



THE POSSIBILITIES ARE INFINITE

SPC BENCHMARK 1™ EXECUTIVE SUMMARY

**FUJITSU LIMITED
FUJITSU STORAGE SYSTEMS
ETERNUS3000 MODEL 100**

SPC-1 V1.8

Submitted for Review: June 22, 2004

Submission Identifier: A00031

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EXECUTIVE SUMMARY**Test Sponsor and Contact Information**

Test Sponsor and Contact Information	
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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 22, 2004
Date FDR was submitted to the SPC	June 22, 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	July 10, 2003
Date the TSC completed audit certification	June 4, 2004

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Fujitsu Storage Systems ETERNUS3000 Model 100	
Metric	Reported Result
SPC-1 IOPS™	11,201.47
SPC-1 Price-Performance	\$9.69/SPC-1 IOPS™
Total ASU Capacity	560.874 GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$108,498

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

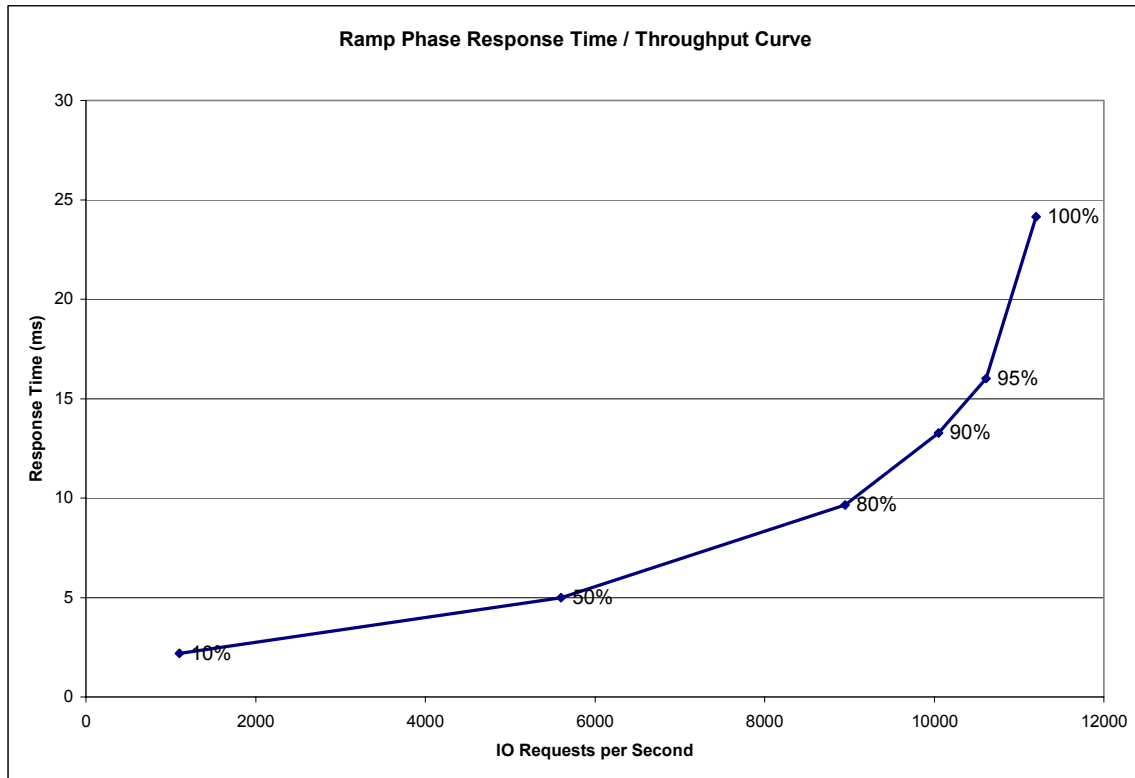
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.

Physical Capacity (GB)							
2,183.764							
Configured Capacity (GB)						Global Ovhd	Unused
1,126.705							
Addressable Capacity (GB)			Unused	Addressable (Mirror, GB)		Metadata & Hot Spares	
561.447				561.447			
ASU Capacity (GB)			0.547	ASU (Mirror, GB)		3.811	
560.900				560.900			0.547
ASU1	ASU2	ASU3					
252.400	252.400	56.100					
2 LVs @	2 LVs @	1 LVs @					
126.200 /LV	126.200 /LV	56.100 /LV					
						38.965	1,018.094

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	1,101.00	5,601.60	8,948.95	10,052.17	10,608.65	11,201.47
Average Response Time (ms):						
All ASUs	2.20	5.00	9.65	13.26	16.01	24.15
ASU-1	2.73	6.26	11.82	15.98	19.09	28.63
ASU-2	2.75	6.96	16.92	25.78	32.85	49.00
ASU-3	0.83	1.45	1.87	2.02	2.10	3.76
Reads	4.45	10.67	21.85	30.67	37.47	55.27
Writes	0.73	1.29	1.71	1.91	2.03	3.87

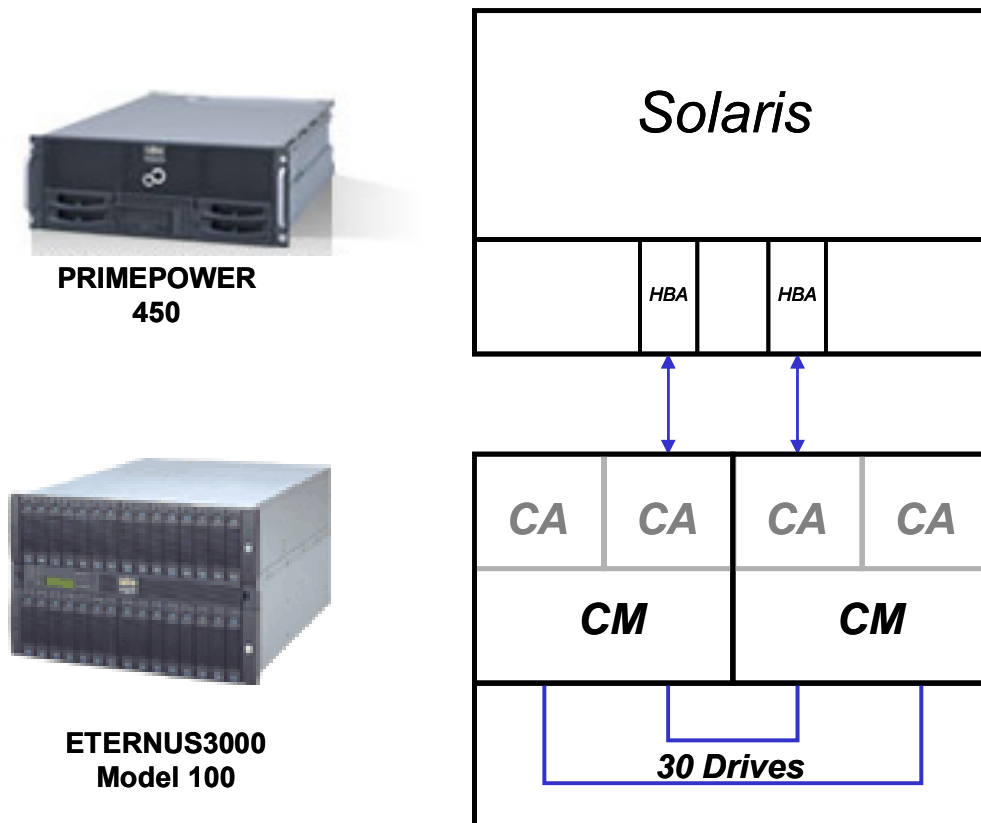
Tested Storage Configuration Pricing (*Priced Storage Configuration*)

Item	Product Id	Description	Qty	Unit \$	Extd \$
1	E310R24BU	ETERNUS3000 Model 100 - 4 ports (rack mount - 4U) including Controller Enclosure, 2x Controllers, each Controller with 2 ports & 1GB Cache dual power supplies, dual battery units 4x FC cables (5m), 2x LAN cables (5m) rack mount kit, ETERNUSmgr & drivers slots for up to 15 disk drives	1	\$20,600	\$20,600
2	E310RE2U	Additional Drive Enclosure - (rack mount - 3U) with slots for up to 15 disk drives	1	\$7,200	\$7,200
3	E310CD7H	73GB/15krpm Disk Drives (set of 5)	6	\$14,475	\$86,850
4	PW028FC3U	Emulex LP9802	2	\$2,590	\$5,180
5	FPC58-1213-01	Enhanced Plus Model 100 - Phone 24x7, On-site 24x7, with 4 hour response - 2 year Warranty Uplift	1	\$7,380	\$7,380
6	FPC58-1217-01	Enhanced Plus Model 100 - Phone 24x7, On-site 24x7, with 4 hour response - 1 year Post Warranty	1		
Total Product List Price					\$119,830
				Product Discount	15%
Net Product Price					\$101,856
Total Service List Price					\$7,380
				Service Discount	10%
Net Service Price					\$6,642
Total Sell Price, including 3 years Service					\$108,498

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	2 – Emulex LP8902 FC HBAs (2 Gbit)
Fujitsu PRIMEPOWER 450R (Rack Mount)	UID=SC-1:
2 - SPARC64 V (1.1 GHz) CPUs 128 KB L1 data cache 1 MB L2 cache	Fujitsu ETERNUS3000 Model 100 2 – Controller Modules (CM), each with 1.26 GHz CPU 1 GB cache
16 GB main memory	
Solaris 9	4 – Front side fibre channels (CA) – 2 Gbit each (2 used, 2 unused)
PCI	2 – Drive side fibre channel loops – 2 Gbit each
WG	30 – 73 GB 15K RPM disk drives
	2 – Drive enclosure modules, each with dual FC-AL interfaces 15 – hot swap drive slots