



**SPC BENCHMARK 1™  
EXECUTIVE SUMMARY**

**IBM CORPORATION**

**IBM TOTALSTORAGE® DS8300** (*RELEASE 6.1.600*)

**SPC-1 V1.9**

**Submitted for Review: October 27, 2005**

**Submission Identifier: A00044**

**Accepted: December 26, 2005**



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

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**Revision Information and Key Dates**

<b>Revision Information and Key Dates</b>	
<b>SPC-1 Specification revision number</b>	V1.9
<b>SPC-1 Workload Generator revision number</b>	V2.00.04a
<b>Date Results were first used publicly</b>	October 27, 2005
<b>Date the FDR was submitted to the SPC</b>	October 27, 2005
<b>Date the TSC is available for shipment to customers</b>	January 27, 2006
<b>Date the TSC completed audit certification</b>	October 26, 2005

## Summary of Results

SPC-1 Results	
Tested Storage Configuration (TSC) Name: IBM TotalStorage® DS8300 (Release 6.1.600)	
Metric	Reported Result
SPC-1 IOPS™	101,101.68
SPC-1 Price-Performance	\$21.61/SPC-1 IOPS™
Total ASU Capacity	6,755.600 GB
Data Protection Level	Mirroring
Total TSC Price (including three-year maintenance)	\$2,185,472

**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.

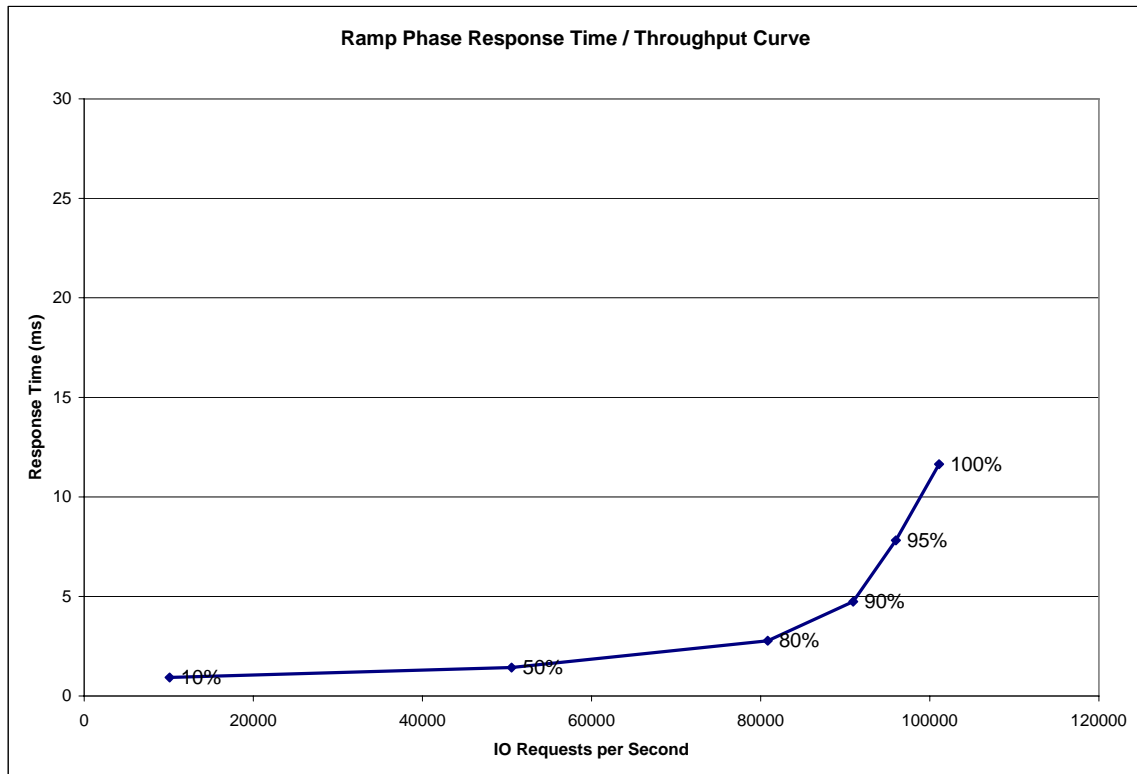
## Storage Capacities and Relationships

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
<b>I/O Request Throughput</b>	10,104.16	50,552.23	80,836.03	90,940.32	95,998.25	101,101.68
<b>Average Response Time (ms):</b>						
All ASUs	0.93	1.43	2.77	4.74	7.82	11.64
ASU-1	1.07	1.55	2.81	4.67	7.67	11.40
ASU-2	1.34	1.91	3.35	5.27	8.34	11.82
ASU-3	0.46	0.95	2.45	4.65	7.90	12.08
Reads	1.75	2.53	4.21	6.22	9.34	12.98
Writes	0.40	0.71	1.84	3.77	6.83	10.78

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

Product	Description	Quantity	Unit Price	Extended Purchase
2107-922	TotalStorage DS8300	1	190,000.00	190,000.00
	1 9xE factory merge	2	N/C	N/C
	221 922 - 92E Position 1	1	N/C	N/C
	222 922 - 92E Position 2	1	N/C	N/C
	700 OEL Indicator	1	N/C	N/C
	815 25.1 to 50.0 TB capacity	1	N/C	N/C
	900 Non-Standby CoD	1	N/C	N/C
	1050 Battery Assembly	3	1,700.00	5,100.00
	1090 Line Cord (US/LA/AP/Canada)	1	1,900.00	1,900.00
	1100 Management Console Internal	1	10,000.00	10,000.00
	1210 Disk Enclosure Pair	4	10,000.00	40,000.00
	1211 Disk Drive Cable Group 1	1	1,000.00	1,000.00
	1300 I/O Enclosure Pair	2	12,500.00	25,000.00
	1316 RIO-G Cable Group 6	1	1,600.00	1,600.00
	1411 50 um Fibre Cable (LC/SC)	16	100.00	1,600.00
	2016 73 GB 15K Drive Set	8	26,000.00	208,000.00
	3011 Device Adapter Pair	4	10,000.00	40,000.00
	3111 2Gb SW FCP/FICON Adapter	16	20,500.00	328,000.00
	4105 256 GB Processor Memory	1	800,000.00	800,000.00
	9090 AC Voltage: 200V - 240V	1	N/C	N/C
	9100 MC Keyboard - US English	1	N/C	N/C
	Serial: N/A	<b>Total</b>		<b>1,652,200.00</b>
2107-92E	TotalStorage DS8000 Enclosure Unit	1	75,000.00	75,000.00
	1 9xE factory merge	1	N/C	N/C
	222 922 - 92E Position 2	1	N/C	N/C
	1090 Line Cord (US/LA/AP/Canada)	1	1,900.00	1,900.00
	1210 Disk Enclosure Pair	4	10,000.00	40,000.00
	1214 Disk Drive Cable Group 4	1	2,400.00	2,400.00
	2016 73 GB 15K Drive Set	8	26,000.00	208,000.00
	9090 AC Voltage: 200V - 240V	1	N/C	N/C
	Serial: N/A	<b>Total</b>		<b>327,300.00</b>

**Tested Storage Configuration Pricing (*Priced Storage Configuration*) – cont.**

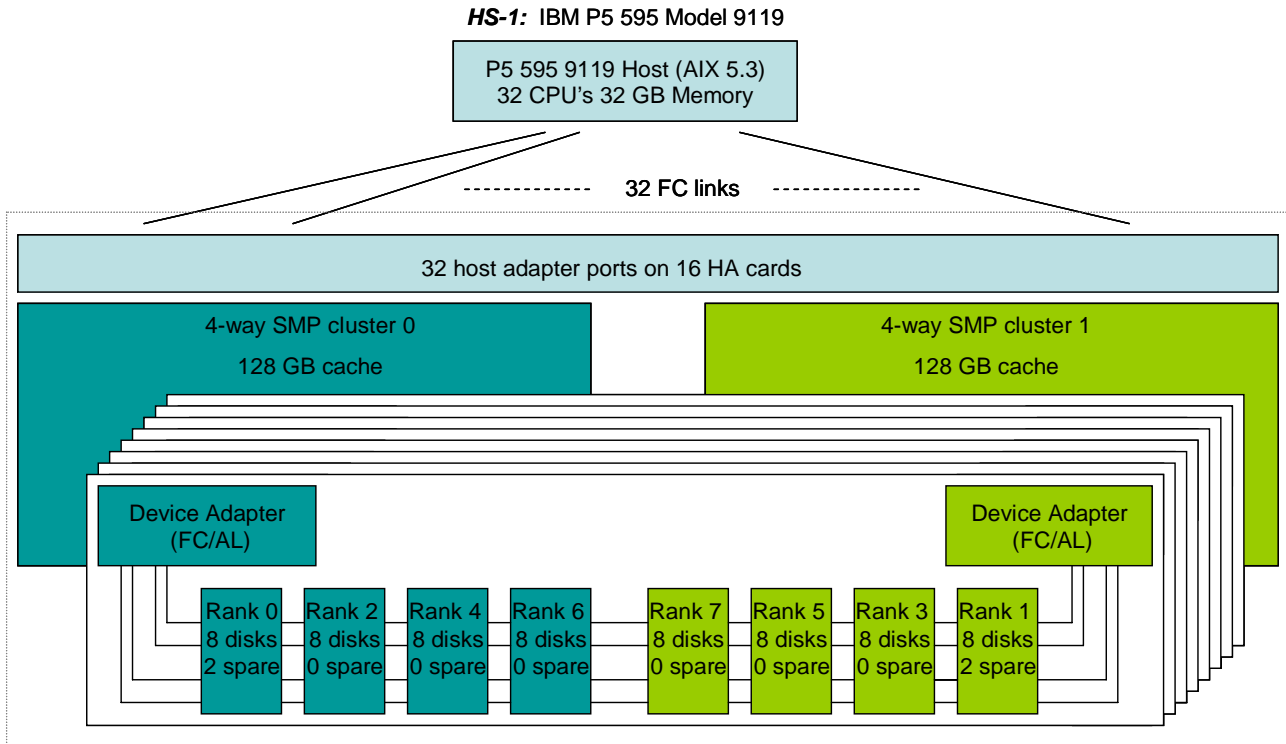
Product	Description	Quantity	Unit Price	Extended Purchase
2107-92E	TotalStorage DS8000 Enclosure Unit	1	75,000.00	75,000.00
	1 9xE factory merge	1	N/C	N/C
	221 922 - 92E Position 1	1	N/C	N/C
	1020 Power Module second pair	1	N/C	N/C
	1050 Battery Assembly	3	1,700.00	5,100.00
	1090 Line Cord (US/LA/AP/Canada)	1	1,900.00	1,900.00
	1210 Disk Enclosure Pair	8	10,000.00	80,000.00
	1212 Disk Drive Cable Group 2	1	1,900.00	1,900.00
	1300 I/O Enclosure Pair	2	12,500.00	25,000.00
	1314 RIO-G Cable Group 4	1	2,300.00	2,300.00
	2016 73 GB 15K Drive Set	16	26,000.00	416,000.00
	3011 Device Adapter Pair	4	10,000.00	40,000.00
	9090 AC Voltage: 200V - 240V	1	N/C	N/C
	Serial: N/A	<b>Total</b>		<b>647,200.00</b>
2244-OEL	DS8000 Function Authorization	1	N/C	N/C
	7001 OEL - 1 TB Unit	3	6,750.00	20,250.00
	7003 OEL - 10 TB Unit	1	54,500.00	54,500.00
	7004 OEL - 25 TB Unit	1	87,500.00	87,500.00
	Serial: N/A	<b>Total</b>		<b>162,250.00</b>
====	Non- S8300 charges =====			
	5716 P5 595 adapter (2 Gbit, PCI-X)	32	2,720.00	87,040.00
	Short wave FC cable (2 Gbit, 25m)	32	210.00	6,720.00
		<b>Total</b>		<b>93,760.00</b>
	<b>Total DS8300 Charges</b>			<b>2,788,950.00</b>
	<b>Field Delegation Discount of 25%</b>			<b>697,237.50</b>
	<b>Total DS8300 Charges after discount</b>			<b>2,091,712.50</b>
	<b>Non-DS8300 Charges</b>			<b>93,760.00</b>
	<b>Total Charges</b>			<b>2,185,472.50</b>

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 Priced Storage Configuration.

### Benchmark Configuration/Tested Storage Configuration Diagram



**SC-1: IBM TotalStorage® DS8300 (Release 6.1.600)**

Host Systems:	Tested Storage Configuration (TSC):
<b>UID=HS-1</b>	32 – P5 595 adapters (2Gb, PCI-X)
IBM P5 595 Model 9119	<b>UID=SC-1:</b> TotalStorage® DS8300 (Release 6.1.600) Each cluster contains: 4 POWER5 CPUs 128 GB processor memory/cluster
32 – 1.9 GHz CPUs – 2 CPUs/POWER5 chip 32 KB L1 cache, 960 KB L2 cache, and 18 MB L3 cache per CPU	
32 GB main memory	
AIX 5.3	
PCI-X/RIO	8 – 4-port 2Gb/s FC-AL device adapter pairs
WG	16 – 2Gb SW FCP/FICON adapters
	32 – Disk enclosure pairs
	16 – 73 GB, 15K RPM disk drives per enclosure