



THE POSSIBILITIES ARE INFINITE

SPC BENCHMARK 1™ EXECUTIVE SUMMARY

**FUJITSU LIMITED
FUJITSU STORAGE SYSTEMS
ETERNUS3000 MODEL 700**

SPC-1 V1.8

Submitted for Review: June 30, 2004

Submission Identifier: A00032

Revised: July 9, 2004

Accepted: August 29, 2004



EXECUTIVE SUMMARY**Test Sponsor and Contact Information**

Test Sponsor and Contact Information	
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Auditor	Storage Performance Council – www.storageperformance.org Walter E. Baker – AuditService@storageperformance.org 643 Bair Island Road, Suite 103 Redwood City, CA 94063 Phone: (650) 556-9384 FAX: (650) 556-9385

Revision Information and Key Dates

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SPC-1 Specification revision number	V1.8
SPC-1 Workload Generator revision number	V2.00.04a
Date Results were first used publicly	June 30, 2004
Date FDR was submitted to the SPC	June 30, 2004
Date revised FDR was submitted to the SPC Revised pricing-three year maintenance	July 9, 2004
Date the TSC is/was available for shipment to customers	August 20, 2004
Date the TSC completed audit certification	June 29, 2004

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Fujitsu Storage Systems ETERNUS3000 Model 700	
Metric	Reported Result
SPC-1 IOPS™	41,202.56
SPC-1 Price-Performance	\$12.67/SPC-1 IOPS™
Total ASU Capacity	8,428.400GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$522,060

SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

Total ASU (Application Storage Unit) Capacity represents the total storage capacity read and written in the course of executing the SPC-1 benchmark.

A **Data Protection Level** of Mirroring configures two or more identical copies of user data.

Storage Capacities and Relationships

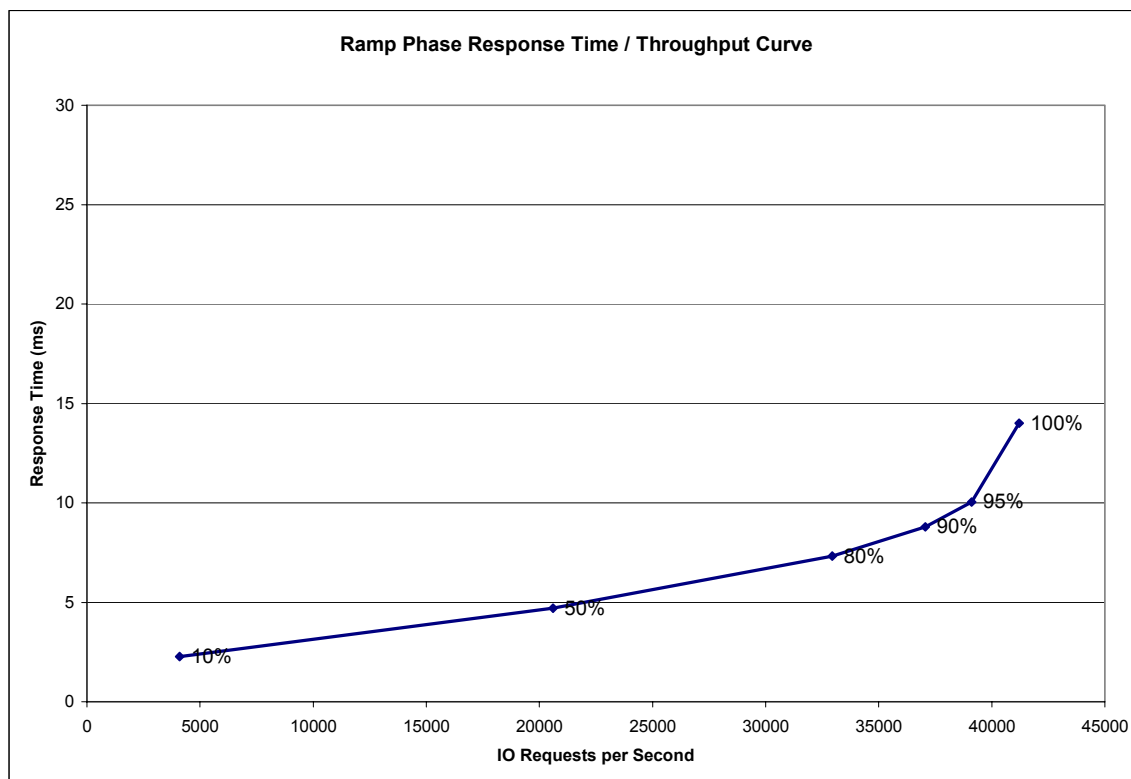
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.

Physical Capacity (GB)						
17,470.115						
Configured Capacity (GB)						Global Ovhd
16,878.634						
Addressable Capacity (GB)			Addressable (Mirror, GB)		Metadata	Unused
8,428.871			8,428.871			
ASU Capacity (GB)			Unused	ASU (Mirror, GB)	Unused	20.892
8,428.400						
ASU1	ASU2	ASU3	0.471		0.471	274.140
3,792.800	3,792.800	842.800				
4 LVs @	4 LVs @	1 LVs @				
948.248 /LV	948.248 /LV	842.887 /LV	317.341			

Response Time – Throughput Curve

The Response Time-Throughput Curve illustrates the Average Response Time (milliseconds) and I/O Request Throughput at 100%, 95%, 90%, 80%, 50%, and 10% of the workload level used to generate the SPC-1 IOPS™ metric.

The Average Response Time measured at the 100% load point cannot exceed 30 milliseconds or the benchmark measurement is invalid.



Response Time – Throughput Data

	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
I/O Request Throughput	4,102.02	20,607.35	32,947.86	37,055.87	39,100.96	41,202.56
Average Response Time (ms):						
All ASUs	2.26	4.70	7.33	8.80	10.05	14.01
ASU-1	2.79	5.60	8.77	10.61	12.17	16.84
ASU-2	2.83	5.82	9.35	11.46	13.32	18.85
ASU-3	0.90	2.29	3.38	3.79	4.12	5.88
Reads	4.49	8.67	13.74	16.87	19.56	26.89
Writes	0.82	2.11	3.15	3.54	3.86	5.61

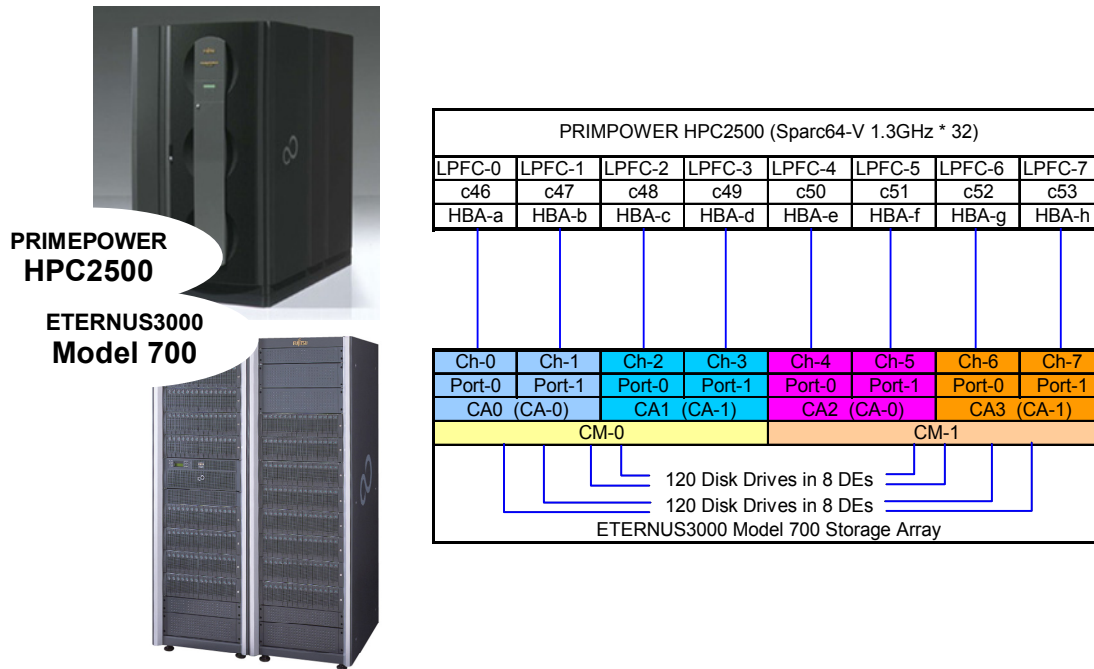
Tested Storage Configuration Pricing (*Priced Storage Configuration*)

Item	Product Id	Description	Qty	Unit \$	Extd \$
1	E370S20AU	ETERNUS3000 Model 700 without Door including Controller Enclosure, 2x Controllers, each Controller with dual ports & 4GB Cache dual power supplies, dual battery units 2x drive enclosures 1800mm (36U) rack, 2x power distribution (200VAC) 4x FC cables (5m), 2x LAN cables (5m) rack mount kit, ETERNUSmgr & drivers slots for up to 30 disk drives	1	\$58,000	\$58,000
2	E340SR3U	ETERNUS3000 Expansion rack without Door including Expansion 1800mm (36U) rack 2x drive enclosures 2x power distribution (200 VAC) slots for up to 30 disk drives	1	\$21,500	\$21,500
3	E300CE2U	Drive Enclosure pair - (rack mount 2x 3U) with slots for up to 30 disk drives	6	\$13,400	\$80,400
4	E370CM8	Additional cache memory (2x 4GB)	1	\$4,500	\$4,500
5	E300CHF4	Additional host interface (2x dual ports)	1	\$4,800	\$4,800
6	E300CD7H	73GB/15krpm Disk Drives	240	\$1,630	\$391,200
7	CBL-MLLB15	Fibre Channel Cable	8	\$250	\$2,000
8	PW028FC3U	Emulex LP9802	8	\$2,795	\$22,360
9		Enhanced Plus Model 700 - Phone 24x7, On-site 24x7, with 4 hour response - 3 year Warranty Uplift Base w/ 2 DEs	1	\$14,256	\$14,256
10		Enhanced Plus Model 700 - Phone 24x7, On-site 24x7, with 4 hour response - 3 year Warranty Uplift per DE pair	7	\$13,464	\$94,248
Total Product List Price					\$584,760
				Product Discount	20%
Net Product Price					\$467,808
Total Service List Price					\$108,504
				Service Discount	50%
Net Service Price					\$54,252
Total Sell Price, including 3 years Service					\$522,060

Differences between the Tested Storage Configuration (TSC) and Priced Storage Configuration

There were no differences between the Tested Storage Configuration (TSC) and the Priced Storage Configuration.

Benchmark Configuration/Tested Storage Configuration Diagram



Host Systems:	Tested Storage Configuration (TSC):
UID=HS-1	8 – Emulex LP9802 FC HBAs (2 Gbit)
Fujitsu PRIMEPOWER HPC2500	UID=SC-1:
32 - SPARC64 V (1.3 GHz) CPUs, each with: 128 KB L1 instruction cache, 128 KB L1 data cache, and 2 MB L2 cache	Fujitsu ETERNUS3000 Model 700
64 GB main memory	2 – Controller Modules (CM), each with 3.2 GHz Xeon CPU 8 GB cache 2 dual channel FC Host interfaces
Solaris 9	8 – Front side fibre channels – 2 Gbit each 4 – Drive side fibre channel switched loops 2 Gbit each
PCI	240 – 73 GB 15K RPM disk drives
WG	16 – Drive enclosure modules, each with dual FC-AL interfaces 15 – hot swap drive slots