

Features - Workstation Backup Agent

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Overview - Workstation Backup Agent

This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

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INTRODUCTION

Workstation Backup Agent is a backup and restore vehicle for protecting and recovering workstation data. Workstation Backup Agent captures the data in incremental chunks using a SmartSync method that identifies just the changed blocks or sub-file segments and transmits across the network to a centralized destination. This results in a highly efficient data movement, which minimizes daily network resource loads. Identifying and transmitting only the changed data at the source avoids sending duplicate chunks of data over the WAN, thus addressing the key concern in protecting Desktop Class and Server Class computers in remote office configurations. The data can be compressed and encrypted for transfer over the network to the destination volume.

The Workstation Backup provides a lightweight console to perform data backup and recovery operations. Backup data can be browsed and restored at the individual file level. Multiple recovery points are available for recovery, allowing data recovery back to specific point in times. Workstation Backup Agent provides operation flexibility by allowing data protection operations from the CommCell Console, typically by a system administrator.

Workstation Backup is specially designed to protect workstations/laptops used in remote offices, outside of the domain network. The Workstation Backup Agent provides the following field-friendly features:

- Sensitive to network usage. Once the initial backup data is transferred to the destination server, subsequent backup operations only contain data that is either new, or has changed since the last backup, thus minimizing the network usage.
- Sensitive to network availability. Provides smart job scheduling options, where the software monitors the network bandwidth availability and transfers the backup data to the destination, only when a successful data transfer is guaranteed.

The Workstation Backup Agent is simple to deploy across heterogeneous and remote environments. A typical Workstation Backup Agent deployment consists of one or more source computers installed with the Workstation Backup Agents, connected to the centralized data center, the destination computer.

SOURCE COMPUTER

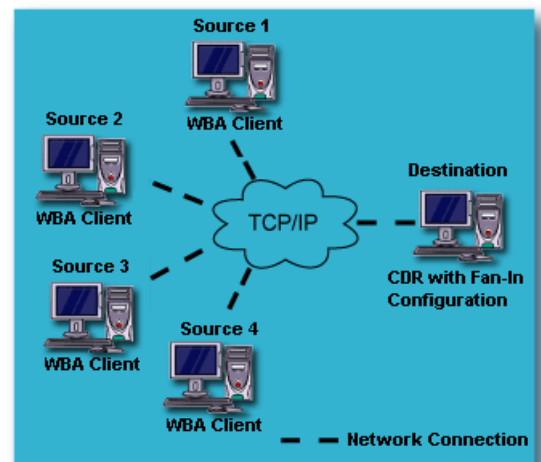
The source computer is a computer installed with Workstation Backup Agent Client Console, which is typically a laptop or a workstation. Data from this source computer will be backed up to the centralized Destination Computer.

Workstation Backup Agent and ContinuousDataReplicator cannot be installed on the same computer.

DESTINATION COMPUTER

The destination computer is a computer installed with ContinuousDataReplicator (CDR) that receives the data backed up from the various Workstation Backup Clients. See [ContinuousDataReplicator](#) for complete information on CDR.

It is recommended that CDR be configured in a Fan-in configuration in the destination computer. See [Supported Configuration](#) for a detailed discussion on CDR Replication scenarios.



parameters. This is a silent installation that installs, configures, and leaves the Client Console ready for backup. This option is ideal for mass deployment, where multiple Workstation Backup Clients are configured in a single CommCell. See Workstation Backup Agent Deployment Guide for a detailed deployment procedure.

- Individual installation, where the user must provide the installation options during the installation. This method is suitable for small scale deployment consisting of fewer installations. See Deployment - Workstation Backup Agent for the different installation options available for this method.

DESTINATION COMPUTER

The destination computer backing up data from the Workstation Backup source computers is installed with the ContinuousDataReplicator Agent. See Deployment - ContinuousDataReplicator for installation options to install the ContinuousDataReplicator on the destination computer.

CONFIGURATION

Review the following configuration requirements:

1. From the CommCell Console, create the Replication Set and Replication Pair(s) identifying the data to be protected using the Workstation Backup Agent. If you had used the custom installation method, then you might have the Replication Set and Replication Pair(s) configured upon installation.
 - Create a Replication Set for the Workstation Backup Agent.
 - Add a Replication Pair to the replication set.
 2. From the destination computer, create or configure the creation of Fan-In recovery points to enable point-in-time data recovery.
 - See Fan-In Recovery Points for details.
-

OPERATIONS

Data protection operations are primarily initiated by the user, from the Workstation Backup Client Console. However, the system administrator can also perform backup and restore operations from the CommCell Console.

DATA PROTECTION OPERATIONS FROM THE CLIENT CONSOLE

See Workstation Backup Client Console for detailed discussions on data protection operations from the Workstation Backup Client Console.

DATA PROTECTION OPERATIONS FROM THE COMMCELL CONSOLE

See Backup - Workstation Backup for detailed discussions on backup operations from the CommCell Console.

See Restore Data - Workstation Backup for detailed discussions on restore operations from the CommCell Console.

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System Requirements - Workstation Backup Agent - Source

Source	Destination	Supported Features
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The following requirements are for Workstation Backup Agent Source Computer:

APPLICATION/OPERATING SYSTEM		PROCESSOR
DESKTOP CLASS ON:		
WINDOWS	WINDOWS 7	
	Microsoft Windows 7 32-bit and x64 Editions	All Windows-compatible processors supported
	WINDOWS VISTA	
	Microsoft Windows Vista 32-bit and x64 Editions	All Windows-compatible processors supported
	WINDOWS XP	
	Microsoft Windows XP Professional 32-bit Edition* with a minimum of Service Pack 3	All Windows-compatible processors supported
	*Contact Microsoft Product Support Services and refer to KB 922582 to obtain this patch.	
	Microsoft Windows XP Home 32-bit Edition* with a minimum of Service Pack 3	All Windows-compatible processors supported
SERVER CLASS ON:		
WINDOWS SERVER 2003	Microsoft Windows Server 2003 32-bit and x64 Editions with a minimum of Service Pack 2	All Windows-compatible processors supported
WINDOWS	WINDOWS 2008	
	Microsoft Windows Server 2008 32-bit and x64 Editions	All Windows-compatible processors supported

HARD DRIVE

221 MB minimum of hard disk space for software/ 221 MB recommended
 100 MB of additional hard disk space for log file growth
 775 MB of temp space required for install or upgrade (where the temp folder resides)

MEMORY

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

PERIPHERALS

DVD-ROM drive
 Network Interface Card

MISCELLANEOUS

NETWORK

TCP/IP Services configured on the computer.

NET FRAMEWORK

.NET Framework 2.0 is automatically installed. Note that .NET Framework 2.0 can co-exist with other versions of this software.

MICROSOFT VISUAL C++

Microsoft Visual C++ 2008 Redistributable Package is automatically installed. Note that Visual C++ 2008 Redistributable Package can co-exist with other versions of this software.

For installation using MSI packages on Windows Vista and Windows 7, Microsoft Visual C++ 2008 Redistributable Package must be manually installed.

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

System Requirements - Workstation Backup Agent - Destination

Source	Destination	Supported Features
--------	-------------	--------------------

The destination is a computer installed with ContinuousDataReplicator. The following operating systems are supported for destination:

OPERATING SYSTEM

WINDOWS SERVER 2008

Microsoft Windows Server 2008 32-bit and x64 Editions* with a minimum of Service Pack 1

*Core Editions not supported

WINDOWS SERVER 2003

Microsoft Windows Server 2003 32-bit and x64 Editions with a minimum of Service Pack 2

HARD DRIVE

66 MB minimum of hard disk space for software

775 MB of temp space required for install or upgrade (where the temp folder resides)

MEMORY

512 MB RAM minimum required, of which a minimum of 64 MB RAM is required beyond the requirements of the operating system and running applications for successful ContinuousDataReplicator operations; 1 GB RAM recommended.

PROCESSOR

All Windows-compatible processors supported

PERIPHERALS

DVD-ROM drive

Network Interface Card

MISCELLANEOUS

NETWORK

TCP/IP Services configured on the computer.

MICROSOFT VISUAL C++

Microsoft Visual C++ 2008 Redistributable Package is automatically installed. Note that Visual C++ 2008 Redistributable Package can co-exist with other versions of this software.

NET FRAMEWORK

.NET Framework 2.0 is automatically installed. Note that .NET Framework 2.0 can co-exist with other versions of this software.

The File System iDataAgent is not automatically installed during installation of the ContinuousDataReplicator. If you wish to install the File System iDataAgent, you must select the option to do so during installation of the ContinuousDataReplicator. For System Requirements specific to the File System iDataAgent, refer to System Requirements - Microsoft Windows File System iDataAgent.

DISCLAIMER

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Install the Workstation Backup Agent

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Install Requirements

Before You Begin

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- Getting Started
- Select Components for Installation
- Configuration of Other Installation Options
- Client Group Selection
- Schedule Automatic Update
- Replication Policy Selection
- Verify Summary of Install Options

Setup Complete

Post-Install Considerations

INSTALL REQUIREMENTS

The following procedure describes the steps involved in installing the Workstation Backup Agent. The Workstation Backup Agent is installed on the computer from which the Agent secures data.

Note that do not install ContinuousDataReplicator and Workstation Backup Agent on the same computer. (This computer is referred to as the *Client* computer in this install procedure.)

Verify that the computer in which you wish to install the software satisfies the minimum requirements specified in System Requirements - Microsoft Workstation Backup Agent.

Review the following Install Requirements before installing the software:

GENERAL

- Review Install Considerations before installing the software.
- Agents should be installed only after the CommServe and at least one MediaAgent have been installed in the CommCell. Also, keep in mind that the CommServe® software and MediaAgent must be installed and running (but not necessarily on the same computer), before you can install the Agent.
- Close all applications and disable any programs that run automatically, including anti-virus, screen savers and operating system utilities. Some of the programs, including many anti-virus programs, may be running as a service. Stop and disable such services before you begin. You can re-enable them after the installation.
- Ensure there is an available license on the CommServe software for the Agent.
- Verify that you have the Software Installation Disc that is appropriate to the destination computer's operating system.

BEFORE YOU BEGIN

- Log on to the client as local Administrator or as a member of the Administrators group on that computer.

INSTALL PROCEDURE

GETTING STARTED

1. Place the Software Installation Disc for the Windows platform into the disc drive.

After a few seconds, the installation program is launched.

If the installation program does not launch automatically:

- Click the **Start** button on the Windows task bar, and then click **Run**.
- Browse to the installation disc drive, select **Setup.exe**, click **Open**, then click **OK**.

NOTES

- If you are installing on Windows Server Core editions, mount to Software Installation Disc through command line, go to the **AMD64** folder and run **Setup.exe**.
2. Choose the language you want to use during installation. Click the down arrow and select the desired language from the drop-down list, and click **Next** to continue.

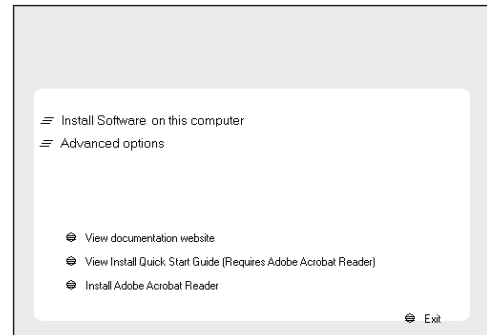
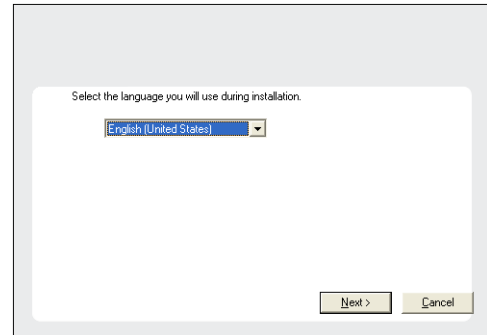
3. Select the option to install software on this computer.

NOTES

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

4. Read the license agreement, then select **I accept the terms in the license agreement**.

Click **Next** to continue.



SELECT COMPONENTS FOR INSTALLATION

5. Select the component(s) to install.

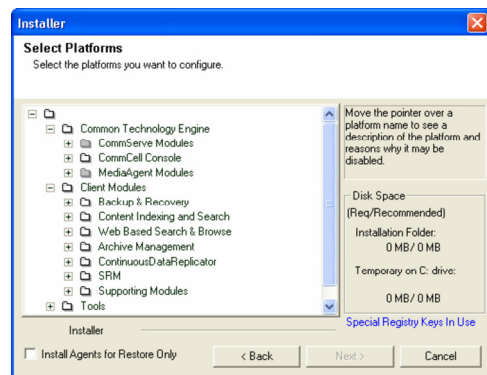
NOTES

- Your screen may look different from the example shown.
- Components that either have already been installed, or which cannot be installed, will be dimmed. Hover over the component for additional details.
- If you wish to install the agent software for restore only, select **Install Agents for Restore Only** checkbox. See Installing Restore Only Agents for more information.
- The **Special Registry Keys In Use** field will be highlighted when `GalaxyInstallerFlags` registry key is enabled. Move the mouse pointer over this field to see a list of registry keys that have been created in this computer.

Click **Next** to continue.

To install the Workstation Backup Agent, expand the following `Client Modules` folder and `ContinuousDataReplicator` folder. Then select the following:

- Workstation Backup

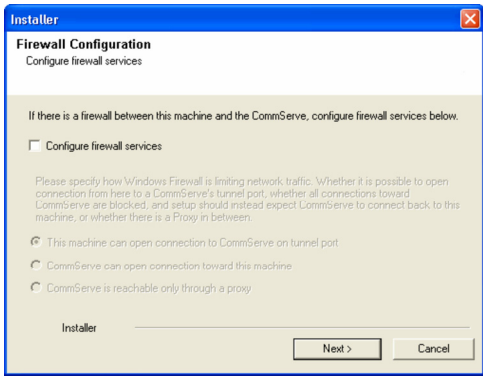


CONFIGURATION OF OTHER INSTALLATION OPTIONS

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

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

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

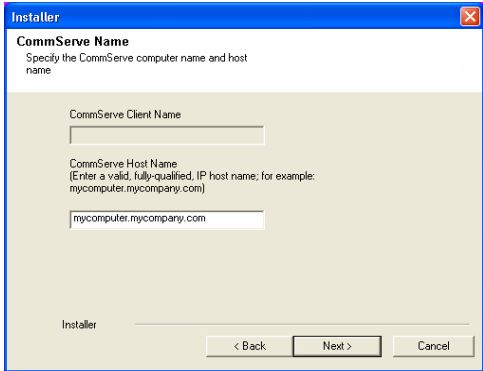


- 7. Enter the fully qualified domain name of the CommServe Host Name. This should be TCP/IP network name. e.g., computer.company.com.

NOTES

- The CommServe client name is the name of the computer. This field is automatically populated.
- Do not use space and the following characters when specifying a new name for the CommServe Host Name:
`\|`~!@#$$%^&*()+=<>/?,[\]{};:"`
- If a computer has already been installed, this screen will not be displayed; instead the installer will use the same Server Name as previously specified.
- If you do not specify the CommServe Host Name, a window will be prompted to continue in decouple mode. Click **Yes** to continue to Decoupled Install. Click **No** to specify a CommServe Name and continue with the installation.

Click **Next** to continue.

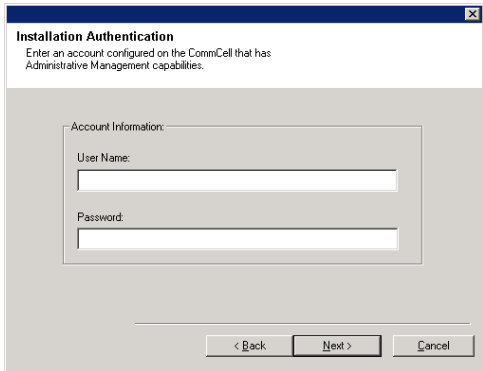


- 8. Enter the **username** and **password** associated with an external domain user account or a CommCell user account to authorize the installation of this agent.

NOTES

- This window will be displayed when the **Require Authentication for Agent Installation** option is selected in the **CommCell Properties**. For more information, see Authentication for Agent Installs.

Click **Next** to continue.



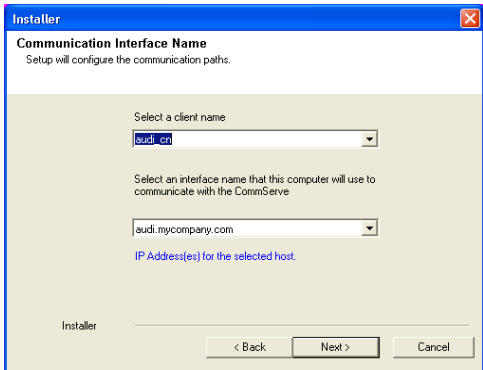
- 9. Enter the following:

- The local (NetBIOS) name of the client computer.
- The TCP/IP IP host name of the NIC that the client computer must use to communicate with the CommServe Server.

NOTES

- Do not use spaces when specifying a new name for the Client.
- The default network interface name of the client computer is displayed if the computer has only one network interface. If the computer has multiple network interfaces, enter the interface name that is preferred for communication with the CommServe Server.
- If a component has already been installed, this screen will not be displayed; instead, the install program will use the same name as previously specified.

Click **Next** to continue.



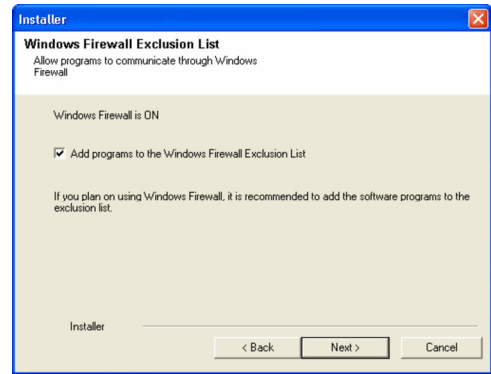
- 10. Select **Add programs to the Windows Firewall Exclusion List**, if you wish to add CommCell programs and services to the Windows Firewall Exclusion List.

NOTES:

- If Windows Firewall is enabled on the computer, this option is selected by default and must be enabled to proceed with the installation.
- If Windows Firewall is disabled on the computer, you can select this option to add the programs and services to enabled CommCell operations across the firewall, if the firewall is enabled at a later time.

You can either select this option during install or add the programs and services after installation. For adding the programs and services after installation, see Configure Windows Firewall to Allow CommCell Communication.

Click **Next** to continue.



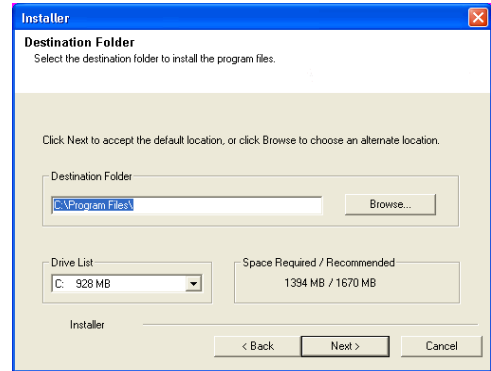
- Specify the location where you want to install the software.

NOTES

- 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.
- If you intend to install other components on this computer, the selected installation directory will be automatically used for that software as well.
- If a component is already installed in this computer, this screen may not be displayed. The software will be automatically installed in the same location that was previously specified.

Click **Browse** to change directories.

Click **Next** to continue.



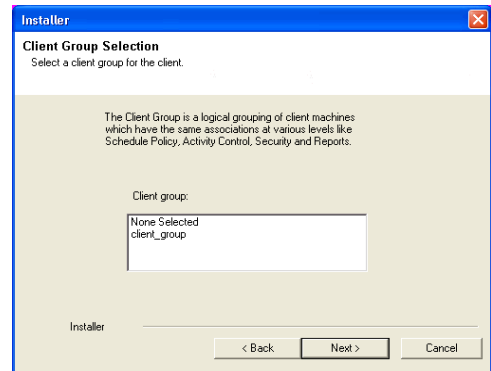
CLIENT GROUP SELECTION

- Select a Client Group from the list.

Click **Next** to continue.

NOTES

- This screen will be displayed if Client Groups are configured in the CommCell Console. For more information, see Client Computer Groups.



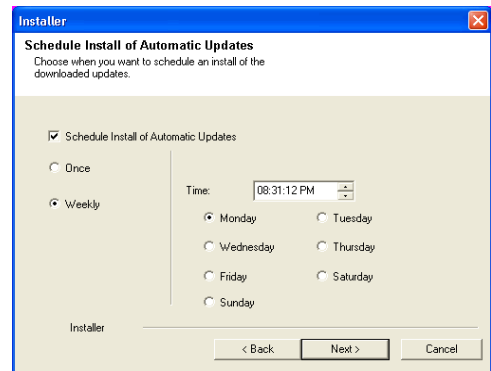
SCHEDULE AUTOMATIC UPDATE

- If necessary, select this option to schedule an automatic installation of software updates.

NOTES

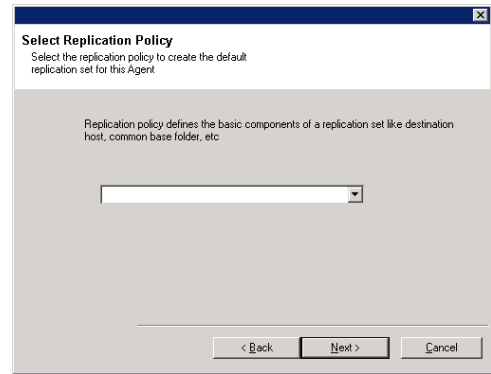
- Schedule Install of Automatic Updates allows automatic installation of the necessary software updates on the computer on a single or weekly basis. If you do not select this option, you can schedule these updates later from the CommCell Console.
- To avoid conflict, do not schedule the automatic installation of software updates to occur at the same time as the automatic FTP downloading of software updates.
- If a component has already been installed, this screen will not be displayed; instead, the installer will use the same option as previously specified.

Click **Next** to continue.



REPLICATION POLICY SELECTION

14. Select the replication policy with which you want to create the Replication Set/Replication Pair(s) for data replication. Replication Policies applicable for your agent will be available for selection.
Click **Next** to continue.



VERIFY SUMMARY OF INSTALL OPTIONS

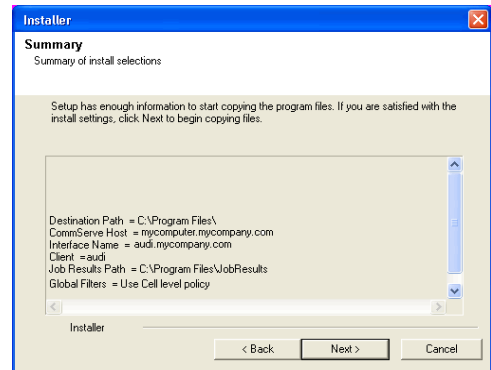
15. Verify the summary of selected options.

NOTES

- The **Summary** on your screen should reflect the components you selected for install, and may look different from the example shown.

Click **Next** to continue or **Back** to change any of the options.

The install program now starts copying the software to the computer. This step may take several minutes to complete.



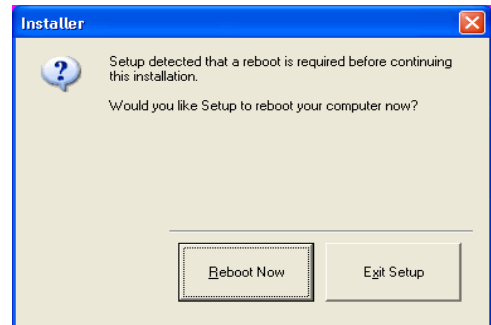
16. The System Reboot message may be displayed. If so, select one of the following:

- **Reboot Now**

If this option is displayed without the **Skip Reboot** option, the install program has found files required by the software that are in use and need to be replaced. If **Reboot Now** is displayed without the **Skip Reboot** option, reboot the computer at this point. The install program will automatically continue after the reboot.

- **Exit Setup**

If you want to exit the install program, click **Exit Setup**.

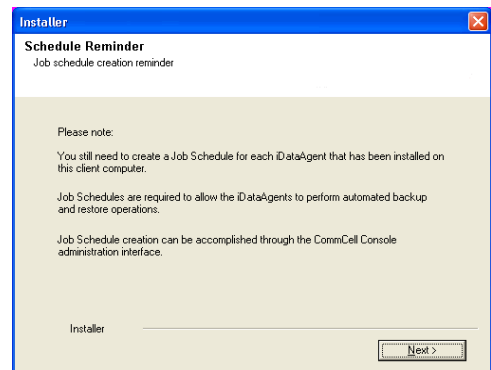


SETUP COMPLETE

17. Click **Next** to continue.

NOTES

- Schedules help ensure that the data protection operations for the Agent are automatically performed on a regular basis without user intervention. For more information, see Scheduling.



18. Setup displays the successfully installed components.

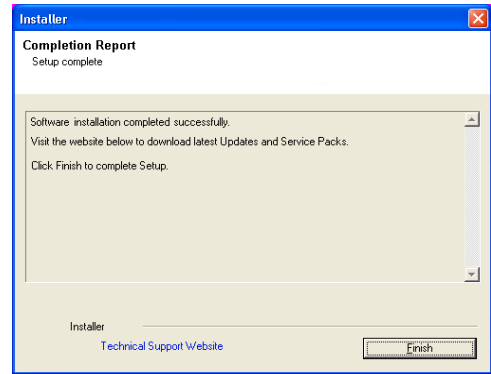
NOTES

- The **Setup Complete** message displayed on your screen will reflect the components you installed, and may look different from the example shown.

- If you install an Agent with the CommCell Console open, you need to refresh the CommCell Console (F5) to see the new Agents.
- If **Reboot Now** button is displayed make sure to reboot the computer before performing any other operations from the computer.

Click **Finish** to close the install program.

The installation is now complete.



POST-INSTALL CONSIDERATIONS

GENERAL

- Install post-release updates or Service Packs that may have been released after the release of the software. When you are installing a Service Pack, ensure that it is the same version as the one installed in the CommServe Server. Alternatively, you can enable Automatic Updates for quick and easy installation of updates in the CommCell component.

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Backup - Workstation Backup

Topics | How To | How Do I | Related Topics

This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

Overview

Supported Backup Types

Optimized Backup

Data Verification

Backup Operations in Workstation Backup Agent

- [Create and Execute Backup Jobs from CommCell Console](#)
- [Execute Backup Jobs from Workstation Backup Client](#)

Post-Backup Configuration

Backup Considerations

OVERVIEW

Plan your backup jobs for this agent by reviewing the following information:

- For an overview of backup jobs, see [Backup Data](#).
 - For a list of supported data types for this agent, see [Supported Data Types](#).
 - For information on replication sets, see [Replication Set](#).
 - For information on replication pairs, see [Replication Pair](#).
-

SUPPORTED BACKUP TYPES

The following backup types are supported in this agent:

- **Full Backup:** A full backup contains all the data included in a subclient's contents. Backups for any client start with a full backup and the full backup becomes a baseline to which subsequent backup types are applied.
 - **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 far less media and place less of a burden on resources than full backups.
 - **Full Optimized Backup:** Full Optimized backup transfers only new/modified data along with deleting any extra data present on destination.
 - **Incremental Optimized Backup:** Incremental Optimized Backup transfers only new/modified data since last backup along with deleting any extra data present on destination.
-

OPTIMIZED BACKUP

Using optimized backup, Workstation Agent can take advantage of data that may already exist on the destination computer. During Full Optimized backup, instead of transferring all files to destination, this method determines the pre-existing files on destination and transfers only new/modified along with deleting any extra data present on destination. If previous backups had files which could not be transferred [like locked files, etc], these files will be transferred during Optimized backup.

Optimized backup can be used in the following scenarios:

- If filtering options are modified, such as removing filter that was previously applied, Optimized Incremental backup transfers these excluded files without having to do a Full backup to pickup excluded data.
- If some data was partially modified/deleted on destination.
- If there are failed files from previous backup.

The optimized backup may sometimes include a file for transfer even if no changes have been made to the file. This transfer may be triggered because the file size information stored in the system cache is different from the actual file size.

See [Start a Full/incremental Backup](#) for step-by-step instructions.

DATA VERIFICATION

The WorkStation Backup Agent provides the capability to run data verification reports to compare the files and folders on the source and destination computers. During a data verification operation, data on the source and the destination computers is compared to check for any differences between the files or for any missing files on the destination computer.

You can perform a data verification job as a part of the backup job or as an independent job. When a data verification operation is performed as a part of the backup job, it verifies that the data on the source and the destination computers match after the backup is completed.

See [Perform Data Verification](#) for step-by-step instructions to perform a data verification as an independent job. For step-by-step instructions on performing a data verification job with a backup job, see [Perform Data Verification during Backup](#).

BACKUP OPERATIONS IN WORKSTATION BACKUP AGENT

Backup operation in Workstation Backup Agent is the process of copying file-level contents from Workstation Backup Source Computer to the Destination Computer. The replication set and replication pair consisting of the default backup data is created by the administrator upon installation. Clients can manage the contents by adding/removing contents (replication pairs) to the backup (replication set).

CREATE AND EXECUTE BACKUP JOBS FROM COMMCELL CONSOLE

Workstation backups can be executed/scheduled either from the CommCell Console, or from the Workstation Backup Client Console. Backups scheduled from the CommCell Console run as per the schedule, without any intervention from the Workstation Backup Clients.

Workstation backups from the CommCell Console involve the sequence of operations:

1. Make sure that Replication Set and Replication Pair(s) are created for this client. Typically the Replication Set and Replication Pair(s) are created during the installation of the agent, using Replication Policies. Any further additions/updates to the Replication Pair(s) are managed by users from the Client Console.

In case the Replication Set/ Replication Pair(s) are not created, use the following procedures:

- o Create a Replication Set for step-by-step instructions to create the Replication Set.
 - o Add or Edit a Replication Pair for step-by-step instructions to add/update necessary replication pairs to the replication set.
2. Start a Full/Incremental Backup. See [Start a Full/incremental Backup](#) for step-by-step instructions.
 3. You can also schedule backup operations. See [Schedule a Full/Incremental Backup](#) for step-by-step instructions.

EXECUTE BACKUP JOBS FROM WORKSTATION BACKUP CLIENT CONSOLE

Workstation Backup Clients Console can manage the backup content, and execute/schedule the backups independent of backups initiated from the CommCell Console. See [WorkStation Backup Client Console](#) for detailed discussions on the backup capabilities and scheduling options in the Workstation Backup Client Console.

Executing a backup job from the Workstation Backup Client Console involves the following sequence of operations:

1. Make sure the data you wish to backup is located in the source path of the backup configured for the client. Modify the backup contents if required. See [Manage Backup Contents](#) for step-by-step instructions.
2. You can use one of the following options to execute the backup job:
 - o Run the backup job once, immediately. See [Start a Backup Job](#) for step-by-step instructions.
 - o Create a classic, time-based schedule to run the backup jobs. See [Create a Classic Schedule](#) for step-by-step instructions.
 - o Create a smart, opportunity-based schedule to run the backup jobs. See [Create a Smart Schedule](#) for step-by-step instructions.

You can also use the CommCell Console Control Panel to enable/disable data protection operations, including scheduling, for all Workstation Backup clients

POST-BACKUP CONFIGURATION

Once the backup operations commence, the next step is to make sure that the backup data is available for recovery. This involves creating recovery points (point-in-time snapshots) of the backup data in the destination CDR computer. Use the following information to create recovery points in the destination.

- See [Fan-In Recovery Points](#) for detailed discussions on recovery points in destination computer.
 - See [Create a Recovery Point in a Fan-In Configuration](#) for instructions to create recovery points.
-

BACKUP CONSIDERATIONS

Review the following before performing a backup operation.

- Ensure that the source path configured in the backup is a valid path in the workstation client computer.
- Ensure the destination path has enough space to support data from all backup jobs.
- Destination path must not be deleted when jobs are expected to backup data to this path.

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Backup - Workstation Backup - How To

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

[Start a Full/Incremental Backup](#)

[Schedule a Full/Incremental Backup](#)

[Perform Data Verification](#)

[Perform Data Verification during Backup](#)

START A FULL/INCREMENTAL BACKUP

Backup jobs using the **Run Immediately** option allow you to secure data immediately without having to wait for the scheduled backup time. This capability can be useful if:

- you have some particularly valuable data that you need to secure immediately.
- your data is not routinely secured through a backup schedule and you want to back up your data.

Required Capability: See [Capabilities and Permitted Actions](#)

▶ To start an immediate backup job:

1. From the CommCell Browser, right-click the replication set to want to back up, select **All Tasks** and then select **Backup**.
2. To backup the entire source data, select **Full Backup**. To backup source data that has changed since the previous backup, select **Incremental Backup**. Note that the very first backup for a replication set will automatically be converted to a Full Backup.
3. To perform optimized backup, Click **Advanced** to display the **Advanced Backup Options** dialog box. Select the **Include files that do not match with destination copy** option. This option is selected by default.
4. From the **Backup Options For Replication Set** dialog box, select **Run Immediately**.
5. Click **OK** to execute the backup job.

For an incremental backup, if a new replication pair has been added to a replication set, the job will be displayed as full but only an incremental backup will be performed for the already existing pairs.

SCHEDULE A FULL/INCREMENTAL BACKUP

You can schedule backups to occur with the following procedure. You will be prompted to create a schedule for the data protection operation after selecting your data protection options.

Required Capability: See [Capabilities and Permitted Actions](#)

▶ To schedule a backup operation from the CommCell Console:

1. From the CommCell Browser, right-click the replication set, select **All Tasks** and then select **Backup**.
2. To backup the entire source data, select **Full Backup**. To backup source data that has changed since the previous backup, select **Incremental Backup**. Note that the very first backup for a replication set will automatically be converted to a Full Backup.
3. To perform optimized backup, Click **Advanced** to display the **Advanced Backup Options** dialog box. Select the **Include files that do not match with**

destination copy option. This option is selected by default.

4. From the **Backup Options For Replication Set** dialog box, select **Schedule**. Click **OK** to continue.
 5. From the Schedule Details (Schedule Details) dialog box, create a schedule for this operation. For step-by-step instructions, see Create a Job Schedule. Click **OK** to continue.
 6. Your backup operation will execute according to the specified schedule.
-

PERFORM DATA VERIFICATION

Use the following procedure to perform a data verification operation to compare files and folders on the source and destination computers.

▶ To perform a data verification operation from the CommCell Console:

1. From the CommCell Browser, right-click the replication set, select **All Tasks** and then select **Backup**.
 2. From the **Backup Options For Replication Set** dialog box, select **Data Verification** backup type.
 3. Select **Run Immediately** to run the data verification operation immediately. Select **Schedule** to schedule the data verification for a specific time.
 4. Click **OK** to execute the job.
-

PERFORM DATA VERIFICATION DURING BACKUP

You can perform a data verification operation as a part of the backup job to verify that the data on the source and the destination computers match after the backup is completed. Follow the steps given below.

▶ To perform a data verification operation during backup:

1. From the CommCell Browser, right-click the replication set to want to back up, select **All Tasks** and then select **Backup**.
 2. To backup the entire source data, select **Full Backup**. To backup source data that has changed since the previous backup, select **Incremental Backup**. Note that the very first backup for a replication set will automatically be converted to a Full Backup.
 3. To perform data verification after the backup job completes, Click **Advanced** to display the **Advanced Backup Options** dialog box.
 4. Select the **Generate data verification after backup completes** option.
 5. From the **Backup Options For Replication Set** dialog box, select **Run Immediately** to run the job immediately. Select **Schedule** to schedule the job for a specific time.
 6. Click **OK** to execute the job.
-

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Restore Data - Workstation Backup

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

Overview

- [Restore Deleted Items](#)

Restore Destinations

Restore Checklist

Restore Types

- [Restore from the Destination Computer](#)
 - [Restore Data from Backed Up Recovery Points](#)
-

OVERVIEW

The following page describes the agent-specific restore options. Additional restore options are accessible from the Related Topics menu.

Workstation Backup Agent supports restoring contents of the backup job at the file level. Backup data can be browsed for file level contents and individual files can be selected for restore. The Workstation Backup Agent supports the following restore options:

- Restore data from the live copy of the backup data.
- Point-in-time restores, which allow you to restore data from the Fan-In Recovery Point created at, or before, a specific point in time.
- Restore from available backups, which allows you to choose from a list of the different point-in-time Fan-In Recovery Points created in the destination computer.

Workstation Backup restores can be performed from the Workstation Backup Client Console, as well as the CommCell Console at the replication set level. The following sections explain restore operations initiated from the CommCell Console. See [Workstation Backup Client Console](#) for discussions on restore operations from the Workstation Backup Client.

RESTORE DELETED ITEMS

Data objects that have been deleted by orphan file processing can be restored. Deleted objects can be restored from the live copy until a recovery point is created. Once recovery points are created, the objects can be restored from the corresponding recovery points. For convenience, objects that were deleted one hour before the last recovery point creation are available in the live copy for restore.

Note that deleted objects are not copied to tape when the recovery points are moved to tape. So orphan data can be restored from the live data or recovery points, but not from tapes.

RESTORE DESTINATIONS

The Workstation Backup Agent restores data to the same client computer from which the backup data originated; this is referred to as in-place restore. You can also restore data to a different client in the CommCell, also known as out-of-place restores.

The following section enumerates the types of restore destinations that are supported by the Workstation Backup Agent.

- In-Place Restore - Restoring data to the same computer, in the same path as source.
- Out-of-Place Restore - Restoring data to the same computer - different path, or, different computer - same path.
- Cross-Platform Restores - Same Operating System - Different Version Restoring data to a computer with the same Operating System, but different path.
- Restore to Network Drive/NFS-Mounted File System

Keep in mind the following considerations when performing restores:

- The destination client must reside in the same CommCell as the client whose data was backed up.
- Note that when you perform an out-of-place restore, the restored data assumes the rights (i.e., permissions) of the parent directory.
- If multiple replication pairs contain folders with the same name in a replication set, while performing out-of-place restore of these folders one folder is overwritten with the other folder. So, it is recommended that you do not restore folders with the same name at the same time. Restoring one at a time is suggested.

See Restore/Recover/Retrieve Destinations - Support for a list of Agents supporting each restore destination type.

RESTORE CHECKLIST

Review the following checklist before performing any restore procedures for this agent.

- Review the general restore requirements described in What You Need to Know Before Performing a Restore.
 - Ensure that the backup operations you wish to restore data are successfully completed. Backup jobs can be executed either from the CommCell Console, or from Workstation Backup Client Console.
 - See Backup - Workstation Backup for discussions on backup operations initiated from CommCell Console.
 - See Workstation Backup Client Console for discussions on backup operations initiated from the Workstation Backup Client.
 - To restore point-in-time data ensure that the data in the destination machine is configured for recovery point creation. See Post-Backup Configuration for details.
 - Once the above mentioned items are verified, you can proceed to restore the backup data. See Restore Data - Workstation Backup - How To for the restore procedure.
-

RESTORE TYPES

Data can be restored in one of the following ways:

RESTORE FROM THE DESTINATION COMPUTER

When the data to be restored is present either in the live backup copy at the destination, or in one of the Recovery Points available in the destination computer, the restore operations can be performed using the browse and restore procedure from the Workstation Backup Client. In this case, data can be restored either from the Client Console by the user, or from the CommCell Console by the administrator.

See Restore Data - Workstation Backup - How To for the restore procedure.

RESTORE DATA FROM BACKED UP RECOVERY POINTS

If the Recovery Point from which the data must be restored is not available in the destination, but backed up to a storage media, then administrator must restore the data from the backup location, and then provide it to the corresponding user. Note that in such a scenario, the user cannot restore the data directly.

The backup of Recovery Points or Consistent Recovery Points is performed using the Windows File System iDataAgent, which is also used to perform restore operations. For more information about restoring from a backup, see Restore Data - Windows File Systems.

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Restore Workstation Client Backup

RESTORE WORKSTATION CLIENT BACKUP

The following procedure describes the steps involved in restoring data from a workstation client backup.

▶ To restore the workstation client backup data:

1. Begin a Browse and Restore procedure, for the replication set you wish restore data.
2. From the **Browse Options** dialog box, select one of the following options to browse the backup data:
 - Browse Latest Data
 - Specify Browse Time - Browse Data Before
 - Select from Available Browse Times to select from the list of browse times available for this client at the destination.
3. If you wish to browse data objects that are deleted on the source, but available on the destination, then mark the **Show Deleted Items** option.

Clearing the **Show Deleted Items** option would return the requested data based on the latest image available.

4. From the Browse window, Select Objects From the Browse Window for Restore.
 5. From the **Restore Options** and **Advanced Restore Options** dialog boxes, select the restore options that you want to use. Do not click **OK** until you have used all of the desired tabs. If you accept all the default settings, you will be restoring the selected data to its original location. See Restore Destinations for the destination options available.
 - If you are restoring the data to a UNC path, then you must provide the user credentials to access the UNC path in the General tab of the Replication Set properties.
 - In order to restore Junction Points, select Restore Junction Points in the **Advanced Restore Options** dialog box. Note that when restoring Junction Points you can only perform a In-place restore and the **Unconditional Overwrite** option must be selected.
 6. After completing your selections, you can either start the restore immediately or schedule the restore job.
 - If you wish to schedule the job, click the Job Initiation tab from the Restore Options dialog box, click **Schedule**, schedule the job, and then click **OK**.
 - If you wish to run the job immediately, accept or click **Run Immediately** in the same tab and then click **OK**.
 7. While the job is running, you can right-click the job in the Job Controller and select **Detail** to view information on the job. After the data has been restored, you will see a job completion message in the Job Controller and Event Viewer.
-

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Workstation Backup Client Console

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

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- Manage Filters

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Start a Data Verification Job

Schedule a Backup Job

- Smart Schedule
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Browse and Restore Backup Data

- Restore Destinations
- Filters
- Restore Deleted Items

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Troubleshooting

OVERVIEW

Workstation Backup Client Console allows you to backup the client computer data to a centralized destination, and restore the backup data when required.

When the software is installed, the source and the destination location information are configured by default. You can manage the contents of the backup and execute the backup jobs. When required, the backup data stored in the centralized destination can be browsed at file-level, and selected contents can be restored to the client computer.

MANAGE BACKUP CONTENTS

Workstation Backup supports all types of data on the local NTFS volume. Data for backup can be configured from the Client Console. Filters can be used to further refine the contents of the backup.

MANAGE CONTENTS

You can manage the contents of the backup by adding source path for backup. You can also remove existing backup contents, if the data is not required to be backed up any more. Data for backup can be configured from the **Manage Content** dialog box.

Consider the following when adding the source location:

1. The same location cannot be added more than once.
2. The parent folder or the child folder of a previously configured source location cannot be added for backup.

MANAGE FILTERS

You can use filters to eliminate certain files or folders from the backup contents. You can define both exclude and include filters. The exclude filters allow you to exclude paths and file names that match certain patterns. The include filters allow you to include paths and file names that match certain patterns. The use of wildcards or regular expressions is supported in defining Filters.

Filters for backup operations are configured in **Manage Content** dialog box. You can add, or remove, filters as required. Backup filters are applicable for the entire backup data. See Using Filters for more details on the different options available for using filters.

To manage backup contents and configure filters for backup, see Manage Backup Contents for step-by-step instructions.

START A BACKUP JOB

The **Summary** page Content section displays the list of source locations currently configured for backup. When a backup job is run, the data from the source locations are backed up to the destination computer. The backup can either be executed immediately, or scheduled.

You can also perform an optimized backup, which identifies the files that already exist on the destination and transfers only the new/modified files. Optimized backup also transfers failed files from the previous backup.

See Start a Backup Job for step-by-step instructions.

The backup job activities from the client are enabled by default. If you wish to not to execute backup jobs to preserve network bandwidth, you can temporarily disable/enable backup activities. See Enable (or Disable) Backup Operations from the Client Console for step-by-step instructions. Note that you can restore data when backups are disabled.

The summary page displays the list of backup jobs that are currently running, in the Current Jobs section. Current jobs can be suspended/resumed/killed as required. See Suspend/Resume a Backup Job and Kill a Backup Job for step-by-step instructions.

SCHEDULE A BACKUP JOB

Schedules for backup jobs can be created from the Client Console. The Client Console offers the following two types of schedules:

SMART SCHEDULE

In the smart schedule, you can specify the frequency in which you wish to execute backup jobs. The smart schedule is sensitive to the status of the previously executed backup job. If the previous job is not completed in a certain specified time, you can choose to discard the job, and start a new backup job. See Create a Smart Schedule for step-by-step instructions.

LAPTOP USERS (ROAMING USERS)

If you are using Workstation Backup Agent on laptop computers, you might not always have the internet connectivity with necessary bandwidth to backup data on a regular schedule. Smart Schedule addresses this situation by considering the status of the previous backup, before proceeding with the current backup.

CLASSIC SCHEDULE

Classic schedule is the conventional time-based schedule, based on the standard calendar. It provides daily, weekly, monthly, and one-time scheduling options. See Create a Classic Schedule for step-by-step instructions.

DESKTOP USERS (HOME USERS)

If you are using Workstation Backup Agent on desktop computers, assuming you have a steady bandwidth available, we recommend you to use the Classic Schedule for backup operations.

The details of the backup job schedules can be viewed from the Client Console. See View Job Schedules for step-by-step instructions.

START A DATA VERIFICATION JOB

The WorkStation Backup Agent provides the capability to run data verification reports to compare the files and folders on the source and destination computers. During a data verification operation, data on the source and the destination computers is compared to check for any differences between the files or for any missing files on the destination computer.

You can perform a data verification job as a part of the backup job or as an independent job. When a data verification operation is performed as a part of the backup job, it verifies that the data on the source and the destination computers match after the backup is completed.

See Perform Data Verification for step-by-step instructions to perform a data verification as an independent job. For step-by-step instructions on performing a data verification job with a backup job, see Perform Data Verification during Backup.

BROWSE AND RESTORE BACKUP DATA

Backup data stored in destination computer can be restored using browse and restore. Data can be restored either from the latest backup copy, or from backup copy at a given point-in-time. If your source data is lost, you might want to restore from the latest backup copy. If you require a previous version of the data, you have two options to restore point-in-time data. You can either provide a specific time in the past, and restore from the nearest copy available at the

destination, or select from the list of point-in-time data available in the destination.

Note that the availability of the point-in-time data is dependent on the frequency of recovery points created at the destination, ideally by your system administrator.

RESTORE DESTINATIONS

The following destinations are supported for when restoring data:

IN-PLACE RESTORE

By default Workstation Backup Agent restores the backup data to the location from which it originated. Use the Unconditional Overwrite option to unconditionally overwrite any data that might be available in the restore location and is more recent than the data that is restored.

OUT-OF-PLACE RESTORE

Data can also be restored to a location that is different from which the backup originated. Provide the path, or use the Browse option to locate the destination to which the data must be restored.

FILTERS

Filters allow you to exclude paths and file names that match certain patterns. The use of wildcards or regular expressions is supported in defining filters. Filters for data restore operations are configured in the **Advanced Restore Options** dialog box. You can add, or remove, file/folder filters as required.

USING FILTERS

Filters can specify the actual files/folders to be excluded or included, or can contain wildcards implying all files/folders that matches the filter specification. The following list summarizes the wildcards available for filters.

1. * - Any number of any characters.
For example: *.doc - includes any file name with the extension ".doc" (e.g., status.doc, mission.doc)
2. ? - Any one character.
For example: access? - includes any file name that begins with- "access" followed by any one character (e.g., access1, access5).
3. [] - Any range of characters.
For example: [ei]nsure.doc - includes any file name that ends with "nsure.doc" and begins either "e" or "i". (e.g., ensure.doc, insure.doc)
4. [!] - The negation of a range of characters.
For example: [!ei]nsure.doc - includes any file name that ends with "nsure.doc", but does not begin with "e" or "i". (e.g., unsure.doc)
5. You can also use a combination of wildcards in a single expression.
For example: [A-K]* - includes any file that begins with any characters in the range of "A" through "K" inclusive, followed by any number of any characters.

RESTORE DELETED ITEMS

Data objects that have been deleted by orphan file processing can be restored. Deleted objects can be restored from the live copy until a recovery point is created. Once recovery points are created, the objects can be restored from the corresponding recovery points. For convenience, objects that were deleted one hour before the last recovery point creation are available in the live copy for restore.

Note that deleted objects are not copied to tape when the recovery points are moved to tape. So orphan data can be restored from the live data or recovery points, but not from tapes.

To browse and restore deleted objects, select the **Include Deleted Items** option on the **Browse Options** dialog box.

See Browse and Restore Backup Data for step-by-step instructions.

VIEW JOB HISTORY

Job history provides information on the status of the backup and the restore jobs previously executed. History of the jobs executed from the client computer can be reviewed from the **History** page. Jobs can be queried based on the execution time and job status. File level details of the job such as the list of successful or failed files can be viewed for each job. See View Job History for step-by-step instructions.

Also, the details of the last successfully executed backup are displayed in the **Summary** page Last Successful Job Statistics section.

SEND LOG FILES

Log files provide the processing details of operations that have occurred on your system. The Send Log Files feature allows you to send the log files to the system administrator for review and diagnosis. See Send Log Files from the Workstation Backup Client Console for step-by-step instructions.

By default, the log files are sent to the <software Installation Path>\Log Files\WBALogs\<Client Name> folder on the CommServe computer. If your system administrator has configured an FTP site to receive the log files, then the log files would be sent to the site as specified.






IMPORTANT CONSIDERATIONS

The following considerations apply:

- Ensure that the source path configured in the backup is a valid path in the workstation client computer.
- If the data in the source path has not changed since the previous backup, then the number of Files Transferred for the subsequent backup job will be zero. However, some system update information might still be exchanged during the backup job.
- Backup jobs can also be configured by the administrator from the CommCell Console. Such jobs follow the corresponding time-based schedule created by the administrator. These schedules are created and maintained by the administrator from the CommCell Console, and executed independent of the schedules from the Client Console. Note that the data to be backed up remains the same in both the schedules.
- Filters for backup contents can also be added by the administrators. See Manage Filters for more details. Such filters, though displayed in the **Manage Content** dialog box, cannot be modified from the Client Console. Contact your system administrator to make changes to any such filters.

WORKSTATION BACKUP ICONS

The Workstation Backup icon displayed on the System Tray indicates the status of the data protection activities by the Workstation Backup agent. The following table illustrates the appearance of these icons and the corresponding statuses:

ICON	STATUS
	Software is ready for backup and restore jobs.
	Previous backup job failed. Review the reason for the job failure and take appropriate action.
 (Blink)	A backup job is currently running.
	Insufficient network availability. No data protection activity possible.
	The computer needs a reboot following an update. Reboot the computer. Backup jobs can be successful only after the reboot.

TROUBLESHOOTING

This section explains some common issues that you might encounter while using the Workstation Backup Agent, and their diagnosis and possible workarounds.

- If the destination location is not configured correctly, then adding the source path from the **Manage Content** dialog box will result in an error with the message that the pair cannot be added. Contact your system administrator to configure the backup destination.
- When a suspended job is resumed, and the job fails, it might be because the services are down due to an update installation. Jobs can be resumed once the update installation is complete.

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MANAGE BACKUP CONTENTS

Use the following procedure to add new backup source, or remove any existing backup source locations:

Before You Begin

- Review Manage Backup Contents before proceeding further.

To manage the contents of the backup:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **Summary** page. The **Content** section displays the backup jobs, containing the source location, destination location, and the pair identification number for the backup.
 3. To add (or delete) additional content for backup, click **Manage Content**.
 4. In the **Pairs** section, click **Add** to add a backup source. Browse the location you wish to backup and click **OK**. The selected path would be added to the backup source.

To remove a backup source, select the source and click **Delete**. Data in the selected source location is removed from backup.
 5. In the **Exclude Filters** section, click **Add** to add exclude file filters to the backup data. For example, `personal?`, `*.exe`, etc.

To remove an exclude filter, select the filter and click **Delete**. The selected filter is removed from the list of exclude filters applied to the backup data.
 6. In the **Include Filters** section, click **Add** to add include file filters to the backup data. For example, `personal?`, `*.exe`, etc.

To remove an include filter, select the filter and click **Delete**. The selected filter is removed from the list of include filters applied to the backup data.
 7. Click **OK** to save the changes.
-

ENABLE (OR DISABLE) BACKUP OPERATIONS FROM THE CLIENT CONSOLE

Use the following procedure to enable (or disable) backup operations from the Workstation Backup Client.

To enable (or disable) backup operations from the client:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **Summary** page.
 3. Select (or clear) the **Enable Backup Activity** option to enable (or disable) backup operations on the client computer.
-

START A BACKUP JOB

Use the following procedure to execute a backup:

To perform a backup job:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.

2. From the **Summary** page, click **Run Backup**. Select **Run Backup** from the dropdown list.
 3. From the **Backup Options** dialog box, select **Full Backup**, **Full Backup w/Comparison**, **Incremental**, or **Incremental Backup w/Comparison**.
 4. Click **OK**. The backup job is started and a confirmation message is displayed.
-

SUSPEND/RESUME A BACKUP JOB

Use the following procedure to suspend/resume a backup job from the Workstation Backup Client:

To suspend/resume a backup job:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **Summary** page.
 3. From the **Current Jobs** list, select the backup job you wish to suspend/resume, and click **Suspend** or **Resume**.
Alternatively, you can right-click the job and select **Suspend** or **Resume**.
 4. The selected job is suspended/resumed.
-

KILL A BACKUP JOB

Use the following procedure to kill a backup job in progress from the Workstation Backup Client:

To kill a backup job that is in progress:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **Summary** page. From the list of backup jobs in the list of **Current Jobs**, select the backup job you wish to kill.
 3. Click **Kill** to kill the backup job.
Alternatively, you can right-click the job and select **Kill**.
 4. The selected job is killed.
-

CREATE A SMART SCHEDULE

Use the following procedure to create a smart schedule to execute backup job operations from the Workstation Backup Client:

To create a smart schedule for backup jobs:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
2. Select the **Scheduler** page.

Set the following options in the **Smart Schedule** section.

3. In the **Backup Frequency** field, enter the frequency (in hours) in which you wish to run the backup job. This will run a backup job once in every interval minutes specified. The default frequency is 24 hours.
 4. In the **Start scheduled backup if currently running job has not completed in** field, enter the number of hours to wait for the previous backup to complete. If the job is not complete within the time specified, the current backup will be discarded, and new backup is started. The default value is 72 hours.
 5. Click **Apply** to save the schedule details. The backup jobs will now be executed according to the schedule created.
-

CREATE A CLASSIC SCHEDULE

The following procedure can be used to create a classic schedule to execute backup job operations from the Workstation Backup Client:

To create a classic schedule for the backup jobs:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
2. Select the **Scheduler** page. In the **Classic Schedule** section, provide a name for the new schedule in the **Schedule Name** field.
3. Select the backup Job Type, **Full** or **Incremental**. To backup the entire source content, select Full backup. To backup the incremental changes since the previous backup, select Incremental backup.
4. Select the frequency in which the backup jobs must be executed.

- **One Time:** Select the option **One Time**. Provide the schedule start date and start time in the **Select Start Date for One Time Job** and **Start Time** fields.
 - **Daily:** Select the option **Daily**, and provide the schedule start date in the **Start Time** field.
 - **Weekly:** Select the option **Weekly**. Select the days you wish to run the backup, and provide the schedule start date in the **Start Time** field.
 - **Monthly:** Select the option **Monthly**. Provide the day of the month to run the backup in the **On Every** field, and the schedule start time in the **Start Time** field.
5. Click **Show Schedules** to view all the available schedules.
 6. Click **Schedule Now**. The system prompts for the user credentials.
 7. Click **OK** to save the schedule details. The backup jobs created for the client will now be executed according to the schedule created.

PERFORM DATA VERIFICATION

Use the following procedure to perform a data verification operation to compare files and folders on the source and destination computers.



To perform a data verification operation:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
2. From the **Summary** page, click **Run Backup**. Select **Data Verification** from the dropdown list.
3. From the **Backup Options** dialog box, select **Data Verification**.
4. Click **OK**. The data verification job is started and a confirmation message is displayed.

PERFORM DATA VERIFICATION DURING BACKUP

You can perform a data verification operation as a part of the backup job to verify that the data on the source and the destination computers match after the backup is completed. Follow the steps given below.



To perform a data verification operation during backup:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
2. From the **Summary** page, click **Run Backup**. Select **Run Backup** from the dropdown list.
3. From the **Backup Options** dialog box, select **Full Backup**, **Full Backup w/Comparison**, **Incremental**, or **Incremental Backup w/Comparison**.
4. Select the **When the backup is complete, generate a comparison between the source and destination content** option.
5. Click **OK**. The data verification operation will be performed after the backup completes.

BROWSE AND RESTORE BACKUP DATA

The following procedure can be used to browse and restore data backed up from the Workstation Backup Client:

Before You Begin

- Review Browse and Restore Backup Data before beginning a restore operation.

To restore backup data from the destination computer:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
2. Select the **Browse and Recovery** page. The **Browse Options** dialog is displayed.
3. The following browse options are available:
 - To browse data from the latest backup, select the **Browse Latest Data**.
 - To browse data based on backup time, select the **Browse Data Before** and provide the date and time. Data from the recovery point before the specified time will be available for restore.
 - To browse data from a particular recovery point (point in time) at the destination, select **Browse From Available Times**. This lists the list of recovery points available for the backup data. Select the desired recovery point.

If the recovery point from which you wish to restore data is not displayed in the **Browse From Available Times** list, check with your system administrator to see if the recovery points have been moved to storage media. In such case, your system administrator must be able to perform the restore operation, and provide you the data.

4. If you wish to browse deleted files and folders, then select the **Include deleted items** option.
 5. Click **OK**. The contents of the selected backup is displayed. Select the data you wish to restore.
If you wish to start a new browse operation, click **New Browse**.
If you wish to view the selected data, click **Preview**. The **Preview Restore** dialog box listing the selected data is displayed.
 6. Click **Restore All Selected** to restore the selected data.
 7. In the **Restore Options** dialog box, select the restore destination.
 - o Select **Restore to Same Paths**, if you wish to restore backup data to the location from which the backup originated.
 - o Clear **Restore to Same Paths**, and provide or use the **Browse** option to locate the destination.
 - o Select the **Unconditional Overwrite** option to unconditionally overwrite any data that might be available in the restore location and more recent than the data that is restored.
 8. If you wish to exclude certain data from being restored, click **Advanced** and provide the necessary filters in the **Advanced Restore Options** dialog box. You can also remove existing filters. Select **OK**.
 9. If you wish to restore Junction Points, select the **Restore Junction Points** option in the **Advanced Restore Options** dialog box. Note that when restoring Junction Points you can only perform a In-place restore and the the **Unconditional Overwrite** option must be selected.
 10. Select **OK** in the Restore Options dialog box. The restore operation is executed, and a confirmation message is received.
-

VIEW JOB HISTORY

Use the following procedure to view the history of jobs executed from the Workstation Backup Client:

To view job history:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **History** page.
 3. Select the number of previous backup/restore jobs you wish to view in the **Number of Backups to Track** field, and click **Apply**. The details of the selected number of previously run backup jobs are displayed.
 4. To view jobs based on time and job state, select the following option from the **Filters** section.
 - o Select the status of the job to be viewed, in the **State** field.
 - o Specify the range of date and time of the job to view, in the **From** and **To** fields.
Select **Now** to use the current date and time in the **To** field. This option is selected by default.Click **Show History** to display the details of jobs performed in the selected time interval that resulted in the selected job state.
 5. For each backup/restore job listed, you can view the list of successful or failed files for that job.
 - o For backup jobs, right-click the job and select **View Failed Files** or **View Backup Files** accordingly.
 - o For restore jobs, right-click the job and select **View Failed Files** or **View Restored Files** accordingly.
 6. For each data verification job listed, you can view the list of the files that do not match on the source and the destination computers.
 - o To view the report, right-click the job and select **View Data Verification Report**.
-

VIEW JOB SCHEDULES

Use the following procedure to view the backup jobs scheduled from the Workstation Backup Client:

To view job schedules:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Select the **Scheduler** page, and select the **Show Schedules**.
 3. The available job schedules will be displayed.
-

SEND LOG FILES FROM THE WORKSTATION BACKUP CLIENT CONSOLE

Use the following procedure to send the log files for review.

To send the log files:

1. Launch the Workstation Backup agent from the **Start | Programs** menu.
 2. Click the Help icon (?) in the toolbar, and select the **Send Logs** option.
 3. The log files are sent.
-

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Replication Set - Workstation Backup Agent

Topics | How To | Related Topics

This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

Overview

Configurable Properties and Operations

- Common Base Folder
- Data Compression
- Data Encryption
- Data Replication Monitor
- Destination Host
- Orphan Files
- Filters
- Replication Pairs
- User Accounts
- User Security

OVERVIEW

A Replication Set is similar is concept to a Backup Set which is used by some Agents, and represents a logical grouping of Replication Pairs. This allows you to configure certain properties and activities at the Replication Set level, and thus control all the included Replication Pairs together.

Replication sets can created in the following ways:

- Create a Replication Set manually. See [Create a Replication Set](#) for step-by-step instructions.
- Create a Replication Set using the Replication Set Creation Wizard. Create the Replication Set by right-clicking the ContinuousDataReplicator icon in the CommCell Browser and selecting **Replication Set Creation Wizard**.
- Create a Replication Set from a Replication Policy. A Replication Policy provides a sample template for the Replication Set. See [Replication Policy](#) for more details. See [Create a Replication set from a Replication Policy](#) for step-by-step instruction.

CONFIGURABLE PROPERTIES AND OPERATIONS

The following are the properties which can be configured, as well as the operations which can initiated, for a Replication Set.

COMMON BASE FOLDER

You can optionally specify a Common Base Folder, so that all destination paths for all Replication Pairs in the Replication Set will be created in the same folder on the destination host. This can be useful when you are adding multiple Replication Pairs at the same time, as in the case of replicating application data. For example, if you specify `\replication\` as the base directory, your Replication Pairs might use the following as their destination directories:

```
\replication\rep_pair_1\  
\replication\rep_pair_2\  
\replication\rep_pair_3\  

```



- If you change the settings for a Common Base Folder after any Replication Pairs have been created, the changes you make will affect only Replication Pairs created after that point; existing Replication Pairs will not be impacted by the change.
- A Common Base Folder is specified in the Manage Pairs dialog. For instructions about how to specify a Common Base Folder, see [Add or Edit a Replication Pair](#).
- For more information about replicating application data, see [Application Integration](#)

DATA COMPRESSION

Specify compression of replicated data on the network. For more information, see [Replication Compression](#).

DATA ENCRYPTION

Specify encryption of replicated data on the network. For more information, see Replication Encryption.

DATA REPLICATION MONITOR

Monitor data replication activities for the Replication Set. For more information, see Monitoring Data Replication.

DESTINATION HOST

Select a common Destination Host for all Replication Pairs within the Replication Set.

ORPHAN FILES

Specify how Orphan Files will be handled, when discovered on the destination computer. For more information, see Orphan Files. By default, orphan file processing for the replication set is turned Off.

FILTERS

Specify files, folders, and patterns to be excluded from data replication activities. For more information, see Replication Filters.

REPLICATION PAIRS

- Create, delete, and edit Replication Pairs within the Replication Set.
- Specify the single destination computer that all Replication Pairs in the Replication Set will use. Note that different Replication Pairs can be configured for different destination paths within that same destination computer, as long as the source path of each Replication Pair is different.

For more information, see Replication Pair.

USER ACCOUNTS

You can define an account for accessing the destination directory. See ContinuousDataReplicator in **User Accounts and Passwords** for more information.

USER SECURITY

Configure User Security for the Replication Set, after it has been created. For more information, see User Administration and Security.

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Replication Set - Workstation Backup Agent - How To

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

- [Create a Replication Set](#)
- [Create a Replication set from a Replication Policy](#)
- [Delete a Replication Set](#)
- [Configure the Replication Set for Data Encryption](#)
- [Enable or Disable Software Compression for a Replication Set](#)
- [Add/Edit/Delete Filters for a Replication Set](#)
- [View Data Replication Monitor](#)
- [View details of data replication activities](#)
- [View the failed files for a Replication Pair](#)
- [Filter which clients activities are displayed](#)
- [Add or Edit a Replication Pair](#)

CREATE A REPLICATION SET

Before You Begin

- Only one Replication Set can be created for Workstation backup clients.

Required Capability: Capabilities and Permitted Actions

▶ To create a Replication Set:

1. In the CommCell Browser, right-click the Workstation Backup Agent icon of the source machine, select **All Tasks**, then select **Add Replication Set**.
2. In the General tab, specify a name for the Replication Set and a Destination Host that has CDR installed.
Use the **User Name** field to specify Windows User Account that is part of the Local Administrator group on the destination, with read/write permissions for the product installation folders on the destination. If the replication logs directory on the destination is not in the default location, then the **User Name** supplied here must also have read/write permissions for that directory as well.
3. Make appropriate selections in the Replication Options tab.
4. Optionally, select the minimum file size to perform hash comparisons, and the block size for hashing in the Advanced tab.
5. In the Orphan Files tab, specify how to treat data on the destination, which is not on the source machine. See Replication Configuration - Orphan Files for more information. Orphan file processing is disabled by default.
6. Optionally, filter the content of any Replication Pairs that are created for this Replication Set in the Filters tab. To exclude data from data replication operations, do one of the following:
 - Click the **Add** button and, in the **Enter Path** window, type the complete path (including drive letter) of the file/folder/directory that you want to exclude from data replication. Repeat this step if you want to add more files/folders/directories to the filter.
 - Click the **Browse** button and expand the file system of the client computer. Click the file/folder/directory that you want to exclude from data replication and then click **Add**. Repeat this step for each additional entry.
7. To configure User Security, select the Security tab. For more information, see User Administration and Security.
8. Click **OK** to save your changes.



- To configure User Security for the Replication Set, after it has been created, expand the Workstation Backup Agent icon of the source machine, right-click the Replication Set and select **Properties**, then select the **Security** tab. For more information, see User Administration and Security.
- To specify that all Replication Pairs created for this Replication Set are to use a Common Base Folder (the same folder on the destination host to contain all destination paths) see Add or Edit a Replication Pair.

CREATE A REPLICATION SET FROM A REPLICATION POLICY**Before You Begin**

- Review Replication Policy.

▶ To create a Replication Set from a Replication Policy:

1. In the CommCell Browser, right-click the Agent icon of the source machine, select **All Tasks**, then select **Add Replication Set From Policy**.
2. In the **Select a Policy** dialog box, select the replication policy based on which you wish to create the replication set. The replication policies created for the corresponding agent will be displayed. Click **OK**.
3. In the **Enter Name** dialog box, specify the name of the replication set, and click **OK**.
4. The replication set will be created with the configurations available in the selected replication policy.

DELETE A REPLICATION SET

When you delete a Replication Set, all of the following are deleted as well:

- all its Replication Pairs
- all its Recovery Points
- all its mounted and shared snapshots

Required Capability: Capabilities and Permitted Actions

▶ To delete a Replication Set:

1. Ensure that all Replication Pairs that you are deleting are in the "Stopped" state.
2. In the CommCell Browser, right-click a Replication Set icon, and select **All Tasks**, then select **Delete**.

For CDR on UNIX, if Recovery Points were created for this Replication Set and any of the snapshots were mounted,



select the **Unmount and delete any manually-mounted snapshots before deleting replication set** option.

3. Click **OK** in the confirmation screen.

CONFIGURE THE REPLICATION SET FOR DATA ENCRYPTION

Before You Begin

- Encryption settings made at the Replication Set level are for encryption of data between the source machine and the destination machine.
- Encryption must be enabled at the client level prior to configuring data encryption for a Replication Set residing on that client. See Configure the Client for Data Encryption.

Required Capability: Capabilities and Permitted Actions

▶ To configure data encryption for a Replication Set:

1. From the CommCell Browser, right-click the Replication Set and select **Properties**.
2. From the Replication Set Properties (Replication Options) tab, either select or clear **Encrypt During Data Transfer**.
3. Click **OK** to save your settings and close the Replication Set Properties.

ENABLE OR DISABLE SOFTWARE COMPRESSION FOR A REPLICATION SET

Before you Begin

- Compression settings made at the Replication Set level are for compression of data between the source computer and the destination computer.

Required Capability: Capabilities and Permitted Actions

▶ To enable/disable software compression for a Replication Set:

1. From the CommCell Browser, right-click the Replication Set and select **Properties**.
2. From the Replication Set Properties (Replication Options) tab, either select or clear **Compression ON**.
3. Click **OK** to save your settings and close the Replication Set Properties.

ADD/EDIT/DELETE FILTERS FOR A REPLICATION SET

Related Topics:

- Replication Filters
- Replication Set
- Data Replication

Before You Begin

- When Filtering is edited for a Replication Set, any existing and active Replication Pairs will be automatically aborted and restarted to effect the change. If the newly configured filtering excludes files or folders that had previously been replicated, these files and folders on the destination(s) will be handled according to your Orphan Files settings.
- To configure filters for a new Replication Set, see Create a Replication Set.

Required Capability: Capabilities and Permitted Actions

▶ To add/edit/delete a filter for a Replication Set:

1. In the CommCell Browser, right-click a Replication Set on the source machine, and select **Properties**.
2. In the Filters tab, specify the files and folders to filter from the content of any Replication Pairs that are created for this Replication Set. For more information, see Replication Filters.
3. Click **OK** to save your changes.

VIEW DATA REPLICATION MONITOR

Before you begin

- Review Monitor Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To view data replication monitor:

1. In the CommCell Browser, right-click the CDR icon, and select **All Tasks**, then select **Data Replication Monitor**.

In the Data Replication Monitor, all replication activities will be displayed for each Replication Pair. For more information about the States displayed, see Job States.

VIEW DETAILS OF DATA REPLICATION ACTIVITIES

Required Capability: Capabilities and Permitted Actions

▶ To view details of data replication activities for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Details**.
 2. The Pair Activity will be displayed with additional details about the job.
-

VIEW THE FAILED FILES FOR REPLICATION PAIR

Required Capability: Capabilities and Permitted Actions

▶ To view the failed files for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **View Failed Files**.
 2. If any failed files have been logged for this Replication Pair, they will be displayed.
-

FILTER WHICH CLIENTS ACTIVITIES ARE DISPLAYED

Required Capability: Capabilities and Permitted Actions

▶ To filter which clients' activities are displayed:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Filters**.
 2. In the Filter Operations dialog box, select from the following:
 - Select an existing filter from the **Filters** list. (You can click the **View Filter Details** button to see which clients each filter is configured to monitor.)
 - Click the **Create a New Filter** button. In the **Create a New Filter** dialog box, select the clients to be monitored and click **OK**.
 3. Click **Apply** and then click **Close**.
 4. The Data Replication Monitor will now show activities only for the Replication Pairs for the clients defined in your selected filter.
-

ADD OR EDIT A REPLICATION PAIR

Before You Begin

- You can only update a Replication Pair whose state is Stopped, New Pair, or Failed.

Required Capability: Capabilities and Permitted Actions

▶ To add or edit a Replication Pair:

1. In the CommCell Browser, right-click a Replication Set in the source machine, and select **All Tasks**, then select **Manage Pairs**.
2. To add a Replication Pair, in the Manage Pairs dialog, perform the following:
 - Specify a Common Base Folder so that all destination paths for all Replication Pairs in the Replication Set will be created in the same location on the destination host.
 - For File System data, click **Add**. In the Add Replication Pair dialog box, type, or click **Browse** to navigate to and select, a source volume or directory for the Source Path and Destination Path fields, then click **OK**.
 - For application data, click **Add App**; in the Add Applications dialog, select all of the directories associated with the application data to be replicated, and click **OK**. For more information about replicating application data, see Application Integration.



Add App discovers the location of system databases on the client, as well as user-defined databases, which you can select for data replication.

3. To edit a Replication Pair, in the **Manage Pairs** dialog, select the new Pair or one to edit, click **Edit**, make any changes in the **Replication Pair** dialog box, and click **Close**.
 4. To specify that additional Replication Pairs must be created for mount points that are part of your selected source volume or directory, select **Automatically detect mount points**. Mount points will be ignored if this option is not selected.
 5. To engage all the VSS writers available in the source path when gathering backup data, select **Engage All VSS Writers** option.
 6. When your changes are complete, click **Apply**.
-

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Replication Pair - Workstation Backup Agent

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

Overview

OVERVIEW

A Replication Pair is similar in concept to a Subclient which are used by other Agents; it maps a designated set of data on a source computer to a location on a destination computer, for the purpose of monitoring changes on the source and replicating the changes to the destination computer. A single Replication Pair can be configured to replicate all the data on a source computer, or multiple Replication Pairs can be created, allowing more granular control of data.

When creating a Replication Pair, and selecting the source and destination paths for replication, consider the following:

- An absolute location on the destination computer, e.g., a directory such as `H:\replication\`, used as a destination path for one Replication Pair, may not be used by any other Replication Pair, even one in a different Replication Set; however, other Replication Pairs can use subdirectories of that one as their destination path, e.g., `H:\replication\pair2\`.
- When source data contains stubs from a data migration, the stubs themselves will be replicated, and not the actual data which has been migrated.
- For a Replication Pair with the **Automatically detect mount points** option selected, for each mount point in the specified directory or volume, an additional, separate Replication Pair will be automatically created and its source path marked with an asterisk ("*") at the beginning to indicate it is a mount point.
- Replication pairs with the **Engage All VSS Writers** option selected in the Manage Pairs dialog box, engages all available VSS writers during backup, ensuring the consistency of backup data.
- The source path cannot be a mapped network drive.
- For Windows, a UNC path can be used as a destination. For data replication to succeed, the destination computer must have permissions to the location pointed to by the UNC path. Note that the UNC path can be to a NetApp file server; for more information.
- When selecting a destination folder for a Replication Pair, ensure that the selected path does not contain any data as the existing data will be pruned during Orphan File processing.

For step-by-step instructions, see [Add or Edit a Replication Pair](#).

Certain Replication Pair combinations are not possible, or are only possible using different Replication Sets. The following table highlights the most common such cases.

TYPE OF COMBINATION OR CONFLICT	Same Replication Set	Different Replication Set	Examples	Notes
Exact same destination path	No	No	Note that (A), (B), (C) in the examples represent different computers (A) D:\test => (B) E:\test (A) F:\test => (B) E:\test	
Child/parent destination paths	No	Yes	(A) D:\test => (B) E:\test (C) F:\test => (B) E:\test\test1 ----- (A) D:\test => (B) E:\test (C) F:\ => (B) E:\	
Source path same as destination (volumes are on different computers)	N/A	Yes	(A) D:\test => (B) D:\test (C) D:\test => (B) E:\test	
Same destination path on multiple computers	N/A	Yes	(A) D:\test => (B) D:\test (A) D:\test => (C) D:\test	For Windows - "Allow Recovery Points" option must be disabled
Same destination volume, different folders	Yes	No	(A) D:\test => (B) D:\test (C) E:\data => (B) D:\test1	
Source volume can also be destination volume; destination volume can also be source volume	No	Yes	(A) D:\test => (B) E:\test (C) F:\test => (A) D:\test ----- (A) D:\test => (B) D:\test (C) D:\data => (A) D:\data	

			<pre> ----- (A) D:\test => (B) D:\test (B) D:\test => (C) E:\data ----- (A) D:\test => (B) D:\test (B) D:\data => (C) E:\data </pre>	
Same source path in multiple pairs	No	Yes	<pre> (A) D:\test => (B) D:\test (A) D:\test => (C) E:\test </pre>	For Windows - the new pair will change to the parent path
Source parent folder already used (Nested mount point is not supported.)	No	No	<pre> Existing: (A) D:\ => (B) D:\ New: (A) D:\data => (B) E:\data </pre>	
Source child folder already used	No	No	<pre> Existing: (A) D:\data => (B) E:\data New: (A) D:\ => (B) D:\ </pre>	

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

[Add or Edit a Replication Pair](#)

[Delete a Replication Pair](#)

[View Data Replication Monitor](#)

[View details of data replication activities](#)

[View the failed files for a Replication Pair](#)

[Filter which clients activities are displayed](#)


[View Orphan Files](#)

ADD OR EDIT A REPLICATION PAIR

Before You Begin

- You can only update a Replication Pair whose state is Stopped, New Pair, or Failed.

Required Capability: Capabilities and Permitted Actions

 To add or edit a Replication Pair:

- In the CommCell Browser, right-click a Replication Set in the source machine, and select **All Tasks**, then select **Manage Pairs**.
- To add a Replication Pair, in the Manage Pairs dialog, perform the following:
 - Specify a Common Base Folder so that all destination paths for all Replication Pairs in the Replication Set will be created in the same location on the destination host.
 - For File System data, click **Add**. In the Add Replication Pair dialog box, type, or click **Browse** to navigate to and select, a source volume or directory for the Source Path and Destination Path fields, then click **OK**.
 - For application data, click **Add App**; in the Add Applications dialog, select all of the directories associated with the application data to be replicated, and click **OK**. For more information about replicating application data, see [Application Integration](#).



Add App discovers the location of system databases on the client, as well as user-defined databases, which you can select for data replication.

- To edit a Replication Pair, in the **Manage Pairs** dialog, select the new Pair or one to edit, click **Edit**, make any changes in the **Replication Pair** dialog box, and click **Close**.
- To specify that additional Replication Pairs must be created for mount points that are part of your selected source volume or directory, select

Automatically detect mount points. Mount points will be ignored if this option is not selected.

5. To engage all the VSS writers available in the source path when gathering backup data, select **Engage All VSS Writers** option.
 6. When your changes are complete, click **Apply**.
-

DELETE A REPLICATION PAIR

Before You Begin

- You can only delete a Replication Pair whose state is Stopped.
- When you delete a Replication Pair, its Recovery Points are not deleted.

Required Capability: Capabilities and Permitted Actions

▶ To delete a Replication Pair:

Select one of the following methods:

- In the CommCell Browser, right-click a Replication Pair, and select **Delete**.
 - In the CommCell Browser, right-click a Replication Set in the source machine, and select **All Tasks**, then select **Manage Pairs**. In the **Manage Pairs** screen, select a Replication Pair, and click **Delete**. When your changes are complete, click **Close**.
-

VIEW DATA REPLICATION MONITOR

Before you begin

- Review Monitor Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To view data replication monitor:

1. In the CommCell Browser, right-click the CDR icon, and select **All Tasks**, then select **Data Replication Monitor**.

In the Data Replication Monitor, all replication activities will be displayed for each Replication Pair. For more information about the States displayed, see Job States.

VIEW DETAILS OF DATA REPLICATION ACTIVITIES

Required Capability: Capabilities and Permitted Actions

▶ To view details of data replication activities for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Details**.
 2. The Pair Activity will be displayed with additional details about the job.
-

VIEW THE FAILED FILES FOR REPLICATION PAIR

Required Capability: Capabilities and Permitted Actions

▶ To view the failed files for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **View Failed Files**.
 2. If any failed files have been logged for this Replication Pair, they will be displayed.
-

FILTER WHICH CLIENTS ACTIVITIES ARE DISPLAYED

Required Capability: Capabilities and Permitted Actions

▶ To filter which clients' activities are displayed:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Filters**.
2. In the Filter Operations dialog box, select from the following:
 - Select an existing filter from the **Filters** list. (You can click the **View Filter Details** button to see which clients each filter is configured to monitor.)
 - Click the **Create a New Filter** button. In the **Create a New Filter** dialog box, select the clients to be monitored and click **OK**.

3. Click **Apply** and then click **Close**.
 4. The Data Replication Monitor will now show activities only for the Replication Pairs for the clients defined in your selected filter.
-

VIEW ORPHAN FILES

Related Topics:

- Destination Configuration - Orphan Files

Required Capability: Capabilities and Permitted Actions

▶ To view the orphan files for a Replication Pair:

1. In the CommCell Browser, right-click the ContinuousDataReplicator icon on a source computer, and from **All Tasks**, select **Data Replication Monitor**.
 2. In the Data Replication Monitor, right-click a Replication Pair and select **View Orphan Files**.
-

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Replication Policy

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Overview

Configurable Properties

- General
- Pre/Post Process
- Replication Options
- Orphan Files
- Advanced
- Filters

Replication Policy Operations

- Create a Replication Policy
 - Add/Update a Replication Pair
 - Delete a Replication Policy
 - Apply Settings
-

OVERVIEW

Replication Policies provide a means through which you can configure multiple replication sets within a CommCell from a centralized template. Replication policy consists of a common configuration for a replication set that can be applied to newly created replication set within the CommCell.

During the Replication Policy creation, you configure the template for a replication set by defining the replication type, replication destination, common base folder, and other replication options. Optionally, you can also add replication pairs to the policy. Replication sets (also called Target Replication Sets) created from these replication policies inherit the properties specified in the replication policy. If the replication policy contains any replication pairs, then the replication set is created with the replication pairs by default. Once created, the properties of the replication set can be modified; additional replication pairs can be added and existing pairs can be deleted.

CONFIGURABLE PROPERTIES

This section explains the configurable properties of a Replication Policy.

Once created, the properties of a Replication Policy can be modified at any later time. Any changes to a Replication Policy will affect only the Replication Sets that are newly created after that point.

GENERAL

DESTINATION HOST

Select a common Destination Host for all Replication Pairs within the Replication Set. All replication sets created from this replication policy will have the same Destination Host.

COMMON BASE FOLDER

Common Base Folder, which is the destination paths for all Replication Pairs in the Replication Set. This can be useful when you are adding multiple Replication Pairs at the same time.

For example, if you specify `\replication\` as the base directory, your Replication Pairs might use the following as their destination directories:

```
\replication\rep_pair_1\  
\replication\rep_pair_2\  
\replication\rep_pair_3\  

```

DATA REPLICATION TYPE

Select the replication type for the replication policy. One replication policy can have only one replication type. The following three types of replication is possible:

- Continuous Replication - to create replication sets for CDR to replicate data in Continuous Replication mode. See ContinuousDataReplicator for more

information.

- Disk Library Replication - to create replication sets for CDR to replicate data in Disk Library Replication mode.
- Workstation Backup - to create replication sets for Workstation Backup Agents.

PRE/POST PROCESS

Specify commands for Pre/Post Processes for Data Replication Activities in the Pre/Post Process tab.

REPLICATION OPTIONS

Provide additional options for data replication in the Replication Options tab.

ORPHAN FILES

Specify how Orphan Files will be handled, when discovered on the destination computer. For more information, see Orphan Files. The following default settings apply:

- Continuous Replication - Orphan file handling is turned On by default.
- Workstation Backup - Orphan file handling is turned Off by default.

ADVANCED

Specify the advanced hashing options, enable Disk Library Replication, and set mining tool options (applicable for ContinuousDataReplicator) in the Advanced tab.

FILTERS

Specify files, folders, and patterns to be excluded from data replication activities. For more information, see Replication Filters.

REPLICATION POLICY OPERATIONS

The following operations can be performed on a Replication Policy.

CREATE A REPLICATION POLICY

You can create a new Replication Policy from the **Create New Replication Policy** dialog box. The name of the Replication Policy, Destination Host, Common Base Folder, and the Data Replication Type in the **General** tab are essential components for a Replication Policy. Follow the options in the rest of the tabs and provide the details as applicable. See Create a Replication Policy for step-by-step instructions.

ADD/UPDATE REPLICATION PAIRS

You can add replication pairs to the replication policy, defining the source path from which data is replicated. When defining the source path, keep in mind that the path specified in the replication pair must be a valid path in the client computer in which the replication pairs are created using this replication policy.

See Add/Update Replication Pairs to a Replication Policy for step-by-step instructions. You can add multiple replication pairs to a replication policy. Replication sets created with this policy will contain these replication pairs upon creation.

DELETE A REPLICATION POLICY

When a replication policy is no longer required, you can delete the replication policy. See Delete a Replication Policy for step-by-step instructions.

APPLY SETTINGS

Replication Set details for multiple Workstation Backup Agents can be simultaneously updated using the Apply Settings option. You can create a Replication Policy with the desired settings, or modify the details of an existing Replication Policy, and use the Apply Settings option to apply the Replication Policy configuration to the Replication Sets to selected Workstation Backup clients. When applied, the details of Replication Sets of the corresponding Workstation Backup client computers are modified, the Replication Pairs are reset to New Pair state, and the subsequent backup is converted to a Full Backup.

WARNING:

Using the Apply Settings option applies the Replication Policy settings to the Replication Sets, resets all the corresponding Replication Pairs to **New Pair** state, and converts the following backup job to a **Full Backup**. It is recommended that you use this option with utmost caution.

See Apply the Replication Policy Settings to Replication Sets for step-by-step instructions.

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Replication Policy - How To

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Create a Replication Policy

Add/Update Replication Pairs

Create a Replication Set from a Replication policy

Delete a Replication Policy

Apply the Replication Policy Settings to Replication Sets

CREATE A REPLICATION POLICY

▶ To create a Replication Policy:

1. From the CommCell Browser, right-click the **Replication Policies** node, then click **New Replication Policy**. The Create New Replication Policy dialog is displayed.
2. In the General tab, specify a name for the Replication Policy and a Destination Host that has the replication Agent installed. If required, for Windows, in the **User Name** field, specify a Windows User Account that is part of the Local Administrator group on the destination, with read/write permissions for the product installation folders on the destination. If the agent uses replication logs, and the replication logs directory on the destination is not in the default location, then the **User Name** supplied here must also have read/write permissions for that directory as well.
3. Specify a Common Base Folder so that all destination paths for all Replication Pairs in the Replication Sets (created with this Replication Policy) will be created in the same location on the destination host.
4. Specify the type of replication for which the replication sets created using this replication policy will be used. The following replication types are available.
 - **Continuous Replication** - to create replication sets for CDR to replicate data in ContinuousDataReplication mode.
 - **Disk Library Replication** - to create replication sets for CDR to replicate data in Disk Library Replication mode.
 - **Workstation Backup** - to create replication sets for Workstation Backup Agents.
5. In the Pre/Post Process tab, specify any commands to be run before a data protection operation (like Recovery Point creation, backup job, etc.) and/or after the operation, and specify a User Account with permissions to run the command(s) on the destination machine. For more information, see Pre/Post Processes.
6. In the Replication Options tab, make any appropriate selections:
 - Enable or Disable Software Compression for a Replication Set
 - Data Integrity Validation on transfer (See Enable (or Disable) Data Integrity Validation on Network)
 - Configure the Replication Set for Data Encryption
 - Configure CDR Recovery Points
 - Configure CDR for Backups of Recovery Points
7. In the Orphan Files tab, specify how to treat data on the destination, which is not on the source machine.
8. Optionally, filter the content of any Replication Pairs that are created for this Replication Set in the Filters tab. For more information about Filters, see Replication Filters. To exclude data from data replication operations, do one of the following:
 - Click the **Add** button and, in the **Enter Path** window, type the complete path (including drive letter) of the file/folder/directory that you want to exclude from data replication. Repeat this step if you want to add more files/folders/directories to the filter.
9. Click **OK** to save your changes.

User Security is configured at the Replication Set level. To specify the security options, expand the Agent icon of the source machine, right-click the Replication Set and select **Properties**, then select the Security tab. For more information, see User Administration and Security.

ADD/UPDATE REPLICATION PAIRS

Required Capability: Capabilities and Permitted Actions

▶ To add new Replication Pairs, or update existing Replication Pairs:

1. In the CommCell Browser, right-click a Replication Policy to which you wish to add the Replication Pair, and select **All Tasks**, then select **Manage Pairs**.
2. To add a Replication Pair, in the Manage Pairs dialog, click **Add**. In the Add Replication Pair dialog box, type a source volume or directory for the Source

Path. Keep in mind that this path must be valid source path in the target computer where the replication pair is created, using this replication policy.

3. To edit a Replication Pair, in the **Manage Pairs** dialog, select the Pair to edit, click **Edit**. Make any changes to the source path in the **Edit Replication Pair** dialog box, and click **OK**.
4. To specify that all VSS writers must be engaged when the acquiring the source snap, select the **Engage All VSS Writers** option. Use this option to create backups that are consistent with the source. The **Automatically detect mount points** option is not applicable when adding Replication Pairs to the Replication Policy.
5. When your changes are complete, click **Apply**.

Filtering of content for Replication Pairs is configured at the Replication Set level; see Replication Filters.

CREATE A REPLICATION SET FROM A REPLICATION POLICY

Before You Begin

- Review Replication Policy.

▶ To create a Replication Set from a Replication Policy:

1. In the CommCell Browser, right-click the Agent icon of the source machine, select **All Tasks**, then select **Add Replication Set From Policy**.
2. In the **Select a Policy** dialog box, select the replication policy based on which you wish to create the replication set. The replication policies created for the corresponding agent will be displayed. Click **OK**.
3. In the **Enter Name** dialog box, specify the name of the replication set, and click **OK**.
4. The replication set will be created with the configurations available in the selected replication policy.

DELETE A REPLICATION POLICY

Required Capability: Capabilities and Permitted Actions

▶ To delete a Replication Policy:

1. From the CommCell Browser, select the **Replication Policies** node, right-click the desired Replication Policy, click **All Tasks** and then click **Delete**.
2. Click **Yes** to the confirmation message.
3. The Replication Policy will be deleted. Note that Replication Sets created from this Replication Policy will have no impact upon deletion.

APPLY THE REPLICATION POLICY SETTINGS TO REPLICATION SETS

Required Capability: Capabilities and Permitted Actions

▶ To apply the Replication Policy settings to Workstation Backup agent Replication Sets:

1. From the CommCell Browser, select the **Replication Policies** node, and select the desired Replication Policy. If you wish you modify the details of the Replication policy, right-click the Replication policy and select **Properties**. Modify the details as required.
2. Right-click the Replication Policy, click **All Tasks** and then select **Apply Settings**. The Apply Settings dialog box is displayed with the list of Workstation Backup client computers configured to the CommCell.
3. Select the Workstation Backup Client computers you wish to apply the Replication Policy settings. Use **Select All** and **Clear All** options to select or clear all the clients in the list.
4. Click **OK** to apply the settings.

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Replication Configuration - Workstation Backup Agent

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

Overview

Replication Scenario

Network Bandwidth Throttling

Orphan Files

Fan-In Recovery Points

Fan-In Backup Set

Best Practices

OVERVIEW

Workstation Backup Agent uses ContinuousDataReplicator on the destination computer to manage the backup data secured from the Workstation Agent source. Managing the backup data includes, creating recovery points to access point-in-time data, and back up the recovery points for future access. This document explains the configurations required in the destination computer and other replication options required for the successful data protection operations using Workstation Backup Agent.

REPLICATION SCENARIO

Workstation Backup source computers are configured to the destination computer in a Fan-In configuration setup.

Fan-In: Replication from multiple Source computers to a single Destination computer:

In a Fan-In configuration, multiple computers on the LAN or WAN have their data replicated to a single computer, either local or remote. This provides protection of all of the source computers against catastrophic failure, while maximizing the use of resources by directing all the data to a single destination computer.

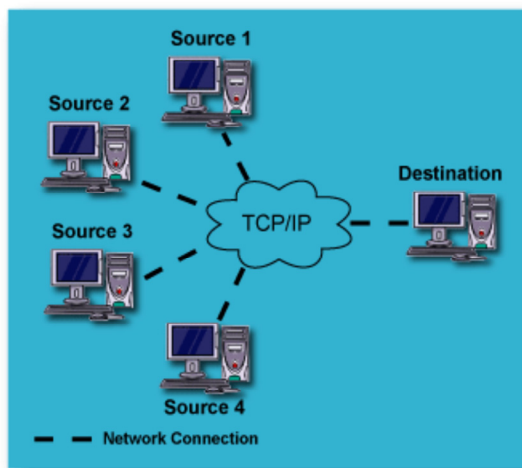
Most of the configuration of replication and Recovery Point options can be accomplished from the Fan-In tab of the Agent Properties on the *destination* computer, and these settings are automatically applied to all the source computer.

SCALABILITY

Although the scalability of a Fan-In setup can vary based on network and system resources, it is recommended that each Fan-In setup contains no more than 100 source clients.

For maximum performance and robustness, the total number of Replication Pairs configured for the same source volume should be kept to a minimum. If multiple Replication Pairs must be configured for the same source volume, the recommended upper limit is five.

For more information, see [Using ContinuousDataReplicator in a Fan-In Configuration](#).



NETWORK BANDWIDTH THROTTLING

Throttling allows you to configure the rate of data transfer over the network, based on the throttling parameters. The various throttling options (including throttling amount and rules) can be configured at the Agent level, in the Operational Parameters tab of the agent properties screen.

The following can be configured on the Source computer:

THROTTLING AMOUNT

In the throttling amount, maximum network transfer rate, is measured in megabits per second (Mbps).

On Windows, the setting for Throttling Amount will apply to each pipeline engaged in replication activity, not the aggregate of all pipelines for all Replication Pairs on the computer. With respect to the number of pipelines that will be active at any one time, review the following based on an example of having a Throttling Amount setting of 10Mbps:

- Each Replication Pair requires a pipeline during Baselining or SmartSync; if you have 3 Replication Pairs in the SmartSync phases at the same time, you have 3 pipelines active, and thus a 30Mbps maximum network transfer rate for the source client (3 pipelines at 10Mbps each.) After Baselining and SmartSync have completed for each Replication Pair, only 1 pipeline will remain in use, and the maximum network transfer rate will be reduced to 10Mbps.
- Fan-Out configurations require a pipeline for each destination client; if you have 5 Replication Sets configured to replicate data to 5 clients, you have 5 pipelines active, and thus a 50Mbps maximum network transfer rate for the source client (5 pipelines at 10Mbps each.)
- Other than the cases listed, Baselining or SmartSync, and Fan-Out, all other replication activity will require 1 pipeline, and thus the Throttling Amount specified will apply to the aggregate of all activity on the source computer, comprised of the replication activities of all Replication Pairs.

On UNIX, the setting for Throttling Amount will apply to the aggregate of all pipelines for all Replication Pairs on the computer. With respect to the number of pipelines that will be active at any one time, review the following based on an example of having a Throttling Amount setting of 30Mbps:

- Each Replication Pair requires a pipeline during Baselining or SmartSync; if you have 3 Replication Pairs in the SmartSync phases at the same time, you have 3 pipelines active, which will equally divide the specified 30Mbps maximum network transfer rate for the source client, for a maximum rate of 10Mbps each. After Baselining and SmartSync have completed for each Replication Pair, only 1 pipeline will remain in use, and the maximum network transfer rate of 30Mbps will apply to that pipeline.
- Fan-Out configurations require a pipeline for each destination client; if you have 5 Replication Sets configured to replicate data to 5 clients, you have 5 pipelines active, which will equally divide the specified 30Mbps maximum network transfer rate for the source client, for a maximum rate of 6Mbps each.

If your destination computer is serving that function for multiple source computer, you may need to set this limit on each of the source computers, such that the destination computer has sufficient time for log replay from all source computers. Note that the Throttling Amount must be specified first, before you can create Bandwidth Throttling Rules (see next item.)

BANDWIDTH THROTTLING RULES

The scheduled network throttling, specifying a time range, and a percentage of maximum transfer rate, specified as the Throttling Amount, during that time range. Once again, the limit set here will apply to the aggregate of all activity on the source computer, comprised of the replication activities of all Replication Pairs. This setting allows you to select high and low (or no) activity periods in a manner similar to the 'operation window' concept used when scheduling the activities of job-based Agents.

CONSIDERATIONS

- When configuring throttling, you should consider what unintended affects throttling might have on operations. As one example, if you have a source computer that has significant file write activity, and you impose network bandwidth throttling which makes it impossible to transfer the logs quickly enough to the destination computer to keep pace with the rate of change on the source computer, log file space requirements would increase dramatically on the source computer. In such a case, provision must be made for sufficient log file space, based on the expected activity and throttling.
- An example of a beneficial use of throttling involves configurations where multiple source computers are all configured to use the same destination computer. In this case, you may want to impose throttling on the source computers to allow the destination computer enough time to keep pace with all the log files it is receiving, and ensure sufficient log space on the destination computer as well to accommodate all of the logs it will be receiving.
- You can configure Alerts to be generated when throttling is imposed, or when 80 percent or more of a volume's disk space is consumed, for all of the client computer's volumes. For more information, see Alerts and Monitoring.
- On Windows in a clustered environment, when a cluster node is the active node for more than one virtual server at the same time, throttling rules are applied equally to all of the virtual servers hosted by that physical node, using the highest numbers specified for any one of them. For example, consider an active node hosting three virtual servers simultaneously, with throttling configured as follows on each of the virtual servers, VS1, VS2, and VS3:

<u>Throttling Parameter</u>	<u>VS1</u>	<u>VS2</u>	<u>VS3</u>
Throttling based on percentage of free log space on destination:	30%	35%	40%
Stop replication based on percentage of free log space on destination:	80%	70%	60%
Abort source based on percentage of free log space on source:	75%	80%	70%
Network Bandwidth Throttling amount:	10Mbps	40Mbps	90Mbps

Since throttling for *all* Virtual Servers will be based on the highest number specified for any *one* of them, all three Virtual Servers would be subject to the throttling numbers shown in bold, not necessarily the numbers specified individually. If throttling is imposed based on the destination computer running low on log space, in this example, when free log space reaches 40% on any virtual server, the maximum transfer rate will be reduced by 50% on each of the virtual servers -- to 5Mbps on VS1, 20Mbps on VS2, and 45Mbps on VS3.

For step-by-step instructions, see Configure Network Bandwidth Throttling.

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ORPHAN FILES

Files that are in the destination directory, but not the source directory, are orphan files. You can choose to ignore, log, or delete such files that are identified in the destination path; these settings are configured in the Orphan Files tab of the Replication Set Properties.

By default, the Orphan File Processing is turned off and the orphan files are moved from the destination directory to another location and are available for restore. You can select the Show Deleted Items option in the browse screen to view and restore orphan files.

To configure Orphan File settings, see [Configure Orphan File Processing](#) for step-by-step instructions.

To view Orphan Files, see [View Orphan Files](#) for step-by-step instructions.

THINGS TO CONSIDER

- A file that is created on the source and is then deleted before it has been replicated, will still be created on the destination and then deleted. This is because both the creation and deletion of the file are captured in the log file, and this will be replayed on the destination computer. These are not treated as Orphan Files.
- A renamed file will be replicated to the destination as a new file. The previous copy with the old name will remain on the destination and be treated according to your Orphan Files settings.
- If you change the orphan file settings for an existing Replication Set, the change will only affect Replication Pairs that are created after the change, or Replication Pairs that are aborted and restarted. Currently active Replication Pairs will not be affected by the change until they are aborted and restarted.
- It is strongly recommended that you do not replicate to the root of the destination filer or the filer volume. If for any reason you need to replicate to the root of the volume then ensure that the Orphan File Processing is turned off from the Replication Set Properties.
- Orphan file processing may sometime fail to process encrypted files and folders and these files and folders may still be available on the destination computer.

See [Restore Deleted Items](#) to restore Orphan Files.

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FAN-IN RECOVERY POINTS

Fan-In Recovery Points consist of snapshots of a Destination Path, created to preserve a point-in-time data on the destination computer in a Fan-In configuration. Snapshot-based Recovery Points can be created, and backed up, affording additional data protection options for recovery of your data. In addition, Recovery Points can be mounted, and for Windows can also be shared, and thus made available to users on the network.

Recovery Points consist of snapshots created on the destination computer by the specified snapshot engine, without any reference to the state of the source computer. It simply represents a point-in-time on the destination computer, and is thus more useful for file system data than for application data. To use Recovery Points, see the following for step-by-step procedures:

- [Create a Recovery Point in a Fan-In Configuration](#)
- [Delete a Fan-In Recovery Point](#)

BACKUPS OF RECOVERY POINTS

Recovery Points can be configured to be backed up automatically when they are created. In addition, you can select any existing Recovery Point and perform an immediate full backup on-demand. This backup capability is only available if the source and destination computers have the appropriate File System *iDataAgent* installed. For more information about installing, configuring, and using File System *iDataAgents*, see [Windows File System](#).

The following types of backups are supported:

- Full
- Differential
- Incremental
- Synthetic Full

See the following for step-by-step procedures:

- [Configure CDR for Backups of Recovery Points in a Fan-In Configuration](#)
- [Back up a Recovery Point](#)

DELETING RECOVERY POINTS

When the maximum number of Recovery Points is reached, based on the maximum number you specified, or based on the maximum number of recovery points allowed by the system, they are automatically deleted by the system in the order they were created (oldest first) unless one of the Recovery Points to be deleted is in use.

Recovery Points can also be deleted manually. For step-by-step procedures, see [Delete a Fan-In Recovery Point](#).

PRE/POST COMMANDS FOR RECOVERY POINTS

You can specify commands to run either before a Recovery Point is created and/or after a Recovery Point is created. For general information about Pre/Post commands, see [Pre/Post Processes](#).

See the following for step-by-step procedures for Pre/Post Processes:

- [Configure a Replication Set for Pre/Post Processes for Recovery Point Creation](#)
 - [Change Account for Executing Pre/Post Commands \(Recovery Points\)](#)
-

FAN-IN BACKUP SET

The default backup set can be used to backup fan-in data for the Workstation Backup Agent. This capability is available if the destination computer has Windows File System /DataAgent installed.

When using file system subclients in default backup set for SnapProtect operations or backing up fan-in data, snapshots of the data are registered as archive files and are used for various data protection and recovery operations. Since the system volume information is critical for the Workstation backup data, ensure that the System Volume Information is included in the subclient content. Ensure that the system volume information is not excluded from the subclient content due to filters.

BEST PRACTICES

It is recommended that you keep the following in mind when performing data replication:

- **Destination volume size:** ensure that the destination volume has sufficient space for all the data that will be replicated to it. If you are replicating data from multiple source volumes to the same destination volume (Fan-In), ensure that the destination volume is sufficiently large for the data which will be replicated from all the source volumes. If you are creating Recovery Points, you must also account for the space requirements of the snapshots that will be created on the Destination.
 - **Individual failed files or folders** will not necessarily fail the replication job. Such individual failures may just be logged and the data replication job will continue. Check the logs periodically for such failures. See [View the Log Files of an Active Job](#).
 - **Replication performance on Windows** - to increase the speed at which data is replicated, the pipeline buffer size can be reconfigured from the default size of 64KB up to a maximum of 256KB (in increments of 32KB) using the `PipelineBufferSizeInKiloBytes` registry key. However, if the value of this key is set too high combined with a low kernel memory the operation may fail because the system lacks sufficient buffer space or because a queue was full.
 - For Windows, when communication is interrupted between the source and destination computers, the source computer will make 30 attempts (this default number can be changed using the `MaxConnectionAttempts` registry key) to reconnect to the pipeline, after which the Replication Pair(s) will show a state of Failed. Each connection attempt takes several minutes, an interval which is neither programmatic nor configurable.
 - For Windows, the virtual memory paging file (`pagefile.sys`) must be configured on a local, fixed disk.
 - For Windows, the `nDoNotReplicateACLs` registry key can be used to disable the replication of the security stream of files. This stream includes user and group access control list (ACL) settings for file access. If this registry key is not present, ACLs will be replicated.
-

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This feature/product/platform is deprecated in this release. See [Deprecated Features, Products, and Platforms](#) for more information.

[View Data Replication Monitor](#)

[View details of data replication activities](#)

[View the failed files for a Replication Pair](#)

[Filter which clients activities are displayed](#)

[Configure Network Bandwidth Throttling](#)

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[View Orphan Files](#)

Fan-In:

Configure Fan-In Recovery Points

Create a Recovery Point in a Fan-In Configuration

Delete a Fan-In Recovery Point

Configure CDR for Backups of Recovery Points in a Fan-In Configuration

Back up a Recovery Point

VIEW DATA REPLICATION MONITOR

Before you begin

- Review Monitor Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To view data replication monitor:

1. In the CommCell Browser, right-click the CDR icon, and select **All Tasks**, then select **Data Replication Monitor**.

In the Data Replication Monitor, all replication activities will be displayed for each Replication Pair. For more information about the States displayed, see Job States.

VIEW DETAILS OF DATA REPLICATION ACTIVITIES

Required Capability: Capabilities and Permitted Actions

▶ To view details of data replication activities for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Details**.
 2. The Pair Activity will be displayed with additional details about the job.
-

VIEW THE FAILED FILES FOR REPLICATION PAIR

Required Capability: Capabilities and Permitted Actions

▶ To view the failed files for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **View Failed Files**.
 2. If any failed files have been logged for this Replication Pair, they will be displayed.
-

FILTER WHICH CLIENTS ACTIVITIES ARE DISPLAYED

Required Capability: Capabilities and Permitted Actions

▶ To filter which clients' activities are displayed:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Filters**.
 2. In the Filter Operations dialog box, select from the following:
 - Select an existing filter from the **Filters** list. (You can click the **View Filter Details** button to see which clients each filter is configured to monitor.)
 - Click the **Create a New Filter** button. In the **Create a New Filter** dialog box, select the clients to be monitored and click **OK**.
 3. Click **Apply** and then click **Close**.
 4. The Data Replication Monitor will now show activities only for the Replication Pairs for the clients defined in your selected filter.
-

CONFIGURE NETWORK BANDWIDTH THROTTLING

Required Capability: Capabilities and Permitted Actions

▶ To configure throttling for replication activities:

1. In the CommCell Browser, right-click the agent icon of the source computer, and select **Properties**.
2. In the Operational Parameters tab of the Properties screen, specify any of the following:

- **Throttling Amount** - maximum network transfer rate in megabits per second (Mbps). The Utilization Percentage specified in the Edit Throttling Rule dialog will be a percentage of the number entered here.
- **Bandwidth Throttling Rules** - click **Add** to configure the following in the Edit Throttling Rule dialog:
 - Days of Week
 - Start time
 - End time
 - Utilization Percentage -- based on the specified Throttling Amount (see previous item)

3. Click **OK** to save your changes.

CONFIGURE ORPHAN FILE PROCESSING

Before You Begin

- Review Orphan Files

Required Capability: Capabilities and Permitted Actions

▶ To configure orphan file processing for a Replication Set:

1. From the CommCell Browser, right-click the Replication Set on a source computer, and select **Properties**.
 2. From the Replication Set Properties (Orphan Files) tab, perform the following selections:
 - Select the **Log orphan file names** option to identify and log the orphan files. Note that the orphan files are always logged whether this options is selected or not.
 - Select **Automatically deleted orphan files** to automatically log and delete all orphan files found on the destination. You will not be able to restore the deleted files.

Deselect the **Automatically deleted orphan files** option to move the orphan files from the destination directory to another location to be available for restore.
 3. Click **OK**.
-

VIEW ORPHAN FILES

Related Topics:

- Destination Configuration - Orphan Files

Required Capability: Capabilities and Permitted Actions

▶ To view the orphan files for a Replication Pair:

1. In the CommCell Browser, right-click the ContinuousDataReplicator icon on a source computer, and from **All Tasks**, select **Data Replication Monitor**.
 2. In the Data Replication Monitor, right-click a Replication Pair and select **View Orphan Files**.
-

CONFIGURE FAN-IN RECOVERY POINTS

Required Capability: Capabilities and Permitted Actions

▶ To configure ContinuousDataReplicator for Fan-in Recovery Points:

1. From the CommCell Browser, right-click a the ContinuousDataReplicator agent, and select **Properties**.
 2. From the Fan-in (Recovery Points) tab, select the **Enable Fan-In** option.
 3. Click **OK** to save your changes.
-

CREATE A RECOVERY POINT IN A FAN-IN CONFIGURATION

Before You Begin

- View How to Setup Fan-In Configuration.
- Configure creation of Fan-In Recovery Points. See Configure Fan-In Recovery Points for instructions.
- This procedure is only for Fan-In configurations.

Required Capability: See Capabilities and Permitted Actions

▶ To create a Recovery Point for a Fan-In configuration:

1. From the CommCell Browser, right-click the destination client, and select **Browse Destination Volumes**.
2. In the **Browse Destination Volumes** window, right-click a destination volume, and select **Create Recovery Point**.
3. From the Create Recovery Point dialog box, select whether to create the Recovery Point immediately or schedule it. See Scheduling for general information.
4. In addition, you can select the option of backing up Recovery Points. If you select this option, click **Enter Backup Details** to select the type of backup as well as any Advanced Options.
5. When you are finished, click **OK**.
6. If you opted to schedule Recovery Point creation, the **Schedule Details** dialog will appear. Specify the details for your schedule; click **Options** for additional choices. When you are satisfied, click **OK**.

DELETE A FAN-IN RECOVERY POINT

Before You Begin

- Review Using ContinuousDataReplicator in a Fan-In Configuration
- Deleting a Recovery Point will remove its corresponding snapshots as well as the Recovery Point Creation History.

Required Capability: See Capabilities and Permitted Actions

▶ To delete a Fan-In Recovery Point:

1. From the CommCell Browser, right-click **ContinuousDataReplicator** on the destination client, and select **Browse Destination Volumes**.
2. In the **Browse Destination Volumes** dialog box, right-click a Recovery Point, and select **Delete**.

CONFIGURE CDR FOR BACKUPS OF RECOVERY POINTS IN A FAN-IN CONFIGURATION

Before You Begin

- Review Using ContinuousDataReplicator in a Fan-In Configuration.

Required Capability: Capabilities and Permitted Actions

▶ To configure CDR for backups of Recovery Points in a Fan-In configuration:

1. From the CommCell Browser, right-click **ContinuousDataReplicator** on the destination client, and select **Properties**.
2. From the Fan-In tab, select **Back up Recovery Points**, and specify a Storage Policy for the destination machine.
3. Click **OK** to save your changes.



- To perform backups of a Recovery Point, see Back up a Recovery Point.
- If you change the Storage Policy, the next backup will be converted to a full.

BACK UP A RECOVERY POINT

Before You Begin

- Review Recovery Points - Backups of Recovery Points.
- Before you can perform backups of Recovery Points, you must first Configure CDR for Backups of Recovery Points.
- You can either configure a Replication Set so that its Recovery Points are backed up when they are created, or you can select an existing Recovery Point and back it up on-demand.

Required Capability: See Capabilities and Permitted Actions

▶ To configure Recovery Points to be backed up when they are created:

1. From the CommCell Browser, right-click a Replication Set, and select **Create Recovery Points**.
2. From the Create Recovery Point dialog box, make your selections for **Recovery Point Type** and **Job Initiation**, then select **Back up Recovery Point**.
3. Click **Enter Backup Details** to select the type of backup from the **Enter Backup Details** dialog box.

4. From the **Enter Backup Details** dialog box, click **Advanced** to display the **Advanced Backup Options** dialog box, from which you can select additional options for the backup operation.
 5. When you are finished, click **OK** to exit each of the dialog boxes.
- ▶ To perform a full backup of an existing Recovery Point on-demand:
1. From the CommCell Browser, right-click a Replication Set, and select **Browse Recovery Points**.
 2. From the **Recovery Points** dialog box, select a Recovery Point and click **Backup**.
 3. An immediate full backup is performed for each of the snapshots that comprise the selected Recovery Point; in addition, the next backup performed will be converted to a full backup.
-

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Backup Job History

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Overview

Items That Were Backed Up

Items That Failed

Pruning Backup History Information

Supported Features

Content Indexing History Information

OVERVIEW

You can view the backup and restore history of *iDataAgents*, *BackupSets/Instances*, and subclients.

The **Backup Job History Filter** dialog box allows you view detailed, historical information about backup jobs. Once you have chosen your filter options, they are displayed in the **Backup Job History** window.

For information on Job Details displayed in the Job History, see [Viewing Job Information](#).

From this window, you can right-click a backup job to:

- Browse the data backed up by the backup set or instance from the **Backup Job History** window. This is provided as right-click option for each job. (This menu option, when selected, initiates the **Browse Options** dialog box preset with the values needed to browse the data.)
 - Browse the snapshots created during SnapProtect backup
 - View items that failed during the backup job
 - View details of the backup job
 - View files that were not indexed during a backup job that performed content indexing
 - View associated media
 - View events of the backup job
 - View a list of items that were backed up
 - View a list of items that were moved to media for a SnapProtect backup job
 - View the log files of the backup job.
 - View the RMAN log of an Oracle backup job.
 - View the BRTools log of a SAP for Oracle job. You can view the BRTools log for only those jobs that were initiated from the CommCell Console.
-

ITEMS THAT WERE BACKED UP

The **View backup file list** option allows you to view a list of the files that were backed up during a backup job, along with the data sizes of each backed up file. The **View backed up messages** option allows you to view a list of messages that were backed up by using, along with the alias name, display name, email address, sender name, and recipient of each message.

From these windows you can conduct searches based on a particular string, allowing to find particular files quickly and easily.



It is not recommended that this option is used to view a very large list of items that were backed up (such as lists that total over 100,000 items). It is suggested that the Browse option is used to find a list of backed up items in such cases.

See [View the Items That Were Protected During a Data Protection Operation](#) for step-by-step instructions.

ITEMS THAT FAILED

The items that failed for a data protection operation include individual files that may fail the job even though a particular job completed successfully. You can determine the degree of success for these jobs using this window.

Filters can be used in conjunction with the "Items That Failed" list on the data protection Job History Report to eliminate backup or archive failures by excluding items which consistently fail that are not integral to the operation of the system or applications. Some items fail because they are locked by the operating system or application and cannot be opened at the time of the data protection operation. This often occurs with certain system-related files and database

application files.

Also, keep in mind that you will need to run a full backup after adding failed files to the filter in order to remove them.



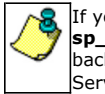
A listing of files and folders that failed is not available for the Quick Recovery Agent, or the Image Level and Image Level ProxyHost *iDataAgents*. These agents do not perform a file level backup/copy.

Certain application related files can never be backed up by the File System *iDataAgent* due to the nature of the data. For example, Microsoft SQL Server database files cannot be backed up by the File System *iDataAgent*. In this and other similar circumstances, consider entering files such as these as exclusions in the corresponding subclient filter.

See [View the Items That Failed For a Data Protection Operation](#) for step-by-step instructions.

PRUNING BACKUP HISTORY INFORMATION

You can prune backup history information based on the number of days established in the **Days to keep the backup job histories** option from the **Media Management Configuration (Service Configuration)** dialog box available in the **Control Panel**.



If you have installed the SQL Server *iDataAgent*, do not use the stored procedure **sp_delete_backuphistory**, **sp_delete_database_backuphistory** and **sp_delete_backup_and_restore_history** provided by Microsoft clean up backup history. By default backup history is automatically pruned from the CommServe database and the Microsoft SQL Server, as necessary.

SUPPORTED FEATURES

- NAS *iDataAgents* do not support the ability to view items that failed.
- The Image Level and Image Level ProxyHost *iDataAgents* do not support the ability to Browse the data of a selected backup job in Backup Job History.

CONTENT INDEXING HISTORY INFORMATION

Content Indexing history can also be viewed of *iDataAgents*, BackupSets/Instances, and subclients. The following information is displayed:

ITEMS THAT WERE SUCCESSFULLY CONTENT INDEXED

You can view the list of items that were successfully content indexed during a Content Indexing operation for a particular job. for step-by-step instructions, see [View the Items that Were Successfully Content Indexed](#).

CONTENT INDEXING FAILURES

Content Indexing failures allows you to look at the messages, files and documents that could not be indexed during a content indexing operation. Content Indexing looks at each file (of the supported data types) and indexes its contents allowing advanced searches of backed up/archived/migrated data.

Files that were not indexed, (perhaps because the file's content could not be read) are added to the Content Indexing Failures list, and are viewable from the View Content Index (Failed Items) option in the Job History window. For step-by-step instruction, see [View the Items that Failed to Content Index](#).

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Backup Job History - How To

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[View Backup Job History](#)

[View the Items That Were Protected During a Data Protection Operation](#)

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[View the Items that were Moved to Media during SnapProtect Backup](#)

[View the Log Files of a Job History](#)

View the Items that Were Not Indexed During Content Indexing

View the Items that Were Successfully Content Indexed

Resubmit a Backup Job

VIEW BACKUP JOB HISTORY

▶ To view backup history:

1. From the CommCell Browser, right-click the entity (client computer, iDataAgent, backup set or subclient) whose backup history you want to view, click **View**, and then click **View Backup History**.
 2. From the Backup History filter window select the filter options, if any, that you want to apply, and then click OK. The system displays the Backup Job History window.
 3. Click **OK**.
-

VIEW THE ITEMS THAT WERE PROTECTED DURING A DATA PROTECTION OPERATION



This option is available for File System-like agents.

Required Capability: none required

▶ To view the list of items that were protected during a data protection operation.

1. From the CommCell Browser, right-click the entity whose history of data protection operations you want to view, click **View**, and then click the necessary options to view a job history.
 2. From the Job History Filter dialog box, select the filter options, if any, that you want to apply, and then click **OK**.
 3. From the Job History window, right-click the operation whose list of protected items you want to view, and then select **View backup file list/View Backed Up Messages**. The **Backup file List** window displays a list of the backed up files/messages that were included in the backup job. You can use the **Search** option to find items in the window.
 4. Click **File -> Exit**.
 5. Click **Close** from the **Job History** window.
-

VIEW THE ITEMS THAT FAILED FOR A DATA PROTECTION OPERATION



A listing of files and folders that failed is not available for the Quick Recovery Agent, nor the Image Level and Image Level ProxyHost iDataAgents. These agents do not perform a file level backup/copy.

▶ To view the list of items that failed for a data protection operation:

1. From the CommCell Browser, right-click the entity whose history of data protection operations you want to view, click **View**, and then click to view a job history.
 2. From the Job History Filter dialog box, select the filter options, if any, that you want to apply, and then click **OK**.
 3. From the Job History window, right-click the operation whose list of failed items you want to view, and then select **View Failed Items**. The **Unsuccessful Backup Files** window (for DataArchiver Agents, **Items On Which Archive Failed**) displays those items that failed. If no items failed, a message to that effect is displayed.
 4. Click **Close**.
-

VIEW JOB HISTORY DETAILS

Required Capability: See Capabilities and Permitted Actions

▶ To view the details of a job history:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job history you want to view, click **View**, and then click job history.
2. From the Job History Filter dialog box, select the filter options that you want to apply and click **OK**.

3. From the Data Management Job History window, right-click the job whose job details you want to view, and then click **View Job Details**.
4. The Job Details dialog box appears, displaying detailed job history in General, Details, Phase Details and Attempts tabs for the selected job.
5. Click **OK**.



If viewing the details of a job with a pending or failed status, the **Reason for Job Delay** field will contain an Error Code, which, if clicked, will launch the customer support website displaying troubleshooting article(s) related to the specific issue.

VIEW THE MEDIA OR MOUNT PATHS OF A JOB HISTORY

▶ To view media or mount paths associated with a job history:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job history you want to view, click **View**, and then select the appropriate history.
2. From the Job History window select the filter options, if any, that you want to apply, and then click **OK**.
3. From the job history window, right-click the backup whose media or mount paths you want to view, and then click **View Media**.
4. The Media Used By Job ID window displays a list of media or mount paths used by the operation.
5. Click **OK**.

VIEW THE EVENTS OF A JOB HISTORY

Required Capability: See Capabilities and Permitted Actions

▶ To view the events associated with a job:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job history you want to view, click **View**, and then click **Job History**.
2. From the Job History Filter dialog box, select the filter options that you want to apply and click **OK**.
3. From the Data Management Job History window, right-click the job whose job details you want to view, and then click **View Events**.
4. The All Found Events window gets displayed. If no events were found for the backup, a message is displayed to that effect.
5. Click **Close**.

VIEW THE ITEMS THAT WERE MOVED TO MEDIA DURING SNAPPROTECT BACKUP



This option is available for the SnapProtect Backup.

▶ To view the list of items that were moved to tape during SnapProtect Backup.

1. From the CommCell Browser, right-click the entity whose history of data protection operations you want to view, click **View**, and then click the necessary options to view a job history.
2. From the Job History Filter dialog box, select the filter options, if any, that you want to apply, and then click **OK**.
3. From the Job History window, right-click the operation whose list of items moved to media you want to view, and then select **View Backup Copy file listing**. The **Backup file List** window displays a list of the backed up files that were included in the backup copy job. You can use the **Search** option to find items in the window.



- To view the files moved to media for a backup copy job, right-click the SnapProtect backup job corresponding to the Backup Copy job and select **View Backup Copy file listing**.
- View backup items will not display anything for a Backup Copy job.

4. Click **File -> Exit**.
5. Click **Close** from the **Job History** window.

VIEW THE LOG FILES OF A JOB HISTORY

Required Capability: See Capabilities and Permitted Actions

▶ To view the log files of a Job History:

1. From the CommCell Browser, right-click the entity whose job history you want to view, and then click to view a job history.
2. From the job history filter window select the filter options, if any, that you want to apply, and then click **OK**.
3. From the job history window, right-click the job whose log files you want to view, and then click **View Logs**.
4. The contents of the log file related to the selected job history are displayed in the **Log File for Job n** window.

VIEW THE ITEMS THAT WERE SUCCESSFULLY CONTENT INDEXED



This option is available for operations that performed content indexing.

▶ To view the list items that were not indexed during content indexing:

1. From the CommCell Browser, right-click the entity whose operations you want to view, click **View**, and then click the necessary options to view a job history.
2. From the Job History Filter dialog box, select the filter options, if any, that you want to apply, and then click **OK**.
3. From the Job History window, right-click the job for which you want to view the successfully content indexed items, select **View Content Index**, and click **Successful Items**.
4. Click **Close**.
5. Click **Close** from the **Job History** window.

VIEW THE ITEMS THAT FAILED TO CONTENT INDEX



This option is available for operations that performed content indexing.

▶ To view the list of items that failed to content index:

1. From the CommCell Browser, right-click the entity whose operations you want to view, click **View**, and then click the necessary options to view a job history.
2. From the Job History Filter dialog box, select the filter options, if any, that you want to apply, and then click **OK**.
3. From the Job History window, right-click the job for which you want to view the list of items failed to content index, select **View Content Index**, and click **Failed Items**.
4. Click **Close**.
5. Click **Close** from the **Job History** window.

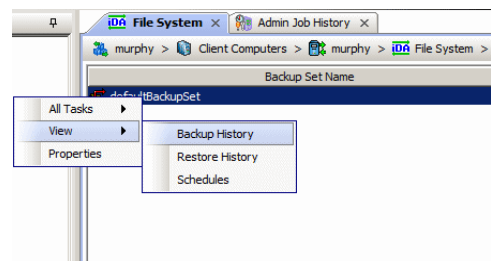
RESUBMIT A BACKUP JOB

▶ To resubmit a backup job:

1. From the CommCell Browser, right-click the subclient whose backup history you want to view, click **View**, and then click **View Backup History**.

Additionally, you can view the backup history for a client computer, iDataAgent, or backup set. However, the dialogs displayed may be different.

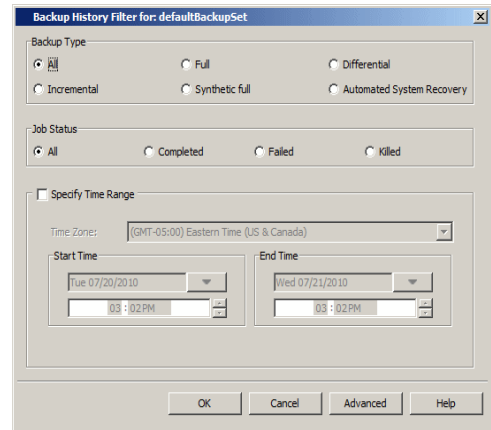
Note, if viewing the backup history for a client computer, right-click the computer name and select **Job History**.



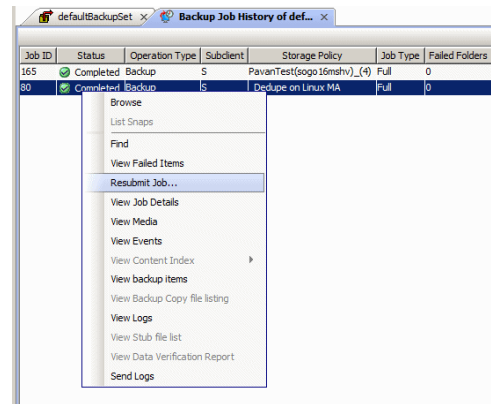
2. From the Backup History filter window select the filter options, if any, that you want to apply, and then click OK. The system displays the Backup Job History window.

Note: If viewing the job history for a client computer, ensure that the **Backup** radio button is selected.

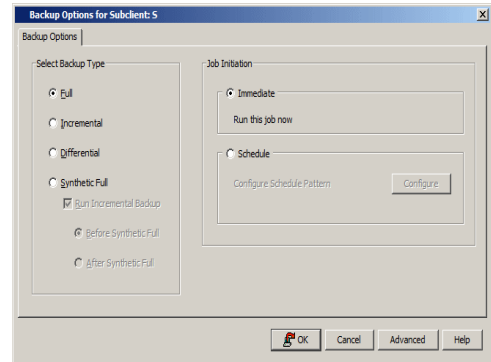
3. The Backup Job History window displays with the specified filter options.
4. Right-click on any job, and select **Resubmit Job**.



5. From the Backup Options dialog box, select the job options appropriate for the job you want to restart.

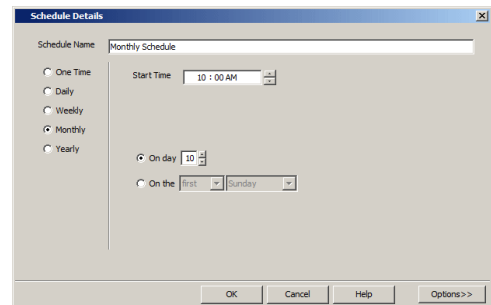


6. If you need to run the backup operation immediately, select **Immediate** from the **Job Initiation** tab. Go to step 11.
7. If you need to schedule the restore operation, select **Schedule** from the Job Initiation tab and click **Configure**.
8. From the **Schedule Details** dialog box that appears, select the appropriate scheduling options.



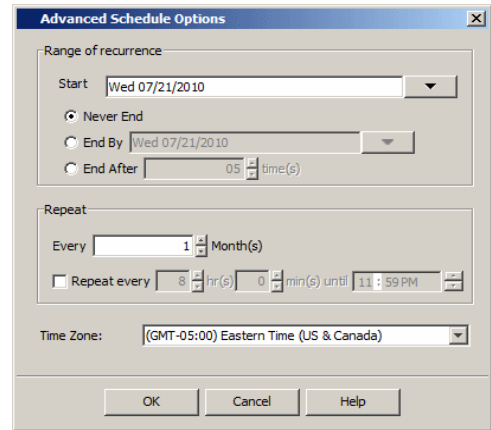
Click **Options** to view the Advanced Schedule Options dialog box.

9. From the **Advanced Schedule Options** dialog box:
 - **Range of recurrence:** Specify the date on which you want this schedule to take effect.



- **Repeat:** Select the value for which you want to run the job repeatedly on the day in which the job is scheduled to run.
- **Time Zone:** Select a specific time zone from which the job schedule time will be based.

Click **OK** to close the **Advanced Schedule Options** dialog box.



10. Click **OK** to close the **Schedule Details** window.
11. Click **OK** to close the job restart window.

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Restore Job History

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Overview

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OVERVIEW

The **Restore History Filter** dialog box allows you to view detailed, historical information about restore jobs.

For information on Job Details displayed in the Job History, see [Viewing Job Information](#).

Once you have chosen your filter options, they are displayed in the **Restore Job History** window. From this window you can right-click a restore job to:

- View Restore Items; items in the job that were **Successful**, **Failed**, **Skipped** or **All**. These items, if any, will be listed in the **Restored Files** window.
 - View Job Details of the restore job. The job details will be listed in the **Job Details** window.
 - View Events of the restore job. The job events will be listed in the **All Found Events** window.
 - View Log files of the restore job. The job log files will be listed in the **Log File** window.
 - View the RMAN Log of an Oracle restore job. The RMAN Log will be listed in the **Oracle Restore Log** window.
 - View the BRTools log of a SAP for Oracle restore job. You can view the BRTools log for only those jobs that were initiated from the CommCell Console.
-

ITEMS THAT ARE RESTORED

When viewing files that are restored in the **Restored Files** window, each of the files is listed with the restore status level appended at the end of the file path. The possible status levels are: `RESTORED`, `FAILED` and `OLDER`.

Successfully restored files will be listed with `RESTORED` appended to the file path. If files are not restored/recovered due to errors, the file paths will be appended with `FAILED`. Under some circumstances, the system may not restore/recover certain files because they are older versions of the same files already present in the files system; these files are appended with the word `OLDER`.

SUPPORTED FEATURES

Consider the following.

- NAS `iDataAgents` do not support the ability to view failed/successful item lists.
 - Restore Job History will not display Oracle `rman_util` jobs at the instance level.
-

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Restore History - How To

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[View Restore Job History](#)

[View the Events of a Job History](#)

[View the Media of a Job History](#)

[View the Log Files of a Job History](#)

VIEW RESTORE JOB HISTORY

▶ To view the restored items associated with a job:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job restore history you want to view, click **View**, and then click **Restore History**.

2. From the Job History filter window, select the filter options, if any, that you want to apply, and then click **OK**.
 3. From the Job History window, right-click the job whose restored items you want to view; click **View Restore Items**, and select from the type of items to view: **Successful**, **Failed**, **Skipped** or **All**.
 4. The **Restored Files** window will display the selected type of restored items for the job.
 5. Click **OK**.
-

VIEW THE EVENTS OF A JOB HISTORY

Required Capability: See Capabilities and Permitted Actions

▶ To view the events associated with a job:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job history you want to view, click **View**, and then click **Job History**.
 2. From the Job History Filter dialog box, select the filter options that you want to apply and click **OK**.
 3. From the Data Management Job History window, right-click the job whose job details you want to view, and then click **View Events**.
 4. The All Found Events window gets displayed. If no events were found for the back up, a message is displayed to that effect.
 5. Click **Close**.
-

VIEW THE MEDIA OR MOUNT PATHS OF A JOB HISTORY

▶ To view media or mount paths associated with a job history:

1. From the CommCell Browser, right-click the entity (e.g., subclient, client computer, etc.) whose job history you want to view, click **View**, and then select the appropriate history.
 2. From the Job History window select the filter options, if any, that you want to apply, and then click **OK**.
 3. From the job history window, right-click the backup whose media or mount paths you want to view, and then click **View Media**.
 4. The Media Used By Job ID window displays a list of media or mount paths used by the operation.
 5. Click **OK**.
-

VIEW THE LOG FILES OF A JOB HISTORY

Required Capability: See Capabilities and Permitted Actions

▶ To view the log files of a Job History:

1. From the CommCell Browser, right-click the entity whose job history you want to view, and then click to view a job history.
 2. From the job history filter window select the filter options, if any, that you want to apply, and then click **OK**.
 3. From the job history window, right-click the job whose log files you want to view, and then click **View Logs**.
 4. The contents of the log file related to the selected job history are displayed in the **Log File for Job n** window.
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Monitoring Data Replication

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Interruptions and Restarts

- Smart Re-Sync
- Full Re-Sync
- Changes that Interrupt Data Replication

System Behavior when Replication is Interrupted

Job States

Job Details

OVERVIEW

Replication is a continuous activity and details of on-going replication activity is shown in the Data Replication Monitor in the CommCell Console. See [View Data Replication Monitor](#) for step-by-step instructions.

From the Replication Monitor you can:

- View details of data replication activities. See [View details of data replication activities for step-by-step instructions](#).
- View the failed files for a Replication Pair. See [View the failed files for a Replication Pair for step-by-step instructions](#).
- Filter which clients activities are displayed. See [Filter which clients activities are displayed for step-by-step instructions](#).
- Send Log Files of Replication Pair. See [Send Log Files for step-by-step instructions](#).
- Start/Suspend/Resume/Abort data replication activity. See [Start/Suspend/Resume/Abort Data Replication Activity for step-by-step instructions](#).

All other job-based activity, such as Recovery Point creation, is reflected in the Job Controller. See [Controlling Jobs in Job Management](#) for comprehensive information.

JOB PHASES

CDR utilizes phases to perform three types of operations - initial data transfer or baselining, smart synchronization, and continuous data replication. The sequence of these phases is listed below along with details of CDR activities during each phase, and the consequence of an interruption, such as a temporary loss of connectivity:

JOB PHASE	ASSOCIATED ACTIVITY	COMMENTS
Baseline Scan	For Windows only, start NTFS journaling on the source to track any file operations that occur during the entire Baseline phase. Scan source path to obtain the number of files and bytes to transfer. Generate Collect File.	The Replication Pair will show a Job State of Preparing for Replication in the Data Replication Monitor. If this phase is interrupted: <ul style="list-style-type: none"> • For Windows, it can resume again at the same point. • For Unix, it will start over. A Full Re-Sync will start at this phase.
Baseline (For Windows)	Calculates checksum on the source and destination to identify files that will be sent to the destination. Data is transferred from the Replication Pair source path to the destination path using the checksum.	If this phase is interrupted, it can resume again at the same point.
SmartSync Scan	Create a non-persistent snapshot; for Windows, compare it to the change journal. Scan snapshot and generate a new Collect File for any files or directories that were <i>added</i> or data that was <i>modified</i> since the beginning of the Baseline Scan phase.	For Windows: <ul style="list-style-type: none"> • During the SmartSync Scan phase, CDR requires a short period of no disk activity on the source to begin monitoring the source path, and if there is significant I/O on the source, this can fail, although CDR will continue making successive attempts to find a short period of inactivity. When you have multiple, active Replication Pairs on the same source computer, CDR requires this short period of no disk activity for

		<p><i>all</i> of them, even for Replication Pairs that use different drives as their source. For example, if you have a Replication Pair on the Client which is already replicating, using <code>F:\</code> as its source, and you create a new Replication Pair on the same Client using <code>G:\</code> as its source, too much I/O on <code>F:\</code> can cause CDR to fail to begin monitoring <code>G:\</code>.</p> <p>For Unix:</p> <ul style="list-style-type: none"> To create the non-persistent snapshot on the source, CDR requires a short period of time, during which no files are deleted, created, or renamed. (File writes will not affect the snapshot.) If one of these three operations occurs while the snapshot is being taken, the process of creating the snapshot will begin again. <p>If this phase is interrupted:</p> <ul style="list-style-type: none"> For Windows, it can resume again at the same point For Unix, it will start over <p>A Smart Re-Sync will start at this phase.</p>
Processing Orphan Files	Compare the Collect File to the Destination to identify orphan files, and apply orphan file settings.	<p>Any data that was <i>deleted</i> on the replication source during the Baselining phases are treated according to your settings for Orphan Files.</p> <p>If this phase is interrupted:</p> <ul style="list-style-type: none"> For Windows, it will resume again from the beginning of this phase; however, if the snapshot is no longer available, it will return to the SmartSync Scan phase. For Unix, it will return to the SmartSync Scan phase.
Checksum Calculation (On Windows only)	Calculate checksums on the source and destination to identify files that have changed since Baseline Scan.	If this phase is interrupted, it will resume again from the beginning of this phase; however, if the snapshot is no longer available, it will return to the SmartSync Scan phase.
SmartSync	Transfer all changed files to destination from the new Collect File.	<p>If this phase is interrupted:</p> <ul style="list-style-type: none"> For Windows, it will resume again from the beginning of this phase; however, if the snapshot is no longer available, it will return to the SmartSync Scan phase. For Unix, it will return to the SmartSync Scan phase.
Updating Smart Sync (On Windows only)	Compare time stamps on source and destination and update. Temporary snapshot is deleted.	If this phase is interrupted, it will resume again from the beginning of this phase.
Replication	Data is continuously replicated from the source to destination.	<p>Log Transfer & Log Replay activity is on-going. For more information, refer to Replication Logs.</p> <p>The Replication Pair will show a Job State of Replicating in the Data Replication Monitor.</p> <p>If the Replication phase is interrupted, when restarted, if it is possible, replication will begin again from the last log replayed on the destination; if this is not possible, the Replication Pair will return to the Baseline Scan phase (Full Re-Sync) or to the SmartSync Scan phase (a Smart Re-Sync) depending on the nature and duration of the interruption. Note that if a user manually restarts Replication by choosing Start Full Resync, the Replication Pair will return to the Baseline Scan phase.</p>



For the SmartSync Scan, while *new* files and directories will be copied in their entirety, *modified* files do not need to be copied. Thus, for larger files, only the modified portion is re-copied, while smaller files with substantial changes may be copied in their entirety. Modified files below a certain size threshold are copied again as complete files, while files above that size are broken into blocks with just the changed blocks copied to the destination computer.

Files smaller than 256KB will be copied in their entirety whether they match the destination or not. For files above 256KB in size, only the changed blocks will be transferred; the default block size for hashing is 64KB. The default values of the minimum file size and the block size for hashing, can be configured in Replication Set Properties. See Create a Replication Set for step-by-step instruction.

INTERRUPTIONS AND RESTARTS

By default, CDR handles interruptions by seamlessly restarting replication, but if that is not possible, Smart Re-Sync will be started. However, some interruptions will require a Full Re-Sync. The following sections describes each phase and restart behavior when the phase is interrupted:

SMART RE-SYNC

Smart Re-Sync is the default behavior of CDR when activities are interrupted and cannot be seamlessly restarted at the same point again. In general, CDR endeavors to do the following in such cases, wherever possible:

- continue logging on the source
- continue replaying logs on the destination which were received before the interruption
- restart activities exactly where they were interrupted, or as close to that point as possible

For examples of common types of interruptions, and how Smart Re-Sync handles the recovery, refer to System Behavior when Replication is Interrupted.

For a detailed listing of each phase, and the specifics of the exact point at which Smart Re-Sync restarts activities, refer to Job Phases.

FULL RE-SYNC

Full Re-Sync should be necessary only in cases such as the following:

- the data on the destination is altered by means outside of the replication process, e.g., manually deleted or modified, etc.
- an interruption is of long enough duration that the logs overflow on the source

In such a case, all existing content in the destination path is considered inconsistent and Full Re-Sync is recommended to rebuild it again based on the current data in the specified source path. When you start replication from the Replication Set or Replication Pair level, you can specify Full Re-Sync, causing the Replication Pair to begin at the Baseline Scan phase.

Data Replication will be interrupted if a hard disk used for either a source or destination is put into the 'standby' state through the power schema configuration. It will be necessary to abort activity for all affected Replication Sets and restart them again using **Start Full Resync** after such an event.

CHANGES THAT INTERRUPT DATA REPLICATION

Changes to the following configuration items will not be effective until data replication activity has been interrupted and restarted:

- **Job Results Directory** in Client Computer Properties (Job Configuration) - any Replication Pairs in the Replicating state must be aborted and restarted.
- **Impersonate User** in Client Computer Properties (Job Configuration) on a Destination computer - restart destination computer. (This applies on Windows only.)
- **Automatically delete Orphan Files** in Replication Set Properties (Orphan Files) - any Replication Pairs in the Replicating state must be aborted and restarted.
- **Exclude these Files/Folders/Patterns** for content in Replication Set Properties (Filters) - any Replication Pairs will be aborted and restarted by the system.

The following will require data replication to be interrupted and restarted:

- On Windows, if `chkdsk` is run on a hard disk used for either a source or destination, the affected Replication Pairs in the Replicating state must be aborted and restarted using Smart Re-Sync.
- By default, CDR will always replicate only the new or updated data in the source path. If data is deleted on the destination, since there has been no change on the source, that data will not be replicated again, unless you abort the Replication Pair and perform the following to recopy the data from the source to the destination again:
 - On Windows, perform a Full Re-Sync.
 - On UNIX, perform a Smart Re-Sync.

SYSTEM BEHAVIOR WHEN REPLICATION IS INTERRUPTED

There are several ways in which data replication activity can be interrupted, and CDR recovers from each of them in a similar manner. The table below provides a listing of common causes of interruption, and the effect of them on Baselining, SmartSync, and data replication, as well as how CDR recovers from them.

INTERRUPTION	EFFECT OF INTERRUPTION & SMART RE-SYNC
Abort a Replication Pair during Baselining phases	Baselining activities stop on the source. When the Replication Pair is restarted, Baselining activities will resume, restarting at the beginning of the phase if necessary, then SmartSync and data replication activities will begin automatically.
Abort a Replication Pair during SmartSync phases	Logging stops on the source. When the Replication Pair is restarted, SmartSync activities will resume, restarting at the beginning of a phase if necessary, and data replication activities will begin automatically.
Abort a Replication Pair during Replication phase	Logging stops on the source. When the Replication Pair is restarted, for NTFS or UNIX, Smart Re-Sync will continue the data replication activities automatically; for FAT file systems, Full Re-Sync will be necessary.
Suspend a Replication Set	Baselining, SmartSync, and data replication activities stop for all Replication Pairs, but any logging activities will continue on the source.

	<p>When the Replication Set is resumed:</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type.
Graceful or non-graceful shutdown of the source computer	<p>The destination computer continues to replay the logs it has received.</p> <p>When the source computer and software are running again, Replication Pair(s) will be in the System Aborted state for some time, then Smart Re-Sync will be performed.</p>
Graceful or non-graceful shutdown of the destination computer	<p>Logging continues on the source.</p> <p>When the destination computer and software are running again:</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type.
CDR software shutdown on the source	<p>All CDR-related activities stop.</p> <p>When the software is restarted, CDR will start Smart Re-Sync.</p>
CDR software shutdown on the destination	<p>Logging continues on the source.</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type.
Replication Service is stopped on the source	<p>Baselining, SmartSync, and data replication activities stop for all Replication Pairs, but logging continues on the source, and the destination computer continues to replay the logs it had received before the service was stopped.</p> <p>When the Replication Service is started again:</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type.
Replication Service is suspended on the destination	<p>Baselining, SmartSync, and data replication activities stop for all Replication Pairs, and log replay stops on the destination, but logging continues on the source.</p> <p>When the Replication Service is started again:</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type.
Interruption of network connectivity (source and/or destination)	<p>Baselining, SmartSync, and data replication activities stop for all Replication Pairs, but logging continues on the source, and the destination computer continues to replay the logs it had received before the network connectivity was interrupted.</p> <p>When network connectivity is restored:</p> <ul style="list-style-type: none"> For any Replication Pairs that were performing data replication, CDR will transfer the accumulated logs to the destination, and data replication will continue. For Replication Pairs that were in the Baselining or SmartSync phases, how activities begin again will depend on the exact phase the Replication Pairs were in, as well as the operating system type. <p>If the network interruption is for a significant amount of time, the following will occur:</p> <ul style="list-style-type: none"> On Windows, the status of the Replication Pair will become Failed, and will need to be restarted manually with Smart Re-Sync when connectivity is restored. On UNIX, CDR will continue to retry sending the logs to the destination computer until network connectivity is restored.
<p>Source computer runs out of log space (Windows)</p> <p>-- or --</p> <p>Source computer tries to create new entries in a log before the old entries have been transferred to the destination (UNIX)</p>	<p>Logging will stop, all logs will be deleted, all Replication Pairs will be System Aborted.</p> <ul style="list-style-type: none"> On Windows, the system will wait 3 minutes, then check space on the log volume. If there is sufficient space, a Smart Re-Sync will occur; if not, the Replication Pair will be Aborted. On UNIX, a Smart Re-Sync will occur.

For instructions on restarting replication after it has been interrupted, see Start/Suspend/Resume/Abort Data Replication Activity.

JOB STATES

The Data Replication Monitor shows the state of each Replication Pair. These states are briefly described:

New Pair	The Replication Pair has been created, but no activity has taken place yet.
Preparing for Replication	CDR is scanning the source paths, preparing for initial transfer or Full Re-Sync.
Baseline	For detailed information, see Baseline.

Initial Sync	For detailed information, see Baseline Scan.
SmartSync Scan	For detailed information, see SmartSync Scan.
SmartSync	For detailed information, see SmartSync.
Processing	For detailed information, see Processing Orphan Files.
Replicating	Data is being continuously replicated.
Replicating (Not verifiable)	The most recent communication between the CommServe and CDR Client indicated the job was in the Replicating state, but this cannot be verified because communication has been interrupted.
Suspended	Replication activity has been temporarily halted, either by a user, or because communication between the source and destination has been interrupted. Logs continue to be written on the source.
Pending	There has been a temporary interruption and CDR is attempting to reconnect and resume operations.
Failed	Phase failed to complete, or log transfer has stopped, perhaps for connectivity issues; logs continue to be written on the source.
Paused	CDR is trying to resume replication activity.
Stopped	Replication activity has been halted by one of the following: <ul style="list-style-type: none"> the Replication Log is inaccessible to be read from on the destination computer the system, because communication between the source and destination has been interrupted and cannot be successfully resumed by the system the system, because the replication destination has run out of space a source or destination throttling condition has not been cleared; if the condition is on a source computer, the job will be System Aborted at first, and if on a destination computer, the job will be Paused at first
System Aborted	For CDR on Windows only, a Replication Pair will be in this state for 3 minutes if the source disk hosting replication logs runs out of space, after which the system will attempt to restart.

To see more information about a particular Replication Pair, see [View details of data replication activities](#).

You can change the state of a Replication Pair, or several at the same time. See [Change the State of Replication Pair](#).

CONSIDERATIONS

- The status of all Replication Pairs is not immediately updated when one Replication Pair is resumed. For instance, when all Replication Pairs had been placed in the Paused state, and you Resume one of them, a prompt will ask if you want all Pairs to be resumed. If you choose to do so, all the Replication Pairs that were placed in the Paused state will Resume, and be placed back in the same state they were in previously. However, the CommCell Console will not immediately reflect the status of all the other Replication Pairs that were resumed, and they may still be shown in the Paused state. The CommCell Console will properly synchronize and display the correct state of the Replication Pairs within a few minutes.
 - During SmartSync of application data, Data Replication Monitor may display more than the actual number of files transferred.
-

JOB DETAILS

The following information is available in the Data Replication Monitor:

Active	When the symbol is green, it indicates recent activity for the Replication Pair; an orange symbol indicates no recent activity. An exclamation point preceding the symbol indicates that some files are not copied successfully to the destination computer during replication. To see failed files for a replication pair, see View the failed files for a Replication Pair for step-by-step instructions.
Phase	The current phase of the job; for more detailed information see Job Phases .

GENERAL

Job ID	A unique number allocated by the Job Manager for the operation.
State	The current state of the Replication Pair; for more detailed information see Job States .
Last Update Time	The date and time of the CommServe when the Job Manager last updated the Data Replication Monitor.
Pair Abort Reason	For a Replication Pair that was aborted, the reason is listed.
Last Error	The most recent error message for this Replication Pair.
INITIAL SYNC INFORMATION	
Start Time	The date and time of the CommServe when data replication activity began for the Replication Pair.
Number of Files To Be Transferred	The files remaining to be transferred for the Replication Log file currently being replayed on the destination.
Number of Files Already Transferred	The files transferred for the Replication Log file currently being replayed on the destination.
Data To Be Transferred during Initial Sync On Source	The aggregate size of all files to be transferred between the source and destination for the Replication Pair. The actual data transferred may differ slightly from this number, based on whether a given file actually gets transferred in full or in part.
Data Transferred during Initial Sync On Destination	The sum of all data already transferred between the source and destination for the Replication Pair.
Throughput Unit	The rate of data transfer during Baseline phase, in GB/hour.
Progress	The percentage of files transferred for the Replication Log file currently being replayed on the destination.

REPLICATING STATE INFORMATION

Last Log Played Time	The date and time of the CommServe when the most recent Replication Log was played on the destination computer.
Replicated Data	The sum of all data transferred between the source and destination machines since the Start Time.
Attempts	The number of attempts at replication the system has made for the Replication Pair.
Latest Source Log	The number of the most recent Replication Log that was created on the source computer.
Latest Destination Log	The number of the most recent Replication Log that was replayed on the destination computer. If this number is lower than the Latest Source Log number, it indicates that the destination computer has not yet replayed all of the Replication Logs that have been created on the source computer.

CONFIGURATION

Pair ID	A unique number allocated by the Job Manager that identifies the Replication Pair.
Source Path	The path on the source computer for the Replication Pair.
Destination Path	The path on the destination computer for the Replication Pair.
Replication Set	The name of the Replication Set.
Replication Type	The type of replication configured for the Replication Set. (See Data Replication Type.)
Client	The CDR Client that is the source computer for the Replication Pair.
Destination Host	The CDR Client that is the destination computer for the Replication Pair.

ATTEMPTS

The following information is available in the Attempts window:

Phase	The phase that the Replication Pair was in at the time of the attempted activity.
State	Current state of the Replication Pair.
Start Time	The date and time of the CommServe when the attempted activity began for the Replication Pair.
End Time	The date and time of the CommServe when the attempted activity ended for the Replication Pair.
Elapsed Time	The amount of time that elapsed while the activity was being attempted for the Replication Pair.
Files to Transfer	Files to be transferred to the destination computer for the Replication Pair, based on the initial scan.
Files Transferred	Files already transferred to the destination computer for the Replication Pair.
Data Transferred	The sum of all data already transferred between the source and destination during the attempted activity.
Data to Transfer	The aggregate size of all files to be transferred between the source and destination for the Replication Pair. The actual data transferred may differ slightly from this number, based on whether a given file actually gets transferred in full or in part.

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VIEW DATA REPLICATION MONITOR

Before you begin

- Review Monitor Data Replication

Required Capability: Capabilities and Permitted Actions

 To view data replication monitor:

1. In the CommCell Browser, right-click the CDR icon, and select **All Tasks**, then select **Data Replication Monitor**.

In the Data Replication Monitor, all replication activities will be displayed for each Replication Pair. For more information about the States displayed, see Job States.

VIEW DETAILS OF DATA REPLICATION ACTIVITIES

Required Capability: Capabilities and Permitted Actions

▶ To view details of data replication activities for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Details**.
 2. The Pair Activity will be displayed with additional details about the job.
-

VIEW THE FAILED FILES FOR REPLICATION PAIR

Required Capability: Capabilities and Permitted Actions

▶ To view the failed files for a Replication Pair:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **View Failed Files**.
 2. If any failed files have been logged for this Replication Pair, they will be displayed.
-

FILTER WHICH CLIENTS ACTIVITIES ARE DISPLAYED

Required Capability: Capabilities and Permitted Actions

▶ To filter which clients' activities are displayed:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Filters**.
 2. In the Filter Operations dialog box, select from the following:
 - Select an existing filter from the **Filters** list. (You can click the **View Filter Details** button to see which clients each filter is configured to monitor.)
 - Click the **Create a New Filter** button. In the **Create a New Filter** dialog box, select the clients to be monitored and click **OK**.
 3. Click **Apply** and then click **Close**.
 4. The Data Replication Monitor will now show activities only for the Replication Pairs for the clients defined in your selected filter.
-

SEND LOG FILES

Required Capability: See Capabilities and Permitted Actions

▶ To send log files:

1. In the Data Replication Monitor, right-click any Replication Pair, and select **Send Logs**. The **Send Log Files** window is displayed.
2. From the **General** tab, provide the following information:
 - one or more recipient email addresses (multiple email addresses separated by a comma)
 - a **Subject (Ticket Number)**
 - a **Problem Description**
3. From the **Computers** tab, select the following options, if desired:
 - **Job ID** if you are sending the log files of a specific job.
 - **App ID** if you are sending the log files of a specific replication pair.
 - If you wish to send the log files to specific computer(s), you can select and move the appropriate client computers from the **Available Computers** list to the **Selected Computers** list.
4. From the **CommCell Information** tab, select the following options, if desired:
 - **CommServe** if you wish to include the CommServe database log files.
 - **SRM Database** if you wish to include the SRM database log files.
 - **Database logs** if you wish to include the error logs for the CommServe Database Engine.
5. From the **Time Range** tab, select the **Time** check box if you wish to include a specific number of hours or days to be included in the log files prior to the current time or date.

Then, select the **Select Date/Time** option if you wish to choose a specific range of dates to be included in the log files. You may also select the time zone that corresponds to the dates and times selected.

6. From the **Machine Information** tab, select the log information you wish to include, if any.
7. From the **Output** tab, select the following options:
 - o If you wish to upload the log files to an existing FTP and/or HTTP location, select the **Upload to FTP Location** and/or **Upload to HTTP Location** check box.
 - o Click the **Proxy Settings** button. This opens the Proxy Setting dialog box. Specify Proxy Location and Proxy Port number.
 - o If you wish to send the log file information immediately, select the **Email to Recipients** box. Type the address of the recipient(s) who are to receive the log file information.

To send log files to multiple recipients, select the desired recipients in the **Available Users** field. You can then add or remove the desired recipients from the **Users to be Notified** using the appropriate arrow buttons. Note that log files can be configured to be sent via e-mail to user groups created from within the CommCell Console as well as external domain user groups.
 - o To save the log files to a specific directory on the CommServe disk, select the **Save to Folder** check box. You can either type or browse the CommServe local path.
8. Click **Ok**.

START/SUSPEND/RESUME/ABORT DATA REPLICATION ACTIVITY FOR A REPLICATION PAIR

Before You Begin

- Review Monitoring Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To Start/Suspend/Resume/Abort a Replication Pair:

- In the CommCell Browser, right-click a Replication Pair, and select **Start**, **Start Full Resync**, **Suspend**, **Resume**, or **Abort**.



From the Replication Pair level, you cannot Suspend a Replication Pair that is in the Replicating state; instead, do this from the Replication Set level. See, Suspend Data Replication Activity from the Replication Set for step-by-step instructions.

SUSPEND DATA REPLICATION ACTIVITY FROM THE REPLICATION SET

Before You Begin

- Review Monitoring Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To suspend all data replication activity from the Replication Set level:

1. In the CommCell Browser, right-click a **Replication Set** in the source machine, and select **All Tasks**, then select **Suspend Data Transfer**.
2. For Windows, if you **Suspend Data Transfer** for one Replication set, you will be prompted with a list of Replication Set that have the same destination.

If you click **Yes** all Replication Pairs on that source computer which use the same destination computer will be placed in the Paused state, even those that are in different Replication Sets.

For UNIX, data replication activities are suspended for all Replication Pairs in the Replication Set.

RESUME DATA REPLICATION ACTIVITY FROM THE REPLICATION SET

Before You Begin

- Review Monitoring Data Replication

Required Capability: Capabilities and Permitted Actions

▶ To resume all data replication activity from the Replication Set level:

1. In the CommCell Browser, right-click a **Replication Set** in the source machine, and select **All Tasks**, then select **Resume Data Transfer**.
2. For Windows, you will be prompted with a list of Replication Set that have the same destination.

Click **Yes** to resume all Replication Pairs between this source and destination - including the replication pairs in other replication sets.

Click **No** to resume only the Replication Pairs in this replication set.

For UNIX, data replication activities are resumed for all Replication Pairs in the Replication Set.

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