Dell Compellent Storage Center with CommVault Simpana 9.0

Best Practices

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General syntax

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Conventions

Notes are used to convey special information or instructions.

Timesavers are tips specifically designed to save time or reduce the number of steps.

Caution indicates the potential for risk including system or data damage.

Warning indicates that failure to follow directions could result in bodily harm.
Preface

Audience
The audience for this document is system administrators who are responsible for the setup and maintenance of CommVault Simpana 9.0 software running on Windows Server 2008 R2 used to backup Dell Compellent Storage Center. Readers should have a working knowledge of CommVault Simpana 9.0, Windows Server 2008 R2 and the Dell Compellent Storage Center.

Purpose
This document provides an overview of CommVault Simpana 9.0 and introduces best practice guidelines for configuring CommVault on Windows Server 2008 R2 using SnapProtect to backup Dell Compellent Storage Center volumes. For installation procedures, please refer to documentation from CommVault’s website.

Customer Support
Dell Compellent provides live support at 1-866-EZSTORE (866.397.8673) 24 hours a day, 7 days a week, 365 days a year. For additional support, email Dell Compellent at support@compellent.com. Dell Compellent responds to emails during normal business hours.
Introduction

Introduction to CommVault Simpana 9.0
CommVault Simpana 9.0 offers scalable data protection via snapshot, replication and persistent copies that are secure and deduplicated. Offering seamless integration with Dell Compellent Storage Center, data can be protected and managed through a single, unified platform.

Dell Compellent Storage Center Integration with CommVault Simpana 9.0

Simpana 9.0 Service Pack 3b or later must be installed in order for Dell Compellent to be listed as a Snap Vendor in Array Management.

CommVault Component Reference

All installed components of CommVault must be at the same service pack level.

CommCell
A CommCell is the basic organizational unit of a data management system. A CommCell contains one CommServe StorageManager, at least one client, and at least one MediaAgent.

CommServe
The CommServe communicates with all clients and MediaAgents and coordinates all operations such as backups, restores, copies, media management, etc. within a CommCell. There is only one CommServe per CommCell. Typically, the CommServe GUI is installed on the CommServe.

MediaAgent
A MediaAgent manages the transmission of data between clients and backup media and manages the data stored in the media.

A MediaAgent installation is required to backup a server. To create SnapProtect backups of ESX Virtual machines, a MediaAgent and Virtual Server iDataAgent must be installed on the same server.

Virtual Server Agent
A Virtual Server Agent backs up a complete image of each virtual machine.

For minimal load on host resources, it is strongly recommended the Virtual Server Agent be installed on a proxy server that can communicate with the Virtual Center or ESX server being backed up. The proxy server can be a virtual machine on the Virtual Center or ESX server if sufficient resources are available on the host.

A single instance of a Virtual Server Agent can support about 30-40 TB of network load when backing up Virtual Machines. Depending on the amount and size of Virtual Machines in the environment, a second Virtual Server Agent may need to be installed on a separate proxy server.
Windows File System iDataAgent
This agent performs the backup and restore of the clients’ data.

The Windows File System iDataAgent must be installed with a MediaAgent in order to create SnapProtect backups of a Windows file server, SQL server or Exchange server.

The Windows File System iDataAgent does not need to be installed to create backups of Windows virtual machines on an ESX server. This process is handled by the Virtual Server Agent.

The CommVault VSS Provider must be installed to create Windows file system backups.

Storage Policy
A logical entity through which data from a subclient is backed up. A storage policy consists of one or more copies which associate data with particular physical media. Within the storage policy options such as deduplication and backup location can be set.
Adding a Storage Center to Array Management

Prior to using SnapProtect to take hardware-based snapshot of a Dell Compellent volume, a Storage Center must be added in Array Management.

Open the CommCell Console GUI.

From the Tools menu, choose Control Panel.

![Figure 1: Tools menu](image1.png)

The Control Panel will appear as shown in Figure 2.

![Figure 2: CommCell Console Control Panel](image2.png)
Double-click **Array Management**.

![Array Management window](image)

**Figure 3**: Array Management window

Click **Add**.

![Adding a Storage Array](image)

**Figure 4**: Adding a Storage Array

Click the drop down arrow for **Snap Vendor** and select **Dell Compellent**. In the **Name** field enter the name of the Storage Center (i.e. SC520). In the **Control Host** field enter the **IP Address** of the Storage Center.

When entering the Array IP, always use the Storage Center Management IP address. This IP address can be found within the web enable Storage Center Properties.

In the **User Name** field enter the name of a user that has administrator access to the Storage Center.

In the **Password** field enter the user’s password.

In the **Confirm Password** field re-type the user’s password.
The User Name and Password are case-sensitive.

In the **Device Group** field enter “none”.
Leave the **Use devices only from this device group** box unchecked.
Leave the **Description** box blank.

**Figure 5:** Array setup example

Click **OK**.

**Figure 6:** Storage Center Listing

To use this CommVault instance to backup volumes on more than one Storage Center, all applicable Storage Centers must be added in Array Management.

If, during backup operations an error displays stating “**___ is not a Compellent device***”, it means the Array Management entries are not correct.
Configuring a Storage Policy to Use SnapProtect

In order to use SnapProtect to create hardware-based snapshot backups, a Snapshot copy of an existing Storage Policy must be created.

Within the CommCell Browser, expand Policies then expand Storage Policies. Right-click on the Storage Policy to use for SnapProtect backups, select All Tasks, then select Create New Snapshot Copy.

![Create New Snapshot Copy](image)

**Figure 7: Create New Snapshot Copy**

In the Copy Name field enter a name for the Snapshot copy. Choose a disk library to use from the Library drop-down list. Choose a media agent from the MediaAgent drop-down list.

![Snap Copy properties](image)

**Figure 8: Snap Copy properties**
If this policy will be used to backup ESX Virtual Machines, choose the Media Agent for the Server on which the Virtual Server Agent is installed.

![Snapshot Copy Properties Example](image)

**Figure 9: Snap Copy Properties Example**

Use the Retention tab to configure retention rules for backup created using this policy.

![Retention Settings](image)

**Figure 10: Retention Settings**

Click OK when finished.
Enabling SnapProtect on Clients

In order to create SnapProtect backups of VMware Virtual Machines, SQL Servers, Exchange Databases or a Windows File Server, SnapProtect must be enabled on the associated client computer where the iData Agent or Virtual Server Agent is installed. For example, to enable SnapProtect backups on a SQL server, follow the directions below to enable SnapProtect on the client where the SQL Server iData Agent is installed.

To use SnapProtect backups VMware Virtual Machines, follow the directions below to enable SnapProtect on the Proxy Server where the Virtual Server Agent is installed.

The instructions below illustrate how to enable SnapProtect on a SQL Server. Follow the same process to enable SnapProtect on an ESX, Exchange, or Windows File Server.

Within the CommCell GUI, expand Client Computers in the CommCell Browser and locate the client computer to enable SnapProtect on.

Figure 11: CommCell Browser

Right-click on the client computer and select Properties

Figure 12: Context menu
Figure 13: Client Computer Properties

Click the **Advanced** tab

Figure 14: Advanced tab
Check the **Enable SnapProtect** box

![SnapProtect Configuration](image)

---

**Figure 15: SnapProtect enabled**

Click **OK** to return to the CommCell Console

---

**Using SnapProtect to backup VMware Virtual Machines**

This section details the steps needed to configure CommVault SnapProtect to backup Windows Virtual Machines running on an ESX(i) host.

Before getting started, it is highly recommended to review the document titled “**Dell Compellent Storage Center Best Practices with vSphere 5.x**” located on Dell Compellent Knowledge Center. This document contains important information about how to configure a vSphere 5.x environment for best performance.

---

As a best practice, do not create Virtual Machine Datastores on the same volume that the ESX/ESXi host uses as its boot volume.
Configuring the Virtual Server Agent

Within the CommCell Console, expand Client Computers in the CommCell Browser and locate the server where the Virtual Server Agent is installed.

![CommCell Browser](image)

**Figure 16: CommCell Browser**

Right-Click on Virtual Server → All Tasks → Create New Instance

![Virtual Server Instance Properties](image)

**Figure 17: Virtual Server Instance Properties**

Enter an Instance Name (usually the VMware vCenter Name), and choose VMware in the Vendor Type dropdown box.
Enter the vSphere Host name, and click **Change** to set the user name and password.

The specified user must have adequate permissions to backup and restore Data Stores and Virtual Machines.

![Virtual Server Instance Properties example](image)

**Figure 18: Virtual Server Instance Properties example**

Click **OK**
Expand the Virtual Server. Right-Click on defaultBackupSet → Properties

**Figure 19: Default Backup Set properties**

Uncheck the box that says **Automatically add new VMs that do not qualify for membership in any of the subclients to default subclient**

Check the **Rule based discovery** box, and choose **Data Store Affinity** from the drop down box.

Choosing Data Store Affinity allows CommVault to back up all VMs within a Data Store automatically.

Select **vStorage** as the backup method.
Figure 20: Default Backup Set Properties example

Click OK

Creating Subclients

Because CommVault processes each subclient as its own job, it is recommended to create a single subclient for each ESX(i) Datastore. When backing up more than one subclient, all jobs run in parallel, increasing performance.
Right-click on defaultBackupSet → All Tasks → New Subclient

![New Subclient](image)

**Figure 21: New Subclient**

**Enter a name for the Subclient**

Although not a requirement, it is recommended that each Subclient name match the Data Store it will be associated with. By following this naming convention, it is easier to manage and back up individual Data Stores.
Click the **SnapProtect Operations** tab.

![SnapProtect Operations Tab](image)

**Figure 22: SnapProtect Operations tab**

Check the **SnapProtect** box

From the dropdown box, choose **Dell Compellent Snap**

Click the **Enter Array Credentials** box

![Array Management](image)

**Figure 23: Array Management**

Verify the Storage Center which the ESX(i) Server Data Store volumes are located on is listed. Click **Edit** to make any changes.

Click **OK** when finished.

In the **Proxy ESX Server** box, click the **Select ESX server for snap mount** box.
CommVault utilizes the ESX proxy server by mounting snapshots to inventory and collect metadata about the Virtual Machines included in the snapshot.

The proxy server must be connected (via Fibre Channel or iSCSI) to the Storage Center where the ESX Data Store volumes are located. A corresponding server object must also exist within Storage Center for the proxy server.

To increase speed of proxy mounting, the ESX proxy server should have as few connected LUNs as possible.
Figure 25: SnapProtect tab example

Click the Storage Device tab

Figure 26: Storage Device tab

From the Storage Policy drop-down box, choose the SnapProtect Storage Policy to use.
Figure 27: Storage Device tab example

Click OK when finished.

Repeat this process for each Subclient needed.
Associating a Subclient with a Data Store

In the CommCell Browser, expand Virtual Server → Right-Click on defaultBackupSet → Properties

Click the Configure box under DataStore Affinity

Click the Discover Data Stores box
This process may take some time depending on how many Data Stores are presented to ESX.

Figure 30: Auto Discovery Data Stores results

Highlight a Data Store. Under Subclient Name, select the Subclient to associate with the Data Store.

Figure 31: Auto Discovery Results example
Repeat this process until all Subclients are associated with a Data Store.

The **default Subclient** does not need to be associated with a Data Store.

**Running a backup**

CommVault has the option to run a backup of a single Subclient, or all Subclients at once.

**Backing up a single Subclient**

Within the CommCell Browser expand the **Virtual Server** and click on **defaultBackupSet**.

![Figure 32: Default Backup Set](image)

In the operations window all Subclients will be displayed.

![Figure 33: Subclient listing](image)

Right-click the Subclient to backup, then choose **Backup**.
Figure 34: Backup single subclient

The Backup Options window appears for the Subclient. Select Full Backup Type.

By default, the first time a SnapProtect backup runs it will create a full backup set regardless of what the backup type is set to. Depending on requirements, subsequent backups can be set to Incremental or Differential.

Figure 35: Backup Options for Subclient
Click Advanced

![Advanced Backup Options](image1)

**Figure 36: Advanced Backup Options**

To send a copy of this snapshot to backup media, check the box to **Create Backup Copy immediately**. If desired, check the box to **Enable Granular Recovery**.

Enabling Granular Recovery allows file and folder restores from within Virtual Machines on the snapshot. Depending on the number of Virtual Machines in the Data Store to back up, enabling this option significantly increases the time needed to create a backup of the Subclient. During this process the SnapProtect volume is mounted to the ESX Proxy Server, and an inventory is taken of all folders and files in each Virtual Machine located in the backup set.

It is not required to enable Granular Recovery to recover files and folders from Windows Virtual Machines. Alternately, using CommVault’s Live Browse functionality allows browsing of a backup set, selecting a specific Virtual Machine, and then choosing which folders/files to restore. This process works in much the same way Granular Recovery does, in that when choosing the Virtual Machine to restore from, Simpana mounts the snapshot to the ESX Proxy server, runs an inventory of all the Virtual Machines within the snapshot, and then displays those folders and files. Depending on Proxy server hardware configuration, and the amount of Virtual Machines contained on the snapshot, it may take some time to mount the snapshot on the ESX server before displaying files and folders.

Click **OK** to begin the backup
Monitor the backup process in the Job Controller window

![Job Controller window](image)

Figure 37: Job Controller window

The backup process is finished when the Job Controller shows **Status** Completed and **Progress** 100%

![Job Controller window](image)

Figure 38: Successful backup

**Backup up all Subclients**

Use this option to backup all Virtual Machines at the same time.

Within the **CommCell Browser** expand the **Virtual Server** and right-click on **defaultBackupSet** → **Backup All Subclients**

![CommCell Browser](image)

Figure 39: Backup all Subclients
Answer Yes to back up all subclients of this backup set.

Figure 40: Confirmation window

The Backup Options window appears, select Full Backup Type, and then click Advanced

Figure 41: Backup Options window

By default, the first time a SnapProtect backup runs it will create a full backup set regardless of what the backup type is set to. Depending on requirements, subsequent backups can be set to Incremental or Differential.

In the Advanced Backup Options window the Enable Granular Recovery box is checked by default.

Enabling Granular Recovery is not checked by default in the Advanced Backup Options window when backing up a single Subclient.
Figure 42: Advance Backup Options

Click OK to close the Advanced Backup Options window.

Click OK to start the backup.
The following error message will appear if the default Subclient is not associated with a Storage Policy.

![Error in running job]

Invalid Storage Policy ID. Application may not yet point to a valid Storage Policy.

Click OK to ignore the error.

Monitor the status of all backup jobs in the Job Controller window.

![Figure 45: Job Controller window]

A separate job will be created for each Subclient that is backed up.

The backup process is finished when the Job Controller shows Status Completed and Progress 100% for all jobs.

![Figure 46: Successful backup]

Improve backup performance by spreading virtual machines over multiple Data Stores. For heavily utilized VMs, Dell Compellent recommends fewer virtual machines per Data Store.
VMware restore from a SnapProtect Backup
Simpana 9.0 allows the following types of restores from a VMware SnapProtect backup:

- Individual files/folders (from a Granular Recovery Enabled snapshot, or by using Live View)
- Entire Volume
- Container Restore (to restore files like VMDK/VHD or entire guest OS)
- Virtual Machine

For detailed information on how to perform the above restores, please refer to the CommVault Online Documentation

Using SnapProtect to backup a SQL Server
Simpana uses SnapProtect to backup a SQL Server by using VSS to quiesce SQL, and then creating a snapshot of the Compellent volume(s) that the SQL database(s) are installed on.

To backup SQL databases with SnapProtect, the databases must be installed on mapped Dell Compellent volumes. The databases cannot be installed on local volumes.

In order to use SnapProtect to backup a Virtual instance of SQL server running on ESX, Dell Compellent volumes must be presented to the Virtual Machine as Physical Raw Device Mappings (RDMs) from the ESX host. The SQL databases must be installed on the Dell Compellent volumes.

Install CommVault components on the SQL server as detailed in the CommVault - SQL Server Deployment Documentation

Once the SQL server iDataAgent has been installed on the SQL server, the SQL server is automatically added to Client Computers in the CommCell Console.

Configuring the SQL Server Subclient
In the CommCell Browser navigate to Client, expand the SQL Server, expand the SQL Server iData Agent, and select the SQL Server.
Right-Click on the default Subclient and select Properties

![CommCell Browser](image1)

Figure 47: SQL server default subclient

![Subclient Properties window](image2)

Figure 48: Subclient Properties window
Click the **Storage Device** tab, and select a SnapProtect-enabled **Storage Policy** from the drop down list.

![Figure 49: Storage Policy selection](image)

Click on the **SnapProtect Operations** tab.

![Figure 50: SnapProtect Operations tab](image)
Check the SnapProtect (Applicable only to Full and Differential jobs) box
Select Dell Compellent Snap from the Available Snap Engines drop-down

From the Use Proxy list, select the MediaAgent where the SnapProtect and backup copy operations will be performed.

Figure 51: SnapProtect Configuration example
Select the Content tab

Figure 52: Content tab

Click **Configure** to discover and associate databases to this subclient.

Figure 53: Database Configuration window
Click **Discover**, Simpana will list all the databases on the SQL Server.

**Figure 54: Database discovery**

Assign databases to backup to the **default** Subclient. Databases not needing backup should be set to **Do Not Backup**.

**Figure 55: Database assignment**
Click OK

Databases assigned to the default Subclient will be listed in the **Database List**:

![Database listing](image)

**Figure 56: Database listing**

Click OK to close the **Subclient Properties** window

### Running a SQL Server backup

In the **CommCell Browser** navigate to **Client**, expand the **SQL Server**, expand the **SQL Server iData Agent**, and select the **SQL Server**.

Right-Click on the **default Subclient** and select **Backup**

![Running SQL backup](image)

**Figure 57: Running SQL backup**
By default, the first time a SnapProtect backup runs it will create a full backup set regardless of what the backup type is set to. Depending on requirements, subsequent backups can be set to Transaction Log or Differential.

Click **OK** to start the backup

Monitor the backup job status in the **Job Controller** and **Event Viewer** windows

Figure 59: Job Controller

Figure 60: Event Viewer
The backup job is complete when the Job Controller Status shows **Completed** and Progress shows **100%**

![Job Controller](image)

Figure 61: Completed Job

**Restoring a SQL Database from a SnapProtect backup**

Please refer to the [CommVault Online Documentation](#) for detailed instructions on how to restore a SQL Database from a SnapProtect backup.

**Using SnapProtect to backup an Exchange Server Database**

Using SnapProtect to create backups of an Exchange Server Database does not allow for the restore of individual mailboxes and messages. SnapProtect creates a backup of the entire Exchange Database, and thus, only allows the restore of the entire Database. For granular Exchange backup and restore capability, please refer to [CommVault’s Exchange Documentation](#).

In order to use SnapProtect to backup a Virtual instance of an Exchange Server Database running on ESX(i), Dell Compellent volumes must be presented to the Virtual Machine as Physical Raw Device Mappings (RDMs) from the ESX(i) host. The Exchange Database(s) must be installed on the Dell Compellent volumes.

Install CommVault components on the SQL Server as detailed in the [CommVault - SQL Server Deployment Documentation](#)

**Configuring the Exchange Server Subclient**

In the CommCell Browser navigate to Client Computers, expand the Exchange Server, and select Exchange Database.

![CommCell Browser](image)

Figure 62: Exchange Database iData Agent
Right-Click on the **default** Subclient Name, and select **Properties**

![Figure 63: Subclient Properties](image)

Click the **Storage Device** tab

Select the SnapProtect-enabled **Storage Policy** from the drop-down list

![Figure 64: Storage Device Tab](image)
Click the **SnapProtect Operations** tab
Select **Dell Compellent Snap** from the **Available Snap Engines** drop-down list
Select a proxy server from the drop-down list.

Unless off-loading backup operations to another server, select the Exchange server for the Proxy. If using a separate proxy server, installation of the Exchange Management tools is required.

![SnapProtect Operations Tab](image)

**Figure 65: SnapProtect Operations Tab**
Select the **Contents** tab, click **Configure**

**Figure 66: Adding Exchange Database**

Click **Discover** to find all Exchange databases. Assign database(s) to the **default Subclient**. Click **OK** to return to **Subclient Properties**. **Contents of subclient** should show the Exchange Database

**Figure 67: Exchange Database Listed in Contents**
Click **OK** to return to the **CommCell Console**.

**Running an Exchange Server Database backup**

In the **CommCell Browser** navigate to **Client**, expand the **Exchange Server**, and select **Exchange Database**.

![Diagram of CommCell Browser]

**Figure 68: Selecting Exchange Database**

Right-click on the default **Subclient** and select **Backup**

![Backup Options for Subclient: default]

**Figure 69: Backup Options**

By default, the first time a SnapProtect backup runs it will create a full backup set regardless of what the backup type is set to. Depending on requirements, subsequent backups can be set to **Pre-Selected Backup Type**.
Click Advanced

By default, **Perform Consistency Check** is enabled. This option utilizes the proxy server specified in the default Subclient properties, and runs against all mailboxes within the database. Depending on the amount of mailboxes in the database, this option can greatly increase backup time.

Click **OK** to return to the backup options screen.
Click **OK** to start the backup.

Monitor backup status in the **Job Controller** and **Event Viewer** windows

**Figure 70: Advanced Options**

**Figure 71: Job Controller**

**Figure 72: Event Viewer**
The backup is finished when Job Controller Status is **Completed**, and Progress is **100%**

![Job Controller Status](image)

**Figure 73: Job Controller**

**Restoring an Exchange Server Database from a SnapProtect backup**

Please refer to the [CommVault Online Documentation](#) for detailed instructions on how to restore an Exchange Server Database from a SnapProtect backup.

**Using SnapProtect to backup a Windows File System**

In the CommCell Browser, navigate to Client Computers, expand the Windows Server, expand File System, and select defaultBackupSet.

![Windows File System](image)

**Figure 74: Windows File System**

Right-click on the default Subclient, and select Properties.

![Subclient Properties](image)

**Figure 75: Select Default Subclient Properties**
Figure 76: Default Subclient Properties

Check the box to **Use VSS**

SnapProtect backups of a Windows File System will fail if VSS is not used.

Figure 77: Use VSS Enabled
Select the **Storage Device** tab.
Select the SnapProtect enabled **Storage Policy** from the drop-down list.

![Figure 78: Storage Device Tab](image)

Select the **SnapProtect Operations** Tab
Check the box to **Enable SnapProtect**
Select **Dell Compellent Snap** from the drop-down list
Choose a proxy server from the drop-down list

![Figure 79: SnapProtect Operations Example](image)
Click the **Content Tab**

![Content Tab](image)

**Figure 80: Content Tab**

Click Browse and specify content for the Subclient.

![Browsing Content](image)

**Figure 81: Browsing Content**
Dell Compellent Storage Center with CommVault Simpana 9.0 Best Practices

Do not select any local or boot from SAN drives. Doing so will cause backups to fail.

If nothing is selected to backup, Simpana will attempt to SnapProtect all Volumes on the server (including local volumes). This will cause the backup to fail.

By selecting an entire drive (i.e. D:), Simpana will backup all files on the drive, and allow for the restore of all files. Selecting specific files and folders only allows for the restore of those files and folders.

When first selecting a drive or file to backup, the following message will appear:

![Warning]

Click Yes to disable auto detection.
Click OK to return to the Content tab.
Uncheck the box to Backup System State

![Figure 82: Warning]

Click OK to exit to the CommCell Console
Running a Windows File System SnapProtect Backup
Right-click on the default Subclient for the Windows Server and select **Backup**

Figure 84: Context Menu

Figure 85: Backup Options

By default, the first time a SnapProtect backup runs it will create a full backup set regardless of what the backup type is set to. Depending on requirements, subsequent backups can be set to **Incremental** or **Differential**.
Select OK to begin the backup

Monitor job status in the Job Controller and Event Viewer windows

The backup job is complete when the Job Status is **Completed** and Progress is **100%**

Restoring a Windows File System from a SnapProtect backup

Please refer to the [CommVault Online Documentation](#) for detailed instructions on how to restore from a Windows File System SnapProtect backup.