



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.
SUN STOREEDGE™ 6920 (20 TRAY)**

SPC-1 V1.8

Submitted for Review: August 16, 2004

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EXECUTIVE SUMMARY**Test Sponsor and Contact Information**

Test Sponsor and Contact Information	
Test Sponsor Primary Contact	Sun Microsystems, Inc. – http://www.sun.com Leah Schoeb – leah.schoeb@sun.com 5300 Riata Park Court AUS08 Austin, TX 78721 Phone: (512) 401-1227 FAX: (512) 266-2523
Test Sponsor Alternate Contact	Sun Microsystems, Inc. – http://www.sun.com Jason Schaffer – jason.schaffer@sun.com 7777 Gateway Blvd 7, UNWK16 Newark, CA Phone: (510) 936-2979 FAX: (510) 936-2323
Auditor	Storage Performance Council – http://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	August 16, 2004
Date FDR was submitted to the SPC	August 16, 2004
Date the TSC is/was available for shipment to customers	July 23, 2004
Date the TSC completed audit certification	August 13, 2004

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Sun StorEdge™ 6920 (20 tray)	
Metric	Reported Result
SPC-1 IOPS™	48,646.62
SPC-1 Price-Performance	\$10.73/SPC-1 IOPS™
Total ASU Capacity	3,022.000 GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$522,087

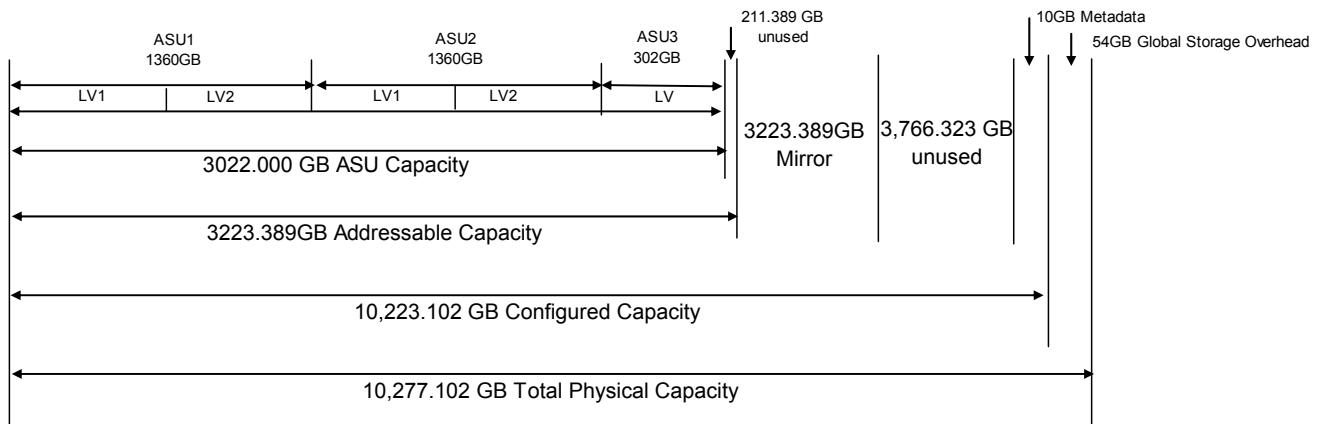
SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

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

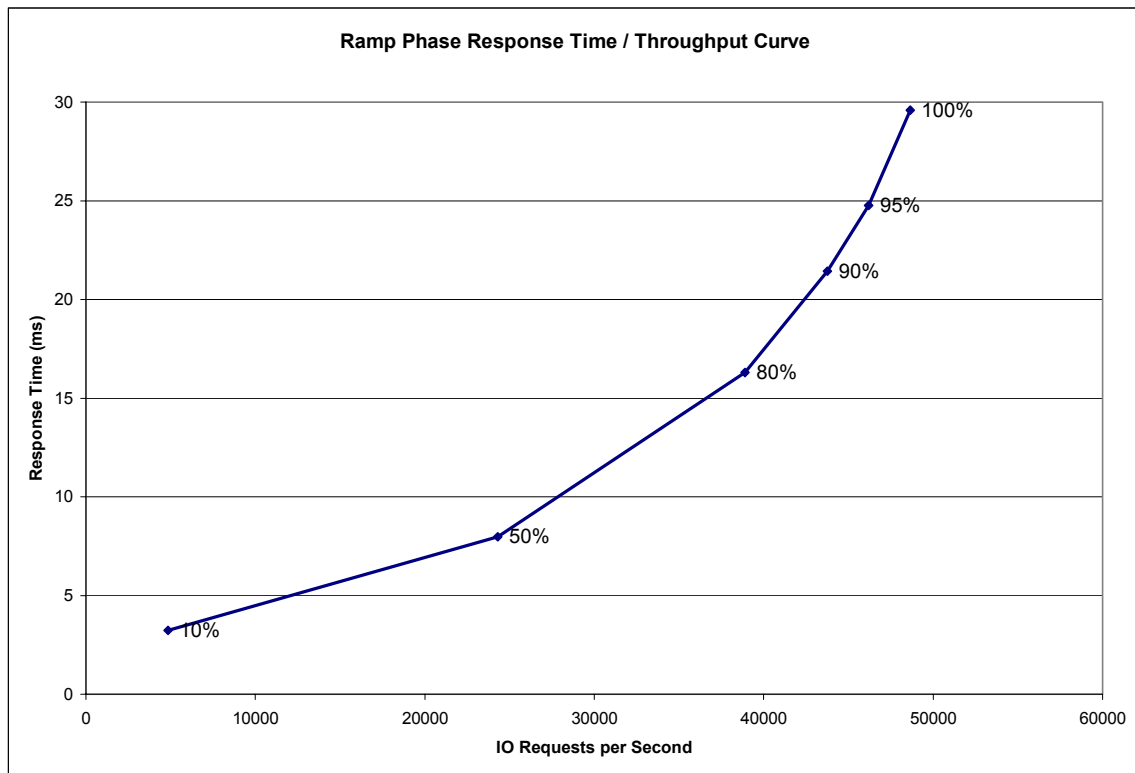
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.



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	4,850.58	24,308.44	38,897.30	43,771.02	46,197.91	48,646.62
Average Response Time (ms):						
All ASUs	3.24	7.98	16.29	21.42	24.76	29.59
ASU-1	3.66	8.39	16.34	21.23	24.35	29.24
ASU-2	3.25	7.76	15.92	20.92	24.18	28.53
ASU-3	2.34	7.20	16.37	22.05	25.88	30.80
Reads	5.11	10.20	17.90	22.40	25.21	29.60
Writes	2.02	6.53	15.25	20.79	24.47	29.58

Tested Storage Configuration Pricing (*Priced Storage Configuration*)

Part Number	Description	Quantity	US List	Total	% Discount	Ave. Price
TA6920-DSP-4F	Base Cabinet 32 ports	1	\$69,995	\$69,995	32%	\$47,597
TA6020M22A1S1008	Storage Partner Pair with 28 36GB 15k rpm	10	\$66,890	\$668,900	32%	\$454,852
XTA6920-SPM-UNLTB	Storage Pool Manager	1	\$9,200	\$9,200	32%	\$6,256
X6767A	2Gb PCI Single FC HBA	12	\$1,560	\$18,720	32%	\$12,730
X9733A	5M LC to LC FC Optical Cable	12	\$80	\$960	32%	\$653
Total			\$147,725	\$767,775		\$522,087

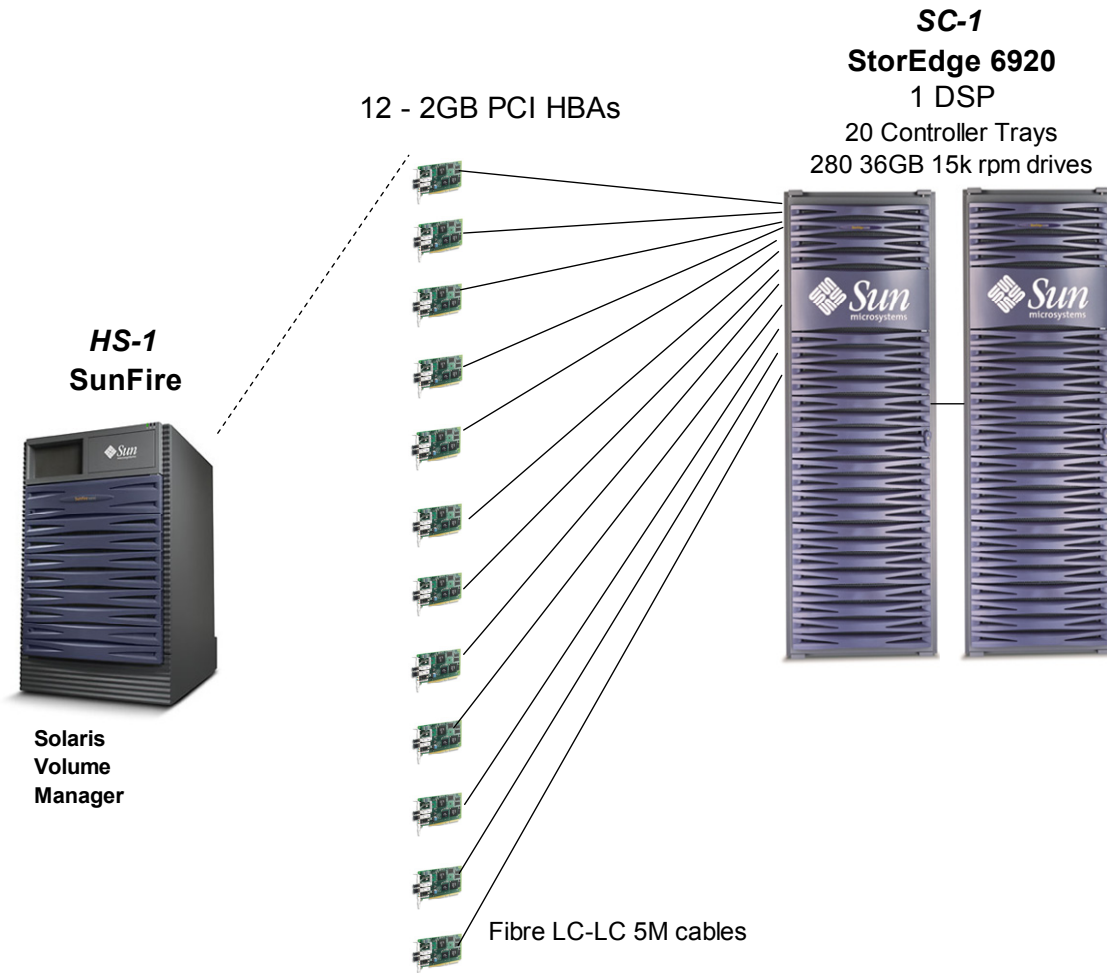
Three year “Gold Service” System Maintenance is included, which provides the following:

- 7 days per week, 24 hours per day coverage.
- Acknowledgement of new and existing problems within four hours.
- Onsite presence of a qualified maintenance engineer or provision of a customer replaceable part within four hours of the above acknowledgement for any hardware failure that results in an inoperative Priced Storage Configuration component. In either of the two cases, the remedy will result in resumption of operation.

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	12 – 2 Gb Single port FC HBAs
SunFire 6800	UID=SC-1:
24 – UltraSPARC™ III 900MHz CPUs with 8MB EEC External cache per CPU	Sun StorEdge 6920: 20 Controllers each with 1 tray 1 GB of cache per controller 14 – 36 GB, 15 K RPM drives per tray
48 GB main memory	
Solaris 9 update 6	
Solaris Volume Manager (SVM)	32 DSP FC Ports
PCI	280 – 36 GB 15K RPM disk drives
WG	