Overview

IBM continues to demonstrate commitment to performance with the introduction of 15,000 rpm disk drives for IBM TotalStorage Enterprise Storage Server (ESS). The 15,000 rpm drives, which are available in 18.2 GB and 36.4 GB capacities, provide new levels of throughput and performance. For a given RAID 5 rank comprised of 36.4 GB 15,000 rpm drives, random read and random write throughput can increase up to 80% compared to 10,000 rpm drives and can help you drive your workloads at significantly higher access densities (without worrying about performance degradation) or achieve significant service time advantages.

The ESS is also enhanced with new and expanded Peer-to-Peer Remote Copy (PPRC) solutions and options.

- **PPRC Extended Distance (PPRC-XD)**, a non-synchronous long distance copy option suitable for data migration and periodic offsite backup. PPRC-XD can operate at very long distances — distances well beyond the 103 km supported with PPRC synchronous transmissions — with the distance typically limited only by the capabilities of the network and channel extension technologies.
- Support for the CNT UltraNet Storage Director.
- Support the Cisco ONS 15540 and Nortel Networks OPTera Metro 5300 DWDMs
- Additional network connectivity options (including Fibre Channel and Ethernet/IP) when using the CNT UltraNet Storage Director or the INRANGE 9801 Storage Networking System.
- Support for Fibre Channel/FICON intermix on the INRANGE FC/9000 Director and the McDATA ED-6064 Director.
- PPRC, FlashCopy™, and Command Line Interface (CLI) support for the Compaq AlphaServer environment running Tru64 UNIX®.

**Key Prerequisites**

The following are supported on all ESS models:

- CNT UltraNet Storage Director
- Cisco ONS 15540 and Nortel Networks OPTera Metro 5300 DWDMs

The following are supported on the ESS Models F10 and F20:

- 18.2 GB and 36.4 GB disk eight-packs with 15,000 rpm drive
- PPRC Extended Distance
- Fibre Channel/FICON intermix (INRANGE and McDATA directors)
- Copy services and CLI support for Compaq Tru64 UNIX

Refer to the Technical Information section for additional prerequisites.

**Planned Availability Date**

May 17, 2002

- 18.2 GB and 36.4 GB disk eight-packs with 15,000 rpm drives
- PPRC Extended Distance

Refer to the Planned Availability Dates in the Description section for all other enhancements and features.

**At a Glance**

The ESS is enhanced with:

- Support for 18.2 GB and 36.4 GB 15,000 rpm drives, providing new levels of throughput and performance

- New and expanded PPRC solutions and options for long distance data copy and network connectivity:
  - PPRC Extended Distance, a non-synchronous long distance copy option to support data migration and periodic offsite backup
  - Support for the CNT UltraNet Storage Director
  - Support for the Cisco ONS 15540 and Nortel Networks OPTera Metro 5300 DWDMs
  - Additional network connectivity options (including Fibre Channel and Ethernet/IP) when using the CNT UltraNet Storage Director or the INRANGE 9801 Storage Networking System
  - Support for Fibre Channel/FICON intermix on the INRANGE FC/9000 Director and the McDATA ED-6064 Director

For ordering, contact:
Your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL
Reference: YE001

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
New Levels of Throughput and Performance with 15,000 rpm Drives

IBM continues to demonstrate commitment to performance with the introduction of 15,000 rpm disk drives for ESS. The 15,000 rpm drives, which are available in 18.2 GB and 36.4 GB capacities, provide new levels of throughput and performance. The new drives are the most recent addition to a long list of performance features offered to ESS customers.

For a given RAID 5 rank comprised of 36.4 GB 15,000 rpm drives, both random read and random write throughput can increase up to 80% compared to 10,000 rpm drives! This improvement translates into substantial price/performance benefits for the entire subsystem — an ESS populated with eight RAID 5 ranks of 15,000 rpm drives can provide up to 80% greater total subsystem random throughput for a cache standard workload than an ESS comparably configured with 10,000 rpm drives.

This latest enhancement can help you drive your workloads at significantly higher access densities (without worrying about performance degradation) or achieve significant service time advantages. For example, at an access density of 1.0, typical of many cache environments, a service time reduction of up to 25% can be achieved. In more demanding environments, an online transaction processing (OLTP) workload at a relatively stressed access density of 2.5 can enjoy a reduction of up to 40% in service time. These improvements may be even more significant for cache hostile OLTP workloads. Improved service times can lead to shorter batch processing windows or improved productivity because transactions complete more quickly.

The new levels of performance and throughput provided by the 15,000 rpm drives can lead to cost savings. For disk-intensive workloads, fewer disk drives may be required to achieve high disk utilization rates.

Your IBM disk marketing specialist can help you assess the potential benefits of 15,000 rpm drives in your environment.

PPRC Extended Distance (PPRC-XD) Offers New Solutions for Long Distance Data Copy

PPRC-XD brings new flexibility to the ESS and PPRC with the introduction of a non-synchronous long distance copy option suitable for data migration, transmission of database logs, and periodic offsite backup.

With PPRC-XD, updates are continually transferred to the secondary ESS at the remote site in a non-synchronous mode. This means updates to the ESS primary at the local site are considered complete (for example, ending status is returned to the application) before they are transmitted to the secondary ESS at the remote site. With a non-synchronous operation, the distance between the primary and secondary ESS will have only a minimal effect on the application response time. Therefore, PPRC-XD can operate at very long distances — distances well beyond the 103 km supported with PPRC synchronous transmissions — with the distance typically limited only by the capabilities of the network and channel extension technologies.

When operating in PPRC-XD mode, the ESS primary and secondary do not transition to full synchronous mode. This can result in a “fuzzy copy” at the remote site since application-dependent writes are not assured to be applied on the secondary ESS in the same sequence as they were written to the primary ESS. To obtain a consistent copy, PPRC-XD mode can simply be changed to PPRC-SYNC (synchronous mode). Upon reaching full duplex mode (consistency), the PPRC pairs can be temporarily suspended, followed by a FlashCopy on the secondary ESS, and then a resumption of PPRC-XD mode. This operation, which may take tens of seconds or less depending upon the level of I/O activity on the primary, provides a point-in-time consistent copy at the remote site which is suitable for data migration, backup, and disaster recovery purposes.

PPRC-XD is provided with the PPRC optional feature on the ESS (#182x). It is managed via a Web interface provided through the IBM TotalStorage ESS Specialist. It is also supported by the ESS Command Line Interface (CLI) in selected open systems environments and by TSO commands in z/OS™ and OS/390®.

New PPRC Channel Extension, DWDM, and Network Connectivity Options

IBM now supports the use of the following products with PPRC.

- CNT UltraNet Storage Director
- Cisco ONS 15540 DWDM
- Nortel Networks OP/Tera Metro 5300 DWDM

PPRC flexibility is further enhanced with support for new network connectivity options when using channel extenders. IBM now also supports the use of PPRC over all the network technologies that are currently supported by the CNT UltraNet Storage Director or the INRANGE 9801 Storage Networking System, including Fibre Channel, Ethernet/IP, ATM-OC3, and T1/T3.

These new options support the exploitation of existing or new communication infrastructures and technologies within metropolitan networks and the WAN to help optimize cost, performance, and bandwidth.

Fibre Channel/FICON Intermix Support

The ESS supports the Fibre Channel/FICON intermix on the INRANGE FC/9000 Fibre Channel Director (IBM 2042 Models 001 and 128) and the McDATA ED-6064 Enterprise Fibre Channel Director (IBM 2032 Model 064).

With Fibre Channel/FICON intermix, both FCP (Fibre Channel Protocol) and FICON upper level protocols can be supported within the same director when deployed independently by port. This new operational flexibility can help users to reduce costs with simplified asset management and improved asset utilization.

PPRC and FlashCopy Support Extended into the Compaq AlphaServer Environment

Support for the ESS PPRC and FlashCopy functions, as well as the new PPRC-XD function, is now available for the Compaq AlphaServer environment running Tru64 UNIX, enabling new business continuance and point-in-time copy solutions.

PPRC is a hardware-based disaster recovery solution that provides real-time mirroring of logical volumes within an ESS or to another ESS, which can be located up to 103 km from the primary machine. PPRC is a synchronous copy solution where write operations are made to both copies (primary and secondary) before they are considered to be done. PPRC-XD is a non-synchronous long distance copy solution ideal for data migration, transmission of database logs, and periodic offsite backup.

FlashCopy provides a near instantaneous copy of data to help minimize the downtime needed for data backup. FlashCopy creates a physical point-in-time copy of data and makes it possible to immediately access both the
source and target copies. By creating an “instant” copy, FlashCopy enables applications using either the source or the target to operate with only a minimal interruption to perform the FlashCopy.

PPRC and FlashCopy can be managed via the Web user interface provided through the ESS Specialist or via the CLI.

The CLI enables open systems hosts to invoke and manage FlashCopy and PPRC functions through batch processes and scripts. The CLI provides commands to query the status of ESS volumes and to execute Copy Services tasks that were previously saved using the ESS Specialist. By integrating CLI commands into host scripts, FlashCopy and PPRC functions can be integrated into new or existing host automation processes.

Planned Availability Dates

April 23, 2002:

- PPRC support for Cisco ONS 15540 and Nortel Networks OPTera Metro 5300

May 17, 2002:

- ESS LIC level 1.5.2, including support for:
  - PPRC Extended Distance
  - PPRC support for CNT UltraNet Storage Director
  - PPRC expanded network connectivity options
  - Fibre Channel/FICON intermix (INRANGE and McDATA directors)
  - Copy services and CLI support for Compaq Tru64 UNIX

- Disk Eight-Packs (15,000 rpm) (#2142/#2143)
- Step Ahead Disk Eight-Packs (15,000 rpm) (#2152/#2153)
- Step Ahead Annual Renewal (15,000 rpm) (#2172/#2173)

June 7, 2002:

- Disk eight-pack feature conversions

Statement of General Direction

IBM plans to support the intermix of 15,000 rpm drives with lower rpm drives of the same capacity within an ESS Model F10 and F20.

All statements regarding IBM’s plans, directions, and intent are subject to change or withdrawal without notice.

Reference Information

Refer to:

- Hardware Announcement 102-050, dated February 18, 2002 (IBM TotalStorage Enterprise Storage Server Enhances TPF Support and Expands Fibre Cable Options)
- Hardware Announcement 101-342, dated November 13, 2001 (IBM TotalStorage Enterprise Storage Server Now Includes a 72.8 GB Drive Option for Improved Scalability and Price/Performance)
- Hardware Announcement 101-341, dated November 13, 2001 (IBM TotalStorage Enterprise Storage Server Introduces New Configuration Options)

Trademark:

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Publications

The following publication has been updated to reflect this announcement:

<table>
<thead>
<tr>
<th>Title</th>
<th>Order Number</th>
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<tbody>
<tr>
<td>IBM TotalStorage™ Enterprise Storage</td>
<td>GC26-7294</td>
</tr>
<tr>
<td>Server Introduction and Planning Guide</td>
<td></td>
</tr>
</tbody>
</table>

This publication, as well as other ESS publications, is available at:


The Publications Center is a worldwide central repository for IBM product publications and marketing material. This site offers customized search functions to locate publications. This site also offers access to the Publication Notification System (PNS), a site where you can subscribe to receive e-mail notifications regarding new or revised publications that are of interest to you.

The Publications Center can be accessed at:

http://www.ibm.com/shop/publications/order

Technical Information

Specified Operating Environment

Hardware Requirements: The ESS ships with IBM Licensed Internal Code (LIC) that is licensed for use by a customer on a specific machine, designated by serial number, under the terms and conditions of the IBM Customer Agreement or the IBM Agreement for Licensed Internal Code.

The following new functions are supported on the ESS Models E10, E20, F10, and F20 and require ESS LIC level 1.3.4.41, or later:

- PPRC support for Cisco ONS 15540 DWDM
- PPRC support for Nortel Networks OPTera Metro 5300 DWDM

The following new function is supported on the ESS Models E10, E20, F10, and F20 and requires ESS LIC level 1.5.2, or later:

- PPRC support for CNT UltraNet Storage Director
- PPRC expanded network connectivity options

The following new functions are supported on the ESS Models F10 and F20 (except where noted) and require ESS LIC level 1.5.2, or later:

- Disk Eight-Pack (15,000 rpm) (#2142/#2143)

- Step Ahead Disk Eight-Pack (15,000 rpm) (#2152/#2153) (Model F20 only)
- Step Ahead Annual Renewal (15,000 rpm) (#2172/#2173) (Model F20 only)
- PPRC Extended Distance
- Fibre Channel/FICON™ intermix support (INRANGE and McDATA directors)
- Copy services and CLI support for Compaq Tru64 UNIX®

15,000 rpm Disk Eight-Packs

The 15,000 rpm disk eight-pack features (#214x/#215x) cannot be intermixed within an ESS with feature number 212x/feature number 213x disk eight-pack features for the same drive capacity. Refer to “Planning for 15,000 rpm Drives” under the Customer Responsibilities section for additional information.

PPRC Extended Distance (PPRC-XD)

PPRC-XD is provided with the PPRC optional feature on the ESS (#182x). A complete and current list of supported environments is available at:


Implementation of PPRC (and PPRC-XD) between two ESSs requires the PPRC feature to be purchased and installed on both the primary and secondary ESS. Additionally, PPRC (and PPRC-XD) requires the installation of an ESCON® Host Adapter (#3011 or #3012) on both the primary and secondary ESS. The adapter provides the communications link between the primary and secondary server.

New PPRC Channel Extension, DWDM, and Network Connectivity Options

A complete and current list of PPRC supported environments, configurations, networks, and products is available at:


Cisco, CNT, INRANGE Technologies, and Nortel Networks should be consulted regarding hardware and software prerequisites when using their products in an ESS PPRC configuration.

Fibre Channel/FICON Intermix Support

Intermix support on the INRANGE FC/9000 Fibre Channel Director (IBM 2042 Models 001 and 128) and McDATA ED-6064 Enterprise Fibre Channel Director (IBM 2032 Model 064) is provided at the port level (director ports operate in either Fibre Channel or FICON mode).

A list of supported environments (servers, adapters, and so forth) and hardware and software prerequisites for the INRANGE FC/9000 is available at:
For implementation and operational details, refer to Planning Information — Customer Responsibilities section.

Copy Services and CLI Support for the Compaq Tru64 UNIX Environment

PPRC, FlashCopy™, and the CLI for the Compaq AlphaServer environment are supported on:

• Tru64 UNIX Versions 4.0F and 4.0G with ASE 1.6 clustering
• Tru64 UNIX Version 5.1 and 5.1A with TruCluster 5.1 and 5.1A

PPRC and FlashCopy are optional features on the ESS (#182x for PPRC and #183x for FlashCopy). The CLI is provided with the ESS at no additional charge. P. Implementation of PPRC between two ESSs requires the PPRC feature to be purchased and installed on both the primary and secondary ESS. Additionally, PPRC requires the installation of an ESCON Host Adapter (#3011 or #3012) on both the primary and secondary ESS. The adapter provides the communications link between the primary and secondary server.

Planning Information

Customer Responsibilities

Physical Planning

Physical planning information can be found in the IBM TotalStorage Enterprise Storage Server™ Introduction and Planning Guide (GC26-7294).

Planning for 15,000 rpm Drives: Your disk marketing specialist can help you plan and anticipate required levels of performance by analyzing your current configuration, utilization and performance, and modeling proposed configurations.

The 15,000 rpm disk eight-pack features (#214x/#215x) cannot be intermixed within an ESS with #212x/#213x disk eight-pack features for the same drive capacity.

• Feature number 2142/feature number 2152 (18.2 GB, 15K rpm) cannot be intermixed with feature number 2122/feature number 2132 (18.2 GB, 10K rpm)

• Feature number 2143/feature number 2153 (36.4 GB, 15K rpm) cannot be intermixed with feature number 2123/feature number 2133 (36.4 GB, 10K rpm)

The 15,000 rpm disk eight-pack features can be intermixed within an ESS as follows:

• Feature number 2142/feature number 2152 (18.2 GB, 15K rpm) can be intermixed with:
  - Feature number 2121 (9.1 GB, 10K rpm)
  - Feature number 2122/feature number 2132 (18.2 GB, 10K rpm)
  - Feature number 2143/feature number 2153 (36.4 GB, 15K rpm)

To install 15,000 rpm disk eight-packs of a given capacity into an ESS which already contains disk eight-packs of the same given capacity (but at 7,200 or 10,000 rpm), those existing disk eight-packs must first be either converted to 15,000 rpm disk eight-packs (of the same capacity) or to disk eight-packs of a different capacity using the disk eight-pack feature conversions.

Disk Eight-Pack Feature Conversions

Disk eight-pack feature conversions are supported for the following disk eight-pack features:

• Feature number 2121 (9.1 GB drives) conversion to feature number 2143 (36.4 GB (15K rpm) drives)
• Feature number 2122 (18.2 GB drives) conversion to feature number 2142 (18.2 GB (15K rpm) drives)
• Feature number 2122 (18.2 GB drives) conversion to feature number 2143 (36.4 GB (15K rpm) drives)
• Feature number 2142 (18.2 GB (15K rpm) drives) conversion to feature number 2143 (36.4 GB (15K rpm) drives)
• Feature number 2142 (18.2 GB (15K rpm) drives) conversion to feature number 2124 (72.8 GB (15K rpm) drives)
• Feature number 2123 (36.4 GB drives) conversion to feature number 2143 (36.4 GB (15K rpm) drives)
• Feature number 2143 (36.4 GB (15K rpm) drives) conversion to feature number 2124 (72.8 GB drives)

These feature conversions must be ordered in pairs of the same type.

The disk eight-pack feature conversion requires the removal of disk eight-packs from the ESS. Removing logically configured disk eight-packs requires the deconfiguration of all disk eight-packs on the SSA loop (not just the deconfiguration of the eight-packs to be removed).

Data contained on the affected SSA loop is not preserved during the deconfiguration. However, data on the remaining SSA loops is not affected and can continue to be accessed.

The customer is responsible for making a copy of the data contained on the affected SSA loops prior to the deconfiguration and restoring the data after the installation of the new disk eight-packs has been completed.

IBM is not responsible for any data contained on the returned disk eight-packs. As required by customer policies and practices, the customer is responsible for erasing and/or invaliding data on disk eight-packs before they are removed from the ESS by IBM service personnel.

The logical configuration of the new disk eight-packs is a customer responsibility.
The additional capacity provided by the new disk eight-packs may require the need to purchase an advanced function license upgrade for Parallel Access Volumes (PAV), Extended Remote Copy (XRC), PPRC, and FlashCopy. The installation of a license upgrade is a concurrent action.

The additional capacity may also require an increase in the maximum number of logical subsystems (LSS) that can be configured. This modification to increase the maximum is a non-concurrent action. Refer to the IBM TotalStorage Enterprise Storage Server Introduction and Planning Guide (GC26-7294) for additional information.

PPRC Extended Distance (PPRC-XD)
The implementation and use of PPRC-XD requires appropriate planning. Detailed information can be found in the following IBM Redbook:

- IBM TotalStorage Enterprise Storage Server: PPRC Extended Distance (SG24-6568)

Implementation and planning services for PPRC-XD are also offered by IBM Global Services (IGS). For additional information, contact your IBM representative or visit:

http://www.ibm.com/services

PPRC-XD is provided with the PPRC licensed feature (#182x). The license must be equal to or greater than the total capacity of the ESS. When purchasing a license for a Step Ahead configuration (Model F20 only), the license must be equal to or greater than the total capacity of the machine (including the Step Ahead capacity). The PPRC license must be purchased for both the primary and secondary ESS. If FlashCopy will be used in conjunction with PPRC-XD, the FlashCopy licensed feature (#183x) must also be purchased for each ESS on which it will be used.

PPRC (and PPRC-XD) requires the installation of at least one ESCON Host Adapter (#3011 or #3012) on each ESS to provide the communications link between the ESS primary and ESS secondary server. For highest availability, IBM recommends that more than one ESCON adapter per ESS be used for the PPRC connectivity.

PPRC (and PPRC-XD) is supported with the use of ESCON Directors, DWDMs, and channel extenders. A complete and current list of supported environments, configurations, networks, and products is available at:


When using channel extender products with PPRC, the channel extender vendor will determine the maximum distance supported between the primary and secondary ESS. CNT and INRANGE should be contacted for their distance capability, line quality requirements, and WAN attachment capabilities.

New PPRC Channel Extension, DWDM, and Network Connectivity Options
PPRC is supported with the use of ESCON Directors, DWDMs, and channel extenders. A complete and current list of supported environments, configurations, networks, and products is available at:


Evaluation, qualification, approval, and support of PPRC configurations using channel extender products is the sole responsibility of the channel extender vendor. CNT and INRANGE should be contacted for their distance capability, line quality requirements, and WAN attachment capabilities.

When using PPRC as a synchronous copy solution, prior approval must be received from IBM if the distance between the primary and secondary ESS will exceed 103 km. Approval can be requested by submitting a Request for Price Quotation (RPQ). The RPQ should include information on distance between sites, the channel extension technology, the type of telecom line, the amount of network bandwidth, the ESS capacity, and a general description of the workload.

Fibre Channel/FICON Intermix Support
Implementation details and operational information for using intermix with the INRANGE FC/9000 Director is available at:

http://www.inrange.com/ibm

For implementation details and operational information for using intermix with the McDATA ED-6064 Director, review the FICON/FCP Intermix white paper that is available at:

http://www.mcdata.com/ibm

PPRC and FlashCopy for the Compaq AlphaServer Environment
The implementation and use of PPRC and FlashCopy require appropriate planning. Detailed information can be found in ESS publications and IBM Redbooks. Implementation and planning services for PPRC and FlashCopy are also offered by IBM Global Services (IGS). For additional information, contact your IBM representative or visit:

http://www.ibm.com/services

PPRC and FlashCopy are licensed features (#182x for PPRC and #183x for FlashCopy). The license must be equal to or greater than the total capacity of the ESS. When purchasing a license for a Step Ahead configuration (Model F20 only), the license must be equal to or greater than the total capacity of the machine (including the Step Ahead capacity).

For PPRC, a license must be purchased for both the primary and secondary ESS. PPRC also requires the installation of at least one ESCON Host Adapter (#3011 or #3012) on each ESS to provide the communications link between the ESS primary and ESS secondary server. For highest availability, IBM recommends that more than one ESCON adapter per ESS be used for the PPRC connectivity.

When using PPRC as a synchronous copy solution, prior approval must be received from IBM if the distance between the primary and secondary ESS will exceed 103 km. Approval can be requested by submitting an RPQ. The RPQ should include information on distance between sites, the channel extension technology, the type of telecom line, the amount of network bandwidth, the ESS capacity, and a general description of the workload.

Cable Orders: No additional cables are required.

Security, Auditability, and Control
This product uses the security and auditability features of the host hardware, host software, and/or application software to which it is attached.

The customer is responsible for evaluation, selection, and implementation of security features, administrative
procedures, and appropriate controls in application systems and communications facilities.

**Terms and Conditions**

This product is available for purchase under the terms of the IBM Customer Agreement.

IBM hardware products are manufactured from new parts and used parts. In some cases, the hardware product may have been previously installed. Regardless, IBM’s warranty terms apply.

**Prices**

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<th>Description</th>
<th>Feature Number</th>
<th>Purchase Price</th>
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<td>18.2 GB to 18.2 GB (15K rpm) Disk Drives</td>
<td>$38,000</td>
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<td>2122</td>
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<td>$52,000</td>
</tr>
</tbody>
</table>

^1 Parts removed or replaced become the property of IBM and must be returned.

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