

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



IBM TotalStorage Enterprise Storage Server Models F10 and F20



IBM TotalStorage Enterprise Storage Server

Highlights

- **Provides superior storage sharing for UNIX®, Windows NT®, Windows® 2000, Novell® NetWare®, AS/400®, S/390®, IBM®@server iSeries™, IBM®@server pSeries™, and IBM®@server zSeries™ servers**
 - **Provides high performance with two powerful four-way RISC SMP processors, large cache and serial disk attachment**
 - **Features industry-standard, state-of-the-art copy services—for rapid backup and disaster recovery**
 - **Uses redundant hardware and RAID 5 disk arrays to provide high availability for mission-critical business applications**
- **Provides fast data transfer rates with attached hosts via Fibre Channel, UltraSCSI, ESCON® and FICON™ interfaces**
 - **Increases administrative productivity by centralizing operations management and providing users with a single interface through a Web browser**
 - **Enables enterprises with multiple heterogeneous hosts to scale up to 26.9TB raw disk capacity while maintaining excellent performance**
- Shared storage for all major types of servers**
- The IBM TotalStorage™ Enterprise Storage Server™ (ESS) is a second-generation Seascape® disk storage system that provides industry-leading availability, performance, manageability and scalability. Virtually all types of servers can concurrently attach to the ESS—including S/390, Windows NT, Windows 2000, Novell NetWare, AS/400 and many types of UNIX servers. As a result, the ESS is ideal for growing organizations with multiple heterogeneous servers.
- Enterprise-strength storage for distributed systems**
- With more business-critical information processing being performed on distributed systems (running several different operating systems), the IBM ESS addresses the need to protect and manage distributed data while maintaining 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 powerful functions:
- *FlashCopy™ provides fast data duplication capability. This option helps eliminate the need to stop applications for extended periods of time in order to perform backups and restores.*
 - *Peer-to-Peer Remote Copy maintains a synchronous copy (always up-to-date with the primary copy) of data in a remote location. This backup copy of data can be used to quickly recover from a failure in the primary system without losing any transactions—an optional capability that can literally keep your e-business applications running.*
 - *Extended Remote Copy (XRC) provides a copy of OS/390® data at a remote location (which can be connected using telecommunications lines at unlimited distances) to be used in case the primary storage system fails. The Enterprise Storage Server enhances XRC with support for unplanned outages. In the event of a telecommunications link failure, this optional function enables the secondary remote copy*

Disaster recovery protection in a scalable, flexible disk system

to be resynchronized quickly—without requiring duplication of all data from the primary location—for full disaster recovery protection.

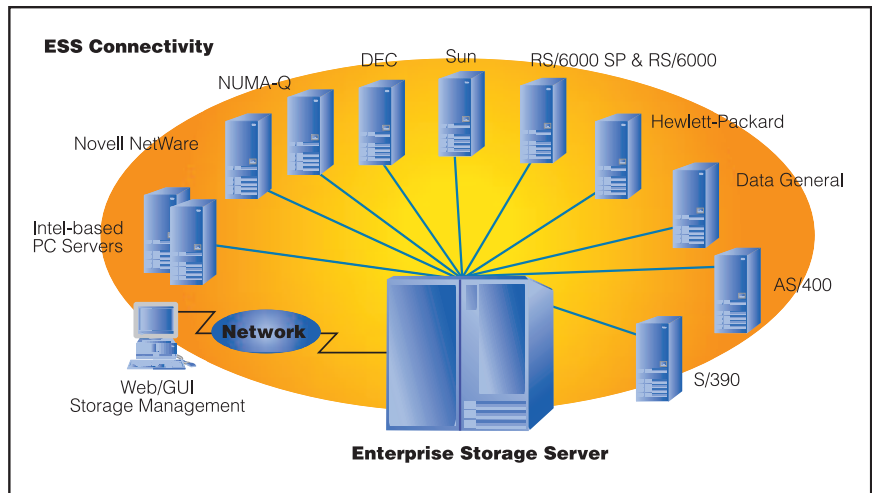
- Custom volumes enable volumes of various sizes to be defined for S/390 servers, enabling administrators to configure systems for optimal performance.
- Storage partitioning uses storage devices more efficiently by providing each server access to its own pool of storage capacity. Storage pools can be shared among multiple servers.

High availability to safeguard data access

Support for 24x7 operations is built into the ESS. RAID 5 disk arrays help provide data protection while remote copy technologies allow fast data backup and disaster recovery. The ESS features dual active processing clusters with fail-over switching, hot spares, hot-swappable disk drives, nonvolatile fast write cache and redundant power and cooling.

The ESS also contains integrated functions to help prevent storage server downtime by constantly monitoring system functions.

If a potential problem is detected, the ESS automatically “calls home” to report the problem.



The IBM TotalStorage Enterprise Storage Server provides superior storage sharing for a range of servers.

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

Built-in flexibility

The ESS provides outstanding flexibility with many options. The system consists of disk drives attached to a storage server via high-speed serial interfaces. A variety of host attachment options (UltraSCSI, ESCON, FICON and Fibre Channel) enable the system to be optimized for the specific requirements of each computing environment.

Scalability for fast-growing environments

The ESS is especially designed for e-business and other applications with unpredictable growth requirements. It provides unprecedented scalability while maintaining excellent performance.

Disk drives for the ESS are provided as integrated packages of eight disk drives (known as eight-packs). Four disk drive capacities are available: 9.1GB, 18.2GB, 36.4GB, and 72.8GB.

The server's base frame can hold a maximum of 16 eight-packs which, when used with 72.8GB disks, yields a total usable RAID 5 protected capacity of nearly 6.7TB (8.9TB raw capacity). An add-on expansion enclosure is the same size as the base frame and can contain twice as many eight-packs—up to 256 hard disk drives—to deliver a maximum usable, protected capacity of more than 22.4TB (26.9TB raw capacity).

IBM TotalStorage Enterprise Storage Server at a glance

2105 Enterprise Storage Server	2105 Model F10	2105 Model F20
Usable, RAID 5 disk storage capacity ¹	420GB to 3.3TB	420GB to 22.4TB
Raw disk storage capacity	582GB to 4.4TB	582GB to 26.9TB
Cache size	8, 16, 24 or 32GB	8, 16, 24 or 32GB
Host server attachments	Up to 32 SCSI or ESCON ports, up to 16 Fibre Channel/FICON ports, and intermix configurations	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)	75.25" H x 54.50" W x 35.75" D (1913 mm x 1383 mm x 909 mm)
Weight	2,160 lb. (980 kg)	2,590 lb. (1175 kg)

Operating environment

Temperature	60 to 90° F (16 to 32° C)	60 to 90° F (16 to 32° C)
Relative humidity	20 to 80%	20 to 80%
Wet bulb maximum	73° F (23° C)	73° F (23° C)
Caloric value	11,000 BTU/hr	16,000 BTU/hr
Power supply	Single phase 50/60 Hz	Three phase 50/60 Hz
Electrical power	3.5 kVA	5.0 kVA

Supported systems²

S/390 and IBM @server zSeries (z/OS®, OS/390, VM, VSE, TPF, Linux®); AS/400; IBM @server iSeries; Compaq; Data General; DEC; Hewlett-Packard; Intel™-based servers (Novell NetWare, Windows NT, Windows 2000); RS/6000®; RS/6000 SP; IBM @server pSeries; NUMA-Q; Sun™

¹On S/390 servers, track formatting can impact effective usable capacity.

²For more details on supported servers, visit ibm.com/storage/ess.

Built-in investment protection

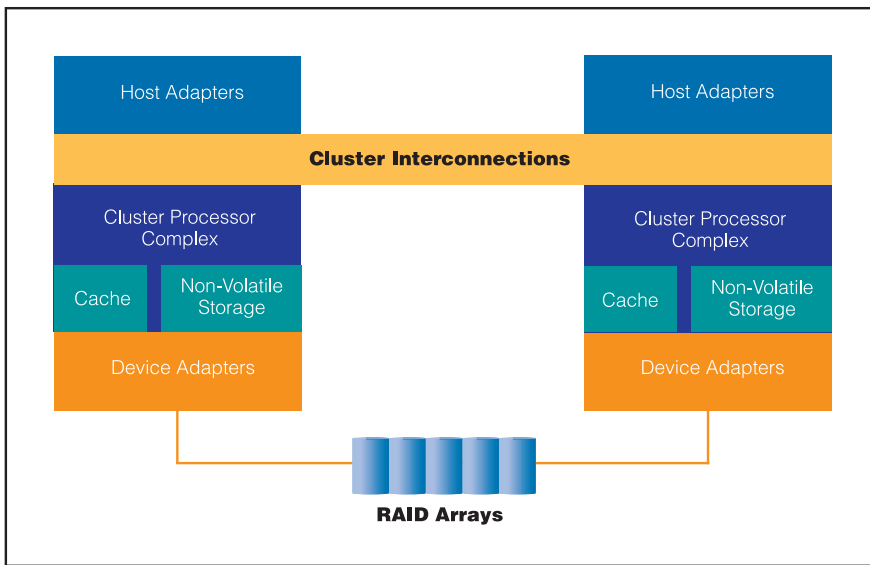
The ESS helps protect existing investments in IBM storage devices. For example, disk capacity from IBM TotalStorage 7133 Serial Disk System drawers (Models 020 and D40) can be attached to the ESS. Furthermore, first-generation (Models E10 and E20) ESS may be upgraded to the F-models, yielding up to 100% improvement in throughput.

This upgrade protects customers' investments in ESS technology and enhances the scalability of installed ESS.

Performance enhancements for S/390 servers

Building on the capabilities of the IBM Versatile Storage Server and the RAMAC® Virtual Array family, the ESS improves function and performance for S/390 servers:

- *Multiple Allegiance: This feature enables different operating systems to perform multiple, concurrent I/Os to the same logical volume — reducing queuing and significantly increasing performance. By enabling the ESS to process more I/Os in parallel, Multiple Allegiance and optional Parallel Access Volumes can dramatically improve performance and enable more effective use of larger volumes. The result is simplified storage management at a reduced cost.*



The logical structure of the IBM TotalStorage Enterprise Storage Server provides outstanding flexibility to meet different price/performance requirements.

- *Parallel Access Volumes: Previous S/390 systems allowed only one I/O operation per logical volume at a time. Now, performance is improved by enabling multiple I/Os from any supported operating system to access the same volume at the same time.*
- *Priority I/O Queuing: The storage server can ensure that important jobs have priority access to storage resources. With Priority I/O Queuing, the Enterprise Storage Server uses information provided by the OS/390 Workload Manager to manage the sequence in which I/Os are processed—matching I/O priority to your application priorities.*

A complete management solution

The StorWatch™ family of products offers an integrated storage management tool set that enables storage administrators to centrally monitor and manage the ESS.

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

The IBM StorWatch Enterprise Storage Server Expert helps storage administrators monitor the performance of all connected IBM ESS in the enterprise. This innovative software tool provides performance statistics, flexible asset management, and tracks a variety of capacity information through a common available browser interface. As such, this tool enables the administrators to centrally manage all ESS located anywhere in the enterprise. This is a fee licensed feature.

For more information

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



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