

HP TurboSTORE/XL

Technical Data



HP 3000 Software Backup Products

The HP TurboSTORE/XL product family offers powerful data backup products for the HP3000 Series 900 family. TurboSTORE/XL products provide high performance data backup as well as unattended dedicated data backup and unattended on-line data backup, thus improving system availability and reducing operating staffing requirements for backup. Important TurboSTORE/XL features and options are available in five products which include various feature levels such as software data compression and software on-line backup. Software data compression provides dramatic boosts to the

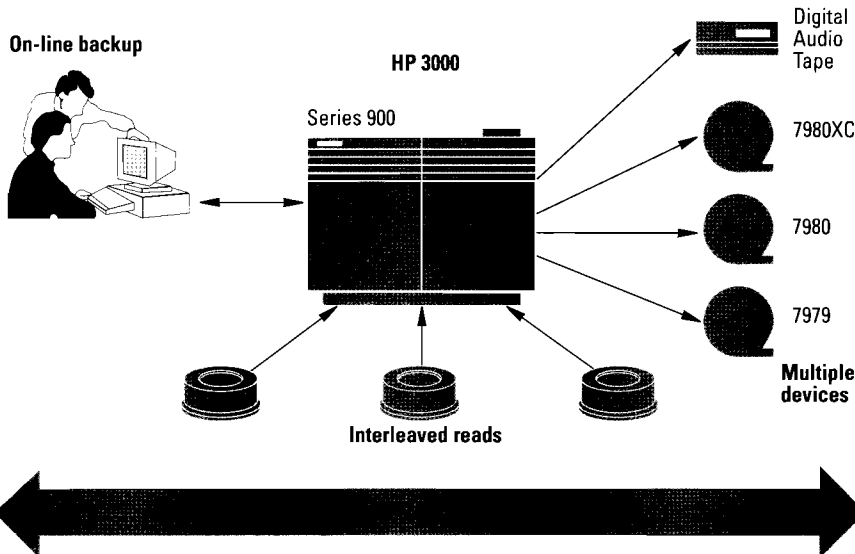
performance and capacity of backup devices, while TurboSTORE/XL II software on-line backup virtually eliminates downtime due to data backup, the primary cause of planned downtime.

TurboSTORE/XL II also introduces possibilities for true unattended operatorless data backup with the high capacity storage technologies of Digital Data Storage (DDS) and Rewritable Optical Disk. Figure 1 illustrates the features and benefits from the TurboSTORE/XL products. Table 1 lists the features associated with each of the five TurboSTORE/XL products.

Features

- software data compression boosts backup performance and capacity
- on-line backup virtually eliminates system downtime for backup
- Digital Data Storage (DDS) technology provides cost effective unattended backup to Digital Audio Tape (DAT)
- Optical Disk Autochanger support provides unattended data backup for the largest configurations
- up to eight backup devices running in parallel or serial can be stored to or restored from
- fast search capability minimizes time to locate individual files on Digital Audio Tape
- can utilize dissimilar tape device families such as 7980 and 7978
- takes full advantage of HP Mirrored Disk/XL disk failure protection and interleaved reads
- supports IBM and ANSI labeled tapes
- provides HP STORE/XL compatibility with operator interface and tape format

Figure 1. Features and benefits of HP TurboSTORE/XL products



HP Computer Museum
www.hpmuseum.net

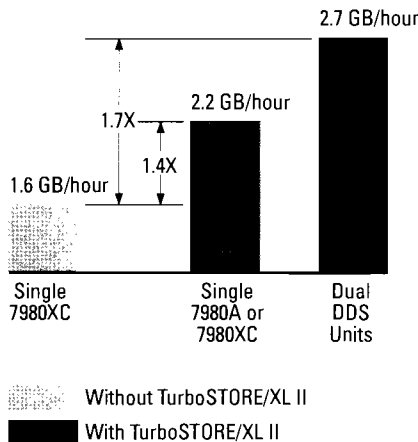
For research and education purposes only.

Software data compression cuts backup time

HP TurboSTORE/XL II increases backup performance through software data compression. For maximum flexibility two different data compression algorithms are provided. The fast algorithm provides on average 2.1 to 1 data compression and more than doubles backup device performance and capacity while requiring the least CPU resources. The high density algorithm provides on average 3.6 to 1 data compression and maximizes backup device capacity. Digital Audio Tape, Rewritable Optical Disk and 1/2-inch tape all realize performance improvement from software data compression. For example, a single 7980A tape drive on an HP3000 Series 960 using the fast data compression algorithm of TurboSTORE/XL II stores data at an effective rate of 2.2 Gbytes per hour after allowing for reel rewinds and reel changes¹. This is double the 7980A backup performance of 1.1 Gbytes per hour that is possible without software data compression. The high density compression algorithm requires more CPU resources but provides more maximum dedicated single device backup performance and capacity for high-end HP3000 Series 900 processors. Figure 2 illustrates the backup performance possible with the use of TurboSTORE/XL II software data compression.

Figure 2. Software Data Compression (2.1 to 1)

Up to 1.7X the backup performance for a Series/Server 960



Supports backup using Digital Data Storage

TurboSTORE/XL II supports the high capacity storage technology of Digital Data Storage. Digital Data Storage media are compact Digital Audio Tape (DAT) cassettes. Although much smaller than the tape reels they can replace, each DAT cassette can store up to 1.3 Gbytes of uncompressed data. This compares quite impressively with the 140 megabytes per reel capacity of 6250 GCR 1/2-tape. The high density data compression algorithm of TurboSTORE/XL II boosts the capacity of a DAT cassette to nearly 4.7 Gbytes of information and the backup rate potential to over 2 Gbytes per hour. In addition, TurboSTORE/XL supports fast-search functionality so that the time to access any individual file on Digital Audio Tape is minimized.

Supports data backup using Rewritable Optical Disk technology

TurboSTORE/XL II supports backup using Rewritable Optical Disk technology. Each optical media holds up to 650 megabytes of uncompressed data and retains data for at least ten years without maintenance. The HP Series 6300 Model 20GB/A Rewritable Optical Disk Library System holds up to 32 optical disk media for an uncompressed data capacity of over 20 gigabytes.

Stores to multiple backup devices simultaneously

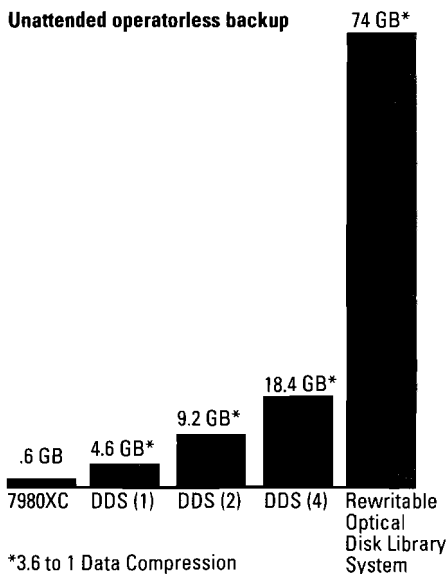
TurboSTORE/XL can store data to multiple backup devices running in parallel during data backup, and overcomes the performance bottleneck experienced by backup solutions limited to a single backup device. In addition, transfers from the disk subsystem are interleaved to preclude any possible disk I/O bottleneck. Using these features of TurboSTORE/XL and four 7980XC tape drives on a Series 955 the effective backup rate of approximately 6 Gbytes per hour is achieved. All TurboSTORE/XL products support storing data to dissimilar tape drives (such as the 7980 and 7978) and can store data to up to 8 devices in parallel.

¹ — Effective rates are dependent upon the type of data being compressed, output devices, system load, and CPU size.

True unattended data backup

TurboSTORE/XL II software data compression, support for multiple device store, and support for high capacity storage technologies such as Digital Data Storage and Optical Disk technology give true unattended data backup for HP3000 Series 900 systems. Nearly 4.7 gigabytes of data can be stored on a single Digital Audio Tape cassette with TurboSTORE/XL II high density software data compression. With four Digital Data Storage units it is possible to perform unattended backup for over 18 gigabytes of data. Using HP's Rewritable Optical Disk Library System it is possible to perform unattended data backup for up to 74 gigabytes of data. Figure 3 illustrates some of the unattended data backup capacities that are possible with TurboSTORE/XL II.

Figure 3. HP TurboSTORE/XL II Unattended Backup



Eliminates idle time during backup

TurboSTORE/XL allows the elimination of unproductive idle time spent waiting for 1/2-inch tapes to be rewound and changed during system backups. TurboSTORE/XL does this by storing sequentially to multiple tape drives. This means that after one tape is filled the backup automatically switches to filling a tape on another tape drive while the previous tape is simultaneously rewound. TurboSTORE/XL supports up to eight drives used in this way.

On-line data backup

For those environments where 24-hour-a-day system availability is critical, TurboSTORE/XL II can be ordered with on-line data backup capability. TurboSTORE/XL II On-Line Backup supports around the clock transaction processing without sacrificing data backups or requiring redundant mirrored disk drives. No modification of applications is required to take advantage of the optional on-line backup capabilities of TurboSTORE/XL II. The only impact on application processing is a short application downtime period of 5 minutes or less as the backup begins to ensure complete logical data integrity. After the backup is started, applications can continue processing throughout the duration and completion of the backup. TurboSTORE/XL II on-line backup is applicable to all types of application data and can be used in combination with any of the other features of TurboSTORE/XL II.

TurboSTORE/XL II on-line backup when used with HP Mirrored Disk/XL, gives full protection against disk failure

during on-line data backup. TurboSTORE/XL II is completely compatible with HP Mirrored Disk/XL, and the interleaved disk reads performed by TurboSTORE/XL II are augmented by the interleaved disk reads of HP Mirrored Disk/XL for additional gains in backup performance.

When using TurboSTORE/XL II data compression for unattended on-line data backup the less CPU-intensive fast data compression algorithm should be used in most cases. Although HP3000 systems with typical loads will experience satisfactory on-line backup performance using TurboSTORE/XL II data compression, heavily loaded systems can achieve higher on-line backup performance by utilizing the hardware data compression of 7980XC tape drives.

Multiple device restore

In addition to providing the multiple device backup capabilities of TurboSTORE/XL, TurboSTORE/XL II adds multiple device restore to provide fast data restore as well. This means that time spent restoring large amounts of data and files is minimized.

Supports both ANSI and IBM labeled tapes

TurboSTORE/XL II supports both ANSI and IBM tape labels. Tape labels help ensure that the correct tape is mounted and protect against operational errors that occur when the wrong tape is mounted. TurboSTORE/XL II support for IBM tape labels allows the easy interchange of information between HP3000s and IBM mainframes or any system supporting IBM tape labels.

HP TurboSTORE/XL II is a high availability component

TurboSTORE/XL II is a component of HP's High Availability Architecture for the HP3000 Series 900 family. This architecture builds on the foundation of HP3000 reliability leadership to provide true high availability for commercial on-line transaction processing. As a component of HP's high availability architecture, TurboSTORE/XL II gives fast and flexible data backup, unattended data backup, and unattended on-line data backup.

Full compatibility with HP STORE/XL operator interface and tape format

The command set of TurboSTORE/XL is an evolutionary superset of the HP STORE/XL operator interface with enhancements to support the new features of TurboSTORE/XL I and II. Because of this, minimal operator training is required to access the powerful features of TurboSTORE/XL.

The tape formats of TurboSTORE/XL I and II are also fully compatible with HP STORE/XL. Full compatibility allows for unrestricted interchange of data between TurboSTORE/XL and STORE/XL systems. To move data between MPE/V and MPE/XL systems, the STORE/V tape format or data communication services should be used.

System environment

TurboSTORE/XL I is supported on MPE/XL release 2.0 and beyond, while TurboSTORE/XL II is supported on MPE/XL release 2.2 and subsequent versions.

| | Multiple Devices | Software Data Compression, Labeled Tapes | On-Line Data Backup | Rewritable Optical Disk |
|-------------------------|------------------|--|---------------------|-------------------------|
| TurboSTORE/XL I 30319A | ■ | | | |
| TurboSTORE/XL II 36387A | ■ | ■ | | |
| TurboStore/XL II 36388A | ■ | ■ | ■ | |
| TurboStore/XL II 36397A | ■ | ■ | | ■ |
| TurboStore/XL II 36398A | ■ | ■ | ■ | ■ |

Table 1. TurboSTORE/XL product family capabilities

Ordering information

The TurboSTORE/XL product family capabilities are outlined in Table 1.

| Product number | Product description |
|----------------|---|
| 30319A | TurboSTORE/XL I |
| 36387A | TurboSTORE/XL II |
| 36388A | TurboSTORE/XL II with on-line backup |
| 36397A | TurboSTORE/XL II with support for optical disk |
| 36398A | TurboSTORE/XL II with support for on-line backup and optical disk |

Each of the products are available for the following options:

| Option number | for use with product numbers listed above |
|---------------|---|
| 310 | S/920, 922LX |
| 315 | S/922RX |
| 320 | S/925, 925LX, 922, 932 |
| 330 | S/935 |
| 335 | S/949 |
| 340 | S/950, 955, 960 |
| 350 | S/980/100 and 980/200 |

Reference the product numbers and system options when ordering. Full return credits are offered when upgrading from one version of TurboSTORE/XL to a higher level TurboSTORE/XL product. The right to use HP TurboSTORE/XL on an

HP3000 computer is subject to the terms and conditions of the Hewlett-Packard Software Purchase Agreement.

Documentation

The operation and functionality of HP TurboSTORE/XL products are documented in the following user's guides:

| Part number | Documentation description |
|-------------|--|
| 30319-90001 | HP TurboSTORE/XL I |
| 36388-90001 | HP TurboSTORE/XL II |
| 36398-90001 | HP TurboSTORE/XL II with support for rewritable optical disk |

For more information, call your local HP sales office listed in your telephone directory. Within the USA, call your nearest dealer or HP sales office at (800) 752-0900.

Technical information in this document is subject to change without notice.

© Copyright Hewlett-Packard Company 1991 All Rights Reserved. Reproduction, adaptation, or translation without prior written permission is prohibited except as allowed under the copyright laws.

Printed in USA M0391 5091-1071E