

Overview

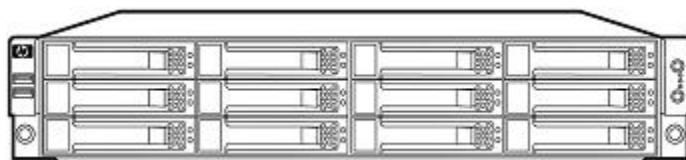
Struggling with timely restores of files that accidentally get deleted or corrupted? You need a disk-based system that automatically consolidates multiple servers into a single backup process.

The HP StorageWorks D2D Backup Systems provide disk-based data protection for small or medium-sized data centers and distributed environments. With 1.5 to 18 TB of useable capacity and speeds up to 540 GB/hour* you can significantly reduce your backup window. The D2D Backup Systems feature HP Dynamic deduplication allowing you to retain up to 50x more data on the same disk providing efficient storage and fast restore, enabling low bandwidth replication over a WAN for cost-effective off-site backup and recovery. Integrating into your existing environment, working with your backup software to automate and consolidate the storage of backup data from multiple servers onto a single, intelligent, rack-mountable device. Reduce errors caused by media handling; plus proven RAID 6 technology and hot spare with D2D4112.

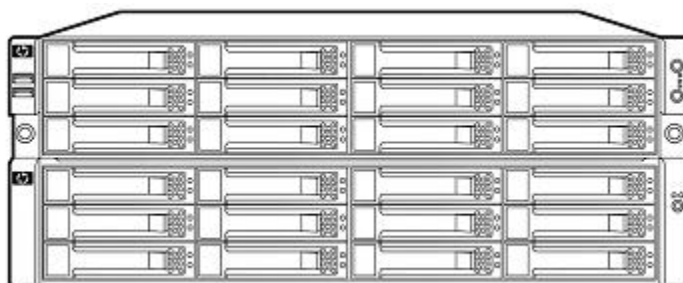
* Assumes 50% duty cycle, excludes housekeeping. Housekeeping is a background process whereby deduplicating stores are groomed to remove unreferenced data chunks after backups have completed.



HP StorageWorks D2D2500 Backup System



HP StorageWorks D2D4000 Backup System



HP StorageWorks D2D4112 Backup System
with 12 TB D2D4112 Upgrade Kit

What's New

- The HP StorageWorks D2D2502i Backup System is an entry level D2D Backup System offering 1.5 TB of usable capacity.
- The HP StorageWorks D2D2504i Backup System offers 3 TB of usable capacity and hot swap hard drives
- D2D Backup Systems, including the D2D2500, D2D4000, and D2D4112, will offer a free firmware upgrade in late 2009 that will provide a NAS interface for backup. Users will have a choice of VTL, NAS, or can use both interfaces on a single platform. This feature will be available to D2D Backup Systems which are currently installed as well as any future systems purchased.

Features and Benefits

Disk-based storage	D2D Backup Systems offers instant access to backups for rapid restores.
Disk-based high performance	<p>D2D Backup Systems offer highest performance backup speeds of up to 540 GB/hour* to a disk-based system instead of sequentially to a tape drive or tape autoloader, meaning that you can substantially reduce your backup window. A choice of iSCSI and 4 Gb Fibre Channel interfaces is available.</p> <p>* Assumes 50% duty cycle, excludes housekeeping.</p>
Proven RAID technology	D2D Backup Systems include hardware-based RAID 5 or RAID 6 to reduce the risk of data loss due to disk failure an additional hot spare in the D2D4112 and hot swap hard drives in the D2D2504i.
Direct attach to tape drives, autoloaders and libraries	D2D Backup Systems can be directly attached to stand alone tape drives, tape autoloaders and tape libraries to provide a complete disk-to-disk-to-tape (D2D2T) data protection solution.
Lower cost than comparable solutions	At a price point less than the cost of comparable products with deduplication and replication, the HP D2D Backup Systems deliver more affordable data protection by storing more data in the same disk supporting savings in IT resources, physical space and power requirements.
Retain up to 50 times more backup data on disk	HP Dynamic deduplication reduces the disk space required to store backup data sets by up to 50x without impacting backup performance. Retaining more backup data on disk for longer, enables greater data accessibility for rapid restore of lost or corrupt files and reduces business productivity impact.
Low bandwidth replication	The HP D2D Backup Systems with HP Dynamic deduplication reduce the network bandwidth needed for remote data replication. With more cost-effective low bandwidth replication, these systems allow automated, centralized backup of remote sites, and deliver a practical disaster recovery solution for the data center.
Scalability	The D2D4112 allows you to scale up from 9 to 18 TB of useable capacity as your data storage requirements grow, by using a simple and cost effective capacity upgrade for a lower cost alternative to purchasing additional systems.
Seamlessly integrates into current environments	<p>The D2D Backup Systems are either 1U or 2U and are easily rack-mounted in standard racks for efficient use of space in the data center. Supported by all leading backup applications, this allows the device to be installed and used without additional investment.</p> <p>D2D2500 units may be installed outside of a rack but this is not recommended by HP. If installed outside of a rack, the D2D2500 unit should be kept in a horizontal fashion, on a flat surface, at a location where there is no obstruction in the front and back of the system for free air flow at the right temperature, and without any other system or weight stacked on top of the system. In addition, the D2D2500 ships standard with a power cord to connect to a PDU inside of a rack. If the unit needs to be powered using a 110V receptacle (NEMA-15), the NEMA power cord (227099-001) must be ordered separately. If the unit requires a local power cord, please check the power cord matrix at: http://www.hp.com/go/powercordmatrix for the appropriate cord.</p> <p>HP strongly recommends that D2D2500 units be installed inside a rack to ensure the unit operates in normal operating parameters as defined in the Technical Specifications section of this document.</p>

Features and Benefits

Hands-free daily backup	HP StorageWorks D2D Backup Systems automate your backup process by simplifying the processes and reducing the time spent managing your data protection. Implementing unattended daily backup is especially valuable for environments with limited IT resources.
Consolidate the backup of multiple servers	D2D Backup Systems can back up multiple servers via a standard Ethernet or Fibre Channel network simultaneously to a disk-based solution at speeds of up to 540 GB per hour * instead of sequentially to a tape drive or tape autoloader, meaning that you can substantially reduce your backup window. * Assumes 50% duty cycle, excludes housekeeping.
Easy to manage	D2D Backup Systems have an intuitive web-based browser interface allows you to monitor your D2D Backup System, locally or remotely, to view results or change settings. This self-managing device also reduces your routine maintenance.

Special Features

HP Dynamic deduplication - keep more data on disk for longer

Data deduplication is a method of reducing storage needs by eliminating redundant data so that over time only one unique instance of the data is actually retained on disk. As a result, up to 50x more backup data can be retained in the same disk footprint.

Adding data deduplication to disk-based backup delivers a number of benefits:

- A cost effective way of keeping your backup data on disk for a number of weeks or even months. More efficient use of disk space effectively reduces the cost-per-gigabyte of storage and the need to purchase more disk capacity.
- Making file restores fast and easy from multiple available recovery points. By extending data retention periods on disk, your backup data is more accessible for longer periods of time, before archiving to tape. In this way lost or corrupt files can be quickly and easily restored from backups taken over a longer time span.
- Ultimately, data deduplication makes the replication of backup data over low bandwidth WAN links viable (providing offsite protection for backup data) as only changed data is sent across the connection to a second device (either a second identical device or one that comes from this product family).

How it works

Deduplication works by examining the data stream as it arrives at the storage appliance, checking for blocks of data that are identical and eliminating redundant copies. If duplicate data is found, a pointer is established to the original set of data as opposed to actually storing the duplicate blocks-removing or "deduplicating" the redundant blocks from the volume. The key here is that the data deduplication is being done at the block level to remove far more redundant data than deduplication done at the file level where only duplicate files are removed.

Data deduplication is especially powerful when it is applied to backup, since most backup data sets have a great deal of redundancy. The amount of redundancy will depend on the type of data being backed up, the backup methodology and the length of time the data is retained.

Example. Backing up a large customer database that gets updated with new orders throughout the day. With the typical backup application you would normally have to back up, and more importantly store, the entire database with each backup, (and even incremental backups will store the full database again). With block-level deduplication, you can backup the same database to the device on two successive nights and, due to its ability to identify redundant blocks, only the blocks that have changed will be stored. All the redundant data will have pointers established.

The HP approach to deduplication - D2D and VLS

Recognizing the differing needs of the small and medium businesses versus large and enterprise data centers, HP has selected two different deduplication technologies to match each requirement.

Features and Benefits

HP Dynamic deduplication for HP StorageWorks D2D Backup Systems - meeting the needs of smaller IT environments with requirements for low cost solutions, smaller storage capacities, ease of use and broad compatibility.

HP Accelerated deduplication for HP StorageWorks Virtual Library Systems (VLS) - delivering maximum benefit for data center environments by being optimized for performance and scalability. Accelerated deduplication takes place outside of the backup window, therefore, allowing all system resources to be focused on completing the backup before starting deduplication. Accelerated deduplication also retains a full copy of the latest backup so that restore times are exceptionally fast.

HP Dynamic deduplication

The HP patented Dynamic deduplication algorithm has been designed specifically for smaller IT environments, such as remote and branch offices and small data centers, to provide for low cost solutions with a small footprint. It uses inline deduplication based on hash algorithms with additional levels of error prevention and correction to verify the integrity of data backup and restore. Importantly and unlike some other forms of data deduplication technology the HP Dynamic deduplication is independent of the data format recorded and so works with most the leading backup application packages.

What deduplication ratio can I expect?

The actual data deduplication ratio you can expect will depend on a number of factors including; the type of data, the backup methodology used, the length of time you retain your data. However, assuming standard business data mix and extended on disk retention (periods of more than 12 weeks) you could expect to see:

20:1 capacity ratio assuming a weekly full and daily incremental backup model

50:1 capacity ratio assuming daily full backups

For more information on achieving deduplication ratios go to: www.hp.com/go/deduplication

Low bandwidth replication - cost-effective data protection and disaster recovery

Data replication is the process of making a replica copy of a data set across a network to a "target site". It is generally used to provide disaster recovery (DR) protection in the event of catastrophic data loss at the "source site"

In the past, only the largest companies could afford to implement data replication as replicating large volumes of data backup over a typical WAN is expensive. However, today's D2D products with data deduplication have made replication a practical disaster recovery solution for most sizes of business, in addition to an ideal solution for centralizing the backup of remote offices.

Data deduplication shrinks the amount of backup data that needs to be replicated from the source HP D2D appliance, and as a result significantly reduces replication bandwidth requirements. Once a replica of the data backup set has been created on a remote HP D2D target appliance, all that is required to keep the replica identical to the source is the automatic, periodic copying and movement of the new data segments which are created during each backup. With such small amounts of data being transmitted asynchronously, low bandwidth networks offer sufficient performance and a much lower cost solution.

They deliver the most affordable replication solution on the market for the following environments:
For remote offices, low bandwidth replication provides an affordable means to centralize backup at the data center, reducing operator costs and also decreasing the usage of removable media.
For data centers, low bandwidth replication gives IT departments a new disaster recovery option by making inter-site replication over WANs a practical alternative.

HP's replication feature includes replication bandwidth limiting, restricting the amount of bandwidth being used when replicating data. Without replication bandwidth limiting, a replication job could use as much bandwidth as is available to it. It is potentially making other network activities unresponsive. Replication bandwidth limiting is customer configurable at the appliance level via

Features and Benefits

the graphical user interface and is set as a percentage of the available network bandwidth.

The following HP StorageWorks D2D Backup Systems are available with replication which may be licensed by target.

D2D2502i - a total of 4 source appliances can replicate to a single D2D2502i target

D2D2503i - a total of 6 source appliances can replicate to a single D2D2503i target

D2D2504i - a total of 8 source appliances can replicate to a single D2D2504i target

D2D4000 - a total of 16 source appliances can replicate to a single D2D4000 target

D2D4112 - a total of 24 source appliances can replicate to a single D2D4112 target

See the 'Related Options - Replication licenses' section of this document for ordering information. Once a license has been obtained, configuring and using replication is made straightforward by the graphical user interface and configuration wizard on the HP D2D appliance.

HP D2D2503 and D2D4000 Backup System products purchased prior to May 2009 may also use the replication feature, but will require the latest version of firmware before purchasing a replication license.

The latest firmware can be obtained via a free firmware upgrade, and is available from the "support for your product" link on www.hp.com/go/d2d or by following the "software drivers and downloads" link from www.hp.com <http://welcome.hp.com/country/us/en/support.html?pagedisplay=drivers>

NOTE: Replication of data can occur between devices within the same product family i.e. between the HP StorageWorks D2D2500, D2D4000 and D2D4112 Backup System. However, replication is not supported outside this configuration. It is not possible to replicate data from the D2D2500 to the D2D100 Backup System, VLS product ranges nor to competitors' disk based backup systems with replication features.

HP LeftHand SAN Solutions - creating an end-to-end IP SAN storage solution with HP D2D Backup Systems

HP LeftHand P4000 SAN Solutions deliver enterprise functionality that enhances virtual environments, simplifies management, and reduces costs. Easy to deploy, scale and maintain, HP P4000 SAN Solutions ensure that crucial business data remains available. This innovative approach to storage provides unique double fault protection across the entire SAN, reducing vulnerability without driving up costs the way traditional SANs can.

When combined with HP D2D Backup Solutions, users can create an affordable end-to-end IP SAN storage solution that is both easy to implement and easy to maintain. From entry-level solutions for a remote or branch office to mid-range solutions that scale for multiple sites, HP D2D Backup Systems provide the optimal balance of affordability, manageability, and reliability to handle the data protection needs of your HP P4000 SAN solution.

Features and Benefits

Models

HP StorageWorks D2D4112 Backup System

For mid-size data centers and distributed offices, the D2D4112 delivers a scalable solution from 9 TB to up to 18 TB of useable capacity using a simple and cost effective capacity upgrade and speeds of up to 540 GB/hour*. It is the highest capacity and performance point in the HP D2D Backup System family automating the daily backup of multiple servers.

* Assumes 50% duty cycle, excludes housekeeping.

HP StorageWorks D2D4004 or D2D4009 Backup System

For remote or branch offices and small to medium sized data centers, the D2D4000 is available in a choice of two useable capacity points of 3 TB or 7.5 TB and offers speeds of up to 325 GB/hour*. The 3 TB model can be upgraded to 7.5 TB by purchasing a cost effective capacity upgrade. This 2U rack-mountable device automates the simultaneous daily backup of multiple servers.

* Assumes 50% duty cycle, excludes housekeeping.

HP StorageWorks D2D2502i, D2D2503i or D2D2504i Backup System

The D2D2500 Backup System provides an entry point to consolidated, disk-based data protection for remote or branch offices and smaller data centers. These 1U rack-mountable devices provide useable capacities of 1.5 TB, 2.25 TB and 3 TB and speeds of up to 288 GB/hour* and automates the simultaneous daily backup of multiple servers.

* Assumes 50% duty cycle, excludes housekeeping.

Compatibility

HP extensive compatibility testing program assures that your HP StorageWorks D2D Backup Systems work with leading servers, operating systems, and backup applications, including those not manufactured by HP.

Server Compatibility The HP D2D Backup Systems are supported on servers that use Microsoft Windows or Linux operating systems, including HP ProLiant, HP Integrity Servers and a variety of third-party servers.

For compatibility details on specific servers, refer to our website for the latest hardware compatibility information: <http://www.hp.com/go/connect> for D2D2500 and D2D4000 or <http://www.hp.com/go/ebs> for D2D4000 and D2D4112.

OS Support The HP D2D Backup Systems are supported with Microsoft Windows, Linux, HP-UX and Solaris operating systems.

For more details, refer to our website for the latest information: <http://www.hp.com/go/connect> for D2D2500 and D2D4000 or <http://www.hp.com/go/ebs> for D2D4000 and D2D4112.

Software Support The HP D2D Backup Systems are supported by a range of popular backup applications, including HP Data Protector software.

For details of specific backup application compatibility, refer to our website for the latest information: <http://www.hp.com/go/connect> for D2D2500 and D2D4000 or <http://www.hp.com/go/ebs> for D2D4000 and D2D4112.

Tape drive compatibility The HP D2D Backup Systems support direct connection of the following HP LTO Ultrium tape drives, tape autoloaders and tape libraries using an appropriate host bus adapter:

- HP External LTO-2, LTO-3, and LTO-4 Ultrium tape drives
- HP Internal LTO-2, LTO-3, and LTO-4 Ultrium tape drives in either an HP 1U or 3U Rack-mount Kit
- HP External 1/8 G2 Autoloader with LTO-2, LTO-3, and LTO-4 Ultrium tape drives
- HP External MSL2024 Tape Library with LTO-2, LTO-3 and LTO-4 Ultrium tape drives
- HP External MSL4048 Tape Library with LTO-2, LTO-3 and LTO-4 Ultrium tape drives

Backup to tape autoloaders and tape libraries is also available across the network, using the tape-to-tape (or media copy) feature in your backup. For further information about these products, visit the HP Web site at: www.hp.com/go/tape

Network Compatibility For the best performance, the HP D2D Backup Systems should be connected to the servers it protects via a 1Gb (gigabit) Ethernet network. It is supported on all 1Gb Ethernet network interface cards (NICs) and switches. The device will run on either IPv4 or IPv6 networks.

The HP D2D Backup Systems are also supported on 100 base-T Ethernet networks, but performance will be severely restricted. This product is not supported on networks using slower Ethernet technology. The D2D Backup Systems communicate data over your Ethernet network using iSCSI technology:

- For Windows systems, this requires installation of the Microsoft iSCSI Initiator 2.02 (or above) software driver on each server that will be backed up to the HP D2D Backup System. This initiator is downloaded and installed from Microsoft automatically by the installation wizard and is also available via free download from the Microsoft website at: <http://www.microsoft.com>
- For supported Linux operating systems, a software iSCSI initiator is provided with the operating system but may need to be installed separately if not included in the initial operating system installation.

SAN Compatibility The HP D2D Backup Systems support a variety of Fibre Channel switches and HBAs.



Compatibility

For more details of SAN compatibility, refer to our website for the latest information:

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

Additionally, HP D2D backup Systems are compatible with HP's new portfolio of HP LeftHand P4000 SAN Solutions. For more information on HP LeftHand SAN Solutions, visit the HP website at: <http://www.hp.com/go/lefthandnetworks>

Service and Support, HP Care Pack, and Warranty Information

Warranty and Services Included with the Product Hewlett-Packard provides a 1 year parts exchange, 1 year labor, 1 year on site, normal business hours, next business day response for HP StorageWorks D2D4004, D2D4009 and D2D4112 Backup Systems, plus 9x5 phone support for the duration of the warranty.

The StorageWorks D2D2500 includes a 1-year, next-day, parts exchange, limited warranty for the HP plus 9x5 phone support for the duration of the warranty.

Where a Tape Drive is attached to a D2D Backup System, the tape drive carries its own separate warranty. Hewlett-Packard provides a 3-year, next-day, parts exchange, limited warranty for the HP StorageWorks Ultrium tape drive, plus 9x5 phone support for the duration of the warranty.

HP warrants only that the HP StorageWorks Data Protector Express Software media will be free of physical defects for a period of ninety (90) days from delivery.

For more information about HP's Global Limited Warranty and Technical Support, visit:
<ftp://ftp.compaq.com/pub/products/storageworks/warranty/321708-408.pdf>

HP Care Pack Services. Scalable, Flexible, Dependable. Like your storage.

Your storage is evolving. Get scalable support that evolves with it. HP Care Pack Services is an easy-to-buy, easy-to-use portfolio of packaged services covering your lifecycle needs. You can rely on our highly skilled, HP certified professionals to offer a breadth of expertise across leading storage technologies, and work side by side with you for optimal results. Partner with HP Technology Services to boost availability and avoid costly downtime by mitigating technology-related business risks. To help take the worry out of deploying, supporting and managing your storage technologies, we've designed a portfolio of service options that are as flexible, scalable and affordable as our storage.

Protect your business beyond the warranty

Standard warranty protects against product defects and some causes of downtime. HP Care Pack Services helps you proactively guard against unplanned downtime which can reduce your productivity and profitability. By using a standard approach to warranty uplifts, such as HP Care Pack Services, customers can be certain of consistency of operations for both mission-critical and standard business computing.

Extending warranties with HP Care Pack Services

The key to normalizing the warranty of combined solutions is making service uplift simple: HP Care Pack Services. This portfolio of predefined packages, extending across the entire IT lifecycle, offering consulting, education, technical support, optimization, risk assessment, and more. It's entirely flexible allowing customers to extend the cover to the precise level of support required. Customer's standard hardware warranty, for example, can be upgraded to next-business-day response, to same-day coverage, or even to a committed six-hour call-to-repair service available 24 hours every day of the week.

Provide consistent, predictable levels of support across your entire department or business

Give you direct access to proven technical and problem-solving expertise

Offer a choice of response-time and repair-time commitments

Are available whenever and wherever you do business

For many products, post-warranty HP Care Pack Services are available when your original warranty has expired. Choose the support levels that meet your business requirements, from basic to mission-critical. In the new world of business technology, when your technology has to work for your business to work, who can you trust to make your technology work? HP Technology Services, the trusted business technology experts who manage your technology in action, because when technology works, business works. <http://www.hp.com/hps/storage>

NOTE: Care Pack Services availability may vary by product and country.

Recommended Services

HP Care Pack Services recommended for optimal satisfaction of all deployments of your product.

Service and Support, HP Care Pack, and Warranty Information

3-Year HP Support Plus 24

3-Year HP Support Plus 24 provides integrated hardware and software support services designed specifically for your technology. HP Services engineers deliver reactive onsite hardware support and over-the-phone software support around-the-clock.

HP Install Storage Autoloader/Tape Drive Array Service

HP Install Storage Autoloader/Tape Drive Array Service provides initial hardware installation of your product into your technology environment (System configuration is not included).

Product Number	Product Name	Service Name	Care Pack Services Product # and Band	Alternate Care Pack Services Product #
		HP Install Storage Autoloader/Tape Drive Array Service	HA113A1-5KK	UD056E
EH993A	D2D4112 Backup System with 12 TB of disk storage	3-Year HP Support Plus 24	HA110A3-9LA	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UM125E
EH995A	D2D4112 Backup System upgrade kit, MSA60 base enclosure offering additional 12 TB of disk storage	3-Year HP Support Plus 24	HA110A3-9LB	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UP629E
EH938A	D2D4004i Backup System with 4.5 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZB	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UL470E
EH939A	D2D4009i Backup System with 9 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZC	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UL492E
EH941A	D2D4004fc Backup System with 4.5 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZB	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UL470E

Service and Support, HP Care Pack, and Warranty Information

EH942A	D2D4009fc Backup System with 9 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZC	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UL492E
EH944A	D2D4904 Capacity Upgrade, enables the D2D4004 products to be upgraded to D2D4009 capacity product	3-Year HP Support Plus 24	HA110A3-6ZD	
		4-Hour, 24x7 Onsite, HW Support, 3 year		UM091E
EJ002A	D2D2504i Backup System with 4 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZA	UJ769E
EH945A	D2D2503i Backup System with 3 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZA	UJ769E
EJ001A	D2D2502i Backup System with 2 TB of disk storage	3-Year HP Support Plus 24	HA110A3-6ZA	UJ769E
EH994A	HP StorageWorks D2D4112 Replication License	3-Year HP Support Plus 24	HA110A3-9L9	
		3-Year HP Software Technical Support, Unlimited, 24x7		UM118E
EH991A	HP StorageWorks D2D4000 Replication License	3-Year HP Support Plus 24	HA110A3-9L7	
		3-Year HP Software Technical Support, Unlimited, 24x7		UM114E
EH990A	HP StorageWorks D2D2500 Replication LTU	3-Year HP Support Plus 24	HA110A3-9L6	

Service and Support, HP Care Pack, and Warranty Information

3-Year HP
Software
Technical
Support,
Unlimited, 24x7

UM118E

Related Services

Services that will enhance the user experience in many product deployments.

HP Backup and Recovery Solution Service

HP Backup and Recovery Solution Service
Helping you to design an architecture that meets your requirements, HP will deploy your HP or ISV backup software, validate your configuration, and integrate the backup software solution into your existing or new storage infrastructure.

Service Name

HP Backup and Recovery Solution Service

Care Pack Services Product # and Band

Contact your HP sales rep or Channel Partner for assistance

Alternate Care Pack Service Product

Contact your HP sales rep or Channel Partner for assistance

eSupport

HP eSupport is a portfolio of technology-based services that assist you with managing your business environment - from the desktop to the data center.

Support Portal

The HP support portal provides one-stop access to the information, tools and services you need to manage the daily operations of your IT environment.

Features include:

- Access to self-solve tools (including search technical knowledge base)
- Efficient logging and tracking of support cases
- Collaboration with other business and IT professionals
- Download of patches and drivers
- Access to diagnostic tools
- Proactive notification of relevant information

Access to certain features of the support portal requires an HP service agreement. To access the support portal, visit: <http://www.hp.com/support>

Customer Technical Training

Consider education as an integral part of your strategy to get the best return on investment for your HP storage solution. HP offers a variety of training courses on storage software, networking, archiving and disk storage systems. Our classes are available in many delivery modalities from traditional instructor-led courses at one of our 80 training centers worldwide to on-site training customized to your needs or online. www.hp.com/learn/storage

HP Services Awards

HP Services continues to be recognized for service and support excellence by customers, partners, industry organizations and publications around the world. Recent honors and award reflect our services team's dedications, technical expertise, professionalism and uncompromising commitment to customer satisfaction. For a list of all our awards, please visit: <http://h20129.www2.hp.com/services/cache/77318-0-0-225-121.html>.

Service and Support, HP Care Pack, and Warranty Information

Additional Services Information

For more information about HP Care Pack Services for Storage, please visit:
<http://www.hp.com/hps/storage>

If you have specific questions, contact your local HP representative. Contact information for a representative in your area can be found at "Contact HP" <http://www.hp.com>

Configuration Information

Step 1 - Select a Configuration

Select one:

Model Name	Model Description	Part Number
HP StorageWorks D2D4112 Backup System	<p>D2D4112 Backup System with 12 TB of disk storage</p> <p>Kit Contents: D2D4112 Backup System (12 x 1 TB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StorageWorks D2D4112 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EH993A
HP StorageWorks D2D4112 Upgrade Kit	<p>D2D4112 Backup System upgrade kit, MSA60 base enclosure offering additional 12 TB of disk storage</p> <p>Kit Contents: HP StorageWorks 60 Modular Storage Array with 12 x 1TB discs MSA60 base enclosure with redundant power supplies and fan modules Rack-mounting hardware kit 0.5m mini-SAS cable Two AC power cords and two PDU interconnect cords Entitlement certificate Installation instructions</p>	EH995A
HP StorageWorks D2D4004i Backup System	<p>D2D4004i Backup System with 4.5 TB of disk storage</p> <p>Kit Contents: D2D4004i Backup System (6 x 750 GB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StorageWorks D2D4000 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EH938A
HP StorageWorks D2D4009i Backup System	<p>D2D4009i Backup System with 9 TB of disk storage</p> <p>Kit Contents: D2D4009i Backup System (12 x 750 GB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StorageWorks D2D4000 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EH939A
HP StorageWorks D2D4004fc Backup System	<p>D2D4004fc Backup System with 4.5 TB of disk storage</p> <p>Kit Contents: D2D4004fc Backup System (6 x 750 GB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StorageWorks D2D4000 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EH941A
HP StorageWorks D2D4009fc Backup System	<p>D2D4009fc Backup System with 9 TB of disk storage</p>	EH942A

Configuration Information

D2D4009fc Backup System	<p>Kit Contents: D2D4009fc Backup System (12 x 750 GB disks) Ethernet cable(Cat 5e) 3m (x2) 2 x Power cords (with IEC 320 C13 plug for Rack PDU) Installation poster HP StorageWorks D2D4000 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	
HP StorageWorks D2D4904 Capacity Upgrade	<p>D2D4904 Capacity Upgrade, enables the D2D4004 products to be upgraded to D2D4009 capacity product</p> <p>Kit Contents: 6 x 750 GB discs Entitlement certificate Installation booklet</p>	EH944A
HP StorageWorks D2D2504i Backup System	<p>D2D2504i Backup System with 4 TB of disk storage</p> <p>Kit Contents: D2D2504i Backup System 4x 1 TB Hot swap hard drives Ethernet cable(Cat 5e) 3m (x2) Power cable (IEC 320 C13 Connector for Rack PDU) Installation poster HP StorageWorks D2D2500 Backup System CD(contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EJ002A
HP StorageWorks D2D2503i Backup System	<p>D2D2503i Backup System with 3 TB of disk storage</p> <p>Kit Contents: D2D2503i Backup System (4 x 750 GB hard disk drives) Ethernet cable(Cat 5e) 3m (x2) Power cable (IEC 320 C13 Connector for Rack PDU) Installation poster HP StorageWorks D2D2500 Backup System CD (contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EH945A
HP StorageWorks D2D2502i Backup System	<p>D2D2502i Backup System with 2 TB of disk storage</p> <p>Kit Contents: D2D2502i Backup System (4 x 500 GB hard disk drives) Ethernet cable(Cat 5e) 3m (x2) Power cable (IEC 320 C13 Connector for Rack PDU) Installation poster HP StorageWorks D2D2500 Backup System CD(contains installation wizard, device drivers, and documentation, all localized in multiple languages)</p>	EJ001A

Step 2- Related Options

Replication Licenses	<p>HP StorageWorks D2D4112 Replication License</p> <p>HP StorageWorks D2D4000 Replication License</p> <p>HP StorageWorks D2D2500 Replication License</p> <ul style="list-style-type: none"> • These licenses enable an appliance to host replication target libraries. (No license is required for appliances which only act as replication sources) • Licensing is "per appliance" i.e. A single license is required to enable an appliance to host as many replication target libraries as it is capable of • Licenses are delivered via www.webware.hp.com and are node-locked by 	<p>EH994A</p> <p>EH991A</p> <p>EH990A</p>
-----------------------------	---	---

Configuration Information

- appliance serial number (and are not transferable)
- Total number of source appliances that can replicate into a single target appliance is as follows:
 - D2D4112 target supports up to 24 source D2D appliances
 - D2D4004/D2D4009i/fc target supports up to 16 source D2D appliances
 - D2D2504i target supports up to 8 source D2D appliances
 - D2D2503i target supports up to 6 source D2D appliances
 - D2D2502i target supports up to 4 source D2D appliances

Rack-mount Options

Rack-mount Tape Drive Kits

NOTE: Connecting a tape drive option to the D2D Backup Systems requires installation of the appropriate host bus adapter. Please select an option from the list provided below.

HP StorageWorks 1U SCSI Rack-mount Kit	A7445B
HP Storage Works 1U SAS Rack-mount Kit	AE459A
HP StorageWorks 3U SCSI Rack-mount Kit	274338-B22
HP StorageWorks 3U SAS Rack-mount Kit	AG576A

Pre-Configured Rack-mount Tape Options

NOTE: Connecting a tape drive option to the D2D Backup Systems requires installation of the appropriate host bus adapter. HP SC11Xe SCSI HBA (412911-B21) recommended for SCSI and HP SC44Ge SAS HBA (416096-B21) recommended for SAS.

HP StorageWorks 1U Rack-mount Kit with one LTO-2 Ultrium 448 SCSI Tape Drive	DW028B
HP StorageWorks 1U Rack-mount Kit with one LTO-3 Ultrium 920 SCSI Tape Drive	EH903A
HP StorageWorks 3U Rack-mount Kit with one LTO-3 Ultrium 960 SCSI Tape Drive	Q1595B
HP StorageWorks 3U Rack-mount Kit with one LTO-4 Ultrium 1760 SAS Tape Drive	EH946A
HP StorageWorks 3U Rack-mount Kit with one LTO-4 Ultrium 1840 SCSI Tape Drive	EH926A

Internal Tape Drive Options for Rack-mount Kits

NOTE: Connecting a tape drive option to the D2D Backup Systems requires installation of the appropriate host bus adapter. HP SC11Xe SCSI HBA (412911-B21) recommended for SCSI and HP SC44Ge SAS HBA (416096-B21) recommended for SAS.

HP StorageWorks LTO-2 Ultrium 448 SCSI Internal Tape Drive	DW016A
HP StorageWorks LTO-2 Ultrium 448 SAS Internal Tape Drive	DW085A
HP StorageWorks LTO-3 Ultrium 920 SCSI Internal Tape Drive	EH903A
HP StorageWorks LTO-3 Ultrium 920 SAS Internal Tape Drive	EH847A
HP StorageWorks LTO-3 Ultrium 960 SCSI Internal Tape Drive	Q1538A
HP StorageWorks LTO-4 Ultrium 1760 SAS Internal Tape Drive	EH919A
HP StorageWorks LTO-4 Ultrium 1840 SCSI Internal Tape Drive	EH853A
HP StorageWorks LTO-4 Ultrium 1840 SAS Internal Tape Drive	EH860A

Configuration Information

NOTE: HP Rack-mount kits can support a maximum of either 2 half-height (1U) or 4 half-height or 2 full-height (3U) tape drives. While the HP D2D can only attach to a single tape drives or libraries, you may add additional tape drives to the kit to allow for connection to other devices in your rack.

Tape Drive Options	Direct attach	
(Connecting a tape drive option to the D2D Backup Systems requires installation of the appropriate host bus adapter. HP SC11Xe SCSI HBA (412911-B21) and HP SC44Ge SAS HBA (416096-B21) recommended for SAS.)	HP StorageWorks LTO-4 Ultrium 1840 SCSI External Tape Drive	EH854A
	HP StorageWorks LTO-4 Ultrium 1840 SAS External Tape Drive	EH861A
	HP StorageWorks LTO-4 Ultrium 1760 SAS External Tape Drive	EH920A
	HP StorageWorks LTO-3 Ultrium 960 SCSI External Tape Drive	Q1539B
	HP StorageWorks LTO-3 Ultrium 920 SCSI External Tape Drive	EH842A
	HP StorageWorks LTO-3 Ultrium 920 SAS External Tape Drive	EH848A
	HP StorageWorks LTO-2 Ultrium 448 SCSI External Tape Drive	DW017B
	HP StorageWorks LTO-2 Ultrium 448 SAS External Tape Drive	DW086A
	HP StorageWorks 1/8 G2 Tape Autoloader	
	http://h18000.www1.hp.com/products/quickspecs/12630_div/12630_div.html	
	HP StorageWorks MSL2024 Tape Library	
	HP StorageWorks MSL4048 Tape Library	
	http://h18000.www1.hp.com/products/quickspecs/13258_div/13258_div.html	
NOTE: HP StorageWorks Tape Autoloaders and Tape Libraries listed above are available with a wide range of LTO Ultrium tape drive and interface options. Please refer to the Tape Autoloader and Tape Library product specific Quickspecs for detailed ordering information. www.hp.com/go/automation		

Host Bus Adapter (HBA) Options	HP SC11Xe Host Bus Adapter (SCSI)	412911-B21
	HP SC44Ge Host Bus Adapter (SAS)	416096-B21

Technical Specifications

	D2D2502i	D2D2503i	D2D2504i	D2D4004i/fc	D2D4009i/fc	D2D4112
Form Factor	1U Rack	1U Rack	1U Rack	2U Rack	2U Rack	2U scalable rack
Total Capacity (Raw)	2 TB	3 TB	4 TB	4.5 TB	9 TB	Up to 24 TB**
Total Capacity (Useable)	1.5 TB	2.25 TB	3 TB	3 TB	7.5 TB	Up to 18 TB**
Data Deduplication Usable capacity using data deduplication at 20:1*	30 TB	45 TB	60 TB	60 TB	150 TB	360 TB
Usable capacity using data deduplication at 50:1*	75 TB	112 TB	150 TB	150 TB	375 TB	900 TB
Replication	Supports low bandwidth replication of libraries between D2D appliances. Replication is automatic and appliances may function as both replication targets and sources simultaneously with a license only being required for any appliance acting as a target.					
Maximum number of source appliances per target appliance (fan in)	4	6	8	16	16	24
Disk Drive Capacity, Type	500 GB, SATA 7200rpm, 3.5 inch	750 GB, SATA 7200rpm, 3.5 inch	1 TB, SATA 7200rpm, 3.5-inch	750 GB, SATA 7200rpm, 3.5-inch	750 GB, SATA 7200rpm, 3.5-inch	1 TB, SATA 7200rpm, 3.5-inch
Number of Disk Drives	4	4	4	6	12	12 (min) , 12+12 (max)
RAID Support	Hardware RAID 5	Hardware RAID 5	Hardware RAID 5	Hardware RAID 6	Hardware RAID 6	Hardware RAID 6 1 RAID hot spare drive per shelf
Performance (maximum aggregated data transfer rate)	180 GB/hr (50 MB/s)	270 GB/hr (75 MB/s)	288 GB/hr (80 MB/s)	325 GB/hr (90 MB/s)	325 GB/hr (90 MB/s)	540 GB/hr (150 MB/s)
Device Interface	2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) OR 2 x 4 Gb Fibre Channel and 2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 1 Gb iSCSI (Ethernet) OR 2 x 4 Gb Fibre Channel and 2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)	2 x 4 Gb Fibre Channel and 2 x 1 Gb iSCSI (Ethernet) (also supports 100 base-T)
Tape Devices Emulated	HP LTO- 2 Ultrium Tape Drive /LTO-3 Ultrium Tape Drive/LTO-4 Ultrium Tape Drive in HP 1/8 G2 Tape Autoloader, MSL2024 Tape Library, MSL4048 Tape Library, HP D2D Backup System Generic Library					
Maximum Number of Tape Autoloader/Libraries Emulated	4	6	8	16	16	24
Maximum Number of Cartridges Emulated (Assumes up to 24 generic 4 drive libraries with 96 slots)	192	288	384	1536	1536	3456

Technical Specifications

Direct attach Tape Drives Supported (maximum of one external tape drive - requires HBA) HP LTO-4 (Ultrium 1840 and Ultrium 1760) tape drives, HP LTO-3 (Ultrium 920 and Ultrium 960) tape drives and HP LTO-2 (Ultrium 448 and Ultrium 460) tape drives as standalone or configured in HP 1/8 G2 Autoloader, MSL2024 or MSL4048 Tape Libraries

*Actual results of data deduplication will vary with data type, change rates over time and backup methodologies used. Assuming standard business data mix and extended on-disk retention, a 20:1 data deduplication ratio could be assumed with a weekly full and daily incremental backup model. A 50:1 capacity ratio could be assumed for daily full backups.

** Assumes use of D2D4112 12 TB capacity upgrade kit to achieve maximum capacity

Dimensions (HxWxD)	Shipping (D2D2502i,2503i, 2504i)	8.88 x 23.31 x 38.56 in (22.5 x 59.2 x 97.9 cm)
	Out of box (D2D2502i, 2503i, 2504i)	1.70 x 17.64 x 26.85 in (4.32 x 44.80 x 68.20 cm)
	Shipping (D2D4004, D2D4009, D2D4112)	11.3 x 23.0 x 38.9 in (28.7 x 58.4 x 98.8 cm)
	Shipping (D2D4112 capacity upgrade)	15.5 x 23.5x35 in (39.5 x 59.7 x 88.5cm)
	Out of box (D2D4004, D2D4009,D2D 4112 and capacity upgrade)	3.44 x 17.64 x 27.50 in (8.75 x 44.80 x 69.88 cm)
	Out of box (D2D4112 capacity upgrade)	3.47 x 17.65 x 23.25 in (8.8 x 44.8 x 59 cm)
Weight (Approx)	Shipping (D2D2502i, 2503i,2504i)	51.00 lb (23 kg)
	Shipping (D2D4004)	61.5 lbs
	Shipping (D2D4009, D2D4112)	71.5 lbs
	Shipping (D2D4112 capacity upgrade)	83.7 lbs (38kg)
	Out of box (D2D2502i, 2503i, 2504i)	37.00 lb (16.78 kg)
	Out of box (D2D4004)	47 lbs (21.3kg)
	Out of box (D2D4009, D2D4112)	57 lbs (25.8kg)
	Out of box (D2D4112 capacity upgrade)	54 lbs (24.5kg)
	Power Requirements (per power supply)	Range Input Voltage
	Rated Input Frequency (D2D4004, D2D4009, D2D4112 and capacity upgrade)	50 to 60 Hz
	Rated Input Frequency (D2D2502, 2503 2504)	47 to 63 Hz
	Rated Input Current (D2D4004, D2D4009, D2D4112)	9.10 A (at 100 VAC), 4.5 A (at 200 VAC)
	Rated Input Current (D2D4112 capacity upgrade)	3.9 A (at 100 VAC), 6A Maximum
	Rated Input Current (D2D2502 2503 2504)	10.0 A (at 115 VAC) 5.5A (at 230 VAC)

Technical Specifications

	BTU Rating (D2D4112)	Maximum 1681 BTU/hr (at 100 VAC) 1646 BTU/hr (at 240 VAC)
	BTU Rating (D2D4004, 4009)	Maximum 1815 BTU/hr (at 100 VAC) 1776 BTU/hr (at 240 VAC)
	BTU Rating (D2D2502,2504)	Maximum 940 BTU/hr (at 100 VAC) 907 BTU/hr (at 240 VAC)
	BTU Rating (D2D2503)	Maximum 1315 BTU/hr (at 100 VAC) 1270 BTU/hr (at 240 VAC)
	Rated Steady-state Power (D2D4112)	360 W (at 100 VAC), 386 W (at 240 VAC)
	Rated Steady-state Power (D2D2502,2504)	215W (at 100 VAC), 211W (at 240 VAC)
	Rated Steady-State Power (D2D4004,4009)	410 W (at 100 VAC), 430 W (at 240 VAC)
	Rated Steady-State Power (D2D2503)	260 W (at 100 VAC), 265 W (at 240 VAC)
	Maximum Peak Power (D2D4112)	500W (at 100 VAC), 515 W (at 240 VAC)
	Maximum Peak Power (D2D4004, D2D4009)	540 W (at 100 VAC), 550 W (at 240 VAC)
	Maximum Peak Power (D2D2502 and D2D2504)	280W (at 100 VAC), 280 W (at 240 VAC)
	Maximum Peak Power (D2D2503)	385 W (at 100 VAC), 390 W (at 240 VAC)
	Input Power (max)	345 W
Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 82.4° F (28° C) maximum wet bulb temperature, non-condensing
	Non Operating	5 to 95% relative humidity (Rh), 101.7° F (38.7° C) maximum wet bulb temperature, non-condensing
Temperature Range D2D 2502i, 2503i,2504i), D2D4004, D2D4009, D2D4112	Operating	50° to 95°F (10° to 35°C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 305 m) above sea level to a maximum of 10,000 ft (3050 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 86°F (30°C)
	Non Operating (D2D2502i, 2503i, 2504i, D2D4004, D2D4009, D2D4112)	22° to 140° F (-30° to 60° C). Maximum rate of change is 36° F/hr (20° C/hr)
	Non Operating (D2D4112 capacity upgrade)	-40° to 150° F (-40° to 66° C)
	Heat Dissipation (maximum) D2D4112 capacity upgrade	1175 Btu/hr* * Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.
Acoustic Noise D2D4004/D2D4009/ D2D4112	Idle (disks spinning)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment LWad 6.7 B LpAm 51 dBA

Technical Specifications

	Operating (random seeks to disks)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment LWAd 6.7 B LpAm 51 dBA
Acoustic Noise D2D2502i, 2503i,2504i)	Idle (disks spinning)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). LWAd 6.82 B LpAm 51.93 dBA
	Operating (random seeks to disks)	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). LWAd 6.84 B LpAm 51.93 dBA

© Copyright 2009 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice.

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.