






Vortrag 1F06 NearLine Overview

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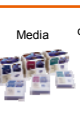







Agenda



- HP's storage vision and strategy
- HP's multi-level data protection solutions
 - Tape product portfolio
 - Two-stage backup
 - Storage media
 - Data protection software portfolio
 - Data protection tools portfolio

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HP StorageWorks Product Portfolio

Infrastructure						
	HP Switches and Directors			Multi-protocol services iSCSI/FCIP		
	Host Bus Adaptors					
Storage Servers (NAS) & Storage Arrays	 ProLiant Storage Servers	 StorageWorks Clustered Gateway	 StorageWorks WAN Accelerator	 MSA Family	 EVA Family	 XP Family
Tape & Optical storage	 Media	 Standalone drives & autoloaders	 ProLiant Data Protection Storage Server	 Virtual Library System	 MSL series	 EML E-Series
				 ESL SE-Series	 Ultra Density Optical jukeboxes	
Software	Unified Server & Storage Management • HP Systems Insight Manager • HP Storage Essentials			Array Integrated software • Device managers • Replication		Information Lifecycle Management • Protect • Archive

SERVICES & SOLUTIONS

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Tape Is Dead



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Tape Is Dead... and here's the timetable



- When there are no more natural disasters
- When electricity is free
- When all people are honest
- When your people no longer make mistakes
- When there are no computer virii or other malicious code
- When government regulations (SarboX, SEC, ...) have gone away
- When hardware never fails
- ... and software is bug-free

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The leader in data protection

#1
in tape drives

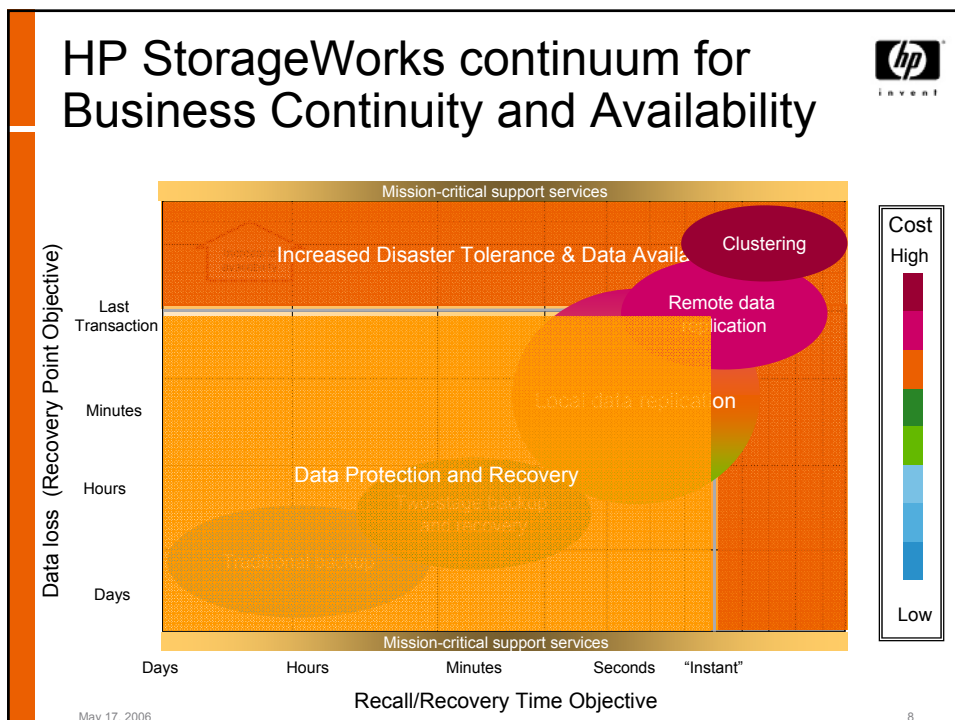
#1
in mid-range automation

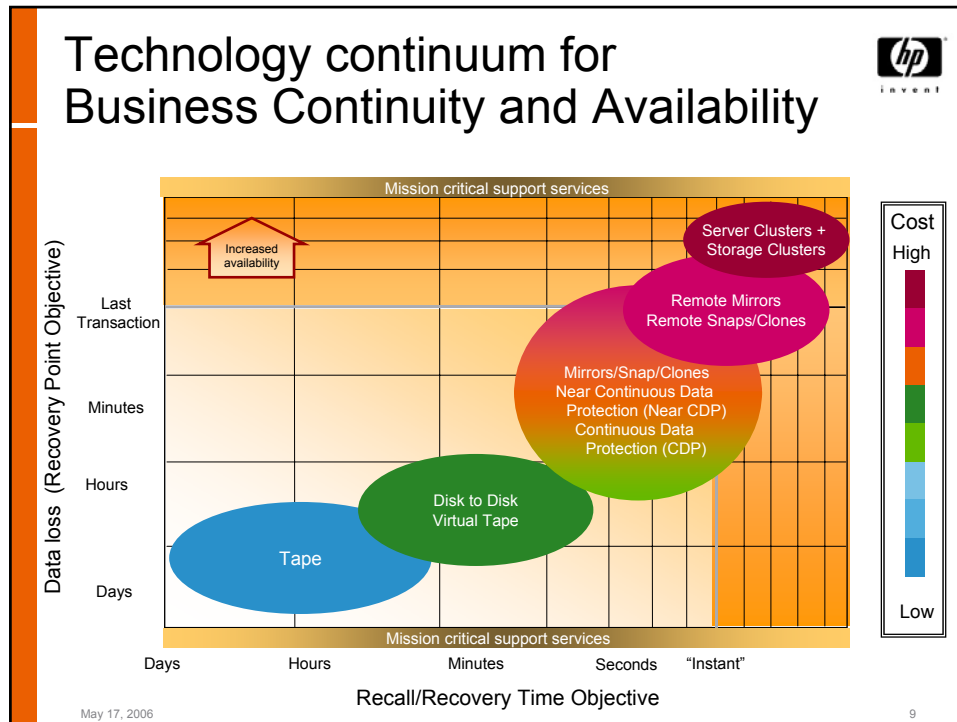
#1
in media supplies

- Leading the industry initiative for open, standard tape formats with Ultrium LTO and DDS/DAT
- Support for major tape formats and platforms
- Hardware, software and services for the entire data protection infrastructure

Source: IDC 1H05 market share reports, October 2005

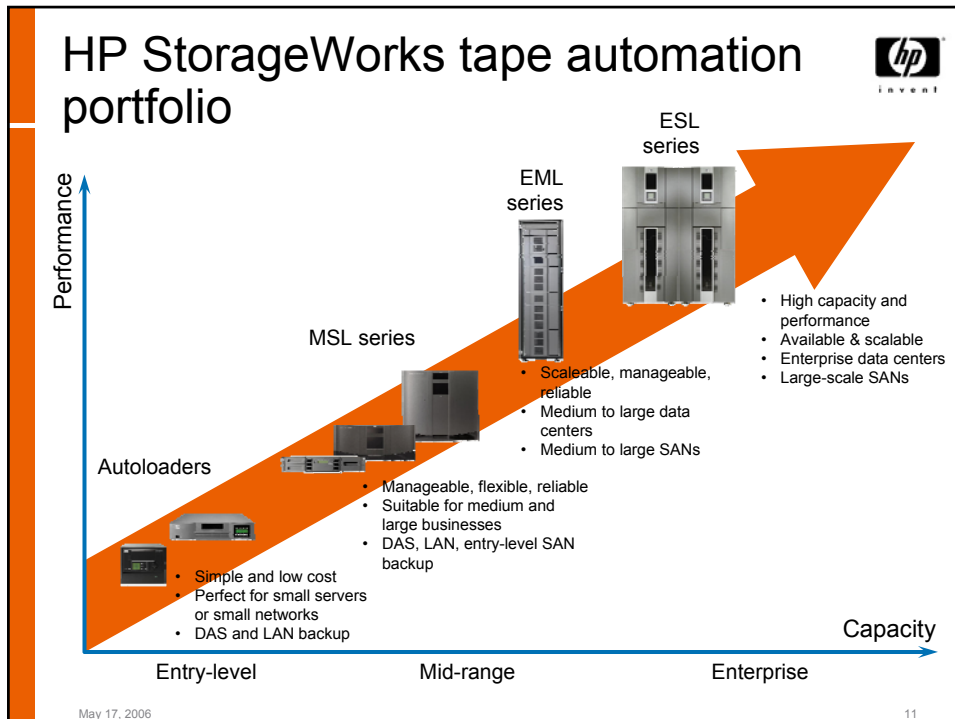
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Tape automation portfolio





HP StorageWorks Extended Tape Library Architecture

ETLA...


brings you the next generation of tape storage systems designed specifically for the networked storage environments

Supported on E-Series Tape Libraries


- Tape libraries that are self-aware, self-managed, automatically maintained, and continuously available
- Complete remote manageability for ESL and EML tape libraries in SANs – configure, manage, and monitor all library components from any location
- Interface Manager provides broad interoperability in complex SANs without requiring users to dig through expert-level details
- Secure Manager prevents unauthorized servers from interrupting critical backup jobs

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HP StorageWorks ESL E-Series Tape Library



Beyond Disk Libraries ...



from 322 Slots
(64 TB LTO-2)

to 3500 Slots
(1400 TB LTO-3)

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ESL E-Series Tape Library



Target application:


- Enterprise data centers requiring high-capacity, high-availability, and ultimately reliable data protection

Key features:

- Best density in the enterprise-class library market
 - Up to 24 tape drives per frame
 - Up to 712 cartridges per frame
 - Up to 28.4 TB of storage per square foot
- High-availability architecture with redundant, hot-swap components
- Built on the Extended Tape Library Architecture (ETLA)
- Removable load port magazines
- Supports both LTO and SDLT, including mixed media environments
- Enables partitioning up to six logical libraries
- Multi-unit scalability




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ESL E-Series specifications

Configurations Available	286e	630e	322e	712e
No. Tape Drives per Frame	1-24	1-24	1-24	1-24
Tape Drives Supported	SDLT 320 SDLT 600	SDLT 320 SDLT 600	Ultrium 460 (LTO-2) Ultrium 960 (LTO-3)	Ultrium 460 (LTO-2) Ultrium 960 (LTO-3)
No. Slots per Frame	286	630	322	712
Max Capacity per Frame	85.8 TB	189 Tb	128.8 TB	284.0 TB
Max Performance per Frame	3.1 TB/hr	3.1 TB/hr	6.9 TB/hr	6.9 TB/hr
MSBF	2 million	2 million	2 million	2 million
Interface	Fibre Channel, 4Gb/2Gb/1Gb Multi-mode optical			

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HP StorageWorks EML E-Series Tape Library



from 103 Slots
(20 TB LTO-2)

→

to 505 Slots
(202 TB LTO-3)

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EML E-Series Tape Library

Target application:

- The foundation for data protection solutions in medium to large data centers

Key features:

- Scales from 1 to 16 LTO drives – available with Ultrium 460 (LTO-2) and Ultrium 960 (LTO-3) Fibre Channel tape drives
- Scales from 103 to 505 slots
- Built on HP's Extended Tape Library Architecture, the EML protects backups from disruption by SAN events and provides access control
- Touch-screen GUI interface
- User configurable load ports with removable magazines
- Enables partitioning for up to six logical libraries



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EML E-Series specifications

Configurations Available	103e	245e	348e	... 505e
No. Tape Drives	1-4	1-8	1-12	1-8
Tape Drives Supported	Ultrium 460 (LTO-2)	Ultrium 460 (LTO-2)	Ultrium 460 (LTO-2)	Ultrium 460 (LTO-2)
No. Slots	103 ³⁾	245 ³⁾	348 ³⁾	505 ³⁾
Max Capacity (w/Ultrium 960)	41.2 TB (LTO-3) 20.6 TB (LTO-2)	98.0 TB (LTO-3) 49.0 TB (LTO-2)	139.2 TB (LTO-3) 69.6 TB (LTO-2)	202 TB (LTO-3) 101 TB (LTO-2)
Max Performance	1.1 TB/hr (LTO-3) 0.4 TB/hr (LTO-2)	1.1 TB/hr (LTO-3) 0.4 TB/hr (LTO-2)	1.1 TB/hr (LTO-3) 0.4 TB/hr (LTO-2)	1.1 TB/hr (LTO-3) 0.4 TB/hr (LTO-2)
MSBF	2 million	2 million	2 million	2 million
Number of I/F Controllers	1	1-2	1-3	1-2
Redundant PSUs	0-1	0-2	0-3	0-2
Interface	Fibre Channel, 4Gb/2Gb/1Gb Multi-mode optical			


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HP StorageWorks MSL tape library family



Reliable backup for networks or smaller SANs that may experience uncertain growth



MSL2024 MSL4048 MSL6030
MSL6026 MSL6060
MSL6052

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HP StorageWorks MSL2024 & 4048 Tape Libraries



Target applications:

- Data protection for small to medium-sized networks
- Ideal for replicated systems where remote management is a benefit

Key features:

- Flexibility: Web-based remote management allows administrator to control and troubleshoot the device remotely -- no local IT administrator required
- Simplicity: Removable 12-slot magazines make bulk loading and unloading of tapes easy – mail slot allows for single cartridge changes – barcode reader provides faster inventory times and facilitates tracking of media
- Value: Library features in an affordable and compact unit

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MSL2024 & MSL4048 specifications



Models Available	MSL2024 Ultrium 448 (LTO-2)	MSL2024 Ultrium 960 (LTO-3)	MSL4048 Ultrium 448 (LTO-2)	MSL4048 Ultrium 960 (LTO-3)
Form Factor	2U	2U	4U	4U
# Slots	24	24	48	48
Max Capacity (native)	4.8 TB	9.6 TB	9.6 TB	19.2 TB
# Drives	1 or 2	1	1 to 4	1 or 2
Max Performance (native)	48 MB/s 172.8 GB/hr	80 MB/s 288 GB/hr	96 MB/s 345.6 GB/hr	160 MB/s 576 GB/hr
Media supported	LTO-2 (R/W) LTO-1 (R/W)	LTO-3 (R/W) LTO-3 WORM (R/W) LTO-2 (R/W) LTO-1 (R)	LTO-2 (R/W) LTO-1 (R/W)	LTO-3 (R/W) LTO-3 WORM (R/W) LTO-2 (R/W) LTO-1 (R)
Reliability	500,000 MSBF	500,000 MSBF	500,000 MSBF	500,000 MSBF
Interface	Ultra160 SCSI	Ultra320 SCSI	Ultra160 SCSI	Ultra320 SCSI

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HP StorageWorks MSL6000 Tape Libraries



Target application:


- Data protection for medium to large SAN or LAN networks, especially in environments with uncertain data growth

Key features:

- Flexibility: Choice of tape technologies – multi-unit scalability allows the library to grow with your storage requirements –web-based remote management
- Simplicity: Easy-to-use front panel GUI – removable magazines for easy off-site storage – user-configurable mail slots
- Value: Compact form-factor provides the maximum storage in minimum space

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MSL6000 specifications

Models Available	MSL6026	MSL6052	MSL6030	MSL6060
Form Factor	5U	10U	5U	10U
Tape Drives Supported	SDLT 600	SDLT 600	Ultrium 460 (LTO-2) Ultrium 960 (LTO-3)	Ultrium 460 (LTO-2) Ultrium 960 (LTO-3)
Max Drives per Unit	2	4	2	4
Max Capacity (per unit, native)	7.8 TB	15.6 TB	12 TB (w/LTO-3)	24 TB (w/LTO-3)
Max No Stacking Units	8	4	8	4
Max Performance (per drive, native)	36 MB/s	36 MB/s	80 MB/s (w/LTO-3)	80 MB/s (w/LTO-3)
MSBF	2 million	2 million	2 million	2 million
Interface	Ultra160 SCSI LVD/SE	Ultra160 SCSI LVD/SE	Ultra160 SCSI, Ultra320 SCSI, 2Gb Fibre Channel	Ultra160 SCSI, Ultra320 SCSI, 2Gb Fibre Channel

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Tape drive portfolio



HP StorageWorks tape drive portfolio

Corporate/networked backup

Departmental/local network

Office servers

Workstations

HIGH-END

SDLT 320, Ultrium 460, SDLT 600, Ultrium 960

MID-RANGE

DLT VS160, Ultrium 448, Ultrium 232, DLT VS80

ENTRY-LEVEL

DAT 72, DAT 40, DAT 24

LTO ULTRIUM

- For those looking for the best performance, reliability, and investment protection
- Ideal for networked backup and heterogeneous environments

SDLT and DLT VS

- For those who need to continue with their DLT investment

DAT/DDS

- Affordable and reliable solution
- Ideal for workstations and small servers
- Lowest media prices mean very low cost of ownership

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HP StorageWorks standalone tape drives

Ultrium

- For those looking for the best performance, reliability, and investment protection
- Ideal for networked backup and heterogeneous environments
- Choose from high-performance full-height or affordable half-height drives

SDLT and DLT VS

- For those who need to continue with their DLT investment
- Choose from high-capacity SDLT or affordable DLT VS

DAT/DDS

- Affordable and reliable solution
- Ideal for workstations and small servers
- Hot-plug models available
- Lowest media prices mean very low cost of ownership

LTO Ultrium

SDLT

DDS/DAT

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HP StorageWorks tape drives – Wide choice of models



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HP StorageWorks Ultrium tape drives



- HP's premier family of backup devices
- Based on LTO Ultrium format, an open standard with a well-defined six-generation roadmap
- The best choice for investment protection
- Designed with ultimate reliability and ease of use in mind
- Choose from high-performance full-height or affordable half-height models



Highest capacity,
performance,
and reliability for midrange to
enterprise backup


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invent

HP StorageWorks DAT tape drives

- HP's industry-leading family of low-cost backup devices
- Based on industry-standard DDS technology, an open format with an illustrious past and a bright future
- The most reliable tape drives in their class
- Two-generation backward read-write compatibility
- Low media and drive prices deliver low overall cost of ownership



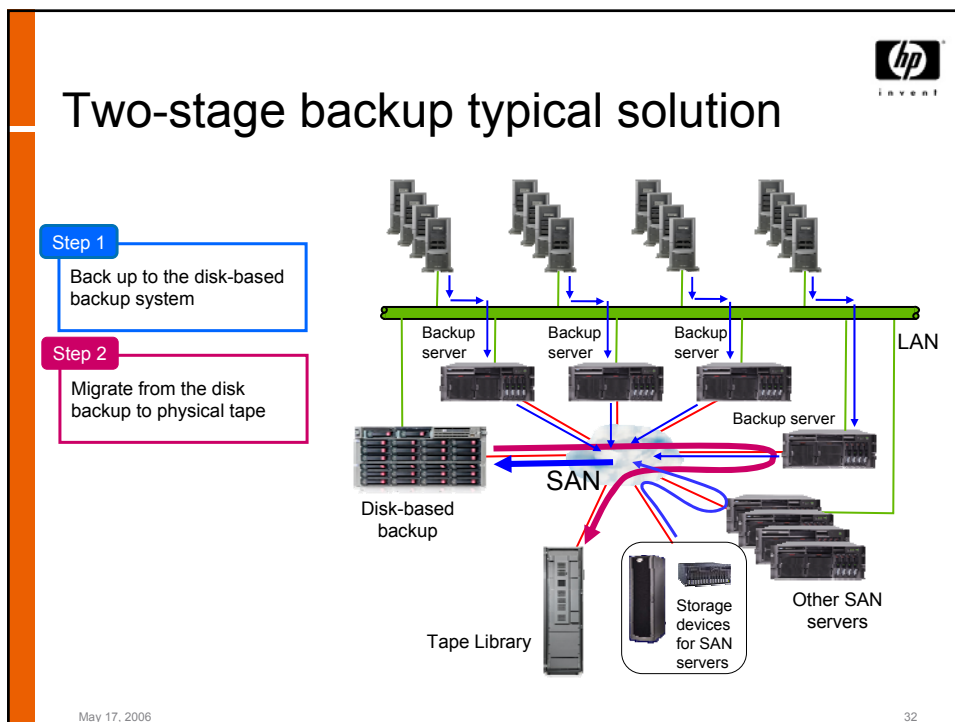
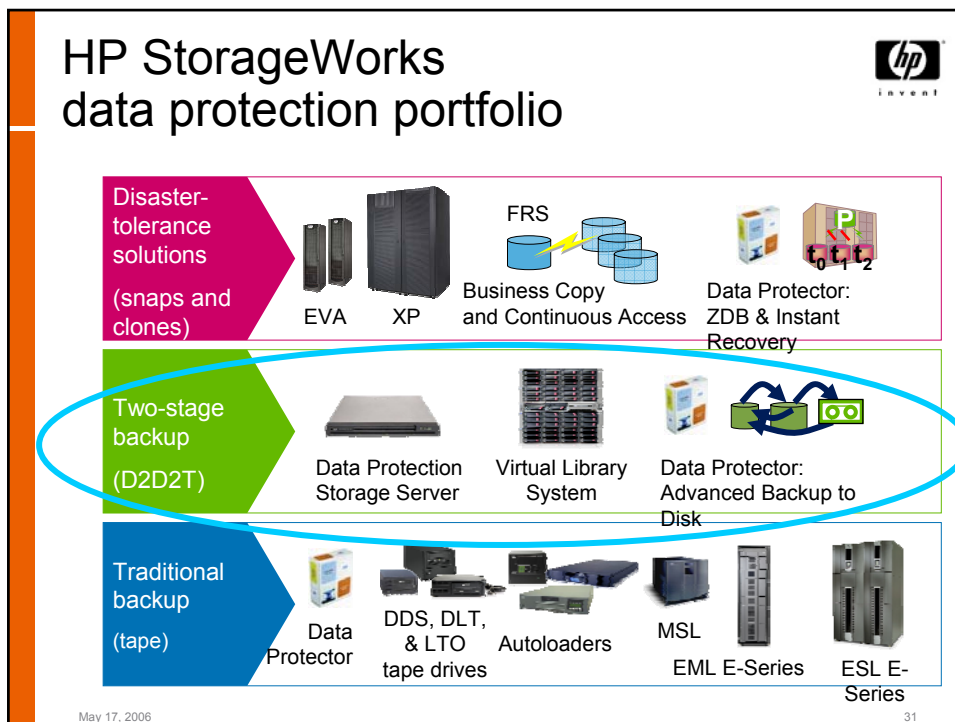
Ideal balance between
cost and performance

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Two-stage backup solutions





HP StorageWorks 6000 Virtual Library System



Disk-based backup that emulates HP tape drives and libraries – ideal for SAN environments with multiple slow hosts

- Integrates seamlessly into current infrastructure
- Increases backup performance for slow SAN servers
- Improves single-file recovery time
- Provides investment protection by scaling both capacity and performance
- EBS-certified with leading backup applications to ensure simple integration






Dramatically improves backup performance!

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HP StorageWorks 6000 Virtual Library System



Models						
	VLS6100		VLS6500		VLS6800	
	VLS6105	VLS6109	VLS6510	VLS6518	VLS6840	VLS6870
Raw capacity	3.0 TB – 6.0 TB	6.0 TB – 12.0 TB	6.0 TB – 12.0 TB	12.0 TB – 24.0 TB	12.0 TB – 48.0 TB	24.0 TB – 96.0 TB
Useable native capacity (compression enables ~2:1)	2.5 TB – 5.0 TB	4.4 TB – 8.8 TB	5.0 TB – 10.0 TB	8.8 TB – 17.6 TB	10.0 TB – 40.0 TB	17.6 TB – 70.4 TB
Interface	Two 2Gb FC ports		Four 2Gb FC ports		Four 2Gb FC ports	
Maximum aggregate throughput*	Up to 0.7 TB/hr (200 MB/s)		Up to 1.4 TB/hr (400 MB/s)		Up to 2.2 TB/hr (600 MB/s)	
Max # of virtual tape drives	64		64		64	
Max # of virtual tape libraries	16		16		16	

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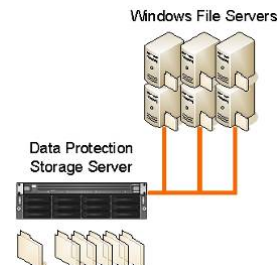
* Maximum Aggregate Throughput is still theoretical – actual results will vary by environment

HP ProLiant Data Protection Storage Servers



- Ideal for those with 3 or more Windows file servers who could benefit from:

- Hourly rather than daily backup
- End-user file restore
- Centralization of branch office backup



Easy-to-deploy NAS appliances that use Microsoft Data Protection Manager (DPM) to provide near-continuous data protection of Windows file servers

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Storage media



HP Storage Media – Completing the solution



- Undergoes additional testing on a batch-by-batch basis to ensure consistently high quality
- Extensively tested in the areas of shock, vibration, and durability
- For more details, please consult the HP white paper, "Media Qualification and Testing – HP Does More" on:




<http://www.hp.com/go/storagemedia>

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Data protection software portfolio





invent

HP data protection software choices




Data Protector
Enterprise-class backup and recovery software for heterogeneous environments and 24x7 availability



Data Protector Express
Easy-to-use backup and recovery software for Windows, Linux and NetWare environments.

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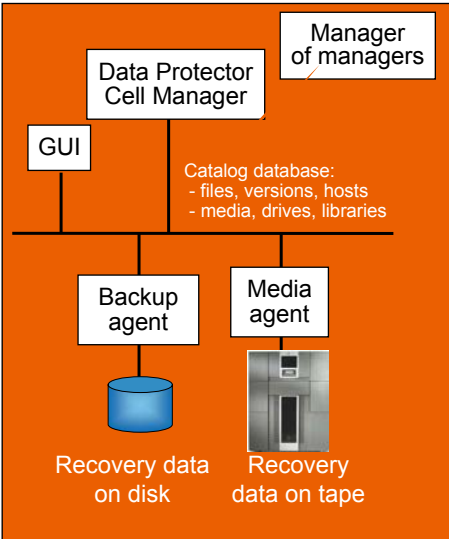

invent

HP OpenView Storage Data Protector

Automates backup and recovery from disk and tape, delivering maximum data protection and continuous business operations

Key features:


- Manages backup and recovery operations
- Includes wide range of data protection alternatives
- Supports distributed architecture with centralized control
- Enables disk- and tape-based protection



```
graph TD
    GUI[GUI] --- DPCM[Data Protector Cell Manager]
    DPCM --- CM[Manager of managers]
    DPCM --- CDB[Catalog database:  
- files, versions, hosts  
- media, drives, libraries]
    DPCM --- BA[Backup agent]
    DPCM --- MA[Media agent]
    BA --- DRD[Recovery data on disk]
    MA --- TRD[Recovery data on tape]
```

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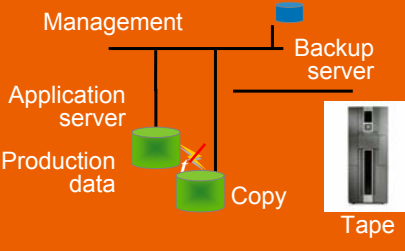
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No backup windows

Zero-downtime backup

Online backup utilizing array replication and backup server to isolate application server from backup process



The diagram shows a Management server connected to an Application server and a Backup server. The Application server is connected to Production data. The Backup server is connected to a Copy of the Production data, which is then backed up to a Tape. A red 'X' is placed over the direct connection from the Application server to the Tape, indicating that the backup process is isolated from the application server.

Online Application Backup


- Data Protector integrates with major databases and applications to enable online backups
- Data Protector enables single-mailbox restore functionality within Microsoft Exchange

Open File Manager

- Data Protector backs up open Windows and Netware files to ensure all files get backed up without downtime

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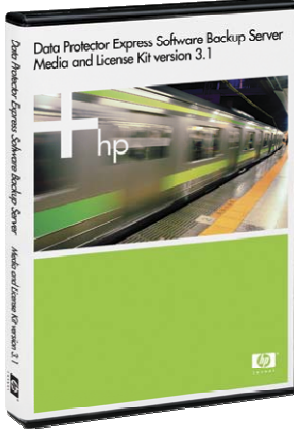


HP StorageWorks Data Protector Express

Designed for easy installation, ease of use and manageability for those without full-time IT staff

Key features:

- Protects up to 10 servers and up to 1 TB of data
- Supports tape, disk and optical as backup media, as well as combinations
- User installable
- Works in homogeneous Windows, NetWare or Linux environments



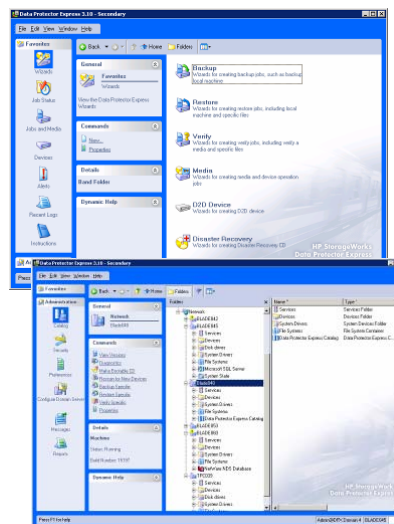
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HP StorageWorks Data Protector Express



- **Simple:** Easy to install, configure and manage without specialist staff
- **Low cost:** Competitively priced with very low operational costs
- **High performance:** Supports multiplexed data streams and multiple media servers
- **Robust:** Bare Metal Disaster Recovery including OBDR on HP tape drives
- **Extendable:** Options for additional features, scale and performance



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Data Protector/Data Protector Express comparison



	upgrade path for Data Protector Express special editions		
	upgrade path (for growth)		
	Data Protector Express Single Server Edition Data Protector Express Proliant Edition	Data Protector Express	Storage Data Protector
typical environment			
number of servers	1	1 – 10	Unlimited
data volumes	100s GB	<1TB	Unlimited
operating systems	Windows, Linux or NetWare	Homogeneous Windows Linux, NetWare	Heterogeneous Windows Linux, NetWare, UNIX
features			
network backup	no	yes	yes
application support	no	Exchange, SQL Svr	many
backup to disk	yes, 36GB	yes, 3.5TB + VTL	yes, advanced D2D backup
ZDB & IR (with disk array)	no	no	yes

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Tools



Tools for data protection with tape

Tape compatibility
website ("go/connect")



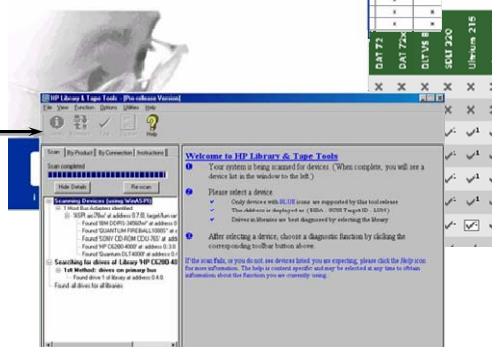
hardware compatibility table

Tape products backup
sizing tool

hp StorageWorks backup sizing tool

HP Library and Tape
Tools (L&TT)

One-Button Disaster
Recovery (OBDR)



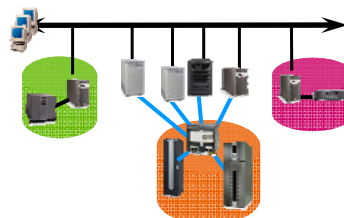
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HP StorageWorks Enterprise Backup Solutions (EBS)



- Tools that make it easy to design, install and configure backup solutions
 - SANs, LANs, and direct-attach
- Certified interoperability based on open standards
- Foundation for advanced data protection
 - Zero-downtime backup solution
 - Two-tier backup
- Manages technology transitions for you
- Broad compatibility with leading backup applications



For more information:
www.hp.com/go/ebs

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EBS 1-2-3 Making sense of data protection for your SAN



Step 1: Design

The Backup Sizer and EBS compatibility matrix provide detailed information on what size of system is appropriate and which components are supported.

Step 2: Configure

The EBS design guide provides detailed information on the setup and configuration of HP StorageWorks Tape Libraries, Fibre Channel Switches, HBAs, and RAID controllers.

Step 3: Implement

Backup application implementation guides and Extended Data Protection Solutions describe, in detail, how to configure backup applications for your particular needs.

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HP StorageWorks One-Button Disaster Recovery



- Restore your entire ProLiant server quickly, reliably and simply just by inserting the most recent backup tape and pushing one button on the tape drive
- No need to search for software disks and manuals – OBDR restores:
 - Operating system
 - Configuration
 - Applications
 - Drivers
 - Data files
- No need to make a new set of disaster recovery floppies each time configuration is altered or a peripheral added



"The sheer simplicity of OBDR means the risk of a user error during recovery, and therefore subsequent recovery failure, is significantly reduced."

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Library and Tape Tools (L&TT)



- Affordable: Free download plus quick installation
- Simple: Intuitive user interface requires no training
- Expansive: Web-based smart firmware downloads, updates and notifications

The most comprehensive diagnostic tool in the industry



For more information about L&TT, visit our Web site at:

<http://h18006.www1.hp.com/products/storageworks/ltt/index.html>

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For further information

Visit <http://www.hp.com/go/storageworks>

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