



**SPC BENCHMARK 1C™  
EXECUTIVE SUMMARY**

**SEAGATE TECHNOLOGY LLC (*TEST SPONSOR*)  
SAMSUNG SPINPOINT F1 RAID CLASS HE103UJ**

**SPC-1C™ V1.1**

**Submitted for Review: December 3, 2008  
Submission Identifier: C00006**

## EXECUTIVE SUMMARY

### Test Sponsor and Contact Information

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### Revision Information and Key Dates

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<b>SPC-1C Specification revision number</b>	V1.1
<b>SPC-1C Workload Generator revision number</b>	V1.0
<b>Date Results were first used publicly</b>	December 3, 2008
<b>Date the FDR was submitted to the SPC</b>	December 3, 2008
<b>Date the TSC is available for shipment to customers</b>	currently available
<b>Date the TSC completed audit certification</b>	December 2, 2008

### Tested Storage Product (TSP) Description

Utilizing Samsung-developed perpendicular recording technology, the new Spinpoint F1 RAID-class hard disk drive (F1R) delivers the solid performance, low power, reliability, compatibility and high capacity that the enterprise needs.

The F1R meets the industry's highest quality standards with a mean time between failure (MTBF) of up to 1.2 million hours. The F1R also offers enterprise class functions such as command completion time limit and vibration tolerance with RV controller (RVC). It features a 16 or 32MB cache, a Serial ATA 3.0Gbps interface, a 175MB/s maximum media transfer rate, and NCQ for random I/O performance.

## Summary of Results

SPC-1C Results	
Tested Storage Product: Samsung Spinpoint F1 RAID Class HE103UJ	
Metric	Reported Result
SPC-1C IOPS™	150.49
Total ASU Capacity	500.103 GB
Data Protection Level	Unprotected
Total Price – Priced Storage Configuration	\$470.07

SPC-1C 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-1C benchmark.

A **Data Protection Level** of “Unprotected” makes no claim of data protection in the event of a single point of failure.

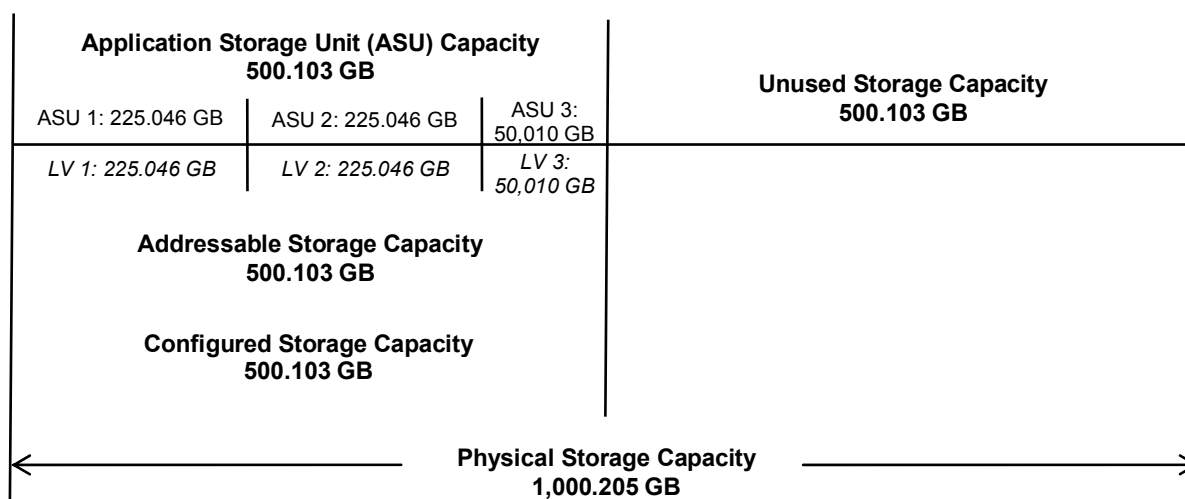
## Storage Capacities and Relationships

The Tested Storage Configuration (TSC) must be configured so that there is either no Unused Storage or that the sum of Total ASU Capacity and storage required for data protection equals 50% (+-1 GiB) of the Physical Storage Capacity. This configuration meets the 50% requirement as documented below:

$$1,000.205 \text{ GB (Physical Storage Capacity)} * 0.5 = 500.102 \text{ GB}$$

$$500.103 \text{ GB (Total ASU Capacity)} + 0.000 \text{ GB (data protection)} = 500.103 \text{ GB}$$

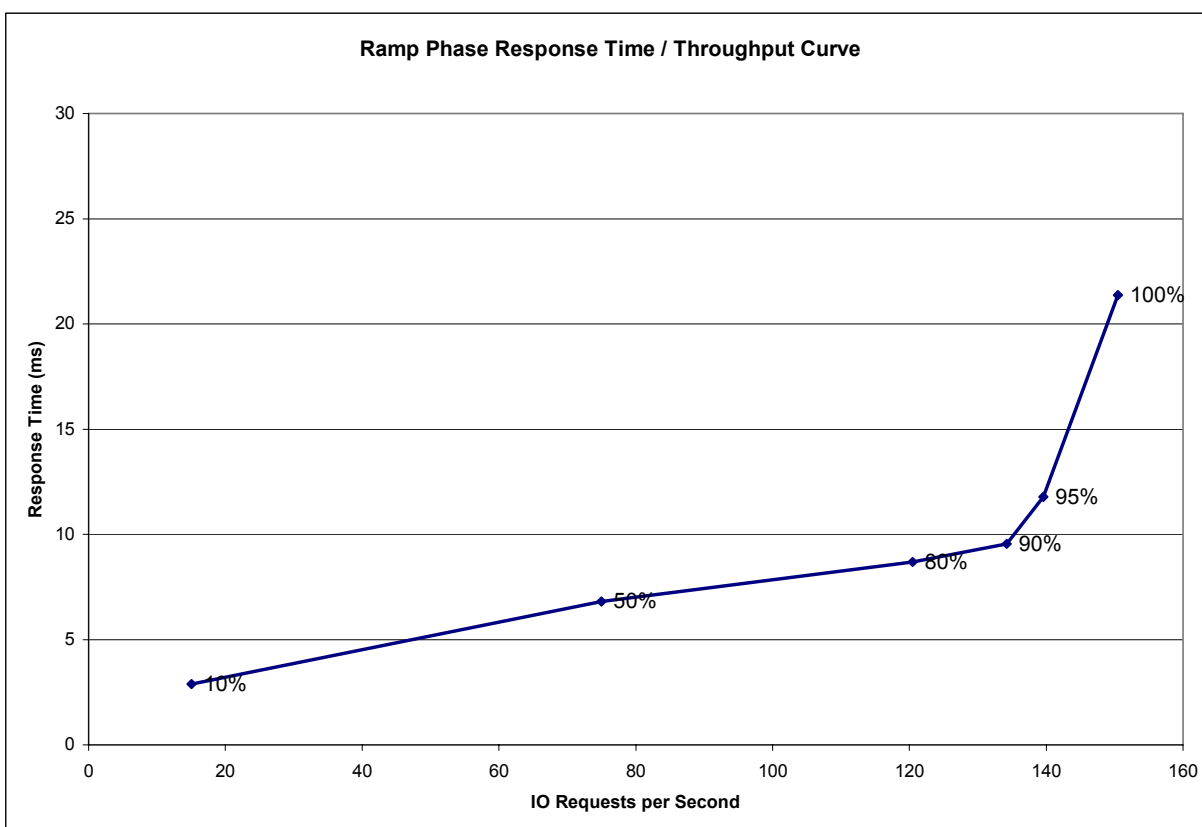
The following diagram documents the various storage capacities, used in this benchmark, and their relationships.



## 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
<b>I/O Request Throughput</b>	15.08	75.00	120.50	134.25	139.59	150.49
<b>Average Response Time (ms):</b>						
All ASUs	2.89	6.82	8.70	9.54	11.79	21.37
ASU-1	4.04	8.72	10.76	11.75	14.63	27.07
ASU-2	3.29	8.21	11.02	12.57	15.67	28.80
ASU-3	0.22	2.20	3.29	3.61	4.23	6.05
Reads	7.13	13.91	17.02	18.92	23.69	45.80
Writes	0.22	2.13	3.24	3.52	4.01	5.45

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

Description	Part Numbers	Qty	Price	Extended Price
1TB GB SATA 3.5" HDD	HE103UJ	1	256.99	256.99
SAS HBA (incl 4 SAS/SATA -1M Cables)	LSI00033-F	1	213.08	213.08
			<b>Total</b>	<b>\$470.07</b>

### 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**



**Benchmark Configuration/Tested Storage Configuration Components**

Host System:	Tested Storage Configuration (TSC):
<b>HS-1</b>	1 – LSI SAS3041X-R HBA
"White Box" Host System: Supermicro X6DH*-XG2 motherboard 2 – 2.8 GHz Intel® Xeon™ CPUs 16 KB L1 cache per CPU 1024 KB L2 cache per CPU 2 GB main memory	1 – Samsung Spinpoint F1 RAID Class HE103UJ SATA disk drive
Windows 2003 Enterprise Edition	1 – Point-to-point cable connection
PCIe	