Deploying Symantec Backup Exec 2014 with Dell PS Series Arrays

Configuration and management recommendations and best practices

Dell Engineering
May 2015

A Dell Best Practices Guide

Revisions

Report	Date	Description
1.0	January 2011	Initial release
2.0	May 2015	Updated with support for Backup Exec 2014

Acknowledgements

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Preface

Dell™ PS Series arrays optimize resources by automating performance and network load balancing. Additionally, PS Series arrays offer all-inclusive array management software, host software, and firmware updates at no additional cost.

Audience

The information in this guide is intended for technology professionals interested in using Dell PS Series storage in a Microsoft® Windows® environment. It is also intended for administrators that have or will be deploying Symantec™ Backup Exec™ 2014 and are interested in using the VSS and offhost function with Dell PS Series storage.

To learn more about Dell PS Series products and new releases being planned, visit Dell TechCenter at http://en.community.dell.com/techcenter/storage/w/wiki/2660.equallogic-technical-content. This site provides articles, demos, online discussions, technical documentation, and more details about the benefits of the PS Series product family.

An updated list of SAN components that have been tested by Dell is available in the *Dell Storage Compatibility Matrix*.

Current customers: You may not be running the latest versions of the tools and software listed above. If you are under valid warranty or support agreements for your PS Series array, you are entitled to obtain the latest updates and new releases as they become available.

1 Introduction to Symantec Backup Exec 2014 and PS Series storage

This document describes how to use Symantec Backup Exec 2014 for Windows Server® with Dell PS Series storage arrays to back up and restore NTFS volumes, Microsoft Exchange® email, and Microsoft SharePoint® data. The procedures use Microsoft Volume Shadow Copy Service (VSS), the Dell Host Integration Tools (HIT) kit for Microsoft, and Symantec Backup Exec 2014 to create point-in-time copies of data called shadow copies or snapshots.

Note: The HIT kit installs and configures several components, including the Remote Setup Wizard, VSS and VDS Provider Services.

This report shows how to use the same products to offload backup and restore operations from the remote host with transportable snapshots. Moving the backup from the remote host to the backup (media) host increases backup performance and reduces backup windows while freeing remote host resources.

Note: PS Series arrays can be used with traditional VSS (non-offhost) backup operations and require no special configuration.

Symantec Backup Exec 2014 for Windows Server provides comprehensive data protection for Windows, and supports the following features:

- Support for VSS and hardware-based snapshots
- Advanced Open File Option (AOFO)
- Advanced Disk-based Backup Option (ADBO)
- Deduplication Option
- Automated data lifecycle management for disk-based storage
- Granular Recovery Technology (GRT) for Exchange 2013 and SharePoint 2013
- Integration with Microsoft Hyper-V® and VMware vSphere®, including physical-to-virtual conversions

PS Series storage arrays are designed to deliver the benefits of consolidated storage in an intelligent iSCSI storage area network (SAN) that provides highly-available and scalable storage to backup and recovery servers and clients running Symantec Backup Exec. The iSCSI SAN, called a PS Series group, consists of one or more arrays connected to an IP network. As your storage needs grow, simply add more arrays to the group; capacity and performance increase linearly and on demand.

Key features for a PS Series SAN include:

- Easy setup
- Redundant, hot-swappable hardware
- Highly scalable, virtualized storage
- Integrated, self-managing software
- Automatic RAID configuration and management
- High-end features like snapshots and replication
- Auto-Stat Disk Monitoring System
- Automatic data and network I/O load balancing

A PS Series volume is seen on the network as an iSCSI target and can be accessed by an iSCSI initiator installed on a host. This storage can play two roles in backup operations:

- Store the application data that will be backed up.
  For example, you can create volumes to store Exchange databases.
- Act as backup media (instead of tape) for storing the backed up data.
  For example, you can create volumes to store the backup of an Exchange database.

With the HIT kit installed, a PS Series SAN can also:

- Serve as a VSS provider to Windows
- Serve as a VDS provider to Windows
- Support Microsoft Multipath I/O

2 Common backup and recovery configurations

Symantec Backup Exec 2014 can be used in a variety of backup and recovery configurations, including LAN backup and recovery, SAN backup and recovery, backup and recovery media, backup to disk and restore from disk operations, and backup to tape and restore from tape operations.

LAN backup and recovery: A centralized backup server (Backup Exec server) runs the backup software and backs up other servers (backup clients) by using software agents. The data movement is over a LAN.

SAN backup and recovery: A centralized backup server (Backup Exec server) runs the backup software and backs up other servers (backup clients) by using software agents. The data movement is over a SAN.

Although PS Series storage arrays can be used in a LAN backup and recovery configuration, the more likely configuration is to use a PS Series SAN with Symantec Backup Exec 2014. Backing up using a SAN can improve backup performance because all data movement is through the SAN. In addition, technologies such as backup-to-disk and VSS off-host are best implemented using a SAN.

This Technical Report focuses on the SAN backup and recovery configuration in Figure 1. In the SAN configuration described in this Technical Report, the **backup server** (Backup Exec server) runs the backup software and schedules, and it runs the backup jobs. The **backup clients** run backup agent software residing on the servers that run the applications (for example, Exchange, SharePoint or host file systems) that you want to back up. In some cases, the backup server can also act as a backup client when backing up its own data. All backed up data resides on a PS Series group including the disk backup media for storing the backed up data.

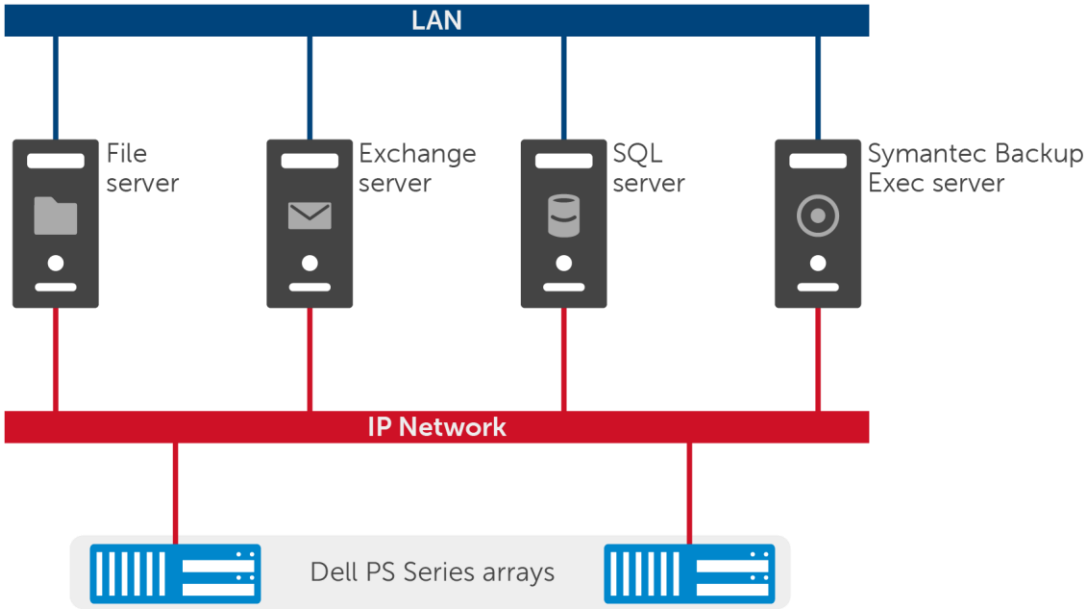

Figure 1 SAN backup and recovery configuration

Backup and recovery media: Backup media refers to the device that stores backed up data. Backup media can be fixed, such as disk, or removable, such as tape. Symantec Backup Exec 2014 supports backup to tape, as well as backup to disk, and PS Series arrays are ideally suited for disk backup media.

Traditionally, tape has been the backup media of choice, because tapes can be easily transported to a separate facility for storage, and retrieved in the event of a disaster. However, disk backup media is becoming more commonplace because it improves backup performance, provides online recovery capabilities, and supports the use of advanced operations such as snapshot-based backups.

Backup to disk and restore from disk operations: In a backup to disk scenario, not only is the data backed up and stored in a volume on a PS Series group, another volume on a PS Series group serves as the backup media to enable disk-based backups. This document describes how use the Backup Exec Storage Provisioning Option (SPO) to configure a virtual disk mapped to a PS Series volume; a quick way to create backup media on a PS Series group.

Environments using Windows Server and the HIT kit can use the Microsoft Volume Shadow Copy Service (VSS) to create snapshots of application data that is used as the source of a backup.

It is important that when performing virtual disk backups that a copy of data is stored away from primary data. This can be accomplished by maintaining tape backups stored at a remote location, or by replicating data to a remote location.

Backup to tape and restore from tape operations: Data stored in a PS Series volume can be backed up using any of the traditional disk-to-tape (D2T) backup methods. Simply follow the Symantec Backup Exec recommended procedures for your environment.

You can also backup to tape using VSS, by following the instructions in the backup-to-disk sections of this report and selecting tape for the backup device (backup media).

2.1 VSS snapshots and backup

Snapshots (also called shadow copies) are point-in-time copies of data. A snapshot enables you to quickly copy data at the disk volume level. This volume copy can then be used as the source for backup operations. Snapshot creation does not disrupt access to the volume. The copy is created, typically in a few seconds, and maintained in disk storage (for example, in a PS Series group), providing high performance and low space utilization.

When using snapshots to backup data, the snapshot capability must be integrated with the backup application, the applications and file systems to be backed up, and the storage devices. Historically, this integration has required using custom scripts, which are difficult to create and maintain for proper operation over time. These requirements have severely restricted the adoption of snapshot-based backups.

Microsoft has a technology in Windows Server called Volume Shadow Copy Service (VSS). VSS provides a framework for creating snapshots that integrates VSS-aware disk storage (for example, PS Series arrays), applications (for example, Exchange or SharePoint), and operating system drivers, delivering a turn-key backup solution to IT departments without the need for scripting.

There are three required components in the VSS framework as illustrated in Figure 2.

VSS writer (1): A business application (such as a database application, e-mail, or file system) that prepares the application for snapshot creation or data restoration (for example, by flushing buffers, switching logs, etc.). Hyper-V, NTFS, Exchange, SharePoint, and SQL are examples of VSS writers.

VSS requestor (2): Requests the creation of snapshots, typically for backup operations. Symantec Backup Exec 2014 supports VSS and can be used as a VSS requestor.

VSS provider (3): The mechanism that actually creates and maintains the snapshot in the storage hardware. For example, the HIT kit installs a VSS provider that can create snapshots in a PS Series group.

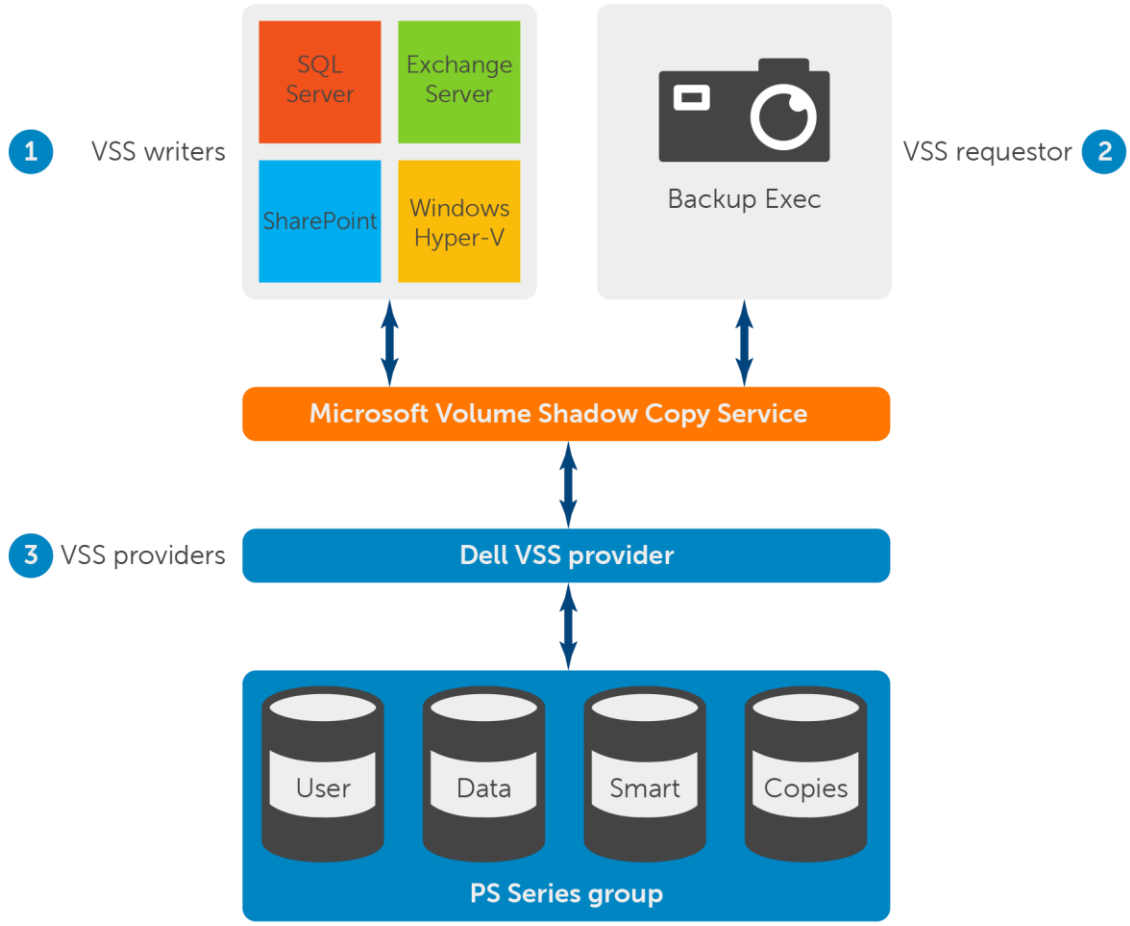

Figure 2 VSS framework

1. VSS writer integrated with the application, which prepares the application for the backup or restore operation.
2. VSS requestor is usually a backup application that requests the creation of shadow copies and provides an interface for backing up and restoring data. Backup Exec functions as a requestor.
3. VSS provider is installed with HIT for Microsoft and interacts directly with the PS Series group.

This illustrates how to use the HIT kit for Windows (VSS provider) with Symantec Backup Exec 2014 (VSS requester) to backup and restore Hyper-V, NTFS, Exchange, SQL, and SharePoint applications (VSS writers) providing an end-to-end backup and restore solution.

A snapshot provides a stable copy of volume data for backups. There are three types of VSS snapshots: Local software-based, Local hardware-based and Transportable (offhost) hardware-based.

Local software-based VSS snapshots: The backup application is responsible for creating and storing the snapshot of a backup client volume. Then, the backup client mounts the snapshot, and the backup server backs up the snapshot.

Local hardware-based VSS snapshots: The backup application requests that the storage hardware create and store the snapshot of a backup client volume. Then, the backup client mounts the snapshot, and the backup server backs up the snapshot.

Local snapshot operations typically work as shown in Figure 3.

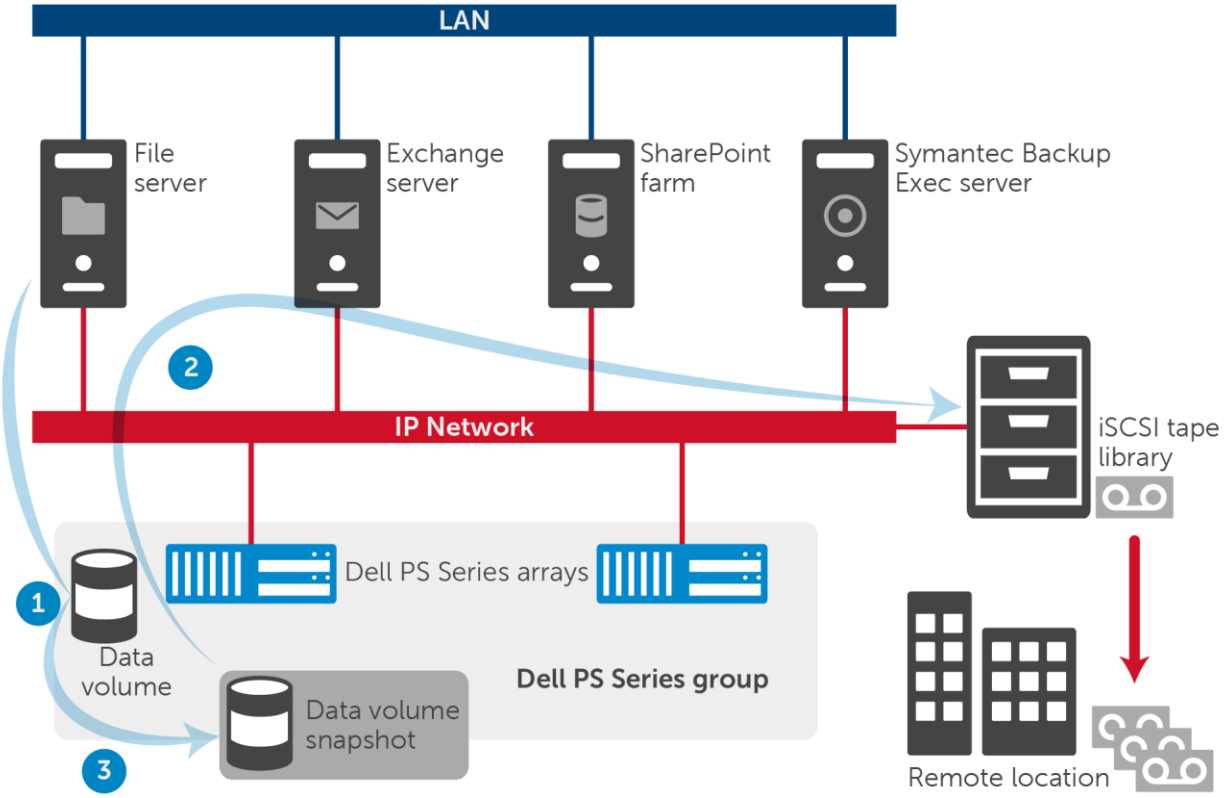

Figure 3 Local snapshot operations.

1. The backup application either creates and stores a snapshot of the backup client volume, or it requests that the storage hardware (PS Series group) creates and stores the snapshot.
2. The backup client mounts the snapshot and the backup server backs up the snapshot.
3. The snapshot may be deleted after the backup is complete.

Transportable (offhost) hardware-based VSS snapshots: The backup application requests that the storage hardware create and store the snapshot of a backup client's volume. Then, the backup server mounts the snapshot and backs up the snapshot. This moves (offloads) backup processing from the backup client and moves it to the backup server (offhost).

Transportable (offhost) snapshot operations typically work as shown in Figure 4.

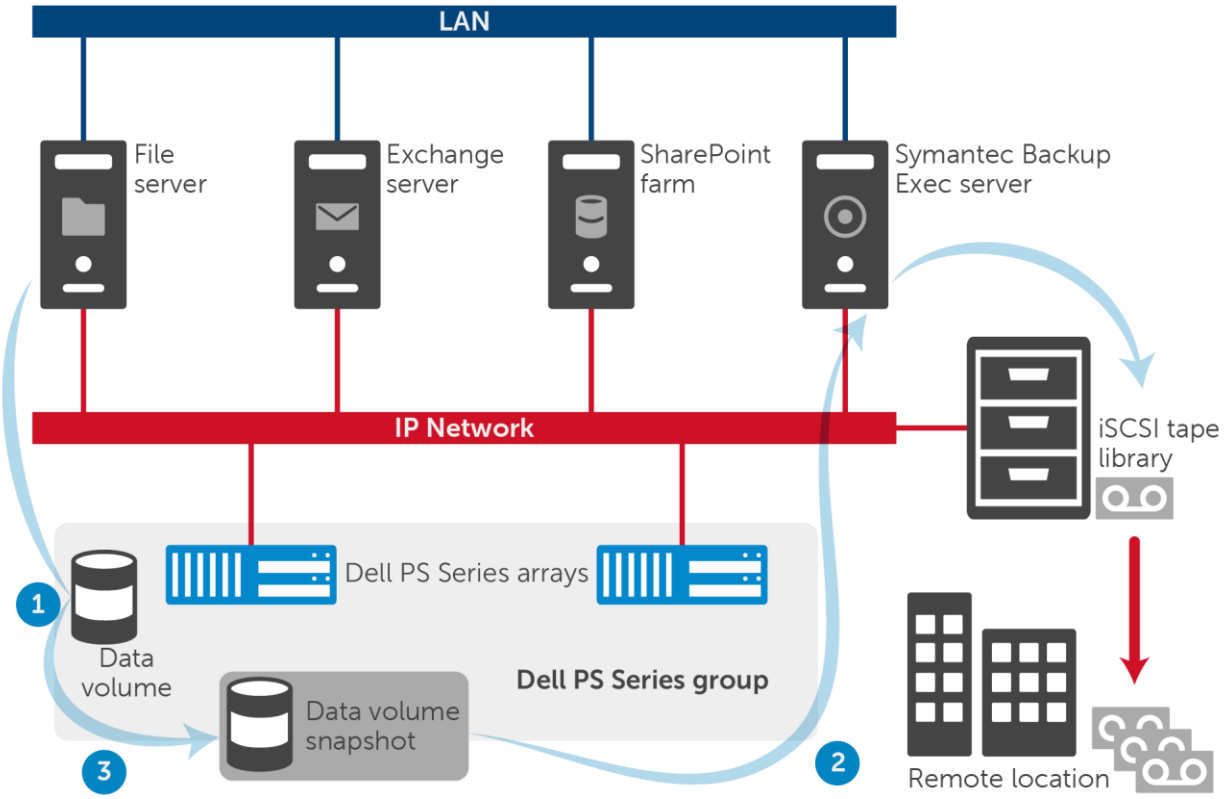

Figure 4 VSS Transportable snapshot operations

1. The backup application requests that the storage hardware (PS Series group) create and store a snapshot of the backup client volume.
2. The backup server mounts and backs up the snapshot.
3. The snapshot may be deleted after the backup is complete.

3 Exchange backup levels

Symantec Backup Exec 2014 supports many levels of backup for Microsoft Exchange 2010 and 2013. Two of the basics are:

- Individual databases network backup / database availability groups (DAG) network backup.
- Snapshot and offhost backups of DAG or individual database(s). The backup software gives you the option of backing up each Exchange mailbox database or complete Information Store to backup media.

Note: Each backup level has its advantages and disadvantages. This report focuses on leveraging the VSS capabilities of Symantec Backup Exec 2014 with ADBO, using the offhost function in backing up the Exchange Information Store and NTFS files.

4 SharePoint backup levels

Symantec Backup Exec 2014 supports many levels of backup for Microsoft SharePoint 2010 and 2013. A few of these are:

- Web applications and their associated databases
- Sites and subsites. Individual objects and their versions can be restored from full database backups
- Individual documents and any pictures that are contained in libraries
- Configuration databases that contain all of the configuration information for the entire SharePoint Server farm. Use caution when you restore this database. Any changes that you make to the farm topology before you restore from the backup are lost. The configuration database can be restored only to its original location.

Note: Each backup level has its advantages and disadvantages. This report focuses on leveraging the VSS capabilities of Symantec Backup Exec 2014 with GRT and enabled farm-level backups.

5 Symantec application agents, and ADBO

Backup Exec 2014 includes agents for backing up a number of database applications, including Microsoft Exchange, and SharePoint/SQL Server.

For transportable snapshots, Backup Exec 2014 supports the Advanced Disk-based Backup Option (ADBO). ADBO allows offhost backup using PS Series arrays with Backup Exec 2014 for Windows Servers on the Backup Exec server (also known as the backup server) that is doing the backup.

If you plan to back up Exchange or SharePoint/SQL Server using VSS, the relevant agents must be installed on the Backup Exec server that is doing the backup, along with having a current version of the Agent for Windows on the application server.

For more information on ADBO or the application agents, see the *Symantec Backup Exec 2014 Administrator's Guide*.

5.1 Deploying Symantec Backup Exec 2014

The following sections describe how to backup and restore NTFS volumes, Exchange e-mail, and SharePoint farm items using Symantec Backup Exec 2014, a PS Series group, and the HIT kit.

The procedures focus on the use of VSS and transportable snapshots. However, traditional backup and recovery methods and vendor-specific backup techniques that do not support transportable snapshots can also be used to back up the data residing on PS Series volumes.

See the Backup Exec 2014 documentation for application installation and configuration details. See the PS Series *QuickStart* or *Group Administration* manual for information about setting up a group and volumes. See the Auto-Snapshot Manager *Installation and Administration* manual for detailed requirements and installation information. Also, appendix B has PS Series storage and Host Integration Tools step-by-step instructions.

5.2 Basic steps

This section provides an overview of the basic steps for backup and recovery operations using a PS Series iSCSI SAN. Refer to the specified sections for detailed information.

1. Set up the PS Series group and create the following volumes:
   - Backup client volumes that will contain the application data to be backed up for each volume, create one or more access control records that allow the backup client access to the volumes. Be sure to reserve snapshot space for each client volume. In addition, for each volume, create one or more access control records that allow the backup server snapshot only access to the volumes.
   - One or more backup volumes for the disk backup media for each volume, create one or more access control records that allow the backup server access to the volumes.

See PS Series group requirements in this document for more information.

If your SAN is composed of multiple PS Series arrays, consider creating multiple pools of storage and segregating application data storage from backup data storage. See the *PS Series Firmware Group Administration* manual for more information.

For more information on Dell Host Integration Tools for Microsoft, please refer to the *Dell EqualLogic Host Integration Tools/Microsoft Edition - Installation and User's Guide – Version 4.7.1* and the *Dell EqualLogic Host Integration Tools for Microsoft Windows – Release Notes – Version 4.7.1* at eqlsupport.dell.com (requires login).

Log in, or click **Create Account** to request a new support account.

Properly configure the SAN network for best performance. See the document, *Windows Server 2012 NIC Optimization and Best Practices with EqualLogic SAN,* for more information.

2. Ensure that the backup server (Backup Exec server) and backup clients (remote servers) meet the requirements described in "Backup server requirements" in this document.

    a. On the backup server, install Windows Server 2012 or later along with the required hot fixes and service packs, and an iSCSI initiator if required. You can use an available hardware iSCSI initiator, or the OS software initiator. Use the HIT kit to install Remote Setup Wizard, VSS and VDS Provider Services on the backup server, configure the server to detect storage group targets, and install the PS Series MPIO Device Specific Module.

    Configure one or more virtual disks for disk backup media. Optionally, you can create a storage device pool for disk backup media. Create persistent connections to the backup volumes for the disk backup media. Initialize the volumes, align disk sectors, and format the new disks. Ensure that the backup server can access the VSS control volume. Then install the Symantec Backup Exec software and the Symantec application-specific agents.

    On each backup client, install Windows Server 2012 or later, the required hot fixes and service packs. Persistently connect to the backup client volumes. Also from the Backup Server create persistent snapshot-only connections to the volumes to be backed up (allows Backup Exec server access to application volumes).

    b. Initialize the volumes, and format the new disks. Install the HIT kit on the backup client. Ensure that the backup client can access the VSS control volume. Install the applications (for example, SharePoint or Exchange) and configure the applications to use the new disks.

3. Perform these tasks on the backup server:

    a. Launch the Symantec Backup Exec Administration Console.
    b. Create one or more virtual disks for disk backup media. Optionally, you can create storage device pools for disk backup media.
    c. Install the Symantec Backup Exec Remote Agent for Windows Servers from the backup server to any clients where you will back up NTFS volumes or application data.

5.3 PS Series group requirements

PS Series group requirements are as follows:

- One or more backup client volumes that will contain the data to be backed up

  Be sure to reserve snapshot space for each volume. For each backup client volume, create one or more access control records to allow the backup client access to the volume. If you will be creating transportable snapshots, you must also create one or more access control records to allow the backup server snapshot-only access to these volumes.

Before creating volumes, be sure to fully understand the individual application requirements (for example, e-mail, database, or file system), so you can allocate a sufficient amount of storage space to each volume. Note that volumes can be expanded easily online.

- One or more backup volumes for the disk backup media. (Not required if you are only backing up to tape.) The volume size depends on the frequency and amount of data to be backed up. /

  Also, for each backup volume, create one or more access control records that will allow the backup server access to the volume.

- VSS control volume. The Host Integration Tools for Windows automatically creates this volume.

Note: Dell PS Series Storage and Host tools step by step instructions are in appendix B.

See the PS Series *Quick Start* or the *Group Administration* manual for information about creating a group, volumes, and access control records.

See the Host Integration Tools for Microsoft Windows *User Guide and Release Notes* manual for installation information and additional requirements.

In addition, it is recommended that you consult the *Network Connection and Performance Guidelines* on eqlsupport.dell.com (requires login) for information about how to improve network performance when using a PS Series SAN.

5.4 Backup server requirements

There are two types of servers involved in backup and recovery operations: Backup server and Backup client.

Backup server (Symantec uses the term Backup Exec server): The backup server schedules, catalogs, and runs the backup and restore jobs.

Backup client (Symantec uses the term remote server): A backup client hosts the file system and application data (for example, NTFS file system or Exchange or SharePoint data) that you want to back up and, through software agent, provides the backup server with access to the data.

Note: The backup server can also act as a backup client when backing up its own data.

See the Symantec Backup Exec 2014 documentation for detailed information about backup server and backup client hardware and software requirements.

For this paper, the backup server (Backup Exec server) requires the following:

- Microsoft Windows Server 2012 with latest Hotfixes and subsequent service packs
- Symantec Backup Exec 2014 R2 for Windows Servers (or later) and the latest Hotfixes
- Symantec Backup Exec Advanced Open File Option (AOFO)
- Symantec Backup Exec Advanced Disk-based Backup Option (ADBO)
- Symantec Backup Exec Granular Recovery Technology (GRT)
- Symantec Backup Exec Microsoft Exchange Agent
- Symantec Backup Exec Microsoft SharePoint Agent
- Microsoft Exchange Management Tools for Microsoft Exchange Server (in order to detect Exchange servers through the Backup Exec Data Discovery feature supporting checksum and GRT)
- Microsoft iSCSI Software Initiator included with Windows 2008 or later and turned on as part of the Host Integration Tools for Windows installation
- Host Integration Tools for Windows Version 4.7.1 or later (VSS provider). Use the Host Integration Tools kit to install Remote Setup Wizard, VSS and VDS Provider Services on the server, configure the server to detect storage group targets, and install PS Series MPIO Device Specific Module

Note: All client servers must be running the same version of Host Integration Tools for Windows as the backup server.

- For each backup volume for disk backup media:
  - Persistently connect the server to the volume (Figure 5)
  - If you want to use multipath I/O, set up redundant paths between servers and storage. See the PS Series Multipath I/O DSM for Windows *Installation and Administration* manual for information (Figure 5)
  - Initialize and format the new disk (Figure 5)
  - Point the backup application to use the new volume for a backup virtual disk, as described in *Creating disk backup media* (Figure 8)
  - VSS control volume. The Host Integration Tools for Windows automatically creates this volume.

- Consult the *Network Connection Guidelines* at eqlsupport.dell.com (requires login) for information about improving network performance between PS Series storage arrays and servers.

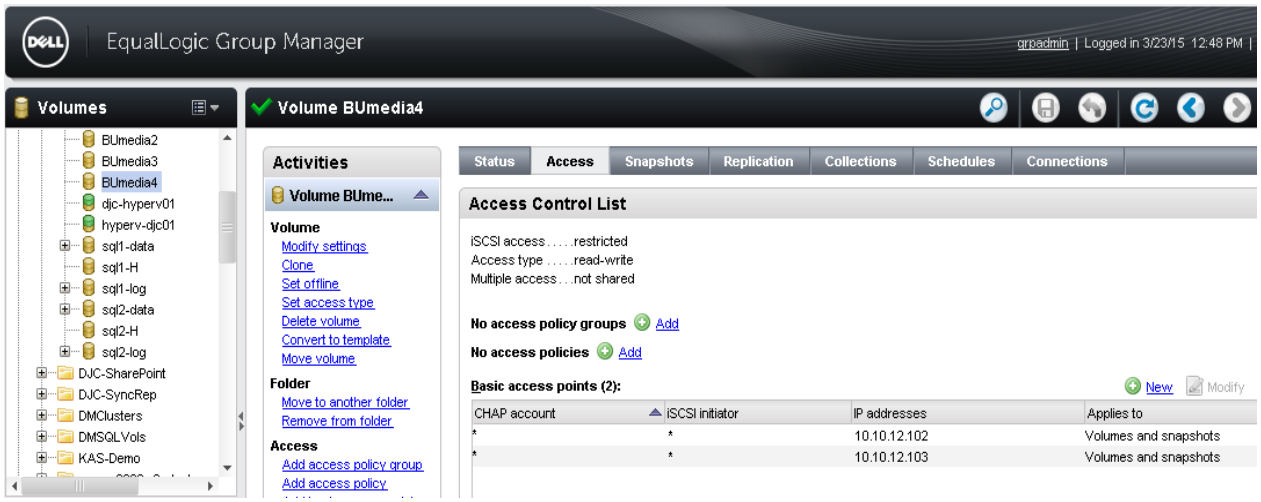

Figure 5 Persistently connect the server to the volume

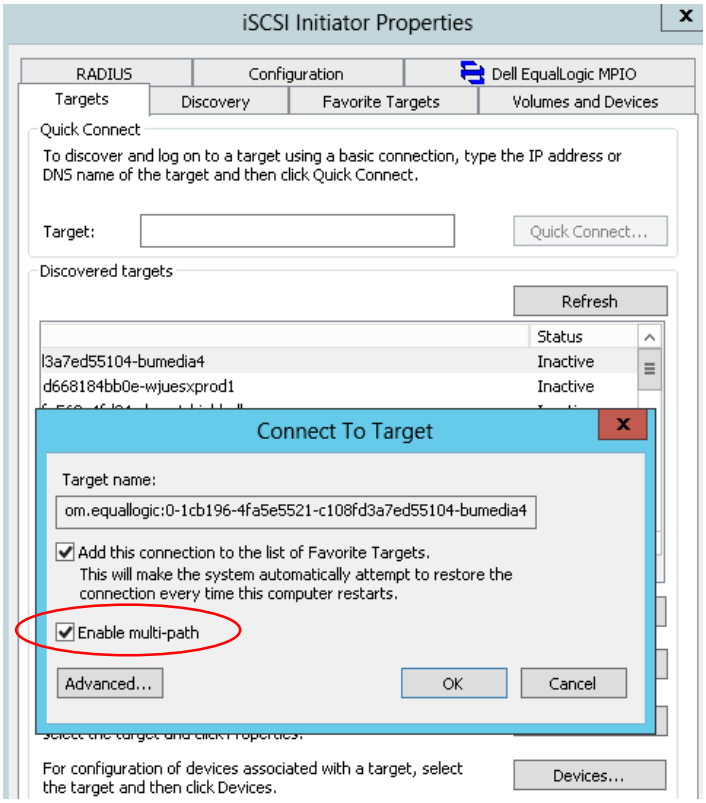

Figure 6 Set up redundant paths between server and storage

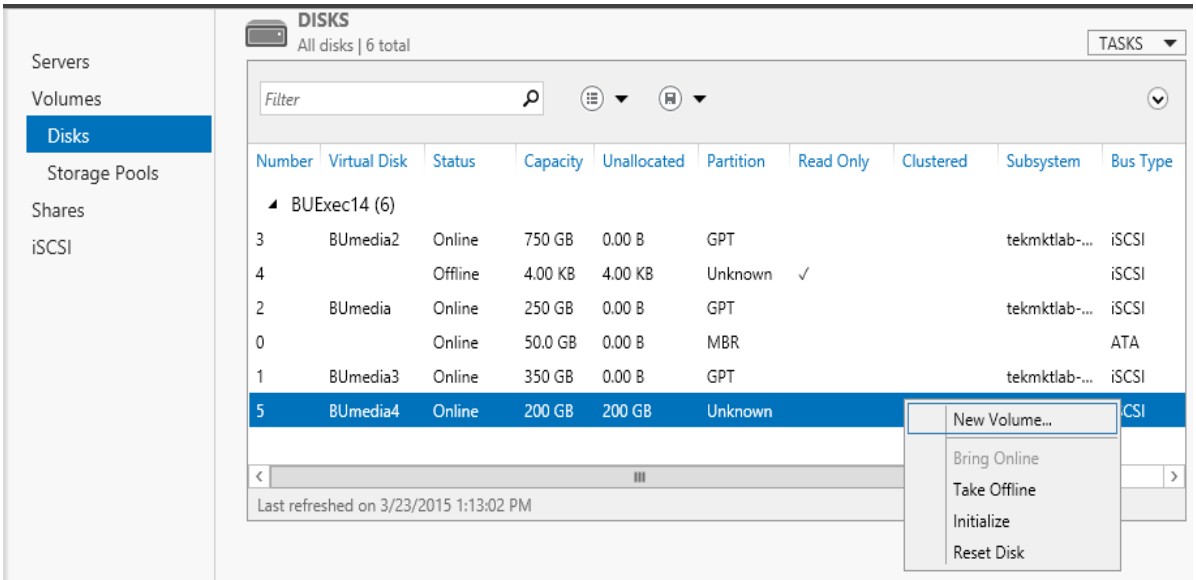

Figure 7 Initialize and format the new disk

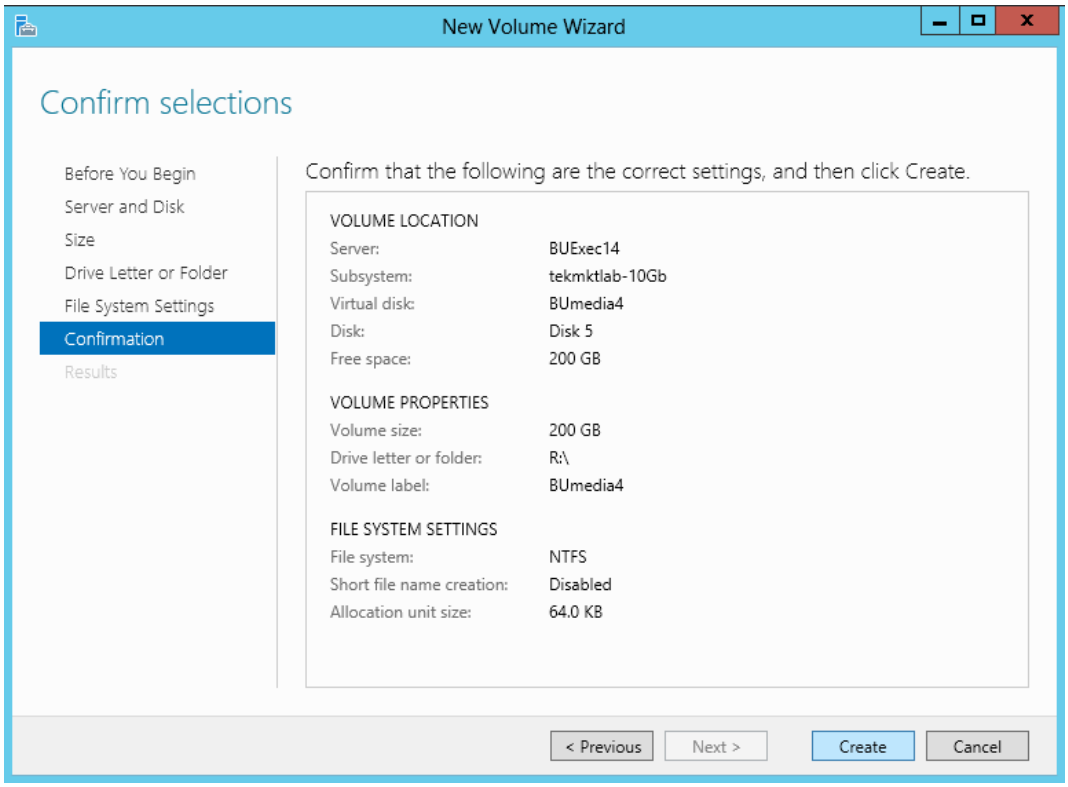

Figure 8 New volume

5.5 Backup client requirements

Each backup client (or remote server) requires the following:

- Microsoft Windows Server 2012 with latest Hotfix and service pack
- Microsoft Exchange Server 2013 with latest Hotfix and service pack (only for Exchange install)
- Microsoft SharePoint Server 2013 with latest Hotfix and service pack (only for SharePoint install)
- Microsoft SQL Server 2012 with latest Hotfix and service pack (only for SQL install). Symantec Backup Exec Advanced Open File Option (lets you use snapshot technology to capture any files that are open when a backup runs)
- Symantec Backup Exec Remote Agent for Window Servers
- Symantec Backup Exec Advanced Disk-based Backup Option (ADBO)
- Symantec Backup Exec Granular Recovery Technology (GRT)
- Host Integration Tools for Windows Version 4.7.1 or later (VSS provider). Use the HIT kit to install Remote Setup Wizard, VSS and VDS Provider Services on the server, configure the server to detect storage group targets, and install the PS Series MPIO Device Specific Module.
- For each client volume that will be backed up:
  - Persistently connect the server to the volume.
  - Persistently connect (snap shot only) the backup server to the volume.
  - If you want to use multipath I/O, set up redundant paths between servers and storage. See the EqualLogic Multipath I/O DSM for Windows *Installation and Administration* manual for information.
  - Initialize the volume.
  - Format the new disk.
  - Point the client application to use the new disk.
  - VSS control volume. The Host Integration Tools for Windows automatically creates this volume.

Consult the *Network Connection Guidelines* at eqlsupport.dell.com (requires login) for information about improving network performance between PS Series storage arrays and servers.

See the Symantec Backup Exec documentation for more information on backup server and backup client hardware and software requirements, including the requirements for VSS. As application data grows and storage capacity needs increase, the environment must accommodate changes without affecting users. Storage used in an Exchange Server environment must be highly scalable to accommodate not only growing numbers of users, but also the ever-growing amount of data each user needs to store.

Modular PS Series storage arrays provide easy, online scalability.

6 Launching the Backup Administration Console

The Symantec Backup Administration Console is run on the backup server and is used to identify backup devices, configure backup and restore jobs, monitor job progress, and restore data.

To launch the Administration Console on the backup server, click: **Start > Backup Exec 2014,** or right-click and add shortcut to task bar, then click shortcut.

The Backup Exec Administration Console appears (Figure 9). You can deploy remote agents, create devices pools, create media sets, create backup and restore jobs, and monitor jobs.

You can also use the **Backup Exec Button** to install Backup Exec software on the backup clients. For example, after clicking the **Backup Exec Button,** click **Installation and Licensing,** then click **Install agents and Backup Exec servers on other servers**. Refer to the Backup Exec 2014 for Windows Servers *Administrators Guide* for instructions on installing the correct Agent for your specific environment.

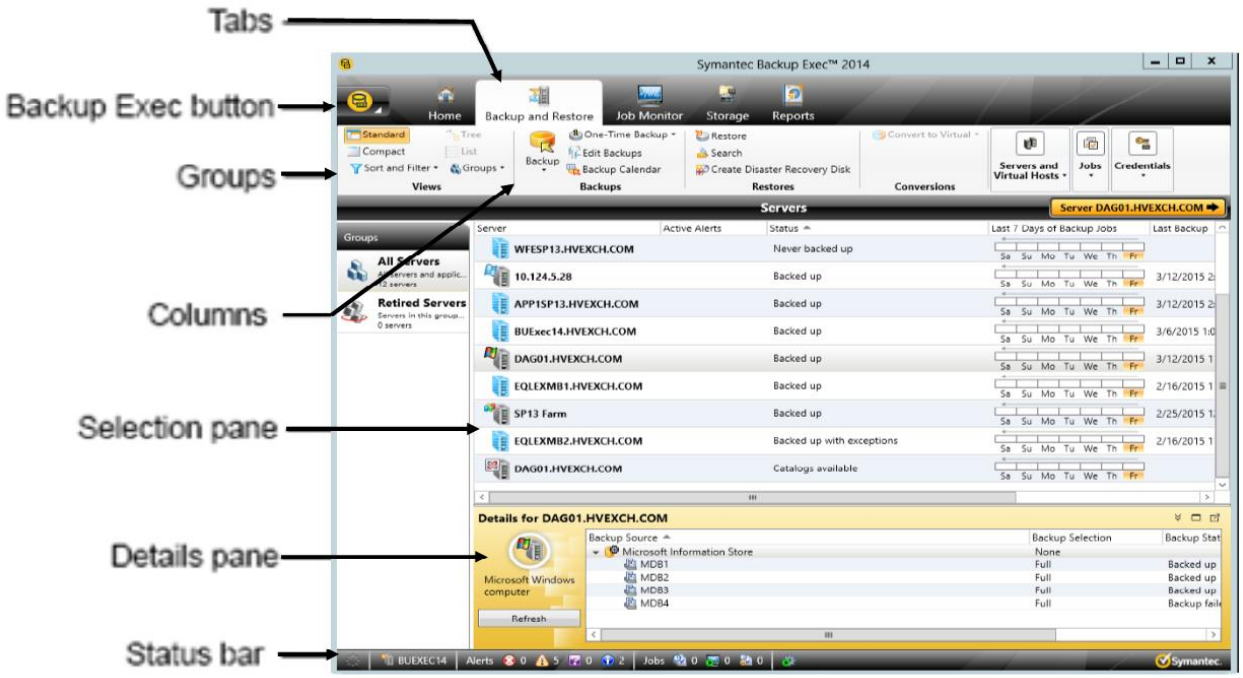

Figure 9 Backup Exec administration console

7 Creating disk backup media

To perform a disk-to-disk backup or a disk-to-disk-to-tape backup, you must configure the backup volumes you set up in *PS Series group requirements* as disk backup media.

Backup Exec allows you to backup data to a virtual disk which maps to a *PS Series* volume. Alternately, you can set up a device pool, which is a group of storage devices (for example, *virtual disks*) that can be used as disk backup media.

To create disk backup media, follow these steps on the backup server:

1. Be sure the backup server meets the requirements and recommendations in sections 5.4, "Backup server requirements," and 5.5, "Backup client requirements."
2. In the Backup Exec tabs, click **Storage**. Backup Exec should display the new volume (New virtual disk) as a virtual disk that is available for configuration but has not yet been configured and will display the icon with a question mark. If the New volume is not displayed, press [F5] or right-click the screen and select refresh. Right-click the new, not-configured disk and select **Configure Virtual Disk**. (Figure 10), Backup Exec will run through the process of configuring the disk. When it is complete, the icon will change and the status will change to **online**.

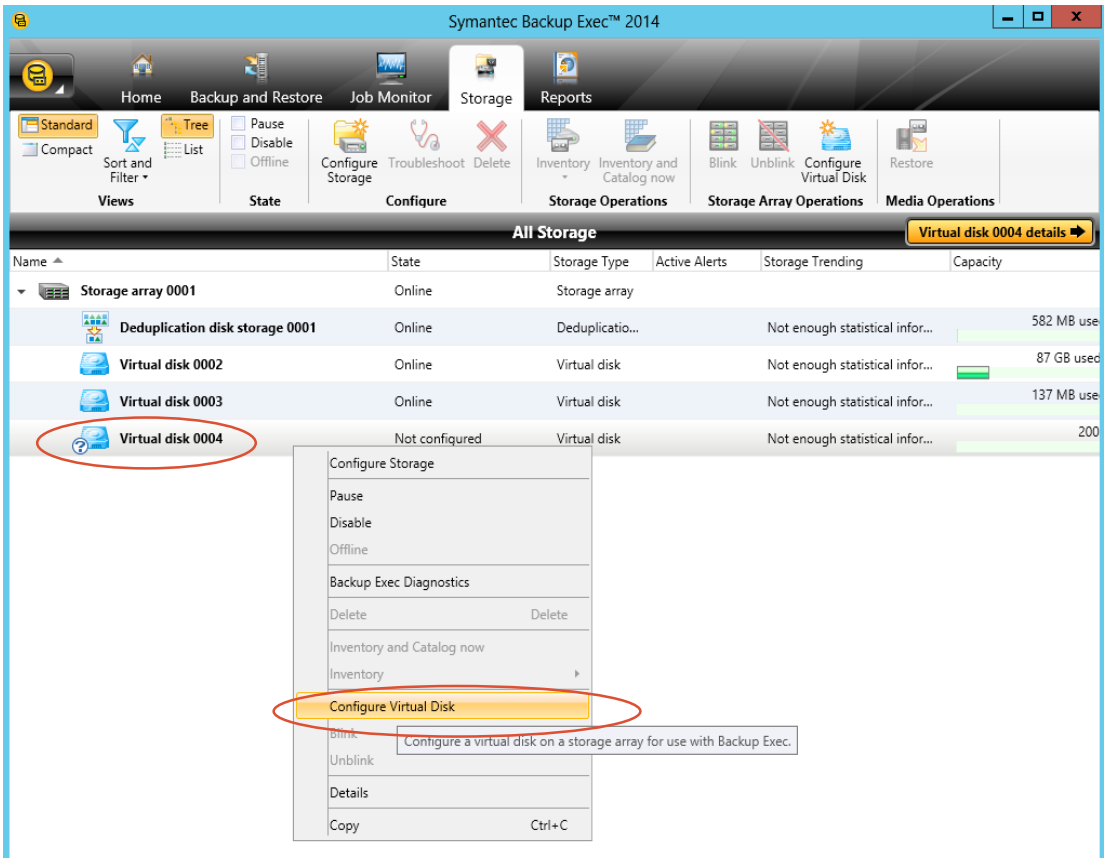

Figure 10 New virtual disk

After you create and configure a virtual disk, it will appear online under the **Storage** Tab. Repeat this step as needed to create another virtual disk from another backup volume you created.

3. To create an optional storage device pool, under the **Storage tab**, click **Configure Storage.**
4. The type of storage dialog box (Figure 11) appears. Select **Storage Pools**. Then click **Next**. The type of pool will be displayed. Select **Storage device pool**, then click **Next** (Figure 12).

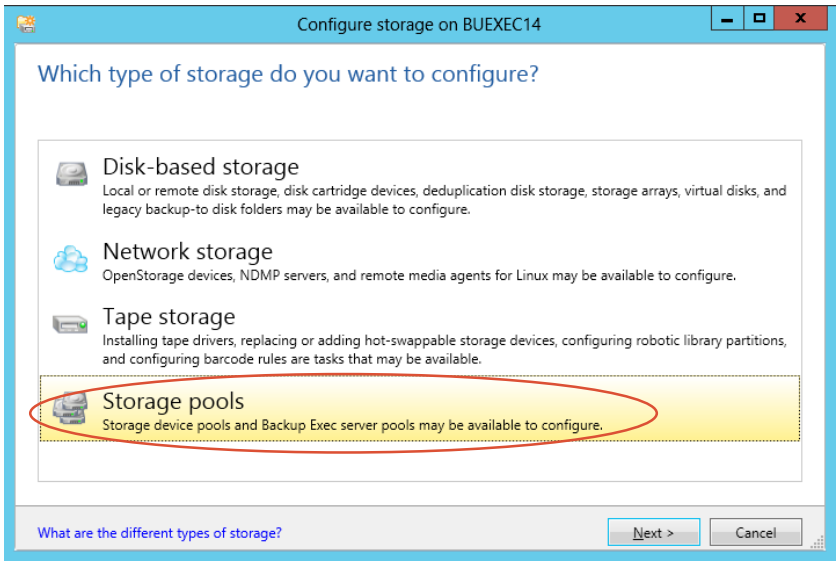

Figure 11 Type of storage

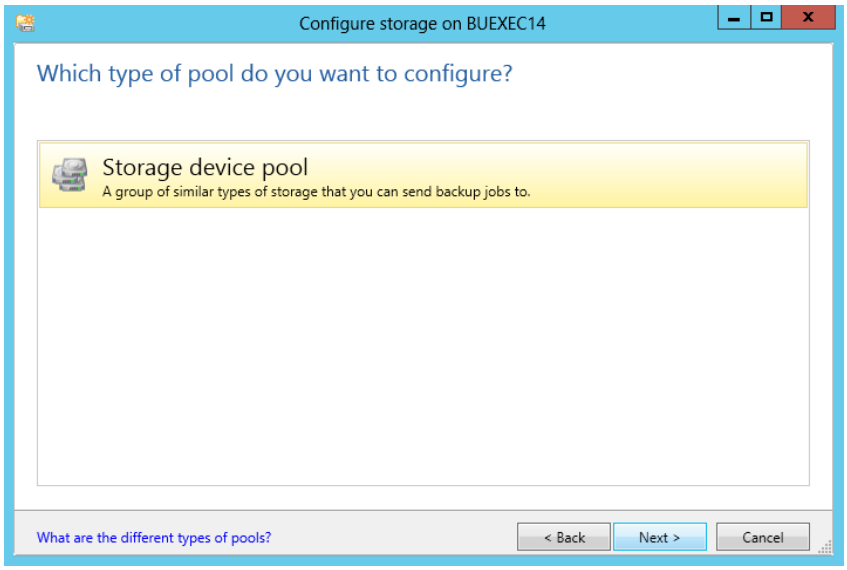

Figure 12 Type of pool

5. Enter a name and description to use for the storage device pool. Figure 13 shows a storage device pool named *storage device pool 0001*. Click **Next**.

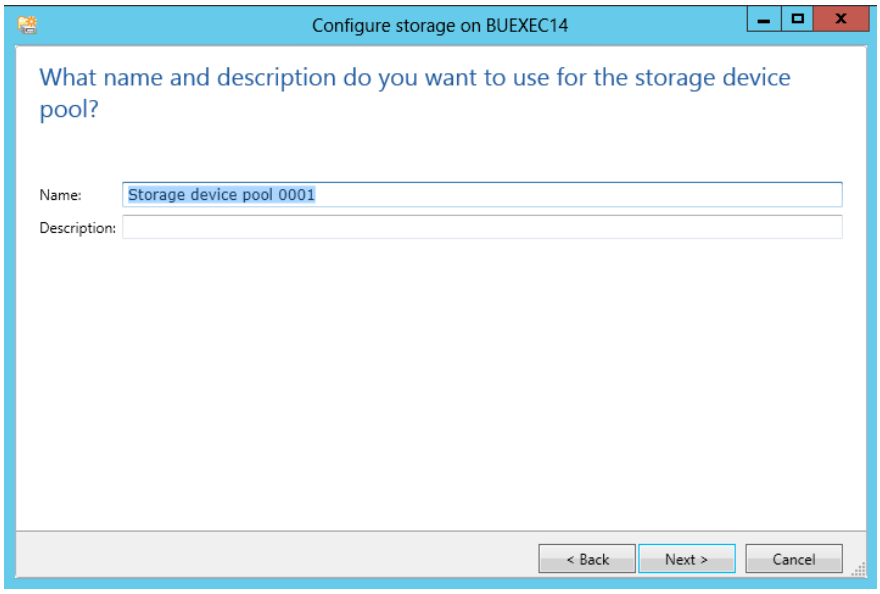

Figure 13 Storage pool name

6. Enter the type of storage device to create. Select **Disk storage** and click **Next** (Figure 14).

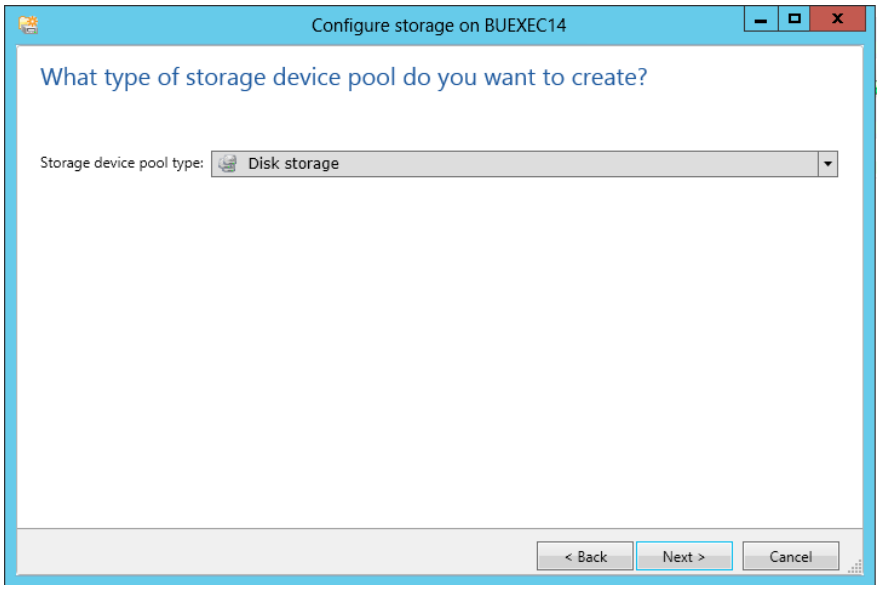

Figure 14 Type of storage device pool

7. Choose the storage device(s) to add to the storage device pool, then click **Next** (Figure 15).

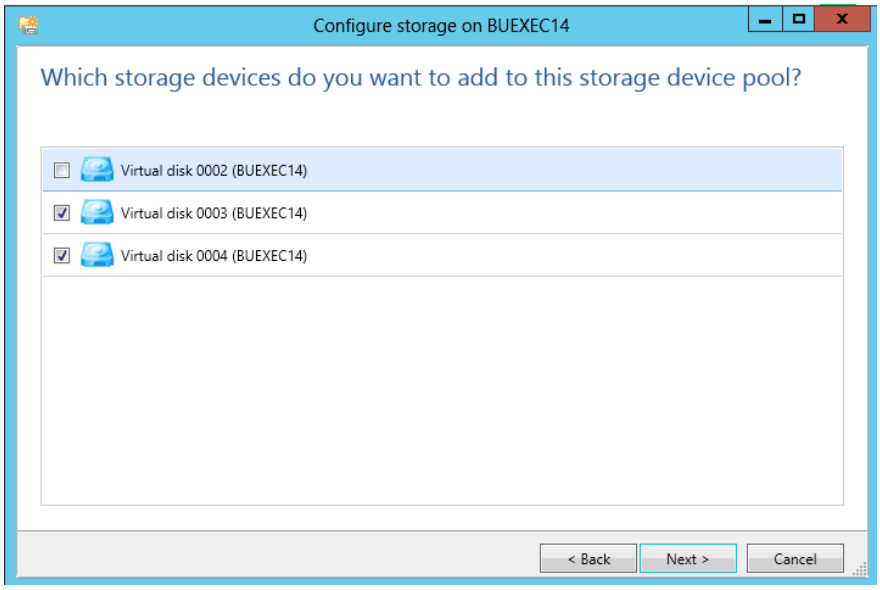

Figure 15 Add devices

8. The Storage configuration summary is displayed (Figure 16). Review then click **Finish**.

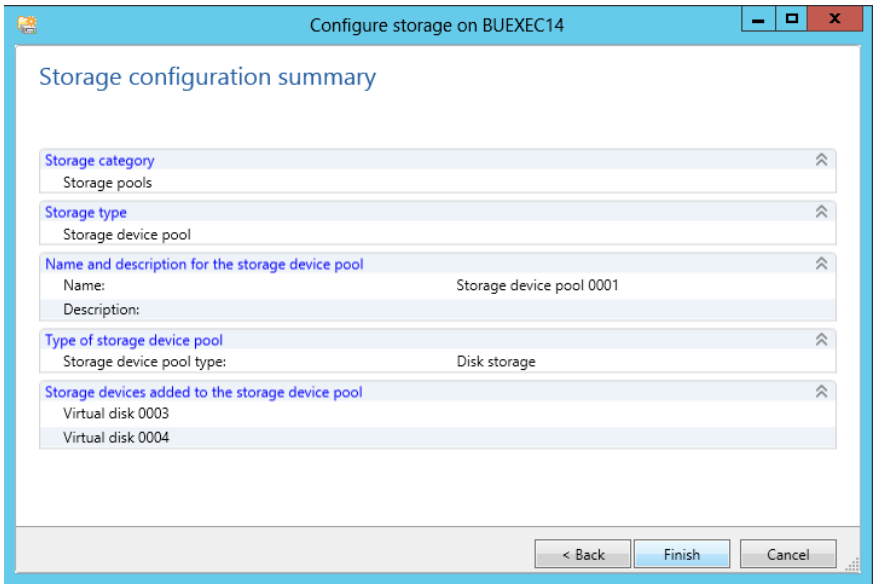

Figure 16 Storage configuration summary

9. When you are returned to **Storage**, **All Storage,** a new All Storage Pools group is displayed with the new Storage device pool 0001 listed (Figure 17).

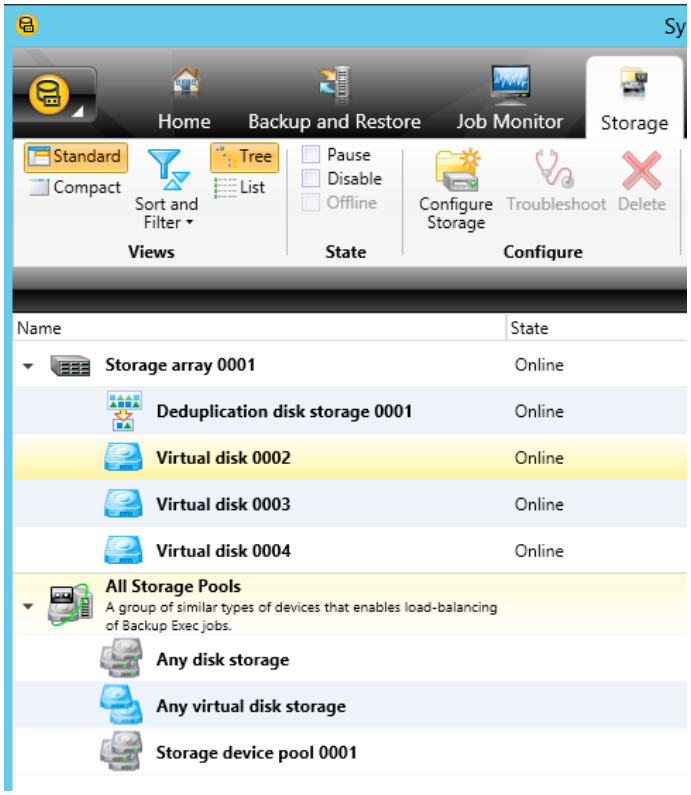

Figure 17 Storage device pool 0001

8 Creating an off-host backup job for NTFS volume(s)

To back up an NTFS volume to disk using VSS, follow these steps on the backup server:

1. In the Backup Exec tool bar, click the **Backup and Restore tab**, and then in the selection pane, right click the server to backup and choose **Backup to Disk** (Figure 18).

Note: If this volume(s) is on a virtual machine, Backup Exec presents a warning that the recommended method for backing up a virtual machine is to select it from the virtual host view in order to use GRT. However, if you are backing up application data such as Exchange or SharePoint on iSCSI in the guest volumes, then you can safely ignore that warning. All data in this paper is stored on Dell PS Series arrays and presented as iSCSI volume(s) to the respective virtual machine(s). In this case, GRT will work with the volumes as noted in this paper.

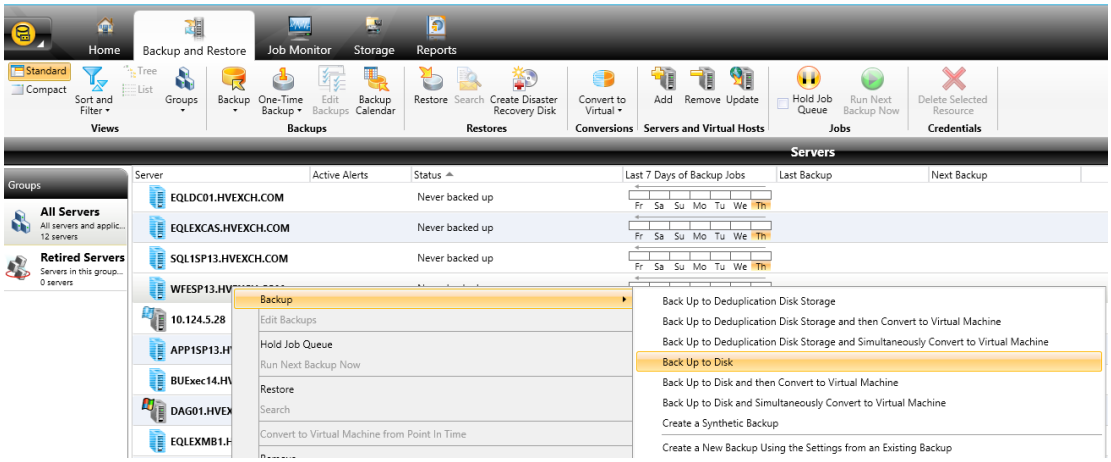

Figure 18 Backup job properties - selecting an NTFS file system

2. Specify the file system to back up. Under **Backup Definition Properties** in the left-most panel, to the right of Test/Edit Credentials, click **Edit** (Figure 19). The **Backup Selections** window appears (Figure 20). To backup data on any backup client that is running an agent, expand **Resources** and then expand a client to display all available remote objects. Select the NTFS objects to back up, then click **OK**.

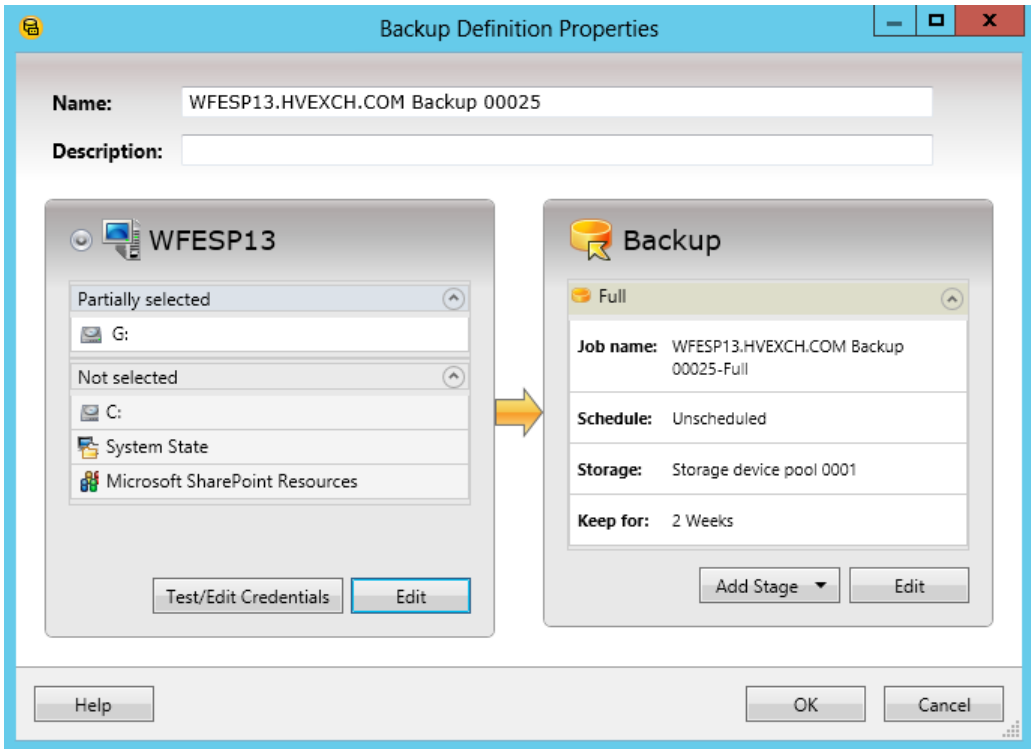

Figure 19 Backup Definition Properties – device and media

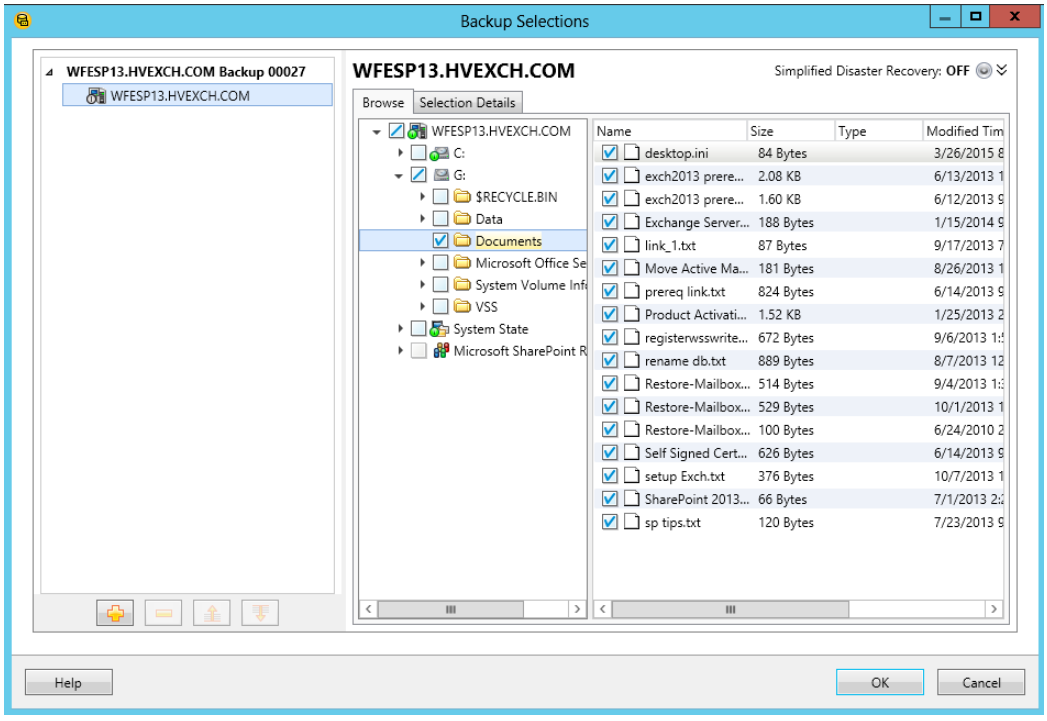

Figure 20 Backup Selections window

3. On the **Backup Definition Properties** page in the right-most panel, click **Edit** (Figure 19). This job used a full backup job; select **Create without schedule** in the Full job template, and click the **x** beside the **Incremental** job template to delete it (Figure 21). Specify the backup storage for the objects you selected in step 2. In the left-most panel of the Backup Options window, select **Storage**, then click on the down arrow beside Storage in the center panel and select **Virtual disk 0002 or any Storage device pool or virtual disk** (Figure 22).

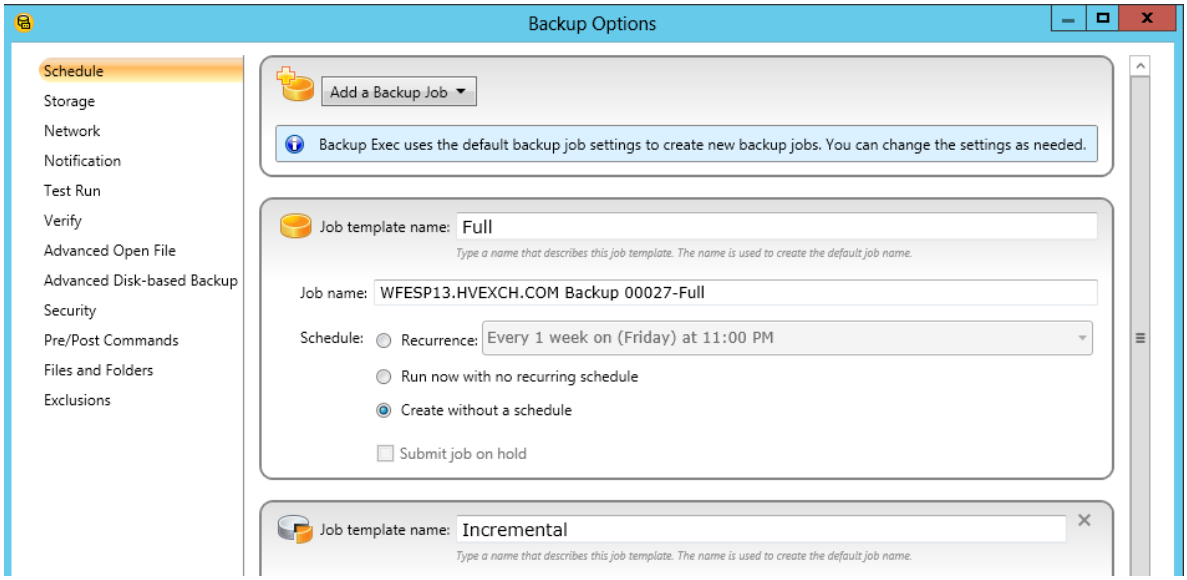

Figure 21 Select Full job and delete Incremental

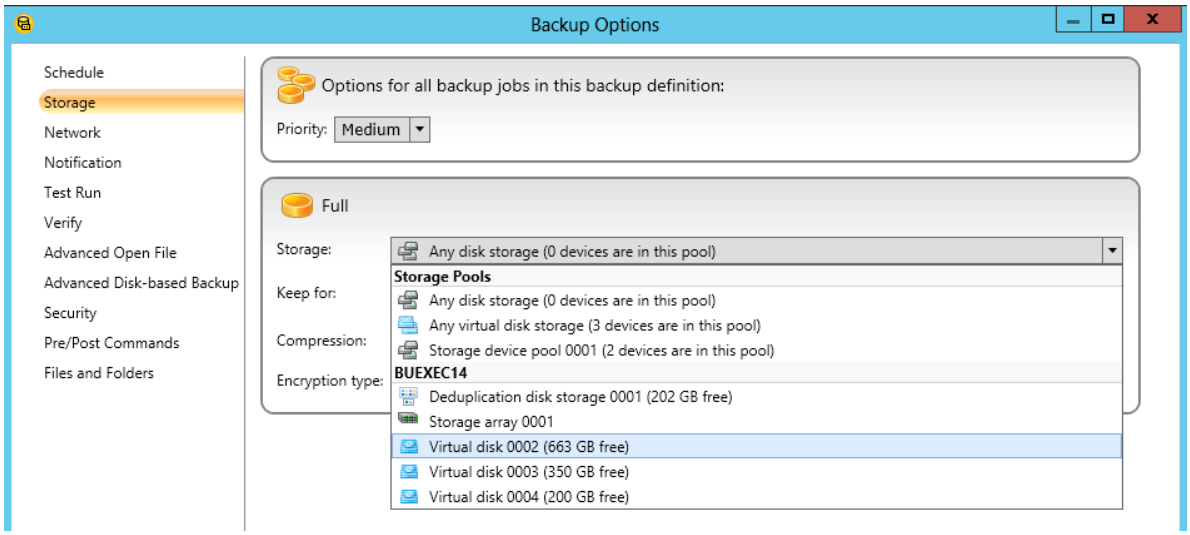

Figure 22 Backup Storage

4. To create transportable snapshots, use the **Advanced Disk-based Backup** option in the left-most panel of the **Backup Options** window. The Backup Options – Advanced Disk-based Backup window (Figure 23) appears. Select **Use offhost backup to move backup processing from remote computer to Backup Exec server**. It is recommended to select **Fail the backup job** if selections do not support offhost backups.

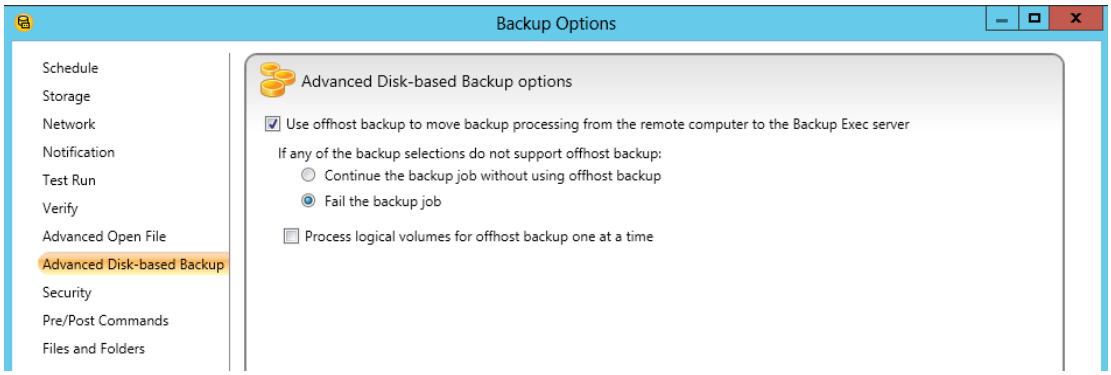

Figure 23 Backup Options – Advanced Disk-based Backup

Note: For more on transportable snapshots, see "About the Offhost Backup Feature" section in the *Symantec Backup Exec 2014 Administrator's Guide*.

For transportable snapshots, in the left-most panel of the Backup Options window, select **Advanced Open File**. The Backup Options – Advanced Open File options window shown in Figure 24 appears. It is okay to leave the default Snapshot provider at **Automatic,** Backup Exec has always correctly picked the PS Series hardware provider. You can also choose a hardware provider as shown in Figure 24. Click **OK** when done and then **OK** again to finish. This will appear in the **Jobs** list under the **Job Monitor** tab.

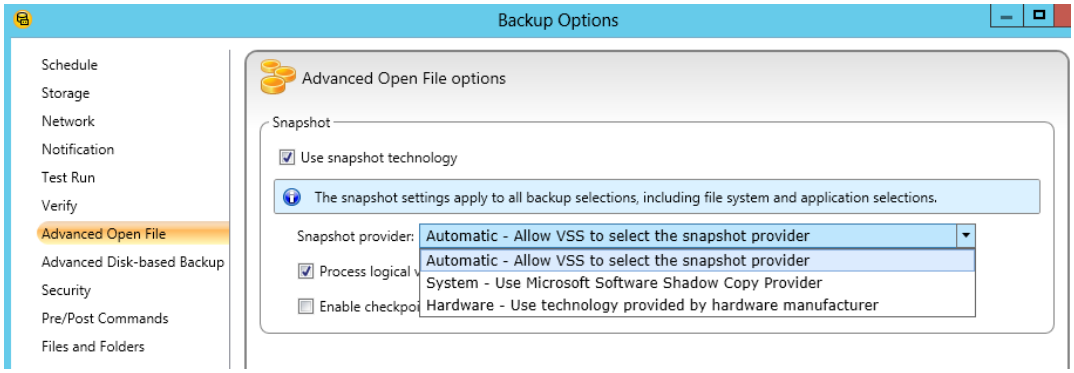

Figure 24 Backup job properties – Advanced Open File options

5. To start the backup job immediately from the **Job Monitor** > **Jobs** section, right click the job and select **Run Now**.

   Alternately, you can schedule the job, from the **Job Monitor** > **Jobs** section, right click the job and select **Edit**. In the **Backup Definition Properties** page in the right-most panel, click **Edit**. In the left-most panel of the Backup Options window, select **Schedule**, in the center panel select **Schedule** and then click the down arrow beside Storage and the schedule dialog box shown in Figure 25 appears.

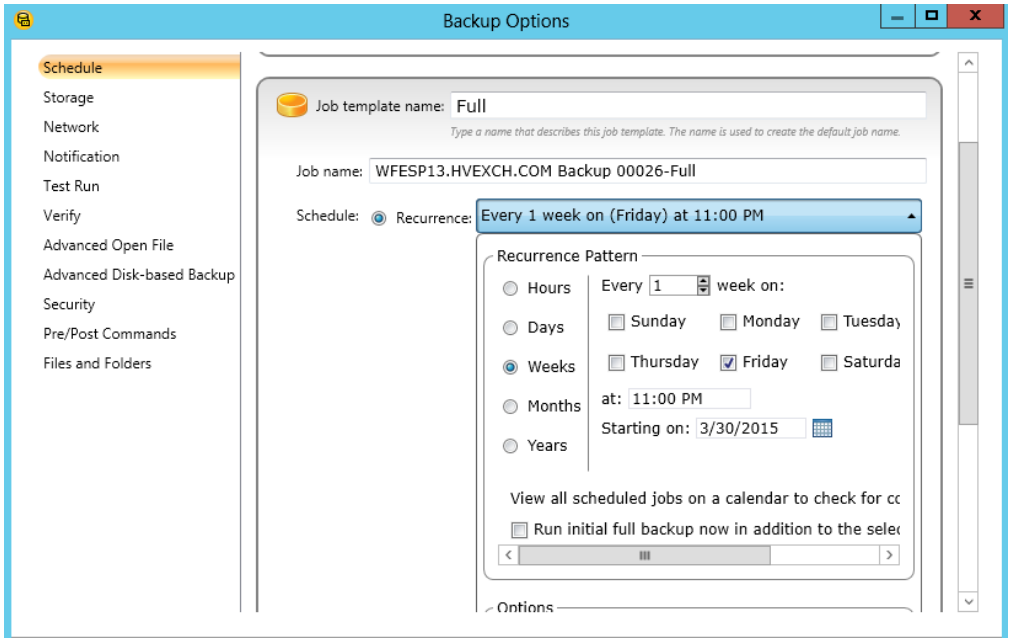

Figure 25 Backup Job Properties – Schedule

6. Select your **Recurrence Pattern** where you can set backup schedule options. Click **OK,** then **OK** again to create and activate the schedule.

7. Monitor the backup job. You can monitor both running and scheduled jobs. In the Backup Exec tool bar, click the **Job Monitor** tab. The **Backup Job Monitoring and Status** window (Figure 26) appears.

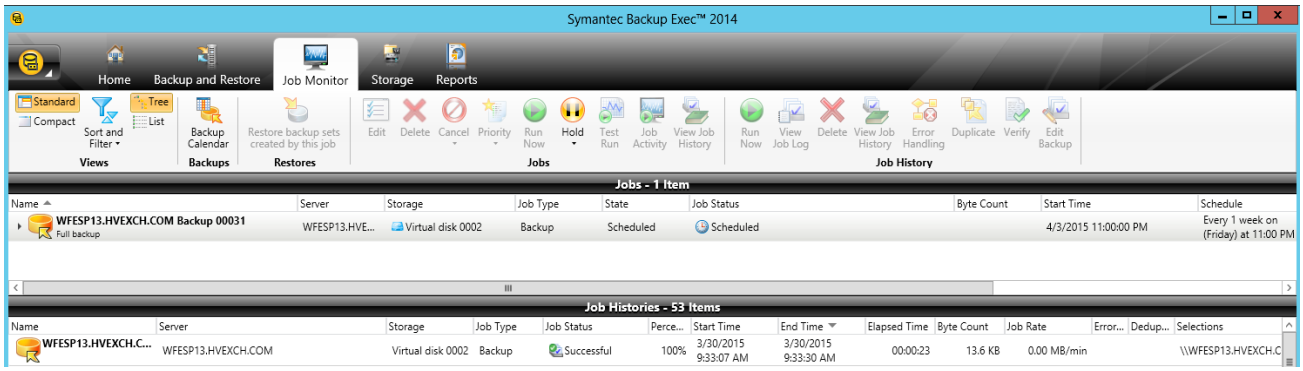

Figure 26 Job Monitor

8. To get the status of jobs, right-click a job in the **Job History** panel and then select **view job log.** Click the **Job History** tab (Figure 27) and then click **Expand All,** scroll down to review history of the selected job. Click the **Job Log** tab and then click **Expand All,** scroll down and locate the server name and ensure that the job is using the Microsoft Shadow Copy Service and the PS Series VSS provider (Figure 28).

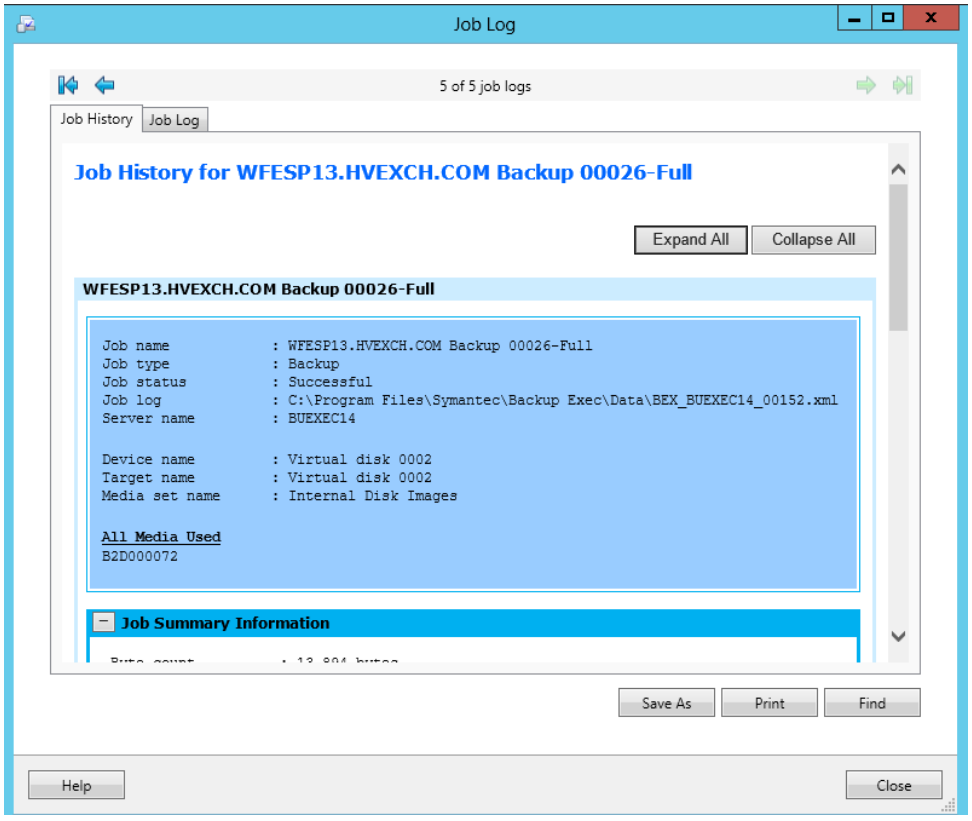

Figure 27 Job History

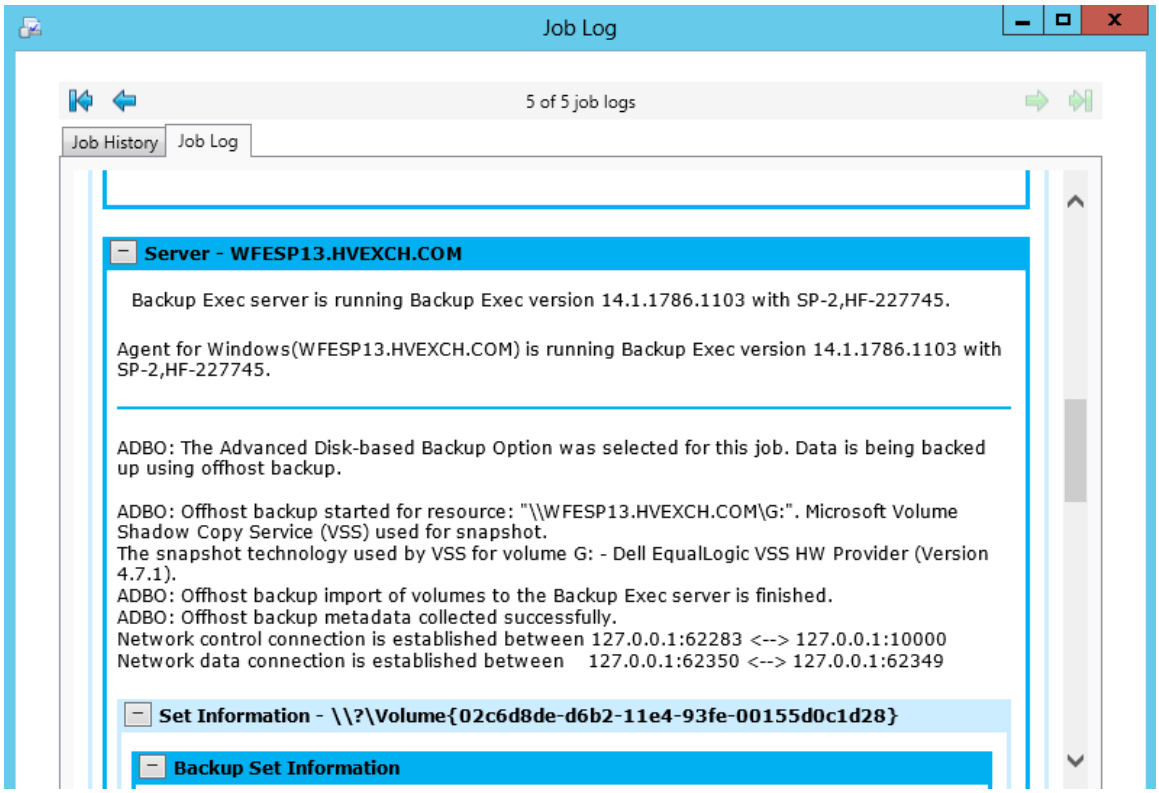

Figure 28 Job Log – Symantec ADBO with VSS and Auto-Snapshot Manager

9 Creating an off-host backup job for Microsoft Exchange 2013

Follow Microsoft Exchange Server 2013 installation instructions to install the application and configure it to use the PS Series volumes that will be backed up. For more information, see the document, *Deploying Microsoft Exchange Server 2013 with Dell EqualLogic PS Series Arrays.*

Before proceeding with this section, read "Snapshot and offhost backups with the Exchange Agent" in the *Symantec Backup Exec 2014 Administrator's Guide*.

Note: Review the section, Creating an Off-Host Backup Job for NTFS Volume(s) in this paper for navigation steps required when working with backup definitions.

Follow the steps below on the backup server to back up Exchange using the Advanced Disk-based Backup Option (ADBO) offhost:

1. In the **Backup Exec** toolbar, click the **Backup and Restore tab**, and in the **Selection** pane, right-click the server to backup and choose **Backup to Disk**.
2. Specify the Exchange data that you want to back up. Under **Backup Definition Properties** in the left-most panel and to the right of **Test/Edit Credentials**, click **Edit** (Figure 29).

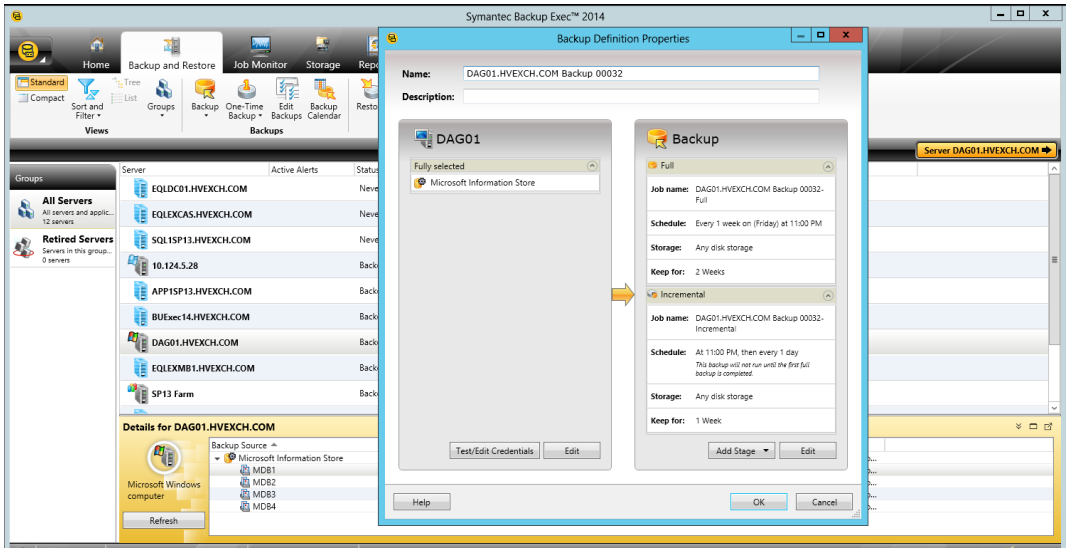

Figure 29 Specify the Exchange data

3. In the **Backup Selections** window (Figure 30), under the **Exchange DAG01**, expand **Microsoft Information Store**, select the database(s) you want to back up, then click **OK**.

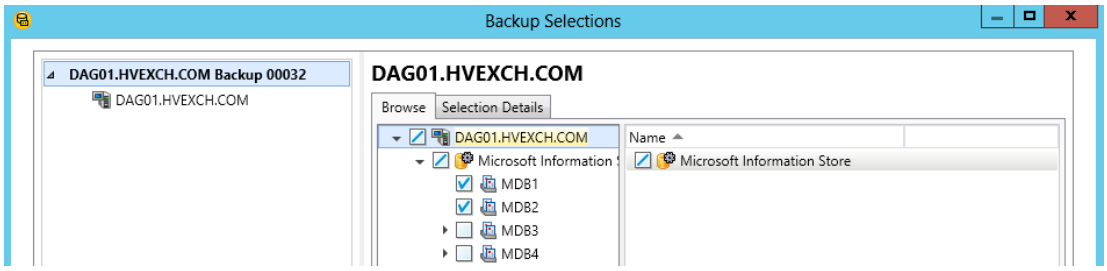

Figure 30 Backup Selections – selecting Exchange database(s)

4. On the **Backup Definition Properties** page in the right-most panel and to the right of **Add Stage**, click **Edit** (Figure 29).
5. For this example job, use a full backup job. Select **create without schedule** in the Full job template under **Schedule** and click the **x** next to the Incremental job template to delete it.
6. Specify the backup storage for the objects selected in step 2. In the left-most panel of the **Backup Options** window, select **Storage**, click the down arrow next to **Storage** in the center panel, and select **Virtual disk 0002 or any available Storage device pool or virtual disk**.
7. To create transportable snapshots, use the ADBO. In the left-most panel of the **Backup Options** window, select **Advanced Disk-based Backup**. The **Backup Options > Advanced Disk-based Backup options window** appears.
8. Select **Use offhost backup to move backup processing from remote computer to Backup Exec server**. It is recommended to select **Fail the backup job** if selections do not support offhost backups (Figure 31).

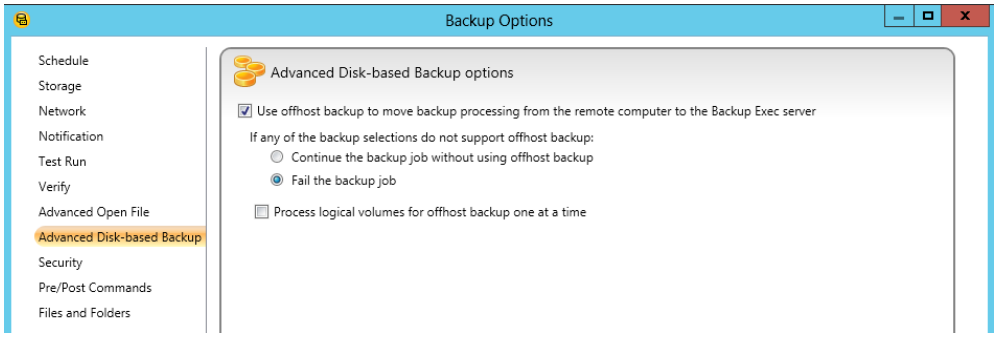

Figure 31 Advanced Disk-based Backup options

Note: For more information on transportable snapshots, see the section, "About the Offhost Backup Feature" in the *Symantec Backup Exec 2014 Administrator's Guide*.

For transportable snapshots, in the left-most panel of the **Backup Options** window, select **Advanced Open File**. The **Backup Options > Advanced Open File options** window appears. This example uses the defaults including **Automatic** for the Snapshot provider**.** Backup Exec has

correctly picked the EqualLogic hardware provider. You can also choose the hardware provider as shown in Figure 32.

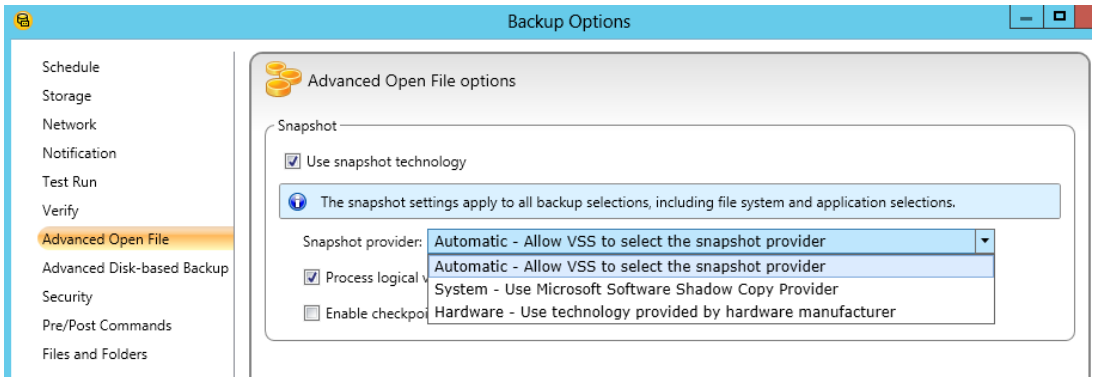

Figure 32 Backup job properties - Advanced Open File options

9. Specify the Exchange options. In the left-most panel of the **Backup Options** window, select **Microsoft Exchange**. The **Backup Options > Microsoft Exchange options** window appears.
10. Choose the desired options (Figure 33), click **OK**, and then click **OK** again to finish. This job will be listed in **Jobs** under the **Job Monitor** tab.

Note: You can enable the Backup Exec Granular Recovery Technology (GRT) option for offhost backups of Exchange resources. When you select the GRT option for a backup, Backup Exec collects additional information for the catalog. This information lets you restore individual mailboxes, mail messages, and public folders from Information Store backups.

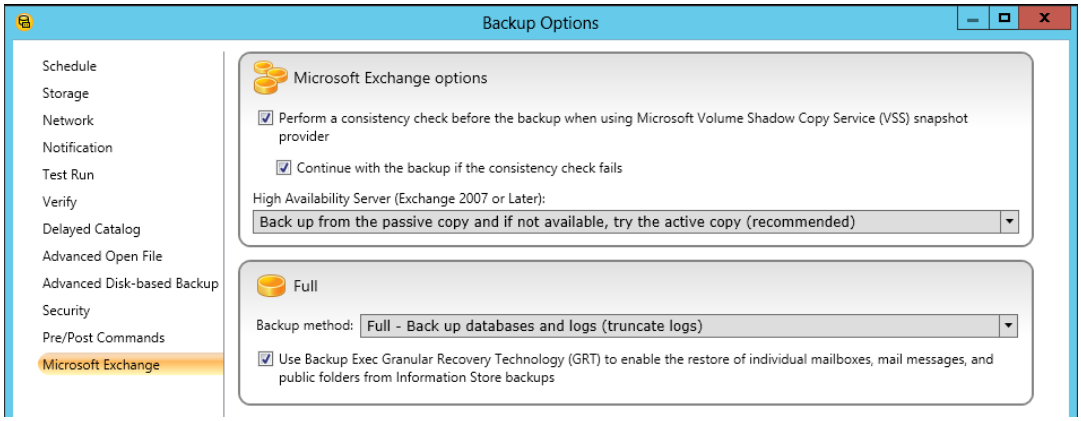

Figure 33 Backup Options – Microsoft Exchange options

11. To start the backup job immediately, from the **Job Monitor** > **Jobs** section, right-click the job and select **Run Now**.

    Alternately, you can schedule the job. In **Properties > Frequency**, select **Schedule**. The Backup Job Properties **>** Schedule window appears.

12. Select **Run according to schedule** to display the Backup Job Scheduling dialog box where you can set the options for the backup schedule. Click **OK** to create and activate the schedule. Click **Edit Schedule Details** if you need to make further changes to the schedule.
13. You can monitor both running and scheduled jobs. In the Backup Exec toolbar, click **Job Monitor** to open the Backup Job Monitoring and Status window (Figure 34).

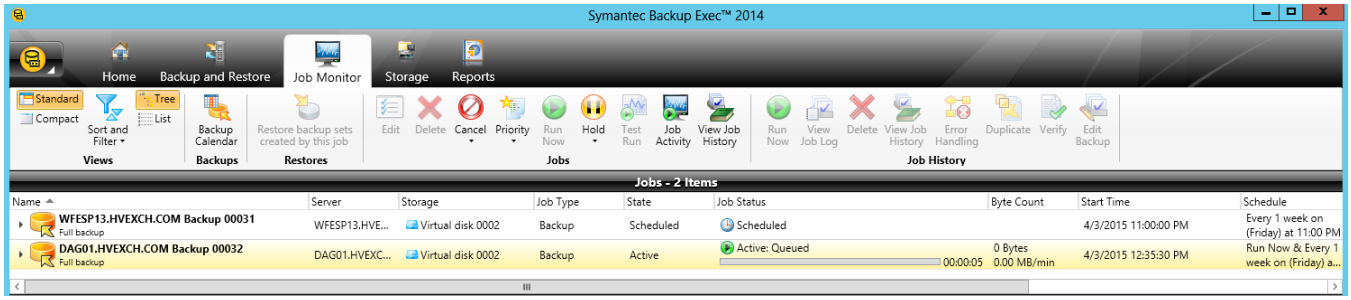

Figure 34 Monitor both running and scheduled jobs

14. To view the status of jobs, right-click a job in the **Job History** panel, then select **view job log** (Figure 35).

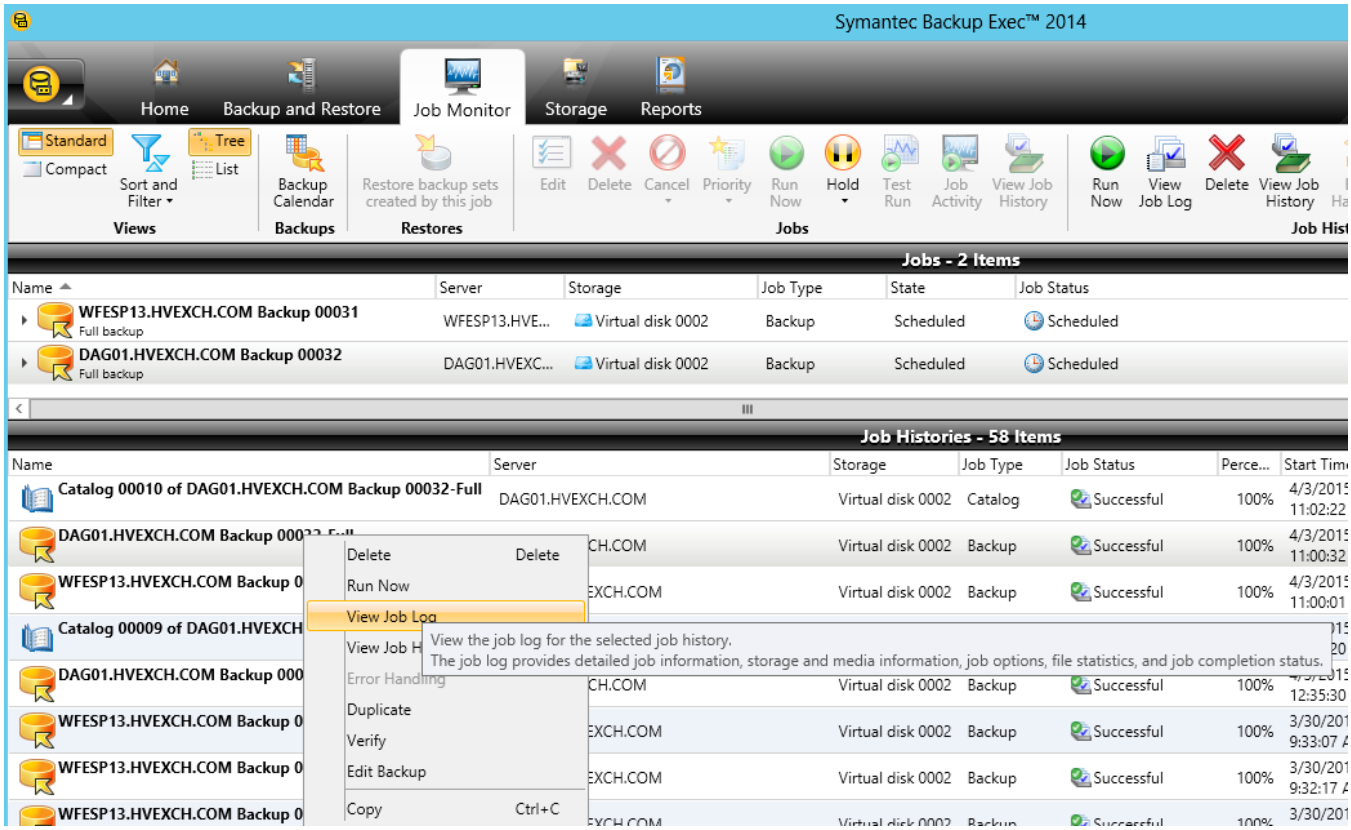

Figure 35 Select View Job Log

15. Click the **Job History** tab (Figure 36), click **Expand All,** and scroll down to review history of the selected job.

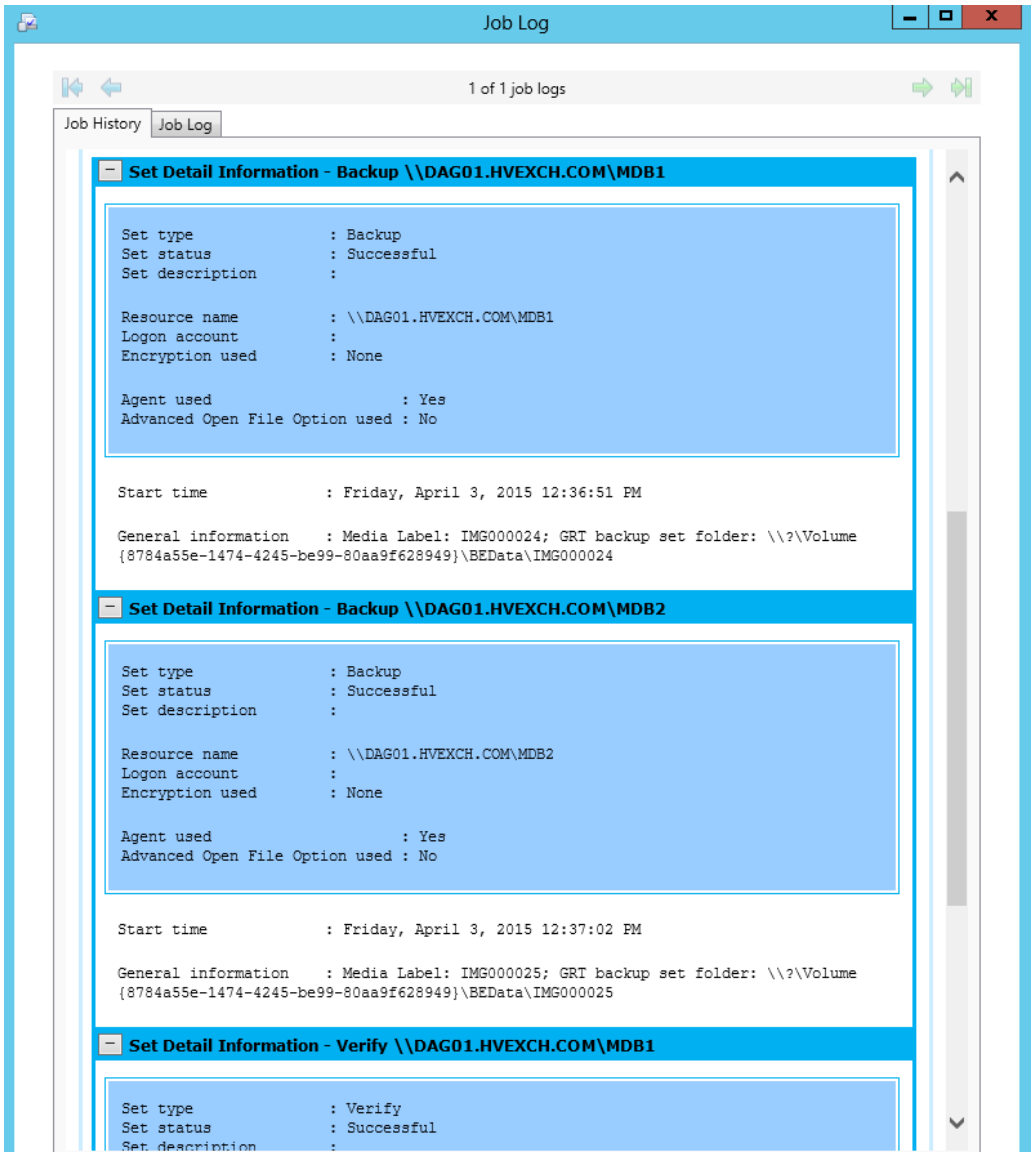

Figure 36 Job History – completed Exchange backup job

16. Click the **Job Log** tab, click **Expand All,** scroll down and locate the server name, and ensure that the job is using the **Microsoft Shadow Copy Service** and the **EqualLogic VSS** provider (Figure 37).

Note: Figure 37 shows that Backup Exec (VSS Requester) told the PS Series group (VSS Provider) to create snapshots of the Exchange data. Next, Backup Exec connected to the volumes (mounted) so it could do the Full backup. It also shows that Backup Exec Granular Recovery Technology (GRT) option was used.

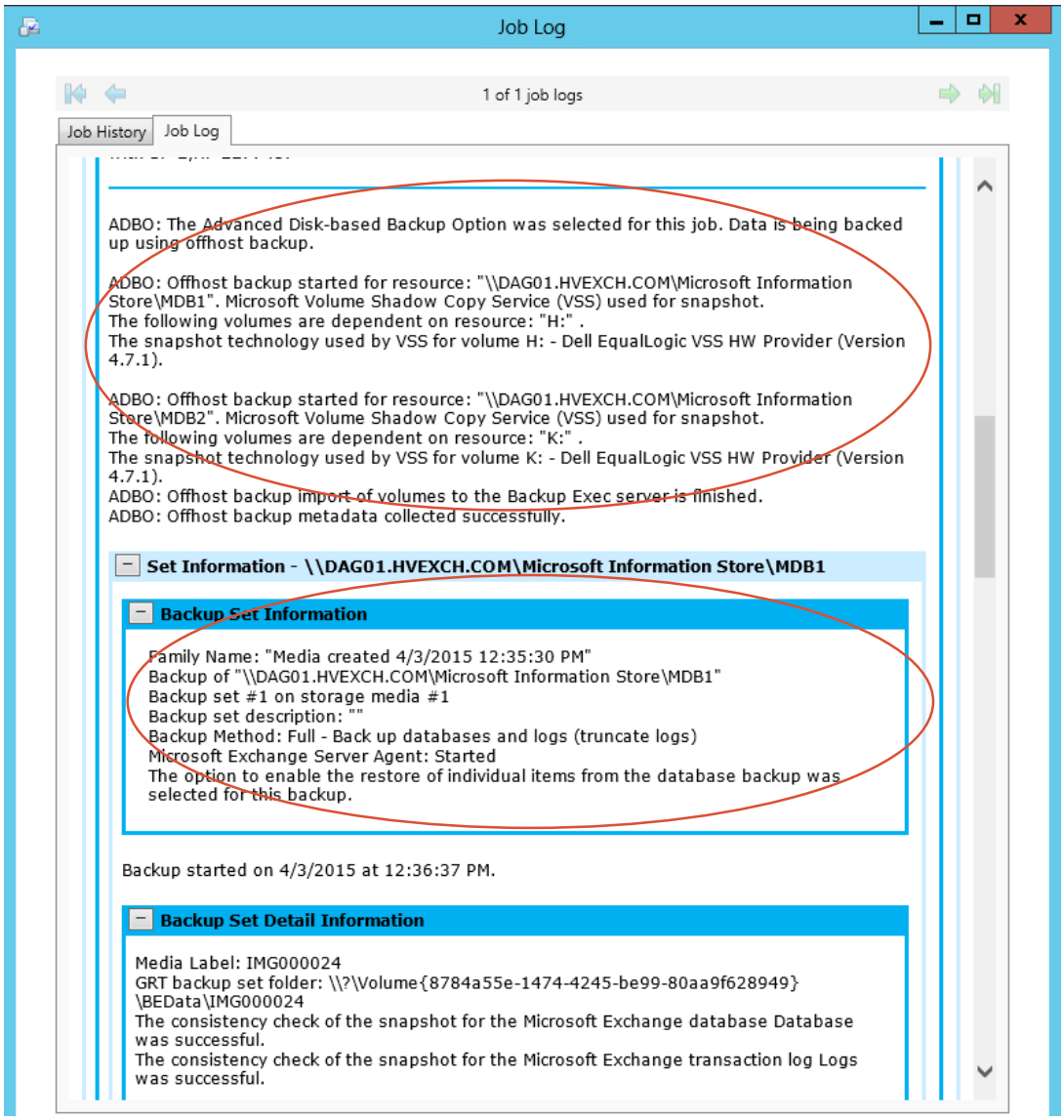

Figure 37 PS Series Group Manager GUI - Job Log

10 Creating a VSS backup job for Microsoft SharePoint 2013

Follow the Microsoft SharePoint 2013 installation instructions to install the application and configure it to use PS Series volumes. For more information, see the following document: *Deploying SharePoint 2013 Using a Dell EqualLogic PS Series iSCSI SAN.*

Before proceeding with this section, review "Using Snapshot Technology with the SharePoint Agent" in the *Symantec Backup Exec 2014 Administrator's Guide*.

Follow the steps below on the backup server to back up SharePoint using VSS.

1. In the **Backup Exec** toolbar, click the **Backup and Restore tab**, and in the **Selection** pane, right-click the SharePoint server to back up and choose **Backup to Disk**.
2. Specify the SharePoint farm to back up. Under **Backup Definition Properties** in the left-most panel and to the right of **Test/Edit Credentials**, click **Edit** (Figure 38).

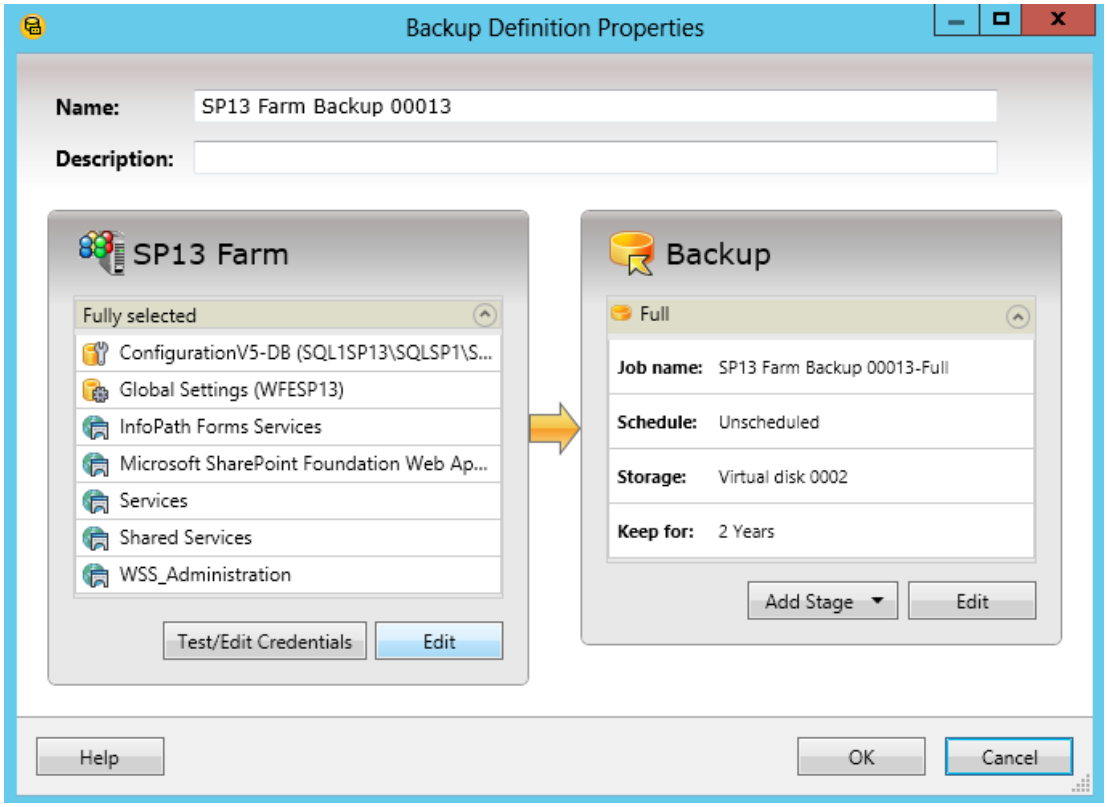

Figure 38 Backup Definition Properties

3. The **Backup Selections** window appears (Figure 39). Under the SharePoint farm, expand the farm name, select or de-select the item to back up, and click **OK**. For this example, all farm content was backed up.

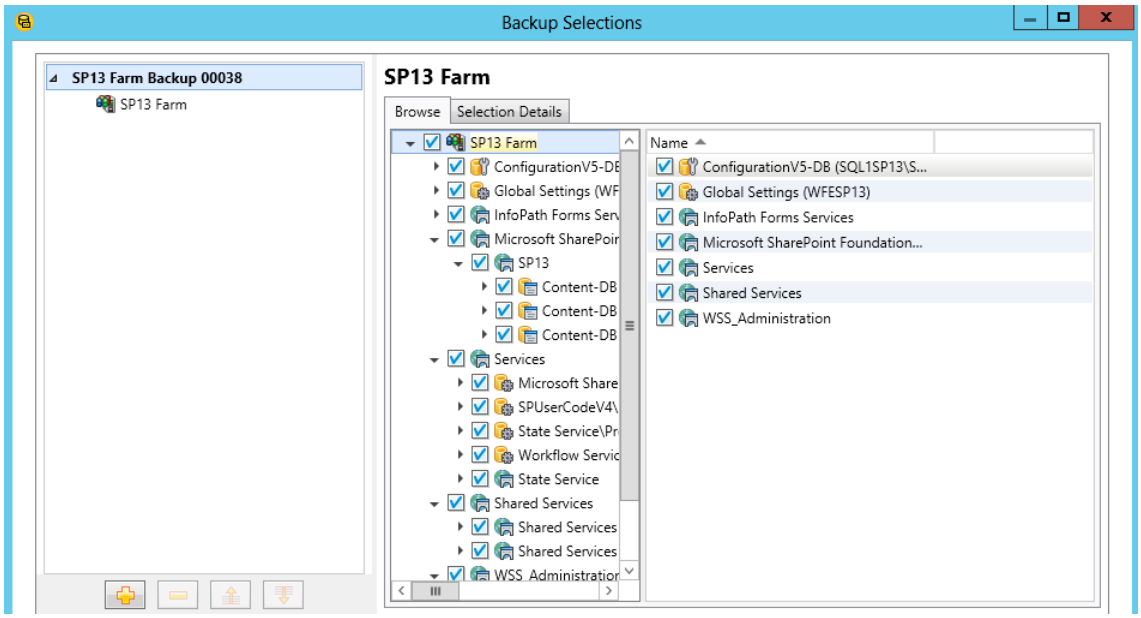

Figure 39 Backup Selections – selecting SharePoint farm

Note: You can enable the Backup Exec Granular Recovery Technology (GRT) option for backups of SharePoint resources. When you select the GRT option for a backup, Backup Exec collects additional information for the catalog. This information lets you restore individual documents, images, sites, and subsites as well as lists and list items from backups.

4. Specify the backup storage for the objects selected in step 2. In the left-most panel of the **Backup Options** window, select **Storage**, click the down arrow next to **Storage** in the center panel, and select **Virtual disk 0002 or any Storage device pool or virtual disk**.
5. For transportable snapshots, in the left-most panel of the **Backup Options** window, select **Advanced Open File**. The **Backup Options > Advanced Open File options** window appears. This example uses the defaults including **Automatic** for Snapshot provider. Backup Exec has correctly picked the EqualLogic hardware provider. You also can choose **Hardware** provider as shown in Figure 40.

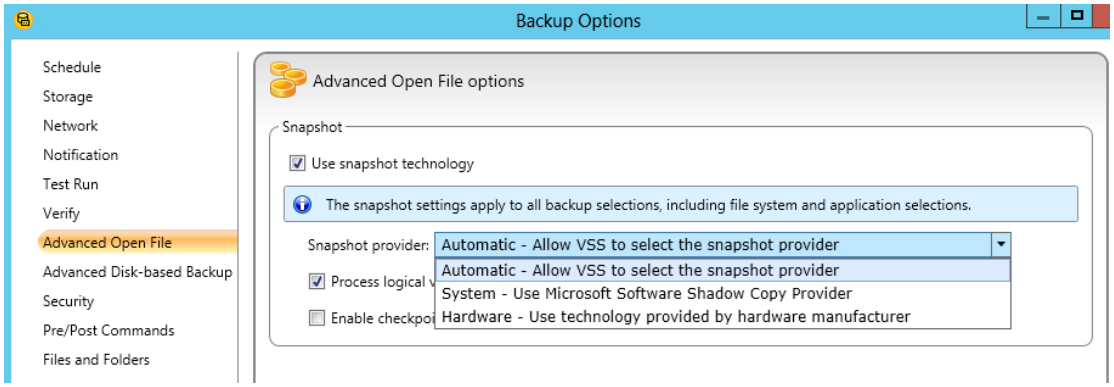

Figure 40 Backup Options – Advanced Open File options

6. Specify the SharePoint options. In the left-most panel of the **Backup Options** window, under **Settings**, select **Microsoft SharePoint**. The Backup Options > Microsoft SharePoint options window shown in Figure 41 appears. For this example, **Full** backup was selected and the Granular Recovery Technology (GRT) option was checked.

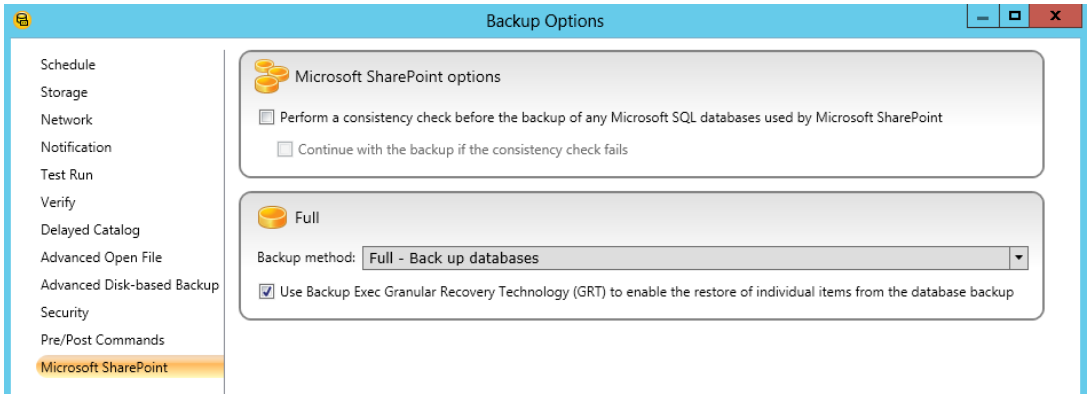

Figure 41 Backup Options – Microsoft SharePoint options

7. To start the backup job immediately from the **Job Monitor / Jobs** section, right-click the job and select **Run Now**.

   Alternately, you can schedule the job. In **Properties > Frequency**, select **Schedule**. The Backup Options > Schedule window appears. Select **Run according to schedule** to display the Backup Job Scheduling dialog box where you can set the options for the backup schedule. Click **OK** to create and activate the schedule. Click **Edit Schedule Details** if you need to make further changes to the schedule.

8. You can monitor both running and scheduled jobs. In the Backup Exec toolbar, click **Job Monitor**. The Backup Job Monitoring and Status window appears. Right-click a backup job in the **Current Jobs** or **Job History** panel and select **Properties** to display the Job History window (Figure 42).

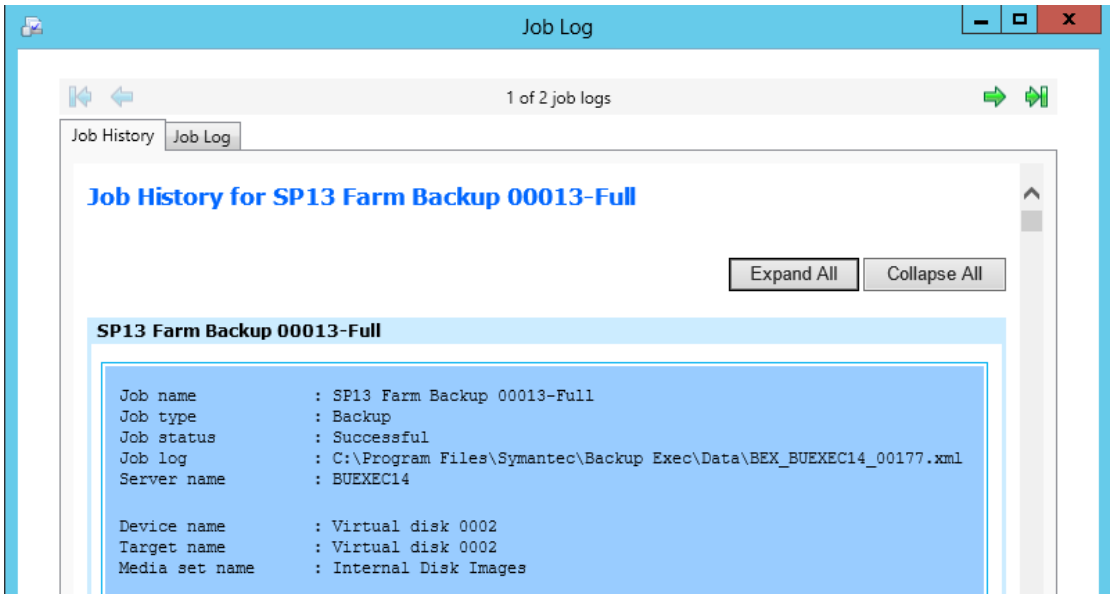

Figure 42 Job History – completed SharePoint backup job

9. Click the **Job Log** tab, scroll down, and ensure that the job is using Granular Recovery Technology (GRT) (Figure 43).

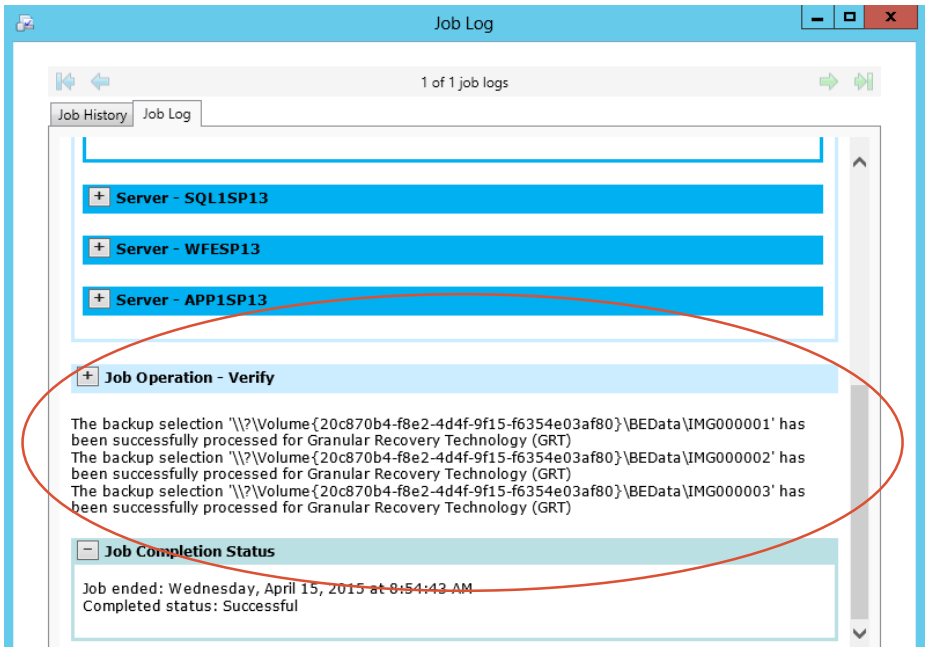

Figure 43 Backup – Job Log

11 Restoring NTFS files from an offhost backup

To restore NTFS files from a backup, follow these steps on the backup server:

1. On the **Backup and Restore** tab, in the list of servers or on the **Job Monitor** tab, right-click a server that has been backed up and click **Restore**.
2. Follow the **Restore Wizard** to restore the data. In the left-most panel, select from the backup job selections by expanding the date and selecting the folders. Then, from the right panel, navigate to select the files to restore (Figure 44).

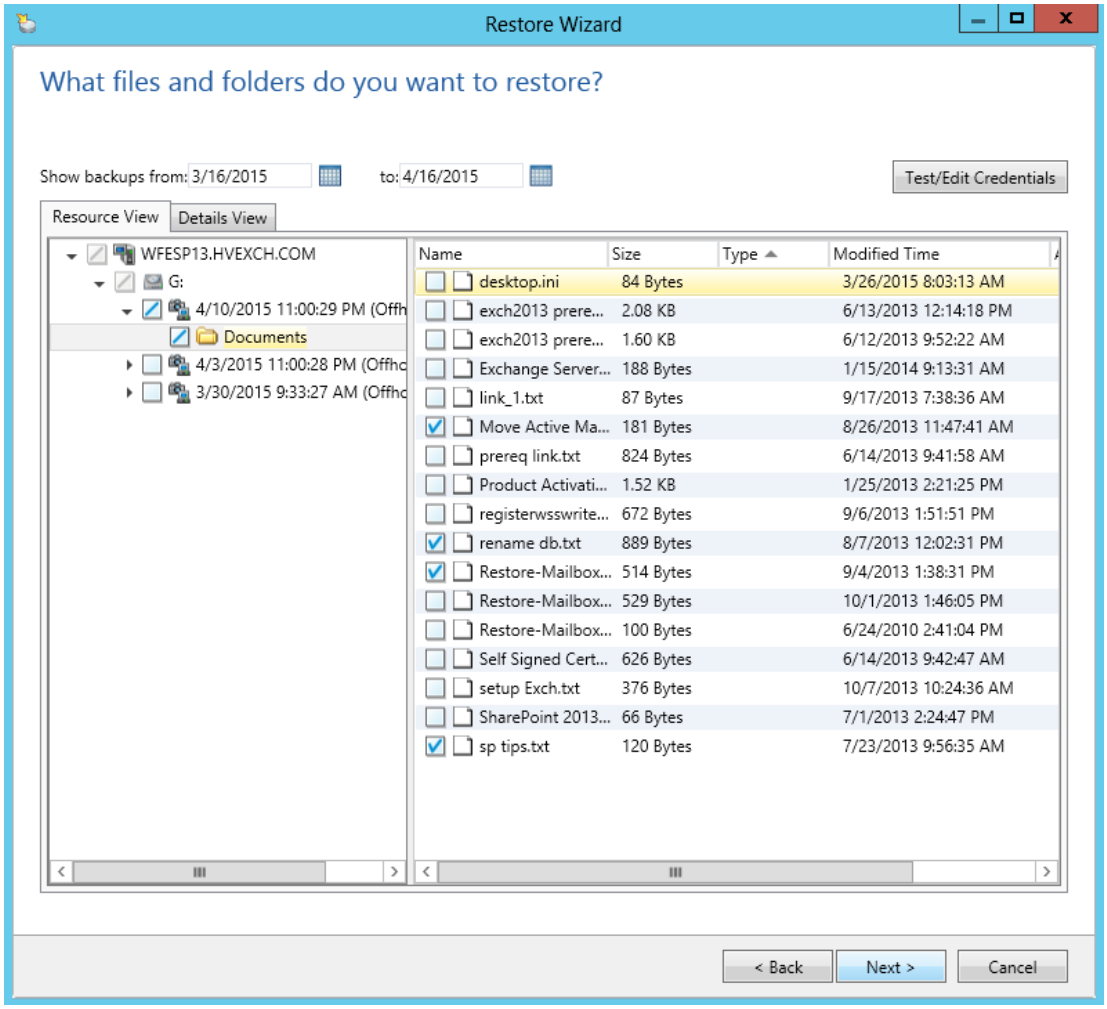

Figure 44 Restore Wizard – selecting the restore source

3. Select the restore destination. By default, the restore operation will restore to the original location of the files (Figure 45).

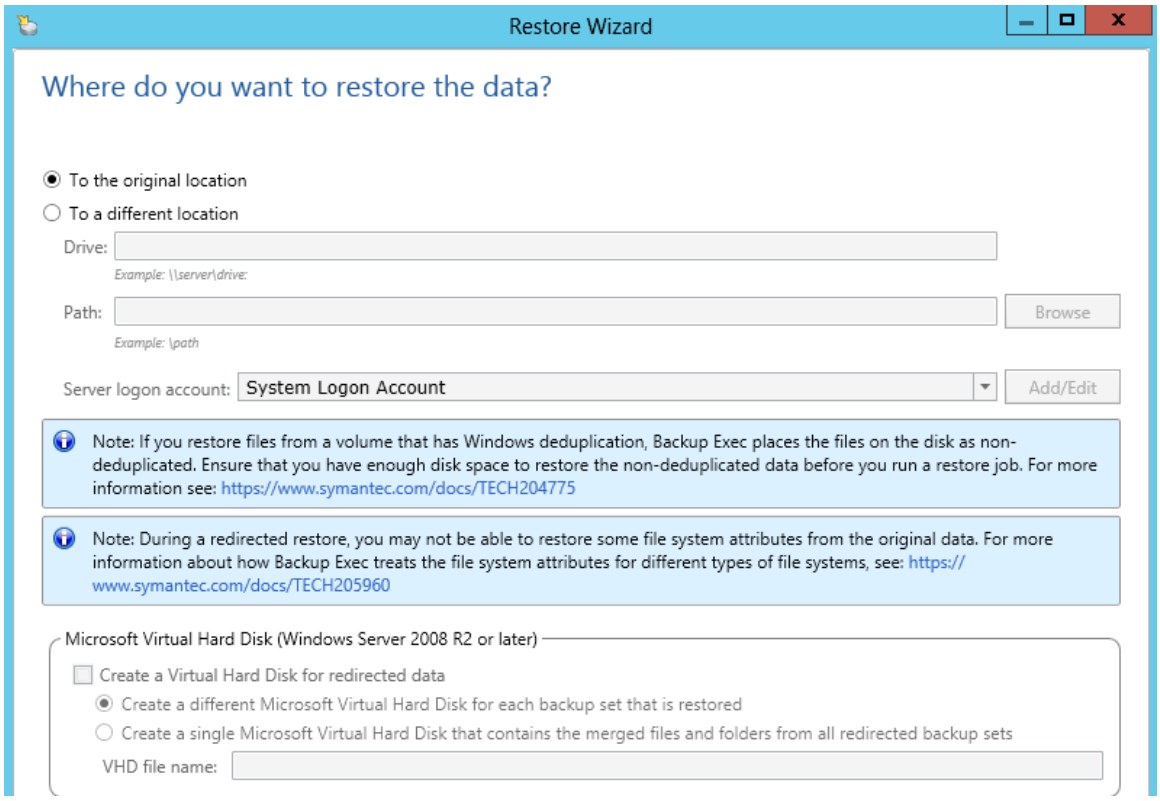

Figure 45 Restore destination

4. Click **Next** as the wizard walks through the restored data security screen, operating features, and tasks to perform before and/or after the restore screen. On the final screen the wizard requests the job name and schedule. For this example, defaults on all screens were chosen, including the default name and **Run now** for the schedule. Click **Next** at the end of each screen, review the restore summary screen, and click **Finish**.
5. You can monitor both running and scheduled jobs. In the Backup Exec tool bar, click **Job Monitor**. The Backup Job Monitoring and Status window appears. Right-click a backup job in the **Current Jobs** or **Job History** panel and select **Properties** to display the Job History window. Verify the restored files.

12 Restoring Microsoft Exchange 2013 from an offhost backup

With the Backup Exec 2014 Granular Recovery Technology (GRT) option for offhost backups of Exchange resources, you can restore individual mailboxes, mail messages, and public folders from Information Store or Storage Group backups.

Before proceeding with this section, review the *Symantec Backup Exec 2014 Administrator's Guide*.

To restore an Exchange Information Store or mail items, follow these steps on the backup server:

1. On the **Backup and Restore** tab, in the list of servers or on the **Job Monitor** tab, right-click a server (DAG) that has been backed up and click **Restore**.
2. The **Restore Wizard** displays several restore options (Figure 46). Because this example used GRT in the backup, **Microsoft Exchange mailbox items** was selected. Click **Next** as the wizard walks through the restore screens.

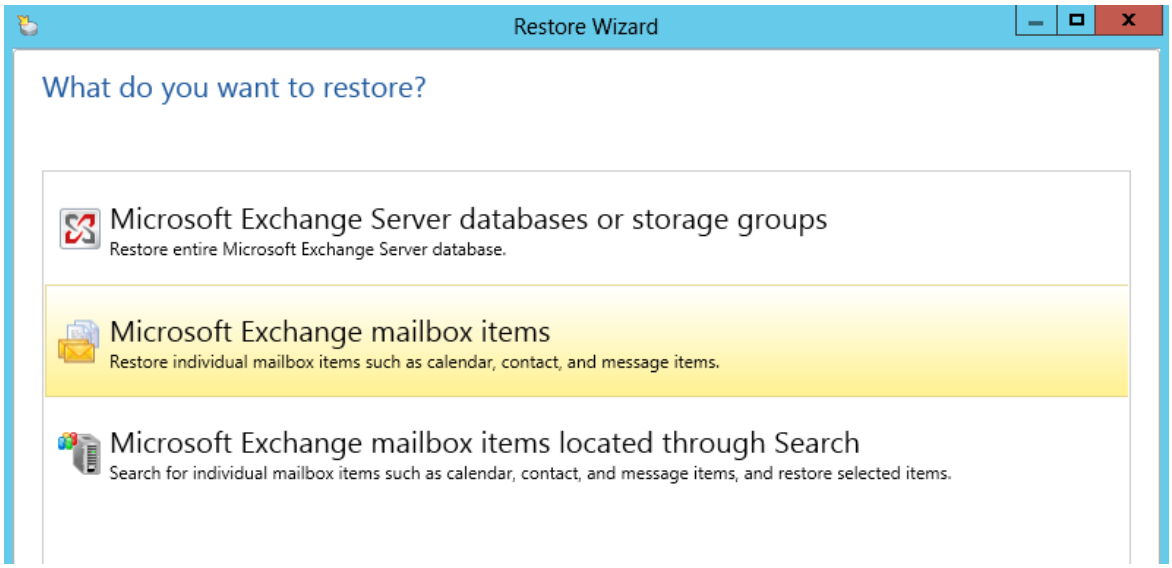

Figure 46 Restore Wizard – Exchange restore choices

3. In the left-most panel of the next screen, select from the backup job selections by expanding the date and selecting the folders. From the right panel, navigate further to select the file(s) to restore (Figure 47) and click **Next**.

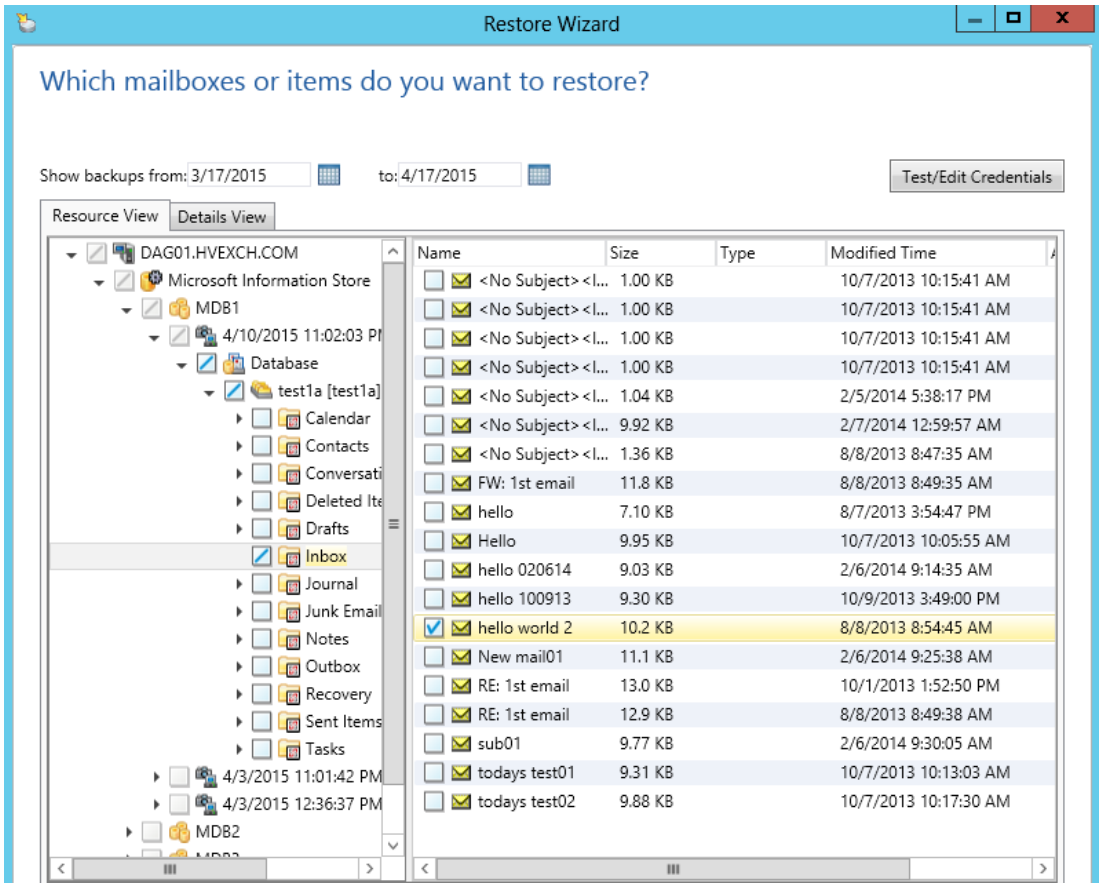

Figure 47 Selecting the Exchange restore source

4. Select the restore destination from the **Where do you want to restore the items** screen. When restoring, there are a few options. The first option is the default and will restore to the original location. The second option is to restore to a different location. This example used the defaults (original location). Select **Next**.
5. In the **How do you want to restore the items** screen, there are two choices: **Recreate user accounts and mailboxes if they do not already exist on the destination server**, and **Overwrite existing mail messages and folders**. This example used the defaults (all unchecked). Select **Next**.
6. The next wizard screen asks what tasks to perform before and/or after the restore. Leave this blank and select **Next.**
7. On the final screen, the wizard requests the job name and schedule. This example used the defaults on all screens including leaving the default name and **run now** for the schedule. Click **Next**, review the restore summary screen, and click **Finish** (Figure 48).

8. You can monitor both running and scheduled jobs. In the Backup Exec toolbar, click **Job Monitor**. The Backup Job Monitoring and Status window appears. Right-click a backup job in the **Current Jobs** or **Job History** panel and select **Properties** to display the Job History window.

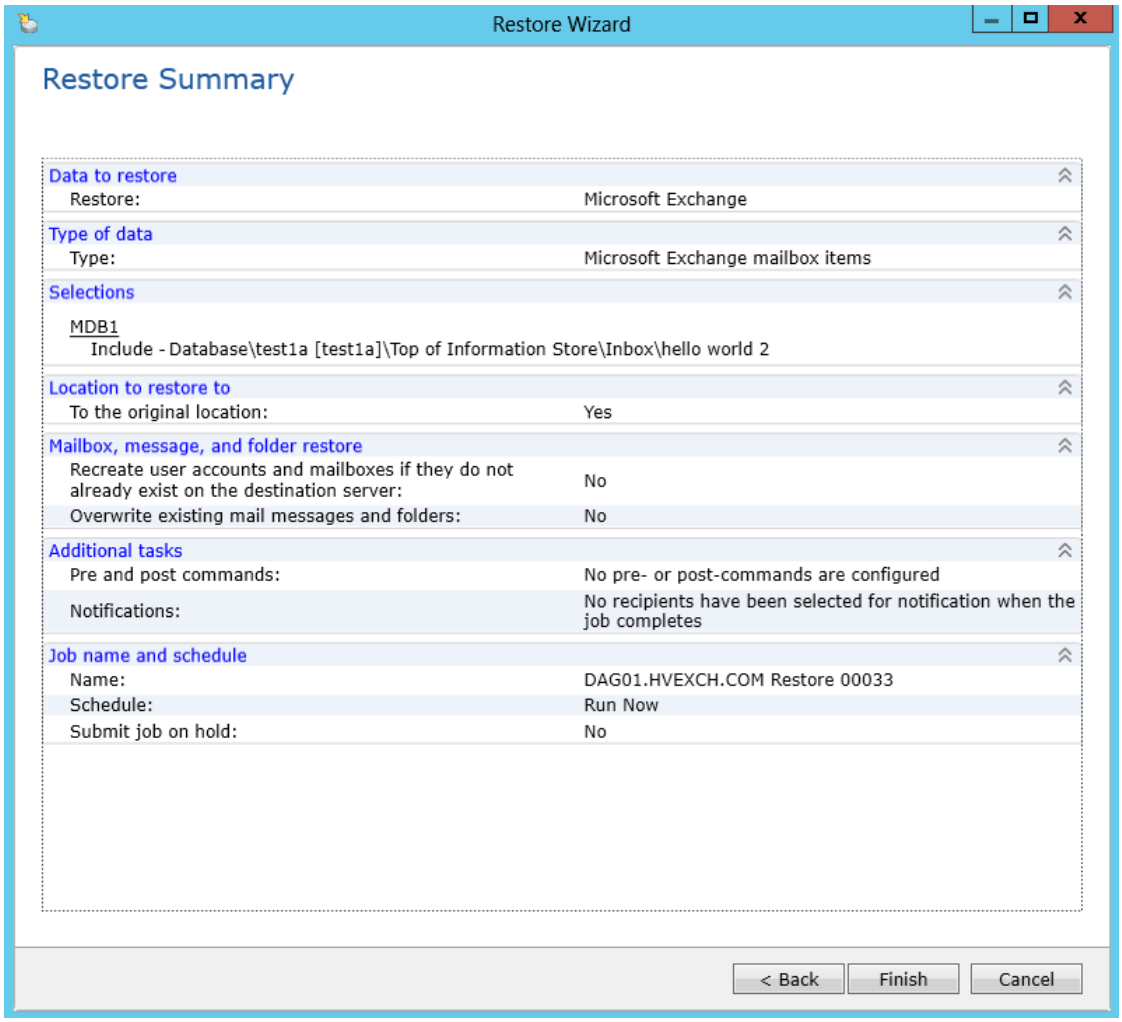

Figure 48 Restore summary

9. Verify the restored Exchange items (Figure 49).

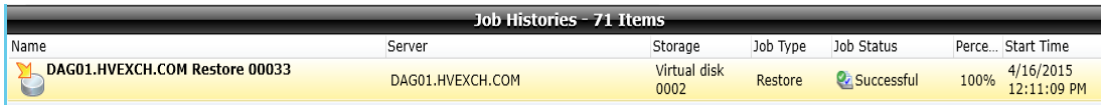

Figure 49 Job status is Successful

13 Restoring Microsoft SharePoint data from a VSS backup

To restore Microsoft SharePoint data from a VSS backup, follow these steps on the backup server:

1. On the **Backup and Restore** tab, in the list of servers or on the **Job Monitor** tab, right-click a server (farm) that has been backed up and click **Restore**.
2. When the **Restore Wizard** screen appears, click **Next**. The next screen lists a choice of restore options (Figure 50). Because this example uses GRT in the backup, select **SharePoint individual items**. Click **Next** as the wizard walks through the restore screens.

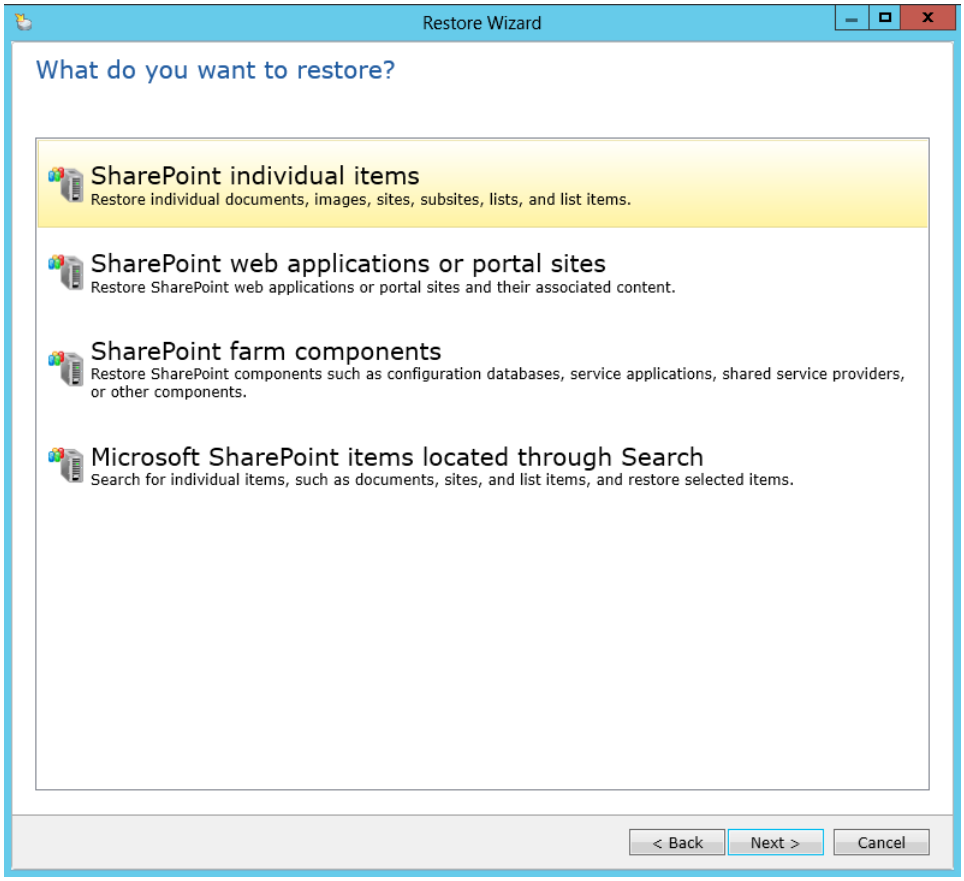

Figure 50 SharePoint restore options

3. In the left-most panel of the next screen, select from the backup job selections by expanding the date and selecting the folders. From the right panel, navigate to select the file(s) to restore (Figure 51) and click **Next**.

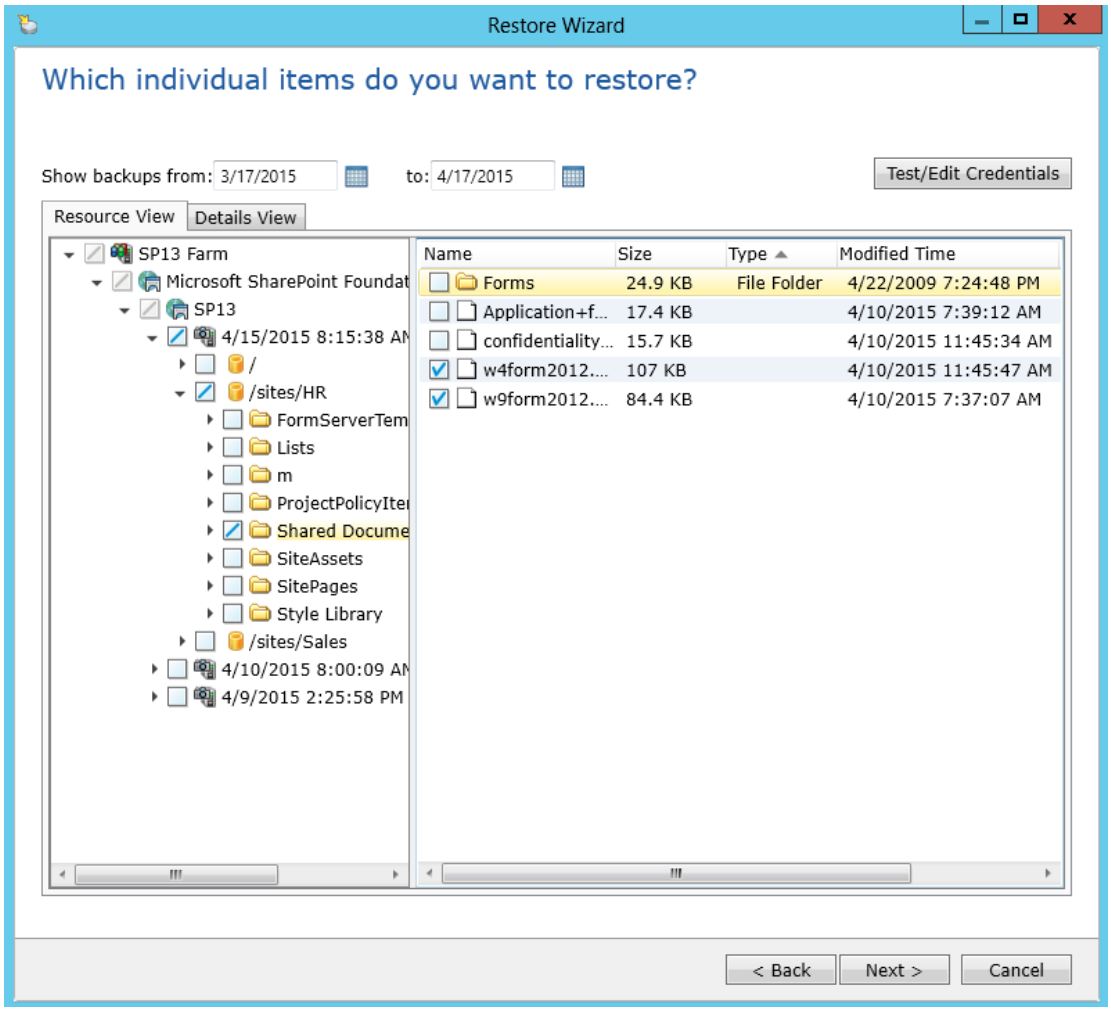

Figure 51 Selecting SharePoint items to restore

4. On the **Where do you want to restore the items?** screen, select the restore destination. When restoring, you have a few options. The first option is the default and will restore to the original location. The second option is to restore to a site with corresponding site options, and the third option is to restore to a path. This example used the defaults (original location). Click **Next**.
5. The next screen asks how to maintain versioning and security for restored data. This example used the **restore over existing items** option. Click **Next**.
6. The next wizard screen asks what tasks to perform before and/or after the restore. This example left this blank. Click **Next**.

7. On the final screen, the wizard requests the job name and schedule to use. This example used the defaults on all screens, including leaving the default name and using **run now** for the schedule. Click **Next**, then review the restore summary screen and click **Finish** (Figure 52).

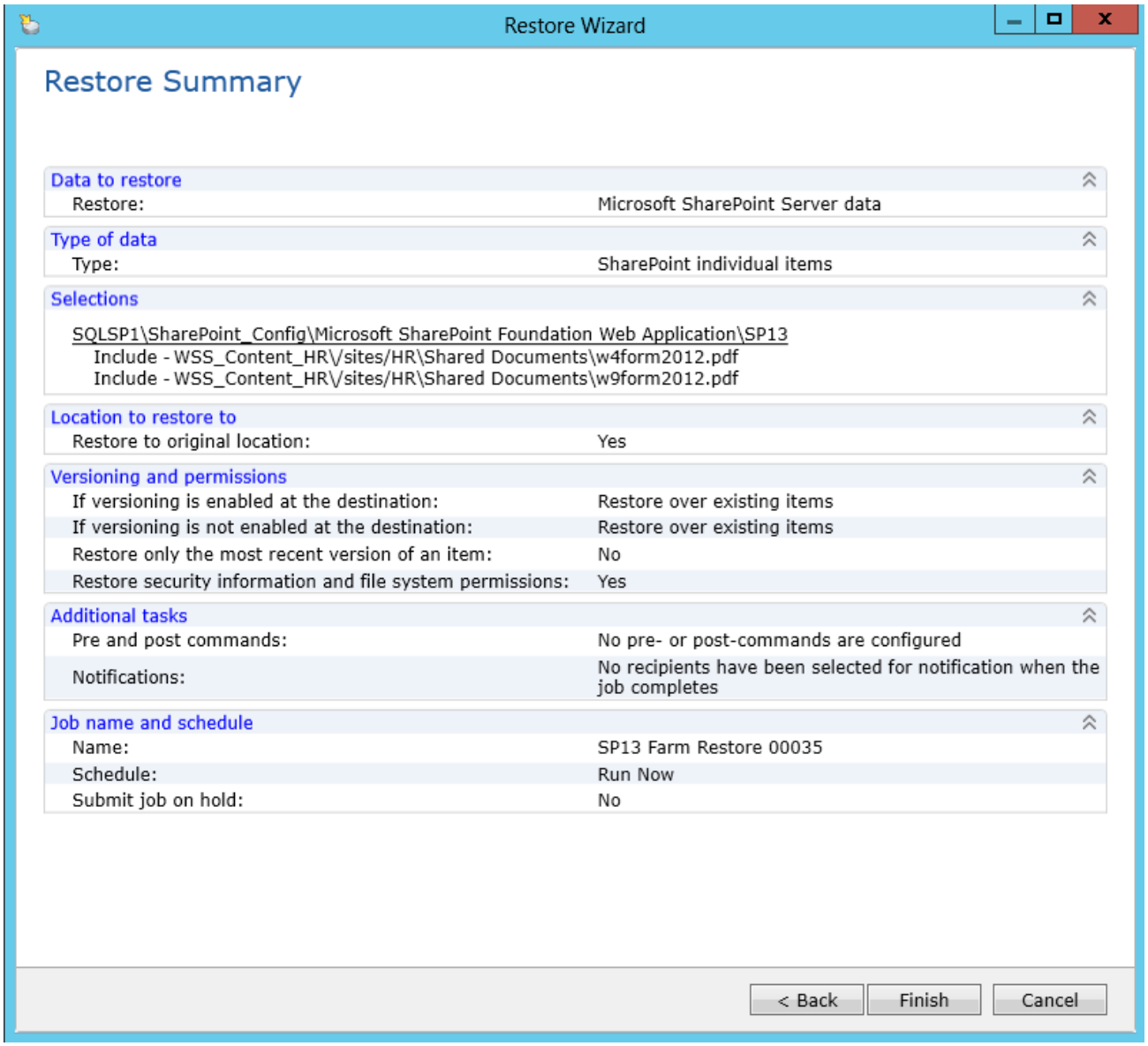

Figure 52 SharePoint restore summary

8. You can monitor both running and scheduled jobs. In the Backup Exec toolbar, click **Job Monitor**. The Backup Job Monitoring and Status window appears. Right-click a backup job in the **Current Jobs** or **Job History** panel and select **Properties** to display the Job History window.

9. Verify the restored database (Figure 53).

Figure 53 Job Histories – Successful status

14 Summary

With Symantec Backup Exec 2014 and PS Series storage arrays from Dell, you can backup and restore local and remote NTFS volumes, Exchange email, and SharePoint data. In addition, the VSS capabilities of Backup Exec 2014 and the PS Series Host Integration Tools for Microsoft allows you to create an integrated, scalable, high-performing, and highly-reliable backup and recovery solution for Microsoft environments.

A Configuration details

Table 1 Software and firmware used in this paper

Vendor	Model	Software revision
Microsoft	Windows Server 2012	6.2.9200
Microsoft	SQL Server 2012	11.0.3128.0
Microsoft	SharePoint 2013	15.0.4420.1017
Microsoft	Exchange Server 2013	15.0.712.24
Dell	Host Integration Tools for Microsoft	4.7.1*
Dell	PS Series Firmware	7.0.3*

* For a complete version support list see the Host Integration Tools for Microsoft release notes on http://eqlsupport.dell.com (requires login).

B Creating a volume in a PS Series group

You can create volumes to access storage space in a pool, and modify volume size and attributes on demand.

1. In the lower-left pane of the **Group Manager**, click **Volumes**.
2. In the **Activities** pane, click **Create Volume**.

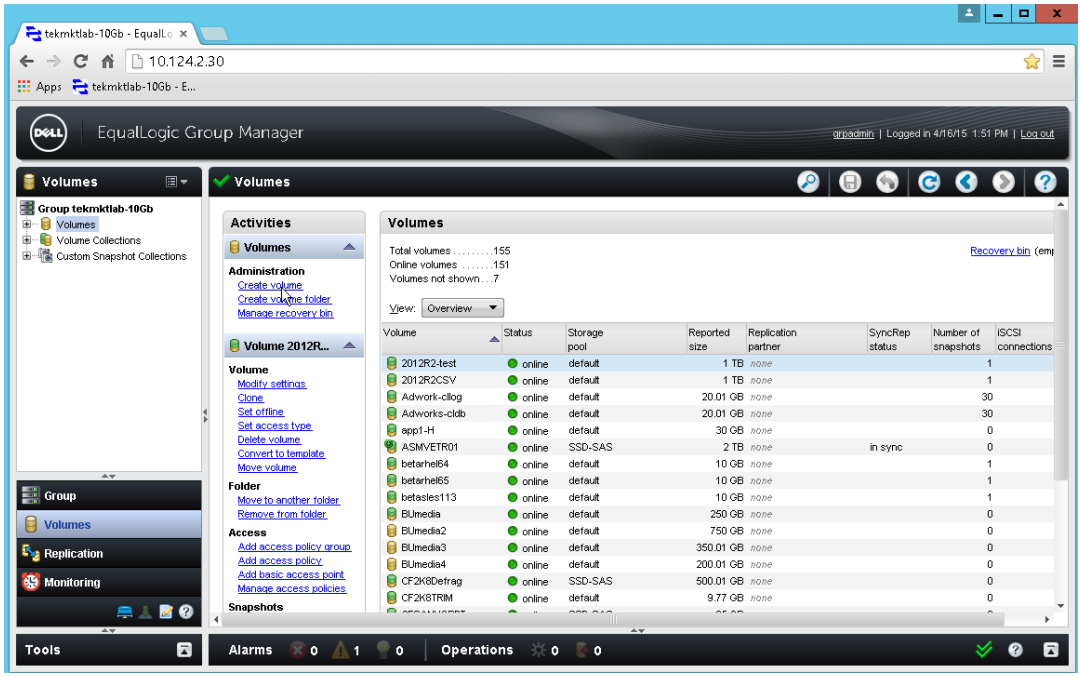

Figure 54 Group Manager

3. Specify the **General properties** and **Storage pool** assignment:

   a. Provide a **Name** and **Description** (optional) for the volume.
   b. Select the storage pool to be used for the volume.
   c. Click **Next**.

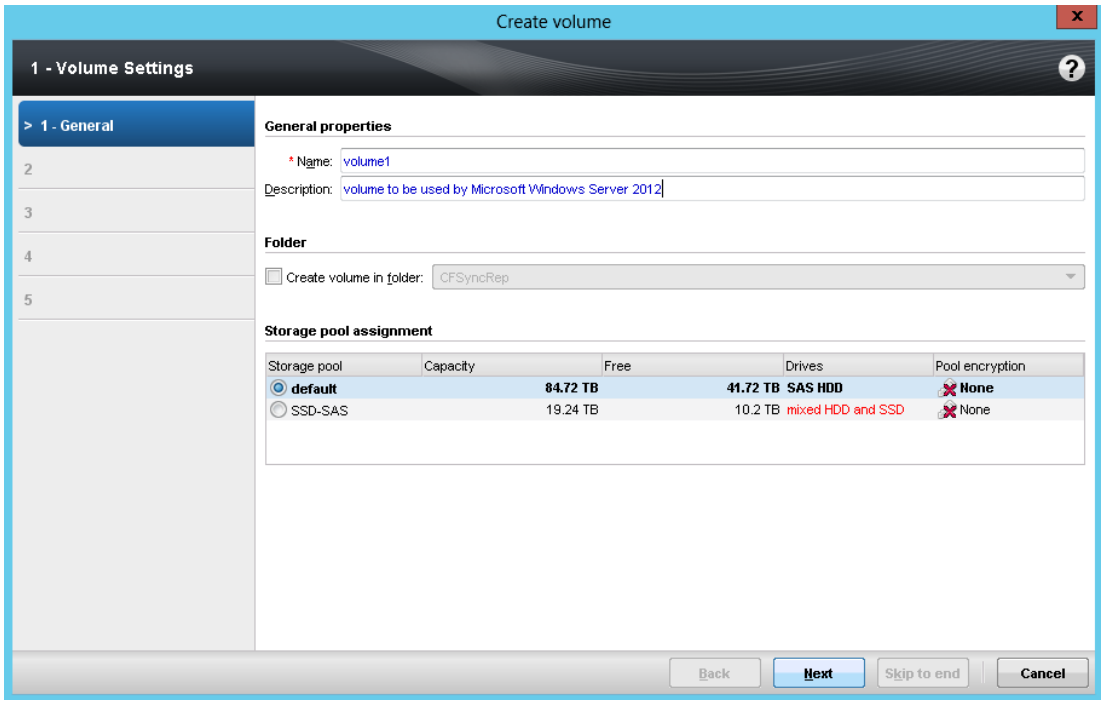

Figure 55 Volume Settings – General properties

4. Specify **Volume space** and **Snapshot space**:

   a. In the **Volume size** field, enter the desired volume size.
   b. To optionally enable thin provisioning, select **Thin provisioned volume**. Use the sliders in the **Reported volume size** section to adjust settings. You can enable or disable thin provisioning on a volume at any time.
   c. In the **Snapshot space** section, enter the desired percentage of the volume to be used for snapshots.
   d. Click **Next**.

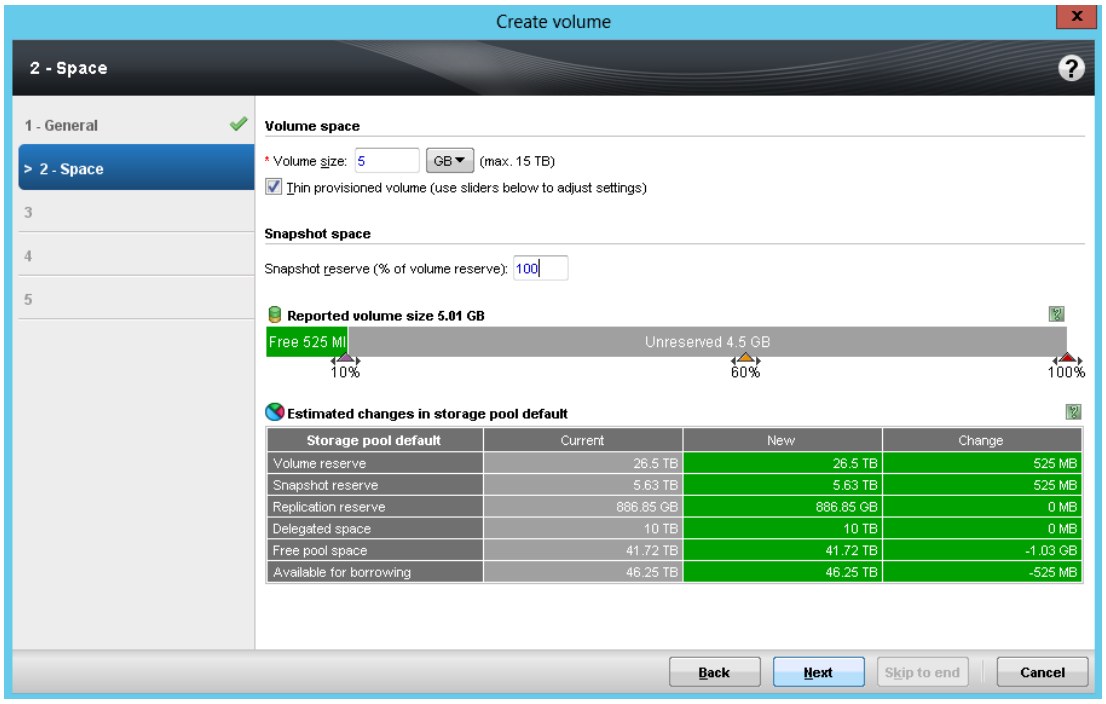

Figure 56 Volume settings – Space

PS Series groups use access control records to prevent unauthorized computer access to iSCSI targets (volumes or snapshots). To log in to a volume or snapshot, the server iSCSI initiator must comply with conditions specified in the access control record. For additional information on access control records, refer to the *Dell EqualLogic Group Manager Administrator's Manual* at eqlsupport.dell.com (requires login).

5. To enable multiple initiators to access the volume, as in a cluster configuration, optionally click to select **Allow simultaneous connections from initiators with different IQNs.**

6. Specify one or more of the options listed in Table 2 and click **Next**.

Table 2 Volume settings – iSCSI Access

Option	Description
Authenticate using CHAP user name	Restricts access to computers that supply the specified CHAP user name and its associated password (or secret). The credentials must match a local CHAP account or a CHAP account on an external RADIUS server.
Limit access by IP address	Restricts access to iSCSI initiators that match the specified IP address.
Limit access to iSCSI Initiator name	Restricts access to iSCSI initiators that match the specified name.
Copy access controls from another volume	Copies the access controls setup on another volume. For example, SQL or SharePoint where lots of volumes are being created with the same access controls.

Figure 57 shows restricted access to iSCSI initiators by specified IP address, copied from another volume.

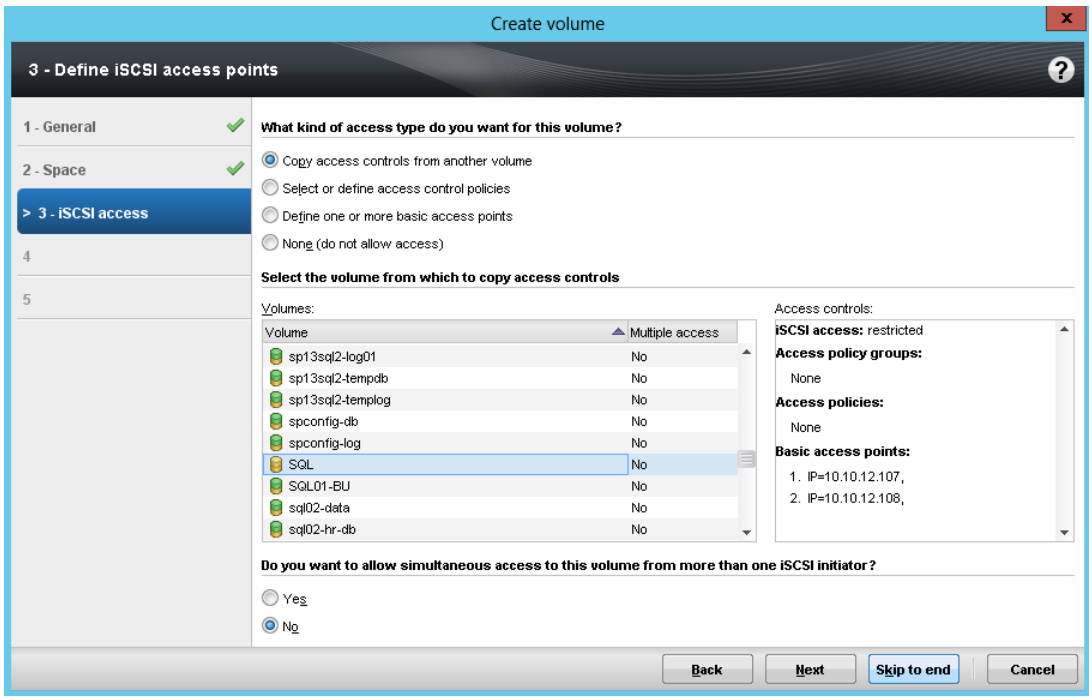

Figure 57 Volume settings – restrict access to iSCSI initiators

7. Review the summary and click **Finish**.

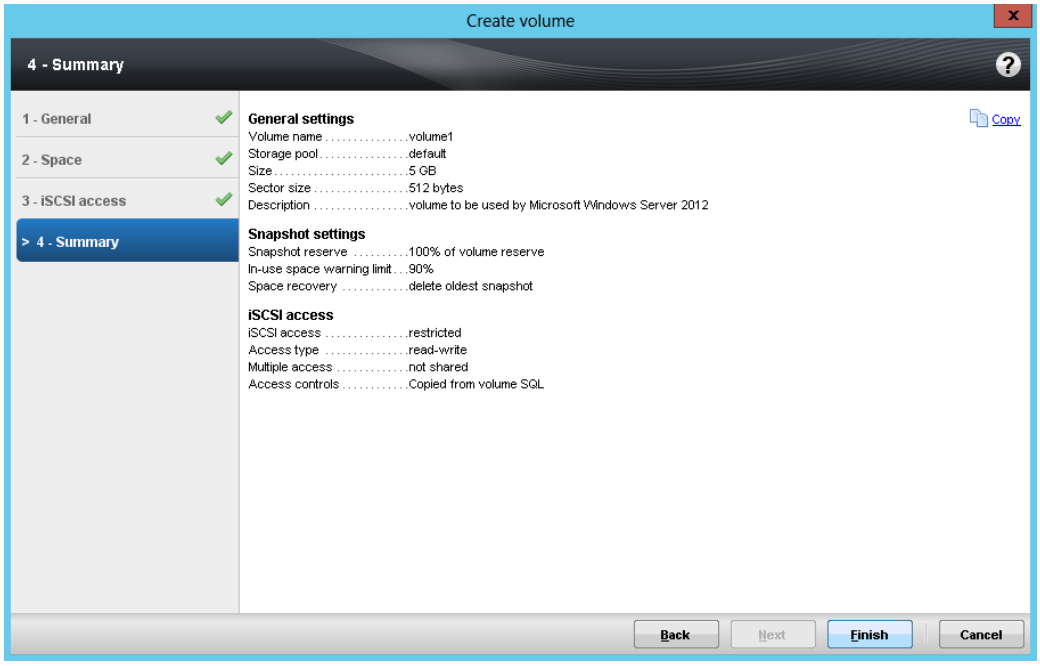

Figure 58 Volume settings – Summary

If you create a thin provisioned volume, you will be presented with a screen as shown in Figure 59, letting you know that snapshot space borrowing will be enabled unless you choose to un-check snapshot space borrowing. Click **OK** to finish.

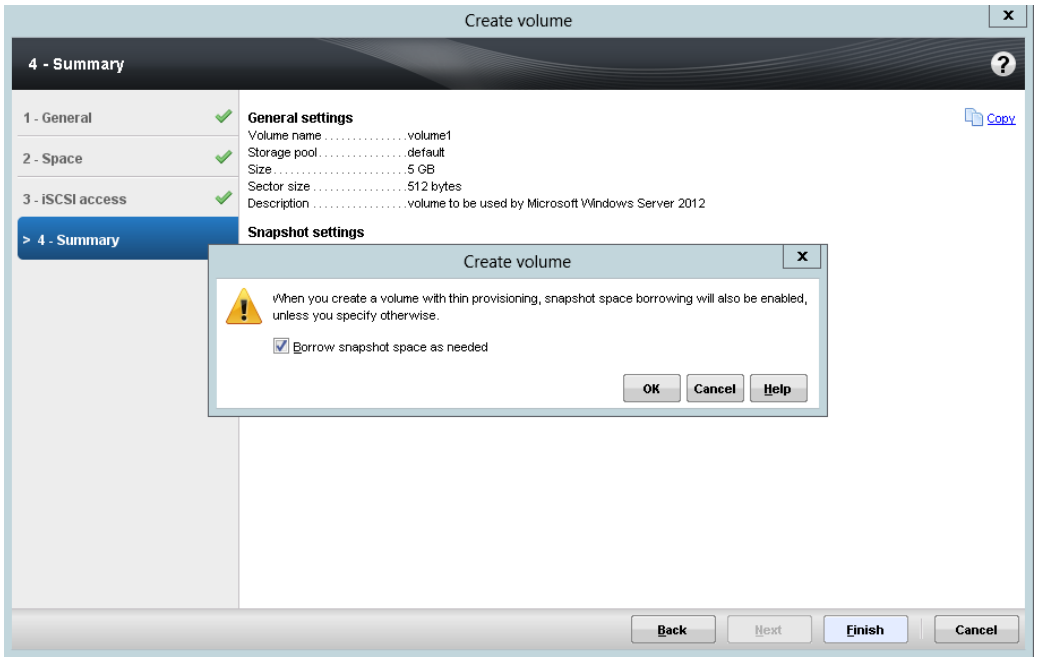

Figure 59 Borrow snapshot space

B.1 Configuring CHAP

1. Access the Group Manager.
2. Click **Group Configuration**.
3. Click the **iSCSI** tab to manage CHAP accounts (Figure 60).

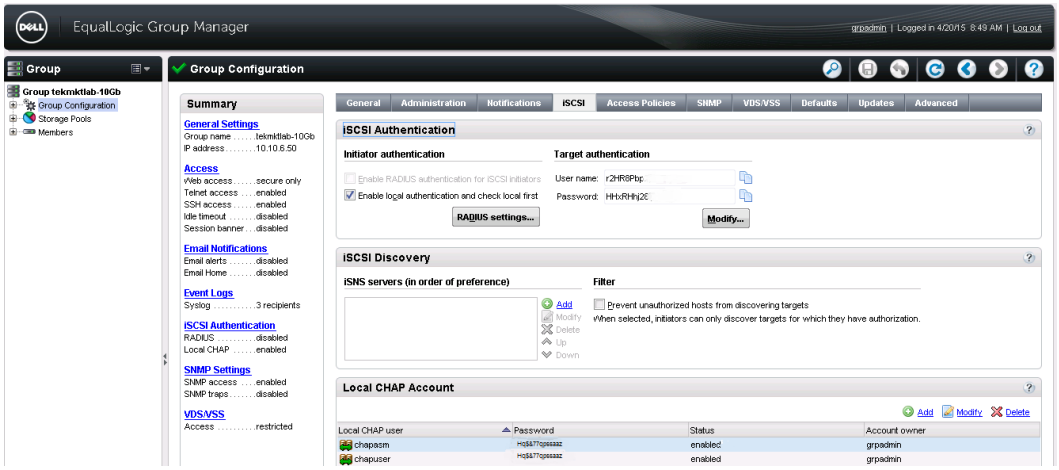

Figure 60 Group Manager – CHAP configuration

4. Click to **VDS/VSS** tab to manage VDS and VSS access to the group. You must enable an existing CHAP user to access the PS Series group using VDS and VSS.

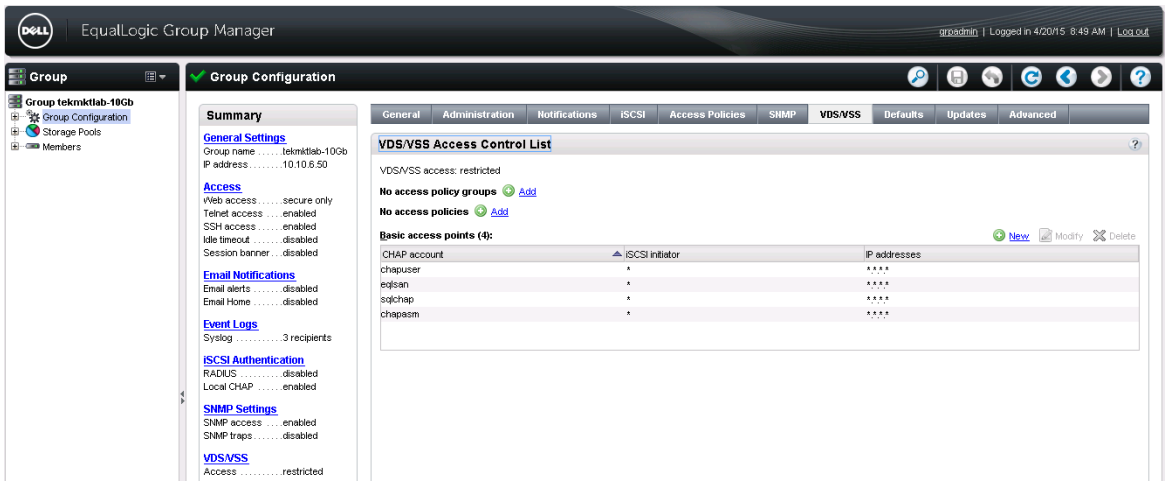

Figure 61 Group Manager – VDS/VSS configuration

For additional information on configuring CHAP on the PS Series Group, see the *Dell EqualLogic Group Manager Administrator's Manual* at eqlsupport.dell.com (login required).

B.2 Host Integration Tools for Microsoft

Host Integration Tools (HIT) for Microsoft simplify the configuration and administration of Dell PS Series storage arrays on Windows computers.

For additional information on HIT for Microsoft, including operating system support and PS Series product compatibility, refer to the *Dell EqualLogic Host Integration Tools for Microsoft Installation and User's Guide* at eqlsupport.dell.com (login required).

Table 3 lists the application and service components included with HIT for Microsoft:

Table 3 HIT for Microsoft components

Component	Description
Remote Setup Wizard	Enables you to initialize a PS Series SAN array and set up or expand a PS Series group. An alternate command-line interface (RSWCLI) can also be used from the Windows command prompt,
PowerShell Tools	Enables you to manage one or many PS Series groups through a comprehensive set of PowerShell cmdlets.
Volume Rethinning Tools	Enables you to perform rethinning and optional defragmentation operations on one or more volumes.
Dell EqualLogic HPC iSCSI Provider	Allows the Microsoft High Performance Computing (HPC) service to provision volumes and deploy compute nodes on PS Series SANs. This service is only available on systems running Windows HPC Server 2008 R2 or later.
Multipath I/O Device Specific Module (MPIO/DSM)	Windows Service: EHCM Service Supports multipathing. This is a driver module that works in conjunction with the Microsoft MPIO driver. This feature dynamically balances your iSCSI SAN traffic load over multiple network paths between the computer and the PS Series group. This requires multiple iSCSI Host Bus Adapters to use this feature.
Auto-Snapshot Manager / Microsoft Edition (ASM/ME)	Windows Service: EqlASMAgent Enables you to create and manage Smart Copies (snapshots, clones, and replicas). An alternate command-line interface (ASMCLI) facilitates custom operations and scripting.
VSS Provider	Windows Services: EqlReqService, EqlVss Supports VSS management of application-consistent Smart Copies.
Virtual Disk Service (VDS) Provider	Windows Service: EqlVdsHwPrv Enables you to use Microsoft VDS and Microsoft Storage Manager for SANs to create and manage volumes in a PS Series group.
SMP	Windows Service: EQLSMPHost Enables you to manage PS Series storage through native Windows storage interfaces such as PowerShell cmdlets, File Services UI in Windows Server 2012, and WMI.

There are multiple methods that you can use to install HIT for Microsoft on a host, including through PowerShell and ASM/ME. For first-time installations, you are first required to perform a manual installation. After that, you can easily install HIT for Microsoft on any number of hosts using the remote installation process from the ASM/ME GUI or through PowerShell.

B.3 Perform a manual installation of HIT for Microsoft

1. Download the Host Integration Tools for Microsoft at http://eqlsupport.dell.com (requires login).
2. Double-click **Setup64.exe** or **Setup.exe,** or right-click and chose **Open**.
3. The InstallShield Wizard installs the Host Integration Tools on your computer. To continue, click **Next**.
4. Accept the terms in the license agreement and click **Next**.
5. Click **Next** to install to the default folder, or click **Change** to install to different folder.
6. Choose the setup type that best suits your needs:

    a. Selecting **Complete** will install all program features listed in Table 4. For components such as Multipath I/O and Volume Rethinning, Windows may require a reboot.
    b. Selecting **Custom** will allow you to choose which program features you want installed and where they will be installed.
7. Click **Install** to begin the installation.
8. Click **Finish** to exit the wizard.

In addition to installing the software components, the installation process automatically performs the following tasks so that HIT for Microsoft can run properly:

- Automatically start the Microsoft iSCSI Initiator Service
- To enable Multipath IO (MPIO) to function properly:
    - The Windows Firewall is configured allow ICMP echo requests
    - Automatically configure and starts the Microsoft Multi-Path Bus Driver service
- Install required Microsoft .NET components
- Install required Visual C++ redistributable components
- Create MSI logs directory at %appdata%\EqualLogic\Logs

B.4 Configuring PS Series group access in ASM/ME

You can use ASM/ME to configure access to multiple PS Series groups.

1. Click **Settings** in the Navigation Area of ASM/ME (Figure 62).
2. Holding down the **Ctrl** key on your keyboard, click to multi-select the servers you want to apply the settings to.
3. In the left panel, select **PS Group Access** to view and modify the current settings.
4. To add a new PS Series group, click **Add PS Group** and provide the PS group name and group IP.

5. To modify settings for a PS Series group, in the PS Group Access window, select the PS group and configure the following settings:

   a. VDS/VSS access: Specify VDS/VSS CHAP credentials
   b. Smart Copy access: Specify CHAP credentials
   c. PowerShell/SMP Access:
      i. Enter the PS group management IP address (this is the group IP address, unless the group has a management network configured).
      ii. Enter the PS group username and password. The user name can be an account configured on the group or a domain account.
      iii. Optionally, check the box to enable Single Sign-On (SSO) to use Active Directory Domain credentials. To use SSO, the PS Series group must be running a minimum of PS Series Firmware Version 6.0 and must be configured to allow SSO. For more information on configuring the PS group for SSO, refer to the *Dell EqualLogic Group Manager Administrator's Manual* at eqlsupport.dell.com (requires login).

6. Click **Save** to apply the settings to the selected hosts.

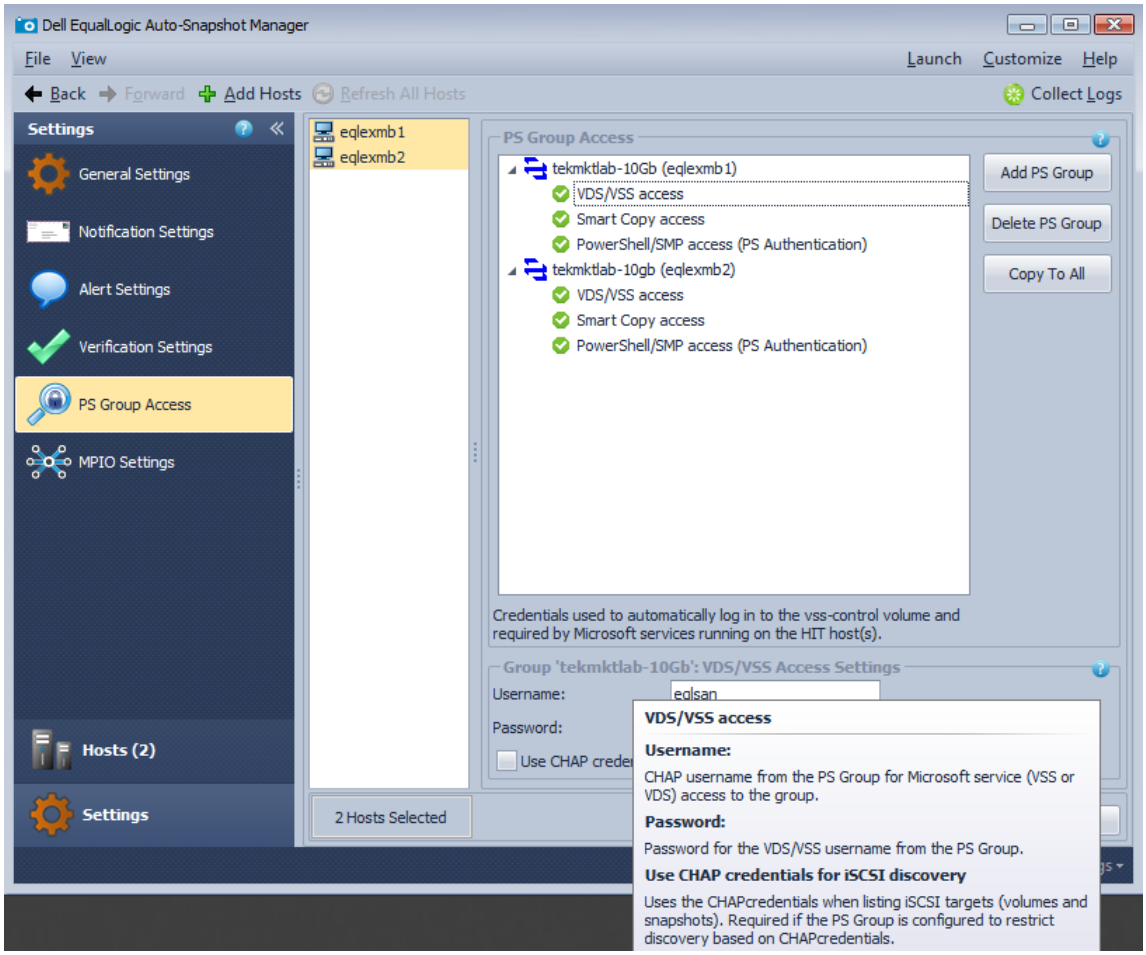

Figure 62 Add PS Series group

B.5 Connecting to a PS Series volume from Windows

The Microsoft iSCSI Initiator enables you to connect a Windows computer to PS Series iSCSI storage through the server network adapters. Connecting to volumes with the Microsoft iSCSI Initiator will cause iSCSI SAN disks to appear as if they are locally attached to the server.

1. Launch iSCSI Initiator from Windows.
2. In the **Discovery** tab, click **Discover Portal (**Figure 63).

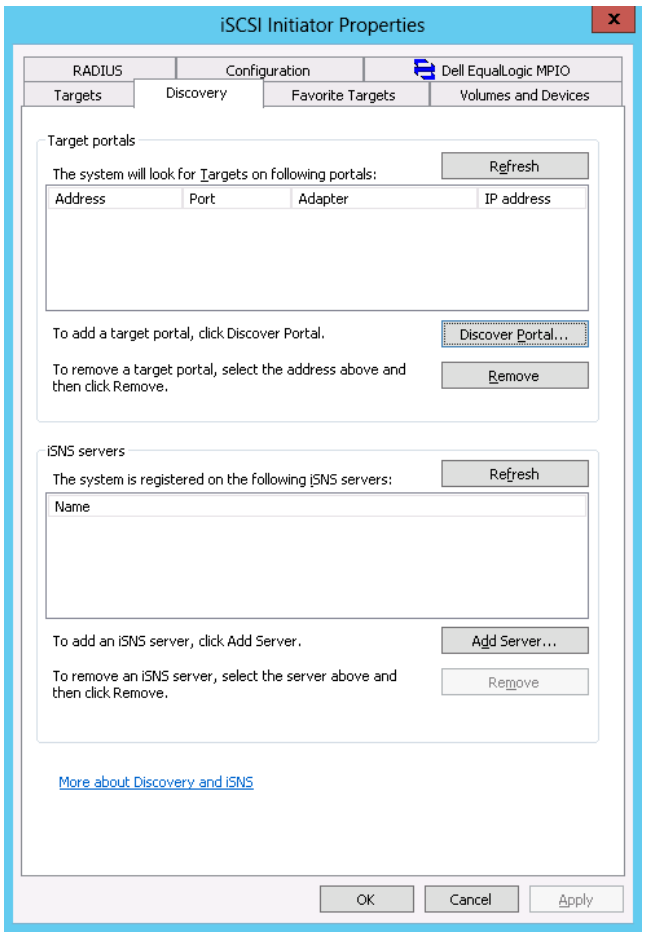

Figure 63 iSCSI Initiator Properties

3. If required, specify the PS Series group that you want to add.
   a. In the **IP address or DNS name** field, enter the IP address or DNS name of the PS Series group (Figure 64).
   b. In the **Port** field, enter the network port number (default is 3260).
   c. To enable CHAP authentication, click **Advanced** and configure the required settings.
   d. Click **OK**.

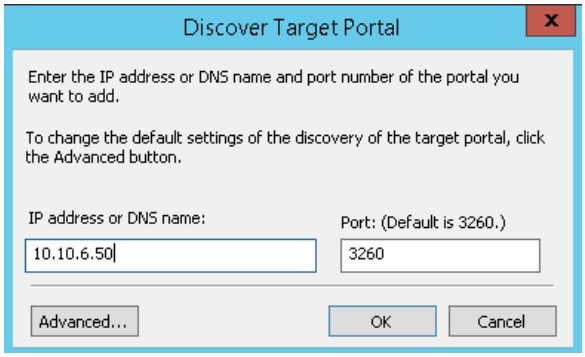

Figure 64 Discover Target Portal

4. Discover all volumes that the server has access to:

   a. Click the **Targets** tab, and then click **Refresh.** A list of discovered volumes is displayed (Figure 65).
   b. Click to select the desired volume and click **Connect.**

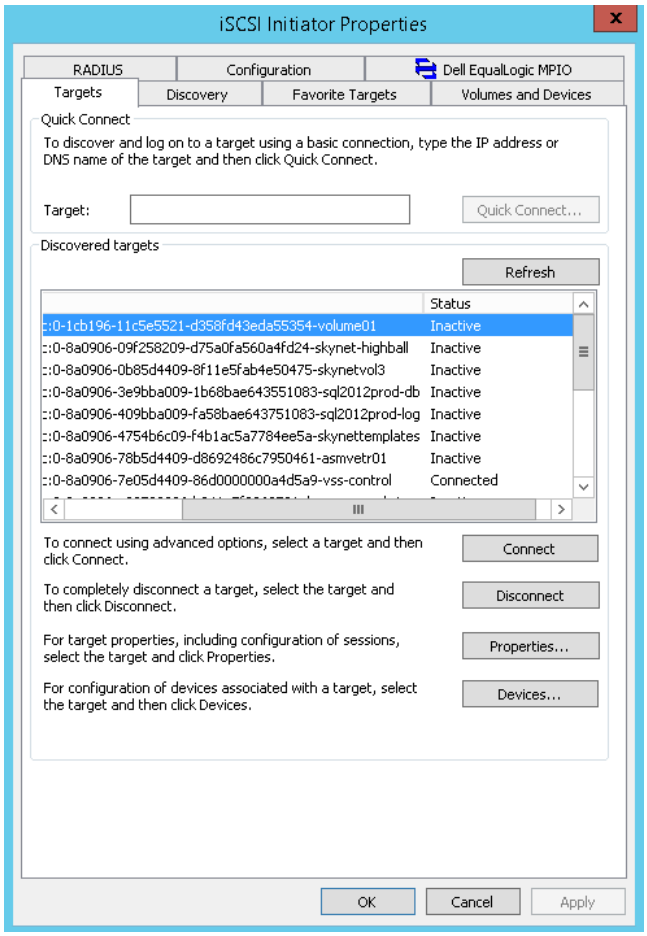

Figure 65 Discover iSCSI targets

5. Connect to the target (Figure 66):

    a. To make the system automatically attempt to restore the connection to the volume upon reboot, click **Add this connection to the list of Favorite Targets**.
    b. Click **Enable multi-path** and click **OK**.

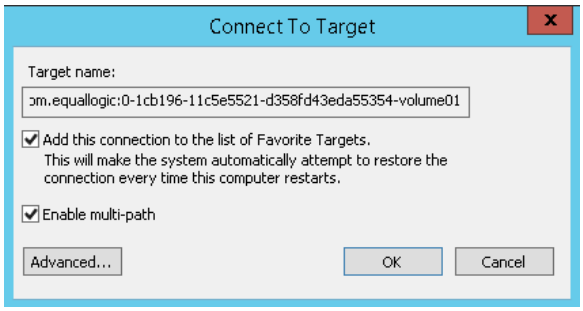

Figure 66 Connect to iSCSI Target

B.6 Making a PS Series volume available to Windows

After you have connected to the iSCSI target, you can make the volume available to Windows so that it can be used to store data:

6. To launch the **Server Manager** console in Windows Server 2012, from the **Task** drop-down menu, select **Rescan Storage** (Figure 67).

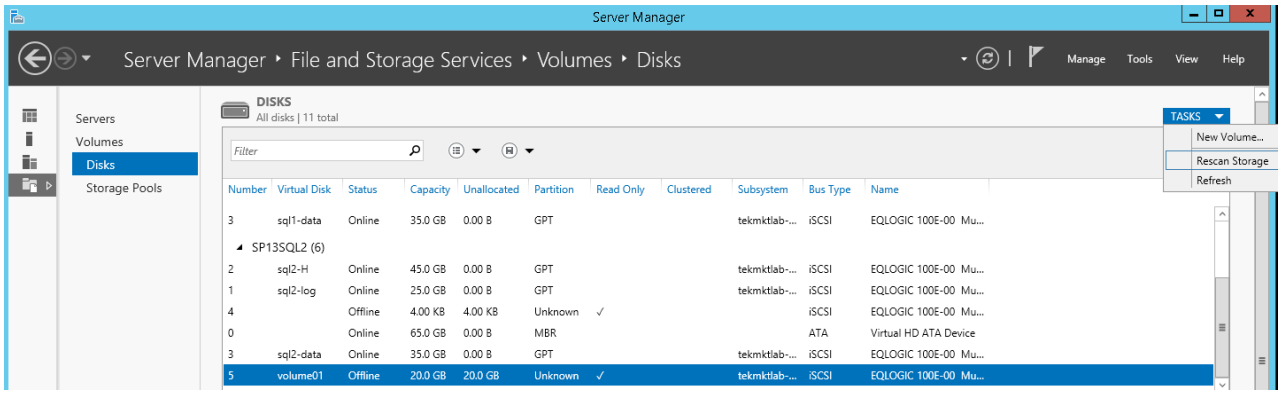

Figure 67 Rescan Storage

7. To bring the new disk online, right-click the disk and select **Bring Online** (Figure 68).

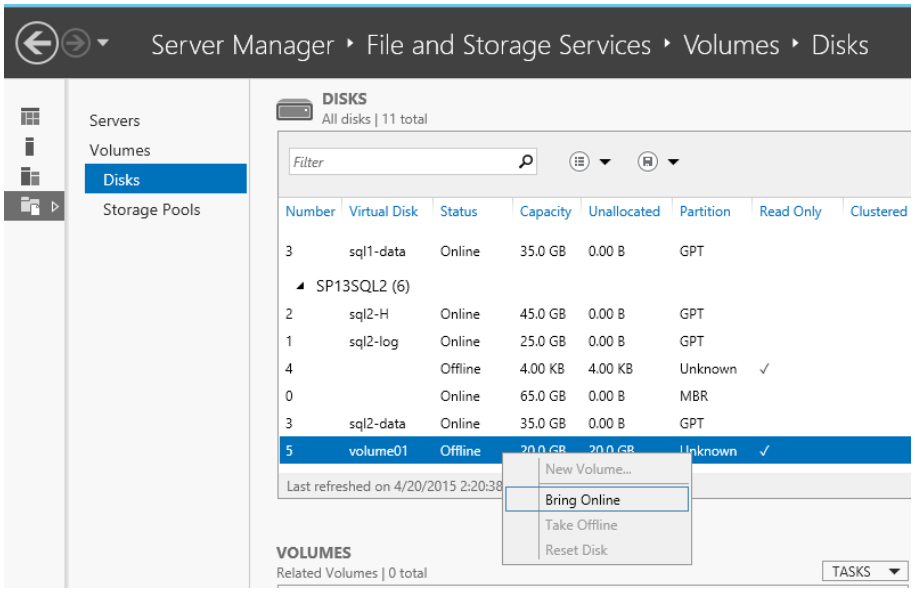

Figure 68 Bring Online

8. You must initialize a disk before Disk Manager can access it. Right-click the disk and select **New Volume**.

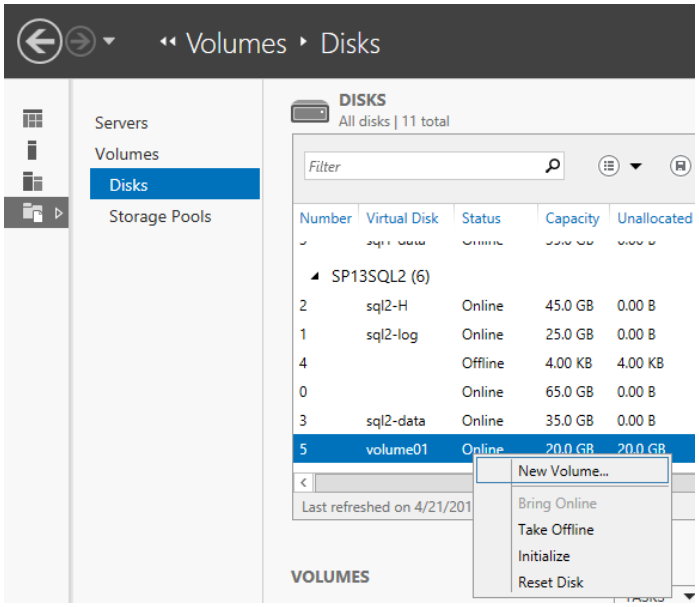

Figure 69 New Volume

9. Select the disk and click **Next**.

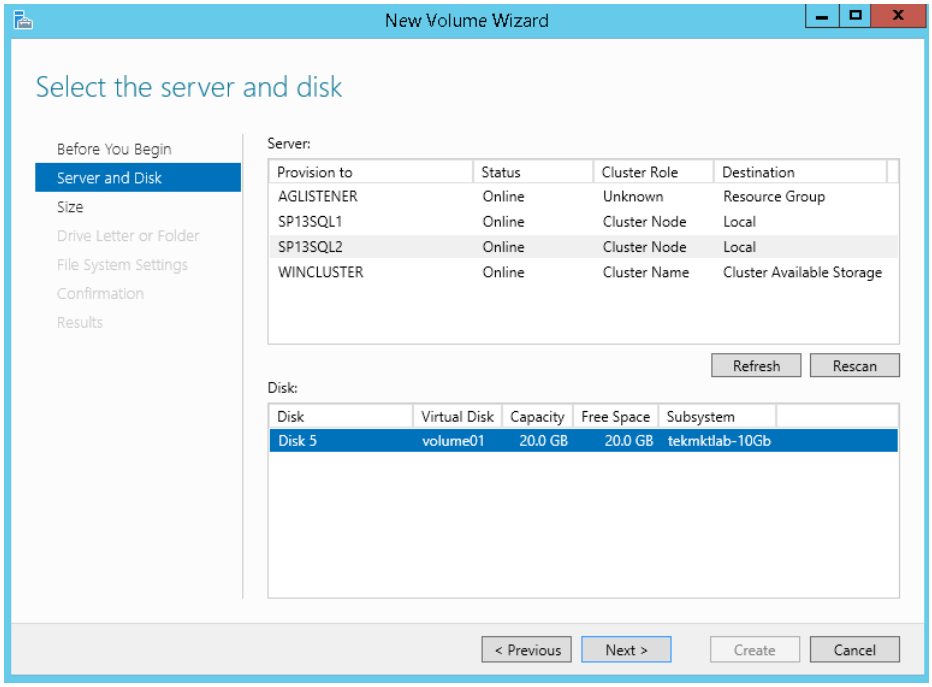

Figure 70 New Volume Wizard

10. Specify the volume size and click **Next**.

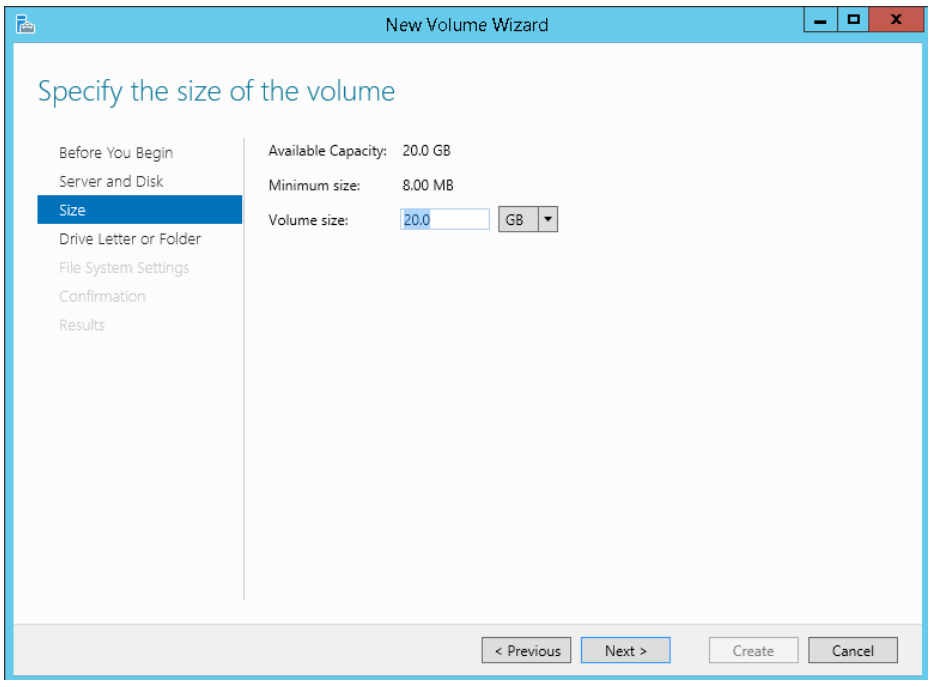

Figure 71 Specify volume size

Optionally, assign a drive letter or path and click **Next**.

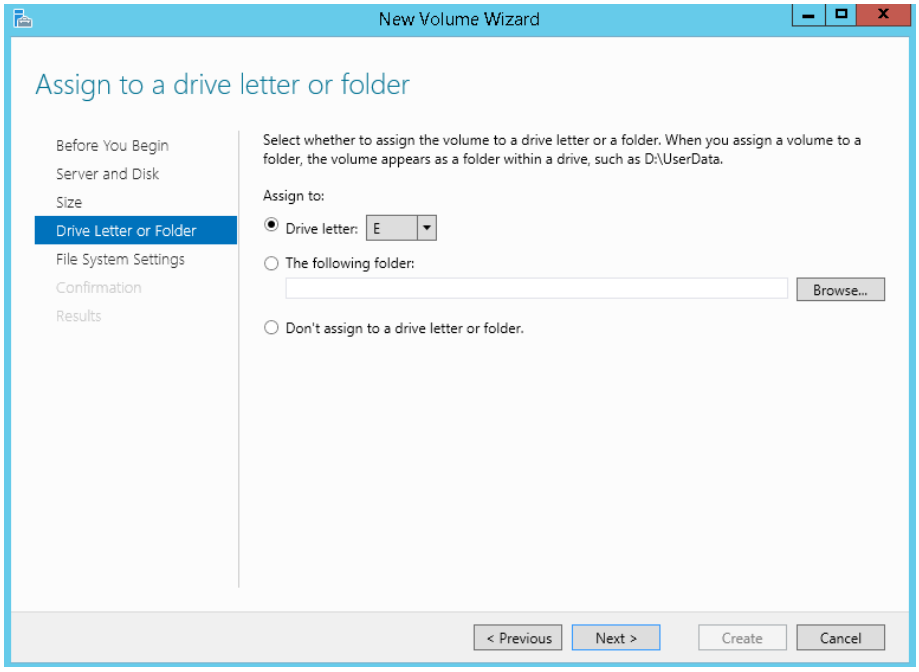

Figure 72 Assign drive letter or path

11. Format the partition by specifying **File System Settings > Allocation unit size** and **Volume label,** and click **Next**.

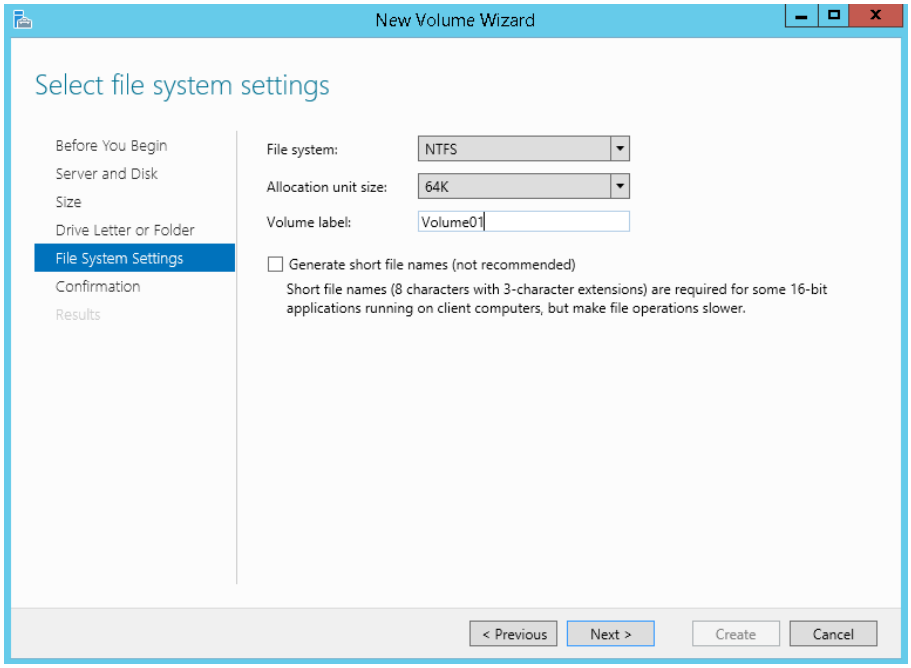

Figure 73 File System Settings

12. Review the settings and click **Create** (Figure 74).

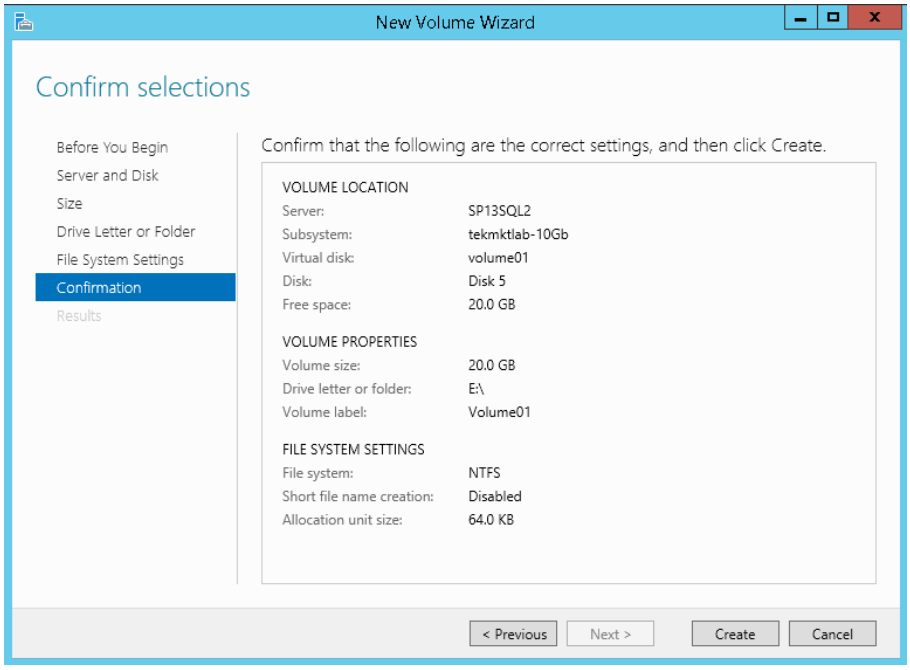

Figure 74 Confirming selections in the New Volume Wizard

The volume is now available to Windows and is ready to store data.

C Additional resources

C.1 Technical support and customer service

Offering online and telephone-based support and service options, Dell support service can answer your questions about PS Series arrays, groups, volumes, array software, and host software. Availability varies by country and product, and some services might not be available in your area.

Visit Dell.com/support or call 800-945-3355 (United States and Canada).

For international support of Dell PS Series products, visit http://www.dell.com/support/contents/us/en/555/article/Product-Support/Dell-Subsidiaries/equallogic

Note: If you do not have access to an Internet connection, contact information is printed on your invoice, packing slip, bill, or Dell product catalog.

C.2 Dell online services

Learn more about Dell products and services using this procedure:

1. Visit Dell.com or the URL specified in any Dell product information.
2. Use the locale menu or click on the link that specifies your country or region.

C.3 Dell PS Series storage solutions

To learn more about current and upcoming Dell PS Series solutions, visit the Dell TechCenter site: http://delltechcenter.com/page/EqualLogic. Here you can find articles, demos, online discussions, technical documentation, and more details about the PS Series product family.

C.4 Related documentation

Table 4 lists the referenced or recommended publications related to this document.

Table 4 Referenced or recommended documents

Vendor	Document
Dell	EqualLogic Configuration Guide v15.2
Dell	Deploying Microsoft Exchange Server 2013 with Dell EqualLogic PS Series Arrays
Dell	Using Dell EqualLogic Storage with Microsoft Windows Server 2012
Dell	Deploying SharePoint 2013 Using a Dell EqualLogic PS Series iSCSI SAN
Dell	Using Microsoft SQL Server with Dell EqualLogic PS Series Arrays
Microsoft	Release notes for Exchange 2013
Microsoft	High availability and site resilience
Microsoft	Planning for high availability and site resilience
Microsoft	Exchange 2013 storage configuration options