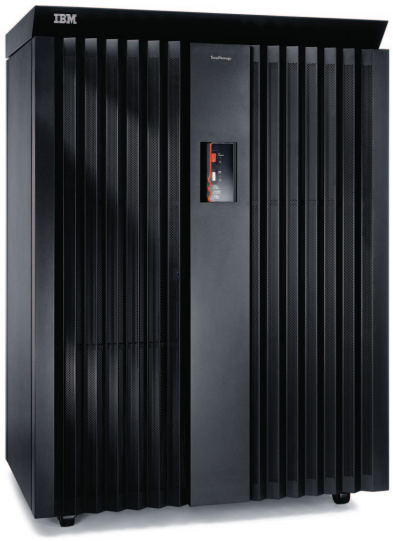
A high-performance resilient disk storage solution for systems across the enterprise

IBM TotalStorage Enterprise Storage Server Model 800



Highlights

- ***Supports storage sharing for a wide variety of heterogeneous operating environments***
- ***Designed to provide outstanding performance scaling up to 55.9TB physical capacity***
- ***Offers high availability and resiliency to support enterprise mission-critical business applications***
- ***Supports fast data transfer rates for mixed server environments with a wide variety of host attachment interfaces***
- ***Helps increase administrative productivity through efficient, centralized management***

e-business on demand

The move to e-business on demand™ presents companies with both significant opportunities and critical challenges. A whole new world of potential customers, automated and streamlined processes and new revenue streams are being fueled by the on demand world. Consequently, companies also face increasing requirements for more information to be universally available online, around the clock, every day of the year.

To address the unique requirements of the on demand world—where massive swings in the demands placed on storage systems are common and continuous operation is imperative—companies must deploy high performance, autonomic, intelligent storage technologies that can offer data protection and functions to support near continuous availability.

The IBM® TotalStorage® Enterprise Storage Server® (ESS) helps set new standards in performance, automation and integration as well as capabilities

designed to support near continuous availability to data for the on demand world. This storage system also supports many advanced copy functions, designed to help increase data availability during planned outages and protect data from planned and unplanned outages. These functions are designed to provide important disaster recovery and backup protection.

Shared storage for major server platforms

Many types of server platforms can concurrently attach to the ESS—including @server® iSeries™ and AS/400®; Linux, Novell NetWare, Windows® NT, Windows 2000®, Microsoft® Windows Server 2003 or SGI Origin servers with IRIX OS; @server zSeries® and S/390®; IBM @server pSeries® and IBM @server xSeries® servers as well as many types of UNIX servers. As a result, ESS is suitable for growing organizations with multiple heterogeneous servers.

Resiliency Family for business continuance

With more business-critical information processing being performed on distributed systems (running different operating systems), the ESS is designed to offer outstanding value while delivering excellent performance. The ESS does more than simply enable shared storage across enterprise platforms—it can improve the performance, availability, scalability and manageability of enterprise-wide storage resources through a variety of advanced copy functions.

These ESS advanced copy services are part of the core technology of the IBM TotalStorage Resiliency Family. They are building blocks of a resilient infrastructure that is designed to support near continuous operations.

FlashCopy® V1

FlashCopy V1 is an advanced, fast replication facility designed to help reduce application outages needed for backups and other copy applications.

FlashCopy V1 NOCOPY option

FlashCopy's "copy on write" NOCOPY option is designed to allow flexible reuse of disk capacity that would otherwise be dedicated to copy operations. With the NOCOPY option, rather than a physical byte-for-byte copy of the source volume, the only data copied to the target is that which is about to be changed or overlaid by the application.

FlashCopy V2

The ESS now supports FlashCopy V2, which includes all the features of FlashCopy V1 as well as many enhancements designed to help improve capacity management and utilization. Among these enhancements are:

Data Set FlashCopy

This feature offers a new level of granularity for the z/OS® environment, helping allow more efficient use of the ESS capacity. Data Set FlashCopy allows the source and target copy to be different sizes and allows the copied data to reside at a different location in the volume.

Multiple Relationship FlashCopy

This function is designed to allow a volume to participate in multiple FlashCopy relationships (up to 12 simultaneous relationships), so that multiple copies of the same data can be made for testing, backup and other applications. This feature is designed to offer excellent flexibility and capacity management and utilization.

Incremental FlashCopy

Incremental FlashCopy offers the ability to track and record changes that are made to the source and

target volumes after the establishment of FlashCopy relationships. This allows the ability to refresh a LUN or volume to the source or target's point in time content using only the changed data. The refresh can occur in either direction. It is designed to offer flexibility and fast FlashCopy completion times.

Peer-to-Peer Remote Copy (PPRC) V1
PPRC V1 includes:

PPRC Metro Mirror (Synchronous), a remote data-mirroring technique for z/OS and open systems designed to maintain an up to date current copy of the local application data at a remote site within the metropolitan area (typically up to 300 km away using DWDM).

PPRC Global Copy (Extended Distance) is designed as an asynchronous long distance copy function for z/OS and open systems that is appropriate for remote data migration, offsite backups and transmission of inactive database logs at virtually unlimited distances.

Peer-to-Peer Remote Copy (PPRC) V2
Peer-To-Peer Remote Copy (PPRC) V2 includes all of the functionality of PPRC V1 in addition to the following:

PPRC Global Mirror (Asynchronous), a remote data mirroring function for z/OS and open systems. It maintains a remote mirror of data asynchronously at virtually unlimited distances in a 2-site configuration. It is designed to provide a high-performance, cost-effective global distance data replication and disaster recovery/backup solution.

PPRC Metro/Global Copy (Asynchronous cascading),
a remote mirroring function for z/OS and open systems. Using PPRC Metro Mirror and Global Copy, it is designed to maintain a copy of data asynchronously at virtually unlimited distances in a 3 site cascading configuration. It is designed to provide high-performance data replication from a primary site to a secondary site that is within metropolitan distances away. It then mirrors that data to a third site which can be global distances away. It provides a 3 site global distance disaster recovery solution.

PPRC support of Fibre Channel
This allows the communications link between the PPRC primary and secondary ESS Model 800s to be Fibre Channel. The support of Fibre Channel for the PPRC link may allow a significant reduction in the PPRC link infrastructure when compared to ESCON®, while delivering similar or better performance.

Extended Remote Copy (XRC)
zSeries Global Mirror (XRC) is a remote mirroring function available for the z/OS and OS/390® operating systems. It is designed to maintain a copy of the data asynchronously at a remote location over nearly unlimited distances, and is designed to provide premium throughput and data protection regardless of the distance to the secondary site.

zSeries Metro/Global Mirror (3-site XRC and PPRC Metro Mirror), a mirroring capability which utilizes zSeries Global Mirror (XRC) to mirror primary site data to a location long distances away and uses PPRC Metro Mirror to mirror that data to a location within the metropolitan area, enabling a 3-site high availability and disaster recovery zSeries solution.

High availability to safeguard data access
Support for nearly continuous operations is built into the ESS. The ability to implement RAID-5 and RAID-10 disk arrays helps provide data protection while remote copy technologies are designed to allow fast data

backup and disaster recovery. The ESS features dual active processing clusters with failover switching, hot spares, hot-swappable disk drives, mirrored write cache and redundant power and cooling.

The ESS also contains integrated proactive self-diagnostics to help prevent and reduce downtime by constantly monitoring system functions.

For example, Predictive Failure Analysis can proactively notify you of many pending issues with select hardware components to help you remedy difficulties before they affect performance.

A technician can be dispatched to make repairs, often before the problem is noticed by data center staff. Maintenance—including licensed internal code upgrades—often can be performed without interrupting operations.

Built-in flexibility

The ESS is designed to provide outstanding flexibility, including intermixable disk sizes and speeds to help optimize price/performance/scalability; intermixable RAID-5 and RAID-10 protection; independent scalability of disk capacity, cache size and host attachments; customer-controlled logical volumes sizes and online reassignment of capacity among servers.

Scalability for fast-growing environments

The ESS is well suited for e-business and other applications with unpredictable growth requirements. It is designed to provide high scalability while maintaining excellent performance.

Disk drives for the ESS are provided as integrated packages of eight disk drives (known as eight-packs). Disk drive capacities include 10,000 rpm 18.2GB, 36.4GB, 72.8GB and 145.6GB drives and 15,000 rpm 18.2GB, 36.4GB and 72.8GB drives (physical capacity).

ESS Model 800 can be configured with up to 384 disk drives, when used with 145.6GB disks, yields a physical capacity of up to 55.9TB.

Delivering storage networking value

ESS can add value to Storage Area Networks (SANs). The ESS is designed to handle the basics well, including high-speed 2 Gigabit Fibre Channel attachments, the ability to share each Fibre Channel port among heterogeneous servers and built-in support for LUN masking (SAN security). And the ESS goes further, supporting a Network Attached Storage (NAS) gateway designed to allow the ESS to handle simultaneously both traditional block I/O over a SAN as well as file I/O over a TCP/IP network.

Total cost of ownership

ESS is an excellent choice to help lower costs. Key ESS features such as advanced business continuance functions, performance, scalability, ability to mix and match drive capacity and speeds, heterogeneous connectivity and the flexibility offered by an open software architecture provide a few reasons why ESS offers excellent value. It is an excellent choice for storage consolidation and an intelligent choice if a low Total Cost of Ownership is desired.

ESS optimization for IBM @server zSeries

The business continuance capabilities of the IBM TotalStorage Enterprise Storage Server are integrated with zSeries Geographically Dispersed Parallel Sysplex™ (GDPS®) environments. GDPS is one of the leading availability solutions for

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Physical disk storage capacity	582GB to 55.9TB
Cache size	8, 16, 24, 32 or 64GB
Host server attachments	Up to 32 SCSI or ESCON ports, up to 16 Fibre Channel/FICON ports, and intermix configurations
Physical characteristics	
Dimensions	75.25" H x 54.50" W x 35.75" D (1913 mm x 1383 mm x 909 mm)
Max Weight	2,650 lb. (1204 kg)
Operating environment	
Temperature	60° to 90° F (16° to 32° C)
Relative humidity	20% to 80%
Wet bulb maximum	73° F (23° C)
Caloric value	16,000 BTU/hr
Power supply	Three phase 50/60 Hz
Electrical power	6.4 kVA
Supported systems[1]	

zSeries server installations. It is a multi-site solution designed to provide the capability to manage the storage and server remote copy configurations to help enable near transparent disaster recovery and continuous operations. The GDPS Open LUN Management capability can provide a cross-platform disaster recovery capability across both IBM @server zSeries and open systems data.

Parallel Access Volumes
Previous S/390 systems allowed only one I/O operation per logical volume at a time. Now, it is designed to help improve performance by enabling multiple I/Os from any supported operating system to access the same volume at the same time.

Multiple Allegiance
This feature is designed to enable different operating systems to perform multiple, concurrent I/Os to the same logical volume—helping to reduce queuing and significantly increase performance. By enabling the ESS to process more I/Os in parallel, Multiple Allegiance and optional Parallel Access Volumes can help improve performance and enable more effective use of larger volumes. This can help provide simplified storage management at a reduced cost.

Priority I/O Queuing
The storage server helps important jobs gain priority access to storage resources. With Priority I/O Queuing,

the ESS is designed to use information provided by the OS/390 Workload Manager to manage the sequence in which I/Os are processed—matching I/O priority to application priorities.

A complete management solution

The IBM TotalStorage software family of products offers an integrated storage management toolset designed to enable storage administrators to centrally monitor and manage the ESS.

The IBM TotalStorage Enterprise Storage Server Specialist helps storage administrators control and manage storage assets for the ESS. With a browser interface, storage administrators can access the ESS Specialist from work, from home or on the road through a network connection.

The IBM TotalStorage Enterprise Storage Server Expert helps storage administrators monitor the performance of all connected IBM Enterprise Storage Servers in the enterprise. This innovative software tool is designed to provide performance statistics and flexible asset management, and tracks a variety of capacity information through a common, available browser interface. As such, this optional tool can help enable administrators to centrally manage all Enterprise Storage Servers located anywhere in the enterprise.

For more information

For more information, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/totalstorage/ess.

respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.

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[1] For more details on supported servers, visit **ibm.com**/totalstorage/ess.

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