



**SPC BENCHMARK 2™
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.
SUN STORAGE TEK® 2510 ARRAY (ISCSI)**

SPC-2™ V1.2.1

**Submitted for Review: May 16, 2008
Submission Identifier: B00030**

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

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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-2 Specification revision number	V1.2.1
SPC-2 Workload Generator revision number	V1.0
Date Results were first used publicly	May 16, 2008
Date FDR was submitted to the SPC	May 16, 2008
Date the TSC will be available for shipment to customers	February 25, 2008
Date the TSC completed audit certification	May 15, 2008

Tested Storage Product (TSP) Description

Designed to meet your ever-increasing storage demands from the workgroup to the enterprise, the Sun StorageTek 2510 array provides simple, reliable, and affordable storage consolidation. With iSCSI connectivity and SAS technology, the StorageTek 2510 is ideal for environments where flexibility, price/performance, and availability are critical. More information can be found at http://www.sun.com/storagetek/disk_systems/workgroup/2510/.

SPC-2 Reported Data

SPC-2 Reported Data consists of three groups of information:

- The following SPC-2 Primary Metrics, which characterize the overall benchmark result:
 - SPC-2 MBPS™
 - SPC-2 Price Performance
 - Application Storage Unit (ASU) Capacity
- Supplemental data to the SPC-2 Primary Metrics.
 - Total Price
 - Data Protection Level
- Reported Data for each SPC Test: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand Delivery (VOD) Test.

SPC-2 Reported Data				
Sun StorageTek™ 2510 Array (iSCSI)				
SPC-2 MBPS™	SPC-2 Price-Performance	ASU Capacity (GB)	Total Price	Data Protection Level
236.54	\$43.42	715.112	\$10,270	RAID-5
<i>The above SPC-2 MBPS™ value represents the aggregate data rate of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video On Demand (VOD)</i>				
SPC-2 Large File Processing (LFP) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
LFP Composite	203.28			\$50.52
Write Only:				
1024 KiB Transfer	142.38	10	14.24	
256 KiB Transfer	118.03	10	11.80	
Read-Write:				
1024 KiB Transfer	214.53	10	21.45	
256 KiB Transfer	174.51	10	17.45	
Read Only:				
1024 KiB Transfer	306.41	10	30.64	
256 KiB Transfer	263.84	10	26.38	
<i>The above SPC-2 Data Rate value for LFP Composite represents the aggregate performance of all three LFP Test Phases: (Write Only, Read-Write, and Read Only).</i>				
SPC-2 Large Database Query (LDQ) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
LDQ Composite	250.76			\$40.96
1024 KiB Transfer Size				
4 I/Os Outstanding	211.32	10	21.13	
1 I/O Outstanding	306.77	10	30.68	
64 KiB Transfer Size				
4 I/Os Outstanding	287.24	10	28.72	
1 I/O Outstanding	197.70	10	19.77	
<i>The above SPC-2 Data Rate value for LDQ Composite represents the aggregate performance of the two LDQ Test Phases: (1024 KiB and 64 KiB Transfer Sizes).</i>				
SPC-2 Video On Demand (VOD) Reported Data				
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream	Price-Performance
	255.59	325	0.79	\$40.18

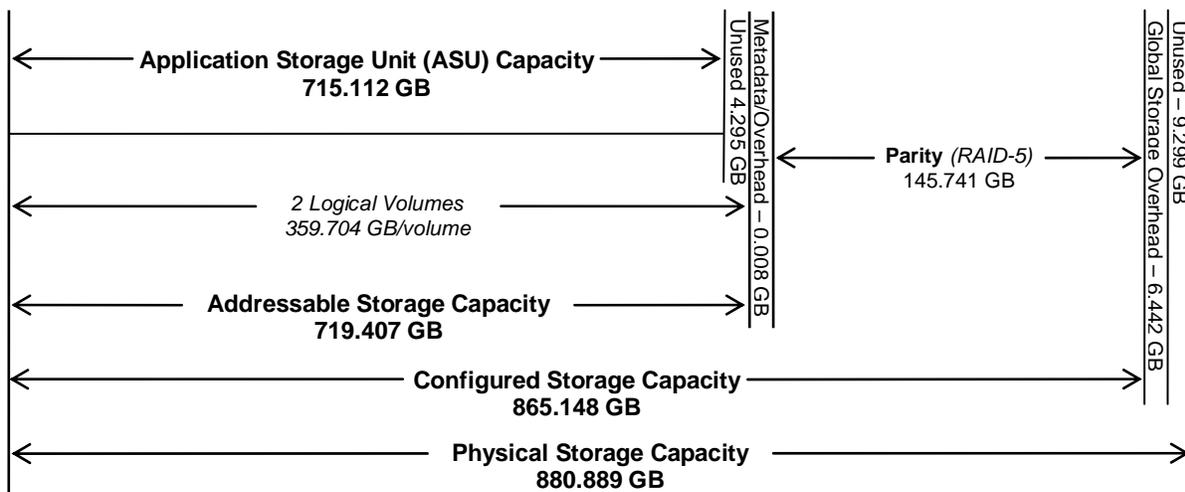
SPC-2 MBPS™ represents the aggregate data rate, in megabytes per second, of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand (VOD).

ASU (Application Storage Unit) Capacity represents the total storage capacity read and written in the course of executing the SPC-2 benchmark.

A **Data Protection Level of RAID-5** provides data protection by distributing check data corresponding to user data across multiple disks in the form of bit-by-bit parity.

Storage Capacities and Relationships

The following diagram (*not to scale*) documents the various storage capacities, used in this benchmark, and their relationships.



Tested Storage Configuration Pricing (Priced Storage Configuration)

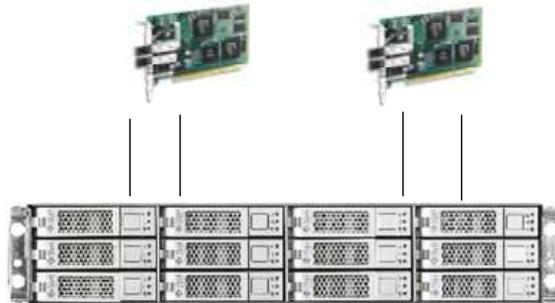
Part Number	Description	Quantity	US List	Total	discount	Ave. Price
XTA2510R01A2D876	Sun StorageTek(TM) 2510 iSCSI Array, Rack-Ready Controller Tray,	1		\$10,855	22%	\$8,467
	- 2 Controllers w/ 512MB cache each					
	- 12 73GB 15Krpm SAS drives					
	- 2 redundant AC power supplies, 2 * redundant cooling fans					
	- 2 redundant cooling fans					
	- 2 storage domains					
	- Common Array Management S/W					
	- RoHS-5					
	- All required cables included					
CABLE10187035-z	CAB ASSY,CAT5E,50IN,24AWG,SHLD	4	\$28.85	\$115	40%	\$69
IWU-ST2510NW-24-3G	Controller unit upgrade 3 year Gold Service Maintenance	1	\$3,096.00	\$3,096	44%	\$1,734
	- 7/24 coverage					
	- 4 hr response time					
	- 4 hour resolution					
Total			\$3,125	\$14,066		\$10,270

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

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

Benchmark Configuration/Tested Storage Configuration Diagram

HS-1
Sun Fire X4600
 (Windows 2003 Server)



SC-1
Sun StorageTek®
2530 Array (iSCSI)

Host System(s) and Tested Storage Configuration Components

Host System:	Tested Storage Configuration (TSC):
UID=HS-1 Sun Fire X4600	2 – PCI Express Dual Gigabit HBAs
4 – 2.6 GHz dual core AMD Opteron™ Processor 885, 1 MB L2	UID=SC-1: Sun StorageTek® 2530 Array
47.5 GB main memory	1 Dual Controller 512 MB cache per controller (1 GB total)
MS Windows Server 2003 Enterprise x64 with Service Pack 2	4 – 1 GB/Sec iSCSI Host Ports available, 4 used (front end)
PCIe	2 – 3 Gb/s “x4 wide” SAS interfaces per controller 4 total, 4 used (backend)
WG	12 – 73 GB, 15K RPM, Seagate SAS disk drives (total)