SPC BENCHMARK 2™

EXECUTIVE SUMMARY

TELECOMMUNICATIONS TECHNOLOGY ASSOCIATION

SCALEWAY SG1000-UF

SPC-2™ V1.7.0

SUBMITTED FOR REVIEW: OCTOBER 1, 2019

SUBMISSION IDENTIFIER: B12005

EXECUTIVE SUMMARY

Test Sponsor and Contact Information

Test Sponsor and Contact Information	
Test Sponsor Primary Contact	Telecommunications Technology Association – http://tta.or.kr/eng/index.jpg Hyo-Sil Kim – hyosil.kim@tta.or.kr
Auditor	InfoSizing – http://www.sizing.com/ Doug Johnson – doug@sizing.com

Revision Information and Key Dates

Revision Information and Key Dates	
SPC-2 Specification revision number	v1.7.0
SPC-2 Workload Generator revision number	V1.3.4
Date Results were first used publicly	October 1, 2019
Date FDR was submitted to the SPC	October 1, 2019
Date the TSC will be available for shipment to customers	Currently Available
Date the TSC completed audit certification	September 28, 2019

Tested Storage Product Description

SCALEWAY SG1000-UF is the unified storage system that supports both SAN and NAS, while providing the following key advantages:

- User-oriented volume configuration using storage virtualization that supports 8PB as a single volume (Multi-volume configurable)
- Easy expansion by Dynamic Provisioning and simplified, lower cost management using a web-based, user-friendly Graphic User Interface

SPC-2 Reported Data

SPC-2 Reported Data consists of three groups of information:

- The following SPC-2 Primary Metrics, which characterize the overall benchmark result:
  - SPC-2 MBPS™
  - SPC-2 Price Performance™
  - Application Storage Unit (ASU) Capacity
- Supplemental data to the SPC-2 Primary Metrics.
  - Total Price
  - Data Protection Level
  - Currency Used
  - Target Country
- Reported Data for each SPC Test: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand Delivery (VOD) Test.

SPC-2 MBPS™ represents the aggregate data rate, in megabytes per second, of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video on Demand (VOD).

SPC-2 Price-Performance™ is the ratio of **Total Price** to **SPC-2 MBPS™**.

ASU *(Application Storage Unit)* **Capacity** represents the total storage capacity available to be read and written in the course of executing the SPC-2 benchmark.

Total Price includes the cost of the Priced Storage Configuration plus three years of hardware maintenance and software support.

Data Protection Level of **Protected 1** using ***RAID-5***, which distributes check data corresponding to user data across multiple disks in the form of bit-by-bit parity.

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

Currency Used is formal name for the currency used in calculating the **Total Price** and **SPC-2 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.

SPC-2 Reported Data				
SCALEWAY SG1000-UF				
SPC-2 MBPS™	**SPC-2 Price-Performance**	**ASU Capacity (GB)**	**Total Price**	**Data Protection Level**
5,549.37	$6.67	47,244.640	$37,035.35	Protected 1 *(RAID-5)*
The above SPC-2 MBPS™ value represents the aggregate data rate of all three SPC-2 workloads: Large File Processing (LFP), Large Database Query (LDQ), and Video On Demand (VOD).				
Currency Used:		**"Target Country":**		
U.S. Dollars		Republic of Korea		

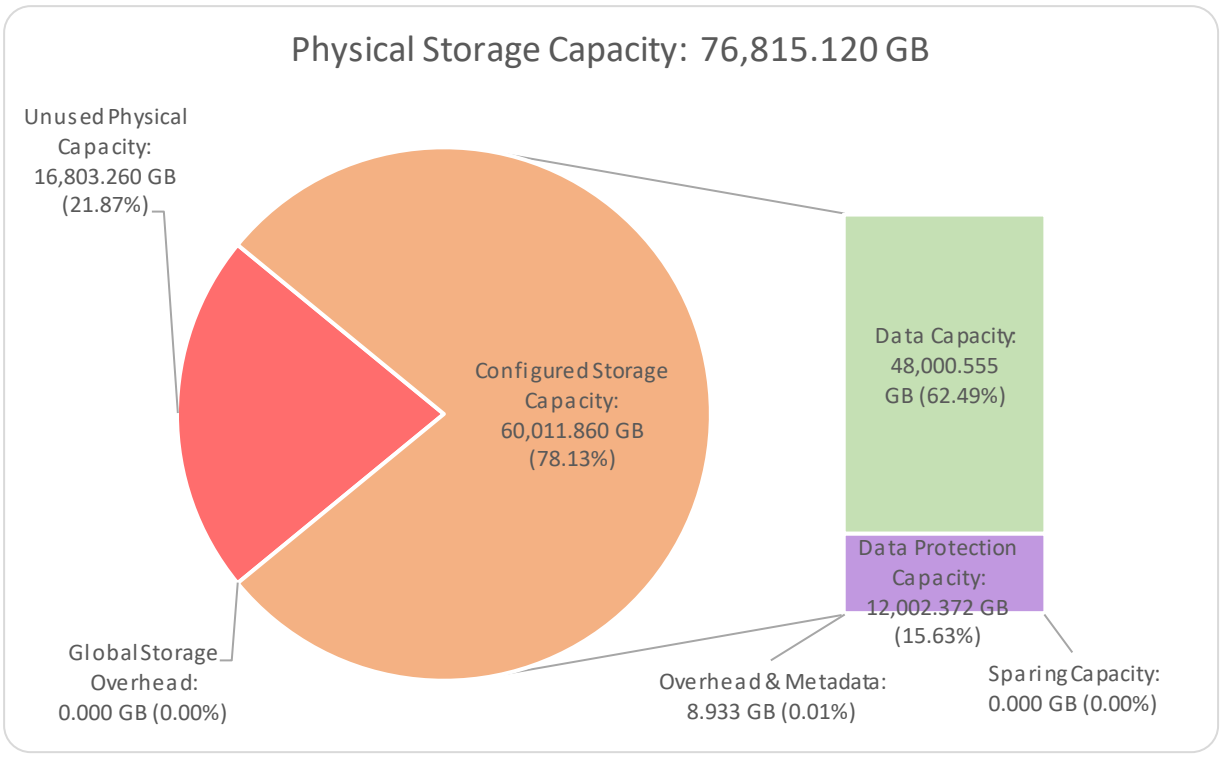
SPC-2 Large File Processing (LFP) Reported Data				
	Data Rate (MB/second)	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
LFP Composite	4,534.95			$8.17
Write Only:				
1024 KiB Transfer	2,805.49	16	175.34	
256 KiB Transfer	2,783.77	16	173.99	
Read-Write:				
1024 KiB Transfer	4,821.34	32	150.67	
256 KiB Transfer	4,454.10	64	69.60	
Read Only:				
1024 KiB Transfer	6,216.47	32	194.26	
256 KiB Transfer	6,128.53	64	95.76	
The above SPC-2 Data Rate value for LFP Composite represents the aggregate performance of all three LFP Test Phases: (Write Only, Read-Write, and Read Only).				

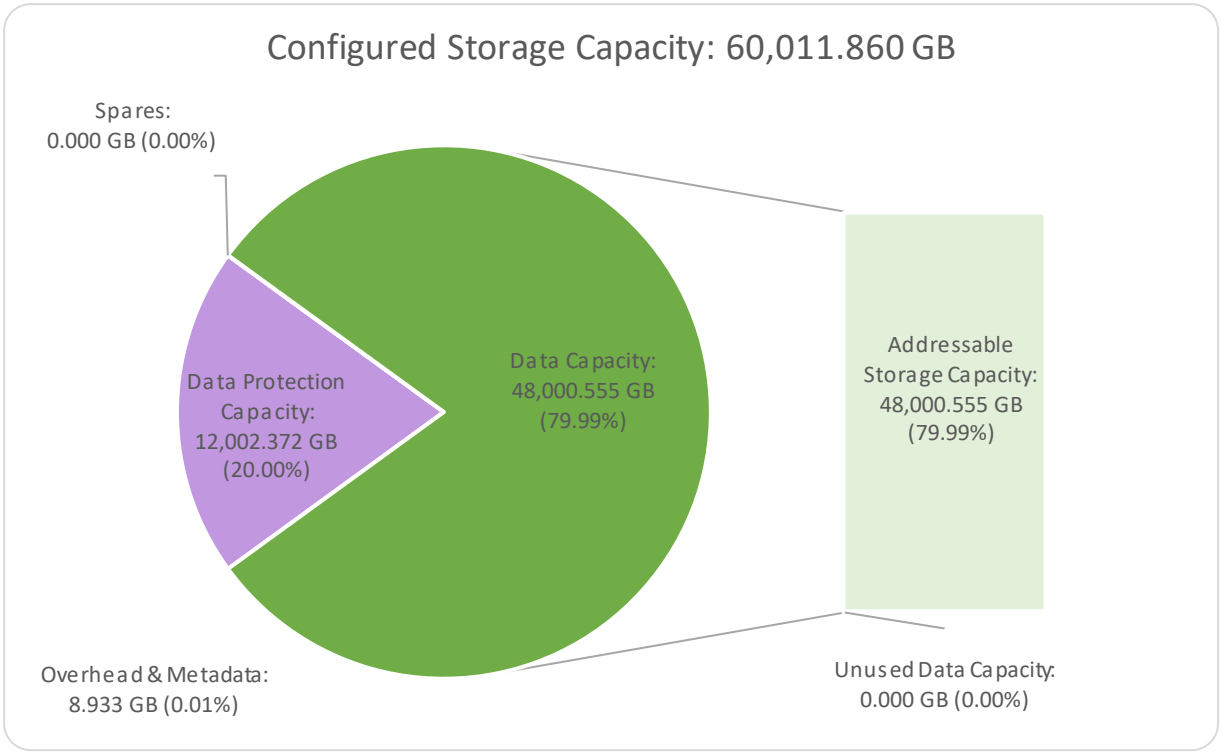
SPC-2 Large Database Query (LDQ) Reported Data				
	Data Rate (MB/second)	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
LDQ Composite	5,978.99			$6.19
1024 KiB Transfer Size				
4 I/Os Outstanding	6,203.78	8	775.47	
1 I/O Outstanding	6,218.37	32	194.32	
64 KiB Transfer Size				
4 I/Os Outstanding	5,813.56	64	90.84	
1 I/O Outstanding	5,680.24	256	22.19	
The above SPC-2 Data Rate value for LDQ Composite represents the aggregate performance of the two LDQ Test Phases: (1024 KiB and 64 KiB Transfer Sizes).				

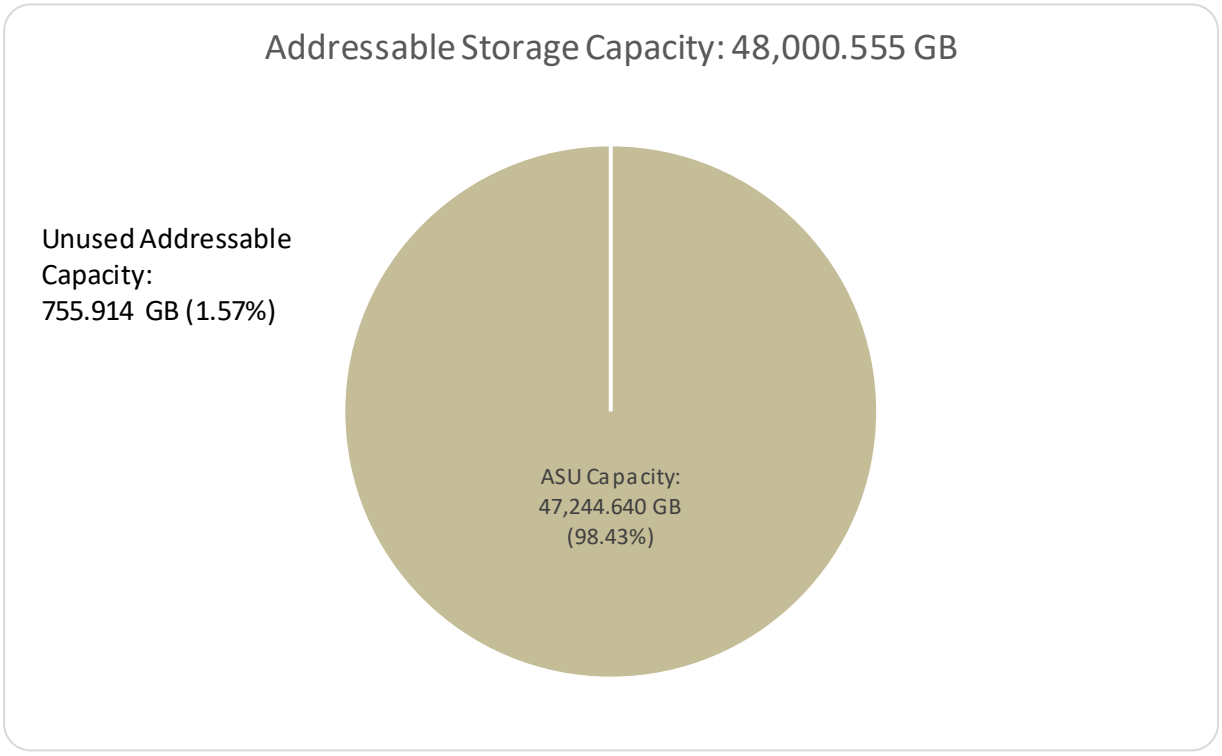
SPC-2 Video On Demand (VOD) Reported Data				
	Data Rate (MB/second)	**Number of Streams**	**Data Rate per Stream**	**Price-Performance**
	6,134.17	7,800	0.79	$6.04

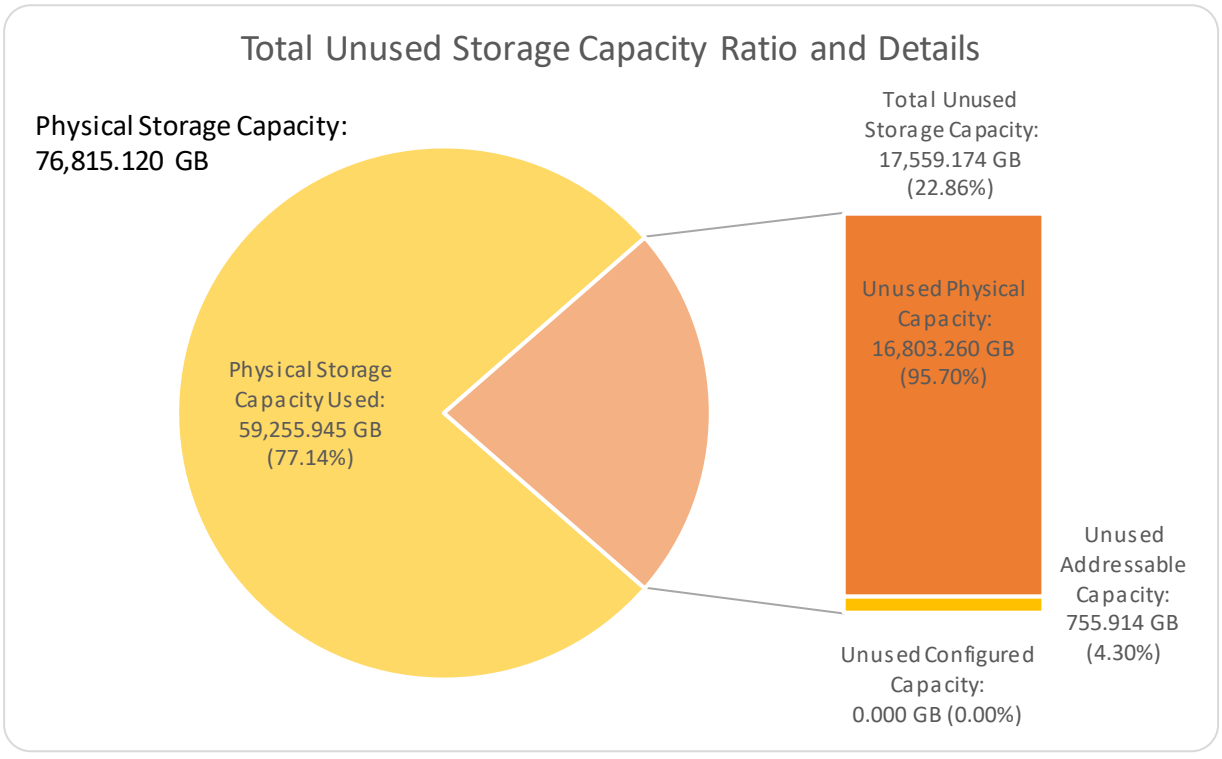
Storage Capacities, Relationships and Utilization

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.






Addressable Storage Capacity: 48,000.555 GB
Unused Addressable Capacity: 755.914 GB (1.57%)
ASU Capacity: 47,244.640 GB (98.43%)


Total Unused Storage Capacity Ratio and Details
Physical Storage Capacity: 76,815.120 GB
Physical Storage Capacity Used: 59,255.945 GB (77.14%)
Total Unused Storage Capacity: 17,559.174 GB (22.86%)
Unused Physical Capacity: 16,803.260 GB (95.70%)
Unused Addressable Capacity: 755.914 GB (4.30%)
Unused Configured Capacity: 0.000 GB (0.00%)

SPC-2 Storage Capacity Utilization	
Application Utilization	61.50%
Protected Application Utilization	77.13%
Unused Storage Ratio	22.86%

Application Utilization: Total ASU Capacity *(47,244.640 GB)* divided by Physical Storage Capacity *(76,815.120 GB)*.

Protected Application Utilization: Total ASU Capacity *(47,244.640 GB)* plus total Data Protection Capacity *(12,002.372 GB)* minus unused Data Protection Capacity *(0.000 GB)* divided by Physical Storage Capacity *(76,815.120 GB)*.

Unused Storage Ratio: Total Unused Capacity *(17,559.174 GB)* divided by Physical Storage Capacity *(76,815.120 GB)* and may not exceed 45%.

Priced Storage Configuration Pricing

Part No.	Description	Source	Qty	Unit Price	Ext. Price	Disc.	Disc. Price
Hardware & Software							
SGFC16G-4P	QLogic QLE2694 16Gbps FC HBA (quad port)	2	1	5,200.00	5,200.00	75.2%	1,289.60
SG1000-BAUF36	SCALEWAY NAS SG1000-UF Unified Storage System 4U/36bay CPU : Intel Xeon Silver 4110 2.1GHz, 16G/s FC 4Ports, 4 Ports iSCSI, or 10Gb 2Ports Slot(s) for NAS, Dual (PSU+FAN Module), 2GB Cache SAS Raid Controller (12Gb/s SAS 8 Channel), OS Disk Mirror supported, 36ea SSD trays, Rackmount Kit	2	1	44,841.00	44,841.00	75.2%	11,120.57
SG8GBDDR4	8GB DIMM modules for SG1000-UF	2	4	280.00	1,120.00	75.2%	277.76
SGRAIDBBU	Cache backup Battery (cachevault), bracket	2	1	1,253.00	1,253.00	75.2%	310.75
OM310GB10M	Optical FC cable, LC-LC, MM-50/125, Duplex, LC, wave-length 850nM, 10 Meters	2	4	110.00	440.00	75.2%	109.12
SGSFP-16G	16GB/s FC SFP optical transceiver, LC, Multi-mode, 850nm	2	4	538.00	2,152.00	75.2%	533.70
SGFC16G-2P	Host Interface, C43FC-16G, Dual ports	2	2	2,171.00	4,342.00	75.2%	1,076.82
SG1S83TB	2.5" SSD 6Gbps 3.84TB	2	20	4,352.00	87,040.00	75.2%	21,585.92
						Hardware & Software Subtotal	**36,304.24**
Support & Maintenance							
SGSVC-1000UF	3 Years Support for all configured components with 4h x 24/7 on site service	2	1	2,948.00	2,948.00	75.2%	731.11
						Support & Maintenance Subtotal	**731.11**
						SPC-2 Total System Price	**37,035.35**

Price Source Key: 1= TTA; 2 = NetClips

Prices used in SPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the SPC benchmark specifications. If you find that the stated prices or maintenance levels are not available according to these terms, please inform the SPC at spcadmin@spcresults.org.

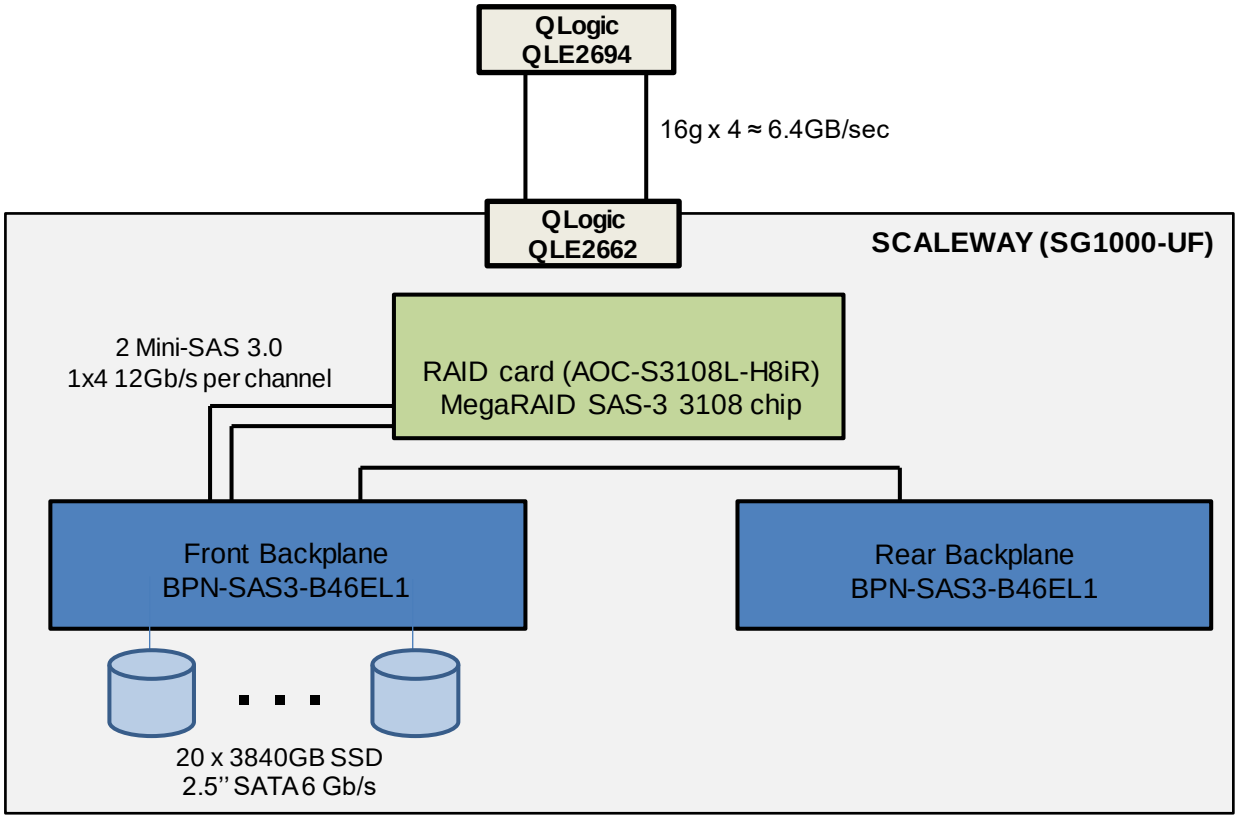
The above pricing includes the following:

- Acknowledgement of new and existing hardware and/or software problems within four hours.
- Onsite presence of a qualified maintenance engineer or provision of a customer replaceable part within four hours of the above acknowledgement for any hardware failure that results in an inoperative Priced Storage Configuration component.

Differences between Tested Storage Configuration and Priced Storage Configuration

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

Priced Storage Configuration Diagram



Priced Storage Configuration Components

Priced Storage Configuration
1x QLogic QLE2694 16Gbps FC HBA (quad-port)
SCALEWAY SG1000-UF 1x Controller (Intel® Xeon® Silver 4110 CPU @ 2.10 GHz) 32 GB main memory L1 cache 32K, L2 cache 1024K, L3 cache 11264K
2x QLogic QLE2662 16 Gbps FC HBA (dual port) 1x MegaRAID 3108 SAS Controller 2x SAS/SATA support backplanes
20x 3840 GB Micron 5200 ECO 2.5'' SATA 6 Gb/s SSD