



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.
SUN STORAGE J4400 ARRAY**

SPC-1 V1.10.1

**Submitted for Review: July 7, 2008
Submission Identifier: A00068**

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

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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: (877) 319-0457 FAX: (512) 266-2523
Test Sponsor Alternate Contact	Sun Microsystems, Inc. – http://www.sun.com Jason Schaffer – jason.schaffer@sun.com 500 Eldorado Blvd. Broomfield, CO 80021 Phone: (303) 272-4743 FAX: (512) 266-2523
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	V1.10.1
SPC-1 Workload Generator revision number	V2.00.04a
Date Results were first used publicly	July 7, 2008
Date the FDR was submitted to the SPC	July 7, 2008
Date the TSC is available for shipment to customers	July 8, 2008
Date the TSC completed audit certification	July 7, 2008

Tested Storage Product (TSP) Description

The Sun Storage J4400 array offers bulk SAS/SATA JBOD storage with double the storage density, twice the connectivity, and higher availability at half the price per gigabyte. Plus, you also get the groundbreaking ZFS file system included at no extra charge. ZFS automates common administrative tasks, protects data from corruption, and provides unlimited scalability.

Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Sun Storage J4400 Array	
Metric	Reported Result
SPC-1 IOPS™	7,201.32
SPC-1 Price-Performance	\$1.73/SPC-1 IOPS™
Total ASU Capacity	2,194.000 GB
Data Protection Level	Unprotected
Total TSC Price (including three-year maintenance)	\$12,446

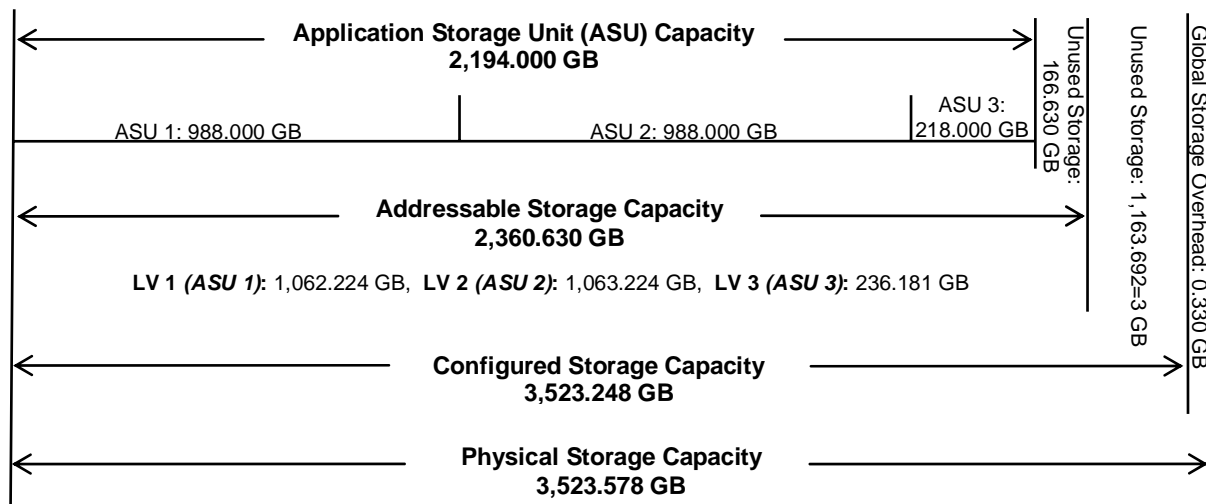
SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

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 “Unprotected” provides no data protection.

Storage Capacities and Relationships

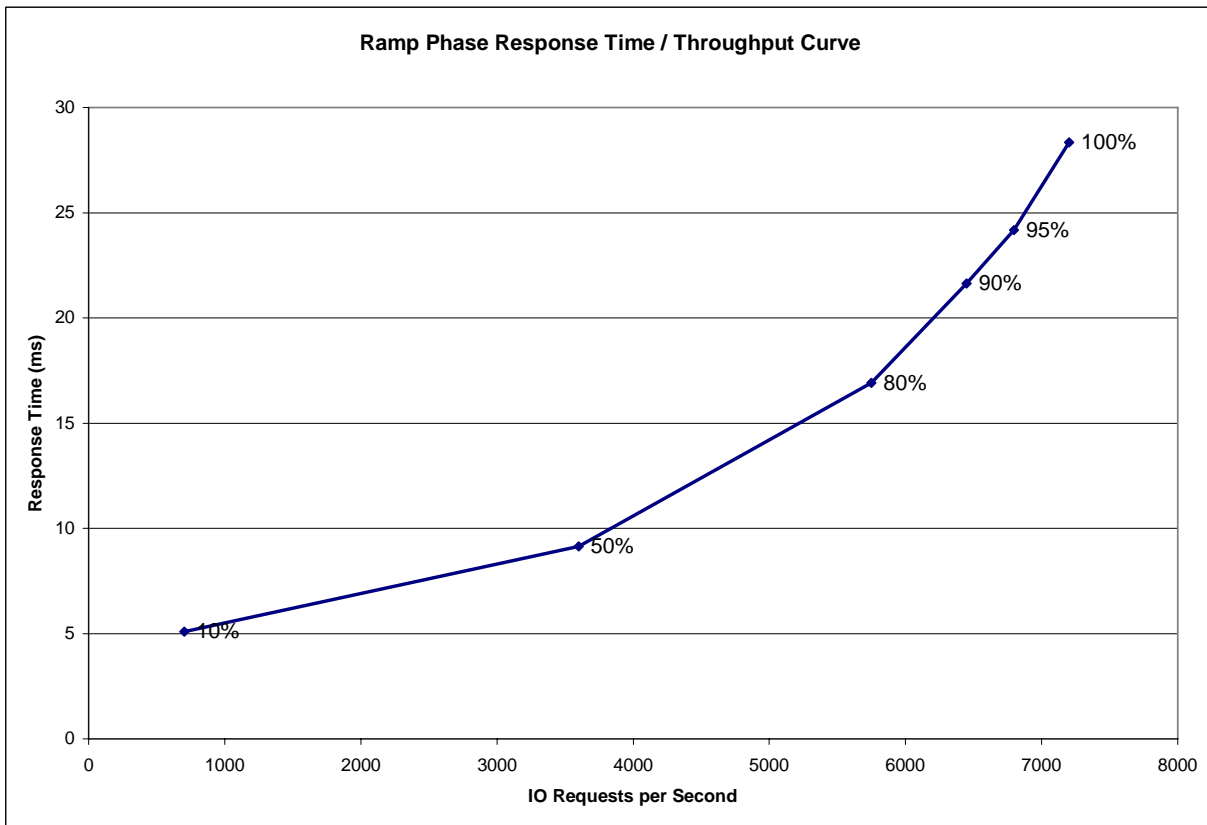
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.



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	701.67	3,600.51	5,749.02	6,447.36	6,798.19	7,201.32
Average Response Time (ms):						
All ASUs	5.09	9.14	16.90	21.63	24.17	28.34
ASU-1	4.91	8.27	13.63	16.78	18.37	21.01
ASU-2	5.45	10.96	26.27	36.35	41.92	50.68
ASU-3	5.29	10.19	19.75	25.46	28.69	34.12
Reads	4.40	7.47	12.24	15.02	16.61	19.02
Writes	5.53	10.23	19.94	25.94	29.09	34.42

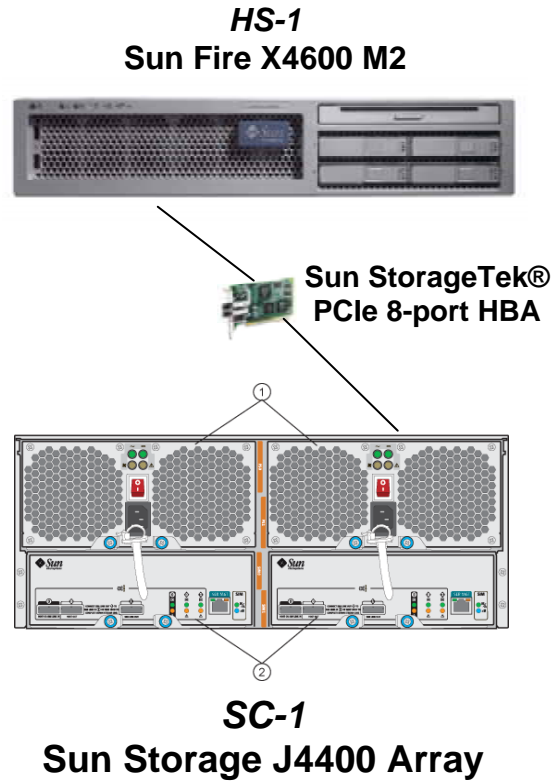
Tested Storage Configuration Pricing (Priced Storage Configuration)

Part Number	Description	Quantity	US List	Total	discount	Ave. Price
XTA4400R00A10DISK	Sun Storage J4400 Rack Ready JBOD Chassis, No drives, dual AC power supplies, dual fan module, rail kit, single SAS I/O module, One .5M SAS cable, RoHS-5.	1	\$3,525.00	\$3,525	22%	\$2,750
XTA-4400-IOM	One three-port SAS I/O module for Storage J4400, One .5M SAS cable.	1	\$600	\$600	22%	\$468
XTA-SS1NJ-146G15K	RoHS-6. Internal 146GB 15K SAS HDD, 3.5" x 1" drive with bracket for J4200 and J4400.	24	\$399	\$9,576	22%	\$7,469
XTA-4200-2URK-19U	Sun Storage J4400 4U universal rack rail kit; RoHS-5	1	\$175	\$175	22%	\$137
SG-XPCIE8SAS-E-Z	Sun StorageTek (TM) PCIe SAS Host Bus Adapter, 8 port, RoHS 6 compliant	1	\$550	\$550	22%	\$429
IWU-STJ4400-24-3G	Controller unit upgrade 3 year Gold Service Maintenance	1	\$2,131.27	\$2,131	44%	\$1,194
	- 7/24 coverage					
	- 4 hr response time					
	- 4 hour resolution					
Total				\$16,557		\$12,446

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

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

Benchmark Configuration/Tested Storage Configuration Diagram



Benchmark Configuration/Tested Storage Configuration Components

Host System:	Tested Storage Configuration (TSC):
UID=HS-1 Sun Fire X4600 M2	1 – Sun StorageTek PCI Express SAS 8-Channel HBA
4 – 2.6 GHz dual core AMD Opteron™ Processor 8222, 1 MB L2	UID=SC-1: Sun Storage J4400
15.5 GB main memory	3 – 3 Gb/s “x4 wide” SAS ports available 1 port used
MS Windows Server 2003 Enterprise x64 with Service Pack 2	24 – 146 GB, 15K RPM Seagate SAS disk drives
PCIe	
WG	