HP OpenView Storage Data Protector

Configuration of Zero Down Time Backup (ZDB) on Windows Virtual Machine running on VMware ESX Server 3.x with Data Protector

Produced by:	Sharanabasappa Kurkoti
Version:	1.0
Created on:	23/07/2007
Last update:	31/07/2007
Checked by:	K. Varada Rajakumar, Vinay Savadatti, Rajesh Mujumdar
Approved by:	
Document location:	

Abstract: This document describes the configuration of ZDB (Zero Down Time Backup) on Windows Virtual Machine running on VMware ESX Server 3.x with Data Protector.

Contents

1 Abstract

This document describes the configuration of Zero Down Time Backup with Windows virtual Machines on VMware ESX Server 3.x with Data Protector. The Data Protector version mentioned and tested here is Data Protector A.05.50 and A.06.00.

This document is divided into two sections. We discuss about VMware ZDB configuration procedure with Data Protector and later on we discuss how to configure and perform backup/Restore with file system ZDB, Oracle agent ZDB and SAP agent ZDB with detailed diagrams.

2 Introduction

VMware ESX Server 3.x is server virtualization software. It consists of a small, Linux-based Server Console that provides working environment for several virtual machines (VMs). Virtual disks can be stored on raw disk partitions or on vmfs file system. The vmfs file system is designed to allow large files (well over 2 GB in size) and to store them efficiently for usage pattern imposed by virtual machines. Many utilities, including Linux commands supplied with ESX Server Console, have problems with vmfs because of file sizes (one cannot copy files to non-vmfs volumes) and block sizes.

Virtual machines can be controlled (scripted) through supplied Perl interface. This includes (but is not limited to) enumeration of virtual machines, querying and controlling machine state and enumeration of used resources.

The Server Console can be backed up when the Data Protector Disk Agent is installed on it. It is possible to recreate the Server Console to a working state from scratch in less than half an hour, even if no backup is available. If a backup of the Server Console is available, then the desired Server Console's state can be restored. It is possible to back up the virtual machines using the full Data Protector functionalities when the machine is treated as a common physical machine.

3 Installation of Data Protector

For installation of DP agents onto Vmware ESX server and backup/restore configuration, please refer to ESX White Paper.

For Integrating Windows Virtual machine running on ESX server with Data Protector we need to push SMISA Agent (for EVA), SSEA agent (for XP) and Media Agent (for Tape device configuration on Backup host). SAP and Oracle agents are to be installed to perform SAP ZDB and Oracle ZDB respectively.

For detailed procedure of installing a Data Protector agents, please refer to the *"HP OpenView Storage Data Protector Installation and Licensing Guide"*

For integrating a Oracle or SAP installation into Data Protector, please refer to the *"HP OpenView Storage Data Protector Integration Guide for Oracle and SAP"*

For configuring ZDB backup/restore with Data Protector, please refer to the *"HP OpenView Storage Data Protector ZDB Integration Guide"*

4 Configuration of ZDB on Windows Virtual Machines

4.1 Support of Data Protector ZDB on various Operating Systems

i) ZDB is supported on Data protector versions A.05.05 and A.06.00
ii) Below are the following Operating System's with which we have performed ZDB in a VMware environment,
    i. Windows 2003 Server 32bit Enterprise Edition
    ii. Windows 2003 Server x64 64 bit Enterprise Edition

4.2 Windows Virtual Machine ZDB configuration

Data Protector ZDB setup requires two servers (one application host and backup host). The virtual disks from array are presented to the application host and are replicated onto the backup host during backup session.

In VMware environment, virtual disks cannot be presented directly to the Virtual Machine and can only be presented to ESX Server. Using ESX Server console the disks are to be presented to the VM manually. After a virtual disk is presented to one VM, it is not available for other VMs.

The above limitation will not allow the replication of virtual disks to the backup host during a ZDB backup session. Hence the ZDB on a VM is limited to having VM on ESX server as application host and a physical machine as Backup host.

The setup diagrams for VMware file system ZDB, Oracle ZDB, SAP ZDB have been shown in the ZDB-configuration.ppt.

4.3 Presenting LUN (Logical Unit Number) to Host (ESX Server)

ZDB configuration with Data Protector in VMware environment is supported with EVA and XP storage virtual disk arrays. The LUN presented to the ESX Server has to be made visible to the guest OS (VM) manually through the procedure called raw disk mapping as mentioned below.

Detail procedure of presenting LUNs to the VM is given below:

1 Select the virtual machine just created and choose Edit Settings.

2 Click Add, select Hard Disk, and click Next.

3 In the Select a Disk page, choose Mapped SAN LUN and click Next.
Your hard disk points to a LUN that uses RDM.

4 In the LUN selection page, choose an unformatted LUN and click Next.

Ask your SAN administrator which of the LUNs are unformatted. You can also see
all formatted LUNs in the hosts Configuration tab and deduce which LUNs are
unformatted by comparing the list of formatted LUNs with the list in the LUN
selection page.

5 In the Select Datastore page, select the local datastore, which is also the
location of the boot disk, then click Next.
This is the location where the RDM (mapping) is stored.

6 Select Physical compatibility mode, then click Next.
A SCSI Controller that uses physical compatibility mode is created when the
virtual hard disk is created.

7 Choose a *new* virtual device node, for example choose SCSI (1:0) and use the
default mode.

NOTE This must be a new SCSI Controller. You cannot use SCSI 0.
----
8 Click Finish to complete creating the disk.
When you are done, notice that the wizard has created both a new SCSI controller
and a new hard disk.

9 Select the new SCSI controller and click Change Controller Type. Select LsiLogic
in the dialog box that appears.
MSCS on ESX Server 3.0 is not supported in conjunction with BusLogic.

10 In the same panel, set SCSI Bus Sharing to Physical, and then click OK.
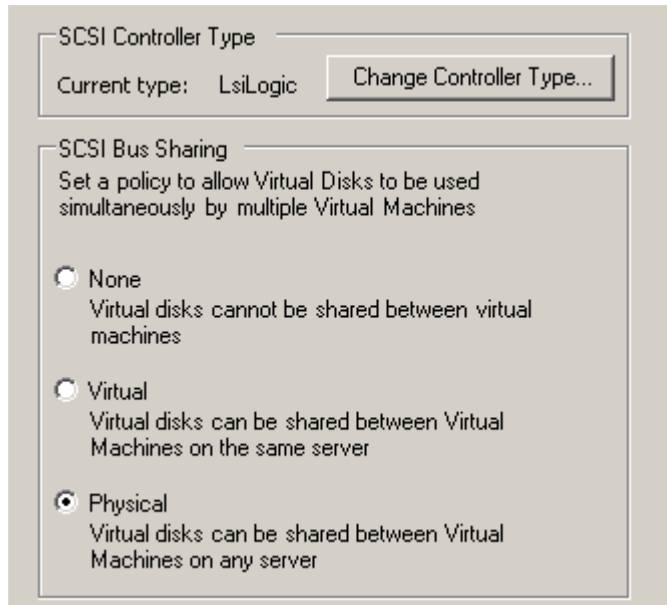
11 Repeat steps 1 through 8 but choose a new Virtual Device Node such as SCSI (1:1) .After you have completed setting up Node1, repeat the process to add two disks to Node2. Point the quorum disk to the same location as the Node1 quorum disk, and the shared storage disk to the same location as the Node1 shared storage disk. To do so, create a new mapped SAN LUN that points to a disk shared with Node1.

Note: VM will not have any information of the FC HBA.

5 Backup/Restore with Data Protector
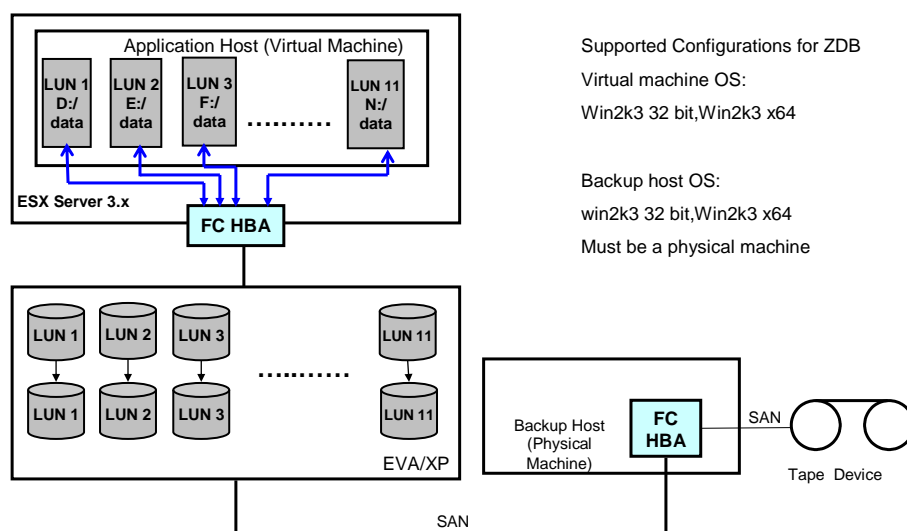
5.1 File system ZDB

LUN presented to the physical machine is not visible automatically to the guest OS on ESX server. Since this is the case, SMISA (EVA) configuration can never have a guest OS as the backup host. But this is not an issue with SSEA (XP) since pvols and svols are preconfigured to the hosts involved (guest OS too).

After the setup, Backup and Restore for ZDB are configured as per ZDB Integration Guide provided by Data Protector.

Limitation:
- We can perform only BC test cases with SMIS provider (EVA-GL/XL)
- Backup host should be a physical machine.

File System ZDB on Windows VM

Application Host (Virtual Machine)

| LUN 1 D:/ data | LUN 2 E:/ data | LUN 3 F:/ data | .... | LUN 11 N:/ data |

ESX Server 3.x

FC HBA

Supported Configurations for ZDB
Virtual machine OS:
Win2k3 32 bit,Win2k3 x64

Backup host OS:
win2k3 32 bit,Win2k3 x64
Must be a physical machine

LUN 1 LUN 2 LUN 3 .... LUN 11

LUN 1 LUN 2 LUN 3 LUN 11

EVA/XP

Backup Host (Physical Machine) FC HBA SAN Tape Device
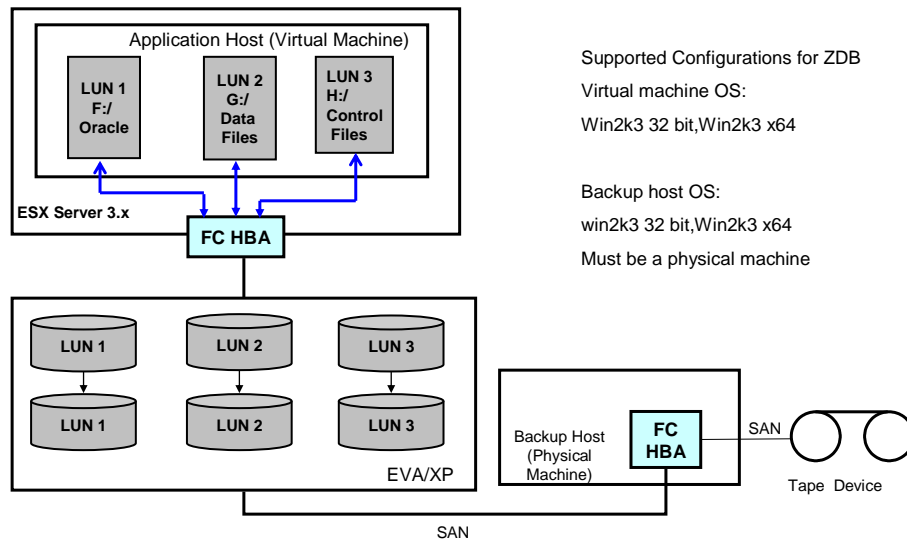
SAN

5.2 Oracle ZDB

In case of oracle ZDB, Backup and Restore are carried out as per Integration Guide for Oracle and SAP provided by Data Protector. The data files and control files are moved to different LUNs to perform IR Backup and IR Restore as shown in ZDB-configuration.ppt.

Oracle ZDB on Windows VM

Application Host (Virtual Machine)

| LUN 1 F:/ Oracle | LUN 2 G:/ Data Files | LUN 3 H:/ Control Files |

ESX Server 3.x

FC HBA

Supported Configurations for ZDB

Virtual machine OS:

Win2k3 32 bit,Win2k3 x64

Backup host OS:

win2k3 32 bit,Win2k3 x64

Must be a physical machine

LUN 1   LUN 2   LUN 3

LUN 1   LUN 2   LUN 3

EVA/XP

Backup Host (Physical Machine)

FC HBA

SAN

Tape Device

SAN

5.3   SAP ZDB:

In case of SAP ZDB, Backup and Restore are carried out as per Integration Guide for Oracle and SAP provided by Data Protector. The data files and control files are moved to different LUNs to perform IR Backup and IR Restore as shown in ZDB-configuration.ppt.
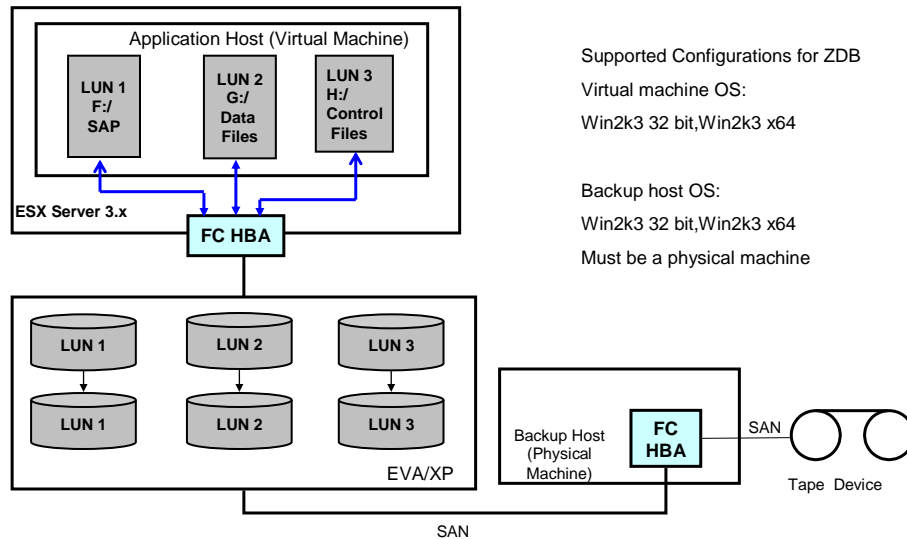
SAP ZDB on Windows VM

6 HP server support on VMware ESX 3.0

Table 7. Hewlett Packard Server Support

Model	Model	ESX Server 3.0	ESX Server 3.0.1
ProLiant	DL360 G3	X	X
	DL360 G4	X	X
	DL360 G4p	X^2	X^2
	DL360 G5	X^7	$X^{3,\,4,\,5}$
	DL365		X^8
	DL380 G3	X	X
	DL380 G4	X^2	X^2
	DL380 G5	X^7	$X^{3,\,4,\,5}$
	DL385	X^1	X^1
	DL385 G2		X^8
	DL560	X	X
	DL580 G2	X	X
	DL580 G3	X^2	X^2
	DL580 G4	X	X^6
	DL585	X^1	X^1
	DL585 G2		X^9
	DL740	X	X
	DL760 G2	X	X
	ML350 G5		$X^{3,\,4,\,5}$
	ML370 G3	X	X
	ML370 G4	X^2	X^2
	ML370 G5	X^7	$X^{3,\,4,\,5}$
	ML570 G2	X	X
	ML570 G3	X^2	X^2
	ML570 G4	X	X^6

For more information on configuring HP ProLiant servers for use with ESX Server, refer to knowledge base article 1081, available at http://www.vmware.com/support/kb/enduser/std_adp.php?p_faqid=1081.

[1] Both single and dual-core Opteron support.

[2] Both single and dual-core Intel processor support.

[3] Dual-core Intel Xeon 5000 series processors.

[4] Dual-core Intel Xeon 5100 series processors.

[5] Quad-core Intel Xeon 5300 series processors.

[6] Dual-core Intel Xeon 7100 series processors.

[7] Supported for Intel Xeon 5000 and 5100 series only.

[8] AMD Opteron 2000 series, Rev F, dual-core processors.

[9] AMD Opteron 8000 series, Rev F, dual-core processors.

[10] Supported in non-SAS configuration only.

Table 7. Hewlett Packard Server Support (Continued)

Model	Model	ESX Server 3.0	ESX Server 3.0.1
BladeSystem	BL20p G2	X	X
	BL20p G3	X^2	X^2
	BL20p G4	X^7	$X^{3,4,5}$
	BL25p	X^1	X^1
	BL25p G2		X^8
	BL30p	X	X
	BL35p	X^1	X^1
	BL40p	X	X
	BL45p	X^1	X^1
	BL45p G2		X^9
	BL460c	$X^{3,4,7}$	$X^{3,4,5}$
	BL465c		X^8
	BL480c	$X^{3,4,7}$	$X^{3,4,5}$
	BL685c		X^9

For more information on configuring HP ProLiant servers for use with ESX Server, refer to knowledge base article 1081, available at http://www.vmware.com/support/kb/enduser/std_adp.php?p_faqid=1081.

[1] Both single and dual-core Opteron support.

[2] Both single and dual-core Intel processor support.

[3] Dual-core Intel Xeon 5000 series processors.

[4] Dual-core Intel Xeon 5100 series processors.

[5] Quad-core Intel Xeon 5300 series processors.

[6] Dual-core Intel Xeon 7100 series processors.

[7] Supported for Intel Xeon 5000 and 5100 series only.

[8] AMD Opteron 2000 series, Rev F, dual-core processors.

[9] AMD Opteron 8000 series, Rev F, dual-core processors.

[10] Supported in non-SAS configuration only.

7 References

[1] VMware Infrastructure 3 Documentation

[2] ESX White Paper

[3] Setup for MS Cluster Service on VMware