



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

IBM CORPORATION

IBM TOTALSTORAGE® DS8300 (*RELEASE 6.1.600*)

SPC-1 V1.9

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EXECUTIVE SUMMARY**Test Sponsor and Contact Information**

Test Sponsor and Contact Information	
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Revision Information and Key Dates

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

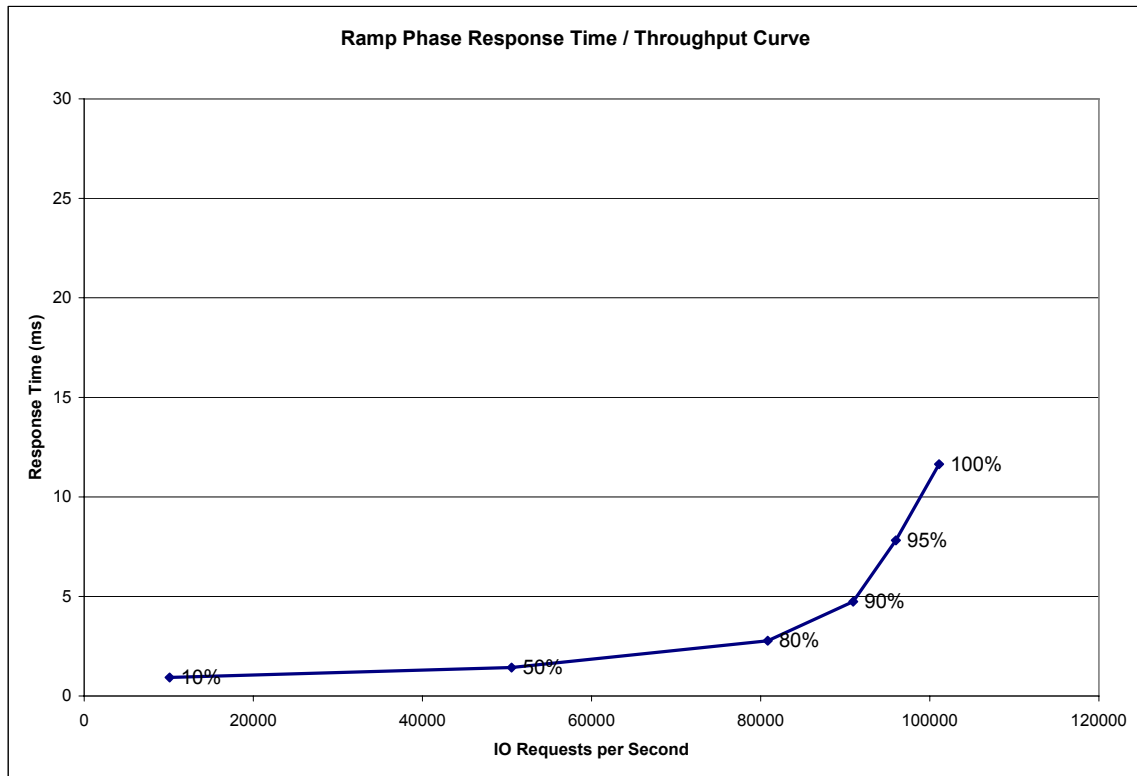
Storage Capacities and Relationships

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
I/O Request Throughput	10,104.16	50,552.23	80,836.03	90,940.32	95,998.25	101,101.68
Average Response Time (ms):						
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	Total		1,652,200.00
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	Total		327,300.00

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

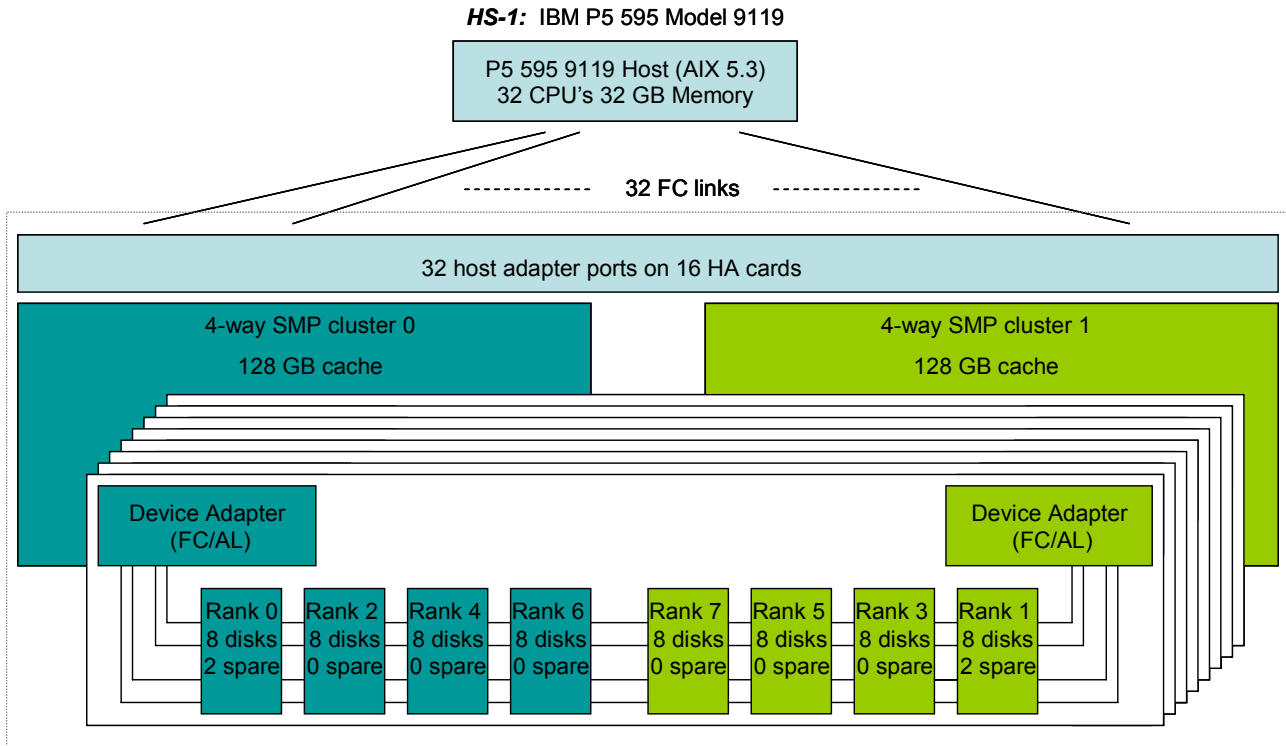
Product	Description	Quantity	Unit Price	Extended Purchase
2107-92E	TotalStorage DS8000 Enclosure Unit	1	75,000.00	75,000.00
	1 9xE factory merge	1	N/C	N/C
	221 922 - 92E Position 1	1	N/C	N/C
	1020 Power Module second pair	1	N/C	N/C
	1050 Battery Assembly	3	1,700.00	5,100.00
	1090 Line Cord (US/LA/AP/Canada)	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	Total		647,200.00
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	Total		162,250.00
====	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
		Total		93,760.00
	Total DS8300 Charges			2,788,950.00
	Field Delegation Discount of 25%			697,237.50
	Total DS8300 Charges after discount			2,091,712.50
	Non-DS8300 Charges			93,760.00
	Total Charges			2,185,472.50

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):
UID=HS-1	32 – P5 595 adapters (2Gb, PCI-X)
IBM P5 595 Model 9119	UID=SC-1: 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