SPC BENCHMARK 1™

EXECUTIVE SUMMARY

SUN MICROSYSTEMS, INC.

SUN STORAGE J4200 ARRAY

SPC-1 V1.10.1

Submitted for Review: July 7, 2008
Submission Identifier: A00067

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

Revision Information and Key Dates	
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 J4200 Array is an easy and inexpensive way to extend your server-storage capabilities. This Array offers high-quality low-cost SAS/SATA JBOD storage that grows with your business. Plus, it comes with 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

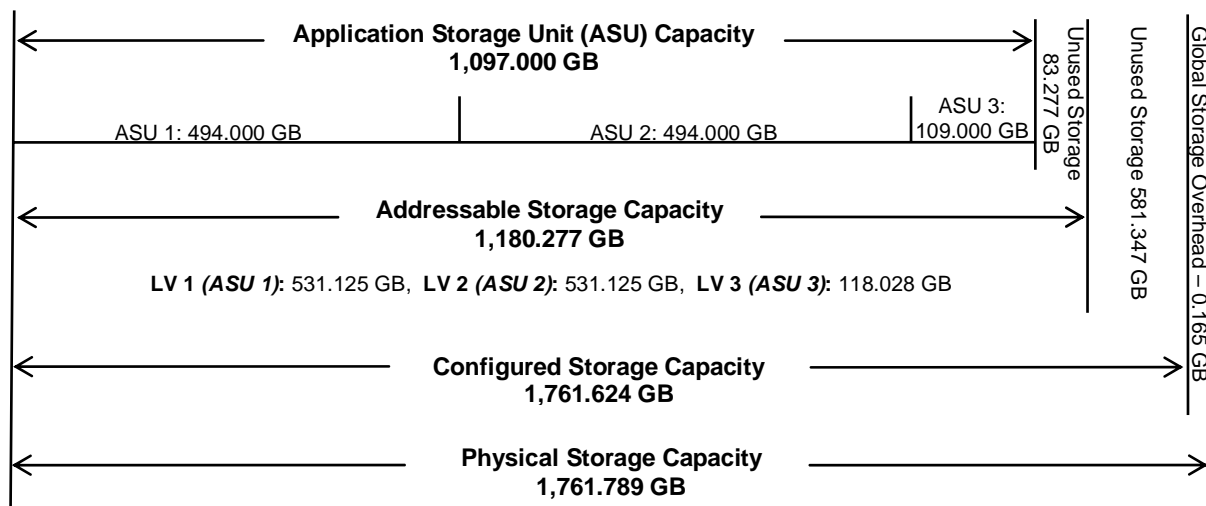| SPC-1 Results	
Tested Storage Configuration (TSC) Name: Sun Storage J4200 Array	
Metric	**Reported Result**
SPC-1 IOPS™	3,144.63
SPC-1 Price-Performance	$2.36/SPC-1 IOPS™
Total ASU Capacity	1,180.277GB
Data Protection Level	Unprotected
Total TSC Price (including three-year maintenance)	$7,432

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.
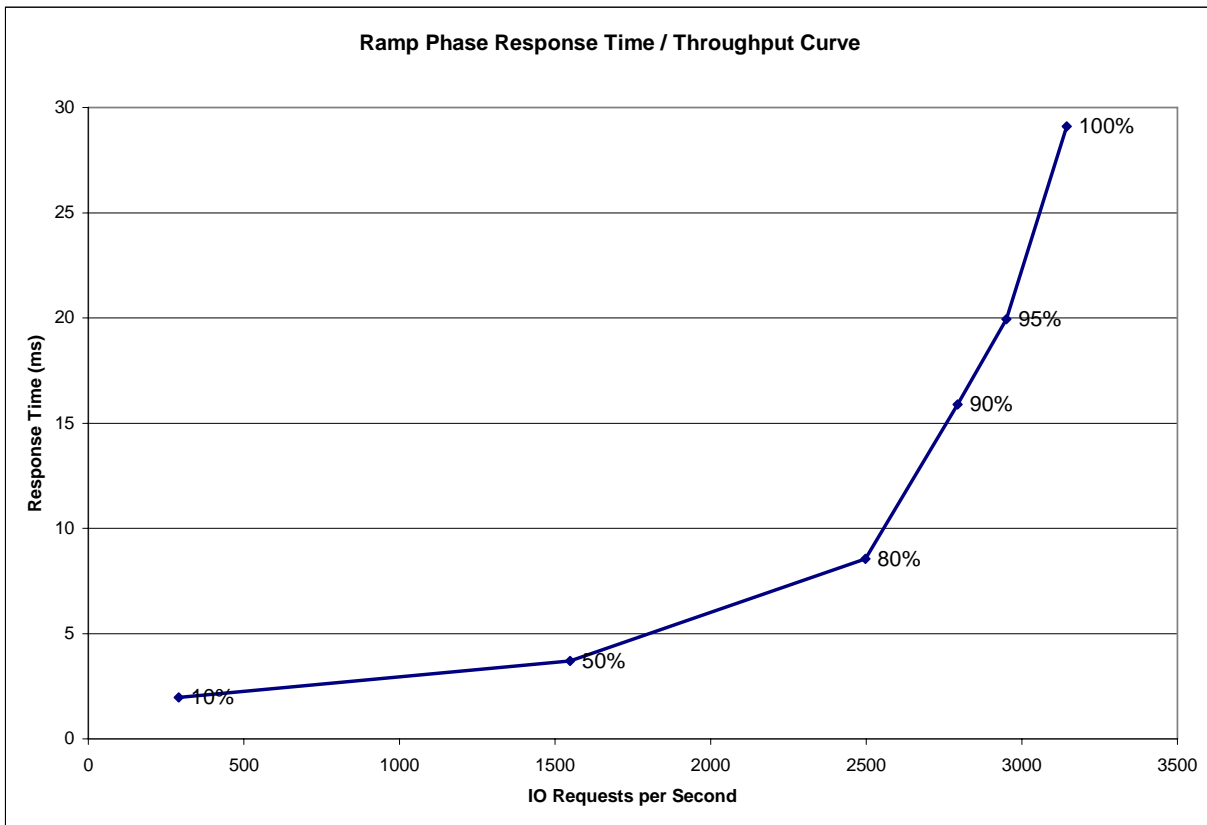
Storage Capacities and Relationships

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

Application Storage Unit (ASU) Capacity
1,097.000 GB

ASU 1: 494.000 GB   ASU 2: 494.000 GB   ASU 3: 109.000 GB

Unused Storage 83.277 GB

Unused Storage 581.347 GB

Global Storage Overhead – 0.165 GB

Addressable Storage Capacity
1,180.277 GB

LV 1 *(ASU 1)*: 531.125 GB, **LV 2** *(ASU 2)*: 531.125 GB, **LV 3** *(ASU 3)*: 118.028 GB

Configured Storage Capacity
1,761.624 GB

Physical Storage Capacity
1,761.789 GB

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

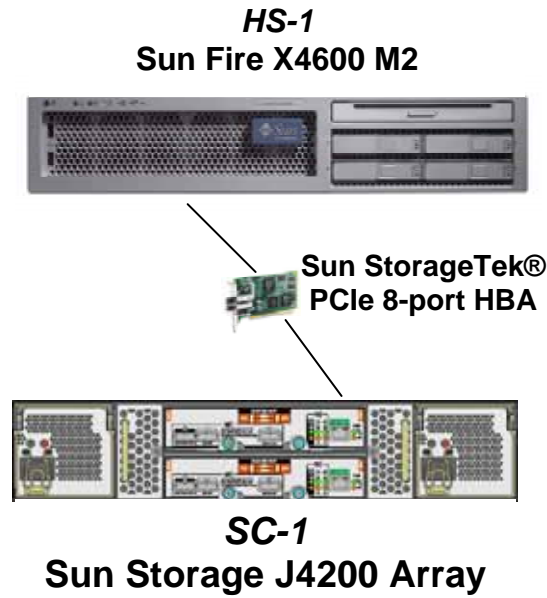|	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
I/O Request Throughput	291.03	1,548.28	2,497.82	2,793.97	2,949.77	3,144.63
Average Response Time (ms):						
All ASUs	1.95	3.71	8.55	15.90	19.94	29.11
ASU-1	2.57	4.23	5.17	5.76	6.17	6.72
ASU-2	2.32	4.05	6.39	7.79	8.84	10.45
ASU-3	0.49	2.46	16.63	40.96	53.94	84.64
Reads	4.25	6.93	9.30	10.63	11.54	12.86
Writes	0.47	1.61	8.05	19.33	25.39	39.68

Tested Storage Configuration Pricing *(Priced Storage Configuration)*

Part Number	Description	Quantity	US List	Total	discount	Ave. Price
XTA4200R00A10DISK	Sun Storage J4200 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	$2,800.00	$2,800	22%	$2,184
XTA-4200-IOM	One three-port SAS I/O module for Sun Storage J4200, One .5M SAS cable.	1	$500	$500	22%	$390
XTA-SS1NJ-146G15K	RoHS-6. Internal 146GB 15K SAS HDD, 3.5" x 1" drive with bracket for J4200 and J4400.	12	$399	$4,788	22%	$3,735
XTA-4200-2URK-19U	Sun Storage J4200 2U universal rack rail kit; RoHS-5	1	$125	$125	22%	$98
SG-XPCIE8SAS-E-Z	Sun StorageTek (TM) PCIe SAS Host Bus Adapter, 8 port, RoHS 6 compliant	1	$550	$550	22%	$429
IWU-STJ4200-24-3G	Controller unit upgrade 3 year Gold Service Maintenance	1	$1,065.64	$1,066	44%	$597
	- 7/24 coverage					
	- 4 hr response time					
	- 4 hour resolution					
Total				**$9,829**		**$7,432**

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

HS-1
Sun Fire X4600 M2

**Sun StorageTek®
PCIe 8-port HBA**

SC-1
Sun Storage J4200 Array

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
	UID=SC-1: **Sun Storage J4200**

4 – 2.6 GHz dual core
   AMD Opteron™ Processor 8222,
   1 MB L2
	3 – 3 Gb/s "x4 wide" SAS ports available
	   1 port used

15.5 GB main memory	12 – 146 GB, 15K RPM Seagate SAS disk drives
MS Windows Server 2003 Enterprise x64 with Service Pack 2	
PCIe	
WG	