



**SPC BENCHMARK 1™  
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.  
SUN STORAGE<sup>TEK</sup>® D240 DISK SYSTEM  
(MIRRORED WRITE CACHE)**

**SPC-1 V1.8**

**Submitted for Review: February 17, 2004**

**Submission Identifier: A00023**

**Accepted: April 17, 2004**

**Revised: September 5, 2006**



**EXECUTIVE SUMMARY****Test Sponsor and Contact Information**

<b>Test Sponsor and Contact Information</b>	
<b>Test Sponsor Primary Contact</b>	Sun Microsystems, Inc. – <a href="http://www.sun.com">http://www.sun.com</a> Leah Schoeb – <a href="mailto:leah.schoeb@sun.com">leah.schoeb@sun.com</a> 5300 Riata Park Court AUS08 Austin, TX 78721 Phone: (512) 401-1227 FAX: (512) 266-2523
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<b>Auditor</b>	Storage Performance Council <a href="http://www.storageperformance.org">www.storageperformance.org</a> Walter E. Baker <a href="mailto:AuditService@storageperformance.org">AuditService@storageperformance.org</a> 643 Bair Island Road, Suite 103 Redwood City, CA 94063-2755 Phone: (650) 556-9384 FAX: (650) 556-9385

**Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-1 Specification revision number</b>	V1.8
<b>SPC-1 Workload Generator revision number</b>	V2.00.03
<b>Date Results were first used publicly</b>	February 17, 2004
<b>Date FDR was submitted to the SPC</b>	February 17, 2004
<b>Date revised FDR was submitted to the SPC</b> Revised Test Sponsor Name, product name, and primary/alternate contact information to reflect Sun/StorageTek merger.	September 5, 2006
<b>Date the TSC is/was available for shipment to customers</b>	September 5, 2003
<b>Date the TSC completed audit certification</b>	February 13, 2004

## Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: Sun StorageTek® D240 Disk System (mirrored write cache)	
Metric	Reported Result
SPC-1 IOPS™	9,099.86
SPC-1 Price-Performance	\$14.05/SPC-1 IOPS™
Total ASU Capacity	478.437GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$127,858

**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, maintained on separate disks.

## Storage Capacities and Relationships

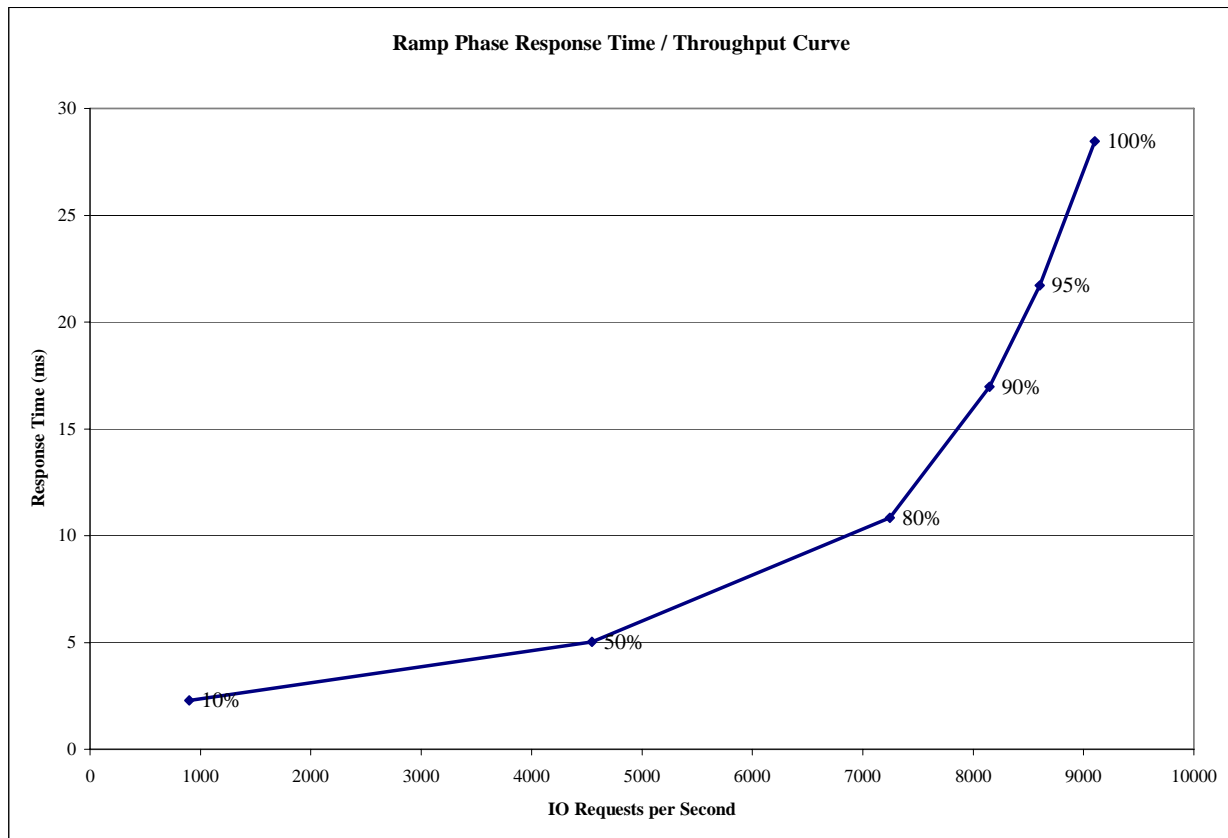
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.

Physical Capacity 1,821.003 GB			
Configured Capacity 956.874GB			Unused Storage 837.285GB
Addressable Capacity 478.437GB		Addressable Mirror 478.437GB	
ASU Capacity 478.437GB			
ASU 1 215.296GB	ASU 2 215.296GB	ASU 3 47.843GB	

### 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 100% load point 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
<b>I/O Request Throughput</b>	899.57	4548.09	7244.26	8147.33	8601.28	9099.86
<b>Average Response Time (ms):</b>						
All ASUs	2.30	5.03	10.84	16.97	21.72	28.46
ASU-1	2.91	5.83	12.05	17.50	21.56	26.85
ASU-2	2.30	5.21	9.42	14.79	19.14	25.99
ASU-3	1.01	3.27	8.88	16.81	23.20	32.97
Reads	4.38	8.10	13.34	17.22	19.97	23.60
Writes	0.95	3.03	9.21	16.81	22.86	31.63

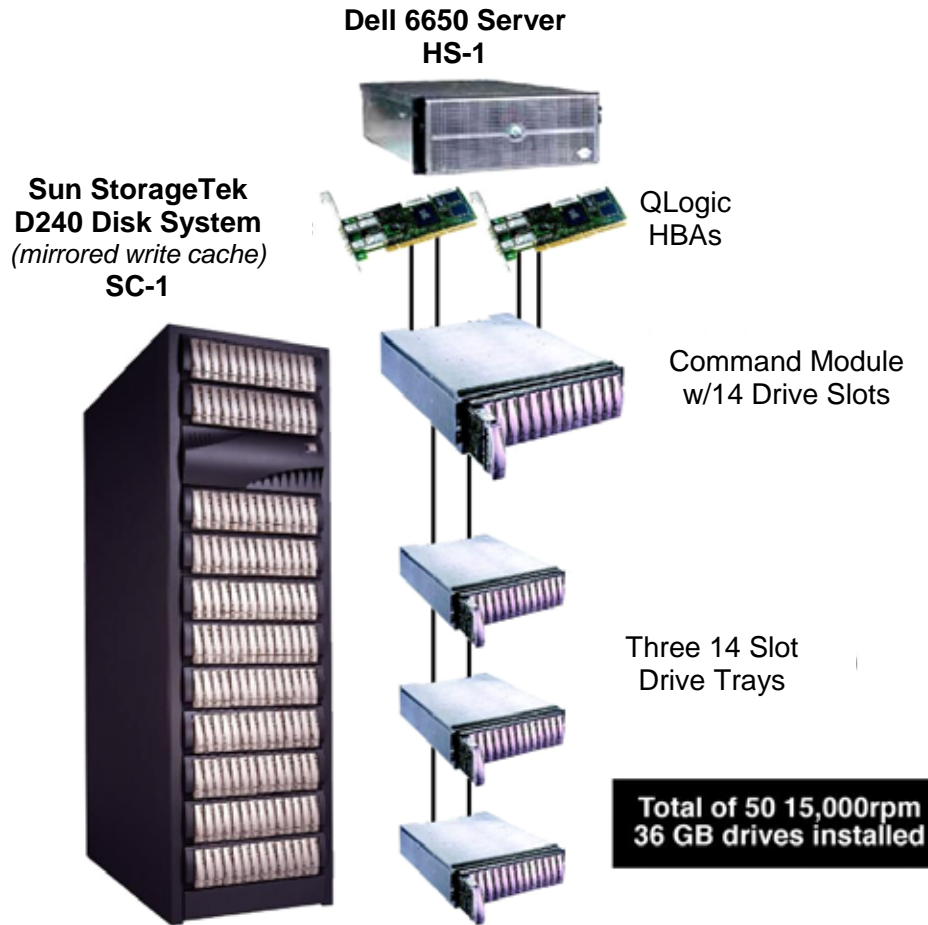
### Tested Storage Configuration Pricing (*Priced Storage Configuration*)

StorageTek Item No.	Description	Unit Price	Qty	Aggregate Price
D240DR4	D240 Command Module, Rack Mount, Dual 2GB Controller	\$ 37,500	1	\$ 37,500
D200014	2Gbit Expansion Drive Module, 14 Slot, Rack Mount, Dual FC ESM	\$ 9,000	3	\$ 27,000
SMGR002	SANtricity 8.40 for Windows 2000 Software Feature	\$ 2,500	1	\$ 2,500
G36	36 GB FC 15K Drive Canister, 2Gb, 1.0" FF	\$ 1,050	50	\$ 52,500
HBAQ003	QLogic 2342 Host Bus Adapter, dualport, 133 MHZ PCI-X	\$ 3,729	2	\$ 7,458
126544-01	25-meter fibre channel cables, optical, switch to Command Module	\$ 225	4	\$ 900
				\$127,858

### 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:	Tested Storage Configuration (TSC):
UID=HS-	UID=SC-1
1 – Dell 6650	Command Module
4 – Pentium 4 Xeon 2GHz with Hyperthreading Enabled	2 Qlogic 2342 dual-port fibre channel host bus adapters
3GB Main Memory	2 – Disk Array Controllers, 1GB RAM Each
Windows 2003, Service Pack 3	4 – 2gb Fibre Channel host connections
WG	2 – 2gb Fibre Channel drive connections
	3 – Drive Modules
	50 x 36GB 15K RPM Disk Drives