



**SPC BENCHMARK 2™  
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.  
SUN STORAGE TEK® 2530 ARRAY (RAID-5)**

**SPC-2™ V1.2.1**

**Submitted for Review: August 16, 2007**

**Submission Identifier: B00026**

**Accepted: October 15, 2007**

**Revised: April 11, 2008**



## **EXECUTIVE SUMMARY**

### **Test Sponsor and Contact Information**

<b>Test Sponsor and Contact Information</b>	
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### **Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-2 Specification revision number</b>	V1.2.1
<b>SPC-2 Workload Generator revision number</b>	spc2rc9g
<b>Date Results were first used publicly</b>	August 16, 2007
<b>Date FDR was submitted to the SPC</b>	August 16, 2007
<b>Date revised FDR was submitted to the SPC</b> Revised pricing and SPC-2 Price-Performance	April 11, 2008
<b>Date the TSC will be available for shipment to customers</b>	July 1, 2007
<b>Date the TSC completed audit certification</b>	August 16, 2007

## **Tested Storage Product (TSP) Description**

With up to six host-side three Gbps SAS interfaces, the Sun StorageTek 2530 array can provide support for up to three servers with redundant connections — enabling capacity-efficient storage consolidation without the need of a storage network.

The Sun StorageTek 2530 array's modular design creates an affordable entry point without sacrificing future scalability — enabling customers to start small and scale incrementally when they are ready to address data growth. Dual-active controllers and up to 12 drives combine to create a feature-rich and highly available storage system within a space-efficient 2U enclosure. When capacity or performance requirements change, the Sun StorageTek 2530 array supports up to a total of 36 drives, allowing further investment protection and flexibility without the need to move to another platform architecture.

The Sun StorageTek 2530 array is ideal for a server clustering environment. By utilizing up to two active/active RAID controllers with mirrored cache — redundant components including power and cooling, hot-spare drive that can be available as a spare to any virtual disk in any tray, and automated I/O path failover—the array is well suited for clusters where continuous application and data availability are key requirements.

## SPC-2 Reported Data

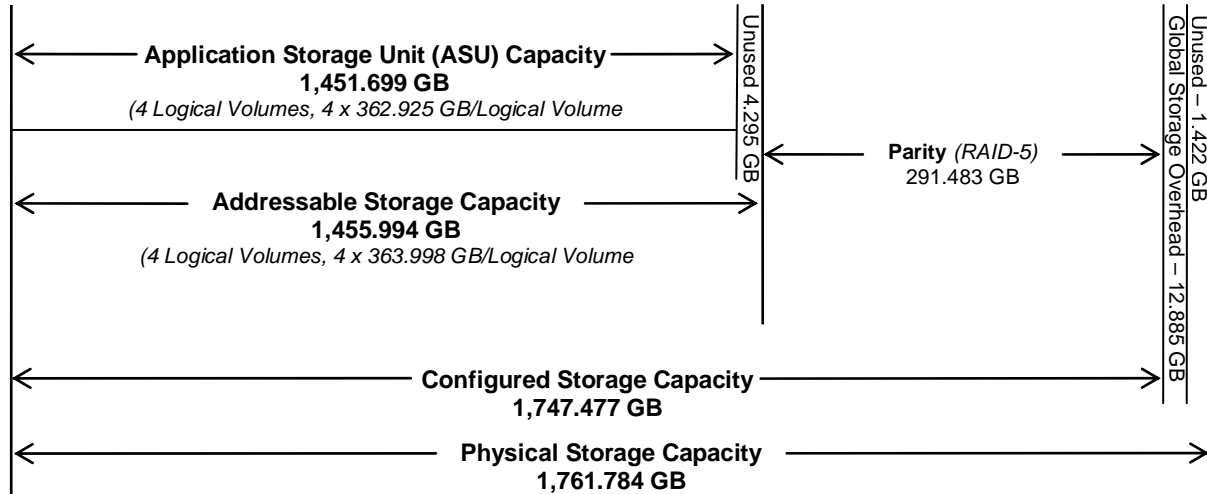
SPC-2 Reported Data consists of three groups of information:

- 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® 2530 Array (RAID-5)				
SPC-2 MBPS™	SPC-2 Price-Performance	ASU Capacity (GB)	Total Price	Data Protection Level
672.05	\$26.15	1,451.699	\$17,572	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	507.24			\$34.64
Write Only:				
1024 KiB Transfer	309.80	10	30.98	
256 KiB Transfer	283.92	10	28.39	
Read-Write:				
1024 KiB Transfer	417.78	10	41.78	
256 KiB Transfer	404.93	10	40.49	
Read Only:				
1024 KiB Transfer	817.06	10	81.71	
256 KiB Transfer	809.94	10	80.99	
<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	773.61			\$22.71
1024 KiB Transfer Size				
4 I/Os Outstanding	814.71	10	81.47	
1 I/O Outstanding	810.49	10	81.05	
64 KiB Transfer Size				
4 I/Os Outstanding	742.17	10	74.22	
1 I/O Outstanding	727.08	10	72.71	
<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
	735.31	935	0.79	\$23.90

### Storage Capacities and Relationships

The following diagram 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
XTA2530R01A2D876	Sun StorageTek(TM) 2530 SAS Array, Rack- Ready Controller Tray	1	\$10,640	\$10,640	22%	\$8,299
	- 2 SAS Controllers w/ 512MB cache each					
	- 12 73GB 15Krpm SAS drives					
	- 2 redundant AC power supplies					
	- 2 redundant cooling fans					
	- 4 shortwave SFPs					
	- Common Array Management S/W					
	- RoHS-5					
	- All required cables included					
XTA2501R01A2D876	Sun StorageTek(TM) 2501 SAS Array, Rack-Ready Expansion Tray	1	\$7,040.00	\$7,040	22%	\$5,491
	- 12 73GB 15Krpm SAS drives					
	- 2 SAS I/O Modules					
	- 2 redundant AC power supplies					
	- 2 redundant cooling fans					
	- Includes two 1m SAS host cables					
	- RoHS-5					
	- All required cables included					
SG-XPCI8SAS-E-Z	Sun StorageTek (TM) PCI-X SAS Host Bus Adapter, Eight Port, RoHS 6	2	\$550	\$1,100	22%	\$858
XTA25X0-1.0M-SAS-Z	1m, Mini, shielded, SAS cable (to connect to host)	4	\$110	\$440	22%	\$343
IWU-ST2530NW-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					
IWU-ST2501NW-24-3G	Expansion unit upgrade 3 year Gold Service Maintenance	1	\$1,512.00	\$1,512	44%	\$847
	- 7/24 coverage					
	- 4 hr response time					
	- 4 hour resolution					
<b>Total</b>			<b>\$22,948</b>	<b>\$23,828</b>		<b>\$17,572</b>

### 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 System(s) and Tested Storage Configuration Components

Host System:	Tested Storage Configuration (TSC):
<b>UID=HS-1</b> Sun Fire X4600	2 – SAS PCI-X 8-lane 3Gb HBAs
8 – 2.6 GHz dual core AMD Opteron™ Processor 885, 1 MB L2	<b>UID=SC-1:</b> <b>Sun StorageTek® 2530 Array</b>
4 GB main memory	1 Dual Controller 512 MB cache per controller ( <i>1 GB total</i> ) 12 – 73 GB, 15K RPM, Seagate SAS disk drives
Windows 2003 Server	6 host connections available, 4 used ( <i>front end</i> )
PCI-X	2 drive connections to expansion tray ( <i>backend</i> )
WG	1 –Expansion Tray (12 drives/tray)
	24 – 73 GB, 15K RPM, Seagate SAS disk drives ( <i>total</i> )