

HP StorageWorks Data Protector Express white paper

Easy-to-use, easy-to-manage, backup and recovery software for smart office data protection



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Introduction

For organizations of all types and sizes, data protection is high on the agenda of business requirements. At the center of all organizations is data and without access to this data the organization will not function for long. Whether this data is customer information, intellectual property, financial reports, the payroll, manufacturing processes, or simply office documents it must be protected in an environment of virus attacks, regulations covering corporate information retention, accidental and malicious user error, and potential hardware failures. This has been understood by most enterprise and large scale businesses, which today have processes to protect their data. HP recognizes that smaller and medium sized organizations need equally good data protection but must achieve this without dedicated IT disaster recovery resources and within the constraints of smaller IT budgets.

To meet the data protection needs of smaller and medium sized organizations, HP offers HP StorageWorks Data Protector Express backup and recovery software. This smart and flexible software meets these data protection requirements simply and cost effectively. HP Data Protector Express is designed to be installed and managed without the need for specialized training or skills but without compromising its functionality or flexibility. Data Protector Express works with the operating systems, applications, and storage devices that smaller and medium sized organizations use.

Several backup and recovery software products are available. Utilities included with operating systems have the advantage of being free but suffer from lack of features and flexibility, which means they do not fully protect your organization's data and can be time consuming to manage. Many commercial backup and recovery products are 10 or more years old and do not meet the data protection requirements of today's world. With Data Protector Express, HP StorageWorks offers a modular software solution designed for multiple platforms, using fixed and removable backup media, and based on a flexible and high-performance three-tier architecture. This white paper describes the major features of Data Protector Express and how they can meet the data protection requirements of your organization.

Three-tier architecture for flexibility and performance

HP StorageWorks Data Protector Express uses the same three-tier architecture as the enterprise-scale HP OpenView Storage Data Protector. This allows smaller installations to benefit from the same flexibility and performance as larger installations.

Tier one is the Data Protector Express backup server. The backup server includes the Data Protector Express catalog and acts as a media server. A backup server is the minimum configuration for a Data Protector Express installation and makes up a minimum Data Protector Express Storage Management Domain. Being a media server allows the backup server to back up data to any supported locally attached storage device.

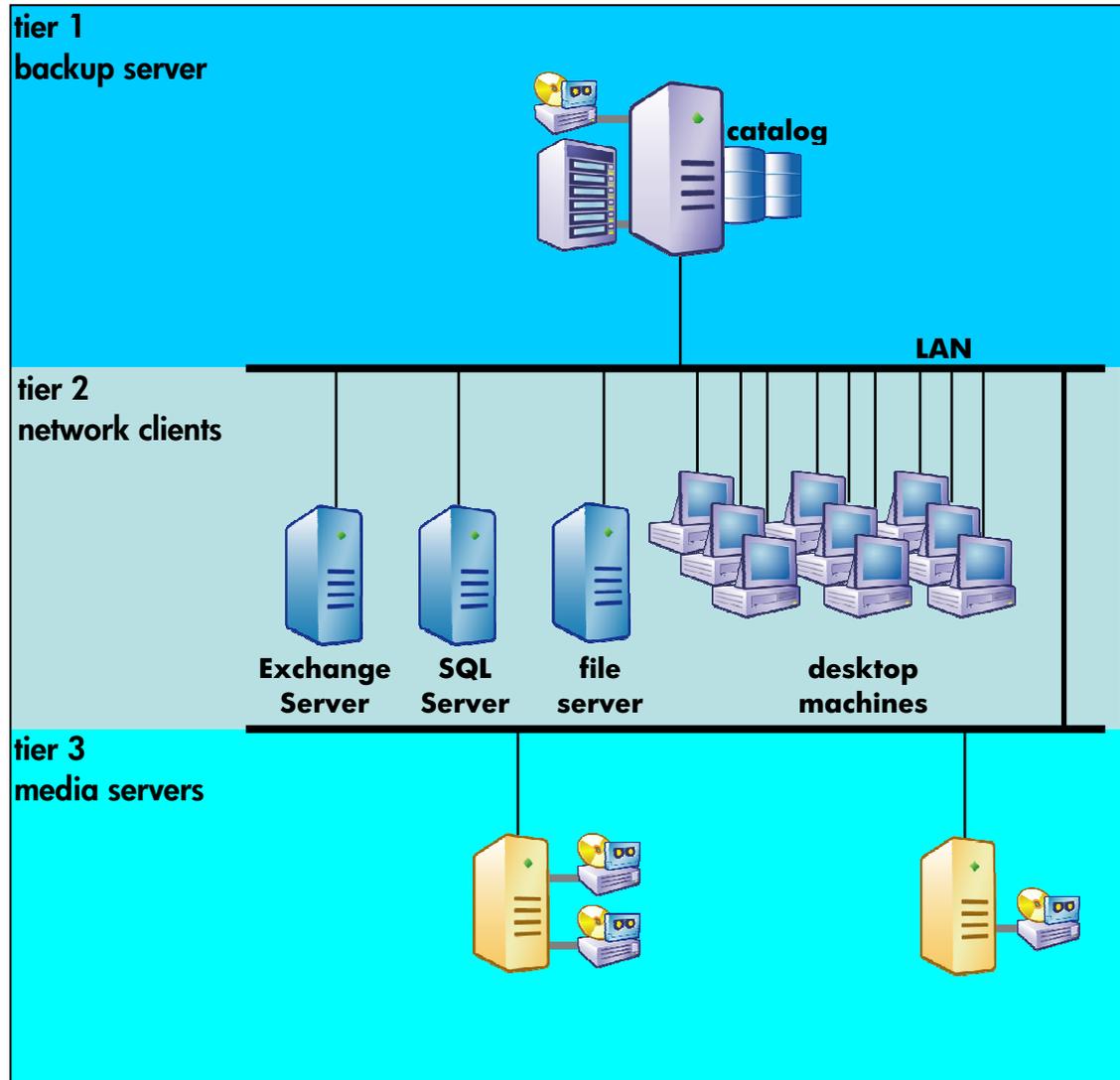
The second tier of the Data Protector Express architecture allows the backup server to protect the machines and data on the network. File servers, application servers, and desktops can be added to the Data Protector Express Storage Management Domain for protection. The Data Protector Express Agents installed on the source networked machines push selected data and machine information to the backup server for protection.

The, optional, third architectural tier adds more media servers. Each additional media server adds performance to the Storage Management Domain since they operate in parallel. This capability to add media servers to the Storage Management Domain makes HP Data Protector Express the highest performance product in its class. Media servers can also fail over backup processes to other devices on the same media server or to other media servers in the Storage Management Domain to add resilience against hardware failure thereby increasing the proportion of successful backups.

All similarly priced backup and recovery software is based on a simple two-tier architecture. HP Data Protector Express uses a three-tier architecture for performance, fault tolerance, and flexibility.

The three-tier architecture is shown schematically in Figure 1.

Figure 1. Data Protector Express has a three-tier architecture for performance, reliability, and flexibility



Operating system support

HP StorageWorks Data Protector Express is a single product that runs on Microsoft® Windows®, Linux, and NetWare operating systems. All Data Protector Express components run on all supported operating systems. Data Protector Express and its options are all licensed and priced the same regardless of operating system or number of processors used. This makes Data Protector Express extremely easy to use in organizations with multiple operating systems. It also means that, for example, a Windows operating system does not have to be introduced into a pure Linux environment to run the backup and recovery application.

Native format or common format data streams

Data Protector Express can back up data in the native operating system format or a common data format. Windows, Linux, and NetWare each use different data formats. Typically these are used for backup because this provides fastest performance and includes embedded information such as security information. If it is planned or likely to share data between different operating systems, then the native data stream format can be replaced with a common Data Protector Express data format. This allows, for example, data from a NetWare machine to be backed up then restored to a Linux machine in a readable format.

Device support

HP StorageWorks Data Protector Express supports disk, tape, and optical media for backup and recovery. The disk can be any disk resource visible on the network or attached to the Data Protector Express backup server or a Data Protector Express media server. The tape support includes HP tape drives, HP tape autoloaders, and HP tape libraries as well as third-party tape products. The optical support covers backup to CD and DVD. The choice of backup media depends upon several factors and should be made according to organizational need. Data Protector Express allows multiple media types to be used and for these media types to be used in combination. Table 1 shows a summary of the merits of disk and tape as backup media.

Table 1. Disk and tape backup media compared

	Tape media	Disk media
Cost	Low per GB cost for tape media. Drive price and robotic price depend on performance. No power costs for stored media.	Low cost for entry-level disks, higher cost for SCSI and Fibre Channel disks. Disk arrays expensive, JBOD and internal disk lower cost. Ongoing power cost for spinning disks.
Performance	Very fast for larger files and sequential backup and restores. Slower than disk for single file backup and restores. Good for full backup and restores.	Typically slower than tape for larger files and sequential backup and restores. Faster than tape for single file backup and restores. Good for recovery based on multiple incremental backups.
Reliability	Media reliability is independent of drive reliability. 10+ years if stored and handled properly. Reliability can be reduced by slow backup sources or restore targets due to tape stop-starting.	Disks media reliability depends on disk type—ATA disk has 20% usage cycle while SCSI and Fibre Channel disks have 100% usage cycle. Disk warranted for 1 or 3 years depending upon type. OK for slow backup sources or restore targets.
Data compression	Built-in to tape drive to increase data storage capacity and transfer rate typically 1.5 to 3 times depending upon data type.	Relies on software data compression, which reduces performance.
Remote replication	Low cost because tapes can be moved off site.	Disks generally not portable. Replication requires additional hardware or software.
Virus resistance	Virus cannot spread to written tapes.	Disk is vulnerable to virus infection.
Media handling	Removable media needs tracking. Autoloaders and libraries add expense but automate media handling. Security implications to be considered.	Not typically an issue as disks generally are not moved. Security good as disks harder to steal.

Advanced features in an easy-to-use product

HP StorageWorks Data Protector Express is designed for simple operation that does not require specialist IT skills or a big investment in training. This simplicity extends to the way the product is structured and licensed. Complexities such as licensing per processor, licensing by backup capacity, or mandatory installation services are deliberately avoided. Data Protector Express offers value, scalability, and flexibility. The base product offers a high degree of functionality to which optional agents and extensions are added, non-disruptively as required.

Disk-to-disk (D2D) backup and recovery

Table 1 describes the benefits of using disk as backup media and where it is the most appropriate backup/recovery medium. HP Data Protector Express allows organizations to easily realize these benefits. A standard feature of Data Protector Express is the capability for disk-to-disk (D2D) backup.

The Data Protector Express D2D backup process uses designated disk volumes as the backup target. The D2D backup capability creates a software-enabled virtual tape library. A single virtual cartridge equal to the size of the backup is created on the designated disk target for the backup. It is possible to limit the size of the virtual tape cartridge, which could be useful if the backup is to be subsequently moved to a physical tape cartridge.

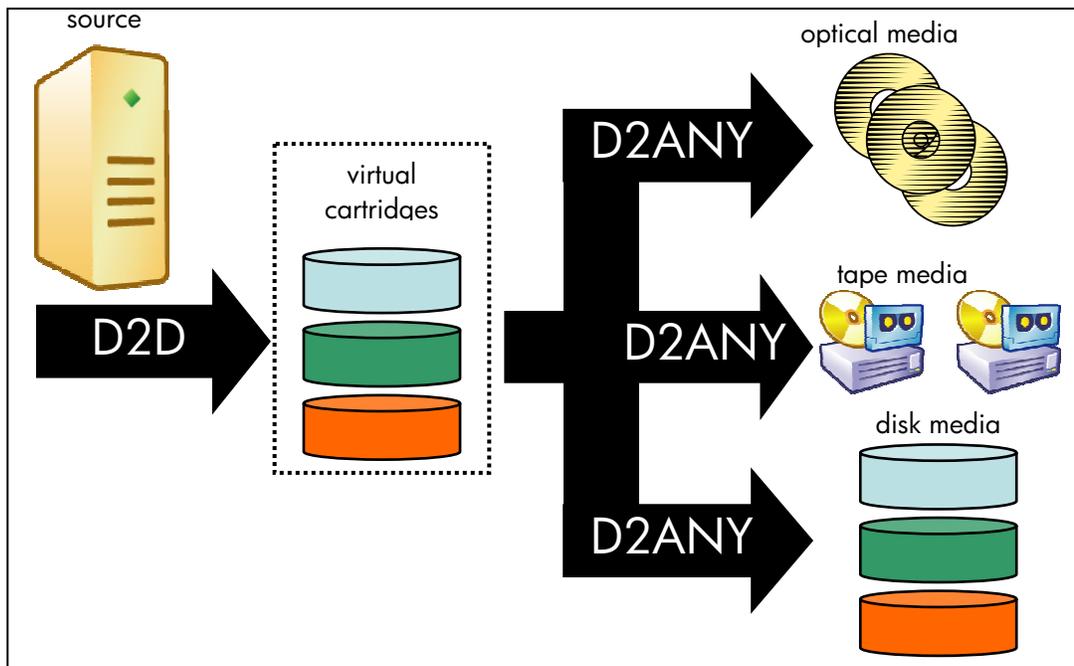
Frequently D2D backup is used as a cost-effective way to make regular, incremental backups throughout the working day to minimize potential data loss.

Disk-to-disk-to-any (D2D2Any) backup and recovery

After the data is stored in the virtual cartridge, there is often still a requirement to protect it from possible disk failure, virus attack, or even to archive it. Data Protector Express makes this possible through the disk-to-disk-to-any (D2D2Any) option. D2D2Any allows you to create a virtually infinite hierarchy of storage that spans platforms and media types. It allows management of data through this hierarchy of storage devices. For example, if you execute a D2D backup, the D2D2Any capability will then manage the movement of the data from virtual cartridge (disk) to tape or another specified medium using pre-defined criteria. These criteria are time based, although there is also self-grooming logic built into Data Protector Express to prevent the allocated space from filling completely.

A D2D2Any storage hierarchy could consist of other virtual tape libraries. This allows you to move data to other disk-based systems and potentially from there to tape, for off-site storage or archival. In addition, the performance features available during a tape-based backup are also available during a disk-based backup.

Figure 2. The Data Protector Express D2D2Any capability allows frequent backups to disk to be combined with the security of longer term backups being stored on tape.



Backup and recovery for the complete network

HP StorageWorks Data Protector Express can protect file servers, application servers, and desktop machines on the same network as the Data Protector Express backup server. After a network machine has the Data Protector Express client agent installed and it is added to the Data Protector Express Storage Management Domain, it can be centrally backed up and protected.

Desktop machines are also protected by installing a Data Protector Express client agent on the machine. The Data Protector Express backup server license includes the capability to centrally back up an unlimited number of desktop machines. Each time the protected desktop machine logs on to the network it can be backed up, using a manual or scheduled backup, for protection.

Data Protector Express has push technology built into the network backup agents. This improves performance by pre-processing data locally to allow it to be efficiently sent from the source machine, rather than having to be "pulled" or requested centrally by the backup server.

Online file server and application server backup

On Windows and NetWare, where data files are open on a file server or for applications where there is not a Data Protector Express application agent, the Open File Backup option can be used to ensure a full backup. This option ensures a complete backup, without files being skipped because they are open. The Data Protector Express Open File Backup option works by detecting file access and then dynamically pre-caching data to present it for backup in a consistent and recoverable state. For the two most popular Microsoft business applications, Exchange and SQL Server, Data Protector Express has optional agents to allow these to be protected without disruption.

Microsoft Exchange protection

The Data Protector Express Microsoft Exchange Agent allows the Microsoft Exchange Server administrator to perform full, differential, and incremental backups of the Exchange database and associated log files with the server online. This allows the Exchange database to be restored in the event of a disaster and then appropriate log files applied. In the event of a more severe disaster, a system-level recovery is possible, followed by restoration of the Microsoft Exchange Server.

Data Protector Express provides comprehensive protection for the Microsoft Exchange Server and the Microsoft Exchange databases so that any major or minor disaster can be quickly recovered.

SQL Server protection

The Data Protector Express SQL Server Agent allows the SQL Server administrator to perform full, differential, and incremental backups of the Microsoft SQL Server storage groups. Special procedures are included for the protection of the inbuilt databases including particularly the SQL Server Master Database. Data Protector Express is also designed to protect the SQL Server log files. All included utilities, such as DUMP, remain available and should be used in parallel with the Data Protector Express SQL Server Agent. In the event of a disaster, the SQL Server database is restored and then transaction logs applied as appropriate.

Data Protector Express provides comprehensive protection for Microsoft SQL Server so that any major or minor disaster can be quickly recovered.

Bare Metal Disaster Recovery (BMDR) for fast restart of operations

The Data Protector Express Bare Metal Disaster Recovery (BMDR) option delivers fast and automated recovery of systems and information following a serious disaster. After a serious incident there will typically be many things to do to get the organization operational again. The Data Protector Express BMDR capability makes it simple to get your servers operational again. It is a fast and robust tool to rebuild your new or replacement systems with the operating systems and applications then to reload the data.

Unlike some other disaster recovery products, the Data Protector Express BMDR option will recover the server from completely new hardware (bare metal). Replacement hardware or components should be the same as the hardware or components they replace. Other recovery products require you to re-install the operating system before recovering the server, whereas Data Protector Express only requires that you create a boot CD/DVD, on one of the media servers, to execute the recovery. With HP tape drives the process is further simplified, as support for HP One-Button Disaster Recovery (OBDR) is provided and any full backup tape can be disaster recovery media. Using HP OBDR, the necessary recovery information is automatically created and stored on the tape. For information on supported BMDR configurations, see the Data Protector Express compatibility matrix at <http://www.hp.com/go/dataprotectorexpress>.

Added simplicity comes from the design of the Data Protector Express full system backups to write all necessary disaster recovery information into the Data Protector Express catalog and onto the backup media. In the event of a disaster, this allows you to create bootable disaster recovery media for any machine in the Data Protector Express Storage Management Domain that has a full backup. When created, the Data Protector Express BMDR media is used as the boot media in a locally attached drive. The smart Data Protector Express BMDR option simply requires you to follow the on-screen prompts to recover your server in the minimum time. There is no need to install or configure anything first. Table 2 shows how quickly and easily the Data Protector Express BMDR option makes rebuilding and recovering a server after a disaster.

Figure 3. Comparison of steps needed for HP OBDR, Data Protector Express BMDR, and other disaster recovery methods (reboots not shown for clarity)

Data Protector Express Bare Metal Disaster Recovery + One Button Disaster Recovery	Data Protector Express Bare Metal Disaster Recovery	Other bare metal disaster recovery products	Manual recovery	solution/preparation
Full backup to HP tape drive.	DR setup + backups	DR setup + backups	backups	
Disaster	Disaster	Disaster	Disaster	
Replace or repair hardware	Replace or repair hardware	Replace or repair hardware	Replace or repair hardware	recovery process
Power on tape drive and server, follow recovery process	Create DR media on Media Server	Create DR media	Re-install OS with service packs/patches and drivers	
	Boot server from DR media, follow recovery process	Boot server from DR media to reload OS and applications	Re-install applications including backup application	
		Recover data	Recreate backup application database	
			Create and run restore job to recover data	

Parallel data streams for high performance

Data Protector Express offers very high performance to maximize the investment in your backup devices. High backup and recovery performance are achieved through parallel streaming of data to reduce the backup time and recovery time of systems.

Data Protector Express is able to multiplex up to eight data streams to each backup device in the Storage Management Domain. This significantly improves throughput, reducing both backup and restore times, allowing a much smaller backup window and faster recovery than if only a single data stream is possible. Each data stream is issued a unique stream ID as it is being written to backup media. This makes it much easier and faster when having to restore data because Data Protector Express automatically knows what information is linked to what Stream ID.

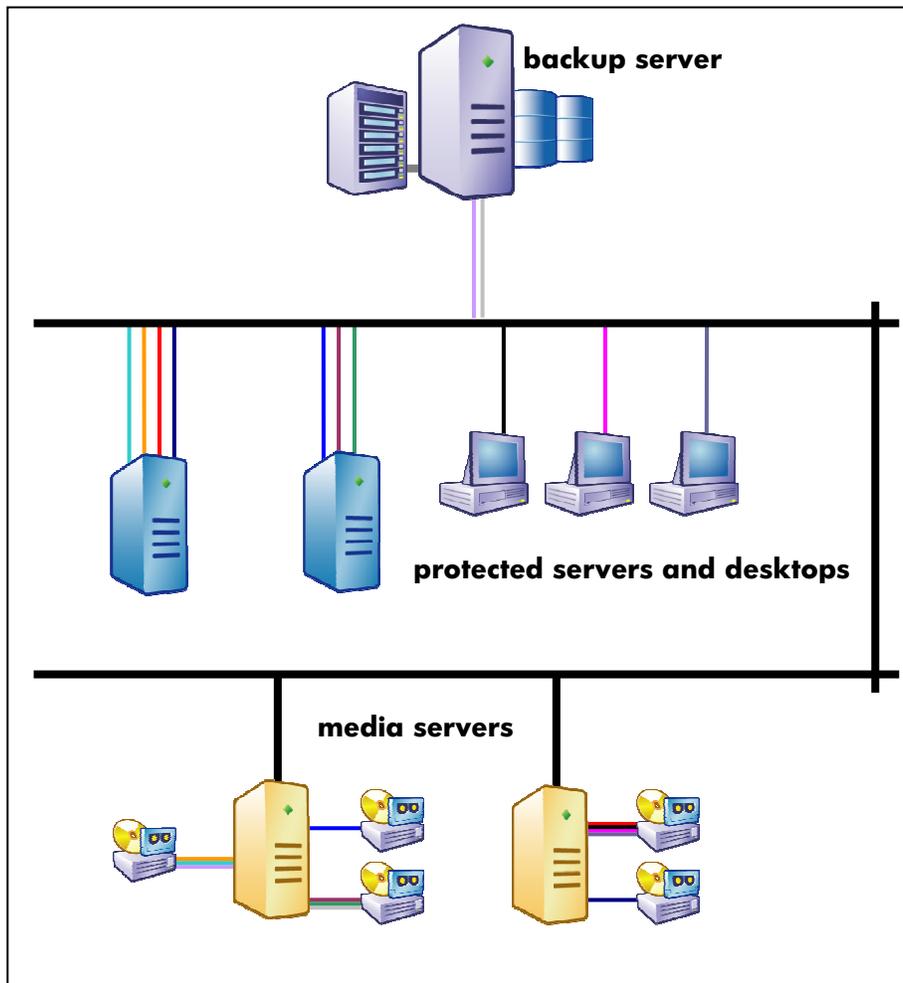
The Parallel Data Streams feature is ideally suited for backing up high-performance storage or multiple machines. When backing up multiple machines, the media server can handle up to eight simultaneous streams per backup device making it possible to back up eight machines or volumes concurrently. As a maximum, 40 backup devices could be operational in a Data Protector Express Storage Management Domain with each device receiving eight streams. Performance is further boosted when backing up to disk because Data Protector Express uses a write format optimized for disk characteristics.

Self-tuning logic for optimized backup and recovery throughput

The capability to create multiple data streams is not on its own enough to ensure optimum performance. Optimum performance is achieved through the intelligence designed into Data Protector Express. A standard feature of Data Protector Express is the capability to tune automatically the number of parallel data streams to the capacity of the source, network, and backup target. There are situations where a single stream will deliver a faster backup than multiple streams. The self-tuning parallel backup streams feature optimizes the backup by detecting how the backup sources are configured to always get optimum performance.

As well as utilizing the self-tuning capability, Data Protector Express users can manually activate and control data streams to enhance backup performance. It is possible to assign a data stream to a single file or an entire hard drive for example. The concept of parallel data streams is shown in Figure 4.

Figure 4. Parallel data streams, governed by self-tuning logic, enable the performance of backup devices to be fully exploited to minimize recovery and backup times.



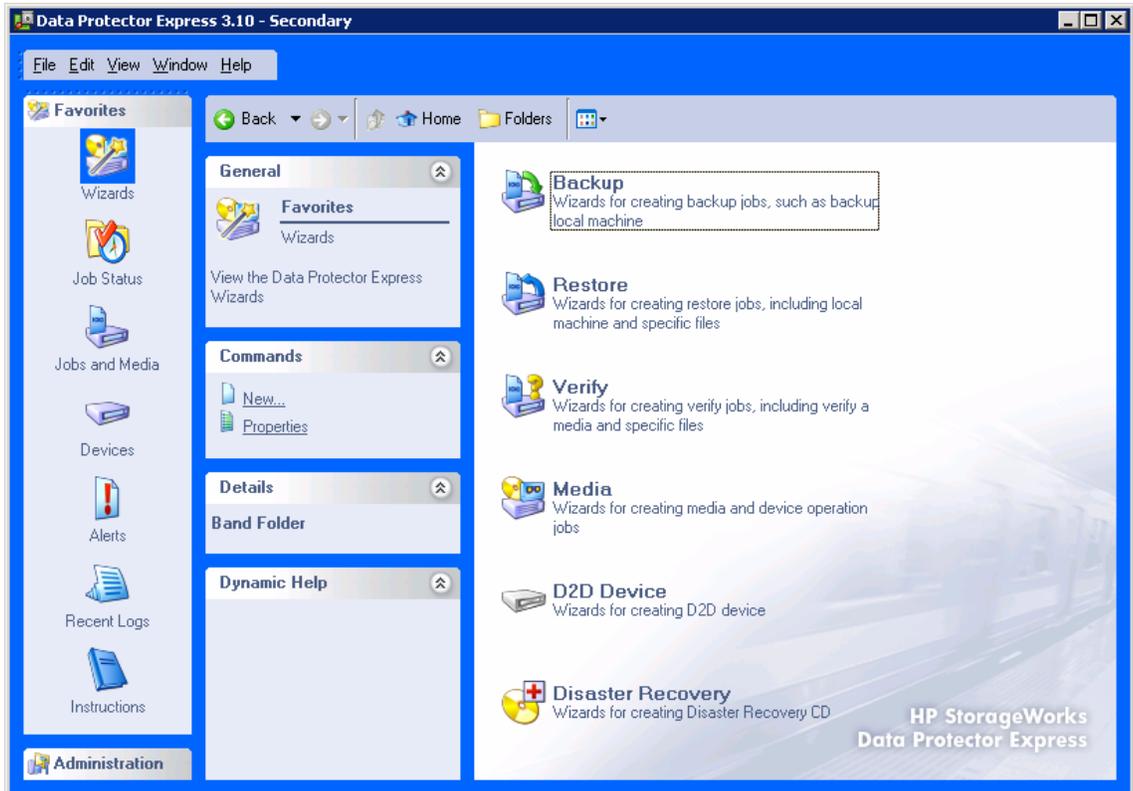
Simple administration and operation

Smart user interface

Backup and recovery scheduling, media management, and reporting can be complicated tasks. The Data Protector Express graphical user interface (GUI) simplifies these tasks with good design and the option to configure the GUI to meet different users' needs and preferences. The GUI customization includes the ability to limit access through role-based security. For example a backup operator can be granted permission to schedule and monitor backup jobs and devices while the System Administrator can be granted wider permissions. Many wizards are available as part of the GUI to execute tasks.

Centralized management is made possible by a GUI, which has a common look and feel across all supported platforms. This makes the management of servers running different operating systems a simple task. The Data Protector Express graphical interface, Figure 5, allows remote management from, for example, an Administrator's laptop. Data Protector Express can also be managed using a command line interface.

Figure 5. The Data Protector Express GUI, main window



Scheduling tasks

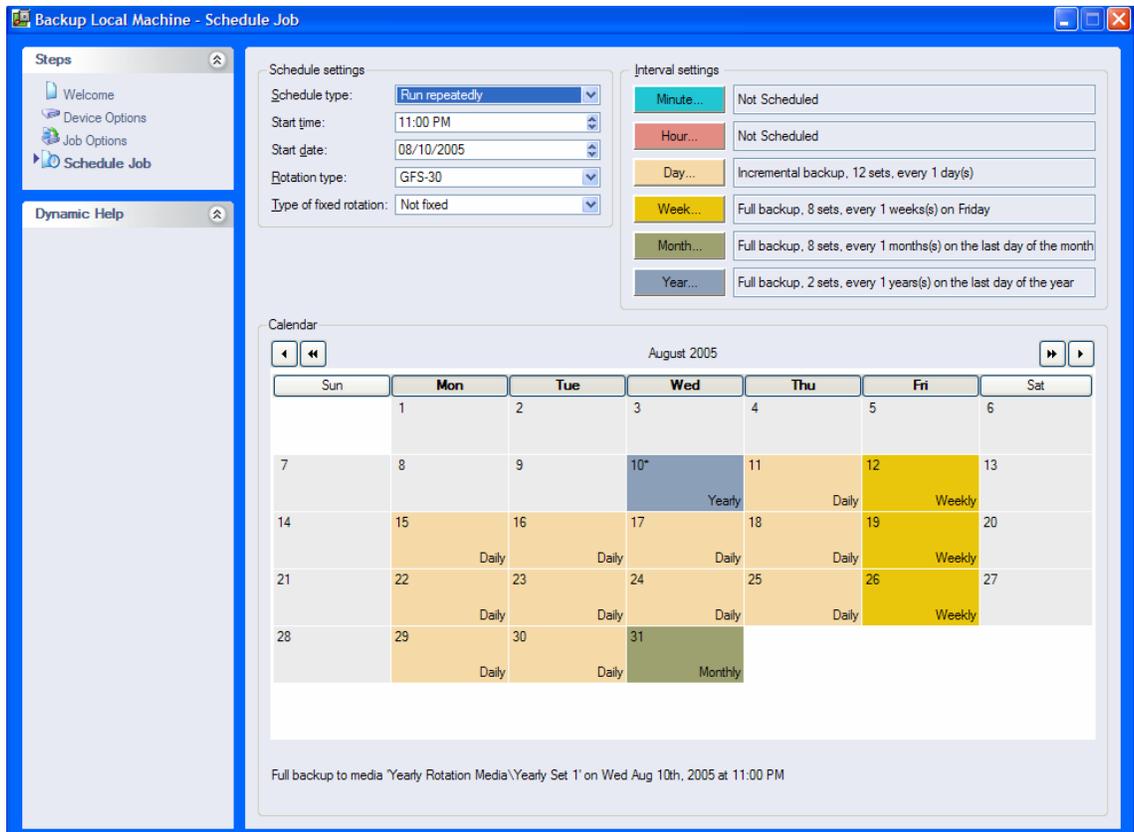
By its nature backup is a repetitive task. Efficiency and reliability are increased by scheduling backup and administration jobs. Data Protector Express includes pre-built schedules based on all the standard types of backup job scheduling. It is also possible for users to create custom schedules by specifying the type and frequency of backup and the number and types of tape pools that Data Protector Express will maintain.

When set up, jobs are run by the Data Protector Express scheduler. This easy-to-use tool is shown in Figure 6.

Smart media management

Data Protector Express fully manages media, including the control of robotic units to load the media pools. All media is recorded in the Data Protector Express catalog. Media is managed in media pools to reflect common properties of the media, for example, archived media or scratch media. Data Protector Express also has the capability to create storage pools with customized backups for different parts of the organization, such as accounting, engineering, or human resources.

Figure 6. The Data Protector Express graphical scheduling tool



Support and services

All components of Data Protector Express have, as standard, a one-year phone-in support service for the user and rights to fixes, upgrades, and new versions for 12 months. This standard service and support can be upgraded and/or extended as your requirements dictate.

The HP Care Pack Services offer upgraded service levels to extend and expand your standard Data Protector Express warranty with easy-to-buy, easy-to-use support packages that help you make the most of your investment in HP Data Protector Express. They let you choose the support levels that meet your business requirements, from business hours to 24 x 7. Additionally, HP Care Pack Services help you plan and manage total cost of ownership.

HP Care Pack warranty extensions can be purchased for HP Data Protector Express to cost effectively upgrade or extend your warranty. HP Care Pack Services for HP Data Protector Express are available when the one-year warranty included with Data Protector Express has expired and, at a lower cost, at the time of purchase of HP Data Protector Express.

Glossary

Backup server—The minimum required to protect a machine or machines. The backup server manages the Data Protector Express Storage Management Domain and contains the Data Protector Express catalog. The backup server can also act as a media server.

Bare Metal Disaster Recovery—The process of rebuilding a new computer, “bare metal,” from scratch after a major failure. Traditionally this required reinstalling the operating system, reloading applications, and then restoring data and settings. Data Protector Express automates this process.

Catalog—The database that stores all required information to run Data Protector Express. The information stored includes jobs and job history, device information, media, media pools, and licensing key details. The Data Protector Express catalog runs on the backup server and stores information for the complete Storage Management Domain.

Media server—A Data Protector Express media server is added to the Storage Management Domain to increase backup and recovery throughput. Each media server controls and manages up to eight backup devices.

Media pool—For easier management, backup media is allocated to media pools. Tasks can be performed on all media in the media pool. A media pool contains media that has common properties. These properties can relate to the source data (for example, engineering, finance) or to the role in the backup schedule (for example, daily backup, weekly backup).

Storage Management Domain—The Storage Management Domain comprises the Data Protector Express backup server and is a collection of machines, devices, media, and history. There is one Storage Domain per Data Protector Express catalog, and one Data Protector Express catalog per Domain.

Data Protector Express ordering information

Part number	Description
BB116-70000	HP Data Protector Express Evaluation Kit
BB117AA	HP Data Protector Express Backup Server
BB118AA	HP Data Protector Express Microsoft SBS Package
BB119AA	HP Data Protector Express Media Server
BB121AA	HP Data Protector Express Network Server Backup Agent
BB123AA	HP Data Protector Express Microsoft Exchange Online Backup Agent
BB124AA	HP Data Protector Express Microsoft Exchange Online Backup Agent
BB128AA	HP Data Protector Express Bare Metal Disaster Recovery
BB131AA	HP Data Protector Express D2D2Any (1 TB)
BB132AA	HP Data Protector Express D2D2Any (3 TB)
BB133AA	HP Data Protector Express Drive Expansion (1 incremental drive)
BB117AT	HP Data Protector Express Backup Server upgrade from HP StorageWorks Data Protector Express Single Server Edition
BB117AP	HP Data Protector Express Backup Server upgrade from HP StorageWorks Data Protector Express ProLiant Edition

For more information

For more information on the HP StorageWorks Data Protector Express, contact your HP partner or visit <http://www.hp.com/go/dataprotectorexpress>.

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