



Ultimate Business Protection

The foundation of secure business

Enterprise Edition



What will this guide do for you?

Data protection is one of the most important issues facing organisations today. To ensure continuity of your data in the event of any threat – it's vital that you have an appropriate data protection strategy in place.

In the past, data archives were maintained in libraries of paper documents, usually filed in secure storage areas such as vaults or file rooms. Today, even though data has moved from paper to an electronic format, the risks for long-term, up-to-date storage remain. As well as having to maintain data availability and minimise data corruption and loss, modern IT managers must also ensure continuous access to business applications – of which even a short interruption can impact your business's ability to perform its core function. As will be illustrated later in this guide, such events can have a devastating impact and, in many instances, can lead to the loss of significant revenue, loss of customers or even bankruptcy.

Today's advances in storage technologies offer many different choices for data protection and business continuity – from tape and disk drives to RAID and data mirroring, in combination with storage software to manage it. It is important to understand that these technologies are not standalone, and the greatest level of data protection may come from a combination of many different technologies working as one. Each approach

has benefits and limitations, and the solution that's right for you is dependent on a number of factors.

This guide will help you to determine which HP data protection solution is right for your environment – focusing specifically on storage area network (SAN), network attached storage (NAS) and multi-level strategies using a combination of technologies.

If your organisation is looking for more of an entry-level data protection solution, then please ask your local HP representative for a copy of our Ultimate Business Protection SMB Edition guide, in which we explore direct attached storage (DAS), networked-based and NAS-based backup.

Don't gamble with data protection – make the right choice.

Why is data protection important?

In the modern business world, data is everywhere – it's created and stored in huge volumes every day. Analysts at IDC estimate data growth at approximately 80% per year across all companies, both large and small. With reliance on data-rich application software, information and communications to generate revenue and optimise costs, businesses need to know that they can recover from any temporary loss of data, however it's caused. So data protection becomes an essential part of an overall IT strategy, and not just a desirable feature.

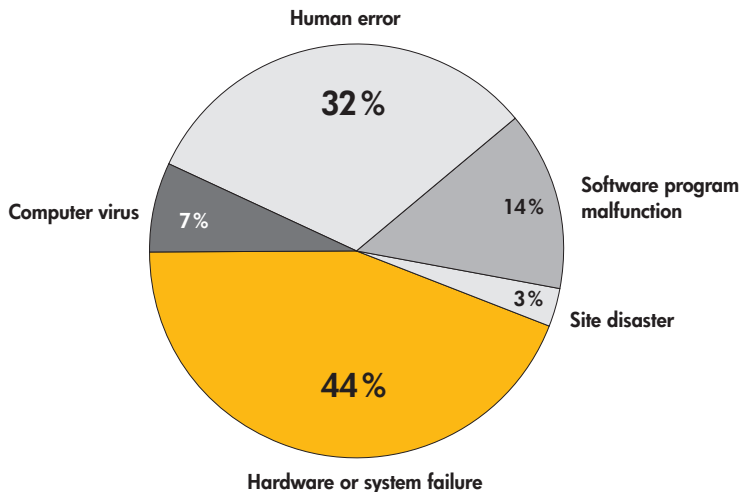
Most businesses have considered the impact of data loss at some point, but the majority still have no explicit strategy in place to deal with such an occurrence. Although implementing a data protection strategy does not remove the risks themselves, it does improve your ability to survive and recover. Later in this guide, different scenarios will be described that outline how the risks of data loss can be negated.

Research shows that the most prevalent cause of data loss and downtime is computer and system failure, but human error also accounts for a large percentage of problems.

The causes of system downtime can be numerous and are illustrated below:

Causes of downtime and data loss

Source: ZDNet by ADIC, October 2002



What happens when data isn't protected?

Downtime due to data loss or unavailability will have a significant impact on business operations and, in turn, on business profitability – whatever the size of your business:

- 70% of businesses that suffered catastrophic data loss were closed within 18 months.

Source: The U.K. Department of Trade and Industry

- The average large company spends between \$100,000 and \$1,000,000 in total ramifications per year for desktop-oriented disasters (both hard and soft costs).

Source: 7th Annual ICSA Lab's Virus Prevalence Survey, March 2002

Although less profound than complete data loss, even short interruptions to a business operation can have a major impact. A recent survey asked companies of all sizes to assess the likely cost of an hour's downtime:

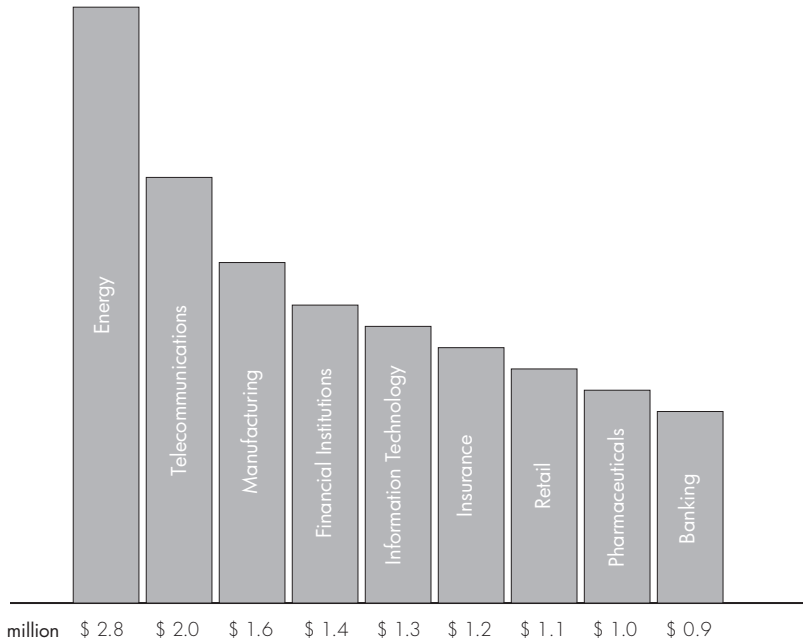
- 46% said it would cost them up to \$50,000 per hour
- 28% said it would cost between \$51,000 and \$250,000 per hour
- 18% said it would cost between \$251,000 and \$1 million per hour
- 8% said it would cost them more than \$1 million per hour

Source: 2001 Cost of Downtime Survey Results, 2001

93% of companies that lost their data centre for 10 days or more due to a disaster filed for bankruptcy within one year of the disaster.

Source: National Archives & Records Administration, Washington

The graph below illustrates the average hourly cost of downtime for a range of larger companies across a range of industry sectors:



Source: IT Performance Engineering & Measurement Strategies: Quantifying Performance Loss, Meta Group, October 2000

These averages indicate the scale of the problem facing large businesses. Smaller businesses will be similarly affected, and with perhaps fewer customers and less ability to withstand a short revenue interruption, their survival may be even more threatened.

You must assess your own vulnerability to data loss, and decide which solution offers the most effective and appropriate data protection for your business. This calls for the assessment of many areas, including:

- Identification of your critical business processes
- Optimum data-recovery point and time
- Loss of revenue due to unavailable data
- Loss of productivity due to unavailable systems

- Cost of restoring data
- Loss of customer and supplier database
- Loss of inventory data
- Loss of customers to your competition

From this assessment, the risks and impacts can be determined, leading you to a range of options to consider for your data protection solution.

What is HP's approach?

With such a high cost associated with downtime and data loss, it is vital that businesses invest in suitable data protection. HP takes a solution approach that focuses on three key customer objectives:

- **Recovery time** – how fast do you have to recover data if an outage occurs?
- **Recovery point** – how recent does the recovered data have to be?
- **Data capacity** – how much data has to be restored?

From this information, HP and its partners can work with you to determine which solution from our comprehensive data protection portfolio is most suitable.

We can implement solutions for the simplest to the most complex environments, running different operating systems and business applications, as well as those with multi-vendor hardware and software. And because we offer a wide range of industry-leading technologies, our solutions enable you to store and access virtually any type of data.

Additionally, we provide a single source for all elements of your data protection solution. For example, HP OpenView Storage Area Manager and HP OpenView Storage Data Protector enable you to manage all storage resources from a single management console.

Choose the technology that fits

Data protection solutions are usually disk- or tape-based, depending on how quickly and frequently you need to access and restore your data. Yet, as businesses require increasing levels of protection and instant recovery of data, multi-level storage solutions that use both disk and tape backup offer the highest levels of data protection.

Tape-based solutions

Tape technologies offer a lower cost of ownership compared to disk-based storage and use durable media that can be re-used and readily located off-site. Tape is very reliable – enabling you to backup and restore

first time, every time – and scalable to suit your changing needs.

HP provides leading tape-based technologies – covering DAT, DLT VS, SDLT and LTO – in a leading range of products, such as standalone tape drives, autoloaders and tape libraries.

Disk-based solutions

As part of an overall data protection strategy for more critical data, the use of disk-based storage provides you with:

- Continuous data protection for 24 x 7 applications
- Fast, random access to data
- Instant data recovery
- Scalability for growing capacity needs (becomes costly over certain capacity points)

HP provides leading disk-based technologies such as RAID, and additional data protection features like remote data replication, snapshots and cloning.

Multi-level storage solutions

HP considers the most viable multi-level storage solution to be a combination of snapshots, clones (or mirrors) and tape-based backup. Snapshots represent a point-in-time image of the data, and use techniques that minimise the amount of disk space each image occupies. Clones are identical byte-for-byte copies of original data, that occupy exactly the same storage space as the original.

Multi-level storage allows you to either recover data from a certain point in time or switch over to a mirrored copy of that data to get back online in seconds. Coupled with an added level of protection using tape-based backup, it provides complete data protection.

Choose the services to match

To complement our technology solutions, HP offers a full range of professional services in four main areas:

Data availability

Accidents, unforeseen hardware outages and downtime are a reality for complex computing environments. HP offers a choice of response times to ensure that we'll be there quickly to restore your system integrity and data availability. These reactive support levels, combined with our proactive availability services, help ensure your data remains safe and available when you need it.

Technology deployment

When integrating your new HP storage solution to an existing IT infrastructure, HP deployment services can ensure it's integrated quickly and efficiently. HP's portfolio of deployment services ranges from basic installation, full integration and personalised configuration services – including operational training.

Performance services

HP performance services ensure your infrastructure provides you with the optimum performance and best return on investment. Performance assessment, tuning, measuring and monitoring services are all available to ensure you get the most out of your IT investment.

Customised business solutions

HP offers a whole range of services to ensure your IT infrastructure is providing your business the support it needs. If you want to turn your IT infrastructure into a rapidly scalable and highly responsive IT solution – we can help. If you wish to offload some of your IT management to the IT management experts, we can help. With HP at your side, you and your business can go anywhere, do anything. Let us turn your IT infrastructure into a competitive advantage for your business.

Guidelines for success

Whatever solution is recommended for an individual business, following these simple guidelines will increase your level of protection.

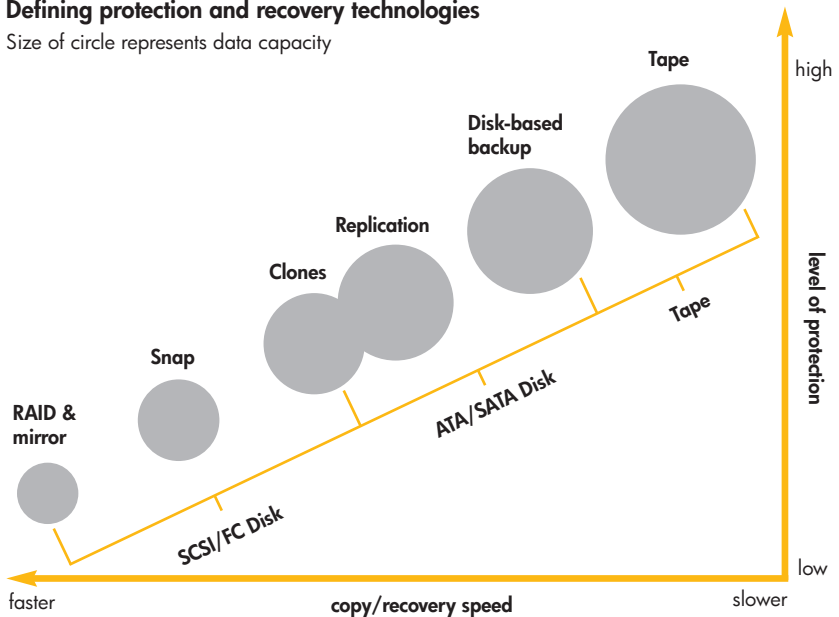
- First, classify your data according to business relevance. Understand what data is business critical, requiring the highest level of data protection, and what data you can afford to restore at a later point in time.
- Perform a full backup to tape and remove tapes to an off-site storage location daily or weekly to reduce the risk of data loss.
- Test the solution's restore capabilities frequently to ensure backup integrity.
- Buy technologies with proven track records and clear product roadmaps – this will ensure backward-read compatibility.
- Consider a multi-level data protection strategy consisting of disk-mirroring, snapshots and tape backup.
- Adopt archival practices for data that can be moved off-site for later retrieval. This increases efficiency by freeing up more costly primary disk storage space.

Data protection technology capabilities

The picture below illustrates the broad coverage of the HP StorageWorks data protection technologies and shows the high-level attributes of our various disk and tape products. The purpose of this picture is to indicate that there are three dimensions to selecting the optimum storage solution depending on your needs for recovery speed, data capacity and level of protection.

Defining protection and recovery technologies

Size of circle represents data capacity





Choosing the right solution

We identified earlier that the fundamental questions that need to be addressed prior to choosing a data protection strategy are:

- 1) How quickly does your system need to be back online (recovery time)?
- 2) How recent does the data have to be (recovery point)?
- 3) How much data has to be backed up for a full recovery?

Over the following pages, we explore four solutions for the enterprise, which present several options for customers that demand quick and reliable recovery of large amounts of data:

- Enterprise NAS-based backup
- Entry-level SAN backup
- Enterprise-level SAN backup
- Enterprise multi-level backup

It is important to note that there are overlaps between these solutions, and your business may well be suited to more than just one. In this case, think about your plans for future growth or your uncertainty over data capacity – and take a look at the considerations we’ve offered – these factors could influence which solution is most suitable. As a conclusion to each, we’ve listed the key advantages you’ll obtain by choosing HP as your solution partner.

NAS-based solution for remote offices

A typical environment

Here we consider a solution for companies that need to protect their data more efficiently in a geographically dispersed environment. For example, you may have a central data centre that is well protected, but have remote locations that are vulnerable to system failure or disaster, and therefore data loss and downtime. If this is a challenge for your business, your remote locations are probably suffering from the following:

- Lack of network bandwidth, preventing remote data from being backed up to the central site.
- A lack of local skilled IT personnel to manage the backup and restore process.

An example of centralised remote office backup

With limited bandwidth over the WAN between remote office and data centre, a traditional backup over the network is not a valid option. Plus, the backup windows needed would be extensive, since all data would have to be pulled through the WAN, causing bottlenecks in both the backup and overall WAN performance.

Ideally, you would want a centralised solution that saves on management costs by leveraging the enterprise backup solution located at your data centre.

Centralised remote office backup is ideal. It uses intelligent software – designed to work over slow bandwidth connections – to mirror the data created at remote sites and copy it over an IP network to a central NAS file server located in the data centre. And because multiple remote sites can replicate their data to one central NAS system or NAS cluster, it enables efficient consolidation of the backup process.

Once the data is replicated, traditional LAN- or SAN-based backup techniques within the data centre can be used to provide complete data protection. For example, because data from the remote site is constantly replicated to the NAS system, it can be almost instantly recovered following a system failure or catastrophic disaster.

Considerations

- Clustering your NAS servers in the data centre provides higher availability.
- If you have a good understanding of how your remote data is changing on a daily basis, you are in a strong position to configure an appropriately sized solution for NAS-based remote site consolidation.

The HP advantage






HP OpenView Storage Mirror makes optimal use of limited network bandwidth by only copying blocks of data that have changed at the remote site. The replication can be configured to use only a percentage of the available bandwidth – or to only run at off-peak times. This enables large amounts of data to be synchronised over slow links, while the majority of the connection speed is used for normal day-to-day business activities.

HP StorageWorks NAS servers are the ideal consolidation platform, offering inexpensive disk capacity for backup staging and acting as the backup server at the same time. Virus scanning can also be integrated to keep your backup data clean. Snapshot technology is built into Microsoft® Windows® Storage Server 2003, enabling you to not only keep daily

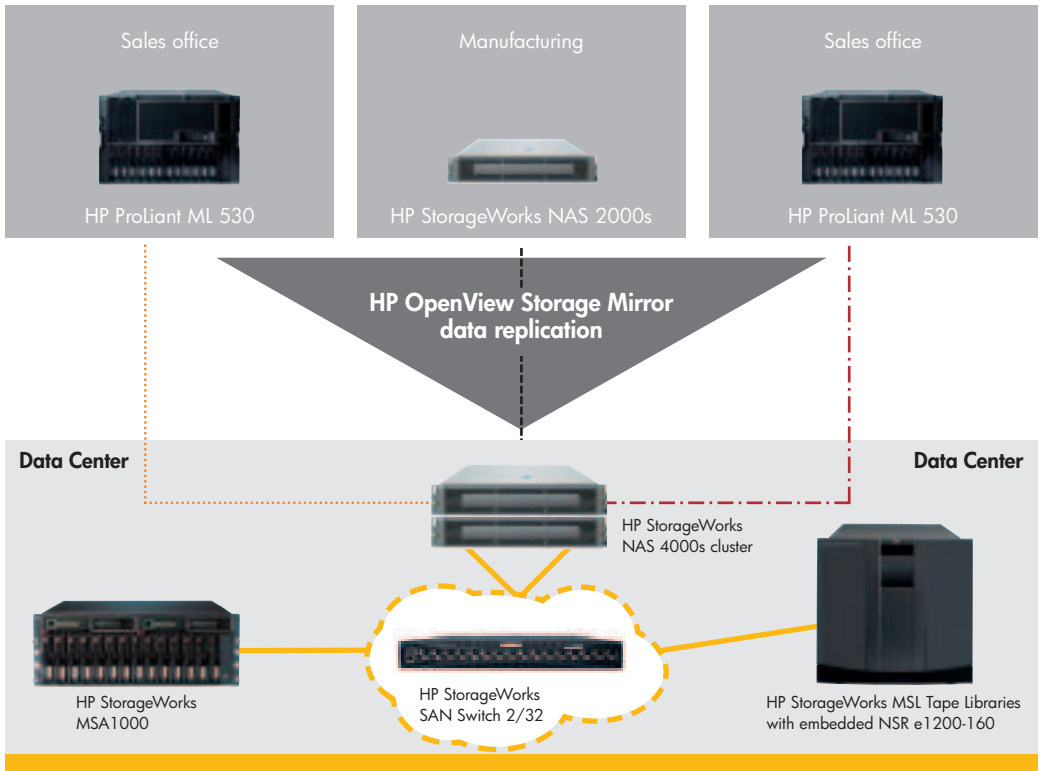
backups of data, but also several versions of each file during the day.

Centralised remote office backup allows you to leverage the existing backup infrastructure at your data centre – which can be cost-effectively scaled to meet future growth needs with HP StorageWorks MSL Series and ESL Series Tape Libraries.

HP's ability to support your entire infrastructure, including multi-vendor, server and SAN interconnectivity, makes HP the clear technology partner for your data protection solution.

-  = 512 kbit/s WAN
-  = 1 Mbit/s WAN
-  = 2 Mbit/s WAN
-  = 2 Gb/s FC
-  = SAN Fabric

NAS backup for remote offices





SAN-based solutions

A typical environment

Here we consider two scenarios that differ in scale only, and in which the storage backup devices are connected across a Storage Area Network (SAN). A SAN is a sophisticated and often complex environment that suits both entry-level and enterprise-level customers. If this is a challenge you face, your business will probably share some or all of the following characteristics:

- Larger network (> 5 servers)
- A need for multiple operating system support
- Legacy infrastructure
- Continuous mission- and business-critical applications
- 24 x 7 operations
- Dedicated IT staff
- Exponential data growth (> 50% per annum)
- A need for instant recovery
- Backup management system in place
- Plans to grow

SAN-based backup overview

SAN-based solutions are highly scalable systems in terms of performance and availability. They provide much higher levels of data capacity and enable much faster recovery of information at the point of loss, thus meeting the three main requirements of a business-critical backup solution.

By consolidating both disk and tape storage within one large solution, you can manage your storage with more efficiency and prevent wasted storage capacity. It also becomes easier to allocate storage capacity to new systems from a centrally managed storage pool. There is no impact on LAN performance because all backup data uses a dedicated fibre-channel protocol to connect devices to the SAN fabric at rates of 2 Gb/s.

Performance and failover capability can be improved by fitting multiple fibre-channel host bus adaptors (HBAs) to the host systems and storage devices, enabling multiple data paths. Also, unlike LAN backup, centralised data storage can be located 10 km or more from the main business centre, improving your business continuity and disaster recovery capabilities.

Disk storage is an integral element of SAN backup. Although not as cost-effective as tape backup, it offers instant recovery for mission-critical data and applications that need to be continuously available. A typical environment will utilise a tape library for routine data and a disk array for critical data.

External disk arrays in a SAN provide higher utilisation of disk storage, because free space can be allocated to any server. Consolidating storage also simplifies management, and the advanced features of high-end disk arrays provide improved security, reliability and redundancy.

Tape drives offer traditional, parallel, SCSI as well as native fibre-channel (FC) connectivity. Consider adopting native FC tape drives in the future with the expectation that, when used in combination with a controller-based architecture, they will provide a simpler connection method, and thus improved reliability.

In addition to better performance, a SAN also increases utilisation of your tape drives with backup software that dynamically allocates them to your servers, using as many as possible at any given time.

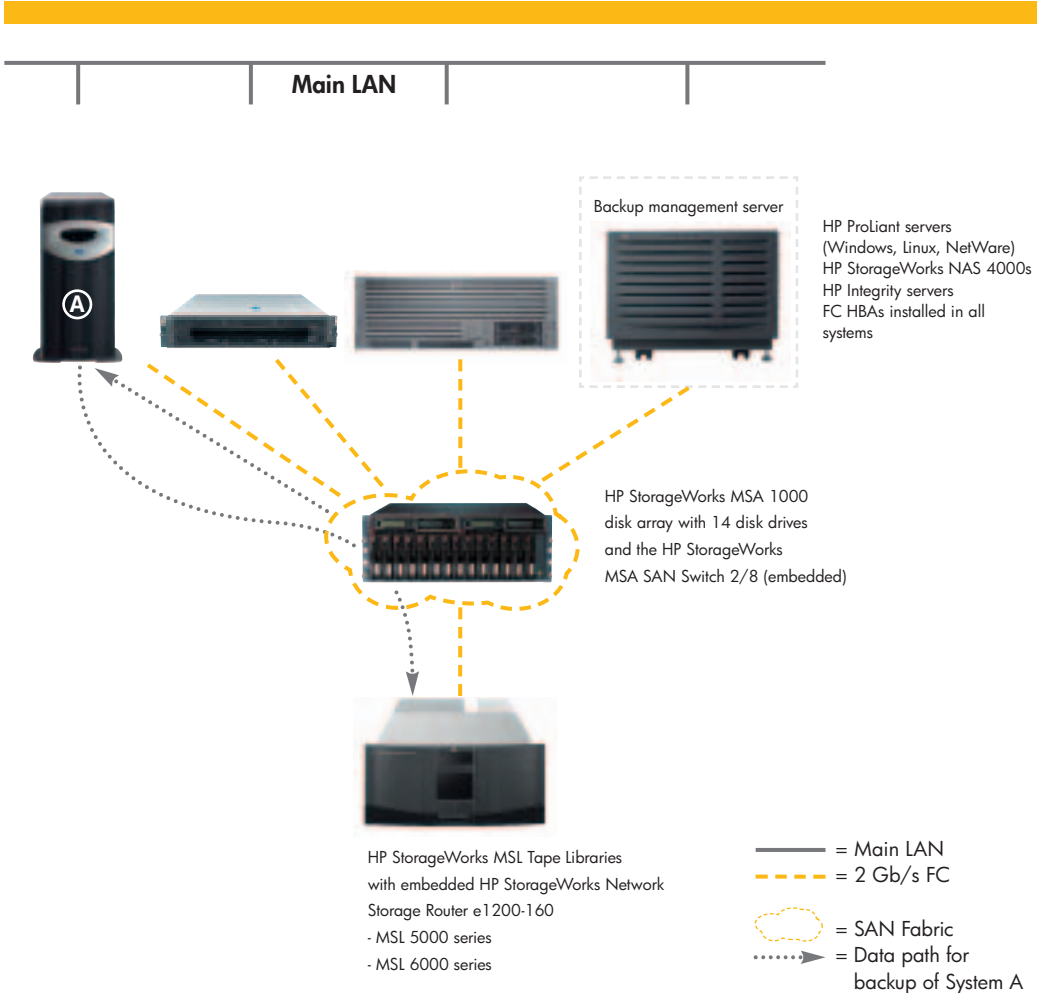
Factors that affect reliability, however, extend far beyond a single tape drive. The important question for IT organisations is not which tape drive interface to deploy, but how to choose the best architecture to meet current and future needs with respect to reliability, functionality and performance – all at a reasonable cost.

Entry-level

Storage Area Network backup

In this example, we will consider a company's first move into storage consolidation as it aims to provide a more scalable solution for growing data-capacity demands. The entry-level SAN implementation allows easier and more cost-effective management of storage resources.

The diagram below shows an example of an entry-level SAN. It features several systems sharing disk storage on the entry-level disk array, together with a mid-range tape library. The SAN fabric is composed of an entry-level 2-Gb 8-port switch, which can be embedded in the disk array or placed externally on the SAN together with the appropriate fibre-channel HBAs in each of the systems.

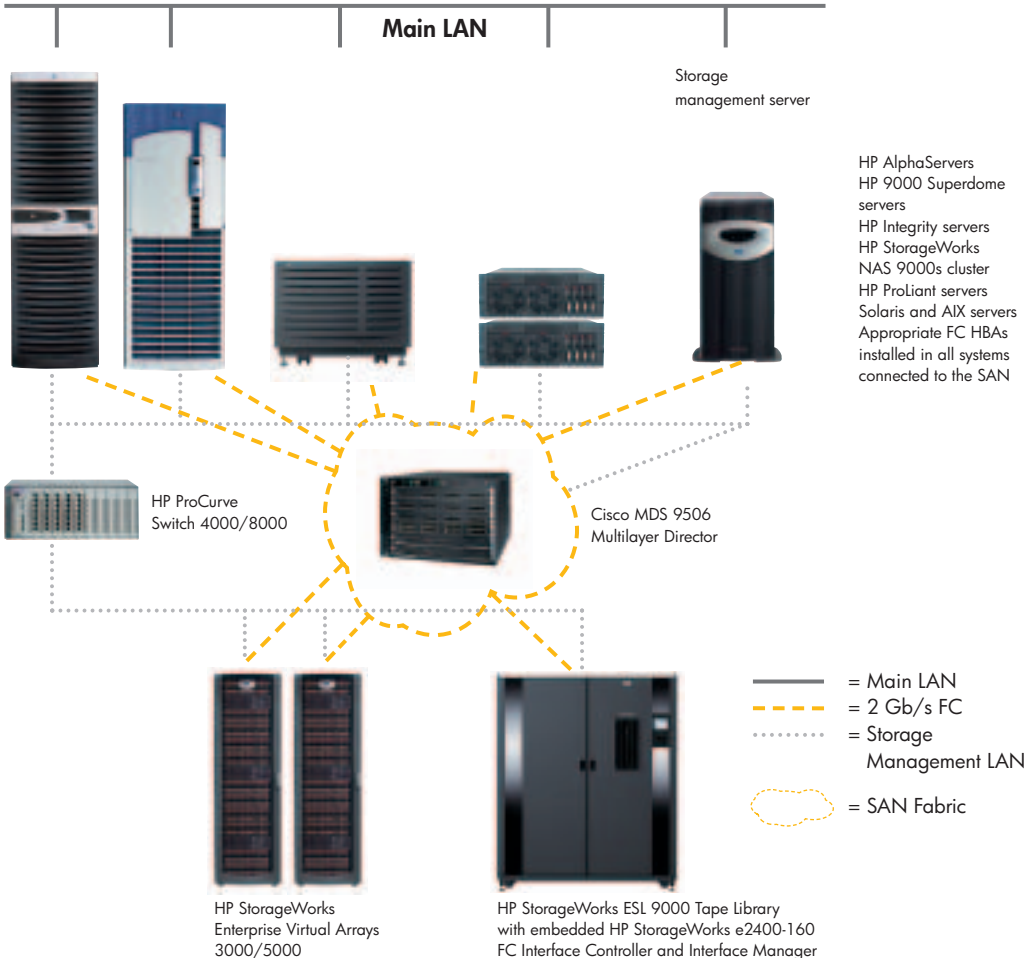


Enterprise-level

Storage Area Network backup

The next example will take the capabilities of a SAN to their natural conclusion in the setting of a data centre. The main difference from entry level is that the enterprise level is more likely to accommodate multiple operating systems and platforms, with a much higher port count in the fabric. Consequently, there is a need for comprehensive storage management tools and diagnostic utilities.

Larger-scale consolidation involves high-capacity disk arrays and tape libraries. And to allow failover to a duplicate system following a disaster, many servers need multiple fibre-channel HBAs. A typical enterprise-level SAN implementation is shown below. The data paths are the same as for the entry-level solution, with data being read from the disk storage array to server, and then passed through the SAN fabric to the tape library.





Considerations

There are a number of considerations in the SAN-based scenarios:

- Tape libraries with removable media cartridges remain the most cost-effective and reliable backup for all data in both entry-level and enterprise-level SAN environments.
- Reliability and performance of high-end tape drives and fibre-channel controllers have improved with each generation, making them a safe choice.
- Only disk backup can give instant recovery for mission-critical data. All other data in the fabric can be backed up on tape libraries.

The HP advantage

HP has a full range of tape automation solutions for the SAN to cover a variety of needs. Designed in accordance with HP StorageWorks Extended Tape Library Architecture (ETLA), our tape libraries provide leading performance, reliability and security, and offer features such as device-level access control, caching, event reporting and simplified, automated configuration. They incorporate an adaptive Interface Manager for remote network control, and offer flexible, future-proof upgrade paths. Plus, with HP StorageWorks CommandView ESL, they can be managed from any location.

For entry-level SAN solutions, HP StorageWorks MSL tape libraries – in combination with Ultrium or SSDLT tape drives – offer unparalleled performance, investment protection and flexibility. They can be scaled with each other to provide 16 drives and 240 slots, allowing you to grow with changing needs. Plus, they're easy to manage via an intuitive GUI control panel and integrated remote web management.

For enterprise-level SAN solutions, HP StorageWorks ESL tape libraries offer the ultimate in high-capacity, mission-critical, unattended backup and restore. They scale up to 142.4 TB of native capacity and a maximum throughput rate of 2.5 TB/hour. And with ELTA integration, administrators can manage the robotics, drives and interface controllers from a single, remote-based terminal.

For solutions using an MSA1000, the optional and affordable MSA SAN Switch 2/8 can be integrated into the MSA1000 chassis without the need for additional rack space. It takes advantage of the MSA's high-availability features and offers full 2 Gb/s fabric performance. A cost-effective and space-saving method of creating a SAN environment.

The HP StorageWorks Enterprise Virtual Array (EVA) is a disk storage system that can be tailored to match your exact requirements. It scales up to 35 TB (240 x 146 GB) and leverages unique, inherent virtualisation

techniques. HP disk arrays save valuable time through ease of management and high transactional I/O performance.

Sophisticated software solutions add further value to your enterprise storage environment. Mirroring or capacity-efficient snapshots provide real-time data protection that can later be archived to tape. Remote replication guarantees continuous business operations in the event of disaster or failure by mirroring data to remote sites.

HP OpenView Data Protector allows you to dynamically share tape drives in a SAN-attached library between the servers connected to the SAN. It also provides an easy way to manage both disk- and tape-based backups, including instant recovery of data using integrations with HP StorageWorks disk arrays.

HP StorageWorks award-winning Enterprise Backup Solution provides a unique solution to the SAN-based backup dilemma with fully certified and supported configurations, scaling from entry-level workgroups to enterprise data centres.



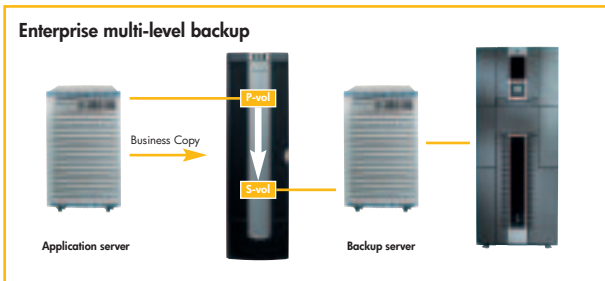
HP's end-to-end and multi-vendor service levels can ensure that your whole storage environment is covered by the same availability guarantee.

Enterprise multi-level backup

A typical environment

With this solution, you can backup applications with virtually no impact on performance and reduce restoration time of business-critical data from hours to seconds using online data copies. The name of the solution is defined by the multiple stages of backup and the use of both disk and tape.

If you run mission-critical business applications across multiple operating systems and have backup software applications in operation 24x7; if you are experiencing exponential data growth of around 80% a year and have a constantly shrinking backup window, then consider an enterprise multi-level backup solution:



- 100% data availability
- Support for multiple operating systems and applications
- Centralised management of backup systems and the entire environment
- Ability to upgrade backup technology over time
- Zero downtime technology, such as mirroring
- No performance degradation caused by backup
- Highest level of storage capacity, performance, reliability, durability and scalability

Snapshot backup

Snapshot backup works the following way:

1. The disk array controller in conjunction with the appropriate backup software takes a snapshot of the application data, with the application data quiesced to guarantee data consistency.
2. This snapshot is then sent to the backup server, which is connected to the SAN but separate from the application server.
3. The backup is performed over the SAN, with data only being read from the snapshot – thereby causing no impact to the application server or its data. Data can be restored instantly following disaster, by assigning the snapshot as the primary disk.

Data replication can be set up between the primary and secondary disk array, which – combined with snapshot backup – improves disaster tolerance.

An example of enterprise multi-level backup

In this diagram, a disk array is configured with a primary (P) volume and a secondary (S) volume. To achieve disaster tolerance from a complete site failure, the S volume should be located in another storage array at a remote site, connected to the P volume via fibre channel. Remote mirroring software will constantly and transparently duplicate source data between the volumes, so if the P volume fails, the S volume can be accessed almost instantaneously.

The major business software packages such as Oracle, SQL and SAP have the ability to “split-away” the secondary mirror and still maintain consistency without any disruption to the running application.

Once the S volume has been split, it can be mounted onto a backup server and a complete point-in-time backup run. This needs no backup window because it’s performed in isolation from the application server. Consequently, backups can happen several times a day to provide more recent recovery points.

Considerations

- The continuing decline in the cost of disk storage – accelerated by the emergence of serial ATA (SATA) technology – has created new data protection opportunities for end-users. Two-stage backup; staging to disk before copying to tape; and disk-to-disk (D2D) backup have given rise to increased functionality – with reduced backup windows and faster restore capabilities (direct from disk).

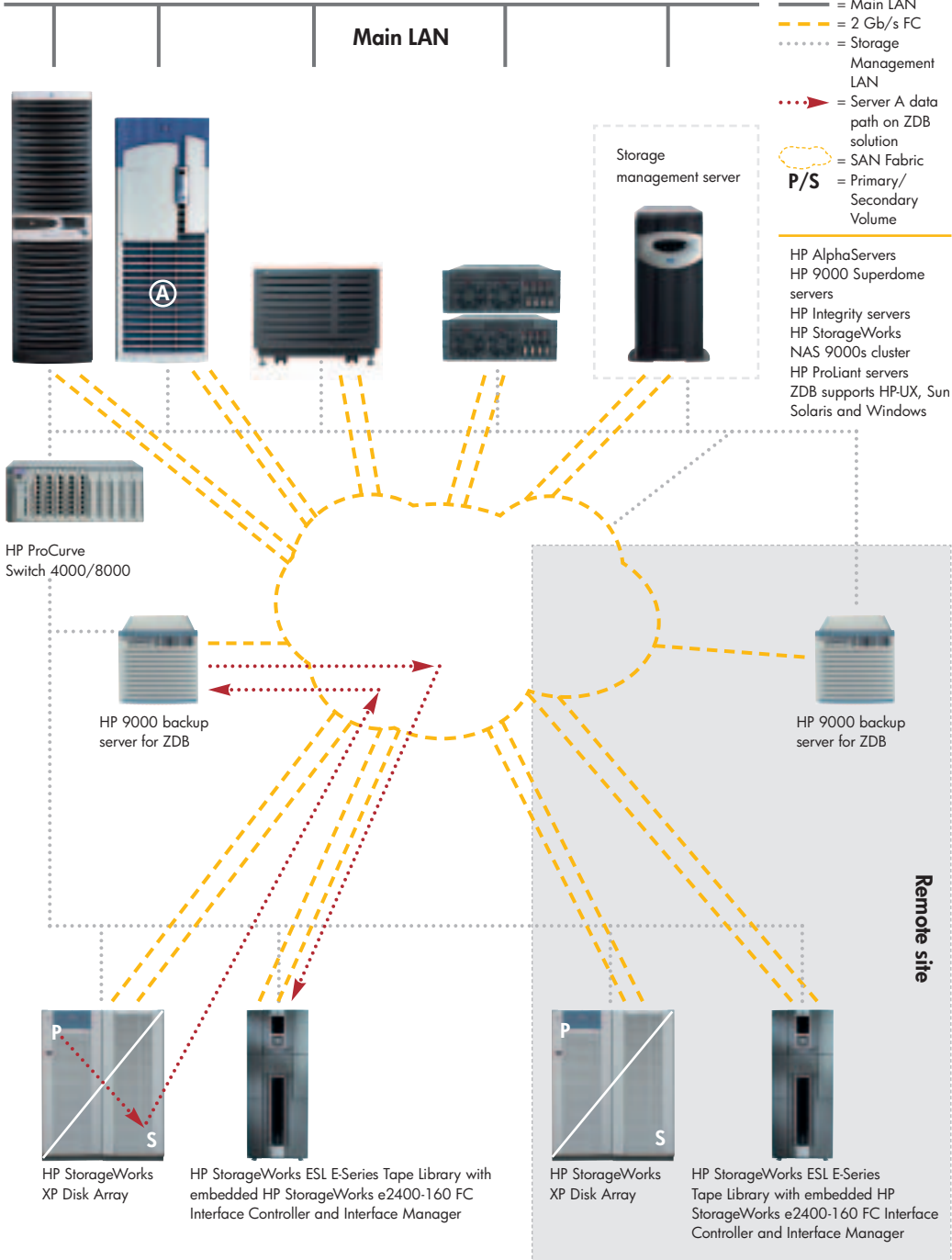
These new capabilities however, should be viewed as enhancements to, and not a replacement for, existing backup and restore strategies. This is because in multi-level data protection, the disk solutions are prone to the same vulnerabilities as any disk subsystem and as such, they should be RAID protected and backed-up to tape.

- These sophisticated multi-level backup techniques can only be used in a SAN environment where the data sources can be shared amongst servers.

The HP advantage

For industry-leading multi-level backup, choose the HP Enterprise Zero Downtime Backup solution. This is a fully integrated multi-level data protection solution combining StorageWorks EVA and XP disk arrays, ESL tape libraries and HP OpenView Storage Data Protector software. The major advantages of this solution are as follows:

- HP is the only vendor in the storage market that can deliver an integrated single-vendor solution for multi-level backup that includes enterprise backup software, disk storage, SAN infrastructure and tape automation.
- Total application integration with SAP, SQL and Oracle.
- Seamless splitting of the S volume without disruption.
- Seamless mounting of the S volume onto the backup server.
- Total elimination of the backup window and no performance degradation of the production environment.
- Total data protection through a multi-level solution.
- The HP libraries used in this configuration fully support the HP StorageWorks Extended Tape Library Architecture, as described earlier.
- For detailed information on supported ZDB configurations with HP OpenView Data Protector, please refer to the URL on page 27.



Why HP data protection?

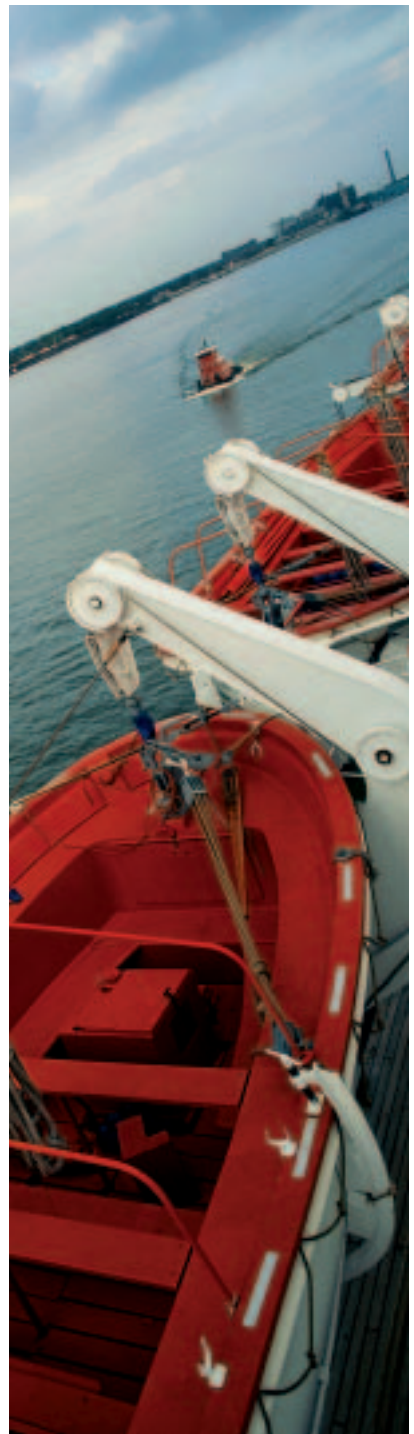
We have seen through the practical examples shown in this guide that enterprise businesses like yours can get Ultimate Business Protection from a variety of HP solutions – all designed to meet your individual requirements and budget. Plus, we offer free tools that help you choose the right configuration from the start and maintain your system once its up and running.

In addition, we provide full peace of mind with reliable solutions and comprehensive support. For example:

- We provide a single source for all your storage solutions, regardless of who provides your network hardware or your preference for operating systems or application software.
- You get a total solution. HP continually tests its storage products with leading workstations, servers and operating systems to ensure full compatibility and reliable, trouble-free performance. And support for industry-leading backup applications, such as HP OpenView Data Protector, helps you to eliminate unplanned downtime and recover systems in minutes.
- HP Services is always on hand to help you cut the cost and complexity of maintaining, managing and protecting your storage investments.

For more details on getting Ultimate Business Protection from HP, please visit:

www.hp.com/eur/ubp



HP OpenView Data Protector

A complete backup and recovery solution for every need.

Ease of Use

Automatically initiates scheduled backup of your applications and files. It also simplifies the management of your backup devices and procedures – even multi-level backup and snapshots – via a simple graphical user interface.

Performance

Can run multiple backup jobs in parallel and make use of all available backup devices simultaneously to provide the best performance. In a SAN environment, it improves performance by sharing devices among all servers.

Scalability

With support for a broad range of platforms and applications, and built around a modular

architecture that allows you to add additional licences or features as your needs grow, it's ideal for all environments, from small configurations and remote office locations to large enterprises.

Instant Recovery

Instant Recovery can restore an application in seconds using integration between OpenView Data Protector and HP StorageWorks disk arrays.

Zero Downtime Backup

Zero Downtime Backup eliminates the backup window and allows backup of application data without any performance impact on the application itself.

First-class support

As with all HP backup and restore solutions, OpenView Data Protector is fully supported by HP, so you can rest assured that if anything happens, we're there to help.

HP OpenView Data Protector for Microsoft Windows

Data Protector offers some significant features specifically for Microsoft Windows, such as:

- Zero Downtime Backup for Microsoft Exchange Server 2003 with Volume Shadow Copy Services (VSS)
- Message-level and mailbox-level backup of Microsoft Exchange Server
- Zero Downtime Backup for Microsoft SQL Server
- Support for HP StorageWorks NAS running Microsoft Windows Storage Server 2003
- Certified for Microsoft Windows Server 2003 and Microsoft Windows 2000 Server

Trust HP storage media for every backup need

Not all tapes are equal, nor will a single brand of tape always perform in the same way. The manufacture of storage media is complex, and the quality between different samples can vary greatly – even if made by the same company. Only a media-testing programme as deep and as wide as HP's gives you the best-quality media every time.

We test every batch of product that is destined to carry the HP brand. And we can, and do, suspend supply from our media manufacturers when their samples fail to meet HP quality standards – which are typically much higher than industry-standard logos. Logo tests usually focus on interchange or a very narrow range of quality parameters, whereas HP brand specifications focus on multiple batches in multiple drives covering an array of environmental conditions.

Yet backup is only half the solution. What really matters is being 100% certain that you can recover data from HP media in an emergency. Therefore, we have 20 custom-built test chambers in use – running over 70,000 tests and 1.3 million test hours a year – that emulate real-world conditions and usage to make sure that, whatever happens, data can be restored.

HP storage media delivers optimum performance in backup and restore operations, lifelong integrity for storage archives and excellent value for money.

With pre-labelled DLT and Ultrium data cartridges, you can save the time and money of labelling up cartridges by hand. More important, our labelling systems are precision engineered to make sure the automation device retrieves the right tape, every time.

All HP media is supported and warranted by HP. So when you combine HP media with HP tape drives and tape automation products, world-class support is just a phone call away. We constantly monitor manufacturing processes and test procedures to make sure all media products are consistent with HP brand specifications. So if the unthinkable happens, you can depend on HP-branded media to get things up and running again. Fast.



HP StorageWorks Library and Tape Tools (L&TT)

HP knows that you rely on your system to function at full capacity, and if downtime should occur, you need immediate corrective actions. We answer this challenge with a free diagnostic tool that's easy to install and operate. L&TT is a single, convenient program for proactive preventative maintenance and downtime analysis that sets industry standards in reliability and convenience.

Download it today at:
www.hp.com/support/tapetools

Configure your ideal solution

StorageWorks Backup Sizing Tool

Designing your data-centre environment is not a simple process, so HP makes it easier with the StorageWorks Backup Sizing Tool (SWBST). This is a web-based tool that allows you to size and configure an ideal solution using specified information, regardless of the type and size of your environment. It can also be used to periodically check that the solution is fulfilling the changing needs of your business.

SWBST is free of charge and available online at Active Answers or in downloadable form at www.hp.com/go/swbst

Q&A

1) Do tape library interface controllers reduce performance?

No. Interface controllers are designed to achieve optimal performance by buffering data and can actually improve performance by blocking third-party traffic. Interface controllers match or exceed tape drive performance in all common implementations.

2) Does HP support native FC tape drives in its libraries?

Yes. HP is introducing native FC tape drives into its ESL E-series 712e and 630e extended libraries now. However, in line with the ETLA, these will not be connected directly to the SAN switch, but supported by a separate type of interface controller that allows better bandwidth utilisation of the FC ports made available to the library.

3) When should I choose an HP native FC library over a SCSI-based library?

HP believes that native FC tape drives in a library do not offer any performance or reliability improvements over native SCSI tape drives, but they do provide an architecture to better manage drive failover and virtualisation features.

Choose a native FC tape library when switch port counts are not limited and you require a simpler overall cabling interface to your library, or if you foresee a future requirement for data path failover within your library (as opposed to on the host system).

Choose a SCSI-based tape library if you are considering a future move to an IP SAN (iSCSI). HP ETLA is flexible enough to develop an iSCSI interface module, should IP SANs grow in popularity.

4) What happens if the amount of data I need to protect grows unexpectedly?

One of the founding principles of the HP ENSAextended strategy is scalability. Our hardware and software solutions are built on a modular architecture, so you can add capacity and performance over time. This allows you to get the maximum return on your storage investment.

5) What HP services are required to deploy an enterprise data protection solution?

If the standard implementation services do not meet your requirements, HP offers a variety of additional implementation services that can be tailored to meet your specific business needs.

6) What is the best way to optimise my tape library backup throughput to the SAN? How do I prevent tape from being the bottleneck?

There are several options for customers looking to optimise their backup resources in a SAN:

- HP performance services ensure your infrastructure provides you with the optimum performance and best return on investment.
- HP Library and Tape Tools (see page 24) has a number of performance-measuring capabilities built in, allowing you to optimise your storage environment yourself.
- You can find additional tools at <http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?objectID=lpq50460>

Glossary

Command View

The common-look-and-feel management console for HP storage devices.

Data path failover (future feature)

The ability to maintain access to the library when one access path is inoperative. This involves using dual fabric switches, dual HBAs in the hosts, and modified HBA drivers to detect path failure and automatically switch to the alternative path.

Interface Controller

HP terminology for the controller that links the tape drives to the SAN. More than a storage router, this controller can manage, report to, and be configured by the Interface Manager.

Interface Manager

The central point of knowledge for all activities within the library. The Interface Manager communicates with the interface controllers and library controller on one side and the management console (through Command View ESL) on the other.

L&TT – Library and Tape Tools

An HP tool that aids the troubleshooting and configuration of tape drives.

Multi-level data protection

Sometimes known as staging, or integrated tape and disk backup and restore, or even D2D2T, multi-level data protection uses a disk as a staging device in the backup process, either to allow the backup to tape to take place over a longer period or act as a means of faster restore.

Native Fibre Channel (NFC) tape drives

These tape drives use 2 Gb fibre channel connections on the rear of the drives instead of the 68-pin SCSI connections. Allows “many to many” connections, unlike SCSI, which tends to be “point to point” connections. Supports data path failover within the tape library itself. However, there is no performance advantage over SCSI drives as both interfaces are much faster than the tape drives can physically write or read.

Virtualisation

The ability to hide the complexity of a storage subsystem by presenting it to hosts as LUNs or volumes, instead of a series of discrete devices.



For more information

Ultimate Business Protection from HP.
Find out more at: www.hp.com/eur/ubp

Discover more about SAN configurations in
the HP Enterprise Backup Solutions guide at:
www.hp.com/go/ebs

For more information on HP tape automation
products go to: www.hp.com/go/automation

For detailed information on supported ZDB
configurations with HP OpenView Data
Protector, visit: [www.openview.hp.com/
products/datapro/spec_0001.html](http://www.openview.hp.com/products/datapro/spec_0001.html)

Download HP StorageWorks Library
and Tape Tools at:
www.hp.com/support/tapetools

To configure the ideal data protection solution
with the HP StorageWorks Backup Sizing
Tool, visit: www.hp.com/go/swbst

Interested in NAS?
Visit the Easy as NAS programme at:
www.hp.com/eur/easyasnas

Thinking about a SAN?
Ask your local reseller for a copy of
the My First SAN solution guide



Find out more about
Ultimate Business Protection from HP at
www.hp.com/eur/ubp

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