FUJITSU

ETERNUS

Backup/Recovery Solution for Hyper-V CSV using ETERNUS Disk storage system and Microsoft System Center Data Protection Manager 2010

System Configuration Guide

May 2011

Fujitsu Limited

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Contents

1. Introduction

Fujitsu carried out verification of data protection and recovery for Hyper-V Cluster Shared Volumes using Microsoft System Center Data Protection Manager 2010, Fujitsu ETERNUS Disk storage system and ETERNUS VSS Hardware Provider. This document describes the steps needed to perform data protection and data recovery.

1-1. Revision Level

Revision	Date	Description
1.0	May 2011	Initial Release

1-2. Audience

This document is intended for IT administrators and system engineers who have an interest in implementing Windows Server 2008 R2 Hyper-V Cluster Shared Volumes using Fujitsu ETERNUS Disk storage systems. It is assumed that the reader has a general knowledge of Microsoft System Center Data Protection Manager 2010, Hyper-V, ETERNUS Disk storage systems and ETERNUS VSS Hardware Provide. Also, this document is not responsible for System integration. We recommend that a user tests a system before being put into operation.

1-3. Glossary

The products and functions are defined as follows:

- SCDPM2010 : System Center Data Protection Manager 2010
- ETERNUS VSSHP : ETERNUS VSS Hardware Provider
- CSV : Cluster Shared Volumes
- SDV : Snap Data Volume of ETERNUS Disk storage system

The servers are defined as follows:

- Hyper-V host : The server where Hyper-V Guest OS is running. DPM Agent is installed.
- DPM server : The server where SCDPM2010 is installed. This server is a backup server.

2. Product Information

2-1. Data Protection Manager 2010

Data Protection Manager (DPM) 2010 is part of the System Center family of management products from Microsoft. It delivers unified data protection for Windows servers such as SQL Server, Exchange, Share Point, Virtualization and file servers -- as well as Windows desktops and laptops. DPM seamlessly uses disk, tape, and cloud-based repositories to deliver an easy-to-use and best-of-breed backup and recovery solution for Windows environments from Microsoft. Windows customers of all sizes can rely on Microsoft to provide a scalable and manageable protection solution that is cost-effective, secure, and reliable.

Please refer to the page below for detail:
http://www.microsoft.com/systemcenter/en/us/data-protection-manager.aspx

2-2. ETERNUS Disk storage system

ETERNUS Disk Storage Systems are designed to meet all the requirements of mission-critical environments. ETERNUS DX8000 series provides the largest capacity disk storage systems and features high scalability in both server connectivity and storage capacity. ETERNUS DX400 series delivers a midrange disk storage system with the flexibility to support a wide range of configurations. The ETERNUS disk storage systems lineup is completed by the compact, highly reliable, and scalable, entry disk storage systems - ETERNUS DX60/DX80/DX90. Their small profile and power-saving design is a great match to any environmental concerns. Business continuity is supported by the high availability of every ETERNUS disk storage system. All provide redundant configurations and hot swappable main components (fans, power supplies, etc.).

- ETERNUS Disk Storage System
  http://www.fujitsu.com/global/services/computing/storage/eternus/products/diskstorage/

2-3. ETERNUS VSS Hardware Provider

This software is designed to provide support for Microsoft Volume Shadow Copy service (VSS) with Fujitsu Disk Storage Systems. Use of this software with backup software and writer software supporting VSS delivers online backup using the one point copy (snapshot) capability of Advanced Copy function available with ETERNUS Disk storage System.

- Product information and download page
  http://www.fujitsu.com/global/services/computing/storage/eternus/tools/vsshp.html
  http://www.fujitsu.com/global/services/computing/storage/eternus/products/diskstorage/feature/strsys-c14.html

2-4. ETERNUS SF Storage Cruiser and ETERNUS SF AdvancedCopy Manager

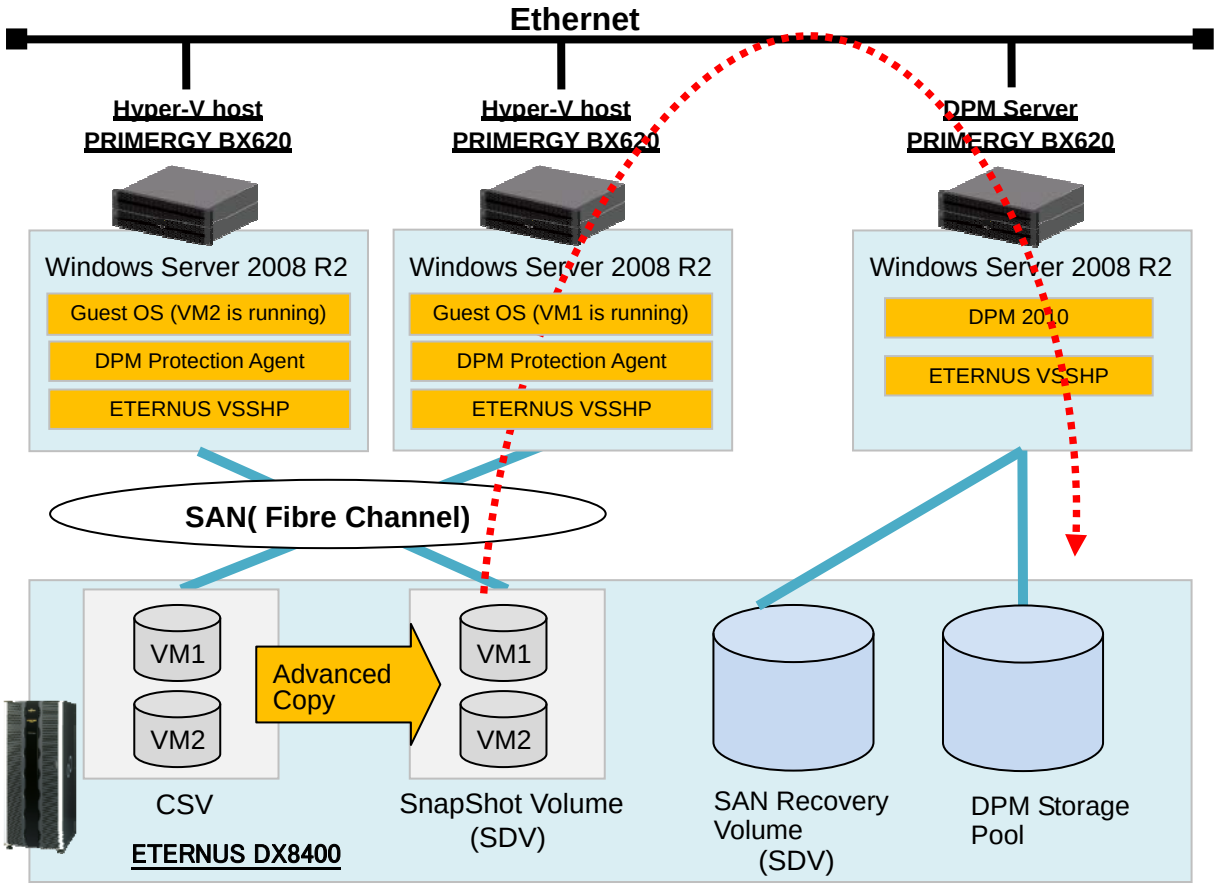
ETERNUS SF Storage Cruiser provides the advanced storage infrastructure management capability based on the SAN (Storage Area Network) management features. ETERNUS SF Storage Cruiser can unify management of ETERNUS Disk Storage Systems as well as the SAN environment including servers and FC switch. This supports the stable operation of the storage systems. In addition, the complex storage environment can easily and surely be managed by using GUI. This leads to a significant cost reduction.

ETERNUS SF AdvancedCopy Manager provides high-speed backup, restore and replication features using ETERNUS Disk Storage Systems. The Advanced Copy functions of ETERNUS Disk Storage Systems ensure that high-speed backups are performed every time, regardless of the size of the data, keeping down backup times to a minimum even for large volumes of data. ETERNUS SF AdvancedCopy Manager supports online backups, where business operations are not interrupted. This feature operates with major database systems such as SQL Server, Exchange Server, Oracle and DB2. ETERNUS SF AdvancedCopy Manager can be used as part of your disaster recovery solution to minimize the risk of data loss and to restore normal operations quickly, thus reducing the overall down time of business operations.

Please refer to the page below for detail:
http://www.fujitsu.com/global/services/computing/storage/eternus/products/eternus-sf/

*) In this verification, we don’t use ETERNUS SF Storage Cruiser and ETERNUS SF AdvancedCopy Manager.

3. System Configuration



The evaluation environment was set up as follows:

- One Hyper-V host serves as Active Directory Domain Controller.
- Two Hyper-V hosts are member of Windows Server Failover Clustering.
- Three open volumes and three SDVs are created on the ETERNUS DX8400.
- Assign two “open” volumes of ETERNUS DX8400 to the Hyper-V host and create two virtual machines on the volumes. Volumes are used as CSV.
- Assign two “SDVs” of ETERNUS DX8400 to the Hyper-V host. The logical capacity of SDV must be the same as that of the CSV. This volume is used as a snapshot volume.
- Assign one “open” volume of ETERNUS DX8400 to the DPM server. This volume is used as DPM Storage Pool volume.
- Assign one “SDV” of ETERNUS DX8400 to the DPM server. The logical capacity of this SDV must be the same as that of the DPM Storage Pool volume. This volume is used for SAN recovery and needs to be set to offline on the Disk Management tool.
- Install ETERNUS VSSHP to all servers and set “Local Copy Configuration”. Target disk pool management setting is only needed on the Hyper-V host. For more details, please refer to the ETERNUS VSSHP User’s guide.
- ETERNUS Disk storage systems perform the Advanced Copy at the request of SCDPM2010 via ETERNUS VSSHP and snapshot volumes of CSV are created. DPM2010 obtains the backup data from the snapshot volumes and stores the data to the DPM Storage Pool.

It is assumed that the installations and setting of Active Directory Domain Service, SCDPM2010, ETERNUS VSSHP and ETERNUS Disk storage system are already completed in this evaluation environment.

3-1. Hardware Configuration

Server Configuration（Hyper-V host and DPM server）

- Model: Fujitsu PRIMERGY BX620 S3
- System: Intel Xeon 2.33GHz , 4096MB RAM

Storage System Configuration

- Model : Fujitsu ETERNUS DX8400
- RAID　: RAID5 (Disk 146GB/15krpm)

3-2. Software Configuration

Hyper-V host

- Microsoft® Windows Server® 2008 R2 Enterprise Edition (Host OS)
- Microsoft® Windows Server® 2008 Enterprise Edition Service Pack 2 (Guest OS)
- Hyper-V Integration Services (Guest OS)
- Microsoft System Center DPM Protection Agent
- ETERNUS VSS Hardware Provider 1.5.0
- ETERNUS Multipath Driver V2.0L16

DPM server

- Microsoft® Windows Server® 2008 R2 Enterprise Edition
- Microsoft System Center Data Protection Manager 2010
- ETERNUS VSS Hardware Provider 1.5.0
- ETERNUS Multipath Driver V2.0L16

4. Protecting and Recovering Hyper-V CSV

This section provides the steps to backup Hyper-V CSV with ETERNUS VSSHP, and to recover the data from DPM storage pool.

In this backup scenario, ETERNUS Disk storage systems perform the high-speed Advanced Copy at the request of SCDPM2010 via ETERNUS VSSHP and create snapshot volumes. No SCDPM2010 settings for using ETERNUS VSSHP should be necessary. SCDPM2010 obtains the backup data from the snapshot volumes across a LAN. Usually, the redirected I/O access occurs when data backup for the CSV VM begins, and I/O performance might be going down. The big advantage of this scenario compared with using Software Provider is the time of redirected I/O access is minimized because ETERNUS disk storage systems and ETERNUS VSSHP instantly create snapshot volumes.

Recovery of the CSV is performed by using SCDPM2010 functions. We confirmed two kinds of recoveries in this evaluation program.

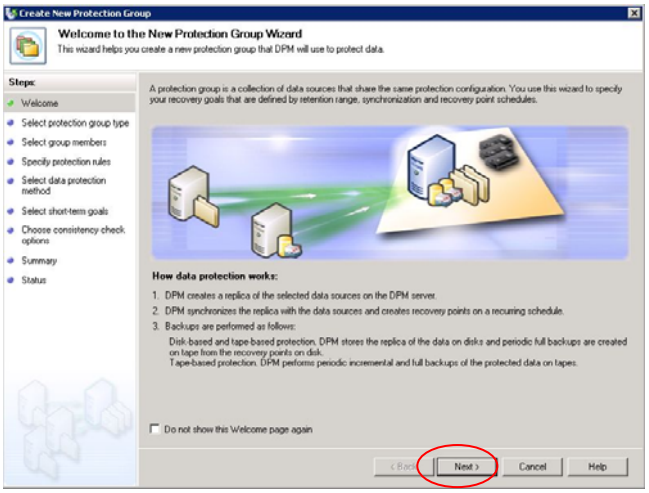
1. Recovery across a LAN by using SCDPM2010 functions.
2. Recovery in a SAN environment by using SCDPM2010 SAN Recovery function and ETERNUS VSSHP commands.

4-1. Data Backup

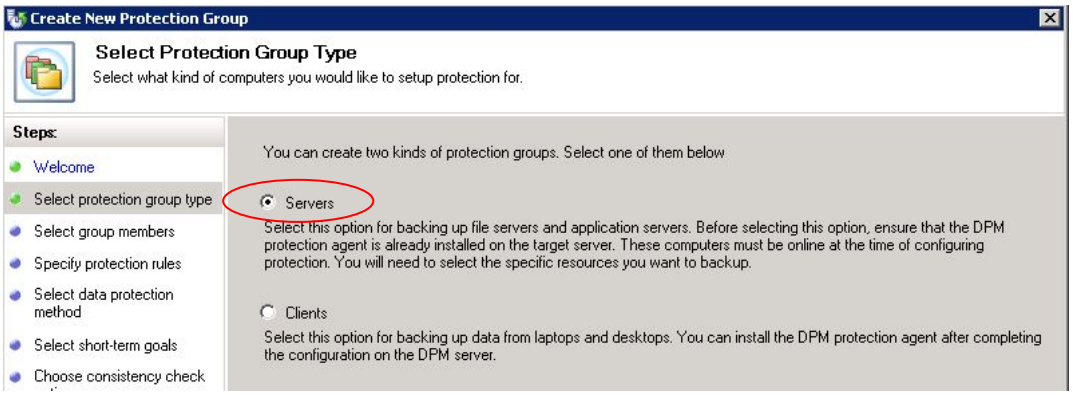
To execute backup with ETERNUS VSSHP, perform the following steps to create new protection group on the DPM server.

1. In the DPM2010 Administrator Console, click [Protection] on the navigation bar, and then [Create protection group].

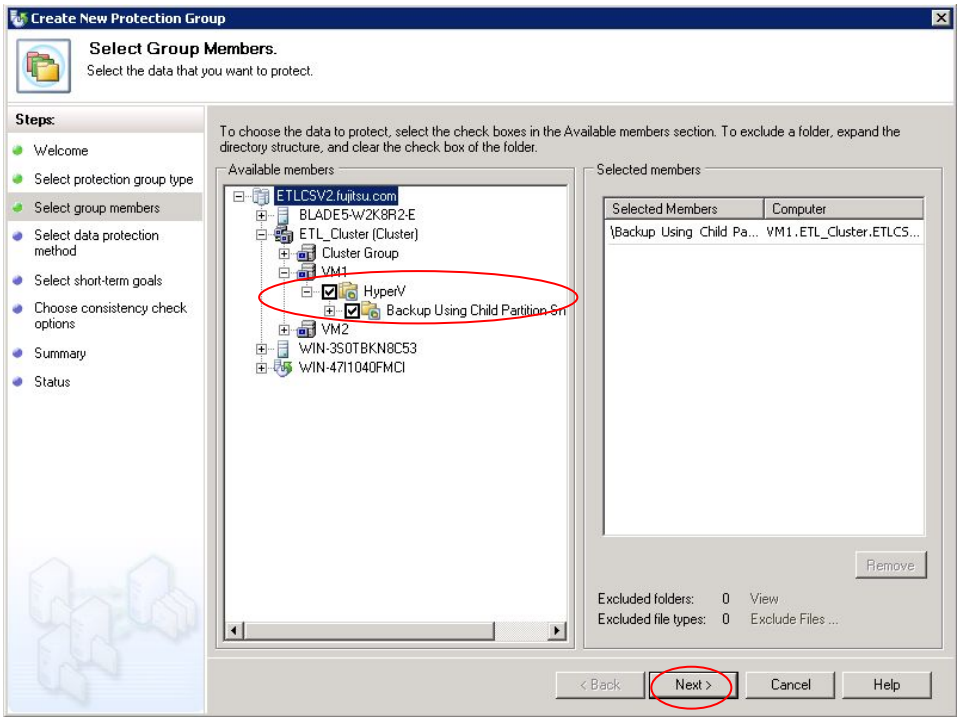
2. Click [Next] on the Welcome to New Protection Group page.



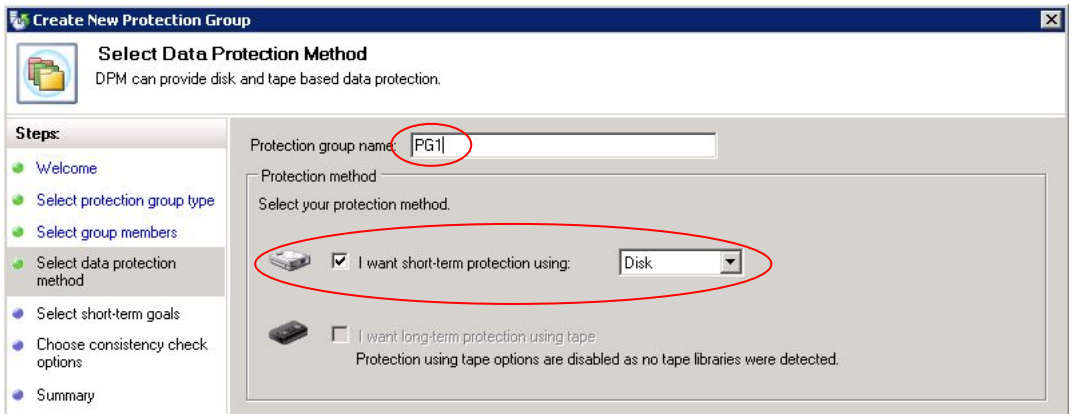
3. In the “Select Protection Group Type” page, confirm that “Servers” is selected, and then click [Next].



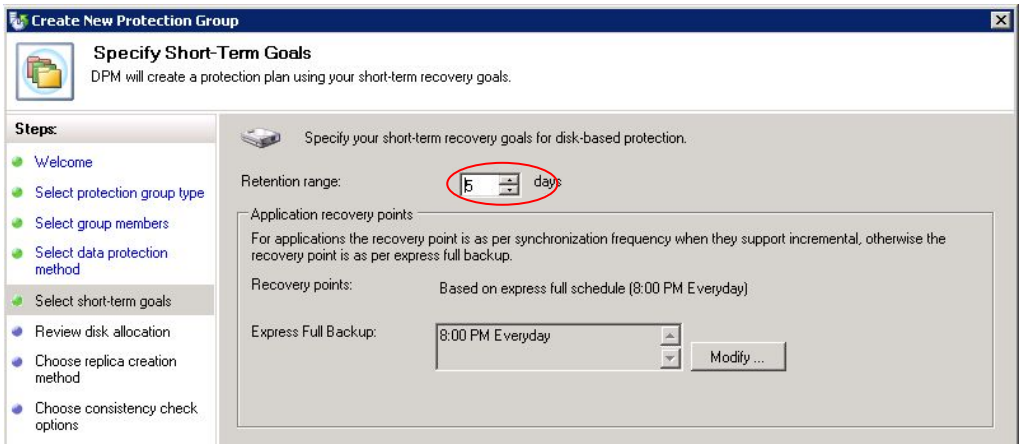
4. In the “Select Group Members” page, select the data source to be protected. This time, select the “Backup Using Child Partition Snapshot” of VM1, and then click [Next].



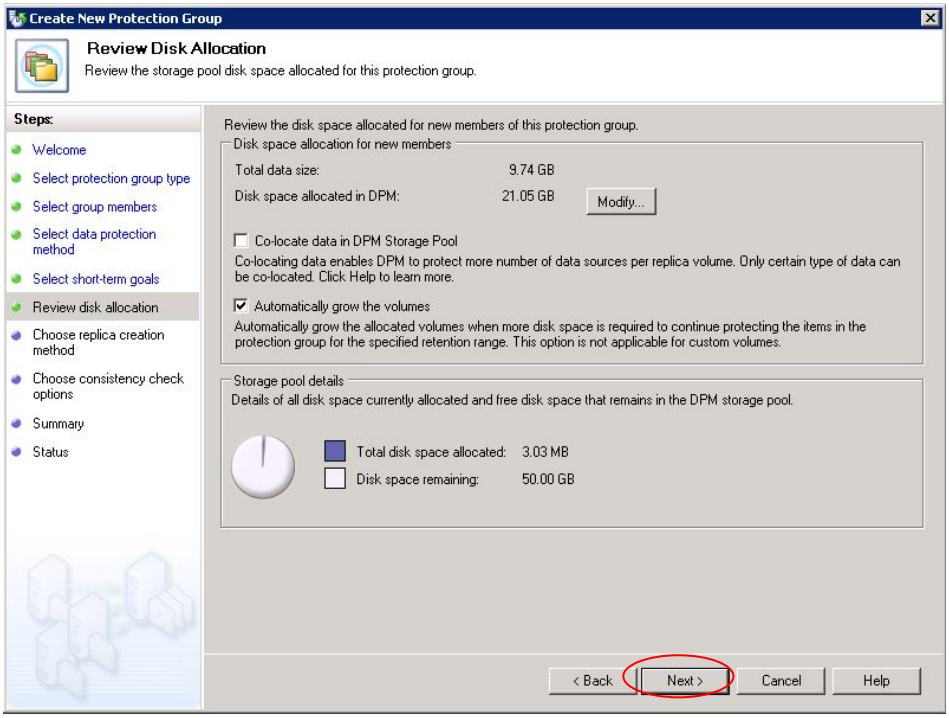
5. In the “Select Data Protection Method” page, name the protection group. This time, enter “PG1”. Confirm that “I want short-term protecting using” is selected and then click [Next].



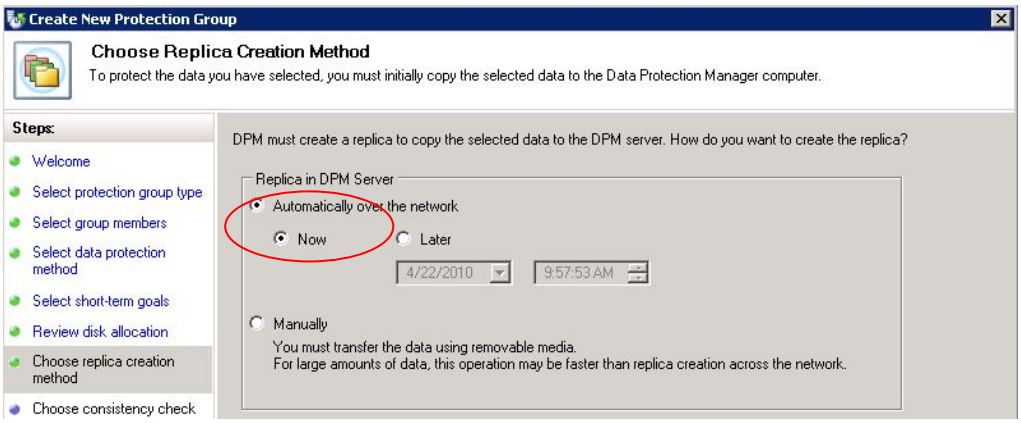
6. In the “Specify Short-Term Goals” page, accept the default setting for Retention Range and then click [Next].



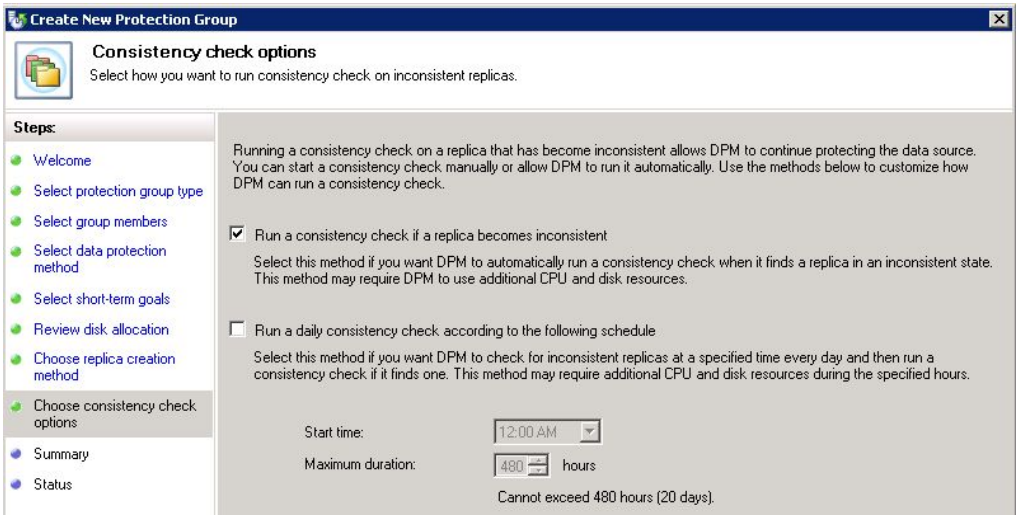
7. In the “Review Disk Allocation” page, accept the default and then click [Next].



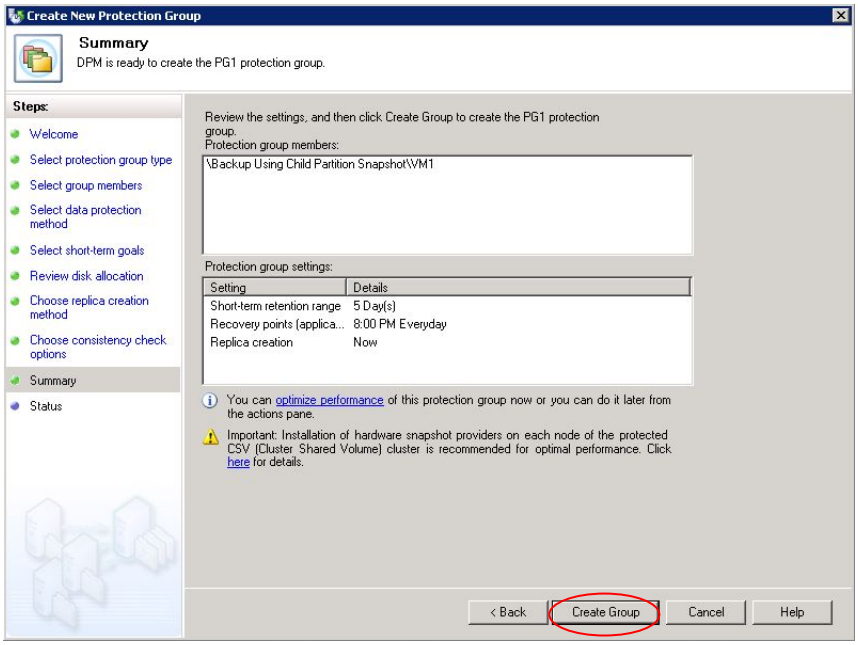
8. In the “Choose Replica Creation Method” page, confirm that [Automatically over the network]-[Now] is selected, and then click [Next].



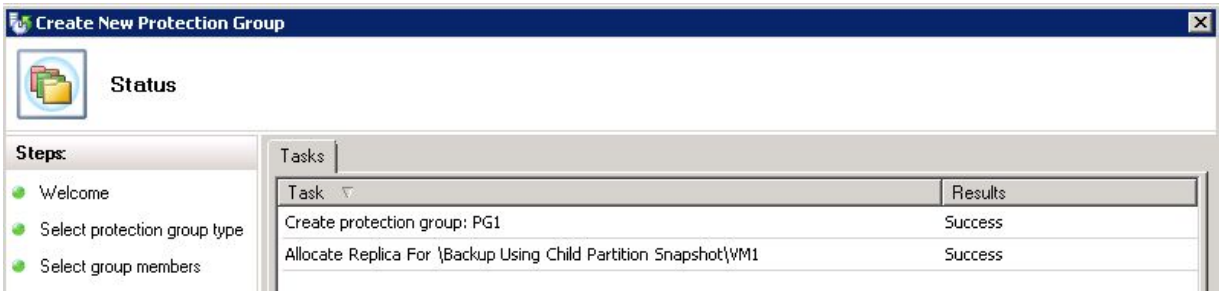
9. In the “Consistency check options” page, accept the default and then click [next].



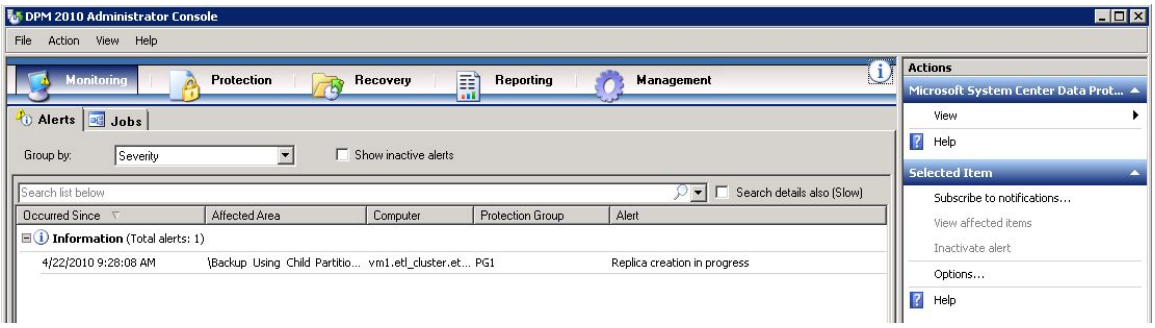
10. In the “Summary” page, confirm the setting summary and then click [Create Group].



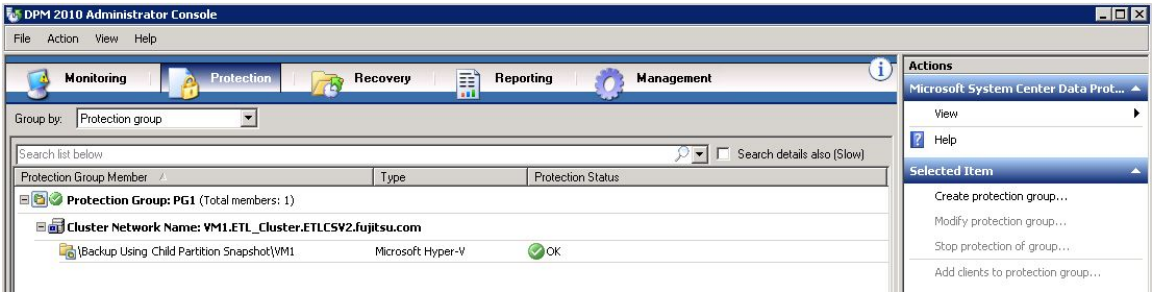
11. In the “Status” page, confirm that all Task show “success” and then click [Close].



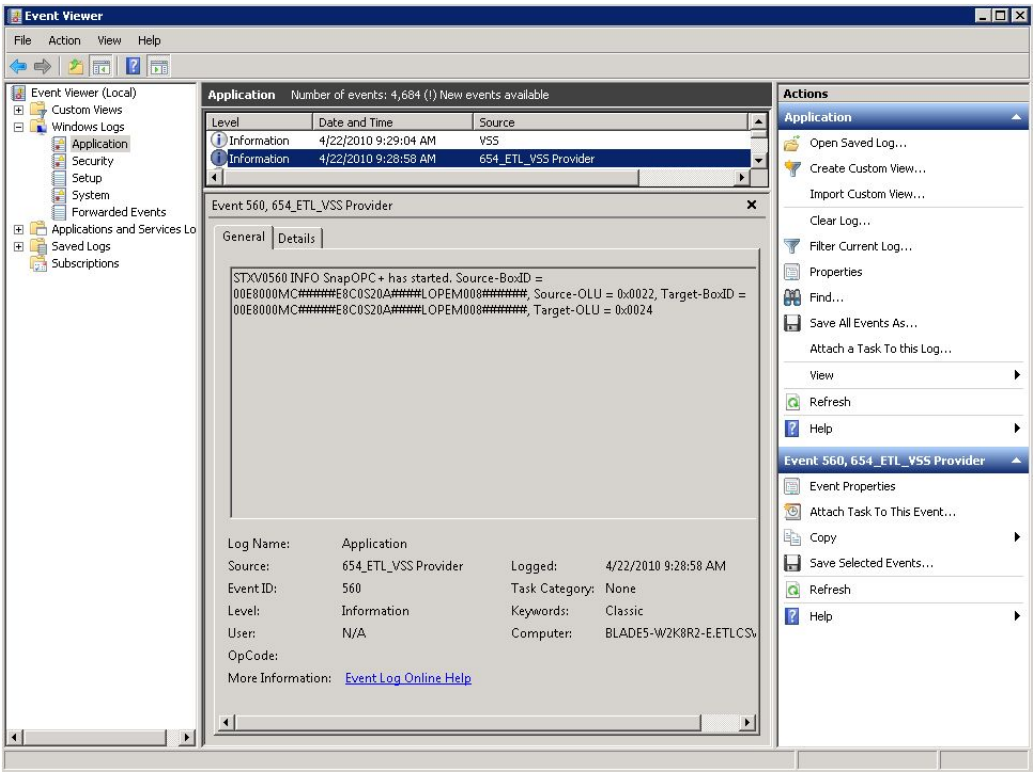
12. Data backup for the CSV VM begins.



After the backup job is complete, the Protection status turns “OK”.



Open the Event Viewer on the Hyper-V host and confirm ETERNUS VSSHP worked for the data protection.



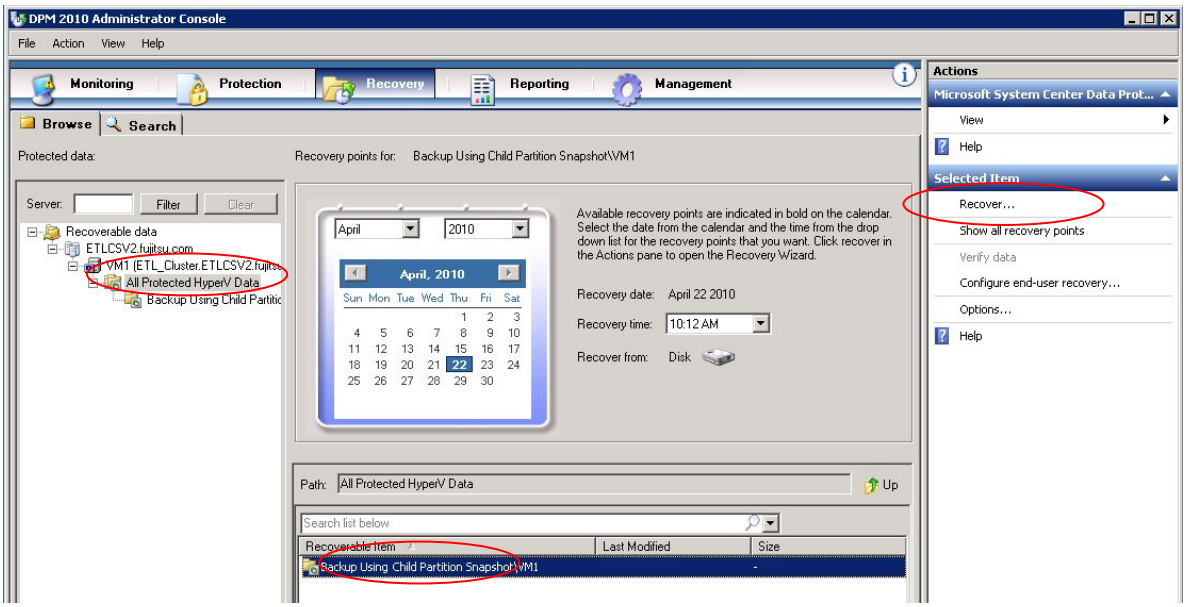
4-2. Data Recovery

To recover data across a LAN, perform the following steps on the DPM server.

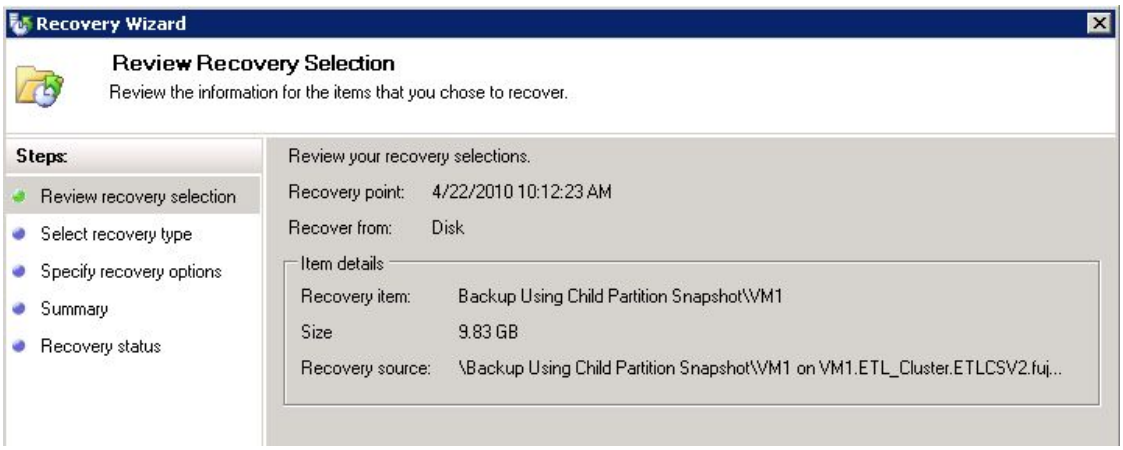
1. Open the Hyper-V Manager on the Hyper-V host. Shut down the target virtual machine if it's running.

2. In the DPM 2010 Administrator Console, click [Recovery].

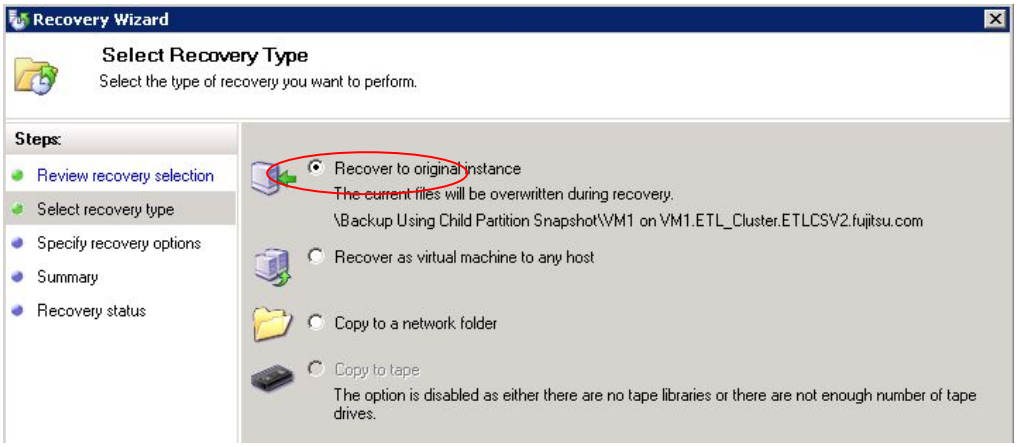
3. From the left panel, select "All Protected Data" of the target virtual machine. Next, select "Backup Using Child Partition Snapshot\VM1" from Recoverable Item panel, and then click [Recovery] from Selected Item panel.



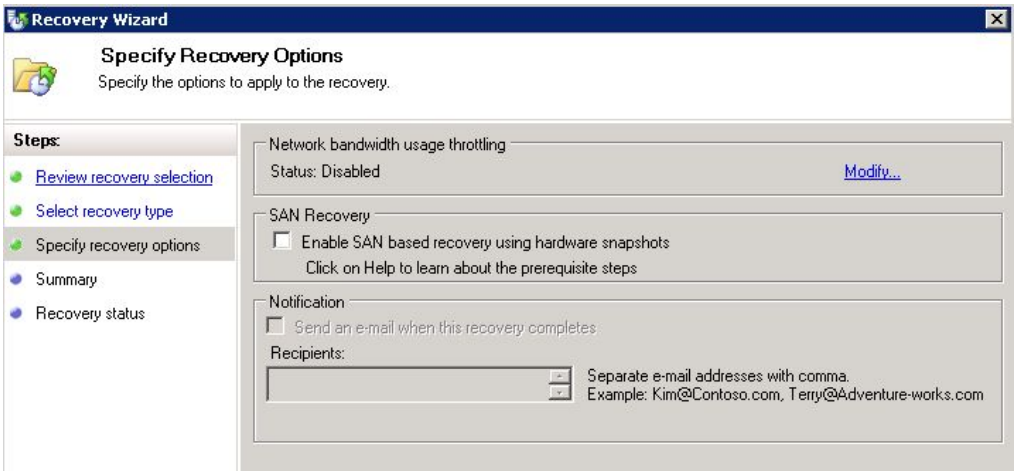
4. In the "Review Recovery Selection" page, confirm the content and then click [Next].



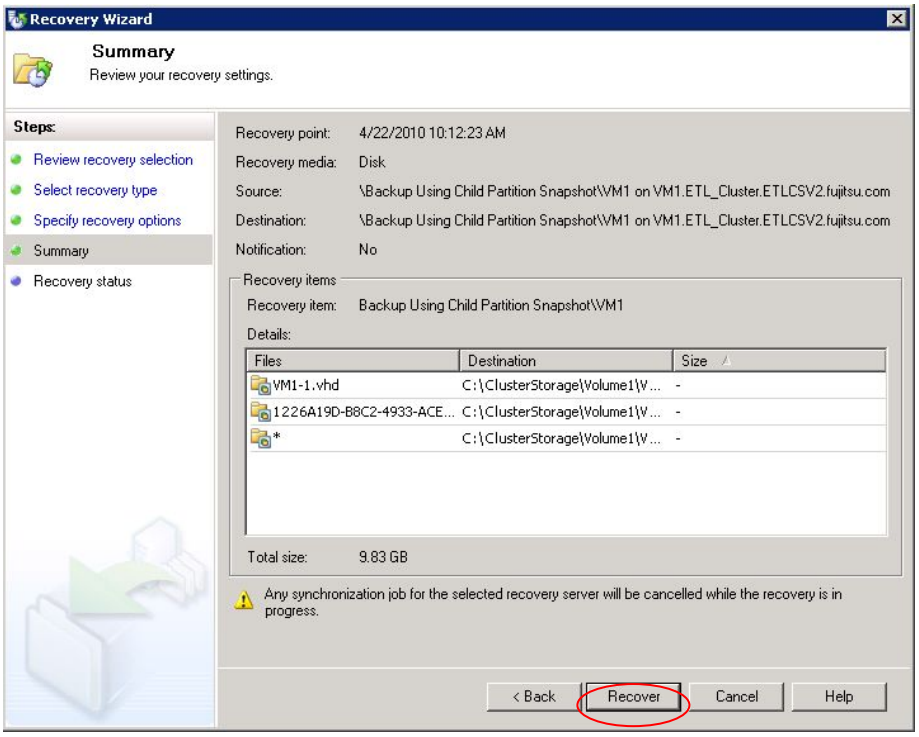
5. In the “Select Recovery Type” page, confirm ”Recover to original instance” is selected and then click [Next].



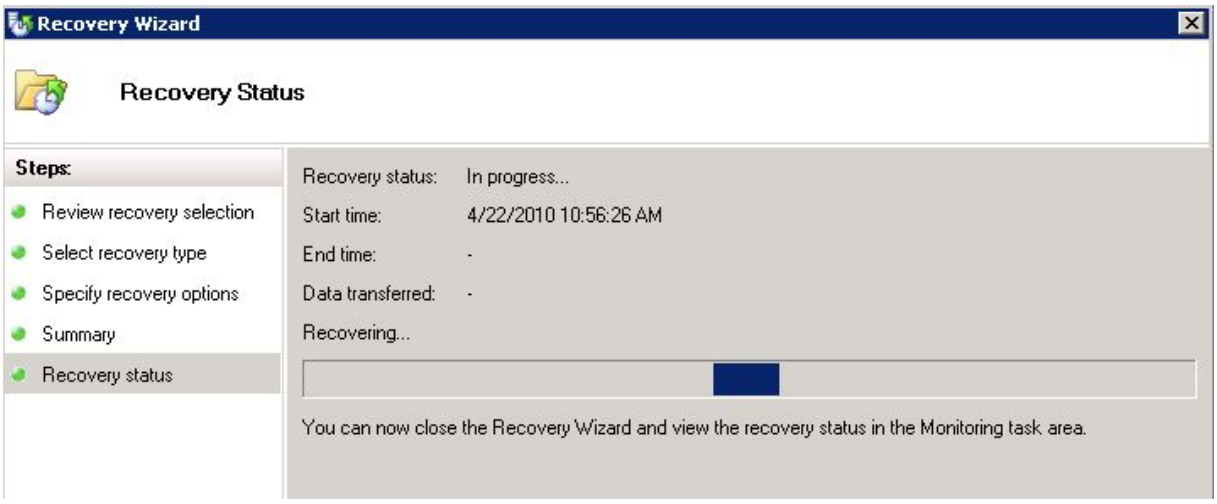
6. In the “Specify Recovery Options”, accept the default and then click [Next].



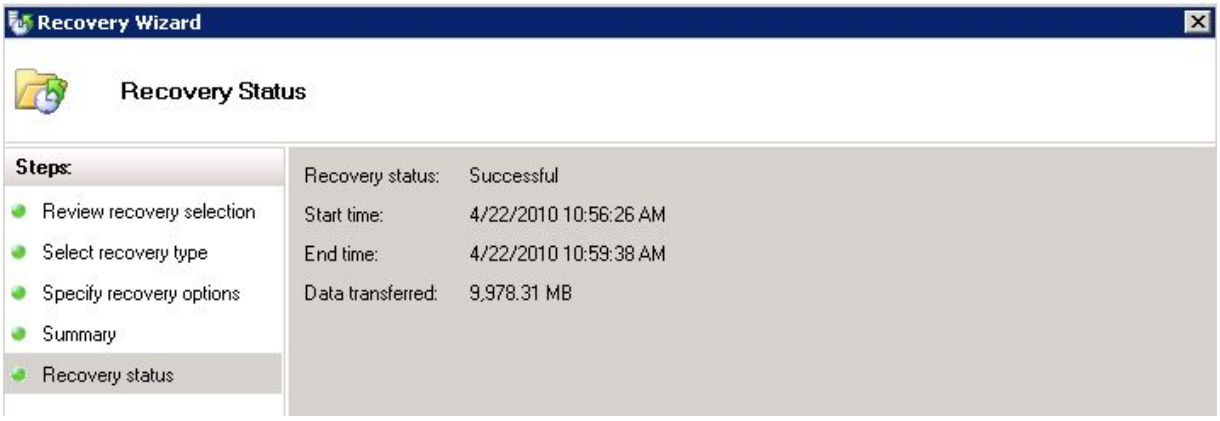
7. In the “Summary” page, confirm the setting summary and then click [Recover].



8. In the “Recovery Status” page, the progress is shown.



After completing the recovery job, the Recovery status turns ”Successful”.



9. Open the Hyper-V Manager on the Hyper-V host. Start the recovered virtual machine and confirm it works properly.

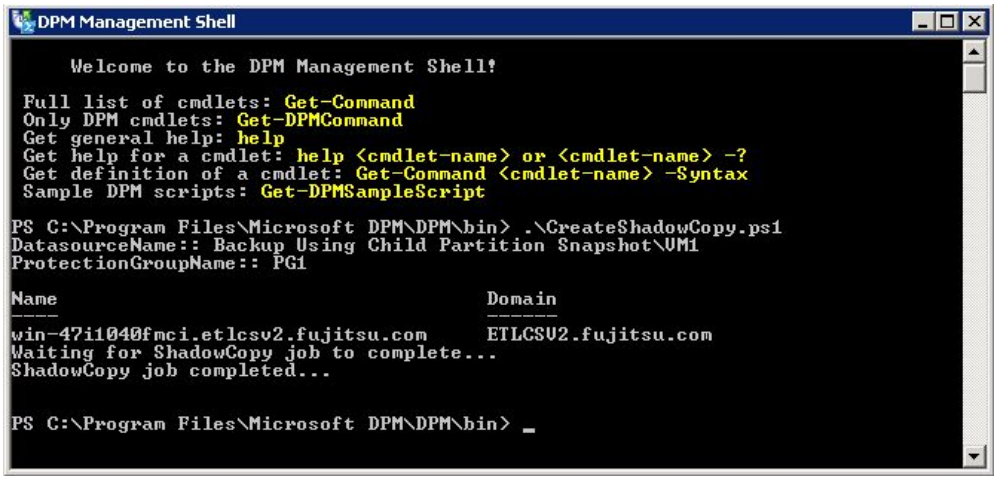
4-3. SAN based recovery

One of the benefits of deploying SCDPM2010 is SAN recovery. SAN recovery can recover the data under SAN environment, bypassing the LAN. You can expect to reduce the amount of network traffic and raise the recovery performance. To recover the data using SAN Recovery, follow these steps:

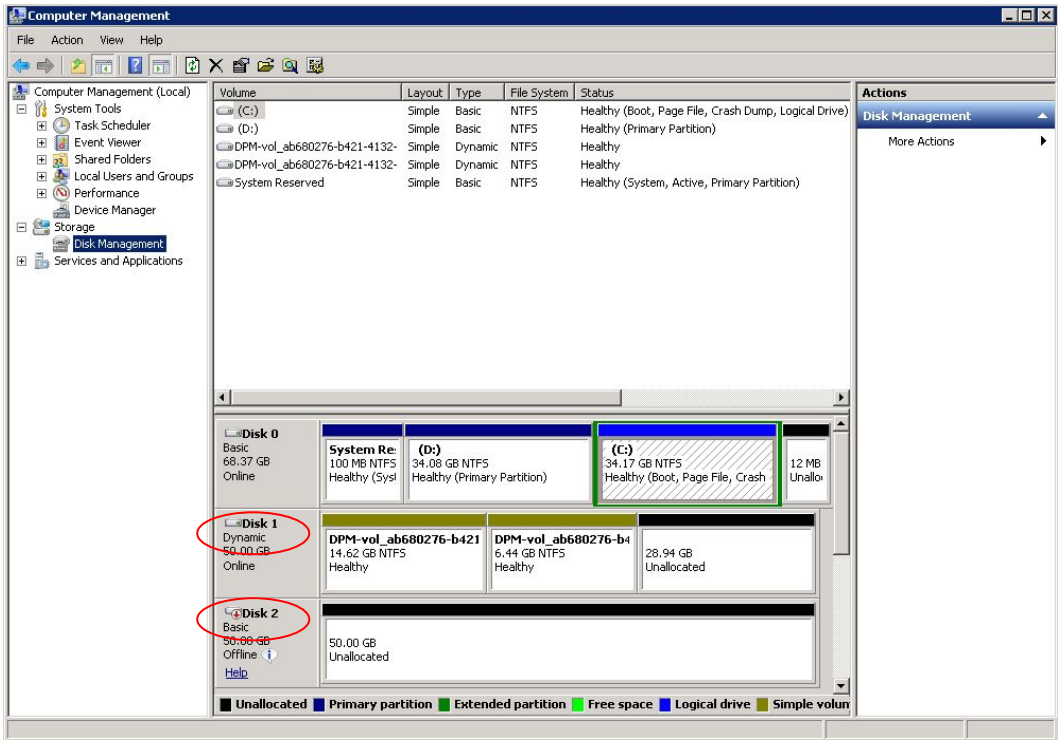
1. Open the Hyper-V Manager on the Hyper-V host and Shut down the target virtual machine if it is running.

2. Create a power shell script named CreateShadowCopy.ps1 and save it in ”C:\Program Files\Microsoft DPM\DPM\bin” on the DPM server. Script content is shown in the Appendix.

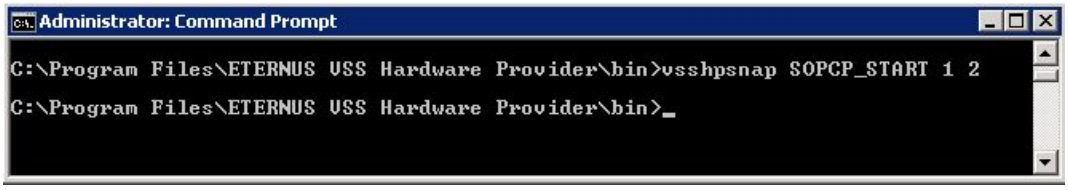
3. Run the “CreateShadowCopy.ps1” script on the DPM Management Shell, and provide the data source name and the protection group name as follows:
   DatasourceName : Backup Using Child Partition Snapshot\VM1
   ProtectionGroupName : PG1



4. Open the Disk Management tool on the DPM server and confirm the disk number of DPM Storage Pool and SAN Recovery volume. In this case, DPM Storage Pool is Disk 1 and SAN Recovery volume is Disk 2.

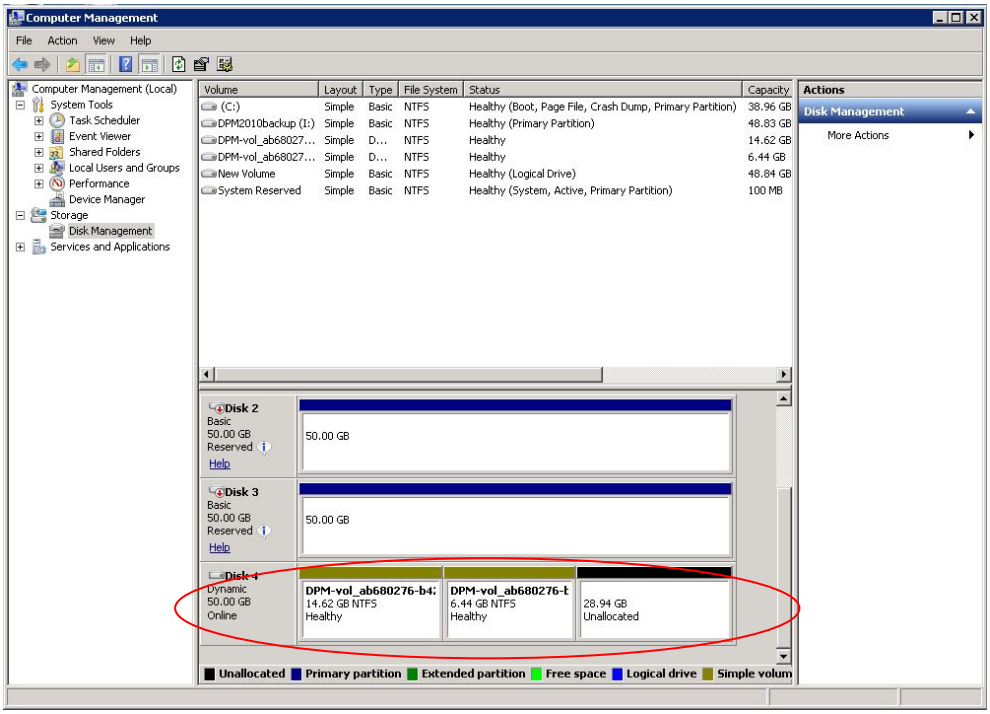


5. Create the snapshot session of the DPM storage Pool on the SAN Recovery volume, using ETERNUS VSSHP vsshpsnap command on the DPM server. Specify SOPCP_START for option, and specify the source disk number and target disk number for operand. In this case, the DPM storage Pool's disk number is disk 1 and the SAN Recovery volume's disk number is disk 2, we need to input "vsshpsnap SOPCP_START 1 2".

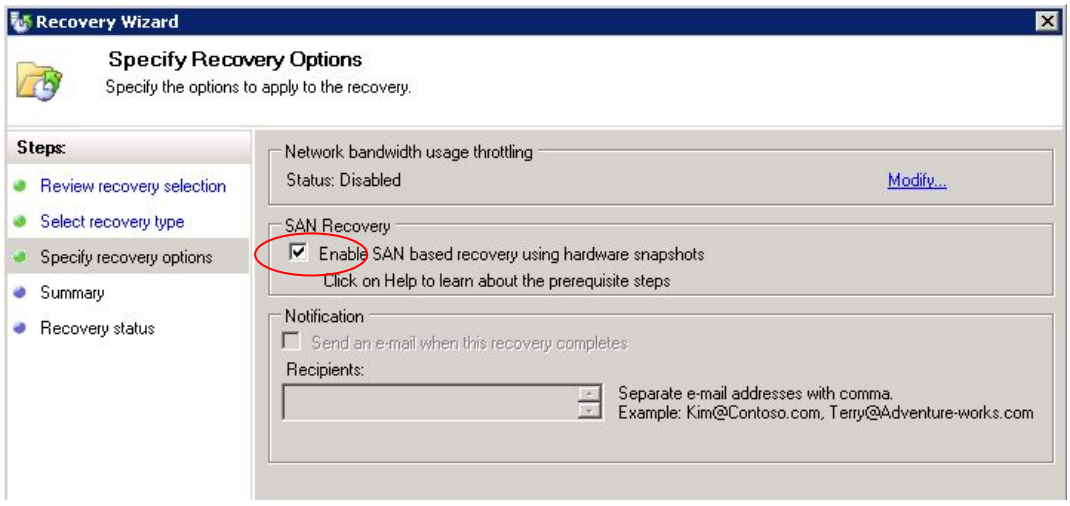


6. By using ETERNUSmgr, unassign the SAN Recovery volume on the DPM server and assign the SAN Recovery volume to the Hyper-V host.

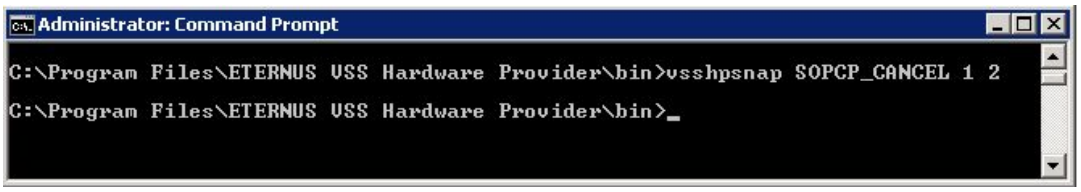
7. Open the Disk Management tool on the Hyper-V host and mount the SAN Recovery volume.



8. Run the recovery job in reference to "4-2. Data Recovery". At that time, check "Enable SAN based recovery using hardware snapshot" in the "Specify Recovery Options" page.



9. After completing recovery job, cancel the snapshot session by using ETERNUS VSSHP vsshpsnap command on the DPM server. Specify SOPCP_CANCEL for option, and specify the source disk number and target disk number for operand.



10. Open the Hyper-V Manager on the Hyper-V host. Start the recovered virtual machine and confirm it works properly.

11. Unassign the SAN recovery volume on the Hyper-V host and then assign it back to the DPM server.

Appendix : Script

```
param([string] $DSName, [string] $PGName)

if(!$args[0])
{
  if(!$DSName)
  {
      $DSName = read-host "DatasourceName:"
  }
}
else
{
   if(("-?","-help") -contains $args[0])
   {
       write-host Usage::
       write-host CreateShadowCopy.ps1 DatasourceName ProtectionGroupName
       write-host Help::
       write-host Creates a shadow copy for the given Datasource
       write-host
       exit 0
   }
   else
   {
       write-host "Usage -? for Help"
       exit 1
   }
}


if(!$PGName)
{
   $PGName = read-host "ProtectionGroupName:"
}


$dpmname = &"hostname"
connect-dpmserver $dpmname

$pg = get-protectiongroup -dpmservername $dpmname
if (!$pg)
{
   write-error "Cannot get the protectionGroup"
   disconnect-dpmserver $dpmname
   exit 1
}


$mypg = $pg | where {$_.FriendlyName -eq $PGName}
if (!$mypg)
{
   write-error "Cannot get the requested protectionGroup"
   disconnect-dpmserver $dpmname
   exit 1
}



$ds = get-datasource -protectiongroup $mypg
if (!$ds)
{
   write-error "Cannot get the datasources for the PG"
   disconnect-dpmserver $dpmname
   exit 1
}


$myds = $ds | where {$_.Name -eq $DSName}
if (!$myds)
{
   write-error "Cannot get the required Datasource"
   disconnect-dpmserver $dpmname
   exit 1
}

$j = new-recoverypoint -datasource $myds –Disk –BackupType expressfull

if (!$j)
{
   write-error "Cannot get the required Datasource"
   disconnect-dpmserver $dpmname
   exit 1
}

$jobtype = $j.jobtype

while (! $j.hascompleted )
{
   write-host "Waiting for $jobtype job to complete..."; start-sleep 5
}

if($j.Status -ne "Succeeded")
{
   write-error "Job $jobtype failed..."
}

Write-host "$jobtype job completed..."
disconnect-dpmserver $dpmname

exit
```

About This White Paper

This white paper is devoted to providing technical information and an overview of the basic facilities of ETERNUS Disk storage systems. The contents of this document may be modified without any prior notice.
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