

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

Follow the steps given below to perform a direct restore to the same location where the data was backed up:

1.
● From the CommCell Browser, navigate to **Client Computers** | **<Client>** | **<File Server>** **NAS NDMP**.
● Right-click the backup set and click **All Tasks** | **Restore**.
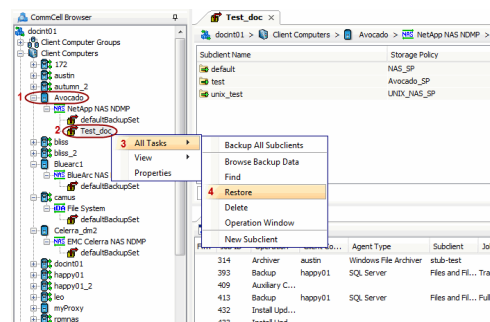
2. Enter the path of the data you want to restore in the **Restore Path** field.
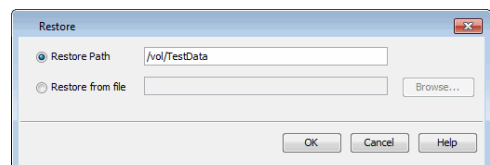
3. Click **OK**.
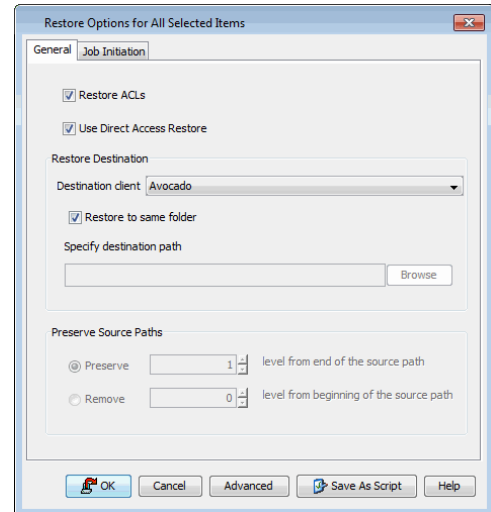
4.   You can track the progress of the job from the **Job Controller** window.
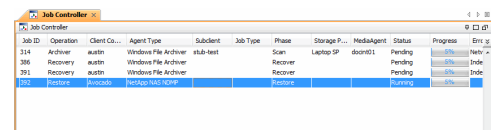
PERFORMING A DIRECT ACCESS RESTORE

Direct Access restores optimize the restore operations by allowing the file server to directly access the backed up data anywhere in the media without having to traverse the media sequentially. By default, all restore operations use the direct access restore process.

It is recommended to perform a direct access restore if the data to be restored is less than 30-40% of the backup. For example, if you are restoring 25-30 files from a backup that contains 100 files, you can use this option. However, it is recommended to disable this option when you restore a major portion of the backup.

1. From the CommCell Console, navigate to **Client Computers | <Client>** | **<File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks** | **Browse Backup Data**.

3. Click **OK**.

4. Select the data that you want to restore and click **Recover All Selected**.

5. Ensure that the **Use Direct Access Restore** option is selected.

6. Click **OK**.
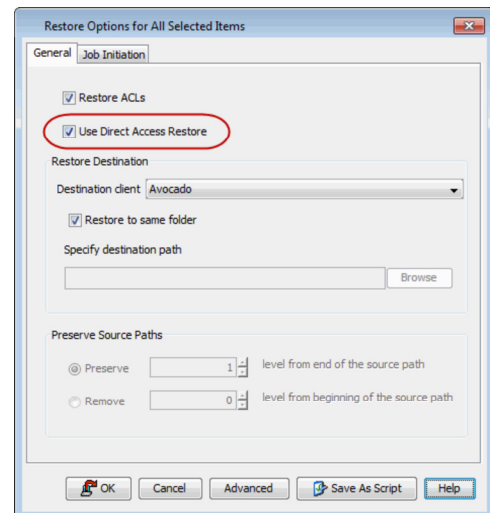
PERFORMING AN OUT-OF-PLACE RESTORE

You can restore the data to the following locations:

- Different volume/folder on the same file server
- Different file server
- Windows or Unix client

RESTORING TO DIFFERENT VOLUME/FOLDER ON THE SAME FILE SERVER

1. From the CommCell Console, navigate to **Client Computers | <Client>** | **<File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks** | **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** checkbox.

6. Click **Browse** to locate the destination path and click **OK**.

7. Use the options in the **Preserve Source Paths** area to exclude folders (and its contents) from the source path.
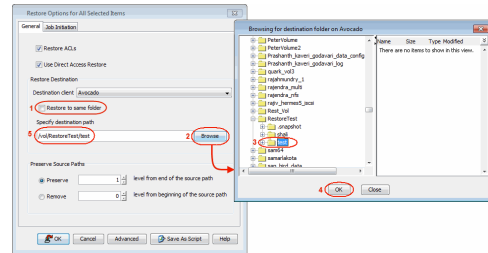
   For Example: If the selected data is `vol/Data/Memos/Sales`, and you want to restore data only from the `Sales` folder, set the **Preserve <n> level from end of source path** option to 1.

   If the selected data is `vol/Data/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 TO A DIFFERENT FILE SERVER

You can restore data to a different file server of the same type as the source file server. For example:

- Restoring from one EMC Celerra file server to another EMC Celerra file server is supported.

- restoring from an EMC Celerra file server to a NetApp file server is not supported.

1. From the CommCell Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks** | **Browse Backup Data**.

3. Click **OK**.

4. Select the data that you want to restore and click **Recover All Selected**.

5. Select the file server from the **Destination client** drop-down list.

6. Click **OK**.
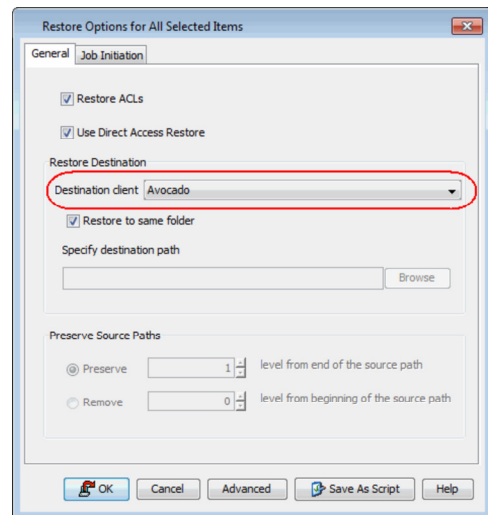
RESTORING TO A CLIENT

In order to restore data to a Windows or Unix client, you need to install the File System Restore Enabler software on the computer where you want the data to be restored. See the File System Restore Enabler documentation for a comprehensive list of steps required to perform this type of restore.

RESTORING DATA USING A MAP FILE

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

CREATING A MAP FILE

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

1. Create a text file on the client computer where you want to restore the data.

2. Add the mapping information in the file in the following format:

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

   ○ 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. (Computer names or UNC paths should not be used in the source and destination names.)

You can provide following information in a map file:

INFORMATION	EXAMPLE
File to File mapping	`"vol1/dir1/file1.txt","vol2/dir2/file1.txt"`
Folder to Folder mappings	`"vol1/dir2","vol2/dir2"`
Drive to Drive mappings	`"vol1/","vol2/"`
Renaming files/folder	`"vol1/dir4/file2.txt","vol2/dir5/file3.txt"`
Filtering files	`"vol/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.

RESTORING USING A MAP FILE

Perform a direct restore to provide a map file containing the list of files to be restored and the destination where the files will be restored.

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

2. Right-click the backup set and click **All Tasks** | **Restore**.

3. Select **Restore from file** and enter the location of the map file.

   You can also click **Browse** to locate the appropriate map file.

4. In the **Restore Options for All Selected Items** dialog box, click **OK**.
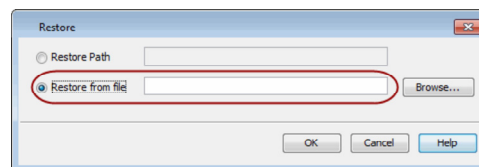
RESTORING DELETED FILES

1. From the CommCell Console, navigate to **Client Computers | <Client>** | **<File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks** | **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**.
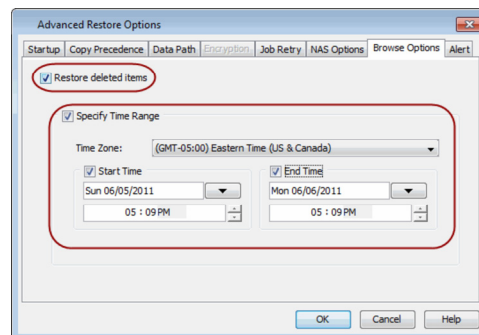
COMMAND LINE RESTORES

You can restore NAS 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 clientName 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 Data to Original Location	`qoperation execute -af restore_template.xml -clientName client1 -sourceItem '/vol/vol1'`
Restoring Data to a Point in Time	qoperation execute -af restore_template.xml -clientName client1 -toTimeValue '2011-11-28 15:40:00' -sourceItem '/vol/vol1'

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 Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks | Browse Backup Data**.

3. Click **OK**.

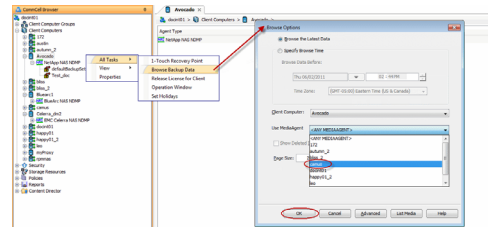4. In the right pane of the Browse window, select the data that you want to restore and click **Recover All Selected**.

5. Select the required restore options which you want to execute using the script.

6. Click **Save as Script**.
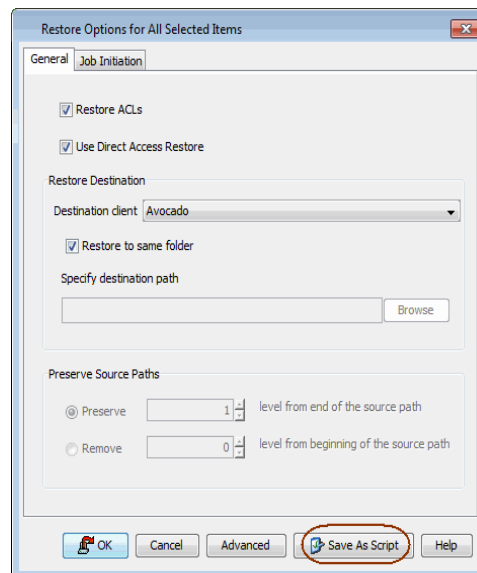
7. Enter the location where you want to save the script or click **Browse** and navigate to the location.

   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**.
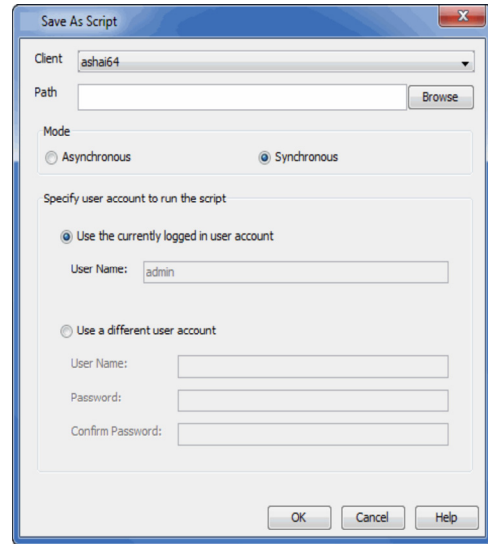
9. Click **OK**.

SCHEDULING A RESTORE

Follow the steps given below to schedule a restore job:

1.
- From the CommCell Console, navigate to **Client Computers | <Client> | <File Server> NAS NDMP**.
- Right-click the backup set and click **All Tasks | Browse Backup Data**.
- Click **OK**.

2.
- Expand the backup set node in the left pane. Select the volume containing the data you want to restore.
- Click **Recover All Selected**.

3.
- Clear the **Restore to same folder** checkbox.
- Specify the destination path by clicking **Browse**.
- Click **OK**.

4.
- Click the **Job Initiation** tab and click **Schedule**.
- Click **Configure**.
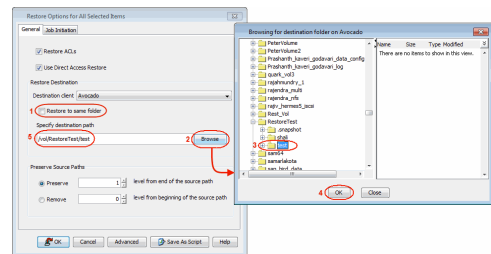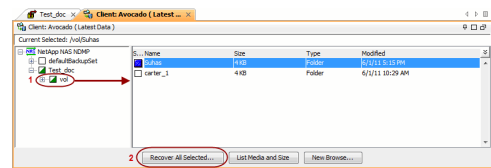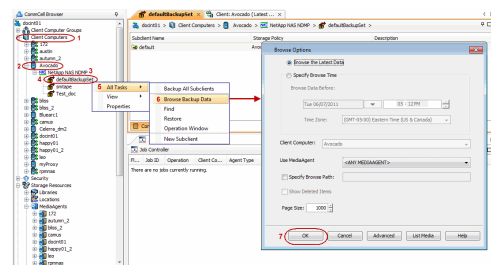
5. Select the appropriate scheduling options. For example:
- Click **Weekly**.
- Select the date and time to run the restore job.
- Click **OK** to close the Schedule Details dialog box.
- Click **OK** to close the Restore Options dialog box.

The restore job will execute as per the schedule.
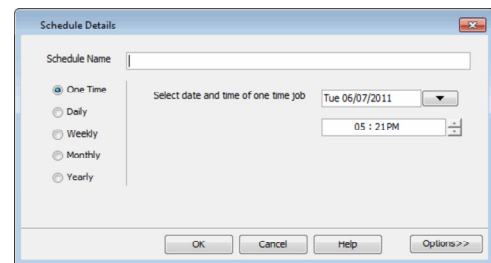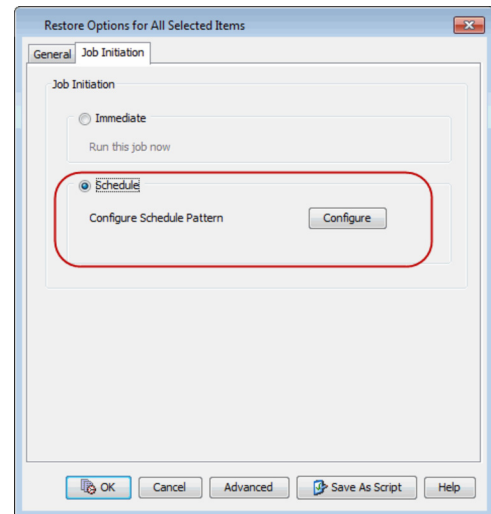
See Scheduling for a comprehensive information on scheduling jobs.

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 Console, navigate to **Client Computers | <Client>** | **<File Server> NAS NDMP**.

2. Right-click the backup set and click **All Tasks** | **Browse Backup Data**.

3. Click **OK**.

4. Select the data that you want to restore and click **Recover All Selected**.

5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**.

6. Click the **Job Retry** tab.

7. Select **Enable Total Running Time** and specify the maximum elapsed time before a job can be restarted or killed

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

9. 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 NAS FEATURES

The following sections describe the additional features available for different file servers.

PERFORMING A TWO-WAY RESTORE

FEATURE	DESCRIPTION	APPLIES TO
Two-Way Restores	A two-way restore consists of restoring the data to a file server from a locally attached (or SAN-connected) library. The following restore methods are supported: ● Restoring to the same location on the file server from where the data was backed up. ● Restoring to a different volume or folder on the same file server.	BlueArc, EMC Celerra, IBM, Hitachi, Hewlett Packard, NetApp, ONStor, Sun

PERFORMING A THREE-WAY RESTORE

FEATURE	DESCRIPTION	APPLIES TO
Three-Way Restores	A three-way restore consists of restoring the data to a different file server or computer. A three-way restore enables more than one file server to share a library allowing the restore of data to a file server which may not have a locally attached library. The following restore methods are supported: ● Restoring to a different file server ● Restoring from a library attached to a MediaAgent ● Restoring to a Windows or Unix computer (using File System Restore Enabler)	BlueArc, Dell, EMC Celerra, IBM, Hitachi, Hewlett Packard, Isilon, NetApp, ONStor, Pillar Data Systems, Sun

PERFORMING A FULL DESTRUCTIVE RESTORE FROM A VOLUME BASED BACKUP

FEATURE	DESCRIPTION	APPLIES TO
VBB Full Destructive Restore	A VBB full destructive restore is an out-of-place restore of a volume based backup. During this process, the last full backup of an entire volume is restored to a raw file system (`rawfs`) created on the file server. Follow the steps below after running a volume based backup: 1. Create a raw file system (`rawfs`) on the file server. Refer to the EMC Celerra documentation for more information. 2. From the CommCell Console, navigate to **<Client>** | **EMC Celerra NAS NDMP**. 3. Right-click the backup set and click **All Tasks** | **Browse Backup Data**. 4. Click **OK**. 5. Select the root volume to be restored and click **Recover All Selected**. 6. Clear **Use Direct Access Restore** and **Restore to same folder**. 7. Specify the destination path such as `/celerra_vol_1078` where `1078` matches the volume name from the `nas_fs-list` command for the raw file system. 8. In the **Preserve** box, set the value to **0**. 9. Click **OK**. 10. Once the restore completes, set the volume type as `usable`.	EMC Celerra

RESTORING FROM A BLOCK BASED BACKUP (SNAPMIRROR TO TAPE)

FEATURE	DESCRIPTION	APPLIES TO
SnapMirror to Tape	SnapMirror to Tape restores from a block based backup. In order to perform this type of restore, you must have configured and backed up an image backup set as described in Configuring Block Based Backups. Restoring from a block based backup is a full destructive restore because any existing data on the destination location will be overwritten. Follow the steps below to restore from an image based backup: 1. Ensure that the volume you are restoring from is in a restricted mode (unavailable for user level data access). 2. From the CommCell Console, navigate to **<Client>** | **NetApp NAS NDMP**. 3. Right-click the backup set and click **All Tasks** | **Browse Backup Data**. 4. Click **OK**. 5. Select the volume to be restored and click **Recover All Selected**. You can restore data that was backed up from either 32-bit or 64-bit aggregates with ONTAP 8.0 to 64-bit aggregates with ONTAP 8.1 and later. However, the data must be restored to volumes that were created using an ONTAP version within two major consecutive releases of the ONTAP version that was used to back	NetApp

	up the data.	
	6. Click **OK** to start the restore.	

EXCLUDING ACCESS CONTROL LISTS

FEATURE	DESCRIPTION	APPLIES TO
Restore ACLs	The ACLs are restored by default during a restore operation. To exclude ACLs from the restore, follow the steps below. 1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP**. 2. Right-click the backup set and click **All Tasks**	**Browse Backup Data**. 3. Click **OK**. 4. Clear the **Restore ACLs** checkbox. 5. Click **OK**.	NetApp, Pillar. All other vendors will restore ACLs when restoring back to the file server - there is no option to not restore ACLs.

OVERWRITING RESTORED DATA

FEATURE	DESCRIPTION	APPLIES TO
Overwrite	By default, the data in the destination is overwritten when the restored version is newer than the one in the destination. Use this option to overwrite data irrespective of the destination version. 1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP**. 2. Right-click the backup set and click **All Tasks**	**Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select the **Overwrite** checkbox. 8. Click **OK**.	BlueArc, Dell, Hewlett Packard, IBM, ONStor

PERFORMING A RECURSIVE RESTORE

FEATURE	DESCRIPTION	APPLIES TO
Recursive Restore	Use this option to include all files and subdirectories during the restore of a directory. 1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP**. 2. Right-click the backup set and click **All Tasks**	**Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select the **Recursive Restore** checkbox. 8. Click **OK**.	EMC Celerra, Hitachi

PERFORMING AN EXCLUSIVE RESTORE

FEATURE	DESCRIPTION	APPLIES TO
Exclusive Restore	Use this option to prevent simultaneous execution of multiple backup or restore operations on the same volume. This is useful as it avoids possible data inconsistency which can be caused by the following operations on the same volume: ● running a backup operation during restore processing ● running a restore operation during backup processing ● running another restore operation during restore processing 1. From the CommCell Console, navigate to **Client Computers |** *<Client>* **|** *<File Server>* **NAS NDMP**. 2. Right-click the backup set and click **All Tasks**	**Browse Backup Data**.	Hitachi

3. In the **Browse Options** dialog box, click **OK**.

4. Select the data that you want to restore and click **Recover All Selected**.

5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**.

6. Click the **NAS Options** tab.

7. Select the **Exclusive Restore** checkbox.

8. Click **OK**.

RESTORING SHORT FILE NAMES

FEATURE	DESCRIPTION	APPLIES TO
Restore Enable 8.3 Names	You can use this option to restore file names from media. When this option is enabled, any short file name that was backed up is restored. If a naming conflict occurs, the file server uses a new file name. When disabled, a file name is generated by the file system, which can result in a name that is different from the backed up file. 1. From the CommCell Console, navigate to **Client Computers | *<Client>*** | ***<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select **Yes** for **Restore Enable 8.3 Names**. 8. Click **OK**.	ONStor

RESTORING USER AND GROUP QUOTAS

| FEATURE	DESCRIPTION	APPLIES TO
Restore User and Group Quotas	You can use this option to restore user and group quotas. When this option is disabled, the tree (hierarchical) quota records are restored, ignoring user or group quotas. 1. From the CommCell Console, navigate to **Client Computers | *<Client>*** | ***<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select **Yes** for **Restore User and Group Quotas**. 8. Click **OK**.	ONStor

RESTORING SUBTREE QUOTAS

FEATURE	DESCRIPTION	APPLIES TO
Restore Subtree Quotas	You can use this option to restore tree quotas. When this option is enabled, tree quota information such as default and limit values are restored. However, usage information is not restored. When this option is disabled, no tree quota information is restored from media. 1. From the CommCell Console, navigate to **Client Computers | *<Client>*** | ***<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select **Yes** for **Restore Subtree Quotas**. 8. Click **OK**.	ONStor

RESTORING TREE QUOTA INFORMATION

FEATURE	DESCRIPTION	APPLIES TO
Restore QTree Configuration and Usage	You can use this option to restore tree or directory quota information from media. When this option is disabled, the quota configuration and usage conditions are not restored and log messages are generated. 1. From the CommCell Console, navigate to **Client Computers | *<Client>* | *<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. Click the **NAS Options** tab. 7. Select **Yes** for **Restore QTree Configuration and Usage**. 8. Click **OK**.	ONStor

ADDITIONAL RESTORE OPTIONS

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

OPTION	DESCRIPTION	RELATED TOPIC
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 Console, navigate to **Client Computers | *<Client>* | *<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore 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. On 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 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 Console, navigate to **Client Computers | *<Client>* | *<File Server>* NAS NDMP**. 2. Right-click the backup set and click **All Tasks | Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore 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**.	Refer to Recovering Data From 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: When restoring NAS data, the same drive pool type that was used during backup should be selected to restore the data.	Refer to Change Data Path.

	1. From the CommCell Console, navigate to **Client Computers |** ***<Client>*** **|** ***<File Server>*** **NAS NDMP**. 2. Right-click the backup set and click **All Tasks	Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore 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**.	
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 Console, navigate to **Client Computers |** ***<Client>*** **|** ***<File Server>*** **NAS NDMP**. 2. Right-click the backup set and click **All Tasks	Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore 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 Console, navigate to **Client Computers |** ***<Client>*** **|** ***<File Server>*** **NAS NDMP**. 2. Right-click the backup set and click **All Tasks	Browse Backup Data**. 3. In the **Browse Options** dialog box, click **OK**. 4. Select the data that you want to restore and click **Recover All Selected**. 5. In the **Restore Options for All Selected Items** dialog box, click **Advanced**. 6. In the **Advanced Restore Options** dialog box, click **Alerts**. 7. Click **Add Alert.** 8. From the **Add Alert Wizard** dialog box, select the required threshold and notification criteria and click **Next**. 9. Select the required notification types and click **Next**. 10. Select the recipients and click **Next**. 11. Click **Finish**. 12. Click **OK**.	Refer to Alert.
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.	Refer to CommCell Readiness Report.

	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.

Data Aging - NAS *i*DataAgent

TABLE OF CONTENTS

Getting Started

Extended Retention Rules

GETTING STARTED

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

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

1. From the CommCell Browser, navigate to **Policies | Storage Policies**.
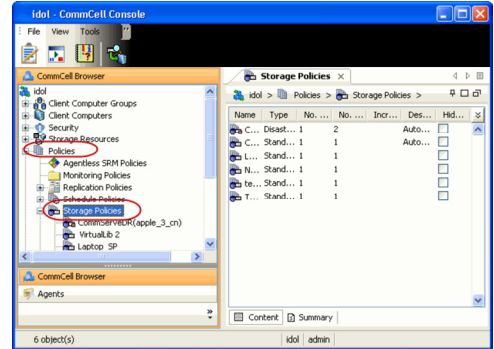
2. Highlight the **Storage Policy**.
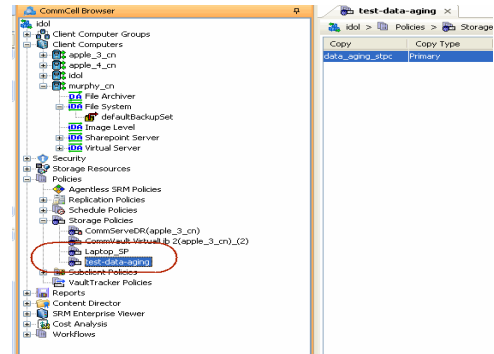
3. From the right pane, right-click the **Storage Policy Copy** and click the **Properties**.
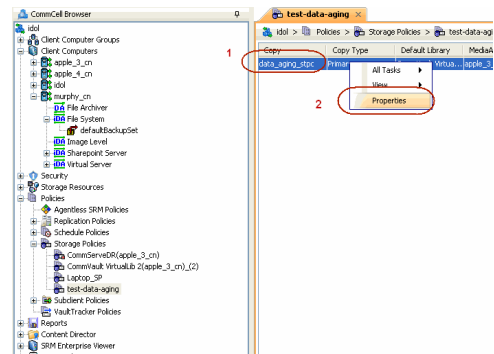
4.
    - Click the **Retention** tab.
    - Click the **Retain For** in the **Basic Retention Rules for All Backups** area.
    - Enter number of days to retain the data.
    - Enter number of cycles to retain the data.
    - Click **OK**.
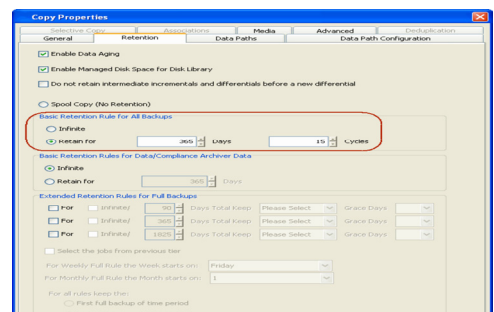
5.

From the CommCell Browser, click the **Reports** icon.
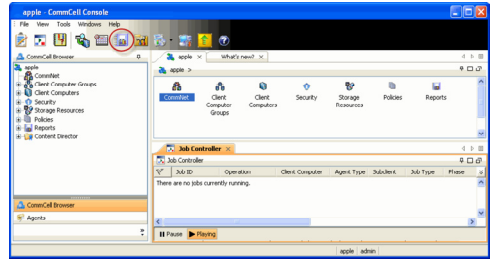
6.

Expand Reports and select **Data Retention Forecast and Compliance.**
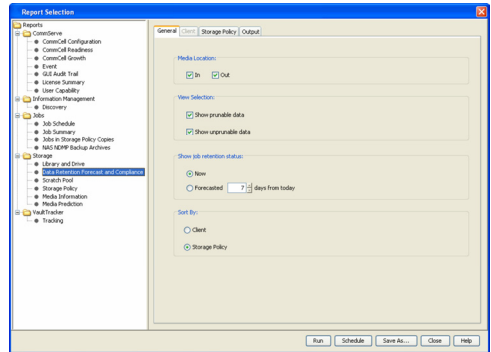
7.

Click **Run**.
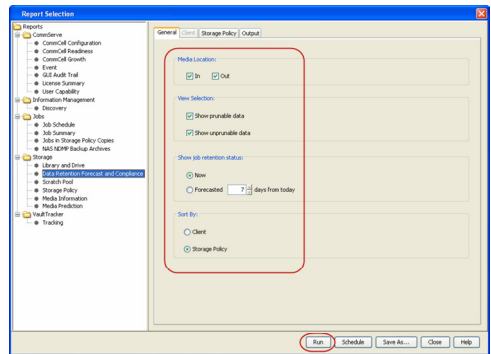
8.

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

> To ensure only data intended for aging is actually aged, it is important to identify the data that will be aged based on the retention rules you have configured. Hence, ensure this report includes only the data you intend to age.
>
> If necessary, fine-tune your rules so that only the intended data is aged.
>
> Once you run a data aging job, the data will be lost.

Data Retention Forecast and Compliance Report
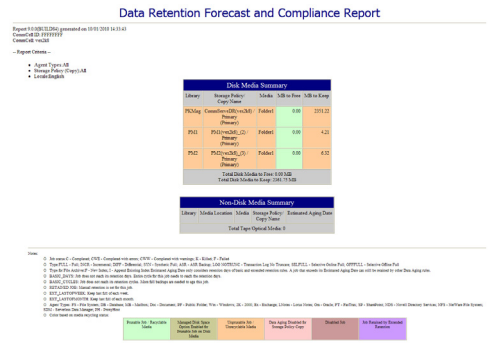
9.

From the CommCell Console, right click the CommServe icon and click **All Tasks | Data Aging**.
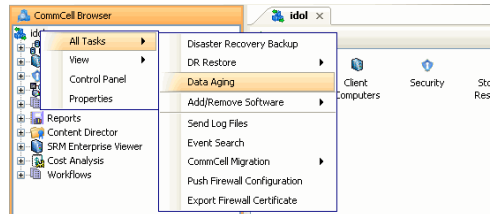
10.

Select **Immediate** in the Job Initiation section and click **OK**.
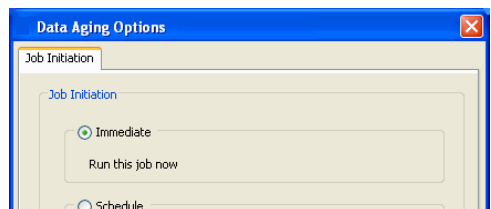
11. You can track the progress of the job from the **Job Controller** window. When the job has completed, the Job Controller displays **Completed**.

    Make sure that the job completes successfully. If the job did not complete successfully, re-run the job.
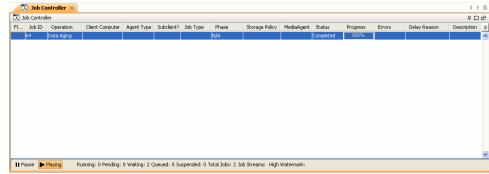
EXTENDED RETENTION RULES

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**.
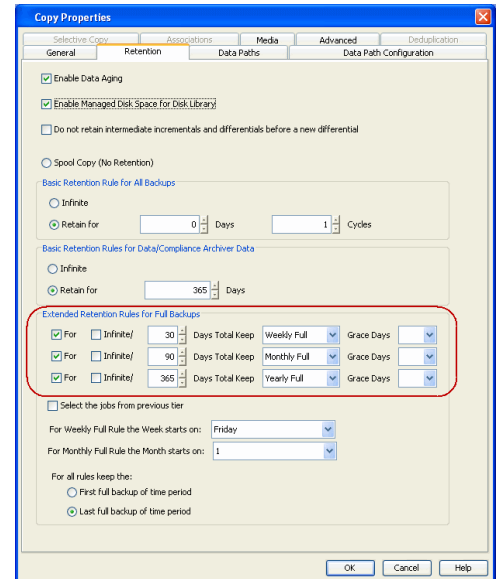
ADVANCED TOPICS

Data Aging - Advanced
Provides comprehensive information on additional Data Aging capabilities.

Disaster Recovery - NAS *i*DataAgent

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PLANNING FOR A DISASTER RECOVERY

Before you begin a disaster recovery, make sure to plan for disaster recovery as follows:

● Perform regular backups of data on a NAS file server.

● Consider dividing the data of a NAS file server into logical backup sets and subclients. This way, voluminous amounts of data can be divided into smaller chunks and you have more control of what to restore, especially if critical data is needed first. Once the subclients are created, schedule frequent backups so that up-to-date data can be comprehensively restored.

FULL SYSTEM RESTORE TO ORIGINAL NAS FILE SERVER

The full system restore of NAS data to the original file server involves the following steps:

1. Rebuild the original NAS file server.

2. Perform a restore using the last valid full backup taken by the NAS *i*DataAgent.

The following sections describe how to perform the full system restore.

PRE-REQUISITES

To run an in-place full system recovery, match the volume/file system structure of the original file server.

REBUILD THE ORIGINAL NAS FILE SERVER

Use the following steps to rebuild the original NAS file server:

1. If your NAS file server was connected to a tape drive or library, ensure that your tape drive or library has the same settings as the original. If it does not, do the following:
   ○ From the **Tools** menu in the CommCell Console, click **Control Panel.**
   ○ Double click **Library & Drive Configuration**.
   ○ Right-click the appropriate tape drive (or library).
   ○ Select the correct drive type and type the correct access path.
   ○ Click **OK**.

2. Load the same version of the operating system to your NAS file server. Ensure the configuration settings are the same as the original file server.

3. Check the hardware documentation for step-by-step instructions on setting up your vendor's file server.

4. If you want to reconfigure the file server with the same host name, change the login and password as follows:
   ○ From the CommCell Console, navigate to *<Client>* | *<File Server>* **NAS NDMP**.
   ○ Right click the *<File Server>* **NAS NDMP** and select **Properties**.
   ○ Click **NDMP Properties**.
   ○ Enter the user account in the **NDMP Login** field.
     ▪ For NetApp, type **root**.
     ▪ For EMC Celerra, type **ndmp**.
     ▪ For all other file servers, use any value.
   ○ Select **Change Password**.
   ○ In the **NDMP Password** field, enter the password for the user account.
   ○ Click **Detect** to automatically configure a library and drives attached to the NAS file server.
   ○ Click **OK.**

ENABLE NDMP ON NETAPP FILE SERVER

Make sure that NDMP is enabled on the filer. This can be done in the following two ways:

OPTION 1: COMMAND LINE

1. From a file server command line, run the **ndmpd on** command.

2. Edit the `/etc/re` file on the file server and add the command to the end of the file. This ensures that NDMP will be enabled each time the file server is rebooted.

OPTION 2: WEB BROWSER

1. From a standard web browser, enter the URL: `http://filername/na_admin`.

2. Login using your login and password.

3. Select **NDMP**.

4. Click **Enable NDMP**.

   NDMP is now enabled and will start automatically each time the file server is rebooted. You can also configure CIFS shares and NFS exports.

RESTORE NAS DATA

1. From the CommCell Console, navigate to *<Client>* | *<File Server>* **NAS NDMP**.

2. Right-click the default backup set from the original file server and click **All Tasks | Browse Backup Data.**

3. Click **OK**.

4. Expand the default backup set node in the left pane. Select the data you want to restore.
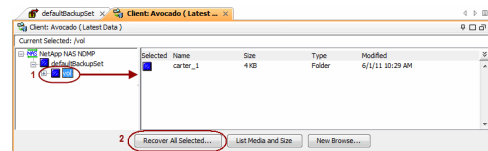
   > For NetApp file servers, do not restore data to the `/`, `/vol/vol0/` or `/etc` directories. Doing so will overwrite your configuration data. If `/vol/vol0` contained user data that must be restored, restore the qtrees or subdirectories individually.

5. Click **Recover All Selected**.

6. If you would like to restore the data to the same path from which it was backed up, click **OK**.

   If you would like to restore data to a different path, clear the **Restore to same folder** checkbox and specify the destination path by clicking **Browse**.

7. Click **OK**.

You have now completed your full system restore job.

FULL SYSTEM RESTORE TO A NEW NAS FILE SERVER

The full system restore of NAS data to a new file server involves the following steps:

1. Configure a new NAS file server. Refer to the hardware vendor's documentation for step-by-step instructions.

2. Add a new NAS client.

3. Perform a restore using the last valid full backup taken by the NAS *i*DataAgent.

The following sections describe how to perform the full system restore.

PRE-REQUISITES

Review the following requirements before restoring NAS data to a new NAS file server:

- If the target computer is to have the same fully-qualified network name as the original, the target computer must have the same login and password as the original.

- If your file server is connected to a library, the original physical connections between the file server and library should match.

- If you plan to run an in-place full system recovery, match the volume/file system structure of the original file server.

- The new file server should have the same configuration settings as the original NAS file server e.g., model and disk shelf configuration.

ADD A NEW NAS CLIENT

Use the following steps to add a new NAS client for the new NAS file server:

1. From the CommCell Browser, right-click **Client Computers** and select **New Client**.

2. Select **NAS Client** from the list.

3. Click **OK**.

4. Enter the following:
   ○ Enter the NAS file server in the **NDMP Server Hostname** field.
   ○ Enter the user account used to access the storage device in the **NDMP Login** field.
      ▪ For NetApp, type **root**.
      ▪ For EMC Celerra, type **ndmp**.
      ▪ For all other file servers, use any value.
   ○ In the **NDMP Password** field, enter the password for the NDMP Server Login account.
   ○ Click **Detect**. The system automatically populates the Vendor, Hardware OS Revision and Listen Port information.

5. Click **OK**.

ENABLE NDMP ON NETAPP FILE SERVER

Make sure that NDMP is enabled on the filer. This can be done in the following two ways:

OPTION 1: COMMAND LINE

1. From a file server command line, run the **ndmpd on** command.

2. Edit the `/etc/re` file on the file server and add the command to the end of the file. This ensures that NDMP will be enabled each time the file server is rebooted.

OPTION 2: WEB BROWSER

1. From a standard web browser, enter the URL: `http://filername/na_admin`.

2. Login using your login and password.

3. Select **NDMP**.

4. Click **Enable NDMP**.

   NDMP is now enabled and will start automatically each time the file server is rebooted. You can also configure CIFS shares and NFS exports.

RESTORE NAS DATA IN A THREE-WAY RESTORE

1. From the CommCell Console, navigate to **<Client>** | **<File Server> NAS NDMP**.

2. Right-click the default backup set from the original file server and click **All Tasks | Browse Backup Data.**

3. Click **OK**.

4. Expand the default backup set node in the left pane. Select the data you want to restore.
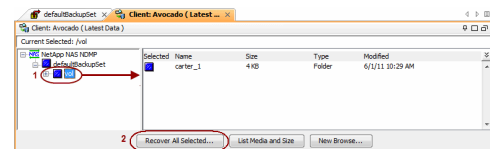
   > For NetApp file servers, do not restore data to the `/`, `/vol/vol0/` or `/etc` directories. Doing so will overwrite your configuration data. If `/vol/vol0` contained user data that must be restored, restore the qtrees or subdirectories individually.

5. Click **Recover All Selected**.

6. Select the name of the new NAS file server in the **Destination client** list.

7. If you would like to restore the data to the same path from which it was backed up on the original file server, click **OK**.

   If you would like to restore data to a different path, clear the **Restore to same folder** checkbox and specify the destination path by clicking **Browse**.

8. Click **OK**.

You have now completed your full system restore job.

DELETE ORIGINAL CLIENT LICENSE

Adding a new NAS client consumes a license. You may want to delete the original file server to free up a license.

However, do not delete the original client until its files have been restored. You may want to keep the original client in the CommCell until you are sure that its backup data will no longer be needed. For example, if your site policy requires a six month retention of backups, then you must keep the original client configuration for six months.

Additional Operations - NAS *i*DataAgent

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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**.

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.

LICENSE ADMINISTRATION

REQUIRED LICENSES

Depending on your vendor and configuration, the NAS *i*DataAgent requires one or more of the following licenses. A license is required when a NAS client is added in the CommCell Browser, not at the point of software installation on the MediaAgent.

BlueArc NAS NDMP	*i*DataAgent for BlueArc NAS NDMP	1 license per client. The license is consumed when this component is configured on the client computer.
NetApp NAS NDMP	*i*DataAgent for NetApp NAS NDMP	1 license per client. The license is consumed when this component is configured on the client computer.
EMC Celerra NAS NDMP	*i*DataAgent for EMC Celerra NAS NDMP	1 license per client. The license is consumed when this

		component is configured on the client computer.
Hitachi NAS NDMP	*iDataAgent for Hitachi NAS NDMP*	1 license per client. The license is consumed when this component is configured on the client computer.
NDMP Remote Server on Windows	*iDataAgent for NDMP Remote Server on MS Windows*	1 license per client. The license is consumed when this component is configured on the client computer.
NDMP Remote Server on UNIX	*iDataAgent for NDMP Remote Server on Unix*	1 license per client. The license is consumed when this component is configured on the client computer.
NDMP Restore Enabler	*iDataAgent for NDMP Restore Enabler*	1 license per client. The license is consumed when this component is configured on the client computer.
Mutli Vendor NAS NDMP	*iDataAgent for Multi Vendor NAS NDMP*	1 license per client. The license is consumed when this component is configured on the client computer.
Library Shared across SAN environment	Shared Library Support on the CommServe	1 license per client. The license is consumed when this component is configured on the client computer.

CONVERTING EVALUATION LICENSES TO PERMANENT LICENSES

If you installed the software using an Evaluation License, you can upgrade to a Permanent License as follows:

1. From the CommCell Browser, right-click the CommServe icon, click **Control Panel**, and then click **License Administration**.

2. Select the **Update License** tab and then click **Convert**.

3. Check the box that corresponds to the evaluation license you would like to upgrade and then click **Convert**.

The license information is updated in the **License Administration** window.

USING CAPACITY-BASED LICENSING

License Usage by Capacity is a licensing mechanism that allows you to obtain licenses based on the amount of data you back up. It provides the following features:

● Flexibility of usage on all agents, rather than being tied to number of server, agents, etc.

● Allows you to purchase licenses based on your data protection needs

Both **Core** and **Enterprise** license types are available. Refer to License Usage by Capacity for comprehensive information on utilizing this method.

RELEASING A LICENSE

If you no longer require a license on a computer, such as cases where the computer is being retired, you can release the license and use it later for another computer. Backup data from the retired computer can still be restored after the license is released provided the data is not aged.

1. From the CommCell Browser, right-click the name of the client from which you want to release a license, click **All Tasks**, and then click **Release License for Client**.

2. Click **OK** to continue releasing the license

3. Click **Yes** to confirm you want to release the license or **No** to abort.

If releasing a license is unsuccessful, a number of popup messages appears. In some cases, the message requests that you take some corrective action. For example, the message might advise you to ensure that there are no jobs running on the agent. In such a case, click **OK** and take the appropriate action. Then repeat the process. If releasing a license is successful, the tree element is dimmed and available for deletion.

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	<File Server> NAS NDMP Properties (General)	
		<File Server> NAS NDMP Properties (Version)	
		<File Server> NAS NDMP Properties (Index)	
		<File Server> NAS NDMP Properties (Security)	

		<File Server> NAS NDMP Properties (Activity Control)	
	Backupset	Backup Set Properties (General)	
		Backup Set Properties (Security)	
	Subclient	Subclient Properties of <Subclient Name> (General)	
		Subclient Properties of <Subclient Name> (Content)	
		Subclient Properties of <Subclient Name> (Filters)	
		Subclient Properties of <Subclient Name> (Pre/Post Process)	
		Subclient Properties of <Subclient Name> (Storage Device)	
		Subclient Properties of <Subclient Name> (Security)	
		Subclient Properties of <Subclient Name> (Media)	
BACKUP	Backup Options	Backup Options for Subclient <Subclient Name>	Save As Script
			Command Line XML Options
			Schedule Details
	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 (NAS Options)	
		Advanced Backup Options (Alert)	
RESTORE	Restore Options	NAS Restore Options	Save As Script
	Direct Restore Options	NAS Restore	
	Advanced Restore Options	NAS Advanced Restore Options (Startup)	
		NAS Advanced Restore Options (Copy Precedence)	
		NAS Advanced Restore Options (Data Path)	
		NAS Advanced Restore Options (Encryption)	
		NAS Advanced Restore Options (Job Retry)	
		NAS Advanced Restore Options (NAS Options)	
		NAS Advanced Restore Options (Browse Options)	
		NAS Advanced Restore Options (Alert)	

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.

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**.

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**.

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**.

UNINSTALLING COMPONENTS

NAS components are installed automatically with the MediaAgent software. Individual NAS clients must be deconfigured from the MediaAgent computer prior to uninstalling the File System *i*DataAgent or MediaAgent software. Consider the following prior to uninstalling NAS components:

- Ensure that all NAS clients have been deconfigured and that they are using storage policies for either NAS attached libraries or for NDMP Remote Server (NRS) attached libraries on another MediaAgent than this one.

- You cannot uninstall a Windows File System *i*DataAgent from a MediaAgent if the MediaAgent is in the Data Path of a Storage Policy associated with NAS subclients.

UNINSTALL SEQUENCE

The following sequence must be used when uninstalling NAS components:

1. Deconfigure all NAS clients by using the following procedure:

    o   From the CommCell Browser, right-click the name of the NAS client which you want to release a license, click **All Tasks**, and then click **Release License for Client**.

    o   Click **OK** to continue releasing the license.

    o   Click **Yes** to confirm you want to release the license or **No** to abort.

2. Uninstall any application components that may be installed by using Method 1 or 2 below.

3. Uninstall any application Agents or *i*DataAgents that may be installed by using Method 1 or 2 below.

4. Uninstall the File System *i*DataAgent (if installed) by using Method 1 or 2 below.

5. Uninstall the MediaAgent by using Method 1 or 2 below.

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 FROM ADD OR REMOVE PROGRAMS

1. Click the **Start** button on the **Windows** task bar and then click **Control Panel**.

2. Double-click **Add/Remove Programs**.

    For Windows Vista/Windows 2008, click Uninstall a Program in the **Control Panel**.

3. Click **Remove** to uninstall the components in the following sequence:

    1. <Agent>

    2. File System *i*DataAgent

    3. Base Software

ADVANCED TOPICS

Provides comprehensive information about additional capabilities for the following features:
*   Audit Trail
*   Auxiliary Copy
*   License Administration
*   License Usage by Capacity
*   Operation Window
*   Schedule Policy
*   Storage Policies
*   Uninstalling Components

Deployment - File System Restore Enabler

Install **Restore** **FAQ**

The File System Restore Enabler software allows you to perform a cross-platform restore of the NAS data to a computer with a different operating system e.g., restoring data from a NetApp file server to a Windows computer.

WHERE TO INSTALL

Install the software on a client computer where you want to restore the NAS data that was backed up from a NetApp or EMC Celerra/VNX/VNXe file server.

INSTALLATION

Use the following procedures to directly install the software from the installation package or a network drive:

OPTION 1: WINDOWS

Use this procedure to install the software on a Windows computer.

OPTION 2: UNIX

Use this procedure to install the software on a Unix computer running either AIX, Linux (Red Hat or SuSE), or Solaris.

BEFORE YOU BEGIN

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

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

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

OPTION 1: WINDOWS

1.   Log on to the client computer as Administrator or as a member of the Administrator group on that computer.

2.   Run **Setup.exe** from the **Software Installation Package**.

3.   Select the required language.

Click **Next**.

4.   Select the option to install software on this computer.

The options that appear on this screen depend on the computer in which the software is being installed.

5.   Select **I accept the terms in the license agreement**.
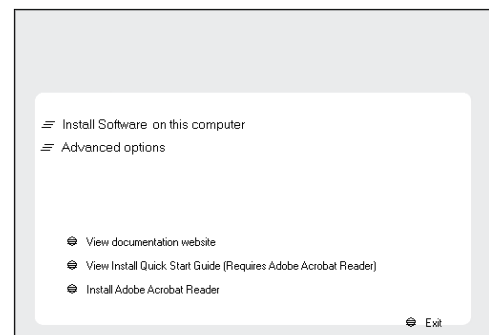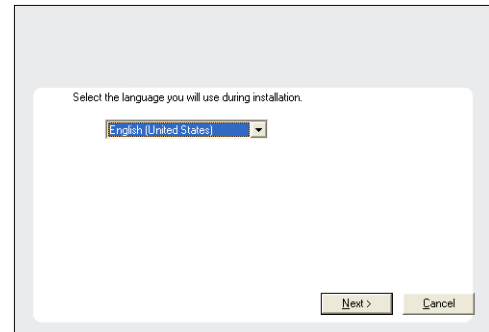
Click **Next**.

6.
- Expand **Client Modules | Backup & Recovery | File System** and select **File System NDMP Restore Enabler**.

  Windows File System _i_**DataAgent** is automatically selected if not installed on the client computer.

- Click **Next**.

7. If this computer and the CommServe is separated by a firewall, select the **Configure firewall services** option and then click **Next**.

For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.

If firewall configuration is not required, click **Next**.

8. Enter the fully qualified domain name of the **CommServe Host Name**.

Click **Next**.

  Do not use space and the following characters when specifying a new name for the CommServe Host Name:

  \|`~!@#$%^&*()+=<>/?,[]{}:;'"

9. Click **Next**.

10. 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.

11. Click **Next**.

> It is recommended to select the **Download latest update pack(s)** option to automatically install the available updates during installation.

12. Verify the default location for software installation.

Click **Browse** to change the default location.

Click **Next**.

- Do not install the software to a mapped network drive.
- Do not use the following characters when specifying the destination path:

  / : * ? " < > | #

  It is recommended that you use alphanumeric characters only.

13. Select a Client Group from the list.

Click **Next**.

> This screen will be displayed if Client Groups are configured in the CommCell Console.

14. Click **Next**.

15. Click **Next**.

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

17. Click **Next**.

18.   Click **Next**.

19.   Click **Finish**.

OPTION 2: UNIX

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 your are installing the software from CD, run the following command to mount the CD:

      mount -t iso9660,udf /dev/cdrom /mnt/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. 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.

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]

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 number associated with the **UNIX File System iDataAgent** and the **File System NDMP Restore Enabler**.

   ● Press **Enter**.

Install Calypso on physical machine angel

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

```
[ ] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) MediaAgent [1301] [CVGxMA]
[ ] 3) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 4) Documentum iDataAgent [1126] [CVGxDctmIDA]
[ ] 5) Oracle iDataAgent [1204] [CVGxOrIDA]
[ ] 6) SAP for Oracle [1205] [CVGxOrSAP]
[ ] 7) SAP for MaxDB [1206] [CVGxSAPMAXDB]
[ ] 8) Informix iDataAgent [1201] [CVGxIfIDA]
[ ] 9) Sybase iDataAgent [1202] [CVGxSybIDA]
[ ] 10) DB2 iDataAgent [1207] [CVGxDB2]
[ ] 11) MySQL iDataAgent [1208] [CVGxMySQL]
[ ] 12) PostGres iDataAgent [1209] [CVGxPostGres]
[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
[ ] 14) File System NDMP Restore Enabler [1303] [CVGxNRE]
>) >>>>>>>>>>>> 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: 1 20

10. 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.

```
[X] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) MediaAgent [1301] [CVGxMA]
[ ] 3) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 4) Documentum iDataAgent [1126] [CVGxDctmIDA]
[ ] 5) Oracle iDataAgent [1204] [CVGxOrIDA]
[ ] 6) SAP for Oracle [1205] [CVGxOrSAP]
[ ] 7) SAP for MaxDB [1206] [CVGxSAPMAXDB]
[ ] 8) Informix iDataAgent [1201] [CVGxIfIDA]
[ ] 9) Sybase iDataAgent [1202] [CVGxSybIDA]
[ ] 10) DB2 iDataAgent [1207] [CVGxDB2]
[ ] 11) MySQL iDataAgent [1208] [CVGxMySQL]
[ ] 12) PostGres iDataAgent [1209] [CVGxPostGres]
[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
[X] 14) File System NDMP Restore Enabler [1303] [CVGxNRE]
>) >>>>>>>>>>>> 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

11. Press **Enter**.

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

12. 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

13. 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]

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

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

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

  Do not use the following characters when specifying the path:

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

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]

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

- Enter a path to modify the default location and press **Enter**.
- All the modules installed on the computer will store the log files in this directory.
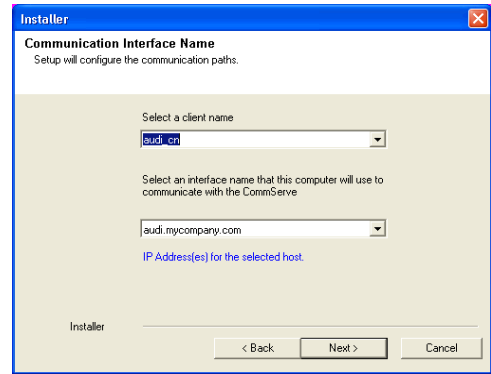
Please specify where you want to keep Calypso log files.

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

Log Directory: [/var/log]

16. Press **Enter**.

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

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]

17. 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 ...

18. Type a network TCP port number for the Communications Service (CVD) and press **Enter**.

Every instance of Calypso should use a unique set of network ports to avoid interfering with other instances

Type a network TCP port number for the Client Event Manager Service (EvMgrC) and press **Enter**.

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]

19. 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]

20. 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

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. 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** 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]

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Restore - File System Restore Enabler

| Install | Restore | FAQ |

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Follow the steps below to restore the NAS data backed up from a NetApp or EMC Celerra/VNX/VNXe file server to a Windows or Unix client computer:

> The File System Restore Enabler does not support restore operations of data that was de-duplicated using the Celerra file system.

1.
- From the CommCell Console, navigate to **<Client>** | **<File Server> NAS NDMP**.
- Right-click the backup set and click **All Tasks** | **Browse Backup Data**.
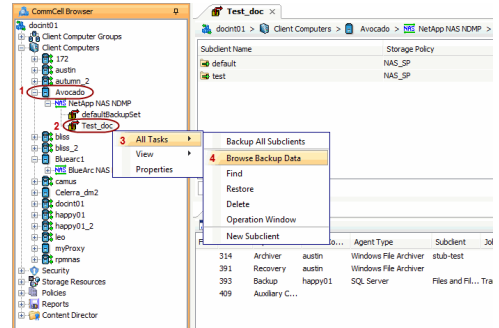
2. Click **OK**.
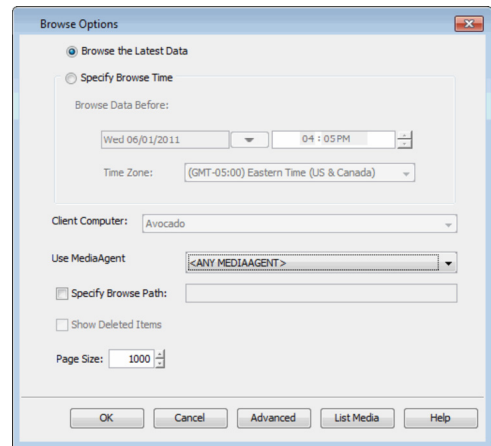
3.
- Expand the backup set node in the left pane. Select the NAS data you want to restore.

> If the path of the files to be restored has a length greater than 1024 characters, you must select a directory at a higher directory level in the file system hierarchy.
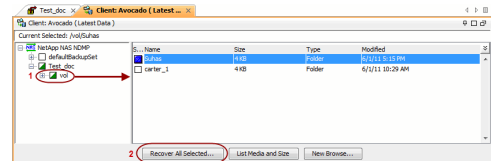
- Click **Recover All Selected**.

4.
- Select the client computer where the File System NDMP Enabler was installed from the **Destination client** drop-down list.
- Specify the destination path by clicking **Browse**.
- Click **OK**.
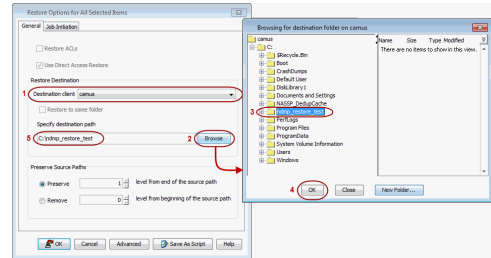
5. You can track the progress of the job from the **Job Controller** window.
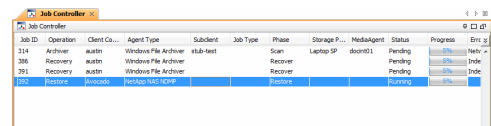
6. Verify that the restored NAS data is available in the restore destination specified during step 4.
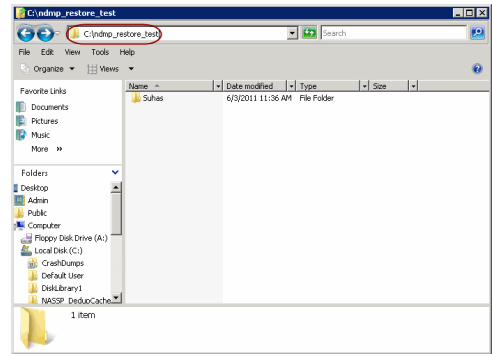
Frequently Asked Questions - File System Restore Enabler

Install | **Restore** | **FAQ**

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WHY SHOULD I USE FILE SYSTEM RESTORE ENABLER SOFTWARE?

Use the File System Restore Enabler to perform a cross-platform restore of NAS data to a computer with a different operating system. For example, data from a NetApp file server running the ONTAP operating system can be restored to a Windows computer.

CAN MY RESTORED DATA LOSE ITS ORIGINAL CHARACTERISTICS?

Yes, it could. When restoring NAS data to a file system, you should consider how the data is restored. When data is restored to an environment from which it did not originate, the data may not always assume its original characteristics as the following describes:

WINDOWS

- File and directory names with case differences will be treated like files and directories of the same name. This may cause one file/directory to overwrite another during the restore.
- Files and directories with names containing Unix-specific characters may have those characters replaced with a "_" character or have some other form of modification in the restored file/directory name.
- Windows allows 1024 characters for filenames, including the path. A filename, including the path, with more than 1024 characters will not be restored to the Windows computer.
- Files and directories that contain Access Control Lists (ACLs) or permissions are not restored.
- Links within files may not be restored.

UNIX

- Files and directories that contain Access Control Lists (ACLs) or permissions are not restored.
- Links within files may not be restored.

HOW CAN I UPGRADE THE FILE SYSTEM RESTORE ENABLER SOFTWARE?

The File System Restore Enabler is installed on a computer with the File System *i*DataAgent and will be automatically upgraded when a File System *i*DataAgent upgrade is performed.

DOES THE FILE SYSTEM RESTORE ENABLER SOFTWARE REQUIRE A LICENSE?

Yes, it requires the `iDataAgent for NDMP Restore Enabler` license.

CAN I RESTORE DE-DUPLICATED DATA FROM A CELERRA FILE SERVER?

No. The File System Restore Enabler software does not support restore operations of data that was de-duplicated using the Celerra file system.

CAN I RESTORE FROM A VOLUME BASED BACKUP?

Files that were backed up using the volume based backup option cannot be restored to a Windows or Unix computer.

CAN I RESTORE FILES WITH LONG PATH NAMES?

Files that have a path length greater than 1024 characters are skipped during restore. During browse, it is recommended to select a directory which is at a higher directory level in the file system hierarchy to perform the restore.

◀ Previous | Next ▶

Deployment - NDMP Remote Server

Install **FAQ**

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The NDMP Remote Server software allows the NAS data from the file servers to be backed up to a library attached to a MediaAgent.

WHERE TO INSTALL

Install the software on the MediaAgent computer to which the library is attached.

INSTALLATION

Use the following procedures to directly install the software from the installation package or a network drive:

OPTION 1: WINDOWS

Use this procedure to install the software on a Windows computer.

OPTION 2: UNIX

Use this procedure to install the software on a Unix computer running either AIX, Linux (Red Hat or SuSE), or Solaris.

BEFORE YOU BEGIN

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

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

OPTION 1: WINDOWS

1. Log on to the client computer as Administrator or as a member of the Administrator group on that computer.

2. Run **Setup.exe** from the **Software Installation Package**.

3. Select the required language.

    Click **Next**.

4. Select the option to install software on this computer.

    The options that appear on this screen depend on the computer in which the software is being installed.

5. Select **I accept the terms in the license agreement**.

    Click **Next**.

6.
- Expand **MediaAgent Modules** and select **NDMP Remote Server**.
- Click **Next**.

7. If this computer and the CommServe is separated by a firewall, select the **Configure firewall services** option and then click **Next**.

For firewall options and configuration instructions, see Firewall Configuration and continue with the installation.

If firewall configuration is not required, click **Next**.

8. Enter the fully qualified domain name of the **CommServe Host Name**.

Click **Next**.

> Do not use space and the following characters when specifying a new name for the CommServe Host Name:
>
> \|`~!@#$%^&*()+=<>/?,[]{}:;'"

9. Click **Next**.

10. 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.

11. Click **Next**.

It is recommended to select the **Download latest update pack(s)** option to automatically install the available updates during installation.

12. Verify the default location for software installation.

Click **Browse** to change the default location.

Click **Next**.

- Do not install the software to a mapped network drive.
- Do not use the following characters when specifying the destination path:

  / : * ? " < > | #

  It is recommended that you use alphanumeric characters only.

13. Select a Client Group from the list.

Click **Next**.

This screen will be displayed if Client Groups are configured in the CommCell Console.

14.   Click **Next**.

15.   Click **Next**.

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

17.   Click **Next**.

18. Click **Next**.

19. Click **Finish**.

OPTION 2: UNIX

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 your are installing the software from CD, run the following command to mount the CD:

mount -t iso9660,udf /dev/cdrom /mnt/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
```

<table>
<tr><td></td><td></td><td>3) Exit this menu

Your choice: [1]</td></tr>
</table>

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. 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]
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 number associated with the **NDMP Remote Server**.
• Press **Enter**. | Install Calypso on physical machine angel |
| | | Please select the Calypso module(s) that you would like to install. |

```
[ ] 1) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) MediaAgent [1301] [CVGxMA]
[ ] 3) ProxyHost iDataAgent [1102] [CVGxProxyIDA]
[ ] 4) Documentum iDataAgent [1126] [CVGxDctmIDA]
[ ] 5) Oracle iDataAgent [1204] [CVGxOrIDA]
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[ ] 7) SAP for MaxDB [1206] [CVGxSAPMAXDB]
[ ] 8) Informix iDataAgent [1201] [CVGxIfIDA]
[ ] 9) Sybase iDataAgent [1202] [CVGxSybIDA]
[ ] 10) DB2 iDataAgent [1207] [CVGxDB2]
[ ] 11) MySQL iDataAgent [1208] [CVGxMySQL]
[ ] 12) PostGres iDataAgent [1209] [CVGxPostGres]
[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
[ ] 14) File System NDMP Restore Enabler [1303] [CVGxNRE]
>) >>>>>>>>>>>> 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: 1 20
```

| 10. | 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) UNIX File System iDataAgent [1101] [CVGxIDA]
[ ] 2) MediaAgent [1301] [CVGxMA]
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[ ] 13) Lotus Notes Database iDataAgent [1051]
[CVGxLndbIDA]
[X] 14) NDMP Remote Server [1303] [CVGxNRS]
>) >>>>>>>>>>>> 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
```

11. Press **Enter**.

12. 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.

13. 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.

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

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

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

   Do not use the following characters when specifying the path:

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

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

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

16. Press **Enter**.

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

   Press **Enter** again.

18. Type a network TCP port number for the Communications Service (CVD) and press **Enter**.

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

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

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

1) Download from the software provider website.

2) Use the one in the installation media

3) Use the copy I already have by entering its unix path

Your choice: [1] 2

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]

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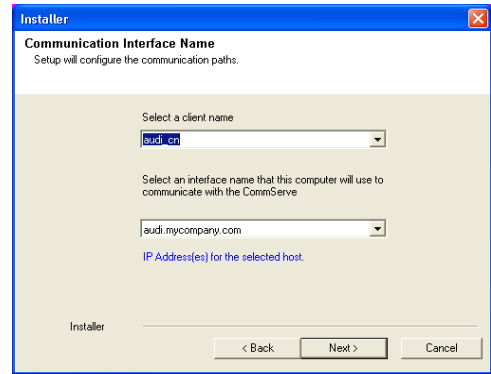
It must be a local directory and there should be at least 176MB of free space available. All files will be installed in a "calypso" subdirectory, so if you enter "/opt", the files will actually be placed into "/opt/calypso".

Installation Directory: [/opt]

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]

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]

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 ...

Every instance of Calypso should use a unique set of network ports to avoid interfering with other instances

Type a network TCP port number for the Client Event Manager Service (EvMgrC) and press **Enter**.

```
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]
```

19. If you do not wish to configure the firewall services, press **Enter**.

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

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.

20. 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
```

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. 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** 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]
```

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Frequently Asked Questions - NDMP Remote Server

Install | **FAQ**

WHY SHOULD I USE NDMP REMOTE SERVER SOFTWARE?

Use the NDMP Remote Server to back up the NAS data from file servers to a library attached to a MediaAgent. The NDMP Remote Server is also needed for the following:

- To perform auxiliary copy operations to a library attached to a MediaAgent.
- To perform deduplication, encryption and compression operations.
- To use a drive pool configured to a MediaAgent. The NDMP Remote Server allows that any storage policy configured to use a drive pool can be selected as a backup destination.
- Use the drive pool as a backup destination for a subclient. Once the NDMP Remote Server is installed, any storage policy configured to use a drive pool on that MediaAgent will be selectable as a backup destination from the NAS Subclient Properties dialog box.

CAN I USE THE NDMP REMOTE SERVER WITH A HITACHI FILE SERVER?

Yes. The NDMP Remote Server is supported for Hitachi file servers. In fact, you cannot configure a library attached to the Hitachi file server. You can only perform backups from a Hitachi file server to a library attached to a MediaAgent with the NDMP Remote Server.

ARE BACKUPS AND RESTORES LAN-FREE?

No. Backup and restore operations using the NDMP Remote Server will not be LAN-free, unlike backups and restores using a library attached to a file server.

HOW CAN I UPGRADE THE NDMP REMOTE SERVER SOFTWARE?

The NDMP Remote Serve is installed on a computer with the MediaAgent and will be automatically upgraded when a MediaAgent upgrade is performed.

DOES THE NDMP REMOTE SERVER SOFTWARE REQUIRE A LICENSE?

Yes, it requires the following licenses: (depending on your operating system)

*i*DataAgent for NDMP Remote Server on MS Windows

*i*DataAgent for NDMP Remote Server on Unix

SRM for NAS - 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 NAS 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 NAS File System report helps you to:

- Gather and view statistics on the network interfaces, system infrastructure, disk and file system assets (CIFS and NFS shares) of the NAS File Server (both NetApp and EMC Celerra are supported).
- 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

Reports are generated from the data collected in a data collection job. The data is then stored on the SRM Server. Schedule your first reports to run after your first data collection jobs have completed. Note that data collection and Report Generation jobs are scheduled independently, at different times and intervals. Thus, you can, for example, collect data nightly, hourly, or on-demand, but generate reports only once per week if desired.

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**. SRM data collection is not supported for vfilers. If you enable this option on a vfiler, then the data is not collected.
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.
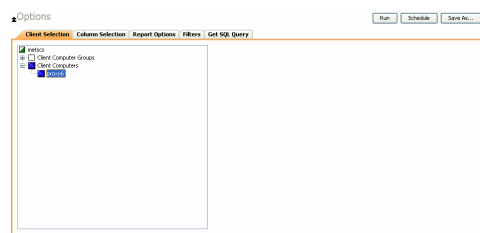
4. Click **Column Selection** tab.

   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.
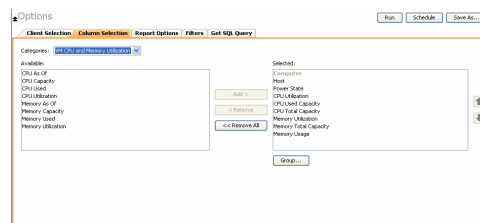
5. Click **Run** to generate the report immediately and view the results.

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.
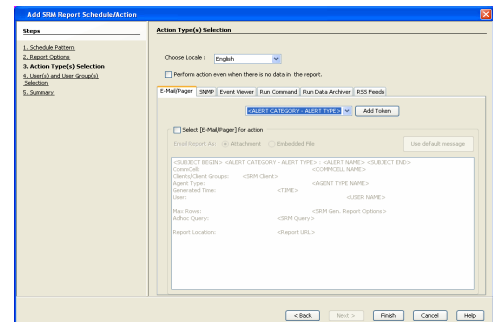
8. In this dialog, select the recipients for the scheduled report.

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**.
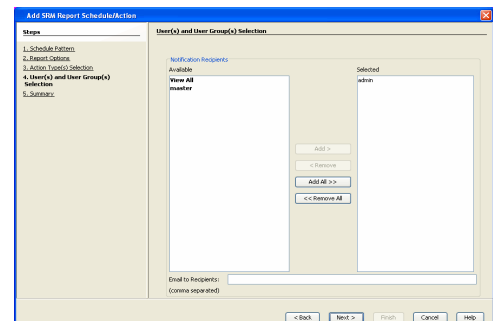
9.   Review the summary and if satisfied, click **Finish**.
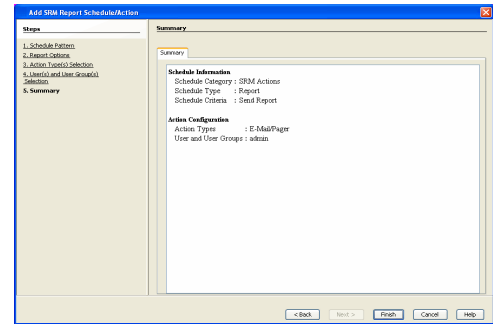
SAVING A REPORT

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**.
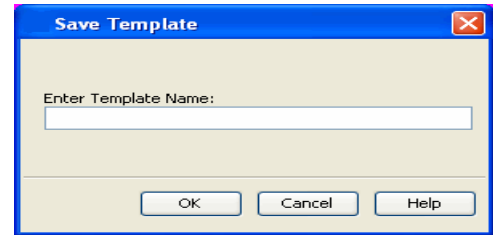
3.   The report template is saved under **My Reports**.

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.
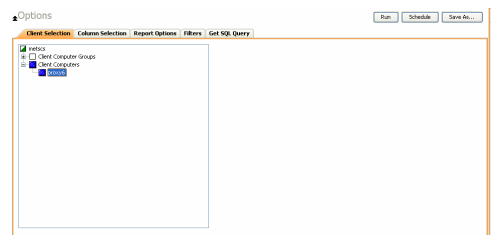
5.   Click **Schedule** to generate and schedule the report on a daily, weekly, monthly, yearly, or even one time basis.

       Optionally, click **Options** to repeat sending the report every so many days, or run it for a particular number of times.

       Click **Next**.
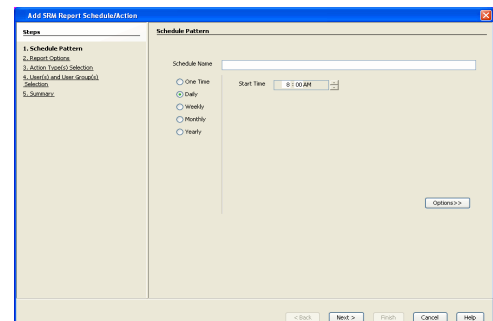
6. In this dialog, select the report output options, such as:

    ● **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 SRM NAS REPORTS

The following illustrates a few possibilities of how SRM NAS 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.

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**.
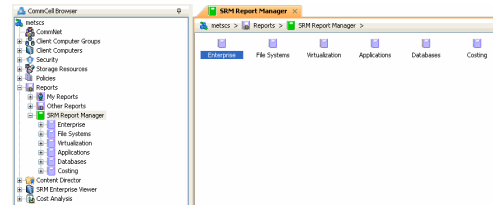
2.   Expand **File Systems** | **NAS** | **Storage**.
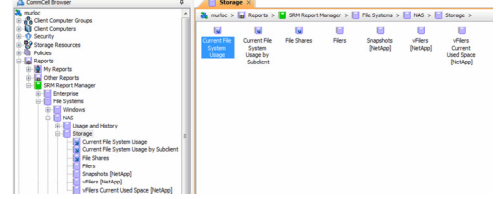
3.   Click the **Current File System Usage** template and select the client computers in the **Client Selection** tab.
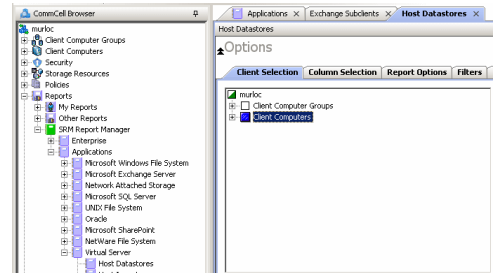
4.   Click **Run**.

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.
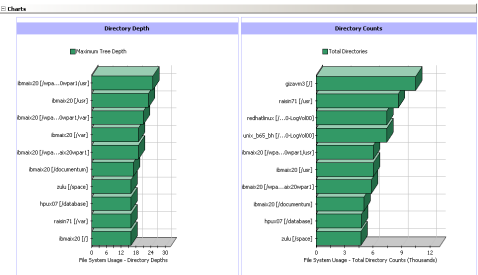
CURRENT FILE SYSTEM USAGE BY SUBCLIENT

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**.
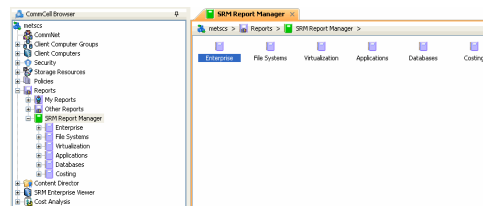
2.   Expand **File Systems** | **NAS** | **Storage**.
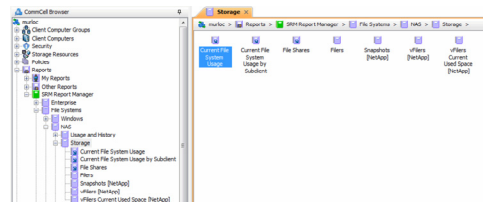
3.   Click the **Current File System Usage by Subclient** template and select the client computers in the **Client Selection** tab.
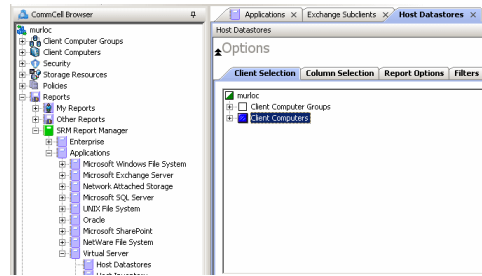
4. Click **Run**.

    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.
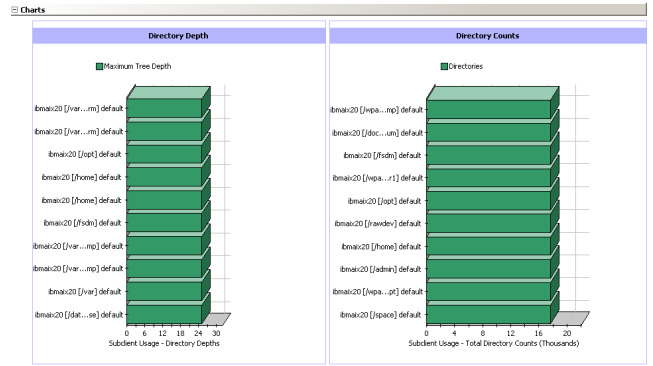
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Cost History and Usage Reports

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 NAS 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 NAS 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.
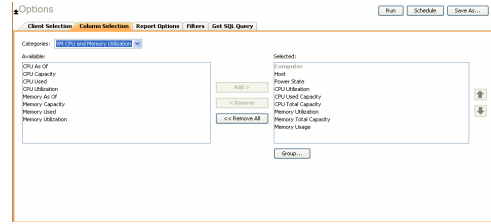
TO FILTER A SRM REPORT:

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.
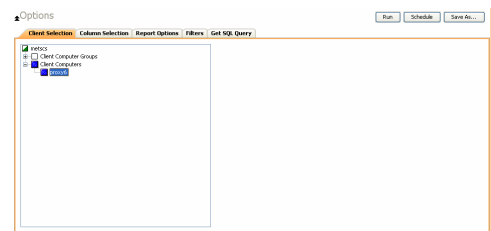
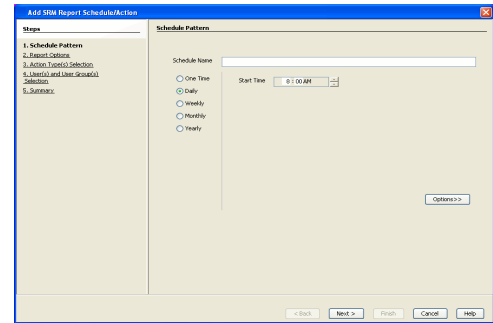4. Click **Column Selection** tab.

   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**.
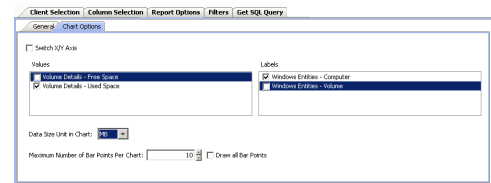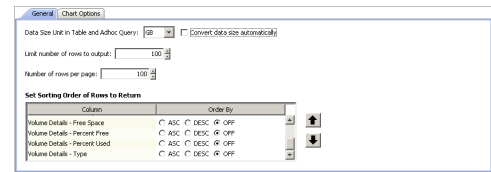
FILTERS

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.
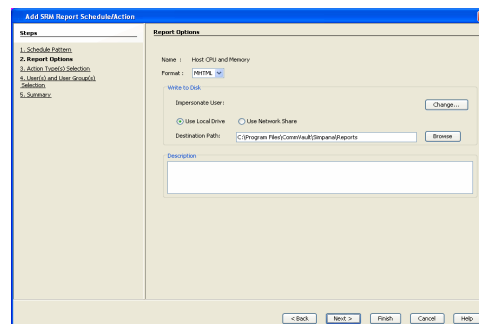
Click **Next**.

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**.
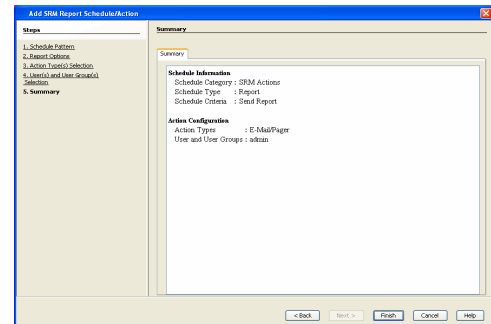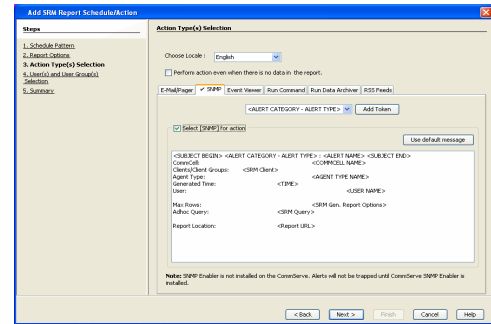
EVENT VIEWER

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**.
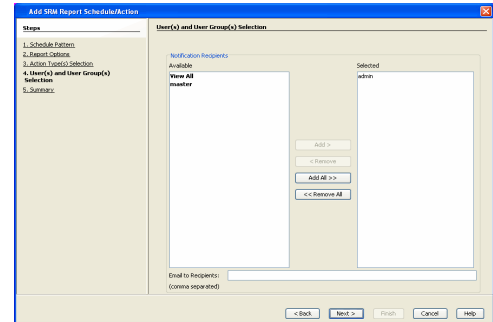
7. Review the summary and if satisfied, click **Finish**.
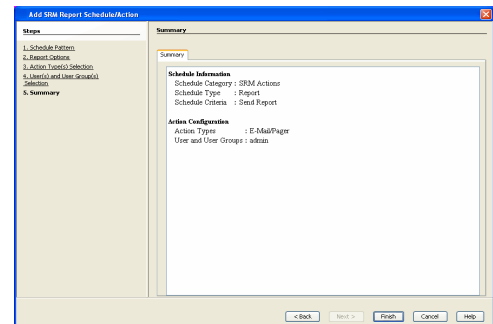
RUNNING A SCRIPT

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:
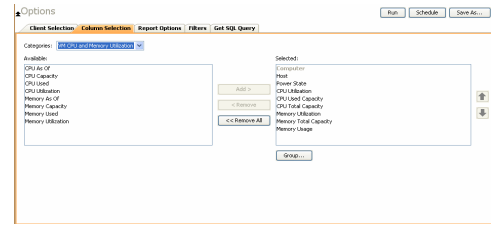
1. From the CommCell Browser, click **Reports**, and then click **SRM Report Manager**.

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**.
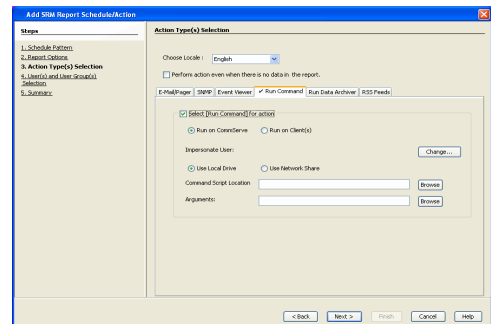
7. Review the summary and if satisfied, click **Finish**.
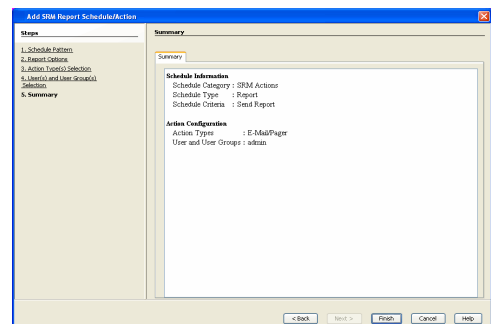
RUN DATA ARCHIVER

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**.
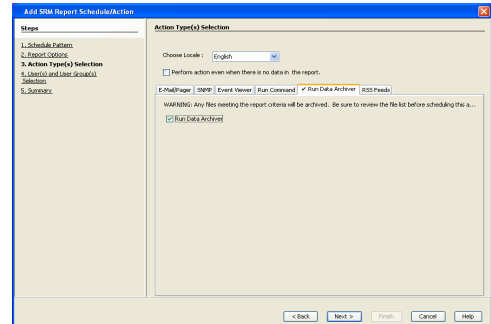
7. Review the summary and if satisfied, click **Finish**.
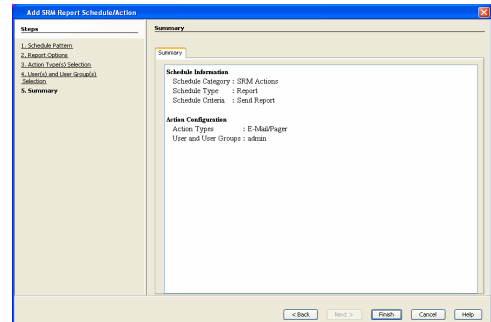
RSS FEEDS

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.
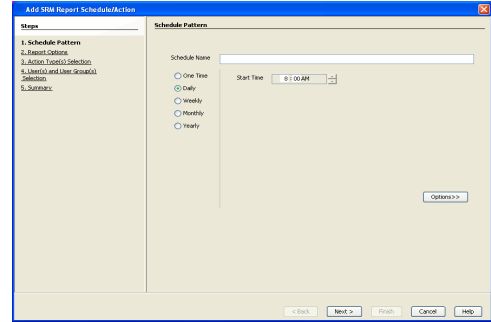
3. Configure the report by specifying clients and columns, report options, and optionally, ad hoc queries.

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.
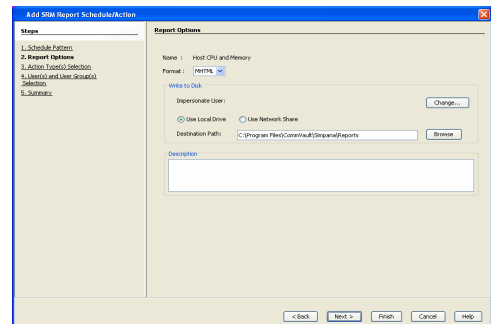
   Click **Next**.

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**.
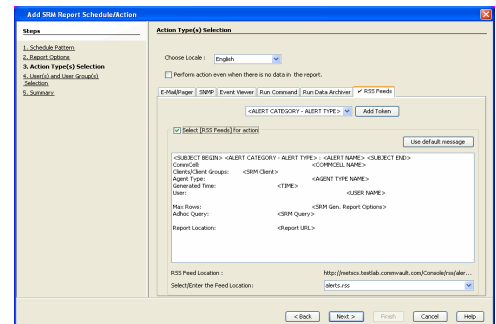
7. Review the summary and if satisfied, click **Finish**.
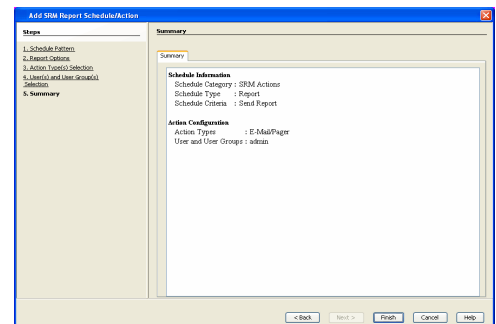
FORECASTING

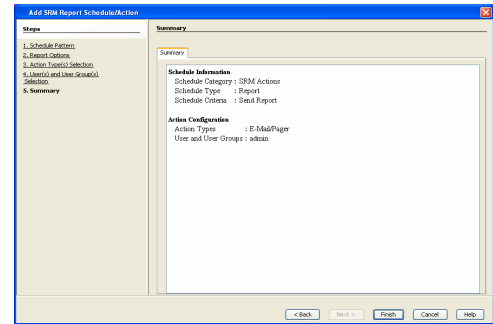Forecasting is prediction of data usage in future, based on the usage pattern in the past. Since Prediction allows visualizing data usage in future, it helps make business decisions accordingly. Prediction is available on history reports and it can be done based on Daily/weekly/Monthly data. In the graphs, 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

The following table lists the available SRM NAS Agent categories and columns that can be selected to configure a customized report.

CATEGORY/COLUMN	DESCRIPTION	SRM NAS AGENT	
		DISCOVERY JOB	DISCOVERY AND ANALYSIS JOB
CIFS Shares	Displays statistics of the Common Internet File System (CIFS) protocol per each share.		
Billable Entity			✔
Free Space			✔
Share Name		✔	
Share Path		✔	
Total Space		✔	
Used Space			✔
CIFS Statistics	Displays various CIFS request types that have been processed since the last time CIFS services were restarted on the NAS file server.		
Data Mover		✔	
Direct		✔	
Get Attribute		✔	
Lock		✔	
Open Close		✔	
Other		✔	
Read		✔	
Write		✔	
Client	Displays aspects of each client and their respective subclients on which the SRM NAS Agent is installed.		
Client Computer Group		✔	
Collection Status		✔	
Collection Time		✔	
Computer		✔	
Subclient		✔	
Client Properties	Displays aspects of the client computer on which the SRM NAS Agent is installed.		
Hostname		✔	
Memory		✔	
Operating System		✔	
OS Vendor		✔	
OS Version		✔	
Processors		✔	
Service Pack		✔	

SP Version		✓	
Time Zone		✓	
Data Mover	Displays the physical data movers that are present on the filer. Displays information such as, type of data mover (NAS, Standby, RDF), and role (primary or standby).		
Data Mover		✓	
Data Mover Status		✓	
EMC ID		✓	
Free Space			✓
Role		✓	
Type		✓	
Uptime		✓	
Used Space		✓	
Data Mover Capacity History	Displays historical view of data movers. Use to predict future use patterns for capacity planning.		
As Of		✓	
Data Mover		✓	
Percent Free		✓	
Percent Used		✓	
Space Free		✓	
Total Capacity		✓	
Used Space		✓	
Data Mover CIFS Servers	Displays the physical data movers that are using the Common Internet File System (CIFS) protocol.		
CIFS Server		✓	
Default		✓	
Domain		✓	
NetBIOS Name		✓	
Data Mover Host Names	Displays the host name and IP address that is associated with the data mover.		
Host Name		✓	
IP Address		✓	
Data Mover Mount Points	Displays the mount points of the data movers.		
File System ID		✓	
File System Name		✓	
Mount Path		✓	
Read Only		✓	
Data Mover NFS Shares	Displays the physical data movers that are using the Network File System (NFS) protocol.		
Share Path		✓	
Share Status		✓	
EMC Checkpoints	Displays the File System checkpoints that are present on an EMC, such as the checkpoint name, name of SnapSure SavVol, and when checkpoint was created.		
Checkpoint		✓	
Date		✓	
Full Mark		✓	
Snapsure SavVol		✓	

Status		✔	
Used Percent		✔	
EMC Data Mover File Distribution By Access Time	Displays file statistics of EMC data movers and average size of files, total file size, and type by access time.		
Average File Size			✔
Files			✔
Group			✔
Total File Size			✔
Type			✔
EMC Quota Trees	Displays the Quota Trees that are present on an EMC, such as the control station name, name of file system, and quota tree path.		
Quota Tree Path		✔	
EMC Storage Pools	Displays a list of system-defined storage pools of an EMC. Use it to report on current capacity of a storage pool, predict future use patterns for capacity planning, and to identify the storage pools with virtual capacity that exceeds physical capacity.		
Automatic Extension		✔	
File System Total Capacity		✔	
File System Used Space		✔	
File System Virtual Capacity		✔	
Free Space		✔	
Name		✔	
Obtain Unused Disk Volumes		✔	
Percent Committed		✔	
Remaining Potential Capacity		✔	
Total Capacity		✔	
Type		✔	
Used Space		✔	
Virtual Capacity		✔	
EMC VDM Capacity History	Displays the capacity of all file systems mounted on VDMs of an EMC, and tracks changes in free and used space over time. Useful for trending purposes.		
As Of		✔	
Name		✔	
Percent Free		✔	
Percent Used		✔	
Space Free		✔	
Total Capacity		✔	
Used Space		✔	
Exchange PST Files	Displays aspects of PST (personal storage) files created by Microsoft Outlook.		
Accessed			✔
Created			✔
Group			✔
Modified			✔
Name			✔
Owner			✔

Size			✔
File by Extensions	Displays aspects of each file per extension that is used and the number of files that include each file extension.		
Average File Size			✔
Extension			✔
Files			✔
Maximum File Size			✔
Total File Size			✔
File System Details	Displays file system statistics such as space capacity, snapshot space usage, and file inodes that store information on files (e.g., user and group ownership, access mode, and type of file).		
%Free		✔	
%Used		✔	
Data Used Space		✔	
Free Space		✔	
Snapshots Used Space		✔	
Total Snapshots		✔	
Total Space		✔	
File System Usage by Subclient	Displays the used space in the file system for each subclient.		
Used Space			✔
File System Usage by User	Displays file statistics for each user and how the files are stored and organized in the file system.		
Average File Size			✔
Files			✔
Maximum File Size			✔
Name			✔
Total File Size			✔
File System Usage by User Group	Displays file statistics by user groups and how the files are stored and organized in the file system.		
Average File Size			✔
Files			✔
Maximum File Size			✔
Name			✔
Total File Size			✔
File System Usage History	Displays overall file system statistics. Useful for trending purposes.		
%Free		✔	
%Used		✔	
As Of		✔	
Free Space		✔	
Total Space		✔	
Used Space		✔	
Filer Details	Displays NAS filers statistics, such as NAS file servers' operating system, firmware version, model number, and type.		
%Free		✔	
%Used		✔	

Firmware Version		✔	
Free Space		✔	
Last Reboot		✔	
Model		✔	
Software Version		✔	
Spare Capacity		✔	
Total Capacity		✔	
Used Space		✔	
Used Space Rank		✔	
Filer Usage History	Displays overall NAS filers statistics. Useful for trending purposes.		
%Free		✔	
%Used		✔	
As Of		✔	
Free Space		✔	
Grouping Set		✔	
Spare Capacity		✔	
Total Capacity		✔	
Used Space		✔	
Junk Files	Displays files in each file system that contain "junk" (e.g., core files, HTML files, swap files). Useful for investigation and/or removal.		
Accessed			✔
Created			✔
Group			✔
Modified			✔
Name			✔
Owner			✔
Size			✔
NAS Common Entities	Displays overall aspects per each computer selected (e.g., file system, shared storage network (filer), etc.).		
File System		✔	
Filer		✔	
Type		✔	
NetApp Aggregate Usage History	Provides a historical view of capacity of all aggregates, and tracks changes in free and used space over time. Useful for trending purposes.		
As Of		✔	
Free Space		✔	
Name		✔	
Percent Used		✔	
Total Capacity		✔	
Used Space		✔	
NetApp Aggregate Volume	Displays statistics of aggregate volumes on NAS filers, such as used space, and total, virtual, and remaining capacity for each aggregate.		
Aggregate		✔	
Flexible Volume		✔	

Free Space		✔	
Space Guarantee		✔	
Total Capacity		✔	
Type		✔	
Used Space		✔	
Virtual Capacity		✔	
Volume Used Space		✔	
NetApp QTrees	Displays properties of Qtrees on NetApp filers.		
Oplocks Enabled		✔	
QTree		✔	
QTree Volume		✔	
Style		✔	
NetApp Snapshots	Displays statistics of the volume snapshots present on NetApp filers.		
Creation		✔	
Snapshot		✔	
Status		✔	
Total Cumulative %		✔	
Total Incremental %		✔	
Used Cumulative %		✔	
Used Incremental %		✔	
Used Space		✔	
Volume		✔	
NetApp VFiler	Displays aspects of vFilers of NetApp filers with MultiStore license.		
As Of		✔	
Default		✔	
Grouping Set		✔	
IP Space		✔	
Name		✔	
Status		✔	
Used Space		✔	
NFS Share Interfaces			
Interface		✔	
NFS Shares	Displays aspects and of NFS Shares.		
Free Space		✔	
Name		✔	
Path		✔	
Total Space		✔	
Used Space		✔	
NFS V2 Statistics	Displays statistics of the various NFS v2 request types that have been processed since the last time NFS services were restarted on the NAS filer or Data Mover.		
Create		✔	
Data Mover		✔	
File System Stat		✔	
		✔	

Get Attribute			
Link		✔	
Lookup		✔	
Make Directory		✔	
Null		✔	
Read		✔	
Read 16B to 32767B		✔	
Read 1KB to 2047B		✔	
Read 2KB to 4095B		✔	
Read 32KB to 65535B		✔	
Read 4KB to 8191B		✔	
Read 512B to 1023B		✔	
Read 64KB to 131071B		✔	
Read 8KB to 16383B		✔	
Read Directory		✔	
Read Link		✔	
Read Under 512		✔	
Rename		✔	
Root		✔	
Set Attribute		✔	
Symlink		✔	
Write		✔	
Write 16B to 32767B		✔	
Write 1KB to 2047B		✔	
Write 2KB to 4095B		✔	
Write 32KB to 65535B		✔	
Write 4KB to 8191B		✔	
Write 512B to 1023B		✔	
Write 64KB to 131071B		✔	
Write 8KB to 16383B		✔	
Write Cache		✔	
Write Under 512		✔	
NFS V3 Statistics	Displays statistics of the various NFS v3 request types that have been processed since the last time NFS services were restarted on the NAS filer or Data Mover.		
Access		✔	
Commit		✔	
Create		✔	
Data Mover		✔	
File System Info		✔	
File System Stat		✔	
Get Attribute		✔	
Link		✔	
Lookup		✔	
Make Directory		✔	
Make Node		✔	

Null		✔	
Path Configured		✔	
Read		✔	
Read 16B to 32767B		✔	
Read 1KB to 2047B		✔	
Read 2KB to 4095B		✔	
Read 32KB to 65535B		✔	
Read 4KB to 8191B		✔	
Read 512B to 1023B		✔	
Read 64KB to 131071B		✔	
Read 8KB to 16383B		✔	
Read Directory		✔	
Read Directory Plus		✔	
Read Link		✔	
Read Under 512		✔	
Rename		✔	
Set Attribute		✔	
Symlink		✔	
Write		✔	
Write 16B to 32767B		✔	
Write 1KB to 2047B		✔	
Write 2KB to 4095B		✔	
Write 32KB to 65535B		✔	
Write 4KB to 8191B		✔	
Write 512B to 1023B		✔	
Write 8KB to 16383B		✔	
Write Under 512		✔	
Prohibited Files	Displays aspects of files that are not allowed (or forbidden) in NAS.		
Accessed			✔
Created			✔
Group			✔
Modified			✔
Name			✔
Owner			✔
Size			✔
Quotas	Displays a list of quotas configured on NAS filers. Quotas are defined per logical volume or qtrees, or per file system or quota tree.		
Default		✔	
Disk Space Hard Limit		✔	
Disk Space Soft Limit		✔	
Disk Space Threshold		✔	
File Count Hard Limit		✔	
File Count Soft Limit		✔	
Files Used		✔	
		✔	

Percent Used			
Scope		✓	
Space Remaining		✓	
Tree		✓	
Type		✓	
Used Space		✓	

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.
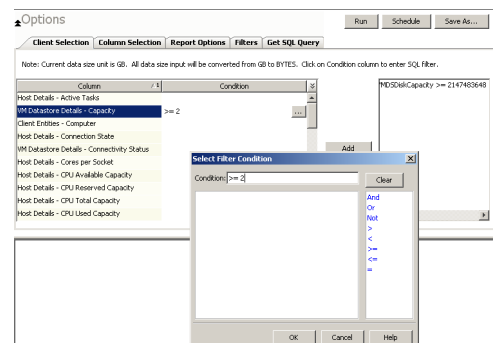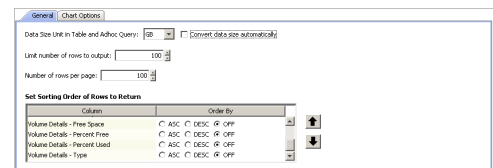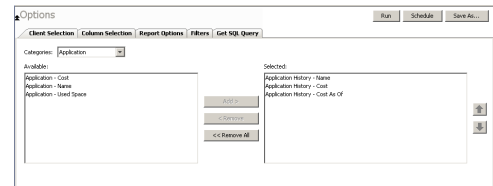
6. Click **Run** to generate the report immediately and view the results.

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Overview

Generate a Report with Filters

Examples of Queries used in filters

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 ad hoc 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 an ad hoc query 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 an ad hoc query, 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 ad hoc 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.
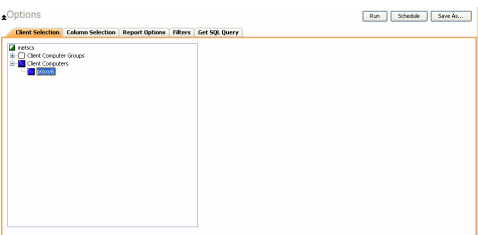
4. Click **Column Selection** tab.

   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.
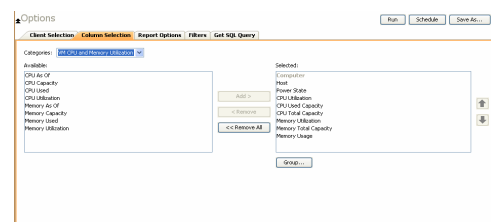
5. Click the **Report Options** tab to configure settings in the report. Click the **General** tab to:

- Set the **Data Size Units** (etc. GB, MB) for the tables. Optionally, you can select **Convert data size automatically** = to have them converted for you.
- 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 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**). The columns that were selected in the **Column Selection** tab are displayed.
- Specify the **Condition** for the column by either typing it in directly or clicking **...** to display the **Select Filter Condition** dialog box.
  - If **...** was selected in the previous step, 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**.
  - After specifying the condition, 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**.
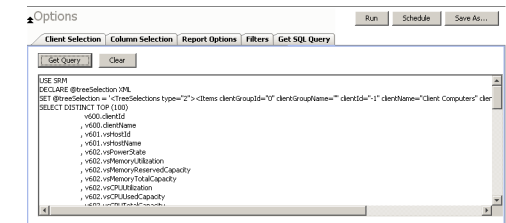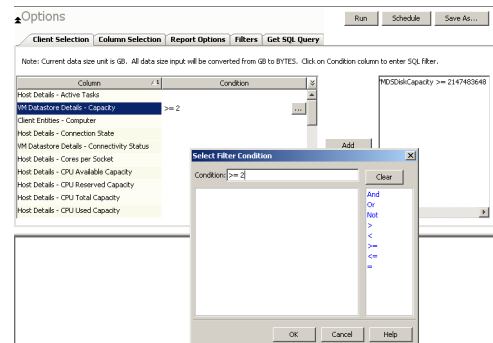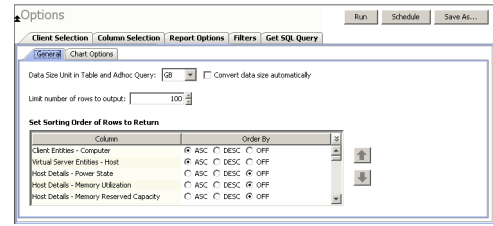
EXAMPLES OF QUERIES USED IN FILTERS

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	Display a computer group that starts with B and ends with M (e.g., Birmingham).

	no result is displayed if either is FALSE.	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"`.

SRM for NAS - Reports

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OVERVIEW

SRM for NAS Summaries provide a concise view of the status of SRM NAS entities 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 a SRM NAS 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 for NAS at different levels in the CommCell Console:

CLIENT SUMMARIES

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.

AGENT SUMMARIES

The SRM for NAS displays charts for **NAS Filer Usage History**, **File Distribution by Size**, **File Distribution by Access Time**, **File Distribution by Modification Time** at the agent level.

Summary information includes Advisories and Properties at the agent level. Advisory information includes severity level, the time stamp, and a brief description. Properties at the Agent level include physical information like, Type, Model, Firmware Revision, OS Version, Uptime, etc.

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 for NAS at this level displays charts for **File Distribution by Size**, **File Distribution by Access Time** and **File Distribution by Modification Time**.

1. From the CommCell Console, select the Client Computer with SRM for NAS for which you want to view summaries.

2. Expand **SRM** and select **Network Attached Storage**, then select **Subclients**.

> You may also expand subclients node and alternatively select default or user defined subclient to view its summary.

3. The associated **Subclient Summary** will appear in the main window.
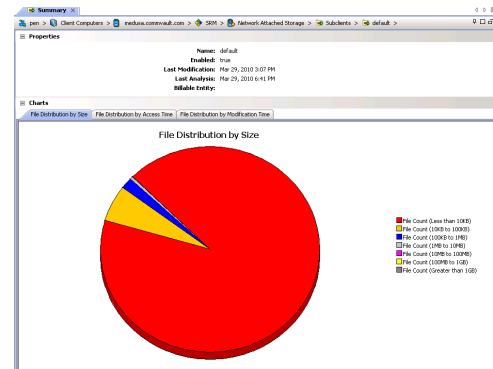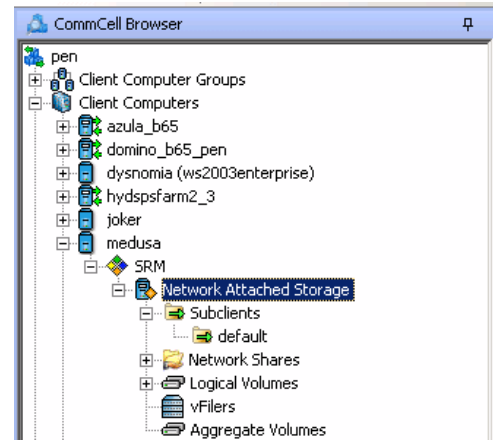
NETWORK SHARES SUMMARIES

The SRM for NAS displays charts for **NAS Usage Statistics**. Each Share also displays Properties including physical information like Path, Protocol, Free Space on Volume, etc. apart form Advisories including severity level, the time stamp, and a brief description.

1. From the CommCell Console, select the Client Computer with SRM for NAS for which you want to view summaries.

2. Expand **SRM** and select **Network Attached Storage**, then select **Network Shares**.
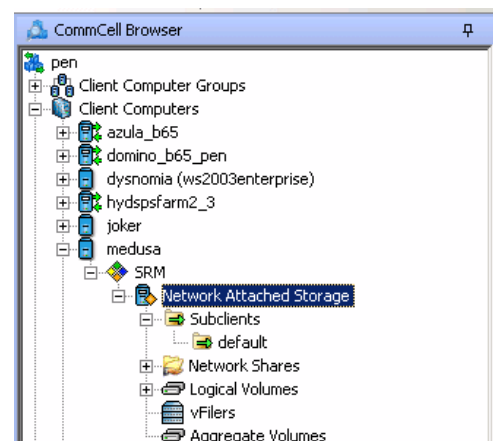
3. The associated **Network Shares Summary** will appear in the main window.
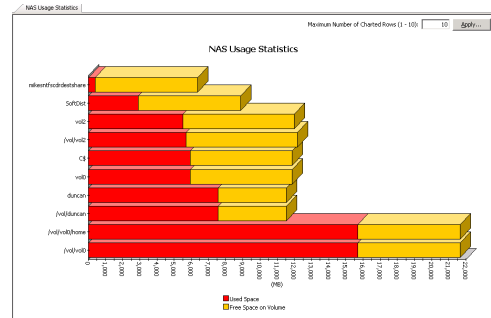
DATA MOVERS SUMMARIES

Summary information at the Volume level include charts for **NAS Usage Statistics** and **Data Mover Uptime Statistics.**

Each Data Mover has various severs that display different summary information. Summary includes - Properties including physical information like Name, EMC ID, Status, Type, etc. Advisories including severity level, the time stamp, and a brief description is displayed. Charts displaying **Usage History**, **NAS Usage Statistics, File Distribution by Size**, **File Distribution by Access Time** and **File Distribution by Modification Time** are available in summary information. Data Mover summary also includes the available CIFS Servers, Mount Points, Hostnames, and Network Shares.

Advisories with severity level, the time stamp, and a brief description are also displayed along with charts at this level.

1. From the CommCell Console, select the Client Computer with SRM for NAS for which you want to view summaries.

2. Expand **SRM** and select **Network Attached Storage**, then select **Data Movers**.

3. The associated **Data Movers Summary** will appear in the main window.
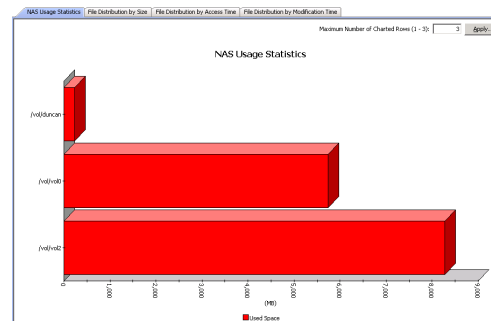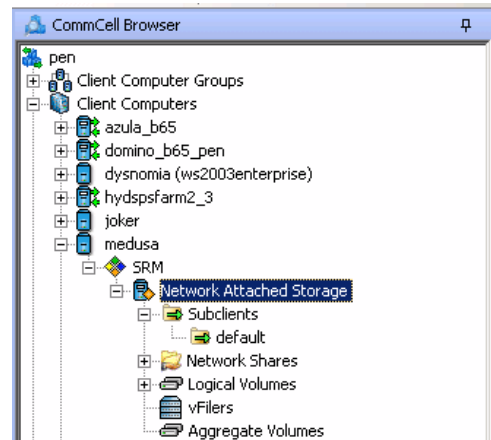
FILE SYSTEMS SUMMARIES

Summary information at the File systems level include charts for **NAS Usage Statistics File Distribution by Size**, **File Distribution by Access Time** and **File Distribution by Modification Time.**

Advisories with severity level, the time stamp, and a brief description are also displayed along with charts at this level.

Each File System also displays Properties including physical information like Name, EMC ID, Status, Type, etc. at the File System level. Quota Trees and Auxiliary Information is also available as summary at this level, depending upon the availability.

1. From the CommCell Console, select the Client Computer with SRM for NAS for which you want to view summaries.
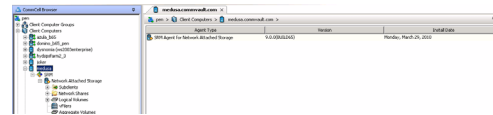
2. Expand **Agent** and select **Network Attached Storage**, then select **File Systems**.
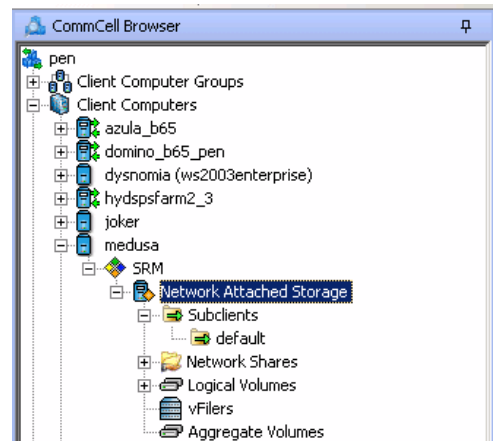
3. The associated **File Systems Summary** will appear in the main window.

STORAGE POOLS SUMMARIES

Summary information at the Storage Pools level include charts for **Storage Pool Capacity.** Summary also includes Advisories with severity level, the time stamp, and a brief description.

Each pool displays Properties including physical information like Name, EMC ID, Type, Description, etc. Volumes, File Systems and SnapSure SavVol depending on the availability.

1. From the CommCell Console, select the Client Computer with SRM for NAS for which you want to view summaries.
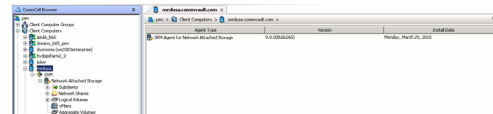
2. Expand **Agent** and select **Network Attached Storage**, then select **Storage Pools**.
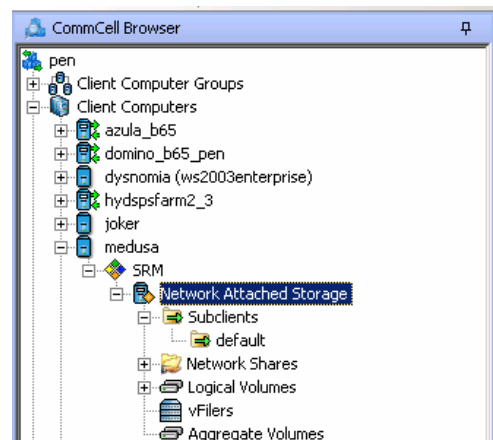
3. The associated **Storage Pools Summary** will appear in the main window.

STORAGE SYSTEMS SUMMARIES

Summary information is displayed in tabular format and includes Name, EMC ID, Status, Type, Model, Serial Number, Disk Count for the storage system.

META VOLUMES SUMMARIES

Summary information includes Advisories with severity level, the time stamp, and a brief description.

ENTERPRISE VIEWER

The **Enterprise Viewer** displays the physical assets of NAS File Server Clients in a single location. Summaries can be viewed by expanding the nodes and clicking the assets displayed in the **Enterprise Viewer**.

- Larger enterprises with many NAS File Servers will find it convenient that the **Enterprise Viewer** displays all NAS assets in one place.

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Best Practices - NAS *i*DataAgent

ENABLE NDMP ON NETAPP FILE SERVER

Make sure that NDMP is enabled on the filer. This can be done in the following two ways:

OPTION 1: COMMAND LINE

1. From a file server command line, run the **ndmpd on** command.

2. Edit the `/etc/re` file on the file server and add the command to the end of the file. This ensures that NDMP will be enabled each time the file server is rebooted.

OPTION 2: WEB BROWSER

1. From a standard web browser, enter the URL: `http://filername/na_admin`.

2. Login using your login and password.

3. Select **NDMP**.

4. Click **Enable NDMP**.

   NDMP is now enabled and will start automatically each time the file server is rebooted. You can also configure CIFS shares and NFS exports.

USE UTF-8 SETTING ON NETAPP FOR VOLUME LANGUAGE

To successfully browse and restore NAS data on a NetApp file server, it is recommended to use the UTF-8 setting for volume language. Please consult with NetApp for implications of changing volume language.

NETAPP ISCSI LUN MUST BE OFFLINE

For a NetApp iSCSI configuration, the iSCSI LUN must be offline before restoring an iSCSI file from a backup job.

USE LOAD-BALANCING TO DISTRIBUTE JOB PROCESSES AMONG SEVERAL AVAILABLE MEDIAAGENTS

If you do not use Alternate Data Paths, do the following to allow job processes to be distributed among the different available MediaAgents:

- Configure drive pools on multiple MediaAgents so that the NAS NDMP jobs will not all run on a single MediaAgent, and thus the processor load for these jobs will occur on different machines. See Master Drive Pools, Drive Pools and Drives.
- Configure multiple Storage Policies, each using a different MediaAgent and drive pool. See Storage Policies.
- Distribute the data to be protected among multiple subclients.
- Associate each subclient to a different Storage Policy. See Associate a Subclient to a Storage Policy.

If you do use Alternate Data Paths, the load-balancing of the job processes described above can be achieved just as effectively in addition to the network load-balancing and fault-tolerance that the Alternate Data Paths feature provides.

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.

USE SNAPPROTECT TO IMPROVE BACKUP PERFORMANCE OF SMALL FILES

A bottleneck of too many read/write operations may occur when backing up small files to tape. Therefore, you may want to consider using SnapProtect to create snapshots of these small files, instead of using regular NDMP backups. Using snapshots may increase backup and restore performance in this case.

Frequently Asked Questions - NAS *i*DataAgent

WHAT ARE TWO-WAY RESTORES?

A two-way restore consists of restoring the data to a file server from a locally attached (or SAN-connected) library.

The following restore methods are supported:

- Restoring to the same location on the file server from where the data was backed up.
- Restoring to a different volume or folder on the same file server.

WHAT ARE THREE-WAY RESTORES?

A three-way restore consists of restoring the data to a different file server or computer. A three-way restore enables more than one file server to share a library allowing the restore of data to a file server which may not have a locally attached library.

The following restore methods are supported:

- Restoring to a different file server
- Restoring from a library attached to a MediaAgent
- Restoring to a Windows or Unix computer (using File System Restore Enabler)

CAN I FILTER SUBCLIENT CONTENT ON ALL NETAPP CLIENTS?

No. Subclient filters are supported only for NetApp 7-mode clients. Subclient filters are not supported for NetApp C-mode clients.

CAN I BROWSE FOR SUBCLIENT CONTENT ON ALL NETAPP CLIENTS?

No. You can browse for subclient content only on NetApp 7-mode clients. You cannot browse for subclient content on NetApp C-mode clients.

CAN I RESTORE BLOCK BASED BACKUPS TO MULTIPLE ONTAP RELEASES?

No. You can restore block based backup images up to one or two major ONTAP releases. It is highly recommended that you consult the NetApp documentation for limitation on block based backup restores.

CAN I PERFORM BLOCK BASED BACKUPS ON FILE SERVERS WITH VERSIONS PRIOR TO ONTAP 8.0?

It is required that you get an approval from NetApp in order to perform a block based backup on a file server running an ONTAP version prior to 8.0.

CAN I ENABLE THE IMAGE BACKUP SET OPTION ON A SNAPVAULT COPY?

Yes, you can enable the **Image Backup Set** option (for SnapMirror to Tape) on a backup set containing the SnapVault copy. However, the image backup of the SnapVault copy will not exactly match the primary (source) volume. For example, the non-qtree data on the primary volume will be in a qtree on the SnapVault copy; the SnapVault copy may also contain data from other primary volumes.

CAN I USE A MEDIAAGENT-ATTACHED (NRS) DRIVE POOL TO RESTORE DATA THAT WAS BACKED UP USING AN NDMP DRIVE POOL?

No. To restore NAS data, you must use the same drive pool type that you selected during backup. For example, if a drive pool associated with the NDMP Remote Server (NRS) was used to perform the backup, you should also select an NRS drive pool during restore.

ARE NON-IMAGE BROWSE OPERATIONS OF CELERRA DATA SUPPORTED FOR DIRECT ACCESS RESTORES?

Yes. Browse operations for EMC Celerra are always non-image browse operations. Even if an image browse is performed, the restore will be a non image restore.

HOW DO DIRECT ACCESS RESTORES BEHAVE WHEN RESTORING LARGE DATA?

The `nRESTORELIMIT` registry key is automatically created during installation to control the behavior of large direct access restores.

This key specifies how many files/directory names can be sent in a single restore request; between each request, the tape will be positioned to the start of the first tape. For example, performing a direct access restore of a tree with 24,000 files/directories would require three restore requests (using the default value of 8192 per request) to be sent to the file server.

WHEN SHOULD I PERFORM A DIRECT ACCESS RESTORE?

It is hard to define when a Direct Access Restore provides better performance as each environment is different and has many variables that can affect restore efficiency. Use the following guidelines to determine if this restore operation is appropriate for your environment:

- If the data to be restored is less than 30-40% of the backup, it is recommended to perform a direct access restore.
- For three-way restores, as it involves more overhead processing between the library and the file server, it is recommended to perform a non-direct access restore even if the percentage of the backup being restored is under 30%.

If you are not using direct access restores, restore performance is still optimized where possible. For instance, if the most recent copy of the data that you want to restore was backed up by an incremental or differential backup, the restore only reads the archive file from that differential or incremental backup, instead of reading the archive files back to the last full backup.

WHY CAN I NO LONGER RUN INCREMENTAL BACKUPS?

Most file servers have a limit to the number of incremental backups, except Celerra, BlueArc, Hitachi, ONStor, and Isilon. Other supported file servers allow incremental backups with the following limitations:

- After a full backup, a maximum of 9 incremental backups can be run sequentially. At this point, a full or differential backup must be run.
- After a differential backup is run, you can run 8 more incremental backups before performing another full or differential backup.

CAN I BACKUP DATA TO A LOCAL TAPE DRIVE FOR A NETAPP VFILER?

No. You can backup data on a NetApp vFiler by adding the vFiler as a NAS client.

WHAT IS TAPE SILVERING?

Tape silvering is the process of shipping a physical copy of the source data to a destination site. This is useful for large file systems as it saves time and resources and also avoids transferring the file system over the network. Refer to the EMC Celerra documentation for more information.

CAN I PERFORM THE BLOCK BASED BACKUP FOR AN ON-DEMAND BACKUP SET?

You can perform the block backup for an On-Demand backup set. You must configure an On-Demand Backup Set for block backup. However, once you configure the On-Demand Backup Set for block backup, you cannot change the configuration and perform the regular backup for the the On-Demand Backup Set.

CAN I PERFORM INCREMENTAL OR DIFFERENTIAL BACKUP FOR A BLOCK BASED BACKUP SET?

When you create a backup set for block based backup, you cannot perform incremental or differential backups using that backup set. You can perform the full backup of the backup set.

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

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

HOW DO I SETUP DEDUPLICATION FOR NAS NDMP BACKUPS?

Deduplication of NDMP data is supported for NetApp and EMC Celerra storage arrays to disk libraries attached to a CommVault Deduplication MediaAgent. When backing up to disk libraries attached to the MediaAgent, the NDMP backup data will traverse the network and be written and deduplicated to the disk library.

For all other NDMP vendors, Deduplication is supported but the savings may not be as high. To achieve higher Deduplication savings of these backups, it is recommended to move backups from NDMP to a mounted file system backup using the data residing on CIFS or NFS mount using the File System iDataAgent. However, before moving to CIFS or NFS file systems, make sure to verify the data transfer rate over CIFS or NFS as low transfer rate may result in slower backups. This configuration also supports Synthetic Full backups and DASH Copy.

CAN I USE A MEDIAAGENT-ATTACHED DRIVE POOL TO RESTORE DATA THAT WAS BACKED UP USING AN NDMP DRIVE POOL?

No. To restore NAS data, you must use the same drive pool type that you selected during backup. For example, if an NDMP drive pool was used to perform the backup, you should also select an NDMP drive pool during restore.

Troubleshooting Backup - NAS *i*DataAgent

Backup   **Restore**

BACKUP FAILURES

The following section provides information on troubleshooting backups.

Incremental backups are failing	If this event is generated:
	`nasBackup: Exceeded maximum number of incremental backups. Must run full or differential backup`
	Then set the the sConvertToFull registry key to `Y` to kick off a Full backup if all paths in a subclient have exceeded the maximum number of incremental backups.
NAS-attached libraries shared across a SAN	During configuration, all of the drive devices must have a value for their serial number.
	If the automatic configuration does not populate a serial number for a drive, you must manually enter a serial number value. Each instance of a drive must have the same serial number.

FILTER DATA THAT CONSISTENTLY FAILS

PROBLEM

Some items such as files or folders e.t.c., fail because they are locked by the operating system or application and cannot be opened at the time of the data protection operation. This items will be displayed in the "Items That Failed" list when Job History Report is run.

SOLUTION

Filter the files that consistently appear in the "Items That Failed" list on the data protection Job History Report and exclude those files or folders during backup to avoid backup failure.

COMPLETED WITH ONE OR MORE ERRORS

Backup jobs from NAS *i*DataAgent will be displayed as `Completed w/ one or more errors` in the Job History in the following cases:

- Backup context no longer exists on the file server. Backup cannot be restarted.
- Failing restarted backup of path [^1%s]. Failed to get context list from the file server.
- Data Loss detected. The number of tape blocks written as reported by NDMP tape server does not match the reported value for the actual tape drive.
- Failed to update the reference time. Failing path.
- Error committing chunks with the Job Manager. Failing path.
- Failing restarted backup of path. The restart string does not match the data backed up.
- Failing restarted backup of path. Unable to parse the restart string. If this error persists, please kill the backup and start a new one.
- Exceeded maximum number of incremental backups. Must run full or differential backup.
- EMC Celerra backup failed: probably an incorrect data backup path in subclient content.
- Error writing chunk trailer to media.
- Error marking the media full at end of media.
- ArchiveManager error marking chunk closed in the database.
- Failure to update restart string.
- Failed to update media information in the database.
- Error writing chunk header to NAS attached tape.
- Error enabling hardware encryption on NAS attached tape drive.
- Error mounting media in NAS attached tape drive.
- NDMP Server [<File Server>] was unable to back up path. It is likely this path does not exist.
- Unexpected NDMP error communicating with client [<File Server>].
- Unexpected NDMP error communicating with tape server [<File Server>].
- NDMP connection to host [<File Server>] failed. Verify if NDMP can be reached on this host.
- Could not position tape. Error returned [<File Server Error String>].
- <File Server> : tape server halted with internal error.
- Tape server halted with INTERNAL_ERROR and may not have received any data for the timeout period. Backup may be retried with NDMP_API DWORD registry key nREADSOCKETTIMEOUT set to a larger value, in seconds.
- NDMP Server is reporting a write error: [NDMP_MOVER_HALT_MEDIA_ERROR].

- NDMP Server is reporting a write error: [NDMP_MOVER_PAUSE_MEDIA_ERROR].

- Received data halt with internal error. See nasBackup.log for problem details.

- Error updating the new chunk information in the database. Error write file mark to NAS attached media.

- Error sending backup file information to indexing.

- When using snapmirror-to-tape, a full volume must be backed up. Backup Path is not a full volume.

- NDMP authentication failed.

- Failed to start the NRS process on remote host [<Media Agent>].

<File Server> NAS NDMP Properties (General)

Use this dialog box to manage the File Server properties.

Client Name

Displays the name of the client computer or application server.

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 or application server.

User Account

Displays the NDMP account used by the system to connect to the NAS data server.

NDMP Properties

Click to access the **NDMP Server Properties** dialog box.

NDMP Restore Enabled

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.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

Version

Use this dialog box to view the *i*DataAgent version.

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 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.

Activity Control

Use this dialog box to enable or disable data management and data recovery operations on a selected client or client computer group.

Enable Backup

Specifies whether data management operations will occur from this agent.

If cleared:

- The button **Enable after a Delay** appears to the right side of this operation activity. It allows to pre-determine the date and time at which data management operations will begin on the selected agent.
- Data management operations from this agent cannot be started and are skipped.
- Running and waiting data management operations for this agent run to completion.
- Stopped data management operations for this agent cannot be resumed until this option is enabled.
- Pending data management operations for this agent do not run until this option is enabled.

(Job states are indicated in the Job Controller.)

Enable Restore

Specifies whether data recovery operations will occur from this agent.

If cleared:

- The button **Enable after a Delay** appears to the right side of this operation activity. It allows to pre-determine the date and time at which data recovery operations will begin on the selected agent.
- Data recovery operations for this agent cannot be started and are skipped.
- Running data recovery operations for this agent run to completion.
- Pending data recovery operations for this agent do not run until data recovery operations are enabled.

(Job states are indicated in the Job Controller.)

Backup Set Properties (General)

Use this dialog box to change the configuration of the selected backup set.

Client Name

Displays the name of the Client computer on which this backup set is found.

Agent Type / *i*DataAgent

Displays the name of the *i*DataAgent 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*.

Backup Set

Specifies the name of the Backup Set. You can use this space to create or modify a name.

Make this the Default backup set

Specifies whether the selected backup set is the default or a user-defined backup. 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.

Image Backup Set

Specifies whether the selected backup set is configured for a block based (SnapMirror to Tape) backup.

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:

- 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.

Subclient Properties of *<subclient name>*(General)

Use this dialog box to manage the File Server properties.

Client Name

Displays the name of the Client computer to which this subclient belongs.

Billable Entity

Displays the name of the Billable Entity, when the subclient is associated with a billable entity.

Billing Department

Displays the name of the billing department, when the subclient is associated with a billing department.

***i*DataAgent**

Displays the name of the *i*DataAgent to which this subclient belongs.

Backup Set

Displays the name of the Backup Set to which this subclient belongs.

Subclient

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.

Description

Use this field to enter a description about the entity. This description can include information about the entity's content, cautionary notes, etc.

Subclient Properties of *<subclient name>* (Content)

Use this dialog box to define the contents of a new subclient or change the content of an existing 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. For Unix, 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. You can Browse the content only for NetApp File Server.

Backup Content Path

Click the drop-down list arrow to display the root volumes on the file server. To change the root volume, click one in the list. If you want to refine the content path further, use the space to the right of (or below) the root volume list to enter additional path information. Note the following:

- For NetApp, the root volume is the mount path of each volume.
  Example: for volume FS1 the root volume will be /vol/FS1.

- For EMC Celerra, the root volume is the mount point created for a volume.
  Example: for volume FS1 with mount point /FS1 the root volume will be /FS1.

- For Hitachi, no root volumes are shown in the drop down list. Type the full path of the root volume.
  Example: for volume FS1 with mount point /mnt/FS1 the root volume will be /mnt/FS1.

- For BlueArc, the root volume is a combination of a descriptor of the path and the volume name.
  Example: for volume FS1 with a mount point of / the root volume will be /__VOLUME__/FS1.

For Celerra tape silvering, specify the source path of the replication that was created from the Celerra Management Console or command line. Append .ts to the path name. For example, /sourcefs/.ts.

Add

Click to add the data that you specified in **Backup Content Path** to the **Contents of Subclient** list.

Filters

Use this dialog box to add, modify, or view the filters on the selected subclient.

Exclude these files/folders/directories/patterns

Displays entries that will be excluded from data protection operations for this subclient.

Add

Click to manually add a path for the data to be excluded from data protection operations for this subclient

Delete

Click to delete a selected filter entry.

Pre/Post Process

Use this dialog box to add, modify or view Pre/Post processes for the selected subclient.

Pre Backup Process

Displays the name/path of the process that you want to run before the pre-backup phase.

You can use this space to enter a process that will execute before this phase, or use the **Browse** button 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 process that you want to run after the post backup phase.

You can use this space to enter a process that will execute before this phase, or use the **Browse** button 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.

When selected, 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.

When cleared, the specified process will only execute for successful, killed, or failed jobs.

Run As / User Account

Displays either the Local System Account, or for added security, another account as having permission to run these commands.

Change

Click to add or modify the account that has permission to run these commands.

Subclient Properties (Storage Device)

Use this dialog box to establish the storage device related settings on the selected subclient.

The following tabs are displayed:

- (Data) Storage Policy
- Data Transfer Option
- Deduplication

(DATA) STORAGE POLICY

Use this tab to select or view storage policy settings on the selected subclient.

Data 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.

Data Paths

Click to view or modify the data paths associated with the primary storage policy copy of the selected storage policy.

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 incremental storage policy copy of the selected storage policy.

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.

DATA TRANSFER OPTION

Use this tab to establish the options for data transfer.

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.

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.

If the subclient is associated with a storage policy copy that is deduplicated, then the compression settings on the storage policy copy takes precedence. See Copy Properties (Deduplication) - Advanced tab for compression settings on deduplicated storage policy copy.

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.

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.

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.

Backup Options

Use this dialog box to schedule or immediately run a backup/archive job. 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.

Select Database 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.

Job Initiation

○ **Run Immediately**

Specifies this job will run immediately.

○ **Schedule**

Specifies this job will be scheduled. Click **Configure** to specify the schedule details.

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.

Advanced

Click to select advanced backup 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 NAS NDMP *i*DataAgent.

Advanced Backup/Archive Options (Data)

You can select advanced backup/archive data options for the operation.

Create new index

Specifies the system will create a new index with a full or On Demand data protection operation, and for archive 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.

○ for Archiver Agents, a new index will be automatically created during the first archiving job run after January 1st provided the associated subclient was created prior to July 1st of the preceding year. If a subclient is created between July 1st and December 31st, the new index will be automatically created during the first archiving job run after January 1st of the year after the next. For example, **Subclient A** was created on March 1st, 2009. When **Subclient A**'s first archiving job of 2010 was run on January 15th 2010, a new index was automatically created. **Subclient B**, however, was created on August 5th, 2009. Therefore, a new index for **Subclient B** will not be created until the first archiving job run in 2011.

Still, a new index can always be created on-demand for an individual job at any time. This is possible by selecting the Create New Index option in the Advanced Backup Options of a backup or schedule policy dialog box.

Skip Catalog phase For Snap Protect

Select this option to skip catalog phase while running Snap Protect 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. (Applies to all backup/archive types.)

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.

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 the Drive selected for this operation is available online and is a part of the associated Storage Policy.

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 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 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.

Advanced Backup Options (NAS Options)

You can select the following advanced options for the backup operation.

Back up Quotas

Specifies that the user quota information and group quota information, registered in the node to monitor and control disk usage, is to be backed up.

Back up from Snapshot

Specifies that the NAS NDMP file server is to create a snapshot and perform the backup from the snapshot, rather than backing up the live file system.

Snapshot to Back-up

Specifies that an exisitng snapshot will be backed up.

○ For NetApp file server, the backup will not delete the snapshot.

If the **Snapshot to Back-up** option is not selected, a new snapshot will be created by the file server for each subclient content item. The snapshot will be deleted when the backup of each path completes.

For an Image BackupSet, if **Snapshot to Back-up** option is not selected, the entire volume including all snapshots will be backed up.

Volume-based Backup

Specifies a data block level backup of an entire specified volume, rather than a file-by-file backup.

When this option is selected:

○ any entries in the Filters tab of the Subclient Properties will be ignored, and the whole volume will be backed up.

○ Direct Access Restore (DAR) will not be available, but individual files, directories, or whole volumes can be selected for restore.

○ three-way backups, three-way restores, and NDMP Remote Server (NRS) are available with EMC Celerra 5.6 or higher. Only for EMC Celerra 5.5, must the library be directly attached to the NAS NDMP file server.

Using this option is incompatible with NDMP Restore Enabler. If selected, you can restore only to an EMC Celerra file server.

Back up ACLs

Specifies that the Access Control Lists (ACLs) will be backed up for the specified subclient content, and therefore its original security attributes will be retained. Clear this option to perform the backup without the ACLs, and consequently the data will assume the ACLs of the parent directory when it is restored.

Back up offline data

Specifies that the original files, not stub files, are copied during the backup job. This allows you to back up data that has been archived, rather than just the stub left by the NAS NDMP file server's data archiving software. Refer to the hardware vendor's documentation for more information about such archived data.

Readahead Processes

Specifies the number of read-ahead processes to use during backup operations of BlueArc file servers. To configure read-ahead processing, select a number from 1 to 10. If left blank or nothing is specified, the file server default setting is used. A value of 0 disables read-ahead processing, which may be used when file sizes are large. If file sizes are small (16 KB or less), it may be useful to select 10 read-ahead processes. Read-ahead processing consumes resources, so you may want to limit the number of additional processes unless it makes a significant difference in performance. See the BlueArc documentation for more information.

Exclusive Backup

Prevents the concurrent execution of multiple backup or restore operations on the same file system.

Block Backup

Specifies that when enabled, the files on a Hitachi file server are backed up in the order in which they appear on disk rather than the order they appear in the directory tree. This can improve the performance of the backup; however the directory restore operations will be slower since the data in the directory is not saved with the backup image. Also, Direct Access Restore (DAR) operations are not possible when this feature is enabled. Version `06-01` supports this feature. See the Hitachi documentation for more information.

Snapshot Expiration

Specifies the retention period for the snapshot created during **Snapshot to Back-up** operation. The value for this parameter must be set long enough for all paths to finish, and short enough so that the snapshot is deleted before the next backup of the subclient kicks off. If no value is set, it takes the default value as 1 hour.

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

For NetApp NAS NDMP *i*DataAgent, specifies whether the restore operation restores the files with Access Control Lists (ACLs). Note that only files that were backed up with ACLs can be restored with ACLs.

Use Direct Access Restore

Specifies whether the restore operation searches only for the specified files and then restore each one separately as an individual restore job. Select this option to restore smaller amounts of data faster. Note that when dealing with a large number of files, this option is not faster.

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/Recover to Same Paths**

Specifies whether the restore operation will restore data to the same path 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.)

For NetApp NAS NDMP *i*DataAgent, this option will be unavailable, if a non-NetApp file system client is selected as the **Destination Computer**.

○ **Destination folder**

Use this space to enter the path on the destination computer to which the data will be restored. If the specified path does not exist, it will be created during the restore process.

Ensure that the specified path is within an existing volume.

○ **Browse**

Click to select a path for the **Destination folder**.

Preserve Source Paths

Specifies the action taken when the data is recovered to another destination. The options are available only when the **Recover to Same Paths** option is cleared.

○ **Preserve n levels from end of source path**

Specifies whether the recovery 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 recovered 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 recovered, and the recovered data for all the other occurrences of the file are overwritten.

○ **Remove n levels from beginning of source path**

Specifies whether the recovery operation must remove the specified number of levels from the beginning 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 recovered as \temp\Sales. (This option becomes available only when the **Restore to Same Paths** option is cleared.)

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

Restore

Restore Path

To restore data without browsing, enable this option and type the path of the data that you want to restore.

Restore from file

To restore individual files to a specified destination using an external map file, enable this option. 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 the space to enter the path and name of the map file, or use the **Browse** button to locate and select the appropriate map file.

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 (Copy Precedence)

Choose the copy from which you wish to recover or retrieve. Select from the following options:

Restore/recover from copy precedence

When selected, the system retrieves the data from the storage policy copy with the specified copy precedence number. If data does not exist in the specified copy, the operation fails even if the data exists in another copy of the same storage policy.

When cleared, (or by default) the system retrieves data from the storage policy copy with the lowest copy precedence. If the data was pruned from the primary copy, the system automatically retrieves the data from the other copies of the storage policy starting with the copy with the lowest copy precedence and proceeding through the copies with higher copy precedence. Once the data is found, it is retrieved, and no further copies are checked.

Use MediaAgent / Library / Drive Pool

See Advanced Restore Options (Data Path)

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 (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 (NAS Options)

Use this dialog box to control how the specified data is to be restored.

Recursive Restore

Specifies that the restore will also include all files and subdirectories of the directory specified, rather than just the specified directory.

Exclusive Restore

Prevents the concurrent execution of multiple backup or restore operations on the same file system.

Overwrite

If selected, specifies that if an item to be restored already exists, that item will be overwritten by the restored item.

If cleared:

○ backed up files/directories whose names are *the same* as those in the restore path will overwrite the existing files.

○ backed up files/directories whose names are *different* from those in the restore path *are* restored.

Advanced Recover Options (Browse Options)

Use the Advanced Recover Options dialog box to specify advanced recovery 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 component installed on the client.

Restore Deleted Items

Specifies that the recovery operation will include data that was secured during all archive operations, including deleted items.

Specify Time Range

Specifies to 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** - 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 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 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.