



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.
SUN STOREEDGE™ 6920**

SPC-1 V1.8

Submitted for Review: February 1, 2005

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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

Revision Information and Key Dates	
SPC-1 Specification revision number	V1.8
SPC-1 Workload Generator revision number	V2.00.04a
Date Results were first used publicly	February 1, 2005
Date FDR was submitted to the SPC	February 1, 2005
Date the TSC is/was available for shipment to customers	July 23, 2004
Date the TSC completed audit certification	February 1, 2005

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Sun StorEdge™ 6920	
Metric	Reported Result
SPC-1 IOPS™	18,945.13
SPC-1 Price-Performance	\$12.45/SPC-1 IOPS™
Total ASU Capacity	1,222.000GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$235,875.00

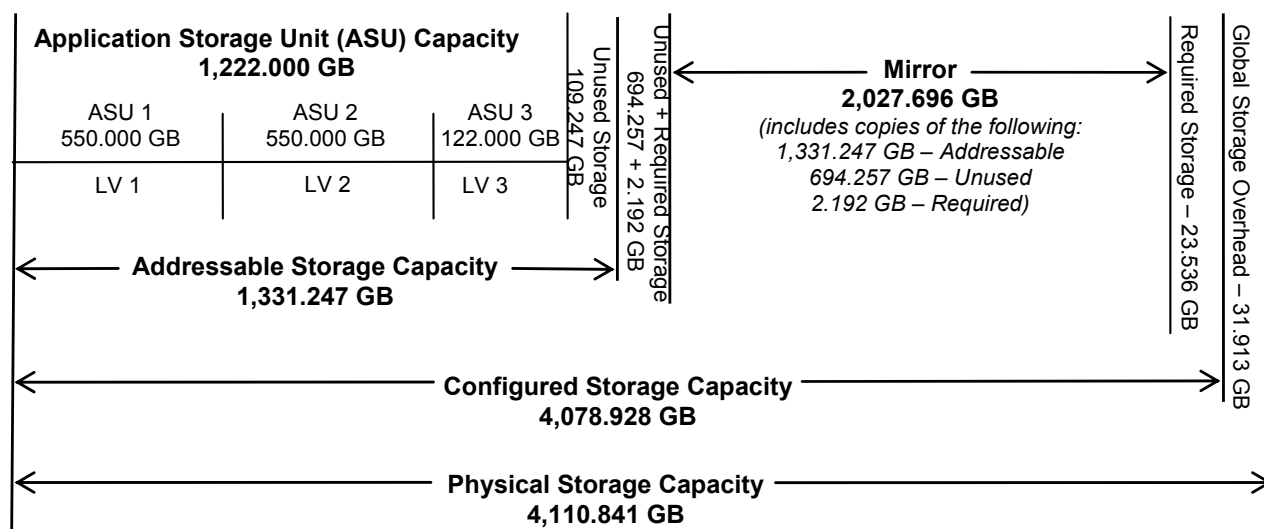
SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

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

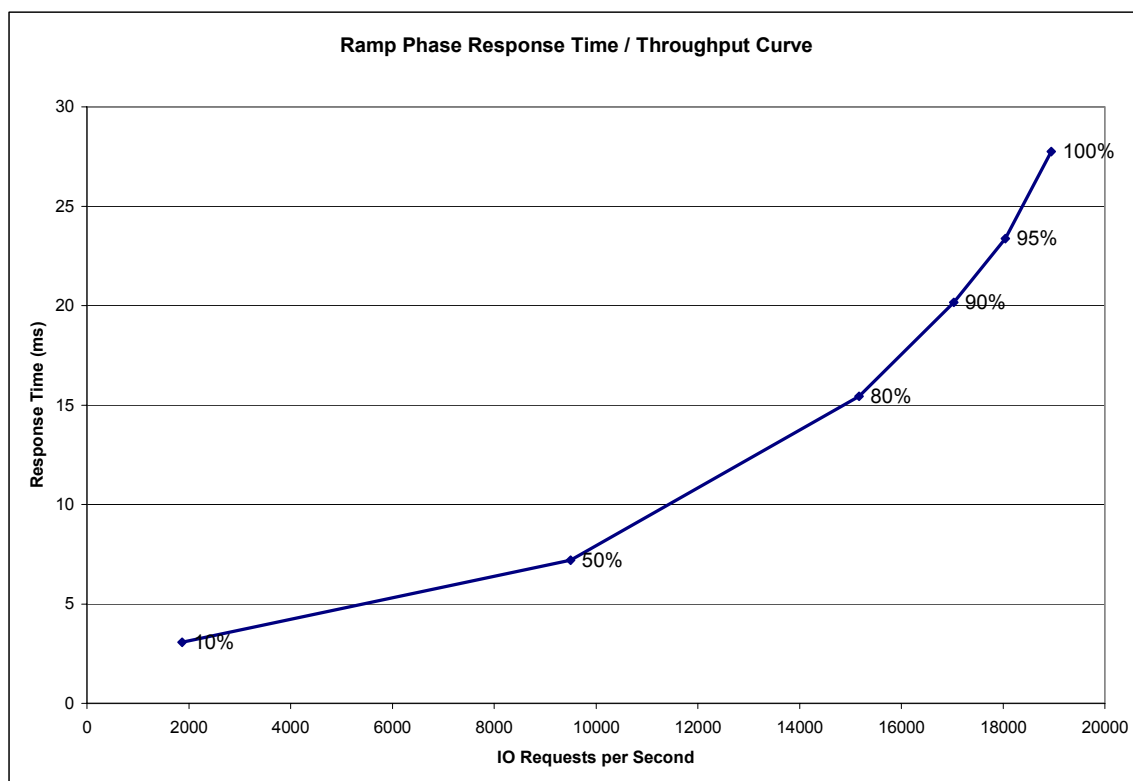
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.



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 any of the above load points 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	1,868.92	9,501.72	15,172.47	17,032.46	18,046.03	18,945.13
Average Response Time (ms):						
All ASUs	3.06	7.20	15.43	20.16	23.38	27.76
ASU-1	3.54	7.83	15.61	20.01	23.03	27.12
ASU-2	3.08	7.11	15.23	19.82	22.99	27.25
ASU-3	2.05	5.92	15.14	20.62	24.30	29.33
Reads	5.07	9.91	17.39	21.33	24.03	27.66
Writes	1.76	5.44	14.16	19.40	22.96	27.82

Tested Storage Configuration Pricing (*Priced Storage Configuration*)

Part Number	Description	Quantity	US List	Total		Ave. Price
TA6920-DSP-2F	Base system with 16 FC ports	1	\$56,995	\$56,995	32%	\$38,757
TA6020M22A1S1008	Storage module with 28 36GB 15k rpm	4	\$66,890	\$267,560	32%	\$181,941
XTA6920-SPM-UNLTB	Storage Pool Management	1	\$9,200	\$9,200	32%	\$6,256
X6767A	2Gb PCI Single FC Host Based Adapter	8	\$1,560	\$12,480	32%	\$8,486
X9733A	5M LC to LC FC Optical Cable	8	\$80	\$640	32%	\$435
Total				\$346,875		\$235,875

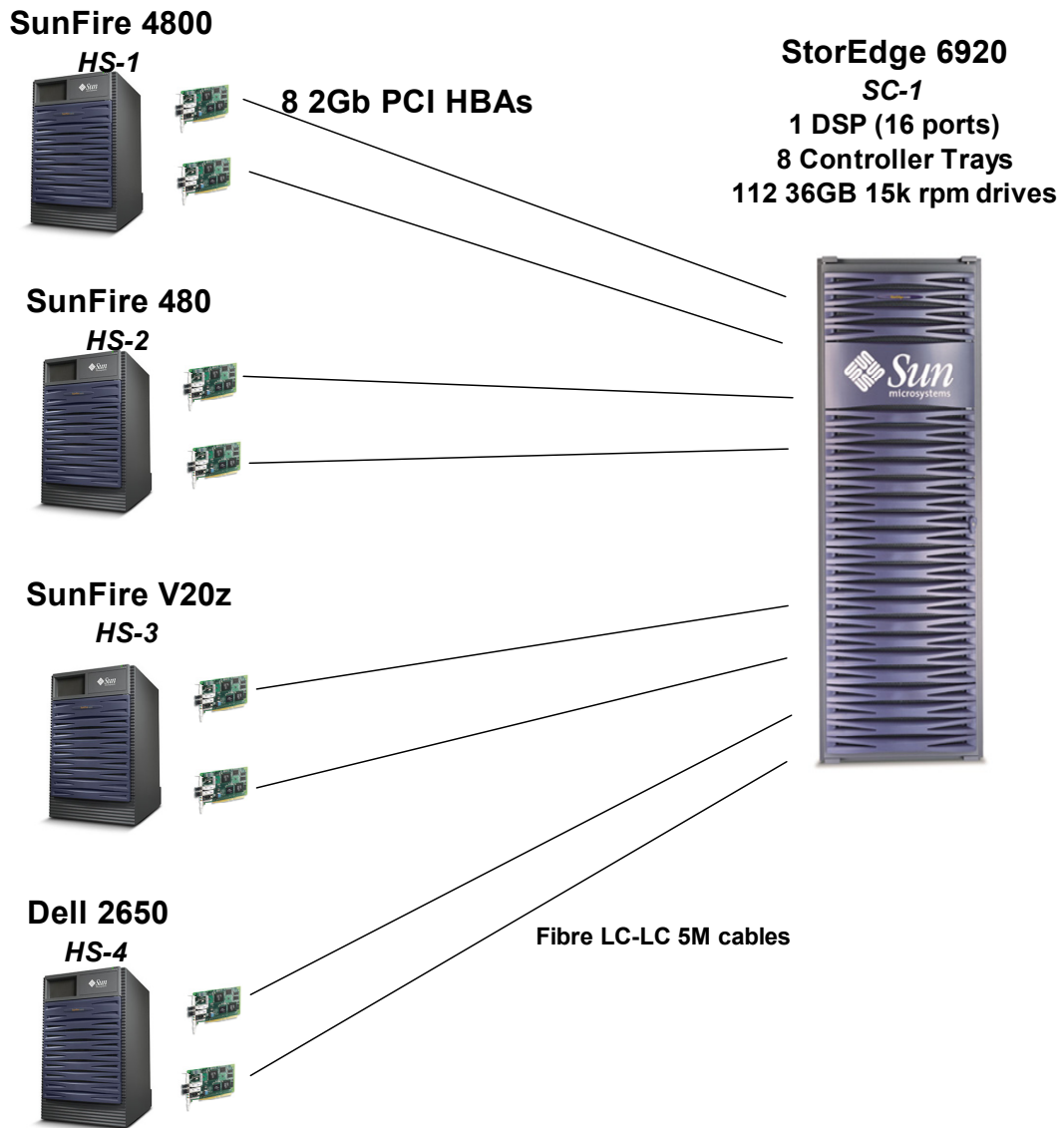
Three year “Gold Service” System Maintenance is included, which provides the following:

- 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 difference between the Tested Storage Configuration and the Priced Storage Configuration.

Benchmark Configuration/Tested Storage Configuration Diagram



Benchmark Configuration/Tested Storage Configuration Components

Host Systems:	Tested Storage Configuration (TSC):
UID=HS-1	8 – 2 Gbit PCI single FC HBAs (2 per Host System)
Sun Fire™ 4800	UID=SC-1:
4- UltraSPARC™ III 750 MHz CPUs each with 8 MB ECC external CPU	Sun StorEdge™ 6920:
4 GB main memory	8 – Controllers
Solaris 9 update 7	1 GB cache per controller
Solaris Volume Manager	1 tray with 14 disks per controller
WG	16 – FC ports
	112 – 36 GB 15K RPM disks
UID=HS-2	
Sun Fire™ 480	
4 – UltraSPARC™ III 900 MHz CPUs each with 8 MB ECC external cache	
8 GB main memory	
Solaris 10 FCS	
Solaris Volume Manager (SVM)	
WG	
UID=HS-3	
Sun Fire™ V20z	
2 – 1.8 MHz Opteron CPUs each with 1 MB L2 cache	
2 GB main memory	
Solaris 10 x86 FCS	
Solaris Volume Manager (SVM)	
WG	
UID=HS-4	
Dell 2650	
2 – 3.2 GHz Xeon CPUs each with 1 MB L2 cache	
2 GB main memory	
Window 2003	
WG	