



**SPC BENCHMARK 2C™**  
**EXECUTIVE SUMMARY**

**SEAGATE TECHNOLOGY LLC** (*TEST SPONSOR*)  
**WESTERN DIGITAL WD RE2-GP** (*WD1000FYPS*)

**SPC-2C™ V1.1**

**Submitted for Review: October 15, 2008**  
**Submission Identifier: D00005**

## **EXECUTIVE SUMMARY**

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

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

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<b>SPC-2C Specification revision number</b>	V1.1
<b>SPC-2C Workload Generator revision number</b>	V1.0
<b>Date Results were first used publicly</b>	October 15, 2008
<b>Date FDR was submitted to the SPC</b>	October 15, 2008
<b>Date the TSC will be available for shipment to customers</b>	currently available
<b>Date the TSC completed audit certification</b>	October 6, 2008

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

As demand for storage continues to expand, the need for more efficient power solutions becomes paramount. WD RE2-GP makes it possible for large scale data centers to increase storage capacity without exceeding available power, and in many cases actually reduce power consumption. WD RE2-GP drives help combat the four major challenges large data installations face—total drive slots, maximum capacity, power allotment, and available operations expense budget—while lowering the overall total cost of ownership.

## 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-2C Reported Data			
Western Digital WD RE2-GP (WD1000FYPS)			
SPC-2C MBPS™	ASU Capacity (GB)	Total Price	Data Protection Level
47.33	500.103	\$451.73	Unprotected
<i>The above SPC-2C MBPS™ value represents the aggregate data rate of all three SPC-2C workloads: Large File Processing, Large Database Query, and Video On Demand</i>			
SPC-2 Large File Processing (LFP) Reported Data			
	Data Rate (MB/second)	Number of Streams	Data Rate per Stream
LFP Composite	54.84		
Write Only:			
1024 KiB Transfer	45.50	5	9.10
256 KiB Transfer	48.23	5	9.65
Read-Write:			
1024 KiB Transfer	49.48	5	9.90
256 KiB Transfer	49.60	5	9.92
Read Only:			
1024 KiB Transfer	68.61	5	13.72
256 KiB Transfer	67.65	5	13.53
<i>The above SPC-2C 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
LDQ Composite	65.13		
1024 KiB Transfer Size			
4 I/Os Outstanding	55.77	5	11.15
1 I/O Outstanding	67.69	5	13.54
64 KiB Transfer Size			
4 I/Os Outstanding	68.11	5	13.62
1 I/O Outstanding	68.94	5	13.79
<i>The above SPC-2C 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
	22.02	28	0.79

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

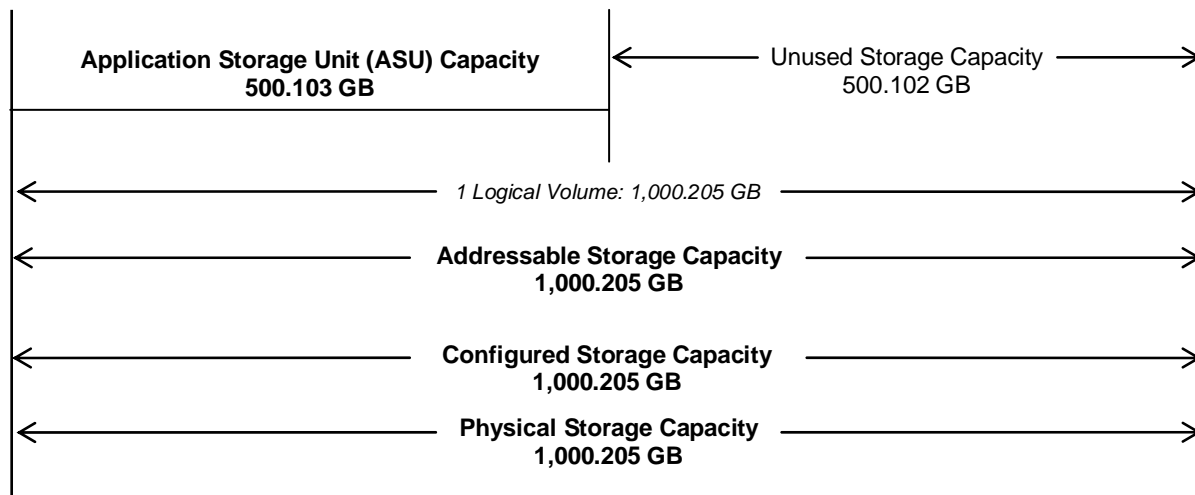
### Storage Capacities and Relationships

The Tested Storage Configuration (TSC) must be configured so that there is either no Unused Storage or that the sum of 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:

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

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

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*)

Description	Part Numbers	Qty	Price	Extended Price
1TB GB SATA 3.5" HDD	WDWD1000FYPS	1	238.65	238.65
SAS HBA (incl 4 SAS/SATA -1M Cables)	LSI00033-F	1	213.08	213.08
			<b>Total</b>	<b>\$451.73</b>

### 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**



**Host System(s) and 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 – Western Digital WD RE2-GP WD1000FYPS SATA disk drive
	1 – Point-to-point cable connection
Windows 2003 Enterprise Edition	
PCIe	