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**SPC BENCHMARK 1™  
EXECUTIVE SUMMARY**

**FUJITSU LIMITED  
FUJITSU STORAGE SYSTEMS ETERNUS3000 MODEL 400**

**SPC-1 V1.6**

**Submitted for Review: February 13, 2003**

**Accepted: April 14, 2003**



## **EXECUTIVE SUMMARY**

### **Test Sponsor and Contact Information**

<b>Test Sponsor and Contact Information</b>	
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### **Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-1 Specification revision number</b>	V1.6
<b>SPC-1 Workload Generator revision number</b>	V2.1
<b>Date Results were first used publicly</b>	February 13, 2003
<b>Date FDR was submitted to the SPC</b>	February 13, 2003
<b>Date the TSC is/was available for shipment to customers</b>	January 27, 2003
<b>Date the TSC completed audit certification</b>	February 13, 2003

## Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Fujitsu Storage Systems ETERNUS3000 Model 400	
Metric	Reported Result
SPC-1 IOPS $\hat{O}$	17,545.88
SPC-1 Price-Performance	\$37.92/SPC-1 IOPS <sup>TM</sup>
Total ASU Capacity	2,075.52 GB
Data Protection Level	Mirroring
SPC-1 LRT $\hat{O}$	1.77 ms
Total TSC Price (including three-year maintenance)	\$665,379

**SPC-1 IOPS<sup>TM</sup>** 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. The Addressable Storage Capacity, which contains the Total ASU Capacity, was 4,027.648. The Total ASU Capacity utilized 51.53% of the Addressable Storage Capacity. The actual Configured Storage Capacity was 8,339.456 GB, which included the multiple copies of user data required by a Data Protection Level of Mirroring. The Configured Storage Capacity utilized 99.94% of the priced Physical Storage Capacity of 8,339.456 GB.

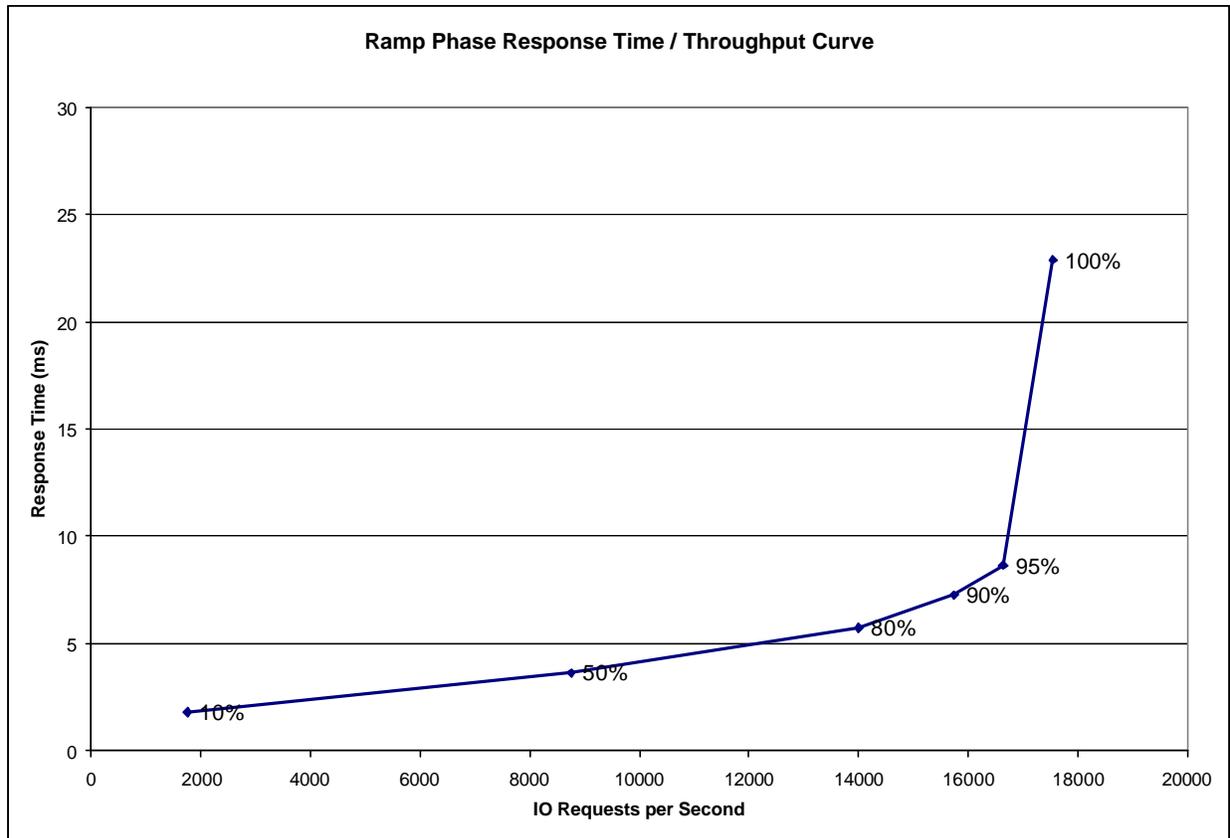
A **Data Protection Level** of Mirroring configures two or more identical copies of user data, maintained on separate disks.

The **SPC-1 LRT<sup>TM</sup>** metric is the Average Response Time measured at the 10% load point, as illustrated on the next page. SPC-1 LRT<sup>TM</sup> represents the Average Response Time measured on a lightly loaded Tested Storage Configuration (TSC).

### 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.



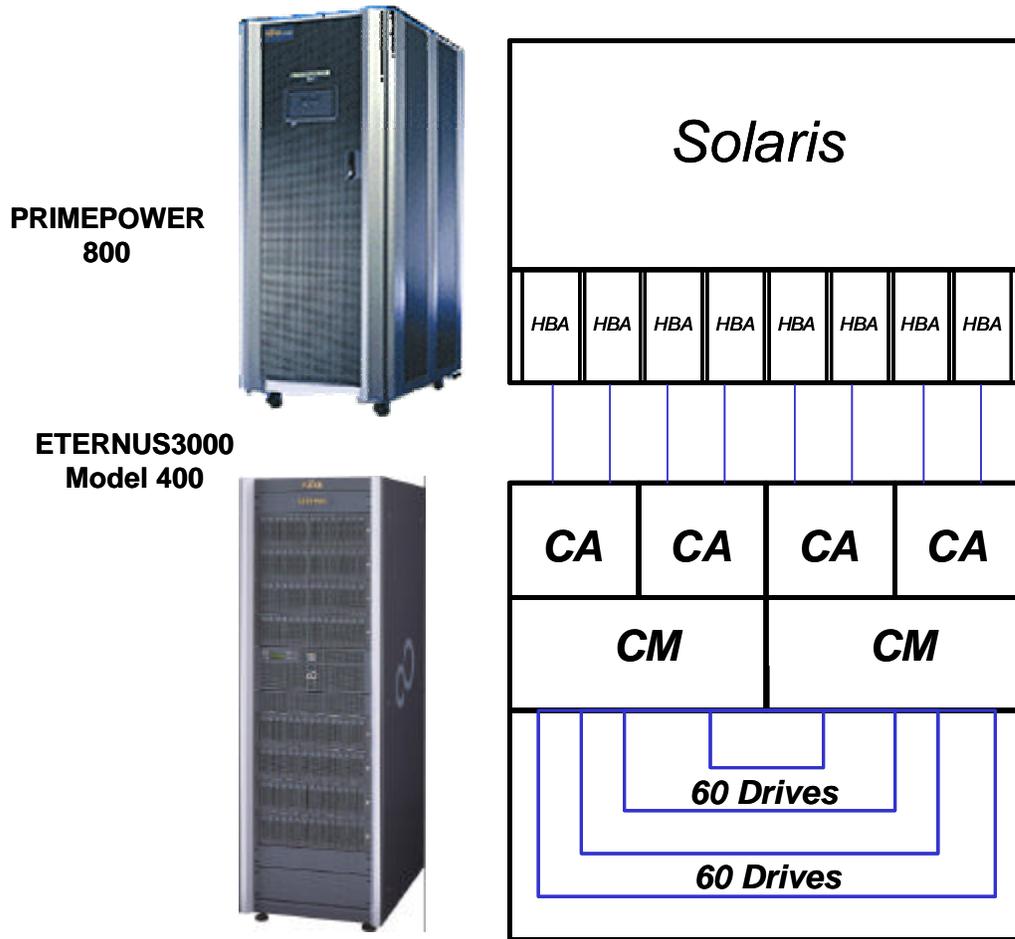
### Response Time – Throughput Data

	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
<b>I/O Request Throughput</b>	1,750.38	8,751.71	14,005.31	15,743.07	16,640.12	17,545.88
<b>Average Response Time (ms):</b>						
<b>All ASUs</b>	1.77	3.59	5.74	7.24	8.62	22.87
<b>ASU-1</b>	2.21	4.33	6.96	8.84	10.55	26.51
<b>ASU-2</b>	1.65	4.32	7.09	9.20	11.27	29.85
<b>ASU-3</b>	0.90	1.71	2.56	3.00	3.37	12.11
<b>Reads</b>	3.26	6.70	10.91	14.09	17.05	41.41
<b>Writes</b>	0.80	1.56	2.36	2.78	3.13	10.81

**Tested Storage Configuration Pricing**

	Product Number	Description	Qty	Unit Price	List Price	Sell Price
1	E340S20AU	1 Controller Enclosure 2 Drive Enclosures 2 Controllers 4-Port Host Interfaces 4GB Cache Memory 2 146GB Disk Drives	1		\$850,033.33	\$595,023.33
2	E300CE1U	2 Drive Enclosures	3			
3	E340CM4	4GB Cache Memory	1			
4	E340CHP4	4-Port Host Interfaces	1			
5	E300CA7H	73GB Disk Drives	118			
6	CBL-MLLB15	Fibre Channel Cable	8	\$250.00	\$2,000.00	\$1,400.00
7	LP9002L	Emulex LP9002 HBA	8	\$2,795.00	\$22,360.00	\$20,124.00
8		3 Year Maintenance	1		\$69,760.00	\$48,832.00
	Total				\$944,153.33	\$665,379.33

**Benchmark Configuration/Tested Storage Configuration Diagram**



Host System:	Storage System:
Fujitsu PRIMEPOWER 800	Fujitsu ETERNUS3000 Model 400
UID=HS-1	UID=SC-1
12 SPARC64GP-IV 675 MHz CPUs each with 128KB L1 Instruction Cache, 128KB L1 Data Cache, 8 MB L2 Cache	Dual Control Modules, each with: 1.26 GHz Pentium 3 CPU 4 GB Cache 2 dual channel FC Host interfaces
20 GB Main Memory	8 – Front side Fibre Channels
Solaris 8	4 – Drive side Fibre Channel Loops
8 - Emulex LP9002L Fibre Channel Host Bus Adapters	8 Drive Enclosure Modules, each with dual FC-AL interfaces 15 Hot Swap drive slots
WG	118 – 73GB disks, 2 - 146GB disks