



ETERNUS4000 Model 400

The ETERNUS storage family combines affordability, flexibility, mainframe-class availability, scalability, and high performance. The ETERNUS4000 Model 400 is perfect for mid-range applications that require greater scalability and also extended replication functionality. The ETERNUS4000 Model 400 can scale to approximately 207 Terabytes of storage capacity.

Overview

High-performance components

- Intel® Xeon® technology
- Multi-lane PCI Express (PCIe) interconnects
- 8 Gbps Fibre Channel (front- and back-end)
- Disk enclosure with embedded switches

High-speed data replication and non-disruptive backup/recovery

- “Copy-on-write” and full clone snapshot capability
- Continuous mirroring with suspend/resume

Synchronous and asynchronous remote replication over iSCSI or Fibre Channel

Intelligent and proactive cache and hard drive management

High reliability through:

- Redundant components
- Assured data integrity
- Protected cache memory
- Proactive disk sparing
- Remote monitoring
- Concurrent maintenance

Flexible system configuration

- Intermix iSCSI and Fibre Channel host connections
- Intermix Fibre Channel and Nearline SATA disks within a single disk enclosure

Disk encryption option

PERFORMANCE

High-Performance Components

The ETERNUS®4000 Model 400 features an architecture employing multiple 2.33 GHz Intel® Xeon® processors and PCI Express bus technology. The 8 GB of read/ write cache, 800 Mbyte/s Fibre Channel links to hosts and 400 Mbyte/s to back-end 15K rpm hard drives complete this high-performance storage solution picture.

Cache Mirroring

Faster cache mirroring, reflected in improved write performance, is achieved through the use of dual PCI Express technology, exclusively dedicated to cache mirroring and inter-controller communications.

Intelligent and Proactive Cache Management

Advanced caching algorithms work to dynamically detect and predict application access trends to stage the necessary data in memory to eliminate delays associated with back-end disk retrieval. These algorithms also work to optimize the use of cache to provide consistent performance to a variety of applications.

Intelligent and Proactive Hard Drive Management

Dynamic Disk Traffic Control (DTC) manages the priority among sequential and random accesses so both types of accesses can simultaneously provide good performance.

HIGH RELIABILITY

Component Redundancy

Exploiting its data center heritage, the ETERNUS4000 storage system has redundant controllers, internal paths, cache, disks, power supplies, and fans. A failure of any of these components causes an automatic and transparent failover. Also, no outage is required for servicing because these components are also hot-swappable.

Data Integrity

All data blocks stored in the ETERNUS4000 are assigned a check code on first entry into the system. This check code stays with the data throughout its life cycle. As data blocks are retrieved, moved, or stored, checkpoints use this code to help ensure that data remains consistent during all storage operations.

Data Protection Within Cache

In many storage systems, cached data is at risk. Not so with the ETERNUS4000 storage system. All new data is replicated in two cache memories until destaged to disk. Cache coherency after a catastrophic power failure is maintained indefinitely, because the cache is destaged to disk upon power failure through the use of an internal battery backup system.

Proactive Disk Sparing

By continually monitoring all hard drives, a problem can be detected before a drive actually fails. When a potentially faulty hard drive is detected, the ETERNUS4000 storage system automatically duplicates the data onto a global hot-spare device, averting major problems.



FLEXIBLE SYSTEM CONFIGURATION

Expandability

Supporting up to 207 TB, the ETERNUS4000 Model 400 can be configured to meet a wide variety of current as well as future storage demands. Up to 8 host connections can provide storage access to up to 256 servers. Up to 2048 Logical Unit Number (LUNs) can be configured and the maximum capacity of a LUN can be as large as 8 TB. Up to 210 hard drives can be installed and arranged in a variety of protection modes (RAID 0, RAID 1, RAID 1+0, RAID 5, and RAID 6). A multitude of hard drives are also supported: 300 GB spinning at 10,000 rpm; 146 GB, 300, and 450 GB capacities spinning at 15,000 rpm; or 500 GB, 750 GB and 1 TB capacity SATA drives spinning at 7,200 rpm.

SATA drives are dual-channel, high-capacity, low-cost drives that can be intermixed in the same disk enclosure as FC drives. Employing these FC drives, the ETERNUS economy mode, provides a cost-effective way to archive tiers of storage for less frequently accessed data. ETERNUS MAID (Massive Array of Idle Disks) delivers the capability of controlling power to selected RAID groups, increasing drive reliability and decreasing power consumption.

Flexible Capacity Expansion

Through a function called Logical Device Expansion, the storage capacity of a protection group can be expanded without stopping the operation of your storage system. This allows more LUNs to be added to the group. Hard drives can be added to any existing RAID group for true on-the-fly, on-demand capacity growth. The ETERNUS4000 also allows the size of a LUN to be dynamically expanded.

Hot-Change The RAID Configuration

The ETERNUS4000 storage system has a feature called RAID Migration, which enables you to non-disruptively relocate a LUN and its data to another RAID group. This allows you to dynamically adapt the RAID level to best meet the demands of the application.

Flexible Storage Network

By supporting both Fibre Channel (1/2/4/8 Gbit/s) and iSCSI (1 Gbit/s) host interfaces, the ETERNUS4000 model 400 lends itself well to storage system consolidation. In a SAN environment, data can be consolidated with a Fibre Channel interface and over an IP network with the iSCSI interface.

SOFTWARE

Remote Monitoring, Alerts, and Centralized Management

Check the status of ETERNUS4000 storage systems from a remote location using ETERNUSmgr software. This software automatically monitors system status and can issue alerts if failures are detected, enabling faster problem resolution. ETERNUSmgr also provides a centralized user interface to set up the ETERNUS configurations and make changes as business requirements dictate. This software can prove to be a valuable asset in simplifying the support and troubleshooting of a complex storage infrastructure.

Resource Management

LUN mapping, Channel Adapter port security, and Host Affinity (host masking) services provide the ability to control and manage the visibility of storage capacity to attached servers.

Path Management

Server-based ETERNUSmpd software is available to support path failover and dynamic load balancing functionality for paths from a server to your ETERNUS storage system.

Non-Disruptive High-Speed Data Backup and Recovery

The ETERNUS One Point Copy (OPC) feature enables backup and recovery of even the largest LUN in seconds. OPC can completely "clone" a volume for long-term storage and fast recovery; incrementally update the "clone" with only changed data using QuickOPC functionality; or snapshot a volume with "copy-on-write" technology using SnapOPC

Extended Replication Functionality

Equivalent Copy offers the capability to create volume replicas within a system, suspend and resume the association, and also replicate to a remotely located ETERNUS4000 storage system using synchronous and asynchronous technology on Fibre Channel or iSCSI links.

Simplified Storage Area Network Management

Fujitsu ETERNUS SF Storage Cruiser simplifies the management of your SAN environment. With this visual representation of all your storage systems, servers, and switches you will be able to clearly see how they correlate with each other, as well as the performance information of each device. Such a tool is invaluable when troubleshooting your system.

Disk Encryption

The ETERNUS disk encryption option delivers security for data drives that have been removed from your system, using Advanced Encryption Standard (AES) 128-bit encryption.

Technical Details

		ETERNUS4000 Model 400	
Model Name		ETERNUS4000 Model 400	
Form Factor		Floor stand	Rack mount
RAID Levels		0, 1, 1+0, 5, 6*5	
Storage Capacity	FC disc drive	Physical capacity*1	Max. 94.5 TB
		Logical capacity*2	Max. 65.7 TB
	SATA disc drive	Physical capacity*1	Max. 207.8 TB
		Logical capacity*2	Max. 146.8 TB
Number of Controllers		2	
Host interface		Fibre Channel (Max. 8 Gbps), iSCSI (Max. 1 Gbps)	
Number of Host Interfaces	Fibre Channel	2-8	
	iSCSI	2 or 4	
Cache Capacity		Max. 8 GB	
Number of Drives		Max. 210	
Disc Drive	FC disc drive	300 GB (10,000 rpm), 450 GB/300 GB/146 GB/ (15,000 rpm)	
	Nearline SATA disc drive	1 TB/750 GB/500 GB, (7,200 rpm)	
Drive interface		Fibre Channel (4 Gbps)	
Dimensions [W x D x H] (with exp. cabinet)		Floor stand	Rack mount
		23.2" x 39" x 70.9"*3 (46.5" x 39" x 70.0")	19" x 30.3" x 21" [12U]*4 [Min. configuration]
Max. Weight		2314.85 lbs.	1675.51 lbs.
Power Requirements	Voltage	AC200-240V	
	No. of phases	Single	
	Frequency	50/60Hz	
Max. Power Consumption (W)		7700	
Max. Heat Dissipation (KJ/h)		27,800	
Environmental Conditions	Temperature	41-95°F (Operating), 32-122°F (Non-operating)	
	Humidity	20-80%RH (Operating), 8-80% (Non-operating)	
Regulatory	Electromagnetic Emissions and Immunity	FCC Class A, CE Mark, EN55024 Immunity, EN55022 Class A, VCCI Class A (for Japan), AS/NZS 3548 Class A (for Australia/New Zealand), Class A (for Taiwan)	
	Safety, Quality, and Environmental Standards	UL60950-1, CSA60950-1, EN60950-1, ISO9001, ISO14001	

*1: Calculated as 1k byte = 1,000bytes

*2: Calculated as 1k byte = 1,024bytes, and when formatted at RAID5. User capacity depends on the system environment.

*3: Up to 14.3U height drive enclosures can be used with the base configuration of model 400 rack mount type

*4: Up to 28 3U height drive enclosures can be used with the base configuration of model 600 rack mount type.

*5: Nearline SATA disc drives support RAID5 and RAID6 only

Supported Servers/OS

Manufacturer	Supported Server	Supported OS
Fujitsu	PRIMEQUEST	Windows Server® 2003 for Itanium-based Systems, Windows Server® 2008 for Itanium-based Systems, Red Hat Enterprise Linux AS (V.4 for Itanium), Red Hat Enterprise Linux (V.5 for Itanium)
	SPARC Enterprise	Solaris™ 10 Operating System
	PRIMEPOWER	Solaris™ 8 Operating System, Solaris™ 9 Operating System, Solaris™ 10 Operating System
	PRIMERGY	Windows® 2000 Server, Windows Server® 2003, Windows Server® 2003 x 64 Editions, Windows Server® 2008 (32-bit), Windows Server 2008 (64-bit), Red Hat Enterprise Linux AS v.3, Red Hat Enterprise Linux AS v.4, RedHat Enterprise Linux ES v.3, Red Hat Enterprise Linux ES v.4, Red Hat Enterprise Linux 5 (for x86), Red Hat Enterprise Linux 5 (for Intel®64), SUSE Linux Enterprise Server 9 for x86, SUSE Linux Enterprise Server 9 for EM64T, SuSE Linux Enterprise Server 10, x86, SUSE Linux Enterprise Server 10 for EM64T, VMware® EXS Server 2, VMware ESX Server 3.0 VMware ESX Server3.5
Sun	SPARC Enterprise	Solaris™10 Operating System
	Sun Fire, Sun Blade, Sun Enterprise	Solaris™ 8 Operating System, Solaris™ 9 Operating System, Solaris™ 10 Operating System
HP	HP 9000 series	HP-UX 11iv2, HP-UX 11iv3
IBM	pSeries, RS/6000 series	AIX 5.2, AIX 5.3
Others	IA server vendors (Various companies)	Windows® 2000 Server, Windows Server® 2003, Windows Server® 2003 x 64 Editions, Windows Server® 2008 (32-bit), Windows Server 2008 (64-bit), Red Hat Enterprise Linux AS v.3, Red Hat Enterprise Linux AS v.4, RedHat Enterprise Linux ES v.3, Red Hat Enterprise Linux ES v.4, Red Hat Enterprise Linux 5 (for x86), Red Hat Enterprise Linux 5 (for Intel®64), SUSE Linux Enterprise Server 9 for x86, SUSE Linux Enterprise Server 9 for EM64T, SuSE Linux Enterprise Server 10, x86, SUSE Linux Enterprise Server 10 for EM64T, VMware® EXS Server 2, VMware ESX Server 3.0 VMware ESX Server3.5



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