SPC BENCHMARK 1™
EXECUTIVE SUMMARY

HUAWEI TECHNOLOGIES CO., LTD.
HUAWEI OCEANSTOR™ S5600

SPC-1 V1.12

Submitted for Review: March 18, 2010
Submission Identifier: A00091
Revised: December 13, 2012

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

Test Sponsor and Contact Information	
Test Sponsor Primary Contact	Huawei Technologies Co., Ltd. – http://www.huawei.com/en/ Eric He – eric.heji@huawei.com No. 1899, Xiyuan Road Chengdu, 611731 P.R. China Phone: 0086 28 65281999 FAX: 0086 28 64686419
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Auditor	Storage Performance Council – http://www.storageperformance.org Walter E. Baker – AuditService@StoragePerformance.org 643 Bair Island Road, Suite 103 Redwood City, CA 94063 Phone: (650) 556-9384 FAX: (650) 556-9385

Revision Information and Key Dates

Revision Information and Key Dates	
SPC-1 Specification revision number	V1.12
SPC-1 Workload Generator revision number	V2.1.0
Date Results were first used publicly	March 18, 2010
Date the FDR was submitted to the SPC	March 18, 2010
Date revised FDR was submitted to the SPC Updated company name, logo and product name to reflect the complete acquisition of Huawei Symantec by Huawei Technologies Co., Ltd.	December 13, 2012
Date the priced storage configuration is available for shipment to customers	currently available
Date the TSC completed audit certification	March 17, 2010

Tested Storage Product (TSP) Description

Targeting the mid-range and high-end storage markets, the Huawei OceanStor™ S5600 is the first end-to-end fiber channel network storage system with exclusive intellectual property rights in China. With high density storage, dual plane, modular interface design, and multi-layer data protection, the S5600 satisfies various applications' storage requirements including large databases, high-end computing, online transaction processing (OLTP), centralized storage, disaster backup and recovery, and data migration. The S5600 effectively guarantees the safety, security and continuity of enterprise activities.

Summary of Results

| SPC-1 Results	
Tested Storage Product (TSC) Name: Huawei OceanStor™ S5600	
Metric	**Reported Result**
SPC-1 IOPS™	34,002.20
SPC-1 Price-Performance	CNY 21.75/SPC-1 IOPS™
Total ASU Capacity	7,200.000 GB
Data Protection Level	Protected *(Mirroring)*
Total TSP Price (including three-year maintenance)	CNY 739,605

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 **Protected** using *Mirroring* configures two or more identical copies of user data.

Storage Capacities and Relationships

The following diagram 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.
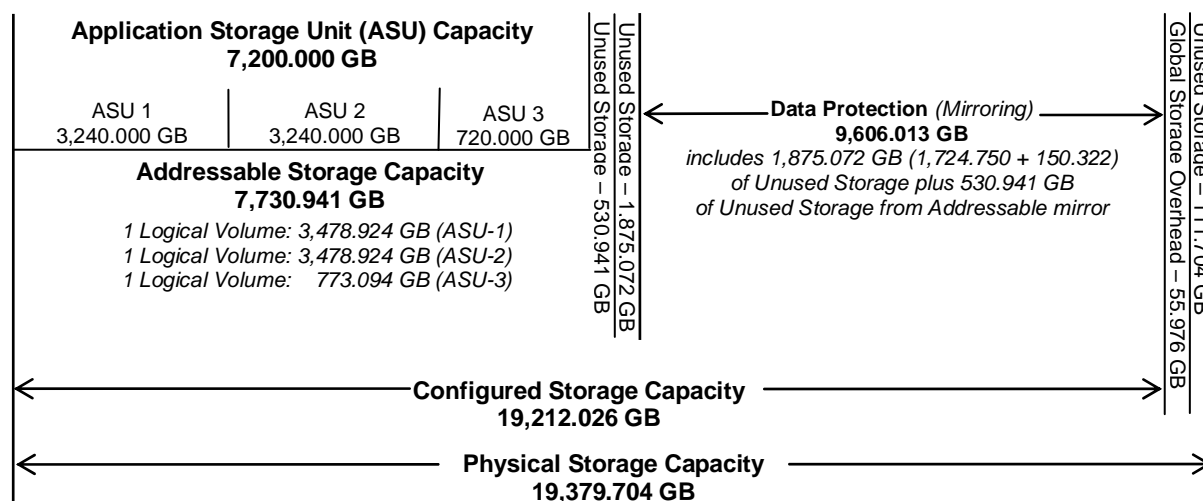
SPC-1 Storage Capacity Utilization	
Application Utilization	37.15%
Protected Application Utilization	74.30%
Unused Storage Ratio	25.41%

Application Utilization: Total ASU Capacity *(7,200.000 GB)* divided by Physical Storage Capacity *(19,397.704 GB)*

Protected Application Utilization: (Total ASU Capacity *(7,200.000 GB)* plus total Data Protection Capacity *(9,606.013 GB)* minus unused Data Protection Capacity *(2,406.013 GB)* divided by Physical Storage Capacity *(19,397.704 GB)*

Unused Storage Ratio: Total Unused Capacity *(4,923.728 GB)* divided by Physical Storage Capacity *(19,397.704GB)* and may not exceed 45%.

Detailed information for the various storage capacities and utilizations is available on pages 20-21 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.
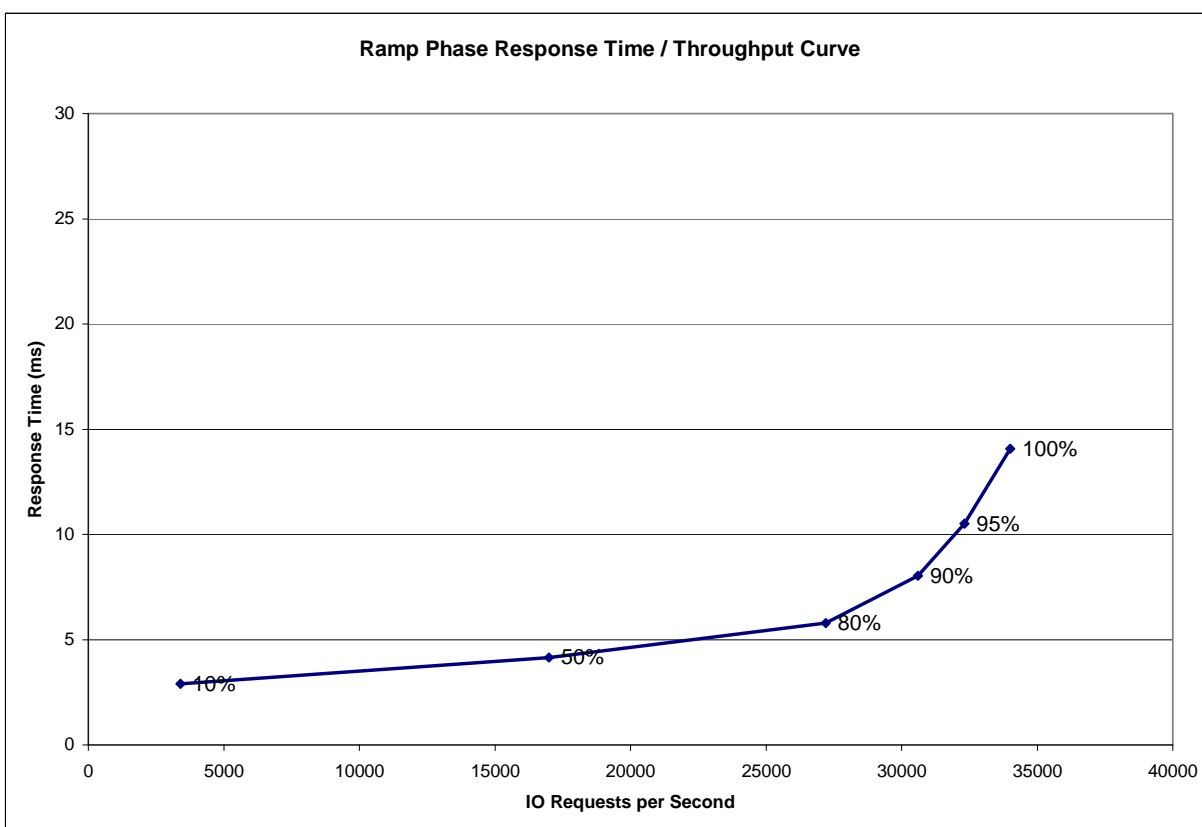
Response Time – Throughput Data

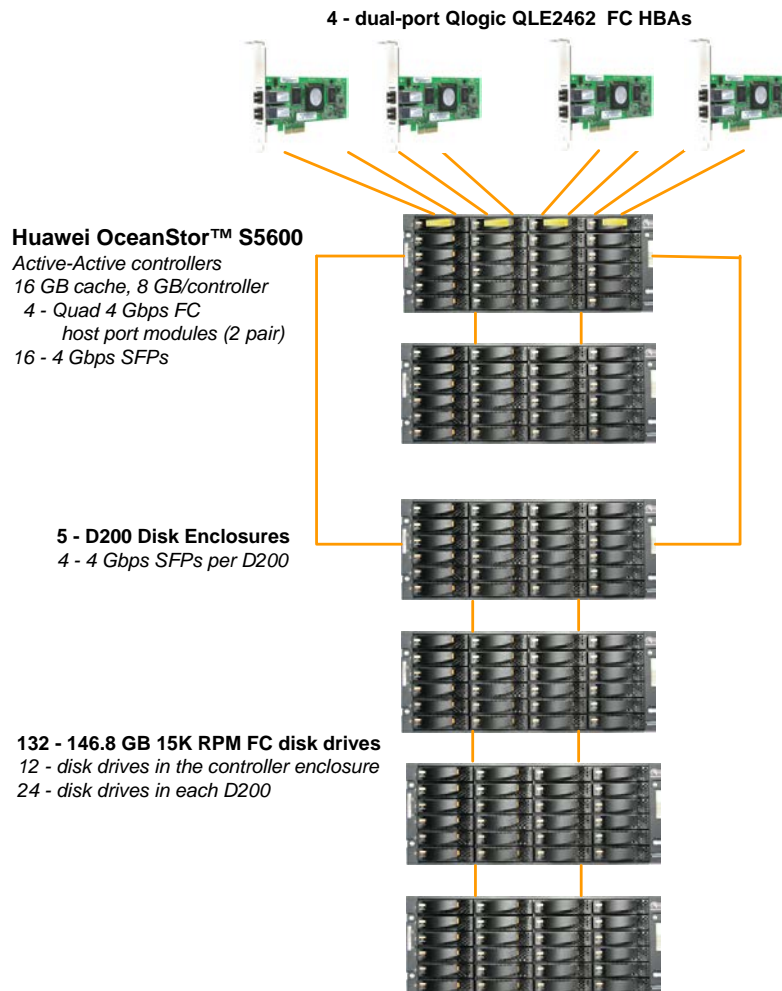|	10% Load	50% Load	80% Load	90% Load	95% Load	100% Load
I/O Request Throughput	3,402.11	17,001.25	27,206.46	30,606.79	32,318.73	34,002.20
Average Response Time (ms):						
All ASUs	2.91	4.16	5.78	8.03	10.51	14.07
ASU-1	3.83	5.31	7.00	9.04	11.21	14.29
ASU-2	3.43	5.56	7.88	10.54	13.13	16.84
ASU-3	0.72	1.10	2.28	4.77	7.88	12.39
Reads	6.29	8.91	11.27	13.21	14.82	17.00
Writes	0.70	1.06	2.20	4.65	7.71	12.17

Priced Storage Configuration Pricing

Product Name	Quantity	Unit list Price in RMB	Total list Price in RMB	Discount	Unit price after discount in RMB	Total price after discount in RMB
OceanStor S5600 Controller subrack * Active-Active controllers ** 16 GB of memory, 8 GB per controller ** 4 - quad host port modules, 2 modules per controller ** 16 - 4 Gb SFPs	1	1,037,000.00	1,037,000.00	85.00%	155,550.00	155,550.00
D200 Disk Enclosure * 4 - 4Gb SFPs * 2 - 5-Meter Fiber Optic Cable	5	137,500.00	687,500.00	85.00%	20,625.00	103,125.00
146GB 15K RPM FC Disk Drive	132	21,500.00	2,838,000.00	85.00%	3,225.00	425,700.00
Blank panel	12	70.00	840.00	0.00%	70.00	840.00
Dual-port Qlogic QLE2462 Fiber Channel HBA	4	11,060.00	44,240.00	0.00%	11,060.00	44,240.00
5-Meter Fiber Optic Cable	8	90.00	720.00	0.00%	90.00	720.00
Maintenance/Support: 3 years, 24*7, with 4-hour acknowledgement and 4-hour onsite response	1	9,430.00	9,430.00	0.00%	9,430.00	9,430.00
Total			4,617,730.00			739,605.00

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

There were no differences between the TSC and Priced Storage Configuration.

Priced Storage Configuration Diagram

4 - dual-port Qlogic QLE2462 FC HBAs

Huawei OceanStor™ S5600
Active-Active controllers
16 GB cache, 8 GB/controller
 4 - Quad 4 Gbps FC
     host port modules (2 pair)
16 - 4 Gbps SFPs

5 - D200 Disk Enclosures
4 - 4 Gbps SFPs per D200

132 - 146.8 GB 15K RPM FC disk drives
12 - disk drives in the controller enclosure
24 - disk drives in each D200

Priced Storage Configuration Components

Priced Storage Configuration:
4 – dual-port Qlogic 2462 FC HBAs
Huawei OceanStor™ S5600
Active-Active controllers with:

16 GB cache total *(8 GB per controller)*
    4 – Quad 4 Gbps FC host port modules
       (2 pair of modules, 1 pair per controller)
    16 – 4 Gbps Fibre Channel host ports *(8 per controller)*
    4 – 4 Gbps Fibre Channel expander ports *(2 per controller)*
    16 – 4 Gbps SFPs

5 – D200 Disk Enclosures each with four 4 Gbps SFPs
132 – 146.8 GB 15K RPM FC disk drives