HP StorageWorks Entry-level Enterprise Backup Solution

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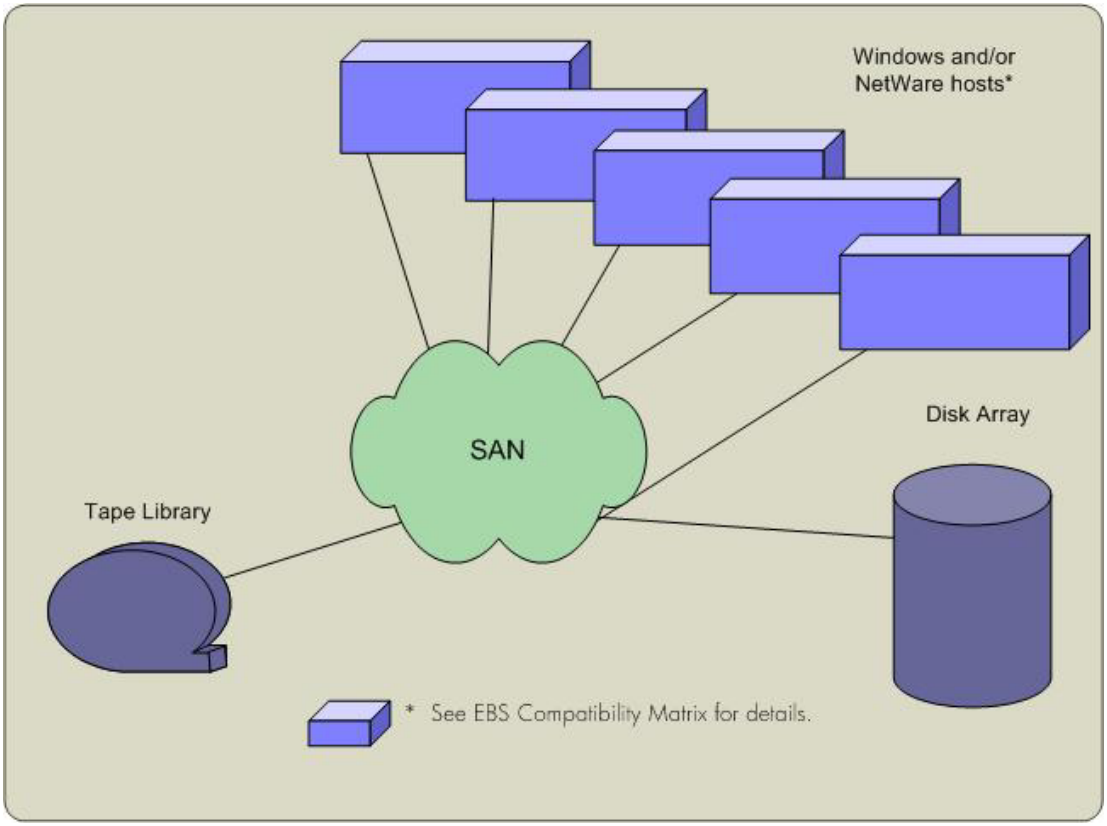
Executive summary

This paper presents an HP StorageWorks Enterprise Backup Solution (EBS) technical blueprint for building entry-level Storage Area Network (SAN) backup solutions. Using this blueprint, customers can consolidate their distributed backup devices into a shared, centrally managed data protection solution that provides more efficient use of their tape resources. Management of your data protection resources can be done system wide from a single console. In addition, consolidation allows easier and more efficient tape backup procedures. As a result, customers realize reduced IT administration expense and higher system availability.

This blueprint includes the EBS design rules and presents an example EBS with a logical view, a physical view, and a bill of materials. Specifications are supplied for the EBS components. A discussion of scaling the Entry-level Enterprise Backup Solution is also provided.

Blueprints are enablers to build HP SAN solutions. These solutions provide storage that is easy to manage and grow while reducing a customer's total cost of ownership. Figure 1 presents a logical view of the Entry-level Enterprise Backup Solution. An additional technical blueprint is available to build a HP tested and supported heterogeneous Enterprise Backup Solution. Visit www.hp.com/go/ebs for a list of all blueprints.

Figure1. Entry-level SAN Solution Logical View



Business needs

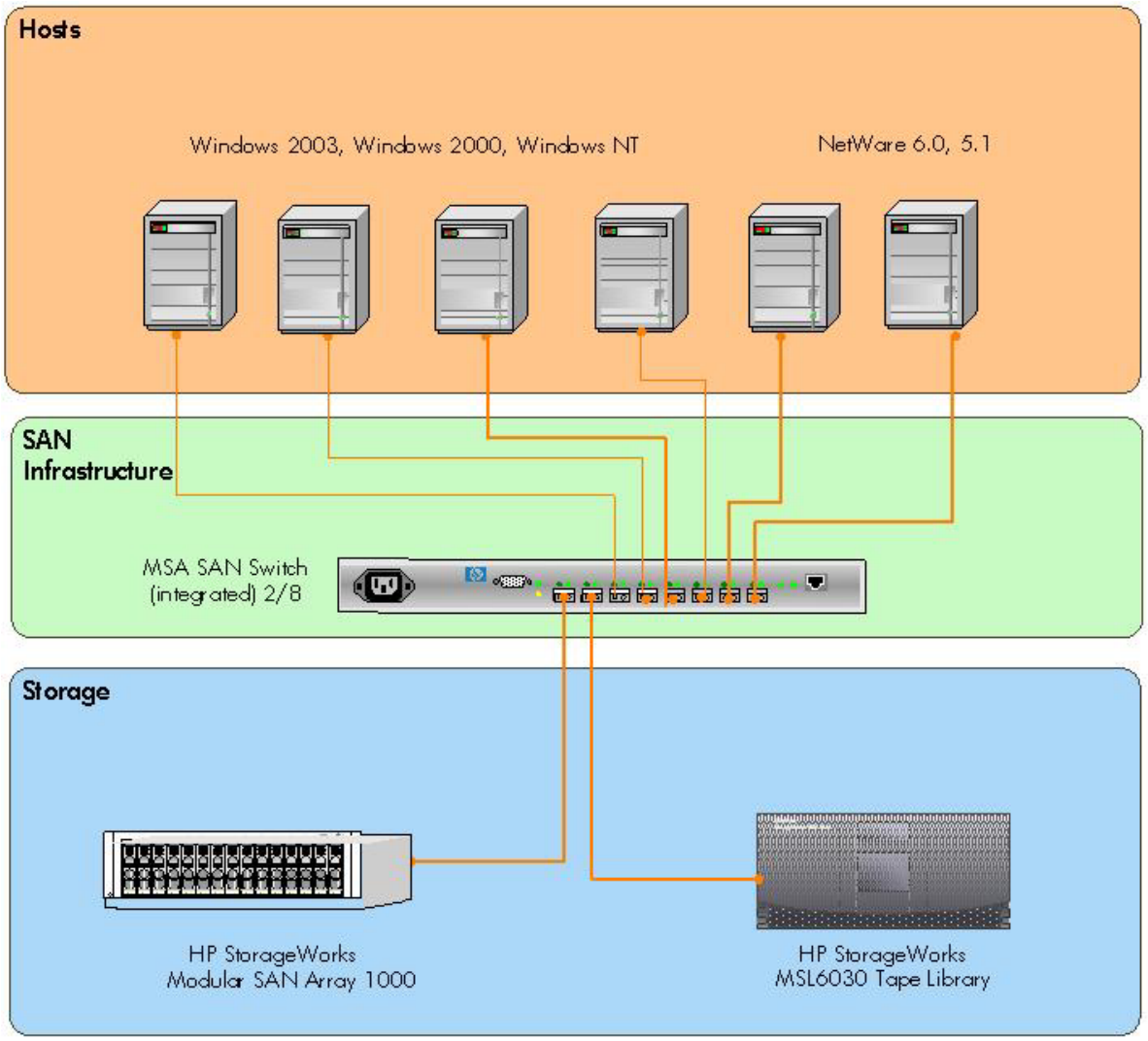
Servers with directly attached tape drives have proven to be difficult to manage in a cost-effective way. Businesses often face the need to reassign tape drives to be able to respond to unpredictable storage demands to avoid business disruption. IT administrators are challenged to manage the backup requirements of each individual server and application. Adding additional tape drives often requires taking servers offline, decreasing the availability of applications and data to the end users. An HP StorageWorks Enterprise Backup Solution can help customers solve their data protection problems in an efficient and cost-effective way.

EBS provides customers with:

- Improved utilization of tape drives in tape libraries, minimizing the need to maintain surplus tape drives to meet unexpected demand, thereby lowering the overall cost of data protection.
- Capacity that can be expanded quickly and easily, providing additional capacity where and when it is needed, without disrupting business activity.
- A central pool of tape storage that can be managed from a single console, reducing the demand for IT resources.
- Increased data access as multiple hosts can access and share tape libraries.

Solution design and design rules

The example Enterprise Backup Solution illustrated in this blueprint can be modified to meet specific customer needs. To provide flexibility, the following assumptions and design rules can be revised as necessary. This information is intended as a guide in configuring a specific SAN backup solution to meet customer data protection requirements.



Assumptions

The following section details underlying assumptions and design rules that can be modified to address specific customer requirements. This information is provided as a guide in configuring this specific Entry-Level Enterprise Backup Solution.

Array

- MSA1000 arrays are fully loaded (that is, 14 drives).
- Disk capacities are calculated with the MSA1000 arrays in Autoraid mode with one hot spare.

Tape

- Incremental backups occur six days a week.
- Full backups occur on the seventh day.
- A full backup of the entire SAN takes no more than eight hours.

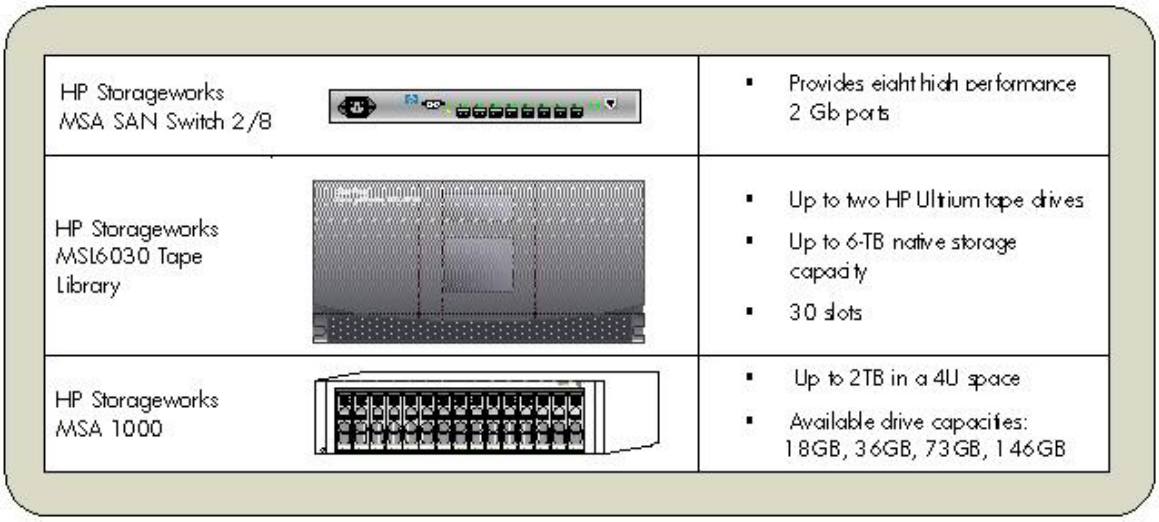
Fibre Channel infastructure

- The SAN configuration conforms to HP SAN guidelines.
- For more information, consult the *SAN Design Guide* referenced in "HP StorageWorks EBS components."

Design rules

- The Enterprise Backup Solution can accommodate multiple hosts of any of the supported types (refer to the "Hosts" section).
- Two Fibre Channel switch ports are used for the MSA1000, and the MSL6030 Tape Library.
- If using 36-GB drives in the MSA1000 (.5TB), HP recommends a one-drive MSL6030 Tape Library.
  - Usable capacity: about 340 GB
  - Required number of Ultrium cartridges: two
- If using 73-GB drives in the MSA1000 (1 TB), HP recommends a one-drive MSL6030 Tape Library.
  - Usable capacity: about 695 GB
  - Required number of Ultrium cartridges: four
- If using 146-GB drives in the MSA1000 (2 TB), HP recommends a two-drive MSL6030 Tape Library. This is the configuration used in the example SAN solution.
  - Usable capacity: about 1360 GB
  - Required number of Ultrium cartridges: seven

Component Review



For more information on HP storage products, visit www.hp.com/go/storage

Hosts

Operating Systems and HBAs					
	Windows 2003 Server	**Windows 2000 Server**	**Windows NT Server**	**Linux**	**NetWare**
	Windows Server 2003 (32 bit)	Windows 2000 Advanced Server	Windows NT 4.0 Server	Red Hat Advanced Server 2.1	NetWare 6.0, 5.1
HBA	FCA2101	FCA2101	FCA2101	FCA2214	FCA2210
Note : Shaded areas represent hardware used in the example technical blueprint configuration.					

Interconnect

SAN Fibre Channel Infrastructure			
Features	**HP StorageWorks MSA SAN Switch 2/8**	**HP StorageWorks SAN Switch 2/8 EL**	**HP StorageWorks SAN Switch 2/16 EL**
Number of ports	8	8	16
Per port line speed	1.0625/2.125 Gb/s, full duplex	1.0625/2.125 Gb/s, full duplex	1.0625/2.125 Gb/s, full duplex
Note 1: Shaded areas represent hardware used in the example technical blueprint configuration.			
Note 2: Extended Fabric license and Remote Switch license not required.			

Tape storage

StorageWorks Tape Libraries				
Features	**MSL6030 Ultrium 460 Tape Library**		**MSL6060 Ultrium 460 Tape Library**	
Number of drives	1	2	2	4
Number of slots	30		60	
Max native storage	6 TB		12 TB	
Max native data transfer rate	60 MBps		120 MBps	
FC-SCSI Router	e1200-160 Fibre Channel Interface Card			
Note: Shaded areas represent hardware used in example technical blueprint configuration.				

Disk storage

StorageWorks array systems				
Features	**MSA1000 18-GB drives**	**MSA1000 36-GB drives**	**MSA1000 73-GB drives**	**MSA1000 146-GB drives**
Number of drives	14	14	14	14
Usable capacity with HP AutoRaid and one hot spare	171 GB	340 GB	695 GB	1360 GB
Raw capacity	252 GB	504 GB	1022 GB	2044 GB

Note: Shaded areas represent hardware used in example technical blueprint configuration.

Backup software

Backup software components			
Software name	**Quantity**	**Required / optional**	**Description**
HP OpenView Storage Data Protector 5.1 Cell Manager	1 x system	Required	Provides data protection through automated backups
Drive Extension LTU	Total number of tape drives in library	Required	License to use (LTU) tape drives in tape library
Online Backup LTU	1 x system	Optional	Enables online backups with major databases and applications, including Oracle, SAP, Exchange, Informix, and more
Manager of Managers LTU	1 x system	Optional	Ideal for centralized management of remote offices. Enables library sharing between Data Protector cells
Windows Open File Backup LTU	1 x server or 1 x 10 servers or 1 x 5 workstations or 1 x enterprise server	Optional	Backs up open Windows and Netware files to ensure all files get backed up without downtime
Zero Downtime Backup LTU	1 x TB	Optional	Online backup utilizing array replication and backup server to isolate application server from backup process
Direct Backup LTU	1 x TB	Optional	Enables serverless backup from disk array to tape library
Instant Recovery LTU	1 x TB	Optional	Enables image to be recovered in seconds from disk
Library LTU	1 x 61-250 slots 1 x unlimited slots	Optional	Supports tape libraries with greater than 60 slots

Note: Shaded areas represent software used in example technical blueprint configuration.

Solution value

HP provides a tested and supported end-to-end solution built with world-class components, supported by a single point of contact—HP. With a service and support organization of over 30,000 professionals in 120 countries around the world, HP offers customers the peace of mind that comes from knowing that their solution works right now and can expand into their future with them.

HP tape libraries and HP OpenView Storage Data Protector software provide a secure and manageable solution enabling optimal customer data protection. Storage Data Protector provides backup protection for data in heterogeneous environments with minimal impact on system performance and application availability. Storage Data Protector is based on a modular design, so it is scalable with a customer's infrastructure to provide highly reliable and cost-effective backup in systems of any size. For customers who have standardized on a third-party backup application, HP has certified ISV backup applications providing investment protection for customers.

Scaling-growth-flexibility

The Entry-level Enterprise Backup Solution example provided in this technical blueprint also can scale over time to meet customer requirements. By adding an additional or larger HP Fibre Channel switch, the example EBS can be grown to support additional hosts, storage arrays, and tape libraries. For specific guidelines on selecting the appropriate components, refer to the *EBS Design Guide* referenced in the "HP StorageWorks EBS components" section.

If there is a need for higher storage capacity, multiple MSA1000 storage arrays can be added. This also would likely require an additional Fibre Channel switch, or a switch with a higher port count, such as the HP StorageWorks SAN Switch 2/16-EL.

With additional storage, a larger backup capacity may be needed. See "Design rules" for more information or consult the *EBS Design Guide* referenced in "HP StorageWorks EBS components."

How can I enhance my support options?

Consulting and Integration Services

- Architectural blueprint services
  - Business continuity
- Storage solution services
  - Data replication solution service
  - SAN solution service
  - Backup and recovery solution service

For details, contact your HP sales representative or visit www.hp.com/hps/storage. For descriptions of additional HP support offerings, refer to the "HP services" section.

Solution configuration

The following table lists a bill of materials (BOM) representing the major hardware and software used in the example solution in this blueprint. Required cables and other necessary items have not been included. For assistance, contact your HP sales representative.

Bill of materials

Backup Software		
QTY	**DESCRIPTION**	**COMMENTS**
1	HP OpenView Storage Data Protector Cell Manager Windows	B6961AA
2	Drive Extension LTU	B6953AA
Tape libraries and media		
QTY	**DESCRIPTION**	**COMMENTS**
1	HP StorageWorks MSL6030, 2 DRV, LTO Ultrium 460, embedded Fibre, RM Library	330731-B25
14	HP Ultrium-2 Data Cartridge, 400 GB	C7972A
1	HP Ultrium Generation 2 Barcode Labels, 100 pack	Q2002A (100 data cartridge labels, 10 cleaning cartridge labels per pack)
1	HP LTO Ultrium Universal Cleaning Cartridge	C7978A
Host Hardware components		
QTY	**DESCRIPTION**	**COMMENTS**
4	FCA2101 Fibre Channel Host Adapter (Microsoft OS)	245299-B21 (1 / host in SAN)
2	FCA2210 Fibre Channel Host Adapter (NetWare OS)	281540-B21 (1 / host in SAN)
SAN infrastructure components		
QTY	**DESCRIPTION**	**COMMENTS**
1	MSA SAN Switch (integrated) 2/8	288247-B21 (includes 4 2Gb SFPs)
Variable	2-Gb Small Form Pluggables Short-Wave Transceiver Kit	221470-B21
Storage arrays		
QTY	**DESCRIPTION**	**COMMENTS**
1	Modular SAN Array 1000	201723-B22
14	146.8-GB Pluggable Ultra320 Universal Hard Drive, 10,000 rpm (1 inch)	286716-B22 (18.2 GB, 36.4 GB, 72.8 GB drives also available)

For more information

To get answers to further solution implementation questions, contact your HP sales representative, who will consult our regularly updated interoperability matrices and provide guidance on additional operating system, fabric topology, and third-party/legacy device interoperability.

HP Storage solutions

To learn more about HP Storage solutions, contact your local HP sales representative or visit our Web site at http://www.hp.com/go/storagesolutions.

For additional HP Storage technical blueprints, visit www.hp.com/go/hpstorage_blueprints.

HP StorageWorks EBS components

For further information on the individual components in an HP Enterprise Backup Solution, visit www.hp.com/go/ebs, and select "EBS Design Guide" from the "technical documentation" section.

For information on HP SANs, reference the HP SAN Design Guide at http://h18006.www1.hp.com/products/storageworks/san/documentation.html

HP services

HP offers a full range of storage services, including design, integration, data migration, and support services, and services to help you evolve your SAN as your needs change. For details, contact your HP sales representative or visit www.hp.com/hps/storage.

Data migration services

HP offers end-to-end management of the entire data migration process, allowing stress-free data migration from mission-critical HP-UX, Windows NT/Windows 2000, SUN legacy, and EMC storage systems to the HP StorageWorks SAN platform.

Operate and evolve services

HP operate and evolve services range from reactive hardware and software support (8 x 5 next-business-day response to 24 x 7 same-day response with six-hour call-to-restoration commitments) to comprehensive, proactive mission-sensitive and mission-critical environment support. To help you evolve your storage environment, HP will analyze your storage environment and provide detailed recommendations on how to tune performance and optimize capacity.

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