

HP StorageWorks

Enterprise Backup Solution with Symantec Backup

Exec

implementation guide

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Enterprise Backup Solution with Symantec Backup Exec

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About this guide

This guide provides information to help you configure Symantec Backup Exec software on an HP StorageWorks Enterprise Backup Solution (EBS).

“About This Guide” topics include:

- [Intended audience](#), page 5
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Intended audience

This guide is intended for use by system administrators implementing an EBS configuration who are experienced with the following:

- Tape backup technologies and tape libraries
- SAN environments and backup software
- Fibre Channel technology

Prerequisites

Before you install and configure Symantec Backup Exec, make sure you have:

- Reviewed the EBS Compatibility Matrix
- Properly installed and configured your EBS hardware according to the *HP StorageWorks EBS Design Guide*

Related documentation


In addition to this guide, HP provides the EBS123 web site at <http://www.hp.com/go/ebs> with corresponding HP StorageWorks Enterprise Backup Solution information. The following list shows some of the content found on the EBS123 site:

- EBS Compatibility Matrix
- Enterprise Backup Solution design guide
- EBS example configurations
- EBS white papers and implementation guides

Document conventions and symbols


Table 1 Document conventions

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	<ul style="list-style-type: none">• Key names• Text typed into a GUI element, such as into a box• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none">• File and directory names• System output• Code• Text typed at the command-line
<i>Monospace, italic font</i>	<ul style="list-style-type: none">• Code variables• Command-line variables
Monospace, bold font	Emphasis of file and directory names, system output, code, and text typed at the command line

 **WARNING!** Indicates that failure to follow directions could result in bodily harm or death.

 **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.

 **IMPORTANT:** Provides clarifying information or specific instructions.

 **NOTE:** Provides additional information.

 **TIP:** Provides helpful hints and shortcuts.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support web site:
<http://www.hp.com/support/>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

Subscriber's choice

HP strongly recommends that customers sign up online using the Subscriber's choice web site:
<http://www.hp.com/go/e-updates>.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support** and then **Storage** under Product Category.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-282-6672.
- Elsewhere, see the HP web site: <http://www.hp.com>. Then click **Contact HP** to find locations and telephone numbers.

Helpful web sites

For other product information, see the following HP web sites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/go/ebs>
- <http://www.hp.com/support/>
- <http://www.docs.hp.com>
- <http://www.hp.com/go/tape>

1 Introduction

Implementing an Enterprise Backup Solution (EBS) can be challenging. HP understands that for any given Storage Area Network (SAN) environment there may be one or more vendor's hardware and software present. Each of these components, including software, servers, interconnects and target devices, must work together. The HP EBS group is dedicated to providing thorough integration testing of industry standard, heterogeneous, and multi-vendor SAN environments. The output of this work can be found at <http://www.hp.com/go/ebs> in the form of the HP StorageWorks EBS Compatibility Matrix, *HP StorageWorks Enterprise Backup Solution Design Guide*, and the various software implementation guides such as this one. This guide is intended to address many of the integration issues that you may encounter when setting up your EBS; it provides new feature information, best practices, and troubleshooting tips from an EBS perspective. This guide is not meant to replace the supporting documentation for the application, but is provided to supplement that documentation with special configuration issues that might not be covered in the application documentation. See the *HP StorageWorks Enterprise Backup Solution Design Guide* for proper hardware setup and configuration. See the HP StorageWorks EBS Compatibility Matrix for the complete list of tested and supported EBS hardware and software. Certain limitations apply and are noted where applicable.

Solution features

EBS with Symantec Backup Exec integrates data protection and archival strategies with disk storage subsystems across multiple platforms and operating systems located on the same SAN. This solution provides for the interconnection of multiple Windows servers to multiple tape backup devices using dynamic device sharing technology.

The servers can share one or more HP StorageWorks tape libraries interconnected through HP StorageWorks Fibre Channel SAN Switches. Online storage, such as the HP StorageWorks XP Disk Arrays, Enterprise Virtual Arrays (EVA), Modular SAN Arrays (MSA), and others can also be attached to the switch.

To determine the compatible hardware components for this system, go to the HP EBS Compatibility Matrix at <http://www.hp.com/go/ebs>.

Solution components

Solution components include:

- Operating systems such as Microsoft Windows® Server 2000 & 2003, Windows Storage Server 2003 and 2005, Windows XP & XP PRO, and Windows Small Business Server 2000 and 2003
- Hardware platforms including Network Attached Storage (NAS), Intel, and AMD-based ProLiant servers, blade servers, servers
- SAN interconnects such as Fibre Channel switches, host bus adapters, and Fibre Channel to SCSI tape drive interconnects
- Fibre Channel disk storage such as the HP EVA, XP, MSA
- Enterprise class tape libraries such as the HP ESL-E Series, EML, and MSL
- HP StorageWorks Virtual Library System (VLS)
- Symantec Backup Exec for Windows

Symantec Backup Exec with the SAN Shared Storage Option allows multiple distributed backup servers to centralize storage devices connected over a Fibre Channel SAN for greater performance, efficiency, and fault tolerance.

The SAN Shared Storage Option load balances activity across multiple Backup Exec servers, increases performance and backup speeds, and centralizes management tasks.

Supported operating systems and platforms

The Enterprise Backup Solution (EBS) with Symantec Backup Exec supports several operating systems and platforms.

Refer to the EBS Compatibility Matrix for a complete list of operating systems and platforms. Refer to the *HP StorageWorks EBS Design Guide* for detailed instructions on SAN configuration of each OS.

Backup

Symantec Backup Exec for Windows Servers is the gold standard in Windows data recovery, providing cost-effective, high-performance, and certified disk-to-disk-to-tape backup and recovery—with available continuous data protection for Microsoft Exchange, SQL, file servers, and workstations. High-performance agents and options provide fast, flexible, granular protection and recovery, and scalable management of local and remote server backups.

EBS-specific requirements

EBS with Symantec Backup Exec requires the Symantec Backup Exec server application and the Shared Storage Option to be installed on all media servers. One server must be designated as the primary media server, while the others will be designated as secondary media servers. Please refer to the Symantec documentation for details on the minimum hardware requirements of each server.

Shared Storage Option

Symantec Backup Exec SAN Shared Storage Option is a powerful LAN-free backup solution that allows multiple distributed backup servers to centralize storage devices that are connected over a switched fabric or iSCSI SAN for greater performance, efficiency, and fault tolerance. SAN Shared Storage Option load balances job activity across shared devices from multiple Backup Exec servers. The increased performance, backup speeds, and centralized management of media help lower the total cost of ownership. The SAN Shared Storage Option is a ground-breaking solution in manageability and performance for large-scale, high-end storage environments.

Symantec Backup Exec Library Expansion Option

Backup Exec's Library Expansion Option scales the media storage system by leveraging additional drives within multi-drive tape or optical autoloader/library storage systems. This option's Advanced Device and Media Management (ADAMM) technology provides extensive configuration and management capabilities, including lights-out backup and restore operations and bar code reader and portal support for both SCSI and Fibre attached devices. Users can partition slots within a library to target backup jobs to a specific slot.

Robotic Libraries used with Backup Exec (tm) can provide convenient automated support for large capacity network environments. Support for a single robotic library drive is included with Backup Exec for Windows Servers. To use additional robotic library drives, additional purchases of the optional Backup Exec for Windows Servers Library Expansion Option (LEO) is required. This option allows concurrent processing on multi-drive robotic libraries.

ADAMM

Backup Exec's Advanced Device and Media Management (ADAMM) feature provides powerful functionality for robotic libraries. With typical robotic library modules, you divide slots in the robotic library into defined groups and then target backups to those groups. This arrangement works fine as long as there is enough media in the group to process the jobs targeted there. Problems occur when the data exceeds the available media in the group because operations cannot continue until media is physically added. This situation can take place even though slots in the robotic library assigned to other groups contain usable media.

Backup Exec's Device and Media Management feature solves the problems associated with typical robotic library modules. Rather than targeting a backup job to a specific group of slots with a finite number of media, Backup Exec accesses all of the media in the robotic library and uses media that belongs to the job's targeted media set. If the backup job exceeds the capacity of one piece of media, Backup Exec searches all media contained in the robotic library, finds a suitable media, and uses it for the job.

Supported configurations

Figure 1 shows a diagram of a basic storage domain configuration. Refer to the EBS Compatibility Matrix and the *HP StorageWorks Enterprise Backup Solution Design Guide* to be sure your system components are included in the compatibility matrix and that your hardware is properly configured.

Sample storage domain configurations

The sample EBS storage domain may consist of a heterogeneous connection of multiple servers sharing multiple libraries and RAID array storage systems.

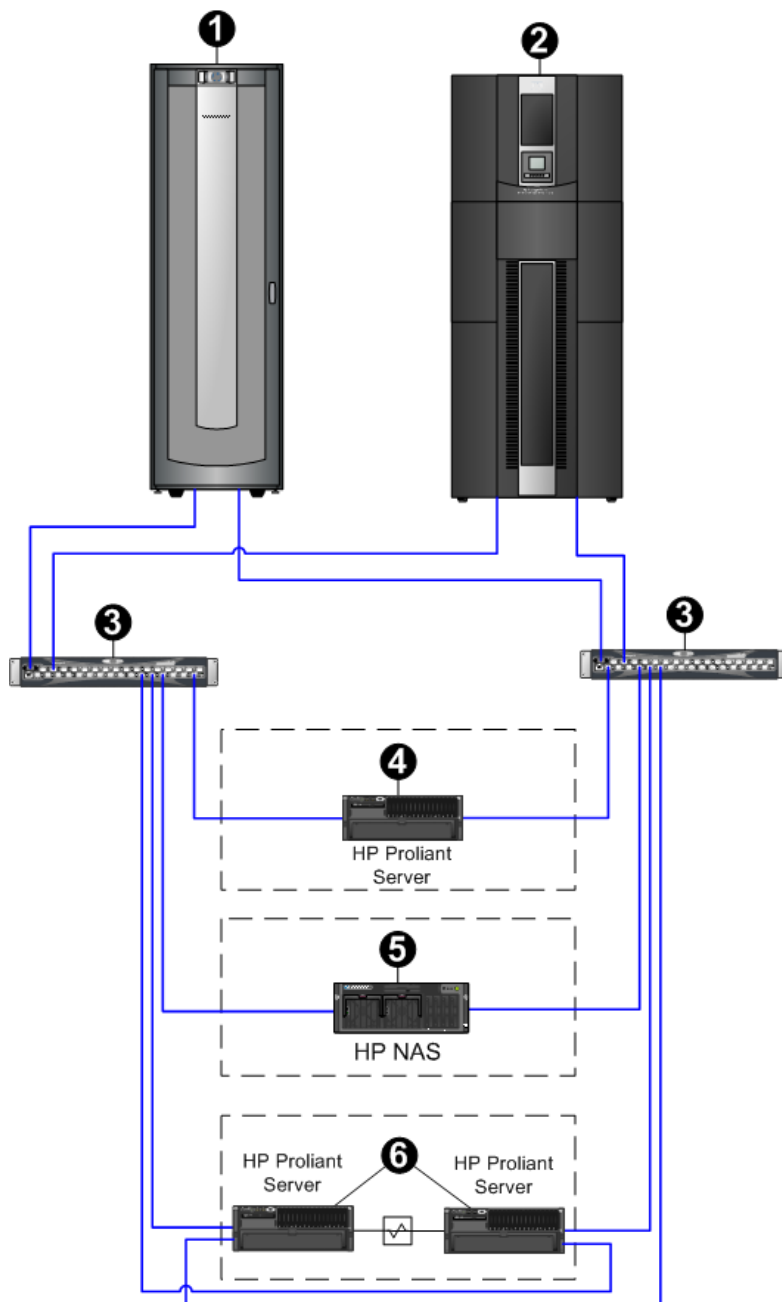


Figure 1 Sample storage domain configuration

- | | |
|------------------------------------|-------------------------------------|
| 1 Enterprise Virtual Array | 2 HP Enterprise Tape Library |
| 3 HP FC SAN Switch | 4 Microsoft® Windows® server |
| 5 HP NAS/AiO/Storage Server | 6 Windows Cluster server |

2 Installation and Configuration

Before installing your backup software, refer to the *HP StorageWorks EBS Design Guide* for assistance in setting up your hardware.

Installation checklist

To ensure that all components on the SAN are logged in and configured properly, you must be able to answer yes to each of the following questions:

- Are all hardware components at the minimum supported firmware revision (HBA, Fibre Channel switch, router, tape library drives, tape library robot)?
- Is the minimum patch level support for the OS installed?
- Is the minimum supported HBA driver loaded on the host?
- Is the tape library online?
- Are all tape and robotic devices mapped and configured on the router?
- Is the router correctly logged into the Fibre Channel switch?
- Is the host server correctly logged into the Fibre Channel switch?
- If the Fibre Channel switches are cascaded or meshed, are all Interswitch Links (ISL) ports correctly logged in?
- Are the router and the host server HBA in the same switch zone (either by World Wide Name (WWN) or Port)?
- Does the host server detect all of the tape and robotic devices you intend to use?

NOTE: HP recommends placing devices in host-centric zones and then making them available to the server. Host-centric zoning is implemented by creating a specific zone for each server or host and adding only those storage elements that will be utilized by that host. Host-centric zoning prevents a server from detecting any other devices on the SAN including other servers. Host-centric zoning also simplifies the device discovery process.

Installing Symantec Backup Exec

After all components on the SAN are logged in and configured, the system is ready for the installation of Backup Exec. Refer to the *Symantec Backup Exec Quick Installation Guide* or contact Symantec customer support for detailed installation procedures and requirements.

Before installing Backup Exec, you should complete the following tasks:

- Run the Backup Exec Environment. Check the computer on which you want to install Backup Exec; the Environment Check analyzes the computer to make sure that the installation process can complete. If Backup Exec finds configuration issues that can be fixed during the installation or that may prevent the installation, warnings appear. Although the Environment Check runs automatically during installation, you may want to run it manually before you install Backup Exec or before you back up data with Backup Exec.
- If the drive on which you want to install Backup Exec is encrypted or compressed and you would like to use a default SQL Express database, verify that an unencrypted and uncompressed drive is available for SQL Express installation.
- Check the computer name of the computer on which you want to install Backup Exec; it should only contain standard ANSI characters. You may receive errors if you install Backup Exec on a computer with a name that uses non-standard characters. You should only use hostnames that are visible to the Internet.
- Exit all other programs.

Installing Backup Exec server software

Symantec recommends that you install in the following order:

1. Primary media server
2. Secondary media servers
3. Any Backup Exec add-on options (such as Backup Exec remote agents)

NOTE: HP recommends that you remove any other backup software currently configured on your system before installing Backup Exec. Other backup software, tape device applications that are part of the OS, and SAN or system management software can negatively affect how Backup Exec installs and functions.

IMPORTANT: To avoid any problems during installation, make sure all programs or applications not associated with Backup Exec are closed and not running.

When installing Backup Exec remote agents and options through Terminal Services and the installation media is on a shared drive (CD-ROM or network share), you must install using a Universal Naming Convention (UNC) path (that is, `\\servername\sharename\path\filename`). Installation via mapped drives is not supported.

Configuring multi-drive robotic libraries

Configuring Backup Exec to work with multiple drive robotic libraries is accomplished by making associations between the robotic library's media drives, robotic arm, and Backup Exec. Backup Exec communicates with multi-drive tape libraries in a SAN SSO environment by using the SCSI Reserve/Release technology. Within a SAN, the Backup Exec Shared Storage Option (SSO) allows any Backup Exec server to dynamically control any one or more tape drives available within the library, and also allows each Backup Exec server to independently issue commands to the robotic arm. All device activity is controlled through software. Device conflicts are managed by issuing SCSI Reserve/Release commands to devices during use. The Reserve/Release mechanism is defined in the SCSI specification and is a way to share devices in multi-initiator configurations. In this way, the sharing intelligence included within SCSI technology is used to provide arbitration of potential device contention. When a Backup Exec server attempts to use a tape drive or a robotic arm, a reservation conflict occurs if another server is currently using that device. This causes the Backup Exec server to either wait in a pending state or utilize other devices if they are available. One of the unique advantages of the Backup Exec Shared Storage Option is that even when the primary group server or central ADAMM database server fails, jobs currently in progress will run to completion due to its utilization of the Reserve/Release technology. By using the SCSI Reserve/Release mechanism, Backup Exec servers can process jobs independently from one another.

NOTE: If the Device Configuration Wizard is unable to detect serial numbers of the robot or tape drives, which can happen when the drive or library firmware is upgraded, check via the library front panel to ensure the library reports a serial number for each device.

Installing the Library Expansion Option

The Symantec Backup Exec for Windows Servers Library Expansion Option enables you to use a robotic library with Backup Exec which provides convenient, automated support for large capacity network environments. To obtain license keys for additional robotic library drives, you must purchase the Symantec Backup Exec for Windows Servers Library Expansion Option (LEO). This option allows concurrent processing on multi-drive robotic libraries.

The Backup Exec optional Library Expansion Option installation requires:

- Purchasing a Library Expansion Option license key for each additional robotic library drive.

NOTE: Support for a single robotic library drive is included with Backup Exec for Windows Servers.

- Installing the necessary Library Expansion Option files.
- Configuring the robotic arm and drives.

Installation best practices

- Follow the HP StorageWorks EBS Compatibility Matrix and the *HP StorageWorks Enterprise Backup Solution Design Guide*.
 - The matrix of hardware, software, and firmware is updated monthly and helps customers and support personnel maintain their EBS environment. It is not necessary to immediately update an environment to the latest revision on the matrix. However, you should be aware of updates and changes if you experience any problems that may be related to newer or older software, driver, and/or firmware versions.
 - The design guide describes currently supported EBS hardware configurations and how to efficiently and effectively provide shared tape library backup in a heterogeneous SAN environment.
- Use the First Time Startup Wizard, then the Device Configuration Wizard.
 - Be sure all of your devices show up in the detected hardware list.
 - During drive configuration, be sure all of your devices show up under the proper robotics device.
 - Be sure your backup account login has administrator privileges if you want to back up everything.
- Limit rebooting during backup windows.

- Rebooting servers in a SAN environment during the backup operations of another server can cause job failures and/or configuration errors.
- When rebooting is necessary, verify that the tape device configuration of the host remains unchanged when the maintenance or reboot is complete. Re-run the configuration wizard if necessary.
- Use Symantec device drivers for all tape devices.
- Disable the Removable Storage Manager Service on Windows to allow Backup Exec to control the library and drives. This reduces the potential for device conflicts.

IMPORTANT: The latest service packs, hot fixes, and device drivers are available on the Symantec web site at <http://www.symantec.com/business/support>.

Devices in the shared storage environment

At startup, Backup Exec recognizes all local storage devices as well as the storage devices on the EBS. If you do not see one or more of your attached storage devices or if the shared storage devices do not appear when **Devices** is selected from the navigation bar, click **Tools**, point to **Wizards**, and then click **Device Configuration Wizard**. This wizard guides you through installing the appropriate drivers for the storage hardware connected to your system.

Backup Exec's device management feature provides the following functionality for the secondary storage units on a SAN:

- **Device allocation.** Jobs must first reserve the shared secondary backup devices before they can be used. The job that gains a reservation on a drive keeps it reserved while the drive is in use. The drive is released after a job completes, which allows other jobs to compete for it.
- **Drive pools.** You can assign the drives to drive pools in which one or more drives are combined as a backup target. Jobs submitted to a particular drive pool run on the first available drive in that pool. You can also submit a job to a selected individual drive in the drive pool.

NOTE: Cascaded drive pools, in which multiple drives are linked together to create the appearance of one drive with greater capacity, are not recommended for shared storage environments.

Using drive pools with the SAN Shared Storage Option

When Backup Exec is installed, the All Drives (<Server Name>) is created by default. In a shared environment, this default drive pool is created for each server using the SAN Shared Storage Option and contains both locally attached and shared devices.

Symantec recommends creating a shared storage drive pool that contains only shared devices. You can create other drive pools to meet your particular requirements. For example, you may want to create a drive pool for high-performance drives and create a second drive pool for lower-performance drives. High-priority jobs can then be sent to the high-performance drive pool for faster completion.

Drives can belong to more than one drive pool, and drive pools can contain different types of drives. In the shared storage environment, drive pools can contain both local and shared drives, but jobs will run only on those drives in the pool to which the server has access.

Symantec Backup Exec in a mixed media environment

To configure an HP tape library with Symantec Backup Exec in a mixed media environment, please see the *HP StorageWorks Implementing Mixed Media in HP StorageWorks Tape Libraries implementation guide* found at:

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00583694/c00583694.pdf>

Performance and tuning

To analyze speed and performance, you must examine the entire backup process as a system. Although many factors contribute to the overall performance of the system, there are five main factors that must be thoroughly understood to determine the maximum performance in any specific situation. These factors are:

- **Storage connection**—For the EBS, this is Fibre Channel connection.
- **Buffer and block size allocation**—EBS with Symantec Backup Exec supports configurable buffer and block sizes.
- **File (data) compression ratio**—The amount of compression has a direct impact on the rate at which a tape drive can read/write data.
- **Source disk and file systems**—Data source, local disk, RAID array storage, file system type, and volume type.
- **Tape drive**—In the EBS, these are the various types of tape drives in HP StorageWorks Libraries.

Buffer and block size allocation

The Symantec Backup Exec default values for buffer allocation are the preferred values for data sent to the drive on each read or write request. The buffer size must be an even multiple of the block size.

You can change the block size, buffer size, buffer count, and high water count on the **Drive Properties Configuration** tab by selecting another size from the scroll list, and then clicking **OK**. Depending on the amount of memory in your system, modifying these values may improve drive performance. Each type of drive requires a different buffer size to achieve maximum throughput. Refer to Symantec documentation for detailed information.

File (data) compression ratio

HP tests show that not all data can be compressed equally. The compression ratio affects the amount of data that can be stored on each tape cartridge as well as the speed at which the tape drives can read or write the data.

Table 2 shows typical compression ratios of various applications.

Table 2 Typical File Compression Ratios

Data Type	Typical Compression
CAD	3.8:1
Spreadsheet/Word Processing	2.5:1
Typical File/Print Server	2.0:1
Lotus Notes Databases	1.6:1
Microsoft Exchange/SQL Server Databases	1.4:1
Oracle®/SAP Databases	1.2:1

Source disk and file systems

In the past, tape performance was typically identified as a bottleneck. However, tape performance has now surpassed many of the source systems available today. Items to take into account when calculating desired throughput and performance metrics are:

- Source Hardware (disk subsystems)
- Source Filesystem status

It is essential that the hardware you use for disk or online storage be able to adequately provide data for the application online along with the backup application and tape devices.

In environments deploying large tape subsystems using HP StorageWorks ESL/EML E-Series Libraries and Ultrium LTO tape drives, disk subsystems become an increasingly important performance component. One ESL712e with 24 Ultrium 1840 tape drives can easily maintain 2.4GBps native of total system throughput. In this scenario, HP recommends that your disk subsystems be able to maintain a 2:1 ratio of disk-to-tape

throughput. That would be approximately 4.8 GBps of disk I/O required to stream data to one single cabinet ESL712e tape library.

The impact of file systems on backup performance can be significant. Highly fragmented systems only allow disk and tape subsystems to run at a fraction of stated or desired performance.

Tape drive

The tape drive is the fifth piece in determining backup and restore performance. HP tape drives have varying levels of performance. Factors such as file size (larger is better), directory depth, and data compressibility all affect system performance. Data interleaving during backup also affects restore performance. Use of the router and its connections to HP StorageWorks tape libraries is a simple way to scale backup performance.

Table 3 shows performance information for various tape drives.

Table 3 Tape Drive Throughput Speed (native)

Tape Drive	Throughput MB/s (native)
Ultrium 1840	120
Ultrium 960	80
Ultrium 920 Half-Height	60
Ultrium 460	30
Ultrium 448 Half-Height	24
Ultrium 230	15
Ultrium 232 Half-Height	16
SDLT 160/320	16
SDLT 110/220 GB	11
DLT8000 40/80 GB	6

NOTE: The calculated native performance is provided by the drive vendor and may not be achievable by some configurations.

HP StorageWorks Virtual Library Systems (VLS)

The Virtual Library System (VLS) provides virtual tape for HP Enterprise Virtual Array environments by seamlessly integrating into existing data protection processes to provide improved performance, reliability, and flexibility. Our disk-based storage solution provides both unattended backup and rapid restores of data for SAN-based servers.

As of this document release, current versions of Symantec Backup Exec do not provide the tools necessary for data migration from virtual tape libraries to physical tape. As an alternative, some virtual tape libraries have automated tools that migrate data without the need for application intervention. Please refer to your specific HP StorageWorks Virtual Library System user manual for more information about features such as Automigration and De-duplication.

IMPORTANT: HP Virtual Library Systems with Symantec Backup Exec require the use of the HP VLS inquiry string for emulation.

Encryption

HP StorageWorks Secure Key Manager

The Secure Key Manager reduces your risk of costly data breach and reputation damage while improving regulatory compliance by providing centralized key management for HP StorageWorks Enterprise Storage Libraries (ESL) E-Series Tape Libraries and HP StorageWorks Enterprise Modular Library (EML) E-Series Tape

Libraries with HP LTO4 enterprise tape drives. The Secure Key Manager automates key generation and management based on security policies for multiple libraries; this occurs transparent to Symantec Backup Exec. The Secure Key Manager is a hardened server appliance delivering secure identity-based access, administration, and logging with strong auditable security designed to meet the rigorous FIPS 140-2 security standards. In addition to the clustering capability, the Secure Key Manager provides comprehensive backup and restore functionality for keys as well as redundant device components and active alerts. The Secure Key Manager supports policy granularity ranging from a key per library partition to a key per tape cartridge.

Installation with Backup Exec

Please refer to the *HP StorageWorks Secure Key Manager users guide* at <http://www.hp.com/go/tape> for further assistance in setting up the HP StorageWorks Secure Key Manager.

Best practices with Backup Exec

To reuse tapes that are encrypted when the key is no longer available, use the Tape Label function within Symantec Backup Exec to recycle the media.

NOTE: Using the Label Tape Function overwrites all media on the tape.

3 High Availability

For information on configuring Microsoft clusters, refer to the Symantec Backup Exec administrator's guide for your operating system available at:

<http://www.symantec.com/business/support/>

This guide provides information on how to install and configure Backup Exec to work with different clustering solutions.

Clustered EBS configuration

The EBS with Symantec Backup Exec supports backup and restore of the primary and secondary nodes of a clustered pair of Microsoft Windows servers with failover.

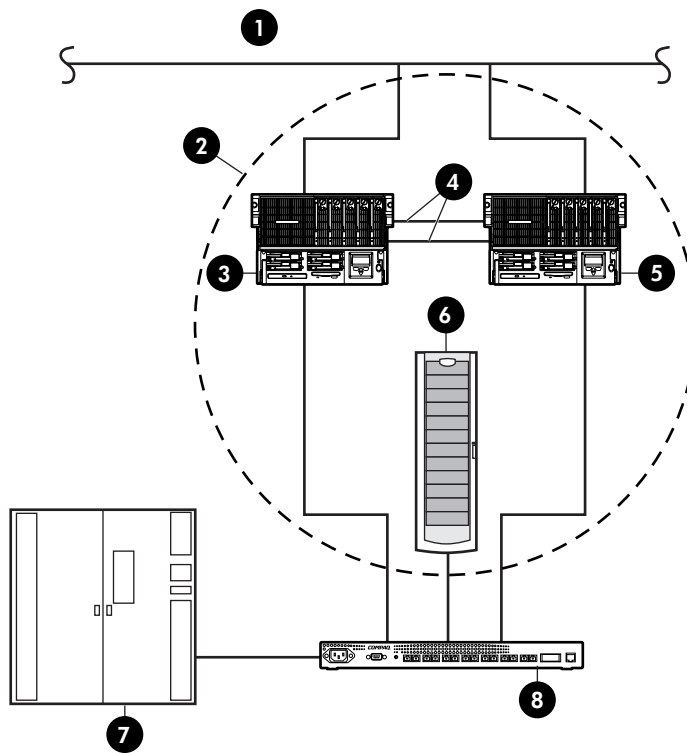


Figure 2 Clustered server EBS configuration

- | | |
|-----------------------|-----------------------------|
| ❶ Ethernet | ❷ Microsoft Cluster servers |
| ❸ Media server node 1 | ❹ Private Ethernet link |
| ❺ Media server node 2 | ❻ RAID array storage |
| ❼ HP tape library | ❽ FC SAN Switch |

4 Troubleshooting

HP StorageWorks Library and Tape Tools

Library and Tape Tools (L&TT) is a robust diagnostic tool for tape mechanisms, tape automation and magneto-optical products. L&TT provides functionality for firmware downloads, verification of device operation, maintenance procedures, failure analysis, corrective service actions and some utility functions.

NOTE: All Backup Exec services must be stopped before exercising or diagnosing the medium changer and drives using HP Library and Tape Tools.

For more information on documentation, troubleshooting and downloads please visit http://h18006.www1.hp.com/products/storageworks/ltt/index.html?jumpid=reg_R1002_USEN.

SGMon utility

The SGMon utility is a debug tool used to view active debugging information. It can be used to monitor some parts of Backup Exec's activity that other logging methods do not monitor. If you have an issue that you would like to capture more data on, then start SGMon and duplicate the issue with SGMon started. When saved to a file the log information can be helpful in getting issues resolved more quickly by support teams in HP and Symantec.

To start SGMon:

1. Locate and run *SGMon.exe*.

NOTE: By default, it is located in `\Program Files\Symantec\Backup Exec\SGMon.exe`.

2. Select all options in the **Capture** box to get all available data.

- To output the information to a file, select **Capture to File**. This will output the information to a file located under `\Program Files\Symantec\Backup Exec\Logs\{(Server Name)-SGMon.log}`. See [Figure 3](#).

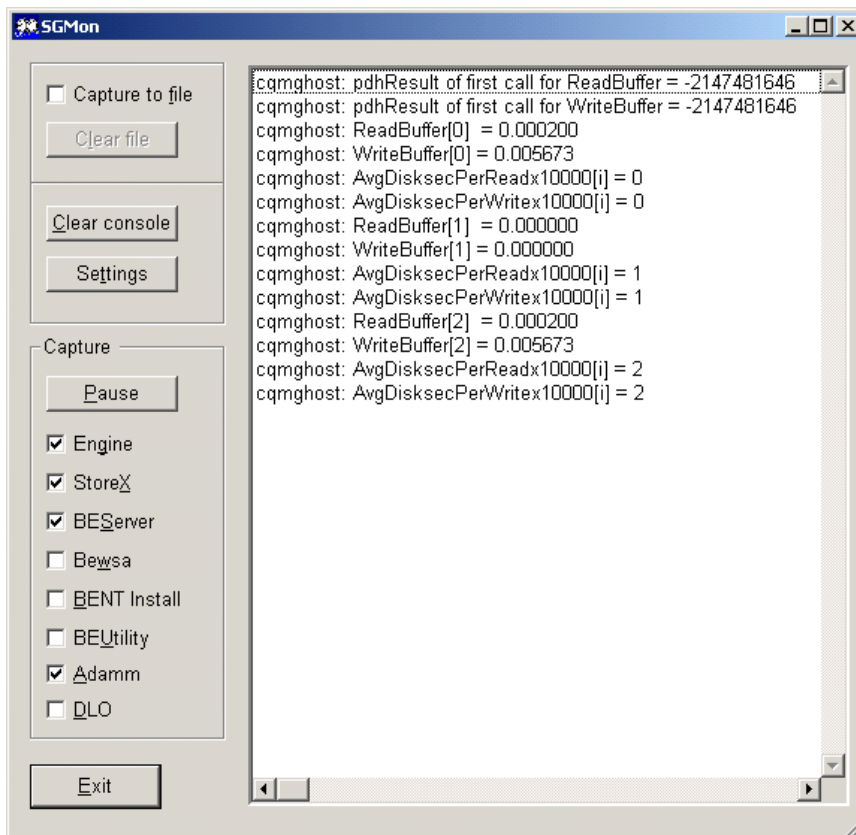


Figure 3 SGMon utility

HP recommends using the four capture components, Engine, StoreX, BE\$erver and A\$amm to capture most of the data needed to help resolve an issue.

Additionally, you can refer to the Symantec web site at <http://www.symantec.com/business/support/>.

Trace utility

Backup Exec for Windows Servers also comes with a SCSI Trace utility. This utility can be used to troubleshoot suspected tape hardware issues in the Backup Exec environment. The SCSI trace utility is useful when it is necessary to determine the specific cause of a hardware error. The information gathered by the SCSI trace utility can then be used by HP and Symantec Technical Services to narrow down the cause of a particular problem.

To start Tracer:

1. Locate and run *Tracer.exe*.

NOTE: By default this is located in `\Program Files\Symantec\Backup Exec\Tracer.exe`.

2. Get Backup Exec as close to the point of the suspected hardware problem as is practical.
3. Press the green Start Trace button in Tracer.
4. Wait for the hardware problem to occur.
5. Press the red Stop Trace button in Tracer.
6. Use the File/Save As menu option in Tracer to save the SCSI trace to a location you can find.

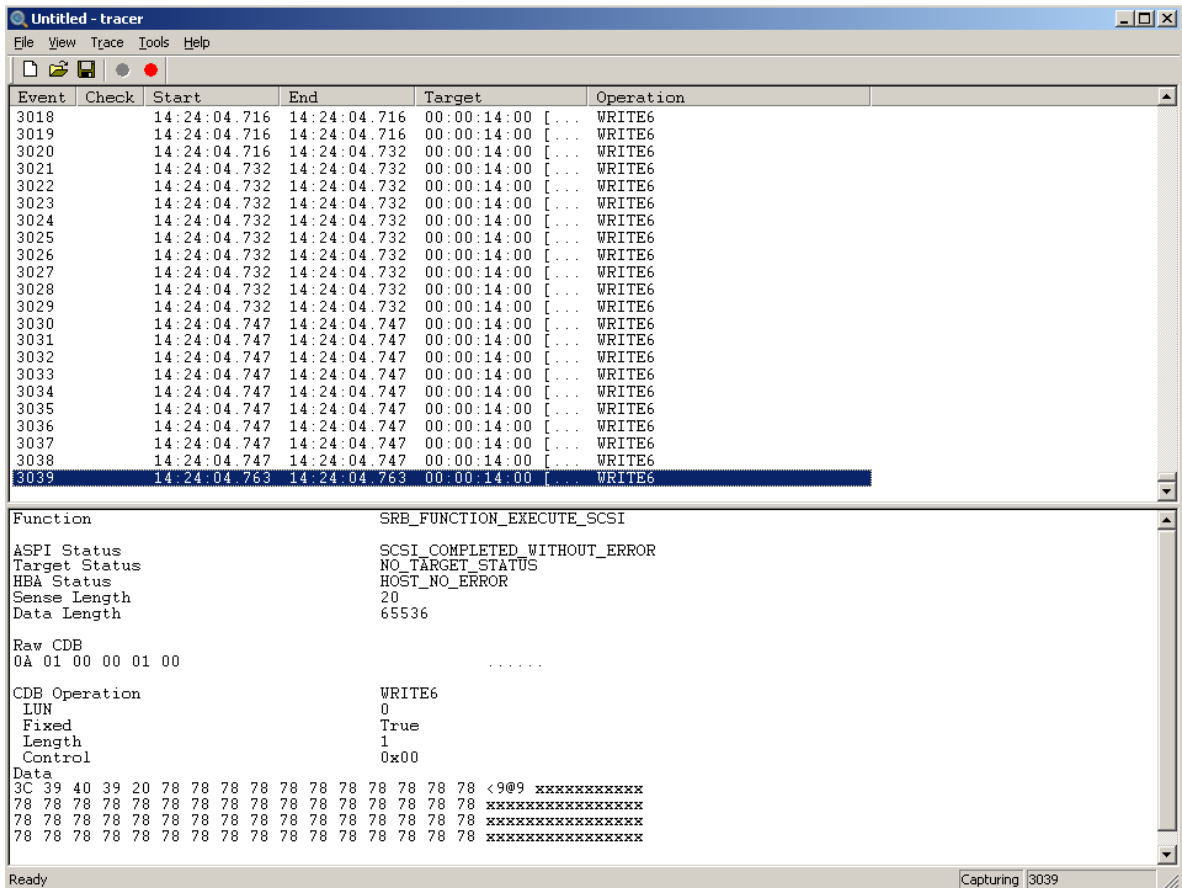


Figure 4 Trace utility

The SCSI trace captures information about very low level events. As such, the trace file that it generates can be very large (in the GigaByte range). For that reason, it is best to try to reproduce the problem in as short an operation as possible to minimize the size of the SCSI trace.

Once the SCSI trace has been saved, it along with other diagnostic files will need to be sent to an HP or a Symantec Technical Support representative for analysis.

Additionally, you can refer to the Symantec web site at <http://www.symantec.com/business/support/>.

NOTE: Trace GUI may become slow or unresponsive under heavy I/O traffic. The Tracer utility may also cause a significant performance impact and should not be run all the time.

Troubleshooting FAQ's

What does it mean when my drive appears as offline?

If the device is offline, a message displays. No operations are allowed on the device until it is online again. When the device is online, no message displays.

Backup-to-Disk folders may go offline if:

- The drive containing the Backup-to-disk folder is full.
- The drive containing the backup-to-disk folder is offline.
- The remote server containing the Backup-to-disk folder is offline.

Other storage devices may go offline if:

- The device was turned off after Backup Exec was started.

- The device was being used by another application (such as a Windows2000/XP/Server 2003 backup utility) when Backup Exec was started.
- The device is removed from the computer.
- A tape drive failure occurred (check the Event Log to troubleshoot the problem).
- A tape is stuck in the drive.
- The firmware of the drive was updated. Backup Exec will behave as if the drive with its old name or identity no longer exists.

To place the device online, try the following:

- Check to make sure the device has power and that cables are properly attached. Turn the device on and reboot the server, or stop and restart the Backup Exec services.
- Stop the utility that is using the device and then reboot the server, or stop and restart the Backup Exec services.

Backup Exec doesn't detect my robotic library. What could be wrong?

- Be sure that Windows 2000/XP/Server 2003 properly recognizes the device. This can be verified by checking the Windows Device Manager.
- Verify that the Library Expansion Option is installed.
- Check for the latest device drivers for Backup Exec. You can download device drivers from <http://www.symantec.com/business/support>.

I'm getting the error "Storage device [device] reported an error on a request to read/write data to/from media. Error reported: Data error (cyclic redundancy check)." What should I do?

The cyclic redundancy check (CRC) error can be caused by many factors. The following list contains the most common reasons for this error and potential ways to resolve the problem:

- Contaminated read/write heads of the tape device. Check with the hardware manufacturer for proper cleaning techniques.
- Bad media. Replace the media. Try a new tape that is certified by the hardware manufacturer.
- Incorrect tape driver. Load the appropriate Backup Exec tape driver. You can download the latest Backup Exec tape drivers from the Symantec Technical Support web site at <http://www.symantec.com/business/support>.
- SCSI controller wide negotiation not configured properly. If the device is a wide (68 pin) SCSI device, then wide negotiation may and should be used. If the device is a narrow (50 pin) SCSI device, disable wide negotiation. Use the manufacturer's SCSI setup program to disable wide negotiation on the SCSI controller card.
- SCSI controller transfer rate is too fast. Use the manufacturer's SCSI setup program to lower the SCSI transfer rate. Check with the controller and backup device manufacturer for the proper configuration for the SCSI transfer rate.
- SCSI controller synchronous negotiation enabled. Use the manufacturer's SCSI setup program to disable synchronous negotiation on the SCSI controller card. Check with the controller and backup device manufacturer for the proper configuration for SCSI synchronous negotiation.
- Incorrect termination or bad cables. Verify that the SCSI cable is good and that it is configured to provide proper SCSI termination. Do not mix passive and active termination.
- Tape driver problems. Confirm that the tape drive is functioning properly. Check with the tape drive manufacturer for diagnostic software to test the condition of the tape drive hardware.
- General SCSI problems. Isolate the tape drive on its own controller card.

A Additional Resources

The HP StorageWorks Enterprise Backup Solution web site has many useful white papers, tech notes, blueprints, and related user guides to assist in using backup software solutions in an EBS environment. View this information at <http://www.hp.com/go/ebs>.

HP guides

- *HP StorageWorks Enterprise Backup Solutions Design Guide*
- *HP StorageWorks Enterprise Backup Solution with Symantec Backup Exec for Windows Servers Implementation Guide* (this guide)
- *HP StorageWorks SAN Design Guide*

Symantec resources

Visit the Symantec support web site at <http://www.symantec.com/business/support/>. This site includes:

- Searchable Knowledge Base
- Technical documentation
 - Manuals
 - Frequently Asked Questions
 - All recent publications
 - White Papers
- Compatibility documents
- Downloads
 - Hot fixes
 - Service packs
 - Device drivers

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