



## **SPC BENCHMARK 1™**

### **EXECUTIVE SUMMARY**

# **HUAWEI TECHNOLOGIES CO., LTD. HUAWEI FUSIONSTORAGE™**

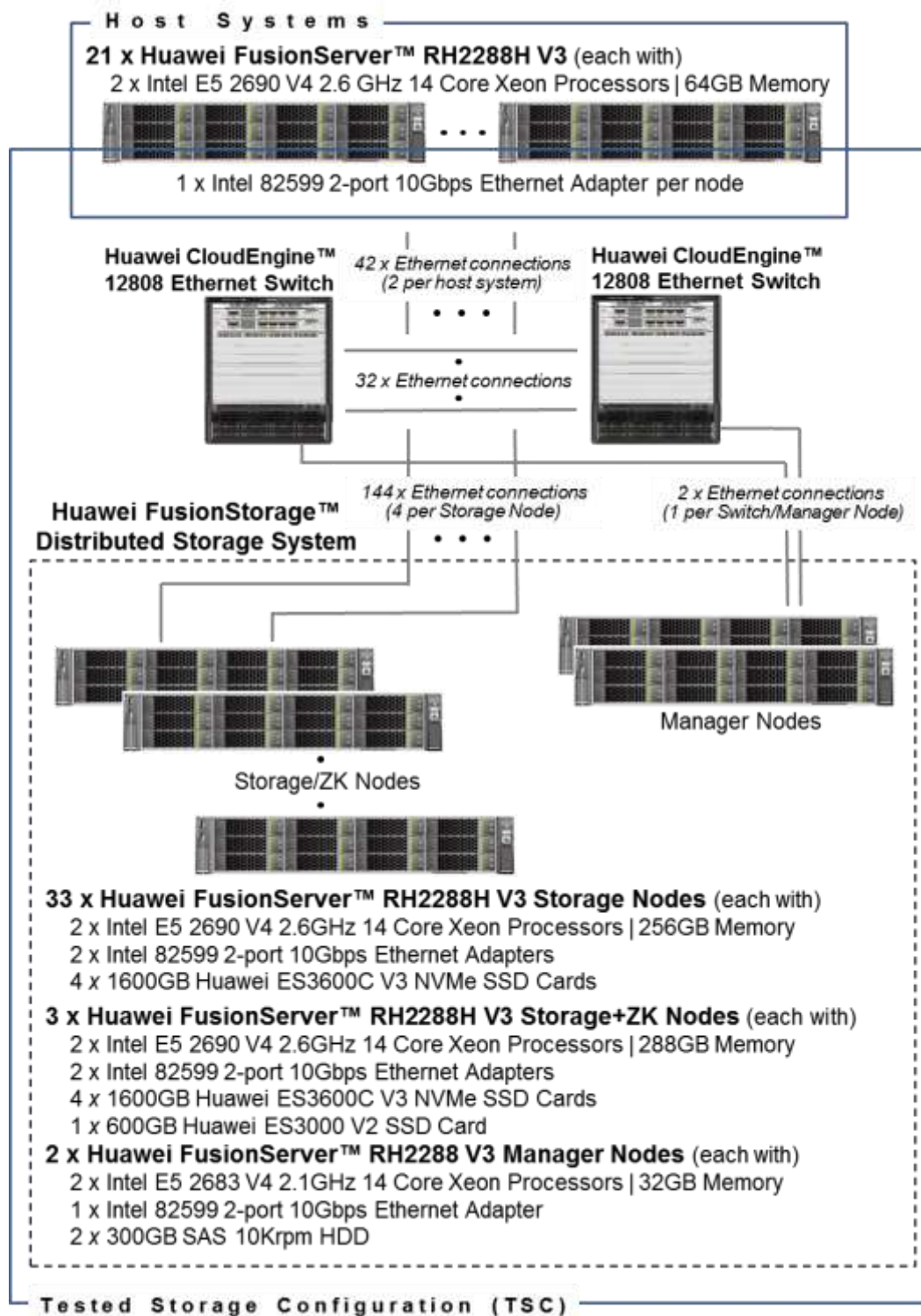
<b>SPC-1 IOPS™</b>	<b>4,500,392</b>
<b>SPC-1 Price-Performance™</b>	<b>\$329.90/SPC-1 KIOPS™</b>
SPC-1 IOPS™ Response Time	0.787 ms
SPC-1 Overall Response Time	0.539 ms
SPC-1 ASU Capacity	83,108 GB
SPC-1 ASU Price	\$17.87/GB
SPC-1 Total System Price	\$1,484,643.15
Data Protection Level	Protected 2 (mirroring and full redundancy)
Physical Storage Capacity	233,454 GB
Pricing Currency / Target Country	U.S. Dollars / People's Republic of China

**SPC-1 V3.4.0**

**SUBMISSION IDENTIFIER: A31007**

**SUBMITTED FOR REVIEW: JUNE 8, 2017**

## Benchmark Configuration Diagram



## Tested Storage Product Description

Huawei FusionStorage fully converged cloud storage features massive scale-out capabilities designed for cloud-based architectures. The on-board storage system software combines the local storage resources of standard x86 servers into fully distributed storage pools, allowing a single system to provide block, file, and object storage services to the upper layer. An enterprise can easily obtain the flexibility and efficiency in data storage required to keep up with the ever-changing dynamics of business.

For more details, visit:

<http://e.huawei.com/en/products/cloud-computing-dc/storage/massive-storage/fusionstorage>

## Priced Storage Configuration Components

<b>21 x Intel 82599 2-port 10Gbps Ethernet Adapters</b>
<b>2 x Huawei CloudEngine™ 12808 Ethernet Switches</b>
<b>33 x Huawei FusionServer™ RH2288H V3 Storage Nodes (each with)</b> <ul style="list-style-type: none"><li><b>2 x Intel E5 2690 V4 2.6GHz 14 Core Xeon Processors   256GB Memory</b></li><li><b>2 x Intel 82599 2-port 10Gbps Ethernet Adapters</b></li><li><b>4 x 1600GB Huawei ES3600C V3 NVMe SSD Cards</b></li></ul>
<b>3 x Huawei FusionServer™ RH2288H V3 Storage+ZK Nodes (each with)</b> <ul style="list-style-type: none"><li><b>2 x Intel E5 2690 V4 2.6GHz 14 Core Xeon Processors   288GB Memory</b></li><li><b>2 x Intel 82599 2-port 10Gbps Ethernet Adapters</b></li><li><b>4 x 1600GB Huawei ES3600C V3 NVMe SSD Cards</b></li><li><b>1 x 600GB Huawei ES3000 V2 SSD Card</b></li></ul>
<b>2 x Huawei FusionServer™ RH2288 V3 Manager Nodes (each with)</b> <ul style="list-style-type: none"><li><b>2 x Intel E5 2683 V4 2.1GHz 14 Core Xeon Processors   32GB Memory</b></li><li><b>1 x Intel 82599 2-port 10Gbps Ethernet Adapter</b></li><li><b>2 x 300GB SAS 10Krpm HDD</b></li></ul>

## Storage Configuration Pricing

	Description	Qty	Unit Price	Ext. Price	Disc.	Disc. Price
<b>Hardware &amp; Software</b>						
BC4M20HGSA	RH2288H V3 (12*3.5inch HDD Chassis)(Only for oversea,except Japan)H22H-03	36	1,410.00	50,760.00	45%	27,918.00
BC4M20HGSB	RH2288 V3 (12*3.5inch HDD Chassis)(Only for oversea,except Japan)H22M-03	1	1,350.00	1,350.00	45%	742.50
BC1M35HGSB	RH2288 V3 (8*2.5inch HDD Chassis)(Only for oversea,except Japan)H22M-03	1	1,250.00	1,250.00	45%	687.50
BC1M64CPU	Intel Xeon E5-2690 v4(2.6GHz/14-core/35MB/135W) Processor (with heatsink)	72	4,769.00	343,368.00	45%	188,852.40
BC1M63CPU	Intel Xeon E5-2683 v4(2.1GHz/16-core/40MB/120W) Processor (with heatsink)	4	4,059.00	16,236.00	45%	8,929.80
N24DDR403	DDR4 RDIMM, 32GB, 2400MT/s, 2Rank(2G*4bit), 1.2V, ECC	171	1,039.00	177,669.00	45%	97,717.95
N24DDR402	DDR4 RDIMM 16GB,2400MT/s, 2Rank(1G*8bit), 1.2V, ECC	244	539.00	131,516.00	45%	72,333.80
CN21EEACJ	ES3000 V2-600 PCIe SSD Card (600GB) Half-height half-length	3	6,600.00	19,800.00	64%	7,128.00
CN2M10FACM	ES3600C V3,NVMe SSD Card,1600GB,Mixed Use,3 DWPD,PCIe 3.0 x4,HH/HL	144	7,390.00	1,064,160.00	64%	383,097.60
BC1M01ESMLB	SR430C-M 1G(LSI3108) SAS/SATA RAID Card,RAID0,1,5,6,10,50,60,12Gb/s,1GB Cache,used for RH2288 V3/RH2288H V3's 12&25HDD chassis/5288 V3	1	565.00	565.00	45%	310.75
BC1M07ESMLA	SR430C-M 2G(LSI3108) SAS/SATA RAID Card,RAID0,1,5,6,10,50,60,12Gb/s,2GB Cache,used for RH2288 V3/RH2288H V3's 12&25HDD chassis/5288 V3	1	665.00	665.00	45%	365.75
N300S1210W2	HDD,300GB,SAS 12Gb/s,10K rpm,128MB or above,2.5inch(2.5inch Drive Bay)	4	315.00	1,260.00	45%	693.00
BC1M10IHDD	2*2.5" Rear Hard Disk Backplane Module	1	59.00	59.00	45%	32.45
BC1M01FXEB02	SM231 Onboard NIC,2x10GE Optical Interface(Intel 82599),SFP+(with 2x Multi-mode Optical Transceiver)	59	1,075.00	63,425.00	45%	34,883.75
CN2ITGAA20	Ethernet Adapter,10Gb Optical Interface(Intel 82599),2-Port,SFP+(with 2x Multi-mode Optical Transceiver),PCIe 2.0 x8	36	566.00	20,376.00	0%	20,376.00
BC1M3S8XV3	PCIe Riser Card,3 slot(x8,x8,x8),used for RH2288 V3/RH2288H V3/5288 V3	72	119.00	8,568.00	45%	4,712.40
EN3MCAACC	750W Platinum AC Power Module	76	279.00	21,204.00	45%	11,662.20
BC1M03FANA	8056 Plus Fan module	144	43.00	6,192.00	45%	3,405.60
BC1M06FAN	8038 Fan module	8	29.00	232.00	45%	127.60
EGUIDER01	2U Static Rail Kit	38	28.00	1,064.00	0%	1,064.00
FS1AD00SFT02	FusionStorage Advanced Edition Capacity license,per TB	231	293.00	67,683.00	50%	33,841.50
CE12808A-B02	CE12808 AC Bundle2 (AC Assembly Chassis,2*MPUA,5*SFU08B,4*PHD-3000WA)	2	111,000.00	222,000.00	70%	66,600.00
SFP-10G-USR	10GBase-USR Optical Transceiver,SFP+,10G,Multi-mode Module(850nm,0.1km,LC)	252	129.00	32,508.00	40%	19,504.80
CE-L48XS-EC	48-Port-10GE Interface Card(EC,SFP+)	6	37,000.00	222,000.00	70%	66,600.00

CE128-LIC-B15	CloudEngine 12800Basic SW,V100R005	2	10,000.00	20,000.00	70%	6,000.00
SS-OP-D-LC-M-10	Patch cord-LC/PC-LC/PC-Multimode-A 1b-2mm-10m-PVC-Orange	220	8.00	1,760.00	0%	1,760.00
RACK-42U-1	42U Storage AC Cabinet	5	1,200.00	6,000.00	0%	6,000.00
PDU2000-32-1PH-20/4-B2	AC Power Distribution Unit	10	180.00	1,800.00	0%	1,800.00
<b>Hardware &amp; Software Subtotal</b>						<b>1,067,147.35</b>
<b>Support &amp; Maintenance</b>						
88125ESH	RH2288 V3 Installation Service - Engineering	2	546.68	1,093.36	30%	765.35
88125ESH	RH2288H V3 Installation Service - Engineering	36	2,102.80	75,700.80	30%	52,990.56
88125ESH	CE12808 Installation Service - Engineering	2	3,986.14	7,972.28	20%	6,377.82
88142DVU	FusionStorage Advanced Edition Solution Design Service	1	46,290.00	46,290.00	20%	37,032.00
88142DVP	FusionStorage Advanced Edition Solution Implementation Service	1	46,290.00	46,290.00	20%	37,032.00
TPV40550	Remark:Advance Edition Capacity108.8TB;	1	0.01	0.01	20%	0.01
FS2AD0SNS03Y	FusionStorage Advanced Edition,3 Years Subscription and Support Service,per TB	231	187.00	43,197.00	50%	21,598.50
02311GGX-88134ULF-36	FusionCube 2000-RH2288H V3 (12HDD EXP Chassis) H22H-03 For oversea(except Japan)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	36	903.00	32,508.00	30%	22,755.60
02311GHL-88134ULF-36	RH2288 V3(12HDD EXP Chassis)H22M-03 For oversea(except Japan)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	1	903.00	903.00	30%	632.10
02311GGP-88134ULF-36	RH2288 V3(8HDD Passthrough Chassis)H22M-03 For oversea(except Japan)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	1	903.00	903.00	30%	632.10
03022UUA-88134ULF-36	ES3000 V2-600 PCIe SSD Card (600GB) Half-height half-length-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	3	330.00	990.00	30%	693.00
02311PBK-88134ULF-36	ES3000 V3,CN2M16FACM,ES3600C-1600GB-3-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	144	492.54	70,925.76	30%	49,648.03
02356212-88134UFR-36	CE12808 AC Bundle2 (AC Assembly Chassis,2*MPUA,5*SFU08B,4*PAC-2700WA)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	2	60,825.00	121,650.00	20%	97,320.00
02310MNV-88134UFR-36	10GBase-USR Optical Transceiver,SFP+,10G,Multi-mode Module(850nm,0.1km,LC)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	252	65.95	16,619.40	20%	13,295.52
03022MNN-88134UFR-36	48-Port-10GE Interface Card(EC,SFP+)-Hi-Care Onsite Premier 24x7x4H Service-36Month(s)	6	15,984.00	95,904.00	20%	76,723.20
<b>Support &amp; Maintenance Subtotal</b>						<b>417,495.80</b>
<b>SPC-1 Total System Price</b>						<b>1,484,643.15</b>
SPC-1 IOPS™						4,500,392
<b>SPC-1 Price-Performance™ (\$/SPC-1 KIOPS™)</b>						<b>329.90</b>
SPC-1 ASU Capacity (GB)						83,108
<b>SPC-1 ASU Price (\$/GB)</b>						<b>17.87</b>

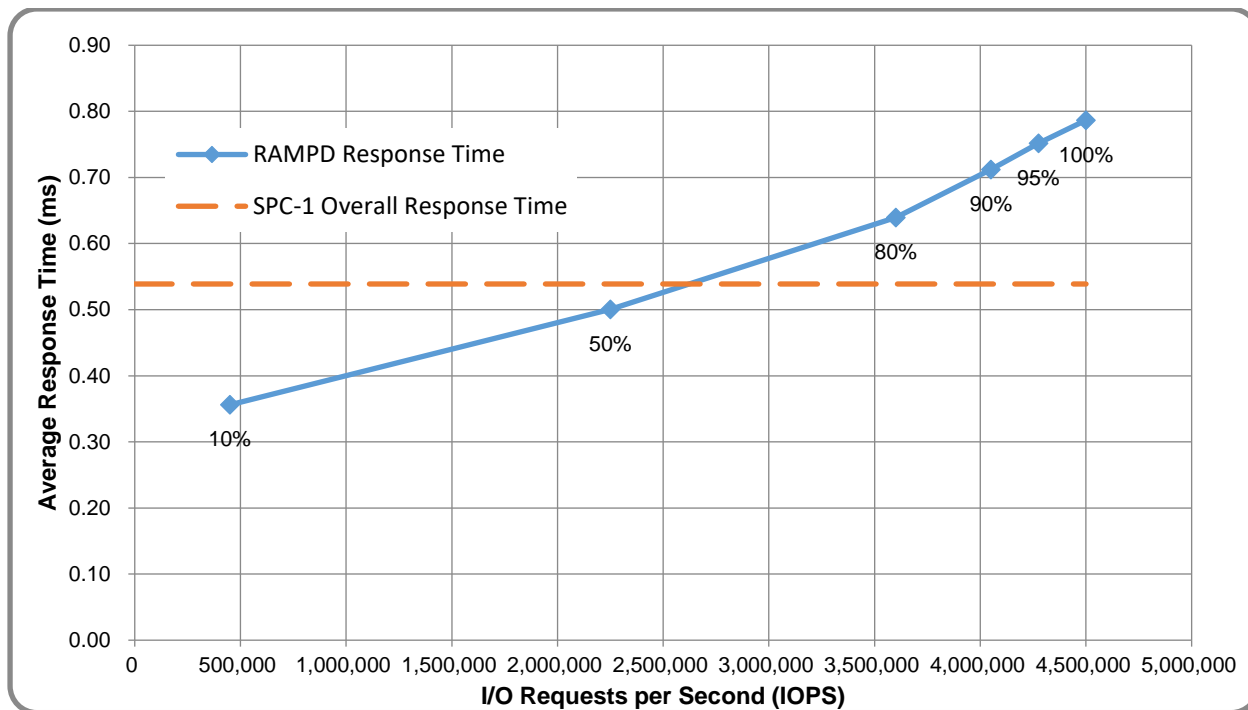
**Third-Party Reseller:** Huawei Technologies Co., Ltd. only sells its products to third-party resellers who, in turn, sell those products to U.S. customers. The above reflects the pricing quoted by one of those third-party resellers. See Appendix B of the Full Disclosure Report for a copy of the third-party reseller's quotation.

**Discount Details:** The discounts shown are based on the storage capacity purchased and are generally available.

**Warranty:** Hi-Care Premier On-Site Service include: 7x24 Technical Assistance Center Access. Access to all new software updates and Online Support. 24x7 with 4-hour On-site Hardware Replacement.

**Availability Date:** Currently available.

### Response Time and Throughput Graph



Contact Information	
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Revision Information	
SPC Benchmark 1™ Revision	V3.4.0
SPC-1 Workload Generator Revision	V3.0.2 build g823a
Publication Revision History	<ul style="list-style-type: none"> <li>First Edition: June 8, 2017</li> <li>Second Edition: February 15, 2018 Updated SPC-1 Price-Performance™ metric based on v3.6.0 definition.</li> </ul>