



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

**SUN MICROSYSTEMS, INC.
SUN STORAGE TEK® 6540 ARRAY**

SPC-1 V1.10.1

**Submitted for Review: June 15, 2007
Submission Identifier: A00051**

EXECUTIVE SUMMARY**Test Sponsor and Contact Information**

| Test Sponsor and Contact Information | |
|---|--|
| 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: (512) 401-1227 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 | June 15, 2007 |
| Date the FDR was submitted to the SPC | June 15, 2007 |
| Date the TSC is available for shipment to customers | currently available |
| Date the TSC completed audit certification | June 14, 2007 |

Tested Storage Product (TSP) Description

Summary of Results

| SPC-1 Results | |
|---|--------------------|
| Tested Storage Configuration (TSC) Name: Sun StorageTek® 6540 Array | |
| Metric | Reported Result |
| SPC-1 IOPS™ | 46,491.72 |
| SPC-1 Price-Performance | \$6.62/SPC-1 IOPS™ |
| Total ASU Capacity | 6,890.000 GB |
| Data Protection Level | Mirroring |
| Total TSC Price (including three-year maintenance) | \$307,710 |

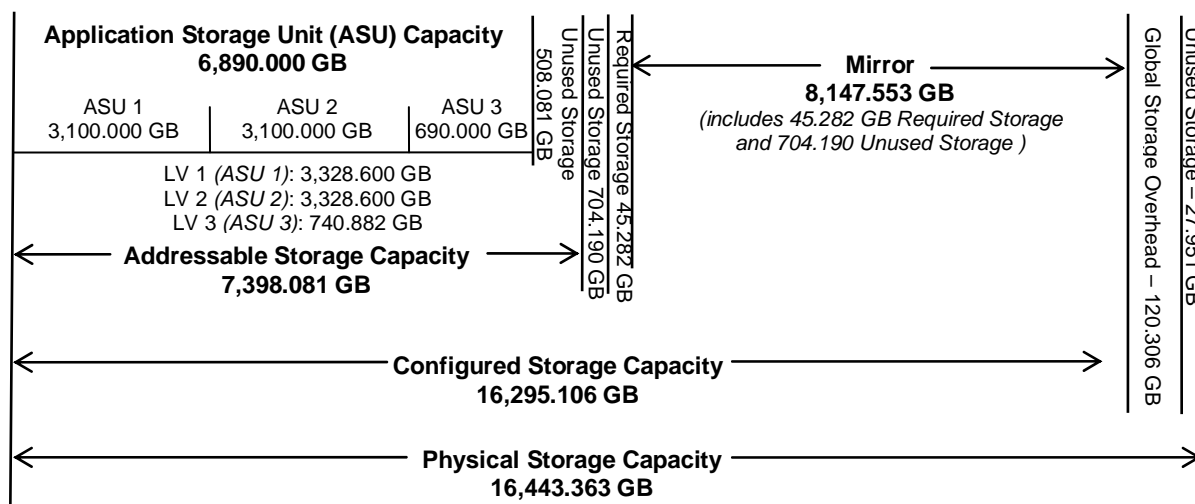
SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

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.

Storage Capacities and Relationships

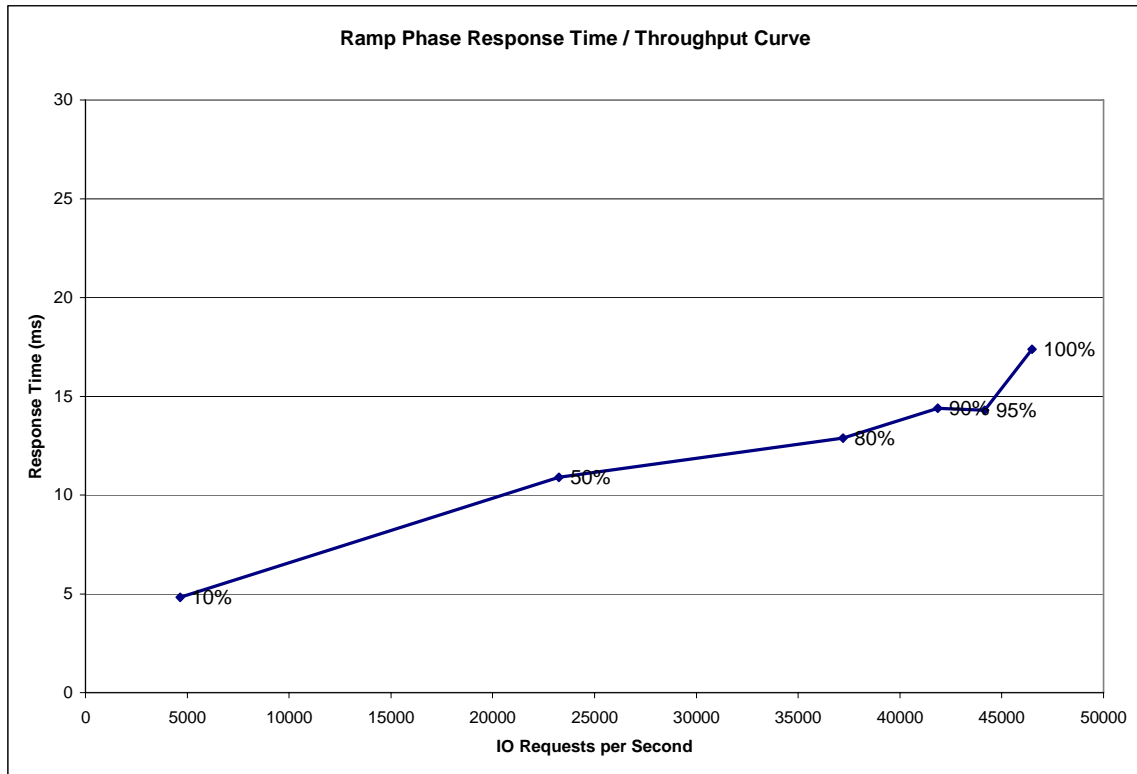
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.



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 | 4,651.01 | 23,253.26 | 37,205.61 | 41,852.62 | 44,150.07 | 46,491.72 |
| Average Response Time (ms): | | | | | | |
| All ASUs | 4.82 | 10.90 | 12.88 | 14.39 | 14.29 | 17.39 |
| ASU-1 | 4.88 | 10.71 | 12.83 | 14.09 | 14.02 | 17.08 |
| ASU-2 | 5.11 | 13.06 | 18.44 | 20.90 | 20.96 | 23.89 |
| ASU-3 | 4.56 | 10.36 | 10.56 | 12.18 | 11.96 | 15.18 |
| Reads | 7.39 | 15.85 | 19.30 | 20.64 | 20.27 | 21.75 |
| Writes | 3.15 | 7.68 | 8.70 | 10.32 | 10.40 | 14.55 |

Tested Storage Configuration Pricing (*Priced Storage Configuration*)

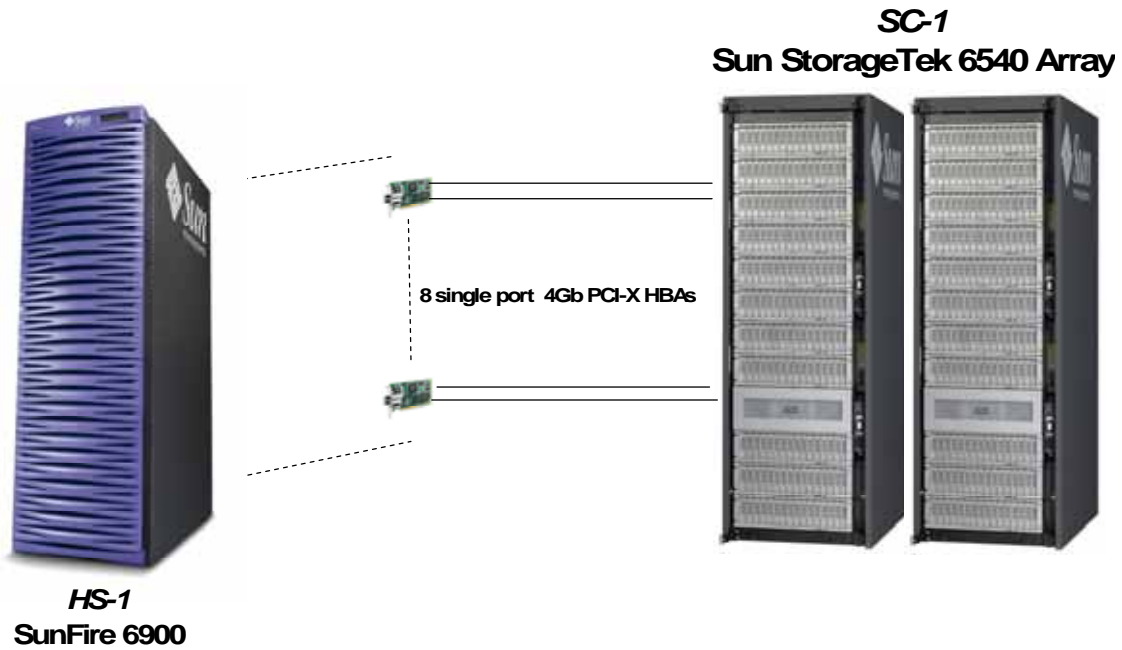
| Part Number | Description | Quantity | US List | Total | discount | Ave. Price |
|--------------------|--|----------|----------|------------------|----------|------------------|
| TA6540M11A2-04FCZ | STK 6540 FC - 4GB RAID Controller Tray - 1x1 - 2 Controllers w/ 2GB cache each - All required cables included | 1 | \$70,000 | \$70,000 | 38% | \$43,400 |
| TACSM2M01A0B1168 | STK CSM200 RM 0x1x16x73G15k - 16 73GB 15k rpm 4Gb drives - All required cables included | 14 | \$27,495 | \$384,930 | 38% | \$238,657 |
| SG-XPCI1FC-QF4 | 4Gb PCI Express Single Port FC Host Based Adapter | 8 | \$1,320 | \$10,560 | 38% | \$6,547 |
| W9D-ST6540-4-24-3G | 3-yr Gold Service Maintainance for controller tray - 7/24 coverage - 4 hour reponse time - 4 hour resolution | 1 | \$4,608 | \$4,608 | 38% | \$2,857 |
| W9D-STCSM2-24-3G | 3-yr Gold Service Maintainance for CSM200 expansion tray - 7/24 coverage - 4 hr response time - 4 hour resolution | 13 | \$2,016 | \$26,208 | 38% | \$16,249 |
| | | | | \$496,306 | | \$307,710 |

The above pricing provides maintenance/support for 24 hours per day, 7 days per week for three years with four hour acknowledgement and four hour subsequent response (support engineer onsite or customer replaceable part available).

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

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

Benchmark Configuration/Tested Storage Configuration Diagram



Benchmark Configuration/Tested Storage Configuration Components

| Host System: | Tested Storage Configuration (TSC): |
|--|---|
| UID=HS-1 SunFire 6900 | 8 – 4 Gb single port FC PCI-X HBAs |
| 24 – 1.2 GHz dual core UltraSPARC-IV processors 64 KB L1 cache per core, 2 MB L2 shared per dual core 32 MB L3 shared per dual core | UID=SC-1: Sun StorageTek® 6540 Array 1 Dual Controller 2 GB cache per controller (<i>4 GB total</i>) |
| 48 GB main memory | 8 host connections (<i>front end</i>) 8 drive connections (<i>backend</i>) |
| Solaris 10 update 3 | 14 – FC Expansion Trays |
| PCI-X | 224 – 73 GB 15K RPM disk drives |
| WG | |