



**SPC BENCHMARK 1™
EXECUTIVE SUMMARY**

**MACROSAN TECHNOLOGIES Co., LTD.
MACROSAN MS3300**

SPC-1 V1.14

**Submitted for Review: January 14, 2015
Submission Identifier: A00151**

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

Test Sponsor and Contact Information	
Test Sponsor Primary Contact	MacroSAN Technologies Co., Ltd. – http://www.macrosan.com/english/index.aspx Yi Shen – shenyi@mcrosan.com 9 th Floor, Tower B, Sanwei Mansion, No. 581 Huoju Avenue Binjiang District, Hangzhou, China Phone: +86 186 6920 1257 FAX: 0571-28182001
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Revision Information and Key Dates

Revision Information and Key Dates	
SPC-1 Specification revision number	V1.14
SPC-1 Workload Generator revision number	V2.3.0
Date Results were first used publicly	January 14, 2015
Date the FDR was submitted to the SPC	January 14, 2015
Date the Priced Storage Configuration is available for shipment to customers	currently available
Date the TSC completed audit certification	January 13, 2015

Tested Storage Product (TSP) Description

The MS3300 is a new-generation mid-range storage product launched by MacroSAN, which incorporates various advanced design ideas and architecture technologies to provide a secure and reliable storage platform that supports flexible resource deployment for small and medium-sized data centers..

Regarding resource management, the MS3300 combines the cell-based virtualization technology to support flexible resource deployment through an innovative intelligent cell management technology (ICMT).

Summary of Results

SPC-1 Reported Data	
Tested Storage Product (TSP) Name: MacroSAN MS3300	
Metric	Reported Result
SPC-1 IOPS™	154,985.90
SPC-1 Price-Performance™	7.81CNY/SPC-1 IOPS™
Total ASU Capacity	3,000.000 GB
Data Protection Level	Protected 2 (<i>mirroring</i>)
Total Price	1,210,000.00CNY
Currency Used	CNY
Target Country for availability, sales and support	China

SPC-1 IOPS™ represents the maximum I/O Request Throughput at the 100% load point.

SPC-1 Price-Performance™ is the ratio of **Total Price** to SPC-1 IOPS™.

Total ASU (Application Storage Unit) **Capacity** represents the total storage capacity available to be read and written in the course of executing the SPC-1 benchmark.

A **Data Protection Level** of **Protected 2** using **Mirroring** configures two or more identical copies of user data.

***Protected 2:** The single point of failure of any **component** in the configuration will not result in permanent loss of access to or integrity of the SPC-1 Data Repository.*

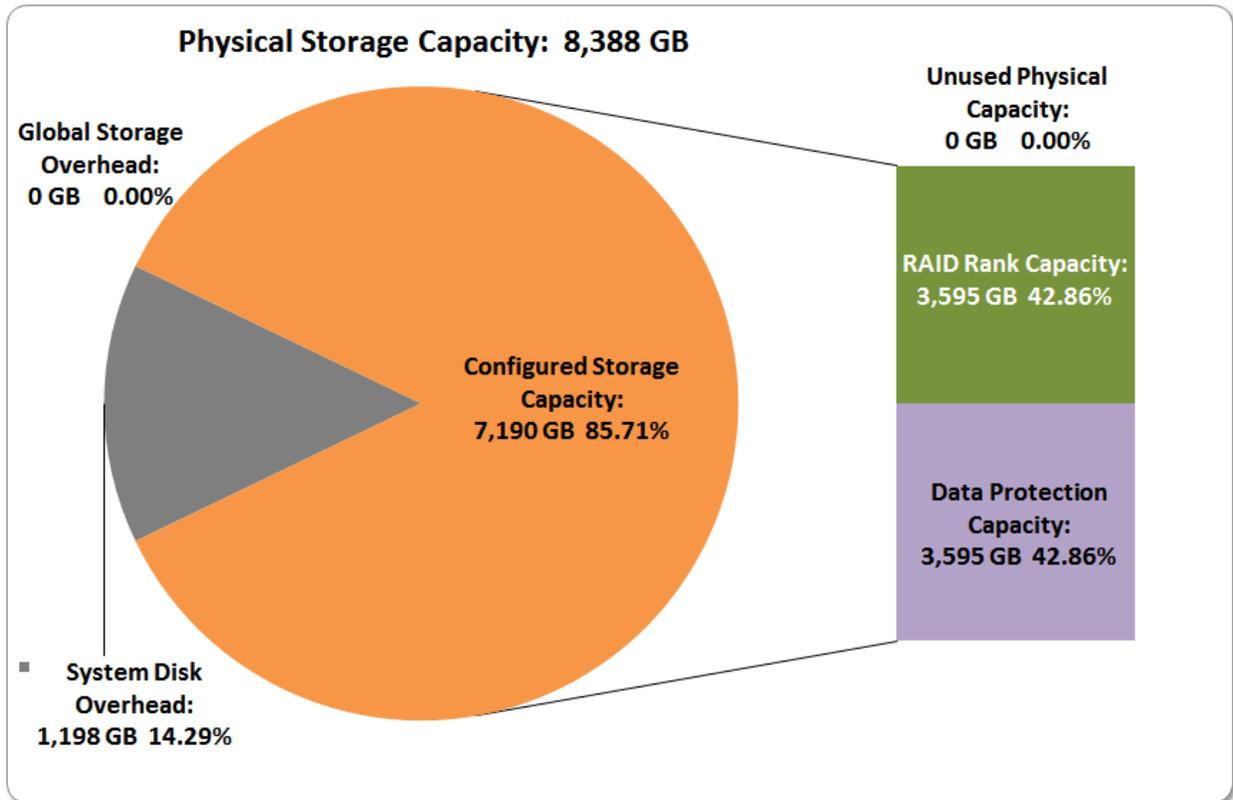
Total Price includes the cost of the Priced Storage Configuration plus three years of hardware maintenance and software support as detailed on page 8.

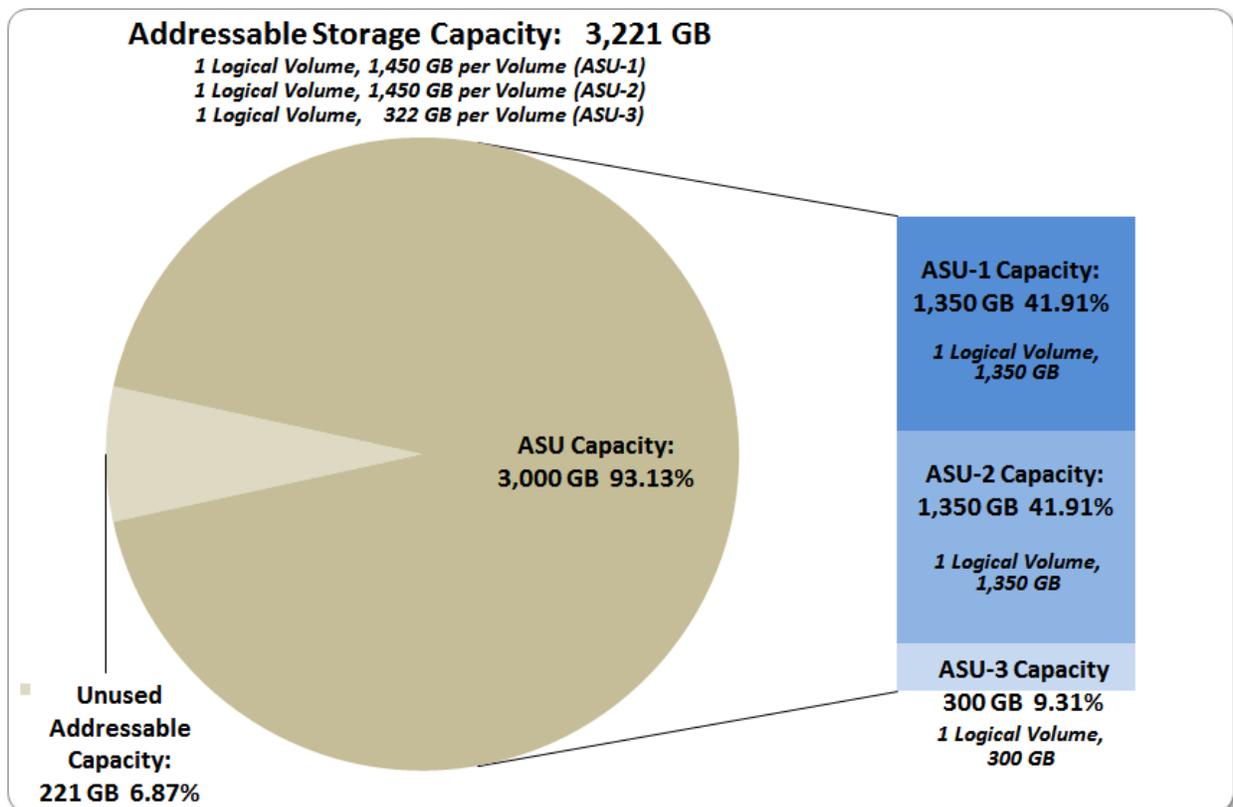
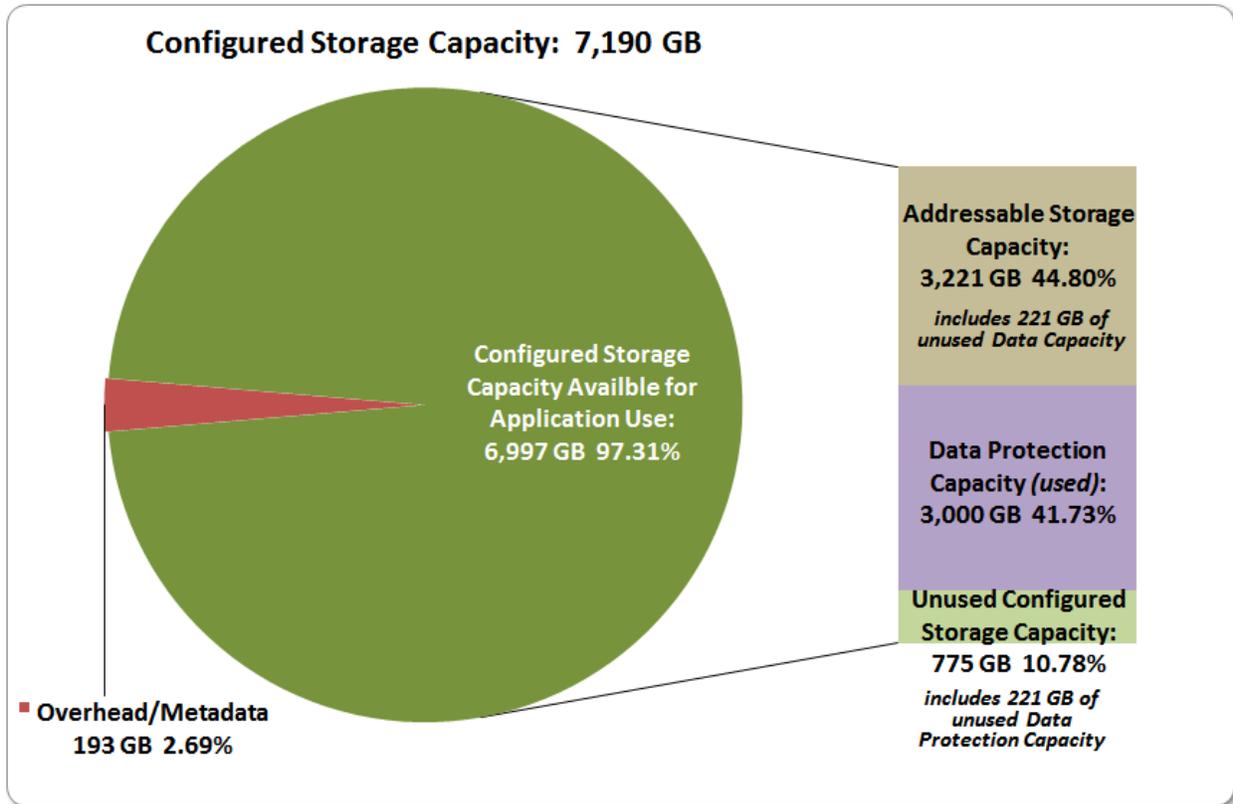
Currency Used is formal name for the currency used in calculating the **Total Price** and **SPC-1 Price-Performance™**. That currency may be the local currency of the **Target Country** or the currency of a difference country (*non-local currency*).

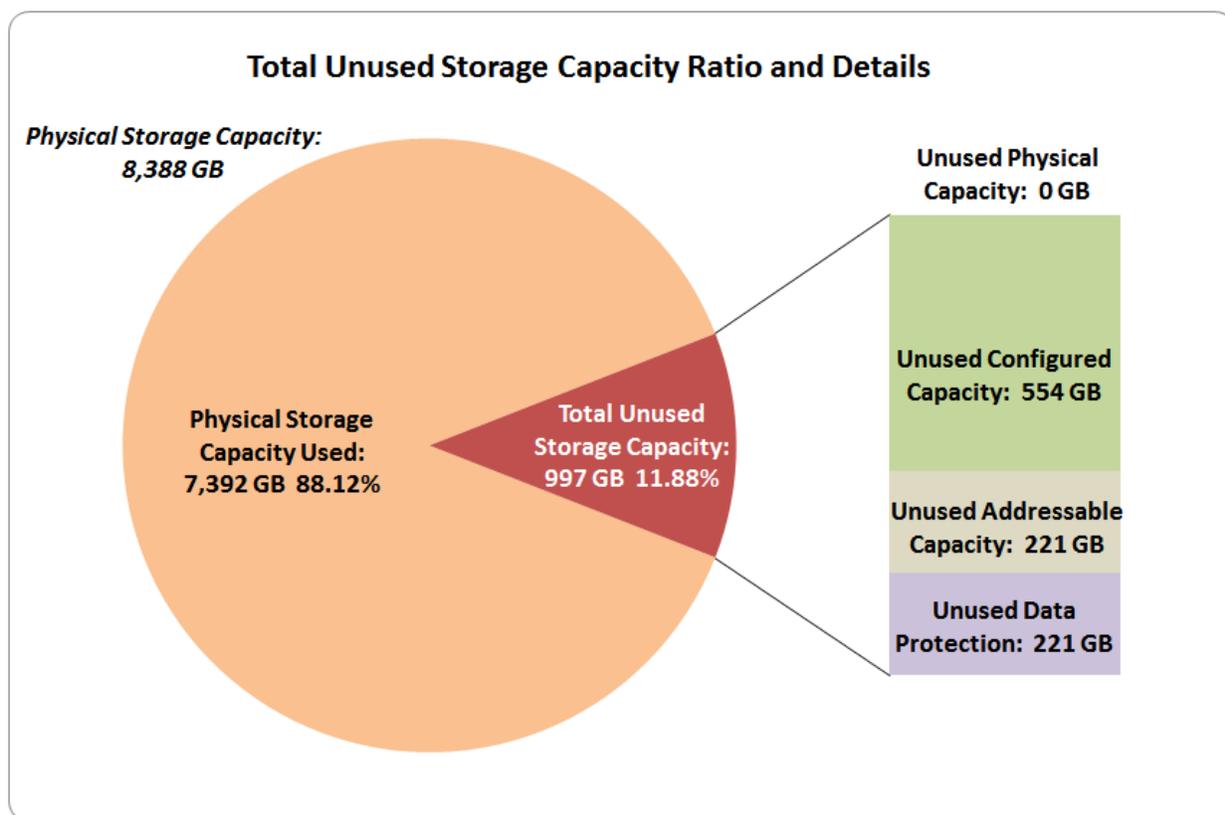
The **Target Country** is the country in which the Priced Storage Configuration is available for sale and in which the required hardware maintenance and software support is provided either directly from the Test Sponsor or indirectly via a third-party supplier.

Storage Capacities, Relationships, and Utilization

The following four charts and table document the various storage capacities, used in this benchmark, and their relationships, as well as the storage utilization values required to be reported.







SPC-1 Storage Capacity Utilization	
Application Utilization	35.77%
Protected Application Utilization	72.68%
Unused Storage Ratio	11.88%

Application Utilization: Total ASU Capacity (3000.00 GB) divided by Physical Storage Capacity (8,388.071 GB).

Protected Application Utilization: Total ASU Capacity (3000.00 GB) plus total Data Protection Capacity (3,594.888 GB) minus unused Data Protection Capacity (498.251 GB) divided by Physical Storage Capacity (8,388.071 GB).

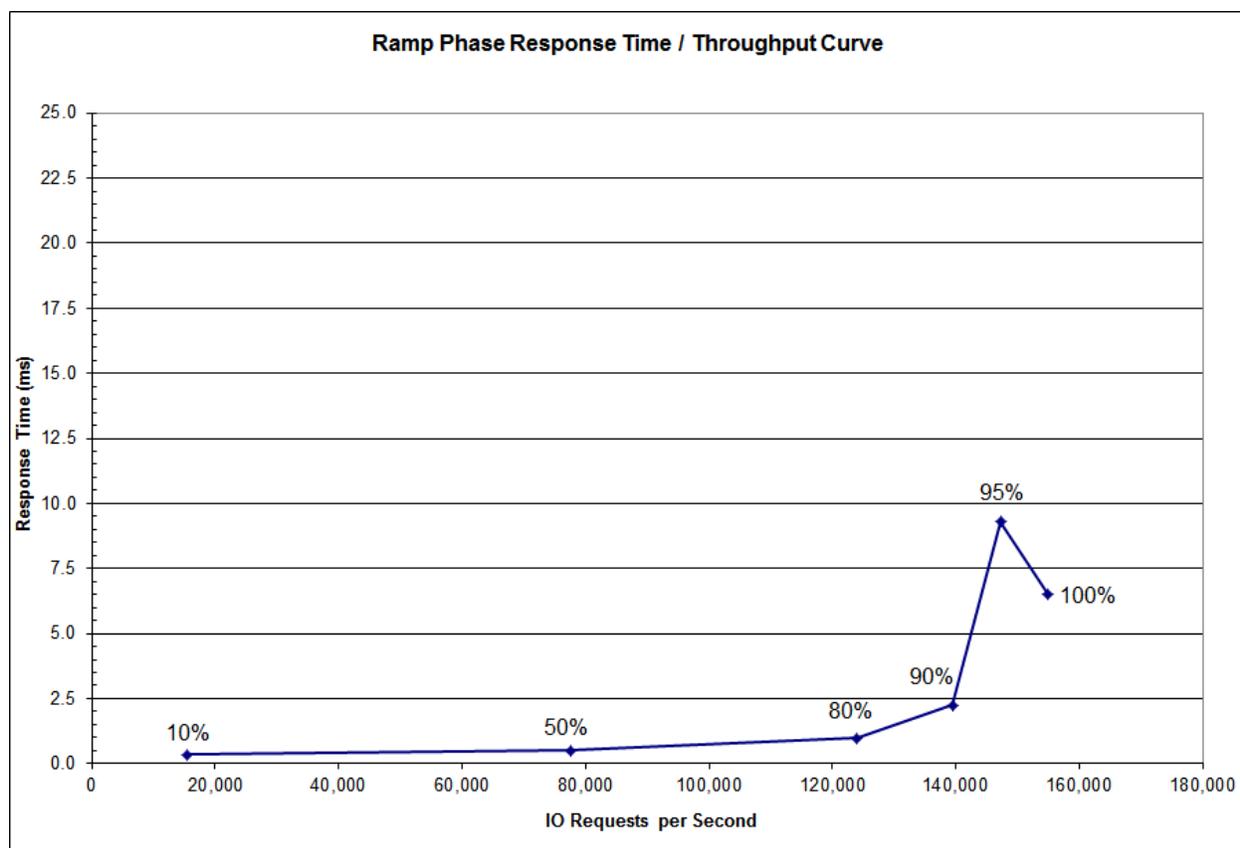
Unused Storage Ratio: Total Unused Capacity (GB) divided by Physical Storage Capacity (8,388.071 GB) and may not exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 27-28 in the Full Disclosure Report.

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	15,502.71	77,502.68	123,978.66	139,502.46	147,256.47	154,985.90
Average Response Time (ms):						
All ASUs	0.34	0.51	0.97	2.24	9.30	6.49
ASU-1	0.34	0.54	1.01	2.26	9.38	6.51
ASU-2	0.34	0.53	1.00	2.28	9.40	6.54
ASU-3	0.33	0.43	0.86	2.21	9.08	6.43
Reads	0.37	0.61	1.11	2.32	9.39	6.48
Writes	0.32	0.45	0.87	2.19	9.24	6.49

Priced Storage Configuration Pricing

No.	Part Number	Description	Qty	Unit Price/¥	Extended Price/¥	Discount	Discounted Price/¥
1	MacroSAN MS3300 Enterprise System						
1.1	Control Module						
	1020025	MS3300 Storage Processor Unit (Dual Controllers,AC,64GB Cache, with Battery Cache Protected Module)	1	540,000.00	540,000.00	85.00%	81,000.00
1.2	Disk Enclosure						
	1020036	DSU1616(3U,2.5"/3.5",AC)	2	115,000.00	230,000.00	85.00%	34,500.00
1.3	Storage Devices						
	1020004	Reserved Disk Suite (4*300GB 15K RPM 3.5" SAS Drive)	1	86,000.00	86,000.00	85.00%	12,900.00
	2080054	200GB MLC SSD Drive(3.5")	36	150,000.00	5,400,000.00	85.00%	810,000.00
1.4	IO Interface						
	2080005	4*8Gbps Fibre Channel I/O modules (Total 4 ports)	2	60,000.00	120,000.00	85.00%	18,000.00
1.5	Storage Software						
	7050005	MacroSAN Open Data Storage Platform MS3000 Storage System Management Software	1	80,000.00	80,000.00	85.00%	12,000.00
1.6	Accessory						
	5040001	Patch Cord,DLC/PC-DLC/PC, Multimode,2mm-Parallel,5m	18	50.00	900.00	0.00%	900.00
1.7	FC Switch						
		Brocade300 8Gbps FC Switch with 24 available ports and 24 enabled ports, including 24*8Gbps SFPs,Single-Power Supply,AC	2	45,200.00	90,400.00	0.00%	90,400.00
1.8	Third Party						
		Qlogic QLE2562 HBA Card,PCIE,8Gbps DualPort, Fiber Channel Multimode LC Optic Interface	6	3,300.00	19,800.00	0.00%	19,800.00
Total of Product							1,079,500.00
1.9	Maintenance Support Service						
	53010041	MS3300 Installation Base Service per Set	1	20,000.00	20,000.00	70.00%	6,000.00
	53010042	Disk Enclosure Installation Base Service per Set	2	10,000.00	20,000.00	70.00%	6,000.00
	53010007	MS3300 SPU Gold-Level 24x7x4H Service (Per Set*3Year)	1	195,000.00	195,000.00	70.00%	58,500.00
	53010060	Disk Enclosure Gold-Level 24x7x4H Service (Per Set*3Year)	2	90,000.00	180,000.00	70.00%	54,000.00
		Brocade300 FC Switch 24x7x4H Service (Per Set*3Year), including Installation Base Service(Per Set)	1	6,000.00	6,000.00	0.00%	6,000.00
Total of Service(3 years)							130,500.00
Total Price							1,210,000.00

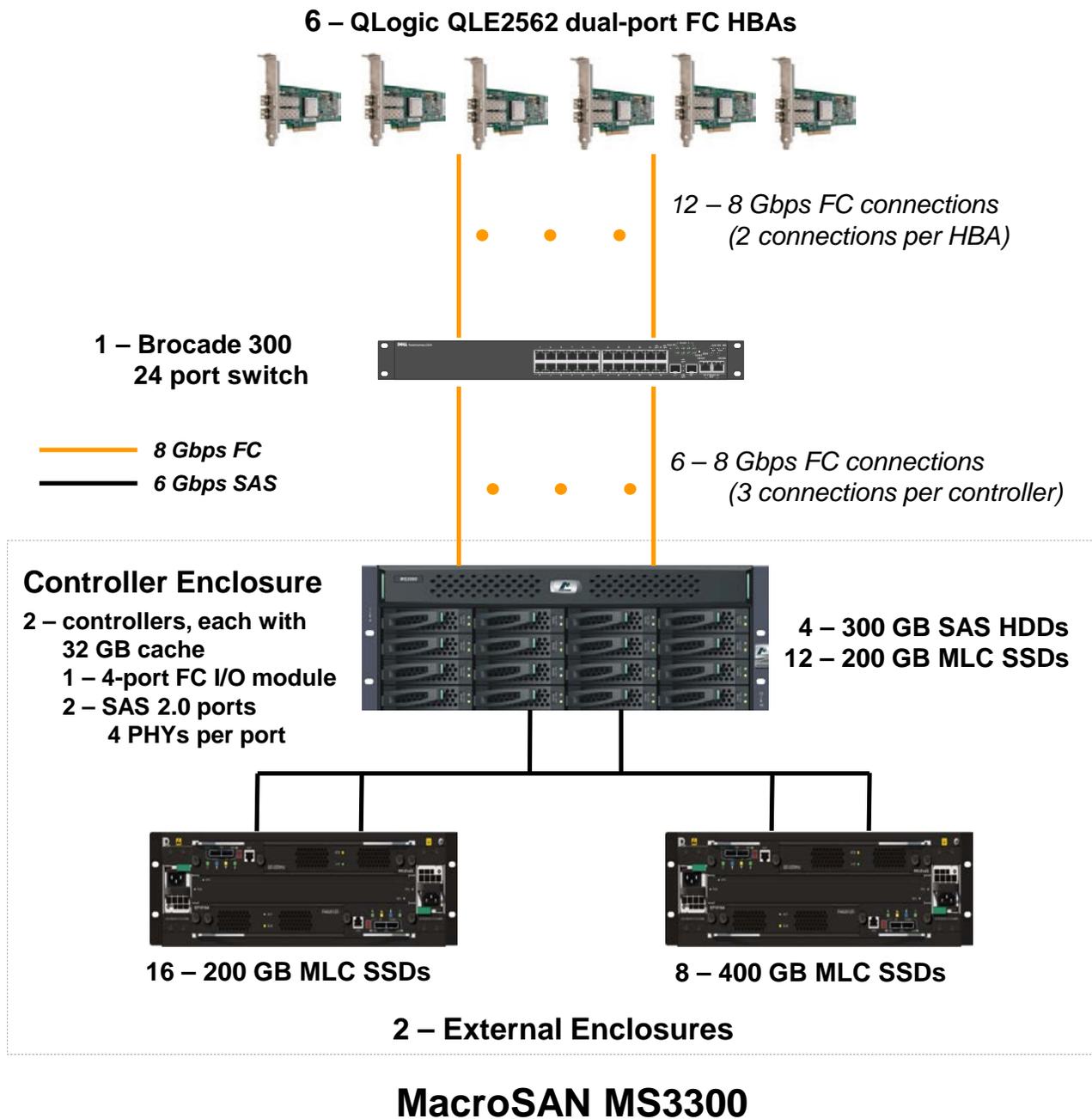
The above pricing includes hardware maintenance and software support for three years, 7 days per week, 24 hours per day. The hardware maintenance and software support provides the following:

- Acknowledgement of new and existing problems within four (4) hours.
- Onsite presence of a qualified maintenance engineer or provision of a customer replaceable part within four (4) hours of the above acknowledgement for any hardware failure that results in an inoperative Priced Storage Configuration that can be remedied by the repair or replacement of a Priced Storage Configuration component.

Differences between the Tested Storage Configuration (TSC) and Priced Storage Configuration

A second 24-port FC switch was included in the Priced Storage Configuration as a spare to fulfill one of the requirements for a data protection level of [Protected 2](#).

Priced Storage Configuration Diagram



Priced Storage Configuration Components

Priced Storage Configuration
6 – QLogic QLE2562 dual-port, 8 Gbps, FC HBAs
2 – Brocade 300 Fibre Channel 24-port switch with 24 ports enabled and SFPs included (2 nd switch included as a spare for the Protected 2 requirement)
MacroSAN MS3300
1 – Controller Enclosure with 2 – controllers, each controller includes: 64 GB cache (128 GB total) 1 – 4-port Fibre Channel I/O modules (2 modules/8 ports total) (6 ports total/3 per controller used) 2 – SAS 2.0 ports, 4 6Gbps PHYs per port (8 PHYs total) (2 ports/8 PHYs used per controller) (4 ports/16 PHYs total and used) 4 – 300GB SAS disk drives (HDDs) (system disks) 12 – 200GB MLC SSD drives
2 – External Enclosures (Enclosure 1: 8 200GB MLC SSDs) (Enclosure 2: 16 200GB MLC SSDs)
4 – 300 GB SAS disk drives (HDDs) 36 – 200 GB MLC SSDs (HDDs and SSDs distributed as documented above)