

# VMware ESX 2.5 Server Software Backup and Restore Guide on Dell PowerEdge Servers and PowerVault Storage




This document provides best practices for backup and recovery of Virtual Machines running on VMware ESX 2.5 Server Software on Dell PowerEdge Servers. The document describes how to use VERITAS Backup Exec 10.0 software to backup Virtual Machines to PowerVault Storage.

[www.dell.com/vmware](http://www.dell.com/vmware)

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# Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
-  **CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.

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# Introduction

This paper overviews best practices for IT and backup administrators to use when backing up and restoring VMware ESX Server 2.5 Host and Virtual Machines (VMs) running on qualified Dell™ PowerEdge™ server configurations.

Virtual Machine data has the same operational maintenance requirements as physical machine data, including backup and recovery. IT and backup administrators require backup/recovery solutions that:

- Are easy to install and manage
- Are flexible enough to protect large and complex data centers with comprehensive backup and restore capabilities
- Provide a cost effective data protection solution

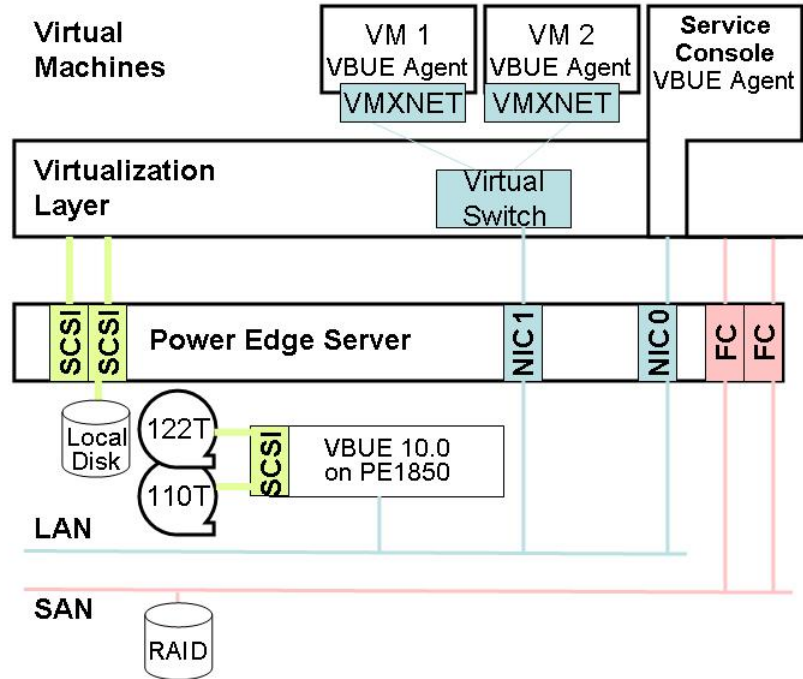
## 1. Understanding Dell Backup Configurations

Dell configurations of ESX Server 2.5 tape backup allow users to:

- Leverage VERITAS™ Backup Exec (VBUE) 10.0 features
- Implement major functionality of backup and restore, including full, incremental, and differential
- Backup and restore specific files in VMs, an entire VM, or any number of VMs hosted on the ESX Server

For this release, Dell supports the following Network Attached Backup Server configurations:

- VERITAS Backup Exec 10.0 for Windows Servers
  - Qualified on Microsoft® Windows Server™ 2003 on Dell PE 1850
  - Dell PowerVault™ (PV) 110T (DLT, SDLT, LTO-1, LTO-2) SCSI Tape Drive or PV 122T (DLT, SDLT, LTO) Single Drive Tape Autoloader
- VERITAS Backup Exec agents
  - VBUE agent on supported VMs
  - VBUE agent on Service Console



**Figure 1: Backup Configurations on VMware ESX Server Software**

Figure 1 illustrates VERITAS backup agent in both Service Console and Virtual Machines. The VERITAS Backup agent is qualified on VMware ESX 2.5 Service Console to back up the VM infrastructure. This configuration backs up the VM configuration files and virtual disk files to a network attached VERITAS Backup Exec (VBUE) 10.0.

The VERITAS backup agent is qualified on a VM to back up its specific files to a network attached VERITAS Backup Exec (VBUE) 10.0, as shown in VM1 and VM2 above. This is identical to using a VBUE agent on a physical machine to backup the OS and applications.

**NOTE:** Dell recommends replacing each VM's default *vlan* virtual NIC with the faster *vmxnet* virtual NIC as shown in figure 1.

## 2. Backup Planning

As a backup administrator, one should be aware of the main steps involved in planning VMware ESX 2.5 server and VM backup operations. Some major steps to consider include:

- Planning: what needs to be backed up and how often?
- Installation: are backup agents going to reside in the Service Console, the VM, or both?
- Restore: where will backup data reside? Local backup path, online storage device, or offline remote media?

There are two main configurations for doing backup in VMware ESX Server environment. This is captured in the table below:

	<b>VBUE Agent</b>	<b>What can be backed up</b>	<b>Recommended Backup Policy</b>
1	Service Console	Virtual disk files and configuration files of each VM	Weekly full backup
2	VMs	Files in a VM	Daily incremental backup

## 3. Backup Server and Agent Installation

Refer to Chapter 2: Installing Backup Exec in the VERITAS Backup Exec 10.0 for Windows Server Administrators Guide to:

- Install VBUE Server on Microsoft Windows Server 2003 on Dell PE 1850
- Schedule the backup and manage the 110T or 122T tapes

## 4. Backup Agent Options

Dell qualifies two network-attached backup options on ESX 2.5. These options are listed in the following table. The Service Console column is recommended for recovery, while the VM column provides file-level backup and recovery.

<b>Single Agent in Service Console</b>	<b>Agent in Each VM</b>
recovery only	File-level restore or recovery
Network backup of each VM's: 1. Application data 2. Boot OS 3. Configuration files	Supplements the Service Console agent when file-level application data backup and recovery is required
Single source suitable for rapid redeployment	Identical to physical backup and recovery
Single agent to license, and configure. Single bottleneck and failure point.	Requires licensing for each VM OS. Must install, and configure the agent software in each VM.
Easy to boot a restored virtual disk	Recovery requires two steps: 1. Restore OS 2. Restore files into running VM

### 4.1 Backup Agent in Service Console

The following backup and recovery options apply to a network attached backup server and a single VBUE agent running in the ESX Service Console.

Perform the following one-time operations for the Service Console to provide full recovery on a Dell PowerEdge Server.

Install VBUE agent in ESX 2.5 Service Console as described in VERITAS Backup Exec 10.0 for Windows Server Administrators Guide

- NOTE: Do not set a password during the initial install of the VBUE agent in the Service Console; otherwise, the auto-detection of the Unix Agent on Service Console will fail. The password can be set later after installation.

### Backing up a Running VM

A utility named vmsnap.pl is provided with the ESX 2.5 release. vmsnap.pl is an easy to use utility that supports online backup of running VMs. Some of the features included with vmsnap.pl are:

- Support for local and remote backup directories
- Archive server specification
- List all VMs available for backup

The following command can be used to backup a running VM:

Where:

-c = configuration file of target VM. Filename must include full pathname.

-d = target backup directory location

-l = specifies localbackup

```
vmsnap.pl -c /home/vmware/W2K3EE/W2K3EE.vmx -d /vmimages/localbackup -l
```

By running this command and associated switches, a running VM called W2K3EE was backed up to a local directory called /vmimages/localbackup. The /vmimages/localbackup can be exported as a published path in the Veritas Backup Exec Unix Agent. This allows for backup to tape or other offline storage media via the Veritas Backup Exec 10 Media Server.

## VM Recovery

Perform the following steps for each VM that requires full recovery.

1. Restore the needed backup files from the VBUE Media Server to the local restore directory.
2. Two simple methods exist for restoring the required VM files:
  - vmres.pl
  - The ESX MUI File Manager can be used to copy and paste the \*.vmdk, \*.vmx, \*.nvram, and \*.log files from the localbackup directory to the /home/vmware directory
  - From the Service Console command line, run the following:

```
cp /vmimages/localbackup/W2K3EE/* /home/vmware/W2K3EE
```

3. After restoring the \*.vmdk, \*.vmx, \*.nvram, and \*.log files to the /home/vmware directory, the recovered VM must be re-registered if the VM was removed from Virtual Center. To re-register the VM, run the following command at the Service Console:

```
vmware-cmd -s register "home/vmware/directoryname/*.vmx"
```

4. If the VM is powered down, power up the VM.

NOTE: We do not recommend backing up the entire ESX Server, since new installations can be automated and are faster than full restores.

## 4.2 Backup Agents in VMs

Backup agents installed in a virtual machine behave identically to those same agents installed on a physical server. Backup agents installed in VMs provide file-level backup and restore. The following best practices are based on having a network-attached backup server.

### Pre-Backup

Configure VMs to use the vmxnet virtual network adapter instead of the default, slower vlane adapter. The vmxnet driver provides 1Gbps access to your switch. For step-by-step instructions, see <VMware ESX 2.5 Installation Guide>

### VM Agents for Backup

Refer to the VERITAS Backup Exec 10.0 for Windows Server Administrators Guide on Backup Exec Agent backup operations to perform backup operations from within the VMs.

### VM Agents for Restore

Refer to the VERITAS Backup Exec 10.0 for Windows Server Administrators Guide on Backup Exec Agent to perform restore operations.

## 6. Additional Resources

Complete and current documentation for Dell qualified VMware configurations is available at <http://www.dell.com/vmware>.

Documentation and Support Resources

- [http://www.vmware.com/support/resources/esx\\_resources.html](http://www.vmware.com/support/resources/esx_resources.html) for Backup Compatibility, Backup Tools, NIC Teaming, Isolating Performance Problems and other backup-related VMware Documents
- [http://www.vmware.com/support/esx25/doc/esx25admin\\_backupvm.html](http://www.vmware.com/support/esx25/doc/esx25admin_backupvm.html) additional backup options
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