SharePoint Data Protection with Auto-Snapshot Manager/Microsoft Edition 4.7 Dell EqualLogic PS Series

Using Dell EqualLogic Auto-Snapshot Manager/Microsoft Edition 4.7 with PS Series arrays to protect Microsoft SharePoint Server with online Smart Copies and recovery operations

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A Dell Deployment and Configuration Guide

Revisions

Table 1   Document revision history

Report	Date	Document Revision
1.0	December 2012	Initial Release
2.0	June 2014	Updated for SharePoint 2013 and HIT 4.7

Configuration details

Table 2   Software and firmware version specifications

Vendor	Model	Software Revision
Dell	PS Series Array Firmware	Version 7.0.3 and later
Dell	Host Integration Tools – Auto-Snapshot Manager	Version 4.7 and later

Table 3   Test configuration specifications

SharePoint Version	Operating Systems	SQL Server Versions
SharePoint 2010: SP1 June 2011 Cumulative Update SharePoint 2013	• Windows 2008 SP2 (x64) • Windows 2008 R2 SP1 (x64) • Windows 2012 (x64) • Windows 2012 R2 (x64)	• 2008 SP3 • 2008 R2 SP2 • 2012 • 2012 SP1

Audience

The information in this guide is intended for administrators that have deployed SharePoint Server and are interested in using EqualLogic snapshots for efficient protection and recovery of SharePoint Server components.

Table of contents

1   Introduction

Microsoft SharePoint is a server application for enterprises that facilitate collaboration, provide full content management features, implement business processes, and provide access to information essential to organizational goals and processes. It provides an integrated platform to plan, deploy, and manage intranet, extranet, and Internet applications across the enterprise. As a SharePoint deployment expands in an organization, it will likely increase the amount of data stored in SharePoint, and subsequently Microsoft SQL Server databases. Data protection and disaster recovery are among the top concerns for administrators. Requirements for reducing backup windows and restore times continue as demands for continuous SharePoint Farm uptime is increasing. PS Series arrays provide administrators the ability to create volume-based copies of data using snapshots, clones and replicas. These copies are known as point-in-time copies of volume data.

The EqualLogic Host Integration Tools (HIT) kit version 4.7 enhances Auto-Snapshot Manager/Microsoft Edition (ASM/ME), adding the ability to create data and application-consistent Smart Copies of SharePoint farms. ASM/ME is a Windows server application that offers application-consistent Smart Copies of SharePoint data leveraging the built-in snapshot, clone and replication facilities in PS Series arrays. With ASM/ME, a SharePoint administrator can:

- Create Smart Copies of SharePoint farm data where the copy operation is coordinated with SharePoint Farm operations.

  - Use the management GUI or built-in scheduler to create Smart Copy sets
  - Use the command-line interface (asmcli) that enables the performance of many common tasks. GUI wizards are included to generate fully formed command lines.
  - Set up automatic email notification of events

- Perform SharePoint restore operations:

  - Restore corrupt or deleted content databases
  - Restore office search
  - Item-level restore, 3rd party database tools

The capabilities of ASM/ME extend the use of SAN copy facilities beyond storage administrators to server and SharePoint administrators. This raises the productivity of SharePoint administrators, and allows them to leverage efficient SAN copy facilities without requiring SAN privileges. By automating data protection and recovery operations, the time consuming day-to-day operations of managing and maintaining volume and SharePoint Server uptime is minimized and data availability is extensively increased. Data availability can be maintained at a higher level of assurance using ASM/ME and Smart Copy technologies with PS Series arrays.

2 ASM/ME and SharePoint Server integration

ASM/ME utilizes the Microsoft Volume Shadow Copy Service (VSS) architecture to provide application integration with SAN copy operations (see Figure 1). During the VSS operation flow, ASM/ME initiates the process by requesting the SharePoint VSS writers to prepare SharePoint farm data for a Smart Copy operation. The SharePoint VSS writer component places the data in a consistent state and the PS Series VSS Provider service initiates the SAN copies using PS Series hardware snapshots, clones, or replication functions. The result is an application consistent point-in-time Smart Copy of the SharePoint farm data and log volumes. Smart Copies can then be used to fully restore a database or simply recover object level data using various recovery options available to the Smart Copy set.
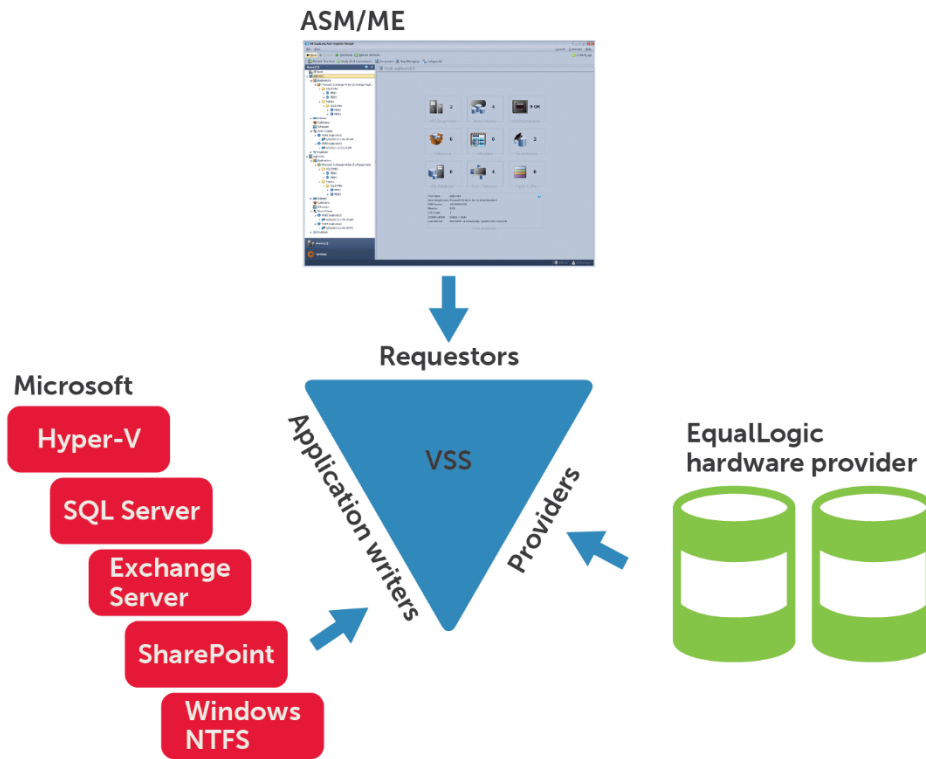
Figure 1   Volume Shadow Copy Service and ASM/ME integration

3 Using ASM/ME 4.7 with Microsoft SharePoint

ASM/ME 4.7 supports Microsoft SharePoint 2010 and 2013. It can discover and manage an entire SharePoint farm, assuming that the farm components reported by the SharePoint VSS writer are stored on EqualLogic volumes. ASM/ME automatically discovers which hosts within a SharePoint farm require an ASM/ME installation. The SharePoint VSS writer is not enabled by default. Choose a farm host where SharePoint is installed to serve as the writer host, and then enable the SharePoint VSS writer on it. See [Appendix E titled, "Installing ASM/ME on a SharePoint farm"_Appendix_E_–](#) for the necessary steps specific to various SharePoint versions.

1. Use either a web front-end server or an application server as the writer host.
2. Perform an initial ASM/ME installation on the farm host running the SharePoint VSS writer.

   After the initial installation is complete, the SharePoint VSS writer provides ASM/ME with a view of the farm layout. ASM/ME then automatically determines the subset of hosts that require an installation.

3. Open the ASM/ME console on the writer host, to view a list of hosts requiring ASM/ME installation (Figure 4).
4. Add those hosts to the installation list using the **Add Hosts** wizard.

The farm hosts that require an ASM/ME installation are those that are running the following SharePoint services:

- Microsoft SharePoint Foundation Database
- SharePoint Server Search
- SharePoint Foundation Help Search

Figure 2 shows an example (from a three-tier Lab farm used in this paper) of the farm hosts that require an ASM/ME installation.

Best Practice: For medium to larger three-tier farms, install SharePoint and Search on an application server(s) to serve as the writer host. For additional information see the SharePoint article titled, "[Overview of SharePoint 2013 installation and configuration](#)" in the Microsoft TechNet library at http://technet.microsoft.com/en-us/library/ee667264%28v=office.15%29.

App1SP13

Application server

    Office search

    SP search

    SharePoint VSS writer

    ASM Agent

Management

WFESP13
Web FrontEnd
ASM Agent

SQL1SP13
SharePoint Database
ASM Agent

Figure 2   Farm hosts that require an ASM/ME installation

4 Setup and configuration best practices

This section details best practices for using Auto-Snapshot Manager with PS Series groups and SharePoint. SharePoint installation best practices are in Appendix D.

4.1 SharePoint VSS writer

The administrator must enable the SharePoint VSS writer on an application host in the SharePoint farm. This writer host is the HIT group member where the farm appears as an application in the ASM tree view. Most farm related operations are initiated from the writer host node in ASM.

4.2 Database file layout

To create SharePoint farm database Smart Copies with ASM/ME, all of the database files must reside on PS Series storage so that ASM/ME recognizes all of the volumes that make up the database object.

PS Series groups create volume-based data copies. All of the volume data is protected during a Smart Copy operation. By default, ASM/ME creates an application-consistent Smart Copy of the selected object or SharePoint farm database. If more than one SharePoint farm database shares the same volume, it results in a torn Smart Copy set. To avoid torn Smart Copies and selective restore scenarios, Dell recommends placing SharePoint content database files on their own PS Series volumes. This also takes advantage of the PS Series snapshot restore technologies that allow faster restore times. See Appendix D and Appendix E for installation details.

Best Practice: Place database and log files on separate volumes to always create pairs of volumes.

4.3 Search index file layout

If the SharePoint farm has a Search Service application or SharePoint Foundation Search, the search components must reside on PS Series storage so that ASM/ME recognizes all of the index files that make up the search component. See Appendix D, "SharePoint installation best practices" for the steps needed to setup or move Query, Crawl and Admin component locations to EqualLogic volumes.

Make sure that search components are not on the same volume as farm databases.

4.4 Two writers can share a volume

In a SharePoint environment, SPSearch VSS writers can share the same volume. Whenever two SharePoint search writers are enabled on the same host, they are included in a single VSS operation.

4.5 Storage resource management

This section describes how ASM/ME and Smart Copies use storage resources and provides best practices for monitoring and managing the space used by Smart Copy sets on the PS Series group.

- Snapshot Smart Copies use the snapshot reserve space allocated to the volume. This snapshot reserve value for each volume that makes up a SharePoint farm database can be monitored and changed.

  When a snapshot smart copy is used to restore a SharePoint farm database, the snapshot continues to exist and use the snapshot reserve for the volumes that make up the Smart Copy.

Best Practice: Maintain keep counts for Snapshot Smart Copy schedules to minimize overusing the snapshot reserve.

- Clone Smart Copies use the same amount of storage as the original volume or volumes. When a clone Smart Copy is created, a new volume appears in the Group Manager GUI with the date and timestamp of the Smart Copy operation. Clone Smart Copies can be brought online through ASM/ME by using the mount option. Dell recommends mounting volumes read-only if changes to the data contained in the Smart Copy are not needed. Mounting the volumes read-write and then making changes to the data, loses the point-in-time nature of the Smart Copy.

Best Practice: Clone Smart Copies are complete copies of SharePoint farm database objects; keep them cleaned up after use to avoid storage resource consumption.

- Replica Smart Copies are created if replication is configured for a volume or volumes that make up SharePoint farm databases. Replication requires a replication partner to store the replica set, and must be set up on the PS Series group. The first replication is of the total volume data for a SharePoint farm database or PS Series volume. Each subsequent replication operation is only of the data that changed for the volume or volumes since the last replication operation. The replication reserve can monitored and increased through the PS Group Manager GUI at any time.

Note: The time it takes to replicate data can vary due to the amount of data being replicated and the bandwidth of the network between the partner groups. For more information on replication, see the PS Series technical document *Dell EqualLogic Auto-Replication: Best Practices and Sizing Guide* at http://en.community.dell.com/dell-groups/dtcmedia/m/mediagallery/19854181/download.aspx.

Best Practices: Size replication space and network bandwidth according to the specific network needs.

4.6 ASM/ME GUI

The ASM/ME GUI has been redesigned in version 4.7 of the Windows HIT kit for SharePoint (shown in Figure 3). The **Hosts** list (1) shows the hosts that have been added to the managed HIT Group. A HIT Group is simply a group of hosts managed by that instance of ASM/ME. With each host, supported component information is listed that includes SharePoint and SQL instances and databases, host volumes, collections, schedules, and existing Smart Copies as appropriate.

The main area (2) displays information about the selected object.

The dynamic toolbar (3) at the top of the screen provides a list of specific actions that are available for the selected object.

Click **Settings** (4) to access a menu that enables the configuration of property-level attributes.
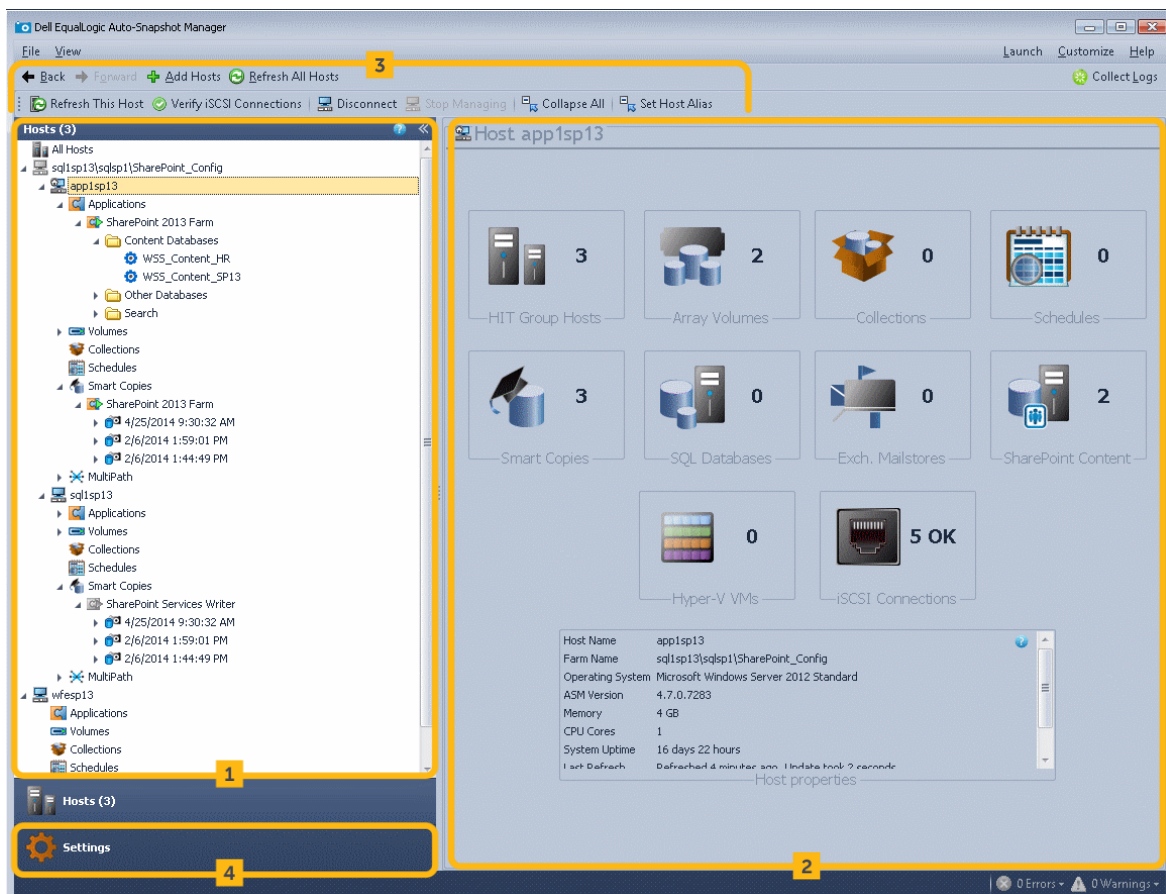
Figure 3   ASM/ME user interface

5   Overview of HIT Groups

A HIT Group is a group of one or more hosts that is managed from ASM/ME. HIT Groups are useful because they allow managing multiple hosts from any machine that is running ASM/ME. For example, if an administrator has to manage and backup Microsoft SharePoint farm databases residing on multiple servers, they can create a HIT Group on a single instance of ASM/ME and manage multiple servers from there.

HIT Groups provide the ability to create and manage Smart Copies and Smart Copy schedules on all the hosts, and simultaneously edit settings on multiple hosts. When a new host is added to a HIT Group, the Host Integration Tools get installed on the host. If a HIT Group already exists, ASM/ME displays a message if any of the hosts are running an earlier version of Host Integration Tools than the version that is running on the local host. Use the **Add Hosts** wizard to remotely upgrade the Host Integration Tools as needed. Clusters and SharePoint farms automatically detect the hosts that need ASM/ME installed and those that need to be added to the HIT Group as seen in Figure 4.
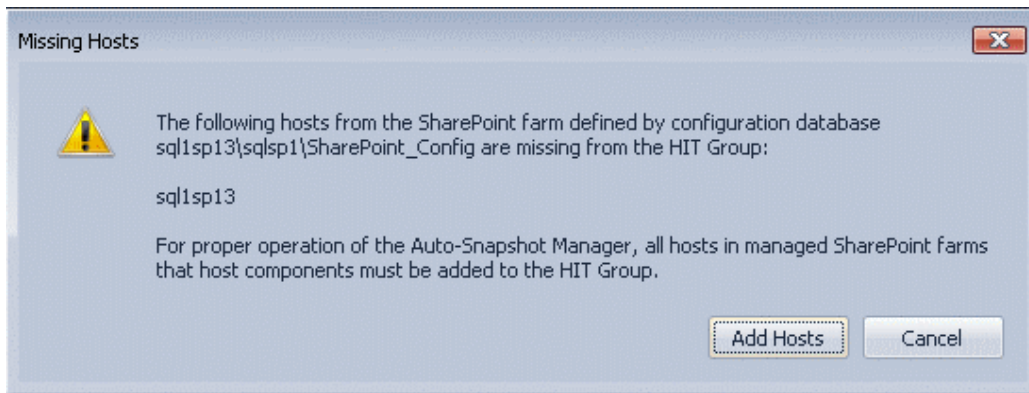
Figure 4   ASM/ME Add Hosts wizard

For more information on Dell EqualLogic Host Integration Tools for Microsoft, please refer to the *Dell EqualLogic Host Integration Tools for Microsoft v4.7.0 - Installation and User's Guide* and the *Dell EqualLogic Host Integration Tools for Microsoft v4.7.0 – Release Notes* on the Dell EqualLogic Customer Support site at https://eqlsupport.dell.com.

5.1   Smart Copy options and backup types

ASM/ME creates Smart Copy snapshots, clones, and replicas. These Smart Copies leverage the built-in PS Series SAN copy facilities.

All Smart Copies are transportable and can be mounted on the same or a different server. All servers on the SAN with ASM/ME installed, that also have access to the Smart Copy backup documents, can mount (or restore) a Smart Copy.

5.1.1 ASM/ME Backup Documents

Backup documents are the link to recovery operations using ASM/ME and are vital to the Smart Copy restore process. They are XML documents that contain the metadata for the Smart Copy set and are by default stored in a local directory. For ASM/ME to perform a volume or database recovery operation, it needs the backup document associated for that Smart Copy set. Without the backup document, there can be no recovery operation with ASM/ME. The location of the backup document folder can be modified within ASM/ME. Figure 5 provides a screenshot of the ASM/ME user interface that shows where the backup document folder location is modified.

Best Practice: Manage the location for the backup document directory on a central share that can be backed up regularly.

All hosts in a SharePoint farm HIT Group must use the same backup document directory.
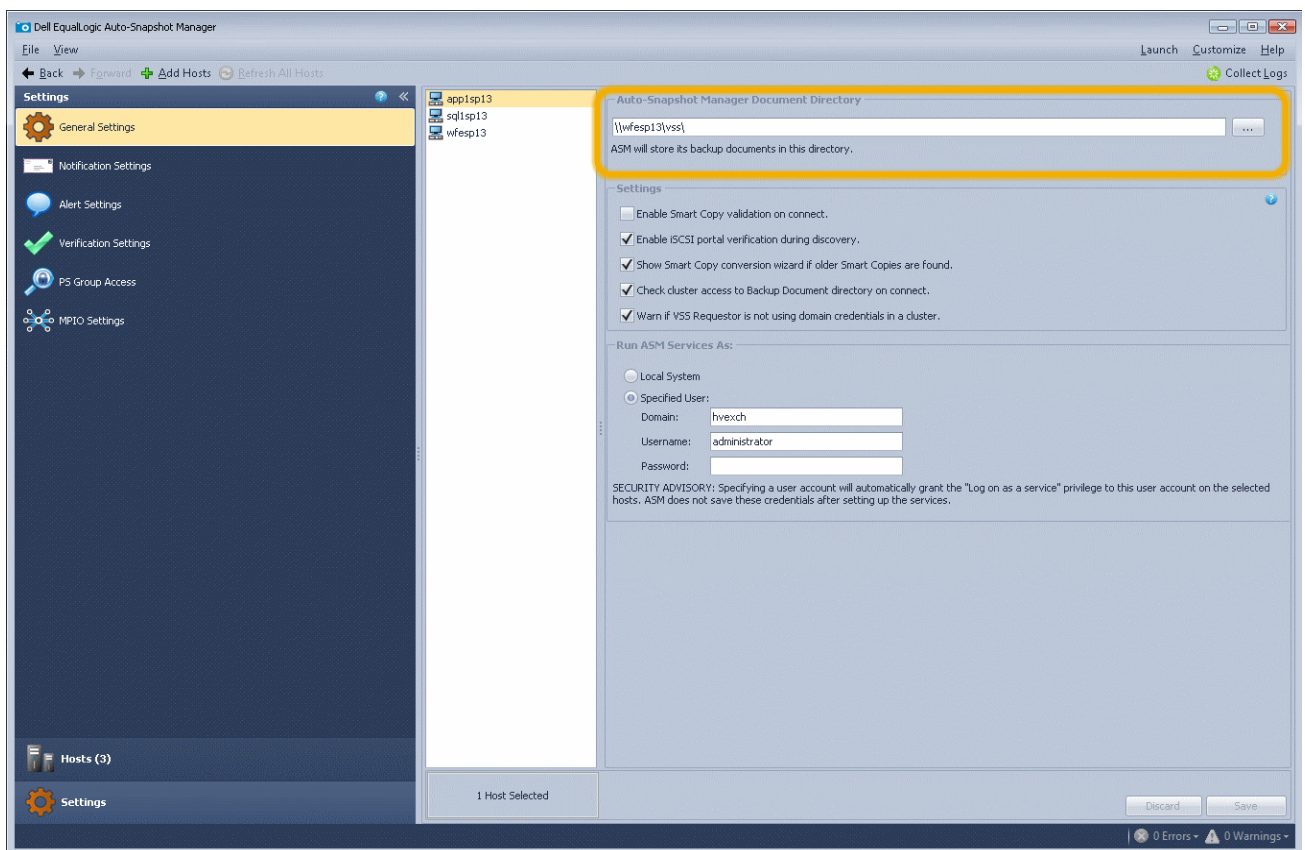
Figure 5   ASM/ME backup document location

5.2 Smart Copy behavior with SharePoint

There are two Smart Copy type options) that can be used with SharePoint (see Figure 6).

- Copy: This backup type creates a copy of the SharePoint farm database with associate logs, and specifies an out-of-band backup operation that has no effect on application log files or backup operations.
- Full: This backup type notifies the SQL Server that there was a backup operation. The operation applies a checkpoint and timestamp to the database log file.
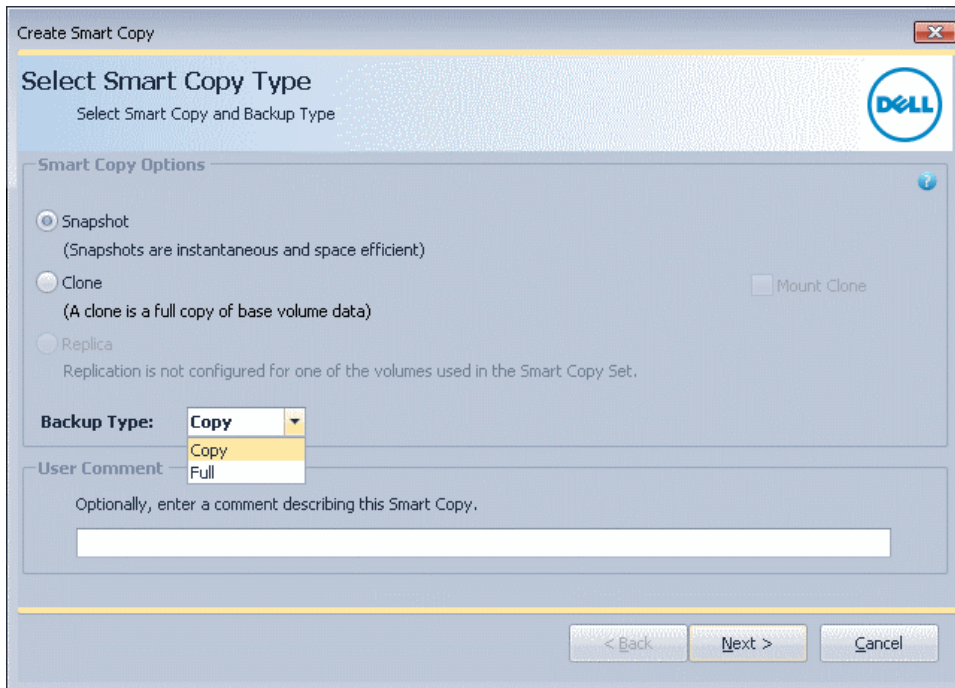
Figure 6   Smart Copy behavior options

5.3 Snapshot Smart Copy

Snapshot Smart Copies are point-in-time copies of SharePoint farm database(s) and log files at the time of the Smart Copy operation. Snapshots are the most space-efficient form of a database Smart Copy and therefore multiple copies of snapshots can be stored and used for restore operations. In the PS Series Group Manager GUI, snapshot Smart Copies are shown under each base volume where they were created. Snapshot Smart Copies are most useful as point-in-time copies of the original SharePoint farm database.

Using ASM/ME, Smart Copy snapshots can be created and applied to restore corrupt or deleted content databases (by using Restore selected DBs) or Search Service Applications (by using Restore SSA).

Best Practice: Maintain keep counts for Smart Copy schedules to minimize overusing the snapshot reserve. Side-by-side restores of Snapshot Smart Copies are best used as temporary copies of databases. For long-term use of a Smart Copy, use Clone Smart Copies.

Clone Smart Copies are exact copies as the original volume or object. When a clone Smart Copy is created, a new volume appears in the Group Manager GUI with the date and timestamp of the Smart Copy operation. Clone Smart Copies can be brought online using the Restore as New option in ASM/ME.

Best Practice: Clone Smart Copies are complete copies of database objects; clean them up after use to avoid storage resource consumption.

Replica Smart Copies are created if replication is configured for a volume or volumes that make up SharePoint farm databases. This requires a replication partner PS Series Group to store the replica set, and must be set up on both PS Series groups prior to creating a replica Smart Copy. The first replication operation always copies the total volume data for a SharePoint farm database volume or NTFS volume. Each subsequent replication operation only copies the data that changed for the volume or volumes since the last replication. Monitor and increase the replica reserve through the PS Group Manager GUI at any time.

Additionally, the Mount as Read-only Smart Copy option halts all replication activity on that Smart Copy set until the replica is un-mounted and demoted.

The time it takes to replicate data can vary due to the amount of data being replicated and the bandwidth of the network between the partner groups.

Best Practice: Size replication space and network bandwidth according to your network needs. Only use the Mount as Read-only option for temporary use. Be sure to un-mount and demote the replica when finished to continue replication on that Smart Copy Set.

5.4   Schedule Smart Copy

Smart Copy sets can be scheduled at various intervals, as shown in Figure 7. The ASM/ME scheduler is based on the Microsoft Windows schedule service that supports Smart Copies to run as often as five minutes apart. ASM/ME also supports a keep count parameter that retains only the specified number of active Smart Copies for an object. This ensures that storage resources are maintained while data recovery remains highly available. Create schedules by either right clicking an object or accessing the command in the dynamic toolbar of ASM/ME. See Appendix B, "Command line options" for instructions on creating schedules in a script.

Note: ASM/ME and Windows scheduling service can process only one scheduled task at a time. A scheduled Smart Copy operation may fail if there is another Smart Copy process occurring at the same time on a server system.
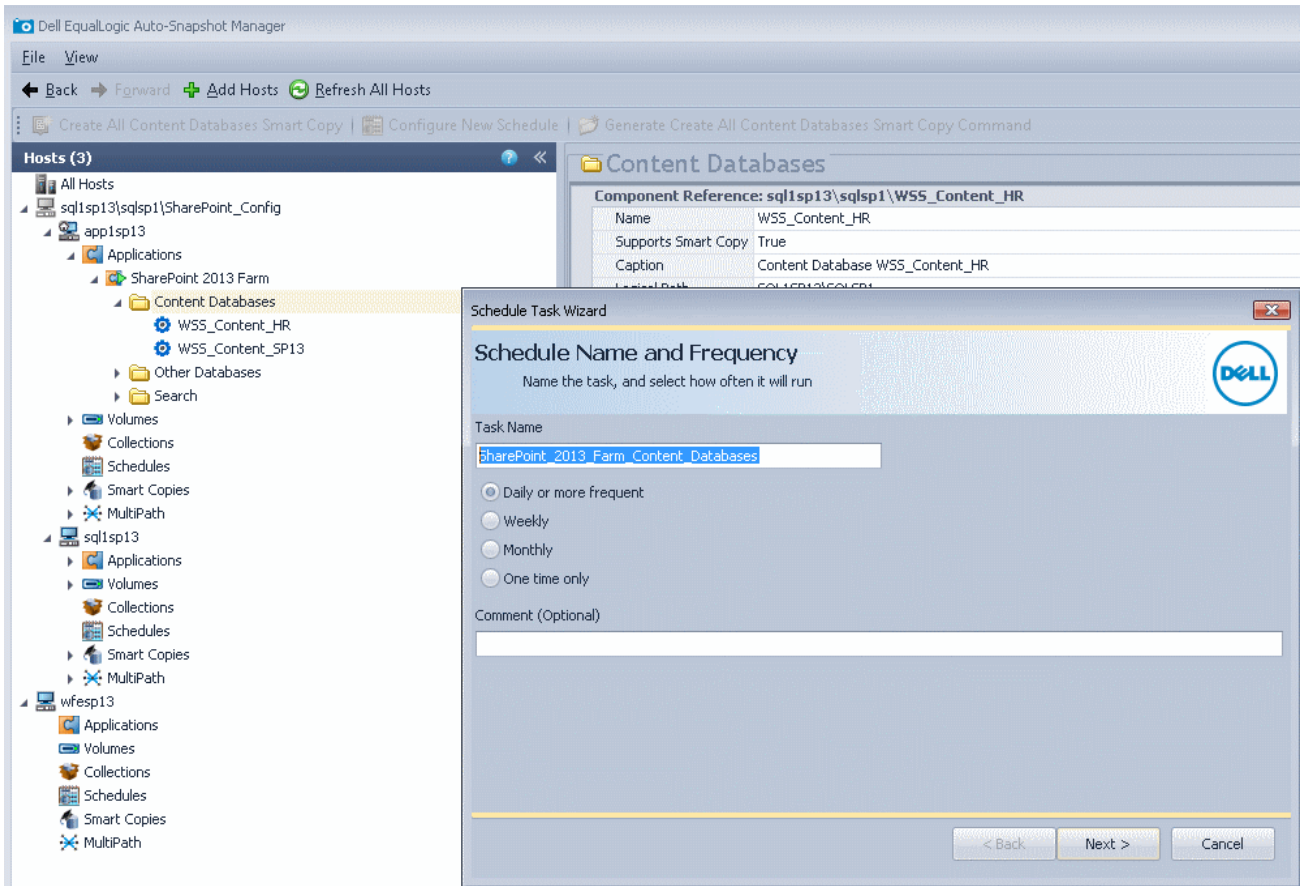
Figure 7   Create Smart Copy schedules

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6 Creating SharePoint farm Smart Copies

The specific business needs of a company determine the type of Smart Copy that ASM/ME needs to create.

- Use snapshot Smart Copies to achieve fast recovery of SharePoint Content. Snapshots consume minimal storage resources, and enable quick roll back to the original volumes for a complete recovery strategy.
- Use clone Smart Copies to create a copy of SharePoint Content for longer durations. Volume clones do not consume snapshot reserve space and they are handled as normal volumes in the PS Series group.
- Use replica Smart Copies if there is a remote array available and to store the latest version of SharePoint content.

6.1 Steps to create Smart Copy sets

All Smart Copies can be created either by right clicking an object or accessing the command in the dynamic toolbar. The wizard (Figure 8) displays options allowed by the object based on the type of Smart Copy operation that is supported (snapshot, clone, or replica).
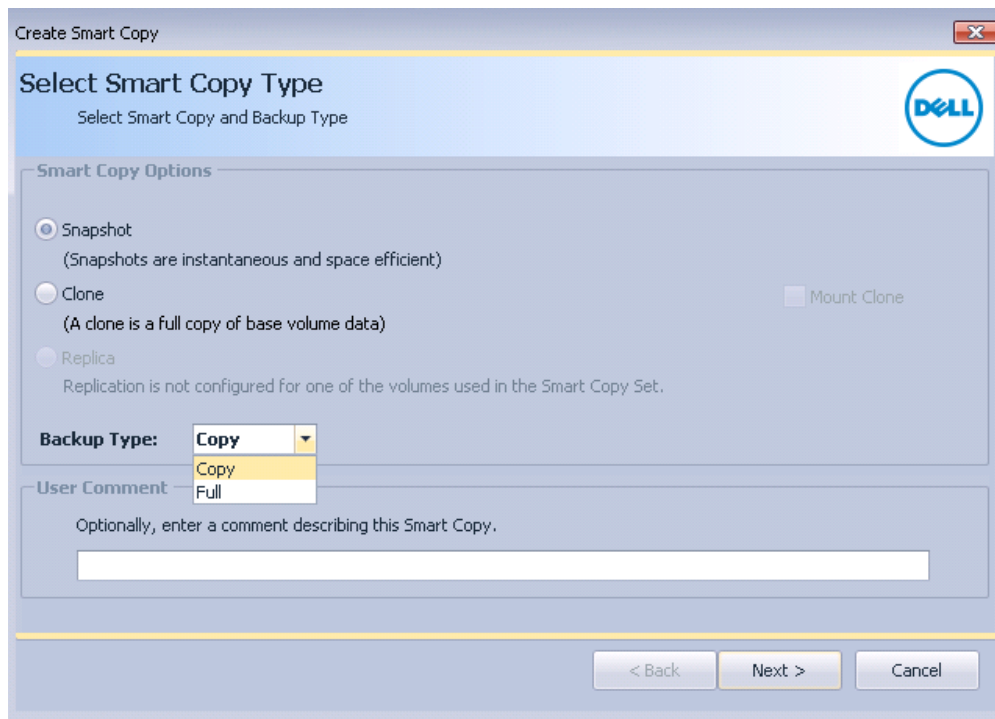
Figure 8   Create Smart Copy window

The recommended configuration is to keep database files separate from logs on their own volumes. Choose the Smart Copy type and behavior based on the planned usage of the Smart Copy (Restore all, Restore Selected Database, or another use).

Optionally, create a schedule to create SharePoint component Smart Copies. By choosing the Configure New Schedule option from the dynamic toolbar, the new schedule can be named and a configured to include a repeating Smart Copy schedule. If notifications are not set up, the schedule service requests that this to be configured prior to creating the schedule. Either decline the request and continue with the Smart Copy schedule, or create a schedule and then click **Next** to proceed.
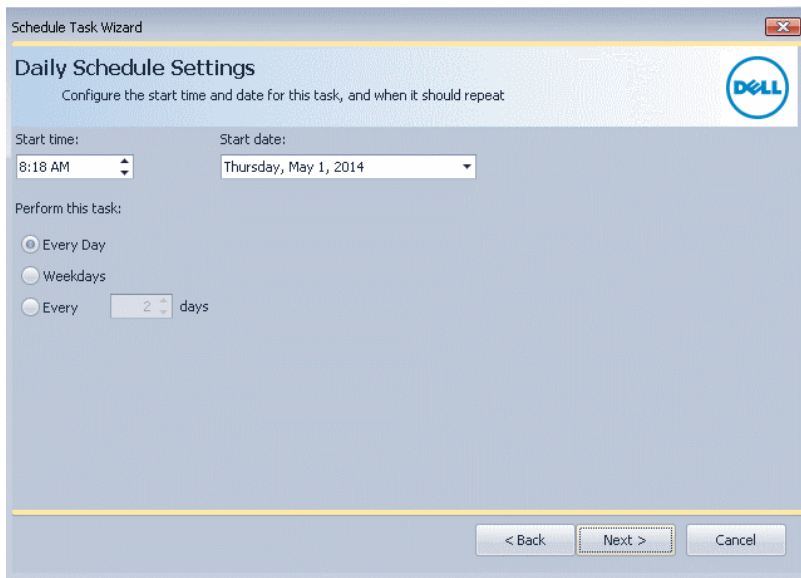
Figure 9   Setup Schedule settings

If a schedule is created, verify the settings displayed in the **Summary** screen (Figure 10).

If the information is correct, click **Create**. If it is not, click **Back** and make the necessary changes.
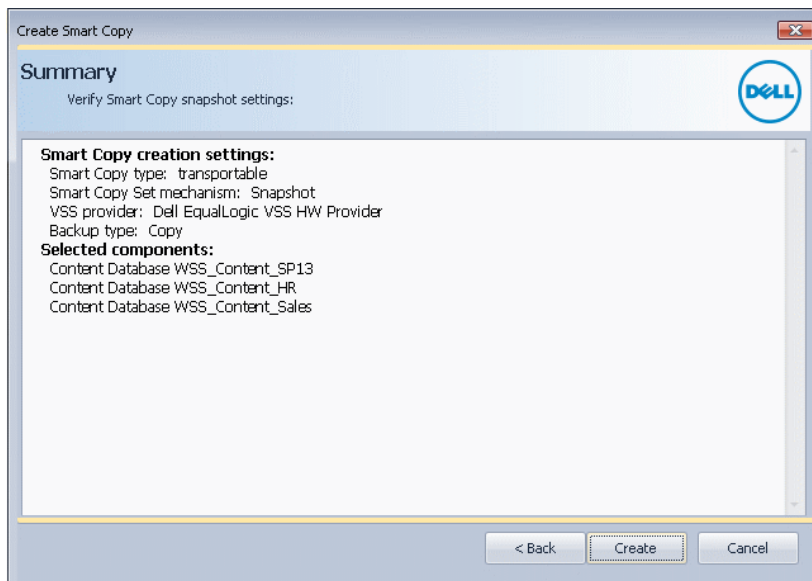
Figure 10   Summary screen

6.2 Displaying Smart Copies

To display information about the Smart Copy set, expand **Smart Copies** in the **Hosts** tree and select a Smart Copy object. The ASM/ME Smart Copy information appears in the right-hand side if the window (Figure 11).
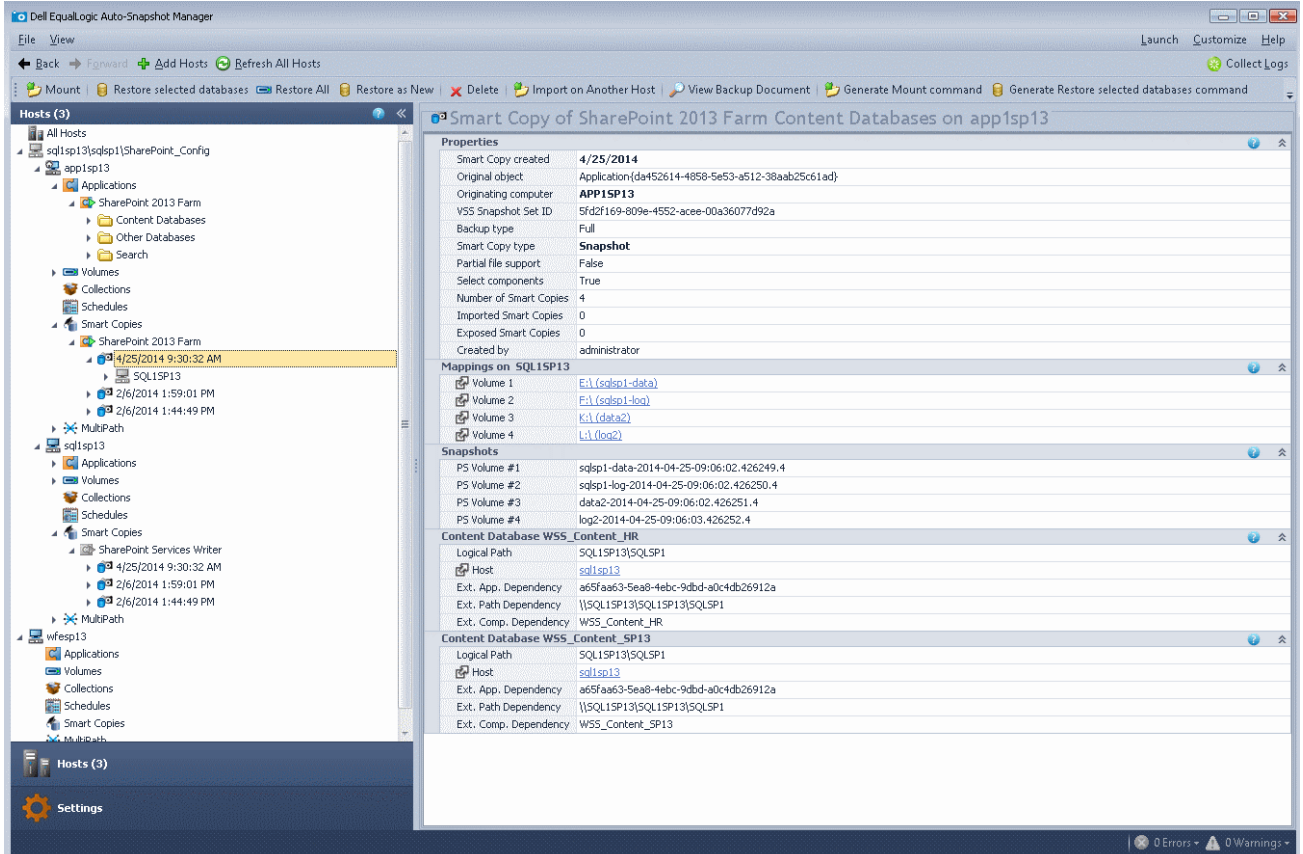
Figure 11   ASM Smart Copy window

7 Restoring SharePoint with Smart Copies

There are various methods used to restore and recover SharePoint using Smart Copies. The underlying PS Series architecture can either restore volumes from a Smart Copy (Restore All or Restore Selected Database) or mount a Smart Copy online to a host as a new volume (Restore as New). The different SharePoint component restore possibilities for these operations are listed in Table 4.

This table describes common restoring scenarios and applying Smart Copy restore options for SharePoint farm data recovery.

Table 4   Restore options for Smart Copy types

| Smart Copy Type	SharePoint Component Type	Data Restoration Options
Snapshot	Entire SharePoint farm	Mount Restore Selected Database Restore As New Database
	Individual content database	Mount Restore All Restore Selected Database Restore As New Database
	Set of all content databases	Mount Restore All Restore Selected Database Restore As New Database
	Search service application (SSA)	Mount Restore SSA
	Search database	Mount Restore As New Database
	Other databases	Mount Restore As New Database
Clone	Entire SharePoint farm	Mount Restore Selected Database Restore As New
	Individual content database	Mount Restore Selected Database Restore As New Database
	Set of all content databases	Mount Restore Selected Database Restore As New Database

Smart Copy Type	SharePoint Component Type	Data Restoration Options
Clone (continued)	Search service application (SSA)	Mount Restore SSA
	Search database	Mount Restore As New Database
	Other databases	Mount Restore As New Database
Replica	Entire SharePoint farm	Mount As Read-Only Clone Restore Selected Database Clone and Restore As New
	Individual content database	Mount As Read-Only Clone Restore Selected Database Clone and Restore As New
	Set of all content databases	Mount As Read-Only Clone Restore Selected Database Clone and Restore As New
	Search service application (SSA)	Mount As Read-Only Clone Restore SSA
	Search database	Mount As Read-Only Clone Restore Selected Database Clone and Restore As New
	Other databases	Mount As Read-Only Clone

7.1   Snapshot Smart Copy Restore options

There are six basic restore options available for snapshot type Smart Copies:

- Restore All: Performs a restore of all the data in the Smart Copy set and brings the SharePoint Farm content database(s) online. This is a point-in–time restoration of the data in all content Database(s).
- Restore Selected Database: Performs a restore of the data in the Smart Copy set and brings the SharePoint farm content database online.
- Restore As New Database: This procedure restores a database from a Smart Copy as a new database for a side-by-side restore.
- Mount: Mounts the Smart Copy set on a specified drive or mount point. It does not restore the databases. By default, the Smart Copy is mounted as read-only, but it can be designated as a read-write Smart Copy.

- Clone and Restore As New: Clones a database from a replica Smart Copy and restores it as a new database for a side-by-side restore. The advantage of using a clone is that it does not disrupt ongoing data replication from the base volume to the replica. The replication process continues while the clone is used for Recovery.
- Restore Search Service Application (SSA): The SSA is restored to the point of the Smart Copy creation. It is recommended to initiate a new incremental crawl, or wait for the next scheduled incremental crawl, to discover new content in the farm.

8 Availability of SharePoint data restoration operations

Within the ASM GUI, some data restoration operations may only be initiated from certain HIT Group members:

- The Restore Selected Database, Restore SSA, and Restore All operations must be initiated in the ASM/ME GUI on the HIT Group host where the SharePoint VSS Writer is running. If the Restore All operation cannot be performed from the writer host, it may be because the Smart Copy contains components other than Content Databases, which cannot be restored; use Restore Selected Database instead.
- The Restore as New operation must be performed from a compatible SQL Server host in the HIT Group. The SQL Server Writer must be running on that host.
- The Clone and Restore as New operation must be performed from a compatible SQL Server host in the HIT Group. The SQL Server Writer must be running on that host.

8.1 SharePoint farm restore scenarios

The following sections discuss SharePoint Farm restore scenarios and how to apply some of the restore options (Figure 12 through Figure 14). Some scenarios may use multiple Smart Copy restore options but each option can have a different effect on the restore. Please read through the next sections carefully to understand how each Smart Copy restore option will affect the SharePoint farm environment.
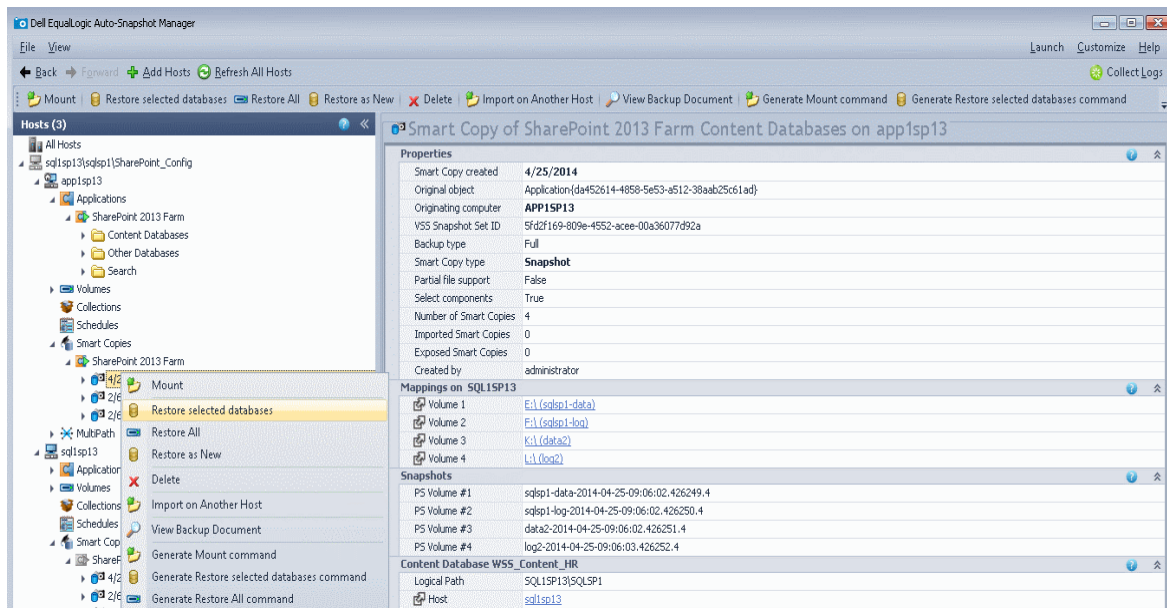
Figure 12   Snapshot Smart Copy Restore options with ASM/ME
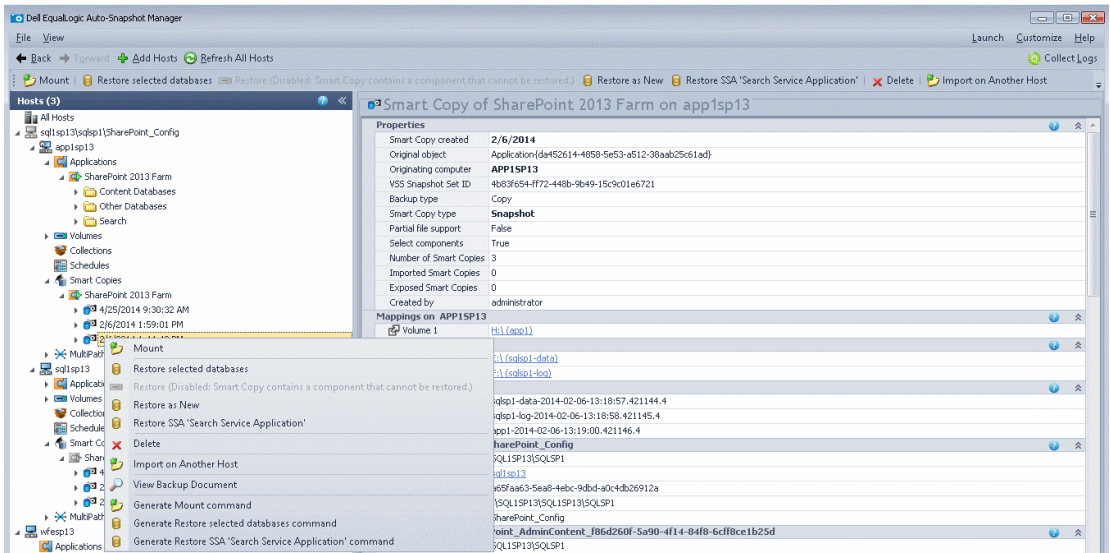
Figure 13   Snapshot Smart Copy Restore options with ASM/ME
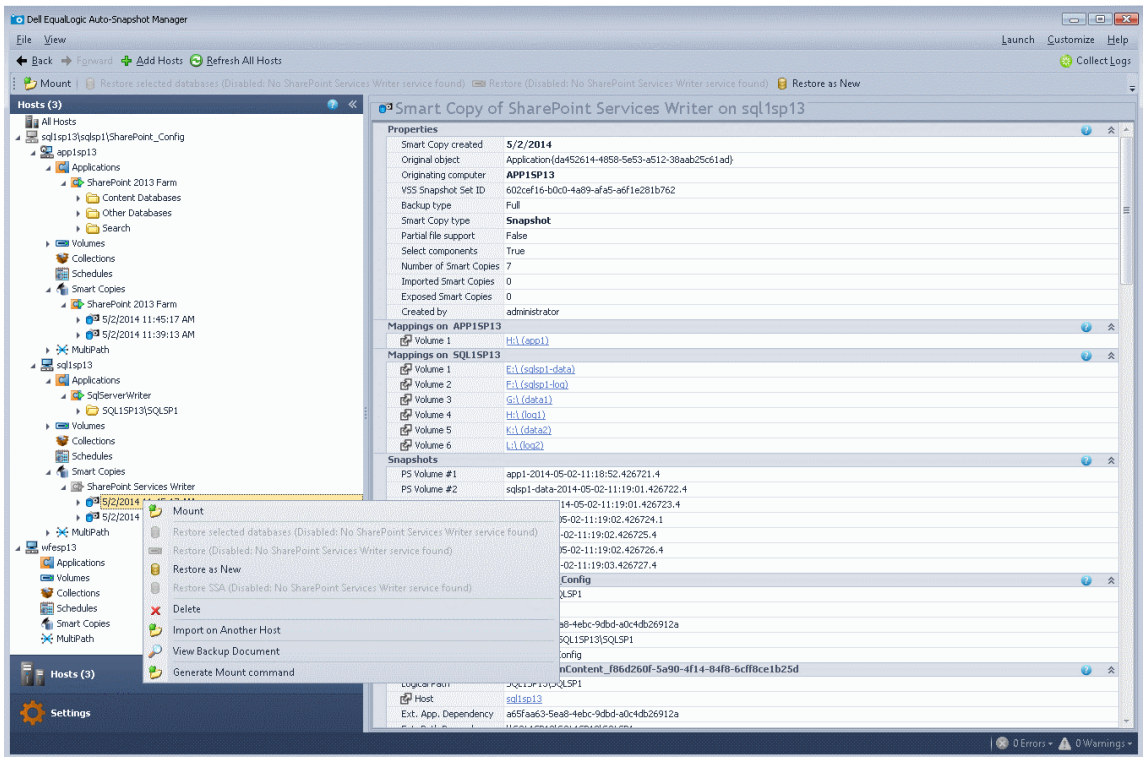
Figure 14   Snapshot Smart Copy Restore options with ASM/ME

8.2 Restore All/Restore Selected Content Database(s) restore

Both Restore All and Restore Selected Content Database perform a restore of the data in the Smart Copy set and bring the SharePoint Farm content database(s) online.

The Restore All process takes all the corresponding content databases and volumes offline, restores the content databases back to the time of the Smart Copy, and brings the volumes and content databases back online to the SharePoint farm.

The Restore Selected Content Database(s) process does the same thing but lets you choose what Content Databases to restore (Figure 15).
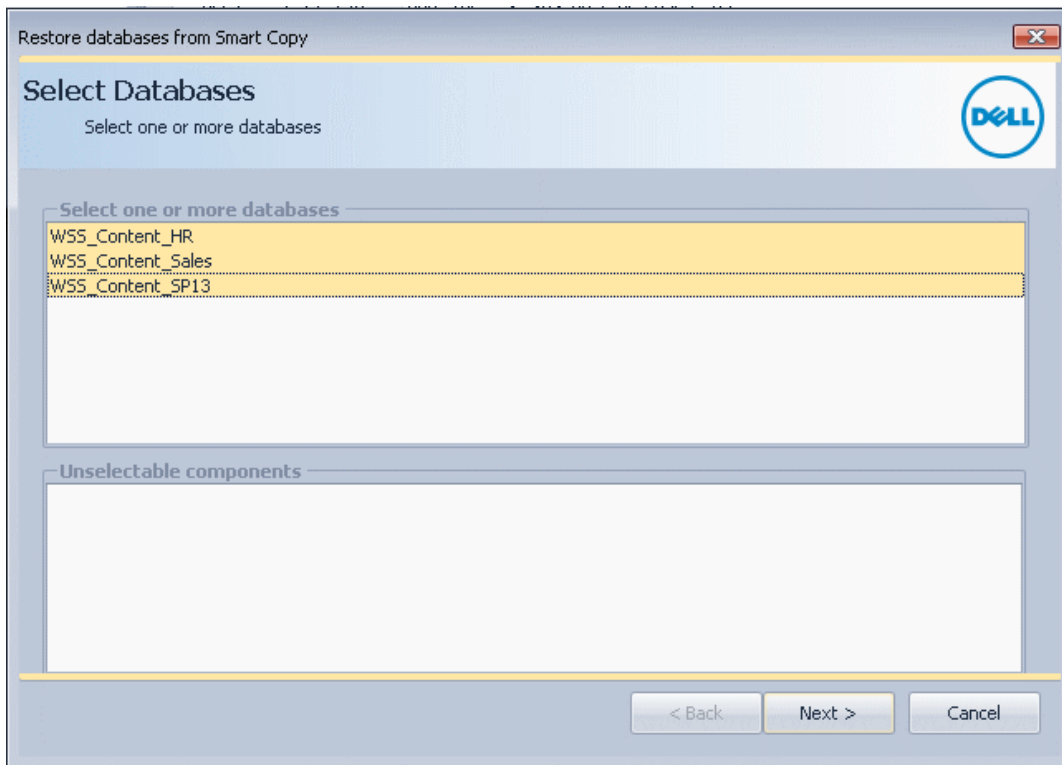
Figure 15   Restore Selected Content Database(s) restore

8.3 Restore Search Service Application

In the event the search database becomes corrupt, the Restore Search Service Application (SSA) can be used to bring the search service database and indexes back (see Figure 16).

Restore steps:

1. The SSA will be deleted if it is online.
2. The search databases and indexes will be restored. All original hosts in the SSA must be online.
3. The SSA will be restored within SharePoint using the original topology.
4. The SSA will use the SharePoint Web Services Default application pool.
5. If necessary, a SSA Proxy will be created.
6. The SSA will be resumed.
7. Incremental or full crawls of content will start as scheduled or can be started manually in Central Administration.
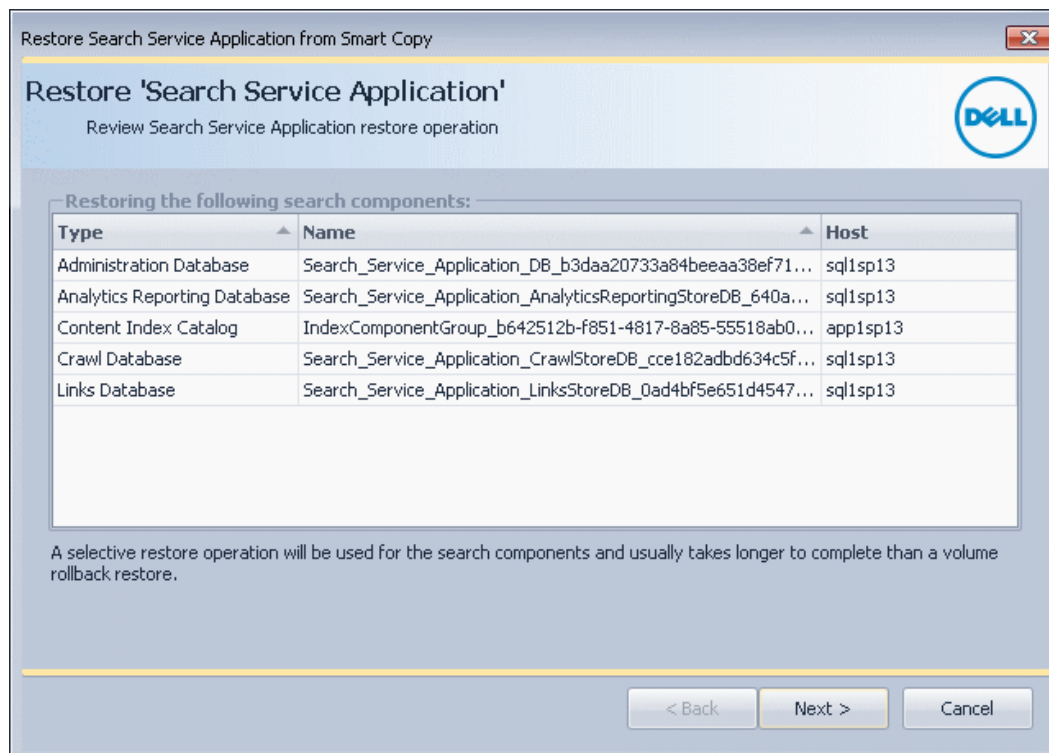
Figure 16   Restore SSA

Click **Next** to proceed, and then click **Restore** in the next window.

> **Note**: Because the SSA will be restored to the point at which the Smart Copy was created, it is recommended to initiate a new incremental crawl, or wait for the next scheduled incremental crawl, to discover new content in the farm.

8.4 Restoring a database from a SharePoint Smart Copy as a new database

This procedure restores a database from a Smart Copy as a new database for a side-by-side restore, or clones a database from a replica Smart Copy and restores it as a new database for a side-by-side restore.

1. Navigate to the SQL host where you want to perform the Restore As New operation. The SQL Server Writer must be running.
2. In the Tree Panel, expand the Smart Copies node for that SQL host.
3. Right-click the Smart Copy and select **Restore As New**. If this operation is for a replica, right-click the replica Smart Copy and select **Clone and Restore As New**.
4. A Snapshot Reserve Warning window will pop up, click **Next** (Figure 17).
5. Select the database that you are restoring and click **Next**. To select multiple databases, press **Ctrl** and click, or press **Shift** and click (Figure 18).
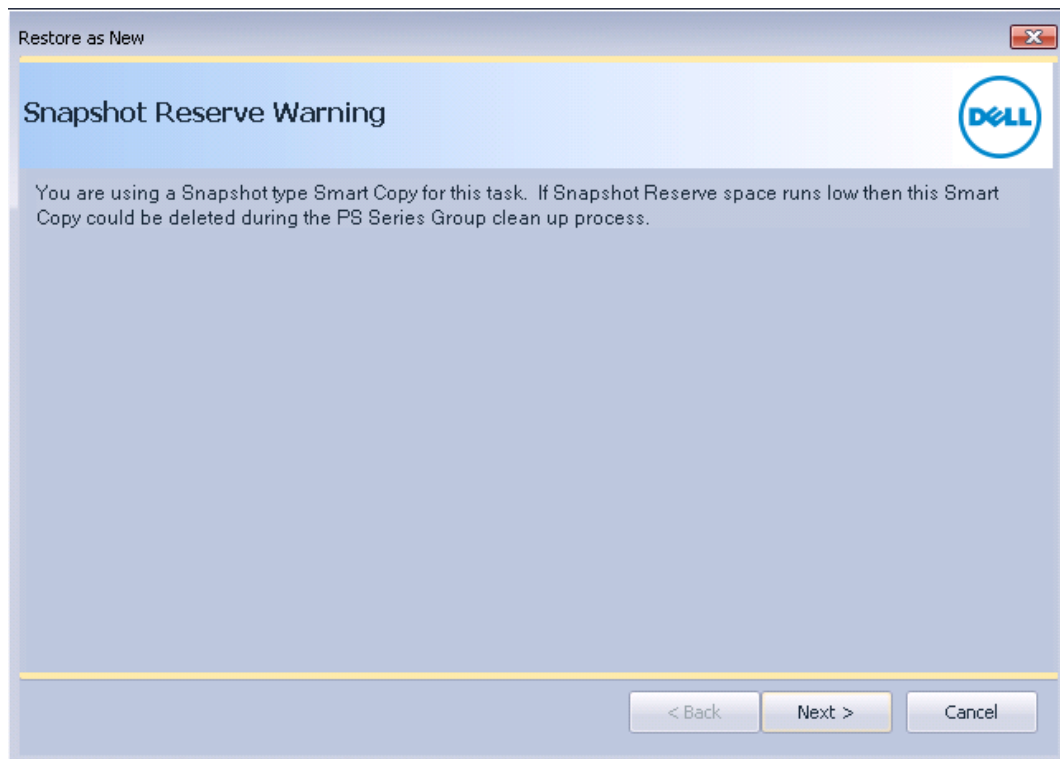
Figure 17   Snapshot Reserve Warning
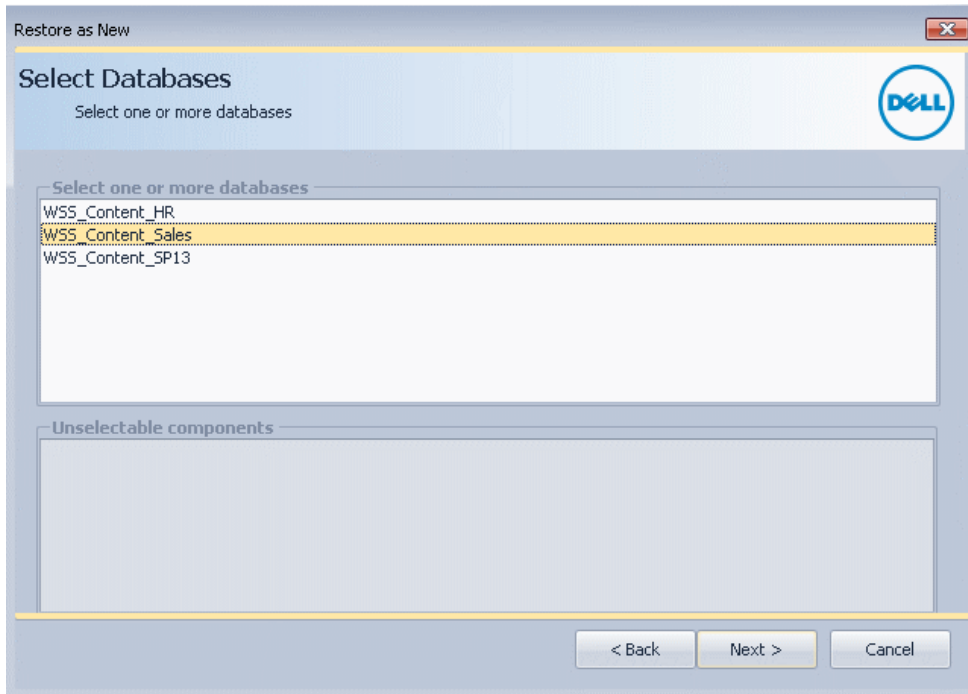
Figure 18   Select Database(s)

6. Specify where to mount the volume.

   You can mount a volume to the default mount folder, specify a different mount folder, or mount the volume to the drive letter of your choice. The default mount folder is C:\ProgramData\EqualLogic\Mounts. A subfolder will be created for each volume in the Smart Copy.

7. To specify a different mount path, click **Browse**.
8. To specify a drive letter instead of a mount path, select the drop-down menu under the **Mount To column** for each listed volume and select a drive letter (Figure 19).
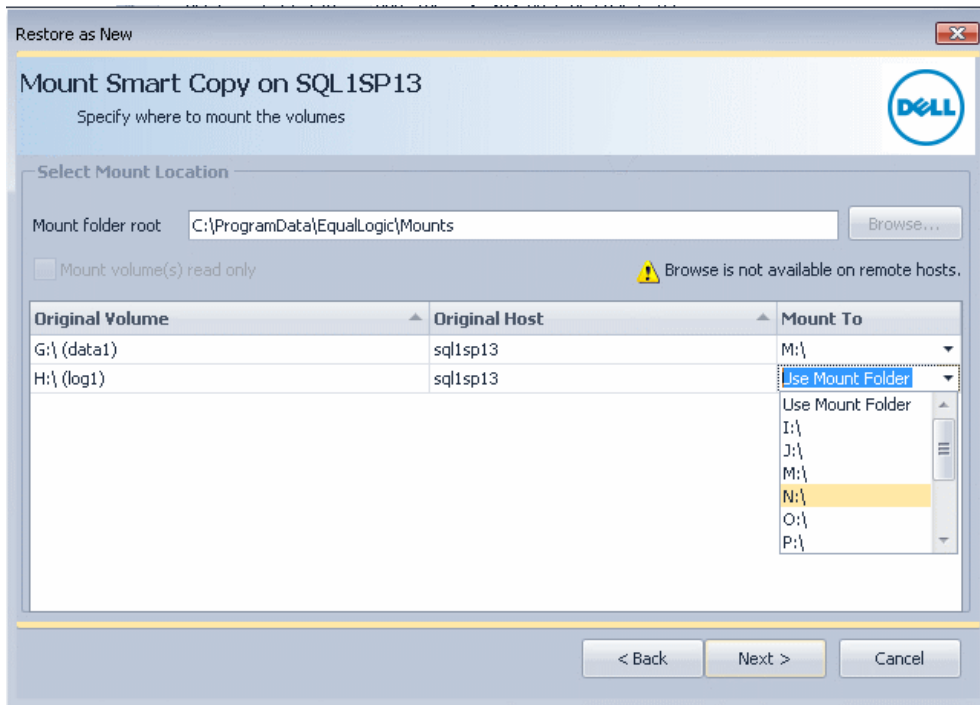
Figure 19   Specify where to mount volumes

9. Click **Next**.
10. Specify the following options (Figure 20):

    –   From the drop-down menu, select a SQL instance.
    –   Check **Read Only** to attach the new database as read only.
    –   **Database Name** displays the name of the new database, which has "_new" appended to the old database name.
    –   To specify a different suffix, select **Use Original Names with Suffix** and type a different suffix.
    –   To change the name entirely, select **Assign Individual Names**. Enter the preferred name in **Database Name**.
    –   Click **Update** if you want to customize the TSQL statements that create the new database. If you modify the TSQL statements before performing the previous steps, your changes will be discarded.
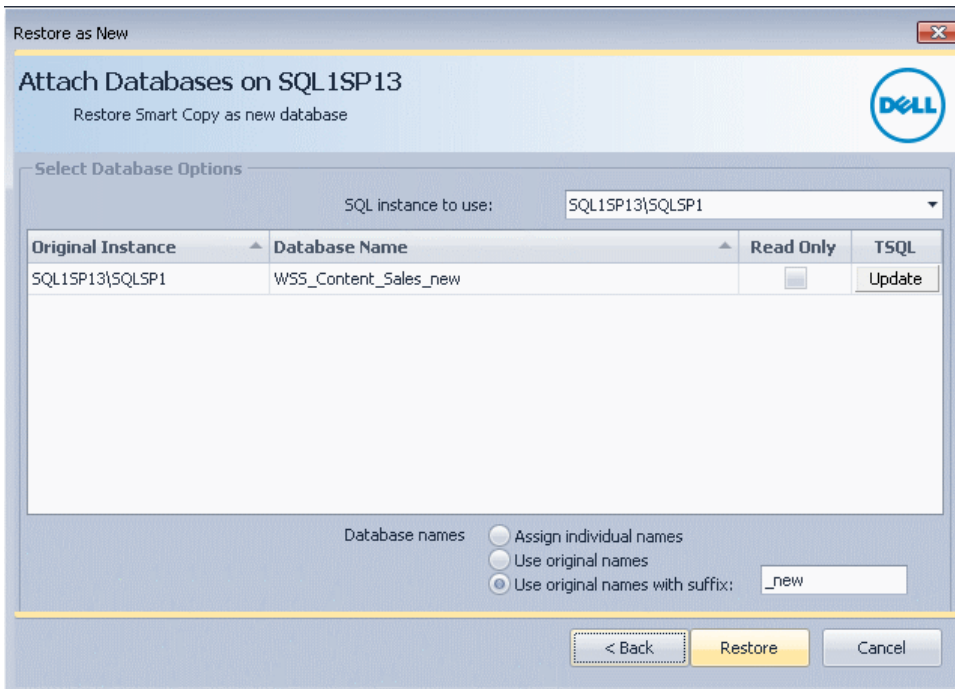
Figure 20   Attach Database options

9 Summary

Auto-Snapshot Manager/Microsoft Edition can substantially increase SharePoint farm component availability by using PS Series data protection technologies. Smart Copy snapshots, clones, and replicas all play a vital role in robust SharePoint farm protection scenarios for on-demand data recovery and SharePoint farm component restores.

Consider using virtual machines on EqualLogic volumes for Web Front-end servers. Smart Copy snapshots of the virtual machines allow recovery of IIS if the WFE fails or needs rebuilding.

Although using ASM/ME will increase SharePoint farm component availability, it is not considered an alternative to long-term backup methods that typically include additional items in the farm outside of the VSS framework. ASM/ME and Smart Copies should be used in conjunction with a normal backup schedule for a higher level of data protection and shorter data recovery time.

Using ASM/ME with regular backup methods ensures that NTFS and SharePoint data is protected and available at all times.

A   Glossary

PS Series Group Manager GUI: A Java-based user interface to manage the PS series SharePoint volumes.

Auto-Snapshot Manager GUI: A host-based management interface to create and manage Smart Copies of SharePoint Farm component and NTFS volumes.

Smart Copy: An application-consistent copy of a SharePoint farm component. Smart Copy types include snapshots, clones, and replicas.

Snapshot Smart Copy: A PS Series volume-based snapshot of a SharePoint farm component or NTFS volume created through Microsoft Volume Shadow Copy Service.

Clone Smart Copy: A PS Series copy of a SharePoint Server component, or NTFS volume created through Microsoft Volume Shadow Copy Service, that is a complete duplicate of the original volume or volumes that make up the SharePoint component and its attributes.

Replica Smart Copy: A PS Series volume snapshot of a SharePoint farm component or NTFS volume created through Microsoft Volume Shadow Copy Service that is stored on a replication partner. Replication must be set up on the PS Series group and on the volume before you can create a replica Smart Copy.

Torn Smart Copy: A Smart Copy Set contains additional components (application data) other than the selected object (SharePoint farm component). Torn Smart Copies will not harm the original SharePoint Farm component or base volume.

Smart Copy Collection: A group of object components (content database and log volume) added to a single Smart Copy operation.

Smart Copy Schedule: A schedule set up though Auto-Snapshot Manager to create ongoing Smart Copies of an object.

Backup Document: An XML file created by ASM that contains metadata of a Smart Copy.

B Command line options

If you have existing scripts for running backups or performing other background operations, you can also schedule the creation of smart copy sets by adding an ASM/ME command to the script.

B.1 Scripting ASM/ME v4.7

ASM/ME v4.7 has enabled much of the functionality of the GUI into the command line interface. Additionally the GUI has included options to automate script creation by allowing users to run through Smart Copy processes in the GUI and outputting the commands needed to perform these operations in the command line.

To initiate the script creation process, highlight the object you want to work with. Either right click or use the dynamic toolbar to **Generate [command type] Command** as shown in Figure 21.
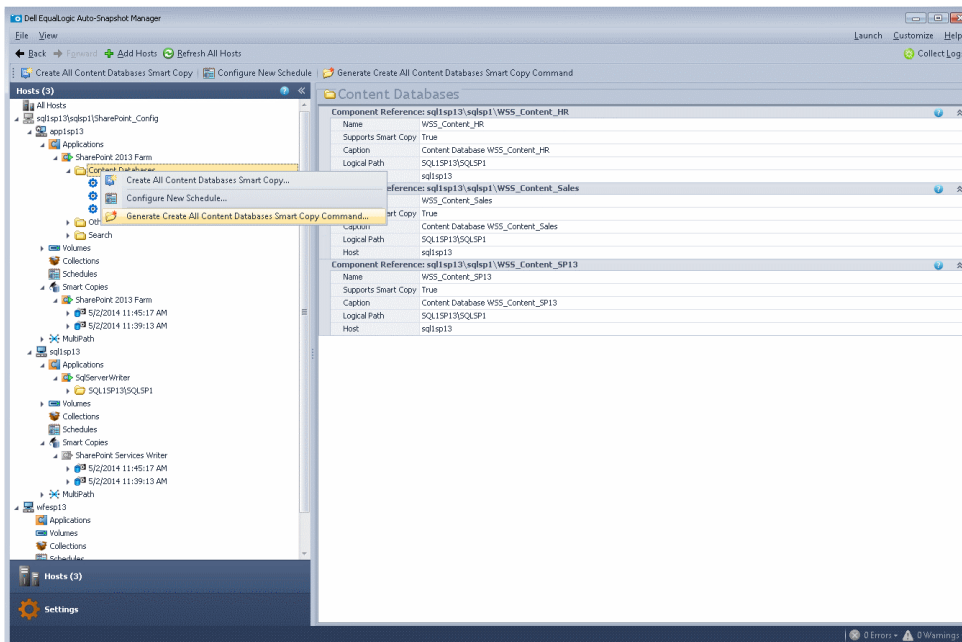
Figure 21   Generate command

This will run through the process of creating a Smart Copy Set and, at the end instead of creating the Smart Copy, generate the script used as shown in Figure 22. This command can then be copied and used to create the Smart Copy in a script or batch file.
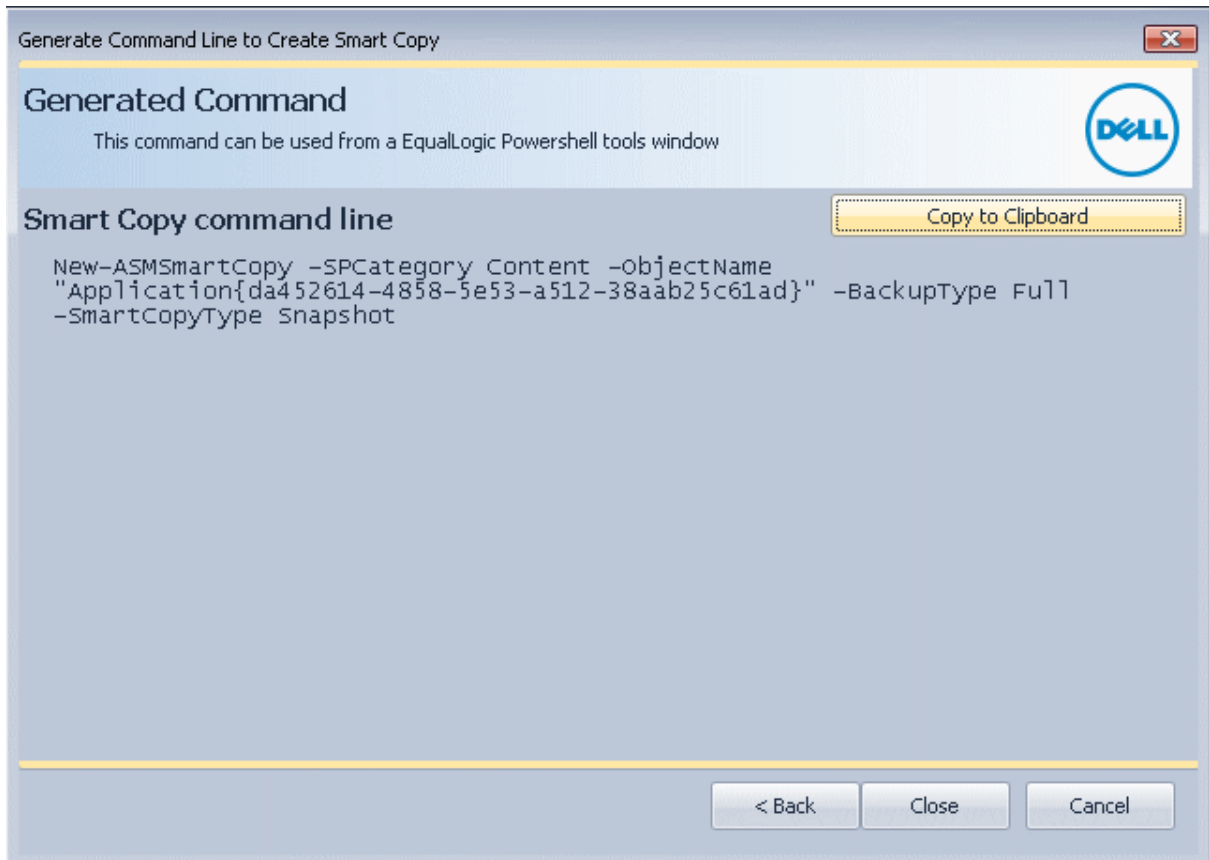
Figure 22   Generated command

Scripts like this can be created for other Smart Copy operations and used accordingly. For a detailed description of script commands and sample usage, see the *Host Integration Tools for Windows v4.7 User Guide,* found on the Dell EqualLogic Customer Support site at https://eqlsupport.dell.com.

C Troubleshooting tips

C.1 VSS-Control

ASM/ME uses Challenge-Handshake Authentication Protocol (CHAP) to communicate with the PS Series group. The authentication user name and password must be the same on the host running Auto-Snapshot Manager and the PS Series group.

If the PS Series group IP address is not already in the group list of the **PS Group Access** tab under the **Settings** tab in Auto-Snapshot Manager, add the IP address of the PS Series group to connect to and add the CHAP username and password to the **VDS\VSS** and **Smart Copy** fields. If the group is in the list, modify the VDS\VSS and Smart Copy access rights to match those of the PS Series group to use with Auto-Snapshot Manager. Be sure to restart the Auto-Snapshot Manager application if the Host Management credentials are modified.

You can determine whether CHAP is set up correctly by selecting the **Targets** tab in the Microsoft iSCSI Initiator service and verifying that the vsscontrol volume is shown in the list. The vsscontrol volume has a status of **connect** if CHAP is set up correctly. If there are multiple vsscontrol volumes in the targets list, display the connection details by selecting the volume and choosing **Details** in the Targets window. The PS Series group connection will be listed in the Session Connections section. Be sure the Volume Shadow Copy service is running on the host prior to checking the vsscontrol volume status.

D   SharePoint installation best practices

Create or verify domain accounts in the domain. At a minimum one account for SQL, and optionally an account for SharePoint management. For example, domain\sp_sqladmin and domain\sp_admin. These domain account(s) should be in the local administrators group of every host in the farm (directly or through group membership).

For more information, see the Microsoft article, "Initial deployment administrative and service accounts in SharePoint 2013" on the TechNet library at http://technet.microsoft.com/en-us/library/ee662513.aspx.

Create volumes on EqualLogic storage for the SharePoint farm Search Service Application or SharePoint Foundation Search, the search components must reside on PS Series storage so that ASM/ME recognizes all the underlying index files that make up the search component. Make sure that search components are not on the same volume as farm databases.

All SharePoint search indexes need to be on EQL storage. Otherwise, ASM will show the components as gray and will not include them in Smart Copies).

> **Note**: Best practice would be to reinstall SharePoint on the application server and define the default index location.

D.1   SQL host

More volumes will be needed on the SQL host to separate content databases for restore.

Database and log files will be placed on separate volumes so always create pairs of volumes.

Create directories and specify a default database location in SQL under **Server** > **Properties/Database Settings**. This makes sure the initial SharePoint databases are created on EqualLogic volumes and minimizes the manual work of moving all of them off of the C drive.

D.2   Web Front-end

Use Virtual Machines on EqualLogic volumes for web front-end servers. Smart Copy snapshots of the virtual machines allow recovery of IIS if the WFE fails or needs rebuilding.

E ASM/ME installation on a SharePoint farm

1. Identify a network-shared directory to store Smart Copy backup documents.

   - All farm hosts that ASM/ME will be managing must be able to access this exact path.
   - The farm administrator must have read-write access to this path.
   - Any HIT Group hosts where Smart Copies will be imported using ASM/ME also have read-write access to this path.

2. Choose a farm host where SharePoint is installed to serve as the writer host, and then enable the SharePoint VSS writer on it. The SharePoint VSS writer is not enabled by default. Use a web front-end server or an application server as the writer host. To enable the SharePoint VSS writer on the host, perform the following steps.

   If SharePoint 2013 is running:

   a. Right-click **Run as Administrator** to open the command prompt.
   b. Run the following command:

   ```
   "C:\Program Files\Common Files\Microsoft Shared\Web Server
   Extensions\15\BIN\STSADM.exe" -o registerwsswriter
   ```

   The message, "Operation completed successfully" is displayed.

   c. Confirm SharePoint VSS writers on the nodes where it is registered by running **vssadmin.exe list writers** from an elevated command prompt. Search writers will appear only on hosts where that SharePoint service is provisioned.

   If SharePoint 2010 is running:

   a. Right-click **Run as Administrator** to open the command prompt.
   b. Run the following command:

   ```
   "C:\Program Files\Common Files\Microsoft Shared\Web Server
   Extensions\14\BIN\stsadm.exe" -o registerwsswriter
   ```

   The message, "Operation completed successfully" is displayed.

   c. Confirm SharePoint VSS writers are on the nodes where it is registered by running **vssadmin.exe list writers** from an elevated command prompt. Search writers will appear only on hosts where that SharePoint service is provisioned.

1. Install ASM/ME on the host running the SharePoint VSS writer.
2. Open the ASM/ME console. ASM/ME will display a list of the farm hosts that need to be added.
3. Add those hosts through the **Add Hosts** wizard.

   a. Click **Add Hosts**.
   b. Select Cluster and SharePoint Farm Nodes and click **Next**.

c. Enter farm administrator credentials (domain, username, and password) for the hosts being added.

d. If you want to install MPIO or the PowerShell Tools on the host, select those options.

e. Specify the directory that contains the installation files.

f. Click **Add Hosts** to begin the installation on the specified host. Progress and status information are displayed. (An error message is displayed if the installation or upgrade cannot complete.) When the process is complete, click **Close**. The **Summary of Hosts** page is displayed.

g. This page displays the hosts that have been added to the HIT Group, and the actions—such as installations or upgrades—that have been performed on each host. This page also shows whether a reboot is required on the remote hosts. If a reboot is required, click **Reboot All**. Otherwise, click **Finish**.

4. Open the **General Settings** page in ASM/ME and specify the farm administrator domain account for the Run ASM Services as an option. On the same General Settings page, specify the shared backup document directory that was identified in Step 1. Ensure that every host in your HIT Group is using this same backup document directory.

5. If the SharePoint farm contains a SQL cluster, proceed with the following step. If not, the installation procedure is complete.

6. If one of the hosts that were just added is a SQL cluster node, ASM/ME will recognize that a SQL cluster is running within the farm, and will prompt to add the remaining SQL cluster nodes. Add these hosts through the **Add Hosts** wizard.

7. Open the General Settings page in ASM/ME and specify the farm administrator domain account for the Run ASM Services as an option. Also, specify the same shared backup document directory for each cluster node.

Related documentation

For detailed information about PS Series arrays, groups, volumes, array software, and host software, log in to the Documentation page at the customer support site at eqlsupport.dell.com.

Vendor	Document Title
Microsoft	Capacity planning for SharePoint Server 2013
Microsoft	Install and configure SharePoint 2013
Microsoft	Configure services and service applications in SharePoint 2013
Microsoft	Hardware and software requirements (SharePoint Server 2010)
Microsoft	Best practices for SQL Server in a SharePoint Server farm
Microsoft	Troubleshooting (SharePoint Server 2010)
Microsoft	Deployment overview (SharePoint Server 2010)

All PS Series technical reports are available on the customer support site at: dell.com/support.

Dell EqualLogic storage solutions

To learn more about Dell EqualLogic products and new releases being planned, visit the Dell EqualLogic TechCenter site: http://delltechcenter.com/page/EqualLogic. Here you can also find articles, demos, online discussions, technical documentation, and more details about the benefits of our product family.

Technical support and customer service

Dell support service is available to answer your questions about PS Series SAN arrays.

1. If you have an Express Service Code, have it ready. The code helps the Dell automated support telephone system direct your call more efficiently.
2. If you are a customer in the United States or Canada in need of technical support, call 1-800-945-3355. If not, go to Step 3.
3. Visit eqlsupport.dell.com.
4. Log in, or click **Create Account** to request a new support account.
5. At the top-right, click **Contact Us**, and call the phone number or select the link for the type of support needed.

Dell online services

You can learn about Dell products and services using this procedure:

1. Visit http://www.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.