



SPC BENCHMARK 1™

EXECUTIVE SUMMARY

IBM IBM® STORWIZE® V5030

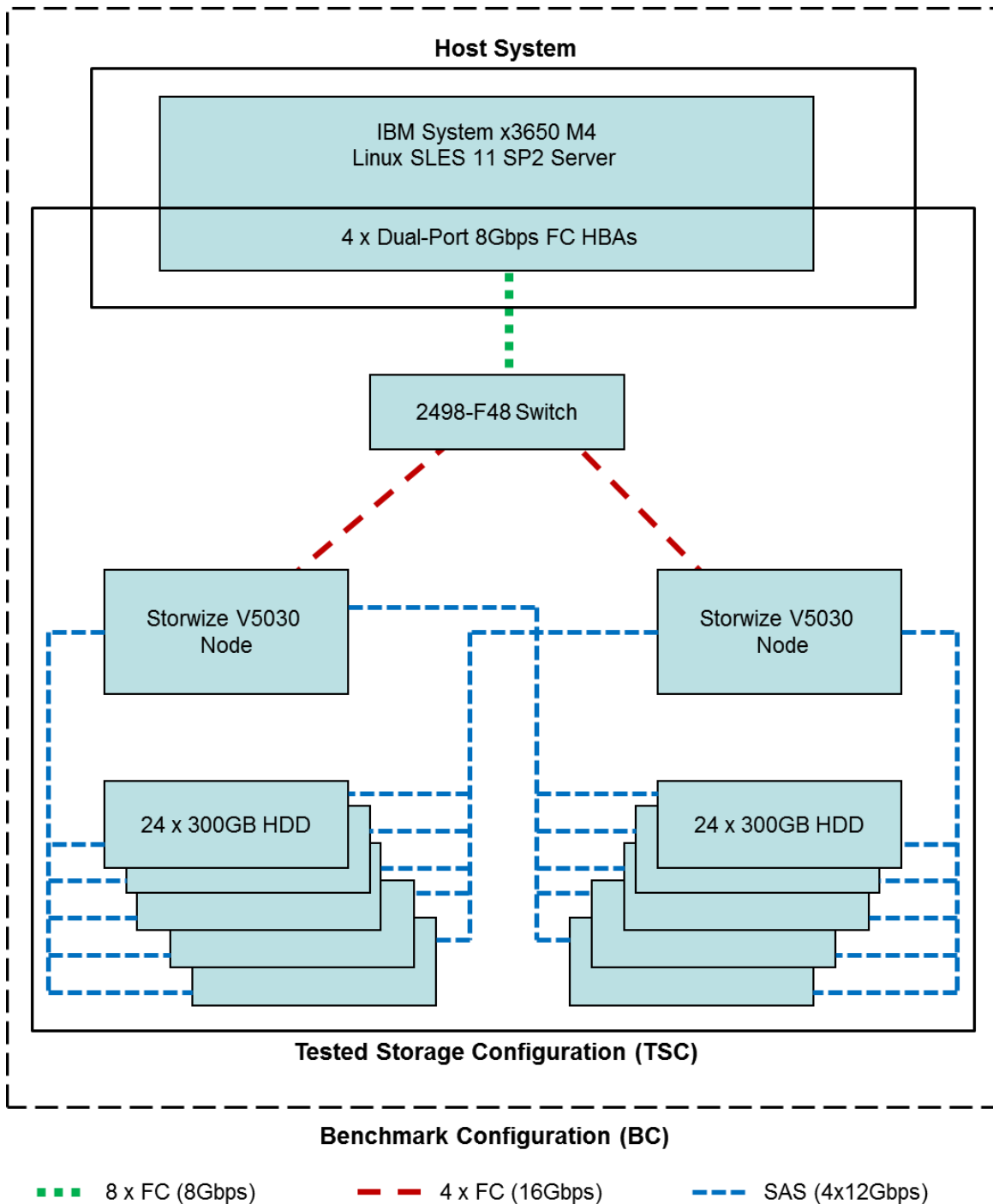
SPC-1 IOPS™	85,020
SPC-1 Price-Performance™	\$4.94/SPC-1 IOPS™
SPC-1 IOPS™ Response Time	13.358 ms
SPC-1 Overall Response Time	5.193 ms
SPC-1 ASU Capacity	34,360GB
SPC-1 ASU Price	\$12.22/GB
SPC-1 Total System Price	\$419,607.89
Data Protection Level	Protected 1 (RAID-10)
Physical Storage Capacity	71,870 GB
Pricing Currency / Target Country	U.S. Dollars / USA

SPC-1 V3.2

SUBMISSION IDENTIFIER: A31001

SUBMITTED FOR REVIEW: JULY 14, 2016

Benchmark Configuration Diagram



Tested Storage Product Description

IBM® Storwize® V5000 second-generation models deliver a range of performance, scalability,

All Storwize V5000 second-generation models include:

- I/O connectivity options for 16 Gb Fibre Channel (FC), 12 Gb SAS, 10 Gb iSCSI / Fibre Channel over Ethernet (FCoE), and 1 Gb iSCSI
- Twelve 3.5-inch large form factor (LFF) or twenty-four 2.5-inch small form factor (SFF) drive slots within the enclosure
- Support for the attachment of second-generation Storwize V5000 12 Gb SAS expansion enclosures
- Support for IBM Spectrum Virtualize™ functions, including thin provisioning, Easy Tier®, FlashCopy®, and remote mirroring
- A 2U, 19-inch rack mount enclosure with either AC or DC power
- A one- or three-year warranty.

Priced Storage Configuration Components

4 x 8Gb Dual-Port FC HBAs
1 x SAN48-5 FC switch, 24 ports, 16 SFP
2 x IBM Storwize V5030 Node, each with:
32GB Memory/Cache
4 x 16Gb FC Port with SFP (switch link)
1 x 2x12Gb SAS connection (internal/unused)
2 x 4x12Gb SAS connection (to expansion enclosures)
10 x Storwize V5030 expansion enclosure, each with:
24 x 15Krpm 300GB HDD

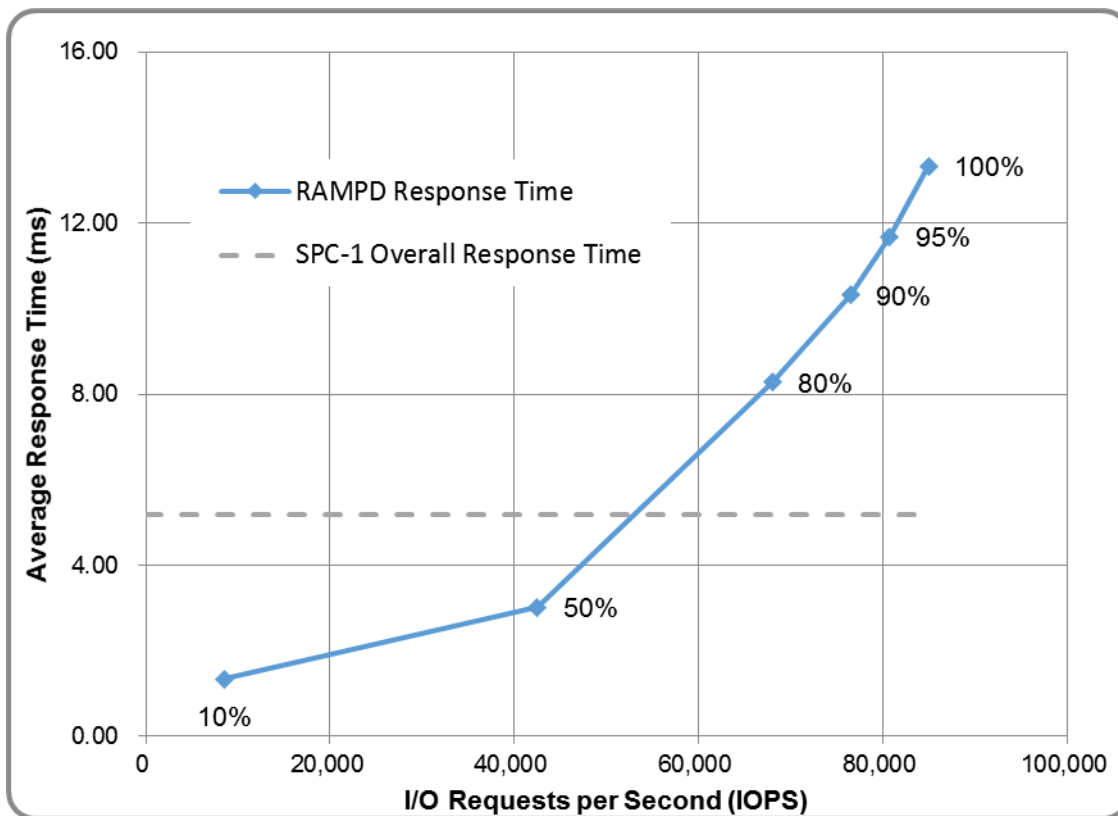
Storage Configuration Pricing

	Description	Qty	Unit Price	Ext. Price	Disc.	Disc. Price
Hardware						
2078-324	V5030 base enclosure w/ 64 GB cache, 8x16 Gb FC	1	37,604.00	37,604.00	28	27,074.88
2078-24F	V5030 expansion enclosur w/ 2 SAS cables	10	11,441.00	114,410.00	28	82,375.20
2078-ACLB	15K RPM 300 GB drives	240	1,309.00	314,160.00	28	226,195.20
2078-5305	Short wave 5m fibre channel cable	8	129.00	1,032.00	28	743.04
2078-5325	Short wave 25 m fibre channel cable	8	189.00	1,512.00	28	1,088.64
7014-T42	19 inch Rack	1	7,940.00	7,940.00	50	3,970.00
42D0510	dual port qllogic HBA for xSeries	4	1,849.00	7,396.00	0	7,396.00
2498-F48	SAN48-5 FC switch w/24 ports active, 16 SFP	1	36,152.00	36,152.00	20	28,921.60
Hardware Subtotal						377,764.56
Support & Maintenance						
	V5030ControllerEnclosure(1year,24x7,4hrresponse)	3	2,800.00	8,400.00	20	6,720.00
	V5030ExpansionEnclosure(1year,24x7,4hrresponse)	30	1,350.00	40,500.00	20	32,400.00
	Switch(1year,24x7,4hrresponse)	3	1,134.72	3,404.16	20	2,723.33
Support & Maintenance Subtotal						41,843.33
SPC-1 Total System Price (USD)						\$ 419,607.89
SPC-1 IOPS™						85,020
SPC-1 Price-Performance™ (\$/SPC-1 IOPS™)						\$ 4.94
SPC-1 ASU Capacity (GB)						34,360
SPC-1 ASU Price (\$/GB)						\$ 12.22

Discount Details: The discounts shown are on a “field delegation” basis. A discount of 28 percent was applied for V5030 product hardware. Other product specific levels of discounting are applicable for non-V5030 hardware including the rack, switch, and HBA's.

Availability Date: Currently Available.

Response Time and Throughput Graph



Contact Information	
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Revision Information	
SPC Benchmark 1™ Revision	V3.2.0
SPC-1 Workload Generator Revision	V3.0 build 2565
Publication Revision History	Revised on 02 November 2016: - Format of pricing spreadsheet - Calculation of \$/SPC-1 IOPS™