



ASTI-FM 03-11
REV 0/2 APR 2018

**DOST-ASTI Bids and Awards Committee
Invitation to Bid (Public Bidding)**

ITB No:	19-02-2302	Date:	February-13-2019
PR No:	DATOS-19-01-7180	Date:	January-15-2019
Source of Funds:			
Total ABC:	Php 28,690,000.00		
Time, Date & Venue of Pre-bid Conference:	March 07, 2019, 1:30 PM at DOST-ASTI		
Time and Date of Submission of Bids:	March 19, 2019, 12:00 PM		
Time, Date & Venue of Opening Bids:	March 19, 2019, 1:30 PM at DOST-ASTI		
Date of availability of Complete Set of Documents:	February 27, 2019		
Deadline of Potential Bidder's Clarifications:	March 09, 2019		
Deadline of ASTI's Supplemental Bid Bulletin:	March 12, 2019		
Delivery Schedule:			

The Advanced Science and Technology Institute (ASTI), through its Bids and Awards Committee (BAC), hereby invites all interested bidders to submit their bids for the item(s) listed below. Guidelines regarding the format, eligibility, technical and financial documents needed are described in the Instruction to Bidders of the Philippine Bidding Documents

Bidding will be conducted through open competitive bidding procedures using a non discretionary "pass/fail" criterion as specified in the 2016 R-IRR of RA 9184.

A complete set of Bidding Documents may be purchased by interested bidders upon payment of a fee for the Bidding Documents. It is also downloadable for free of charge at DOST-ASTI's website - www.asti.dost.gov.ph

For further inquiries, contact ASTI's BAC Secretariat via email at bac-sec@asti.dost.gov.ph. Interested bidders may also call the number - (632)-426-7423 and look for ASTI's BAC Secretariat.

Respectfully,

PEDRITO B. MANGAHAS
Chairperson, BAC-1

NO.	TECHNICAL SPECIFICATIONS	QTY	UNIT	UNIT PRICE(Php)	TOTAL PRICE(Php)
1	Compute Server/s 1. GPU Server 1.2. Technical Specifications: 1.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not. 1.3. Barebone: 1.3.1. Memory Technology: DDR4 ECC 1.3.2. Form Factor: 2-node in 1 2U (Rackmount) or equivalent (2 node of 1U each) 1.3.3. Memory Slots: 8x 288-pin DDR4 DIMM per node 1.3.4. Graphics: Aspeed AST2400 BMC or equivalent per node "1.3.5. Network: At least 2x Port of at least 1GbE per node, Dedicated Out-of-Band Management Port per node"	1	lot	13740000.00	13,740,000.00

1.3.6. Power: 1280W Redundant with PMBus or equivalent, 80-plus Platinum (include Verification and Testing Report)"

1.3.7. Drive Bays: At least 8x 2.5" Hot-swap SAS/SATA Drive Bays per node, At least 2x SATADOM port or equivalent Flash Memory Drive Technology per node"

"1.3.8. Expansion Slots: 1x PCI-E 3.0 x16 Low-profile slot per node, 1x PCI-E 3.0 x8 slot per node & 1x PCI-E 3.0 x16 for GPU/Xeon Phi support (w/ GPU kit) per node"

1.3.9. USB: At least 2x of 2.0/3.0 per node

1.3.10. VGA: Dedicated VGA port per node

1.3.11. Operating Environment/Compliance: RoHS Compliant

"1.3.12. Accessories: 2x C14 to C13 power cord (0.5-meter), Quick-release, tool-less mounting rail kit"

1.4. Processor:

1.4.1. Product Line: Intel® Xeon® E5 Family or equivalent/better

1.4.2. Clock Speed: At least 3.00GHz

1.4.3. Smart Cache: At least 20MB

1.4.4. Cores/Threads (per CPU): 6C/12T

1.4.5. Intel VT-x Technology: Yes

1.4.6. Intel Hyper-Threading: Yes

1.4.7. CPU: At least 2x per node

1.4.8. Intel QPI Speed: At least 9.6GT/s

1.4.9. # of QPI Links: 2

1.5. Memory:

1.5.1. Technology: DDR4 ECC Load-Reduced

1.5.2. Type: At least 16x 288-pin DIMM per node

1.5.3. Capacity: At least 16x 64GB per node or equivalent/better

1.5.4. Speed: At least 2400MHz

1.6. Boot Drive

1.6.1. Type: SATA Disk-on-Module (DOM) or equivalent

1.6.2. Capacity: At least 2x of at least 100GB per node

1.6.3. Interface: 6.0Gbps SATA

1.6.4. Endurance: At least 0.62 PBW

1.6.5. Max Sequential Read: At least 500 MB/s

1.6.6. Max Sequential Write: At least 160 MB/s

1.7. Network Card:

1.7.1. Transmission Speed: 10-Gbps Ethernet

1.7.2. Port Interface: LC

1.7.3. Host Interface: PCI Express 2.0/3.0 x8

1.7.4. Cable Medium: Fiber

1.7.5. VT for Connectivity (VT-c): VMDc

1.7.6. VT for Directed I/O (VT-d): Yes

1.7.7. Ports (per Card): At least 4x per node

1.8. Co-Processor:

1.8.1. Type: GPU (Compute)

1.8.2. Product Series: NVIDIA Tesla P40 or better

1.8.3. Core Type: NVIDIA CUDA

1.8.4. Core Clock Speed: At least 1303MHz (1531Mhz Boost Clock)

1.8.5. Interface: PCI-E 3.0 x16 Compliant

- 1.8.6. Stream Cores: At least 3840 CUDA Cores
- 1.8.7. Memory Clock Speed: At least 7.2Gbps GDDR5
- 1.8.8. Max Memory: 24GB GDDR5
- 1.8.9. GPU: At least 1x per node
- 1.9. Certifications:
 - "1.9.1. Manufacturer of the hardware platform must possess and Present documentary proof of active and valid certifications of compliance issued by accredited registrars for the following international management systems:"
 - 1.9.1.1. ISO 9001 (Quality Management Systems); &
 - 1.9.1.2. ISO 14001 (Environmental Management System)
 - "1.9.1.3. The scope of the certifications should cover the design, development, production, distribution and service of computing solutions and data storage equipment/systems for Commercial and Industrial applications"
- 1.10. Warranty & Technical Support
 - 1.10.1. At least three (3) years hardware warranty with advanced parts replacement
 - 1.10.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.
 - 1.10.3. Assembly and installation of the server hardware into the rack cabinets specified by ASTI.
- 1.11. Compatibility:
 - 1.11.1. All devices under specification should be compatible with each other.
- 2. Server Network Cards
 - 2.1. Quantity: 53
 - 2.2. Technical Specifications:
 - 2.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.
 - 2.3. Features:
 - 2.3.1. Controller: Intel® 82599 10GbE or equivalent/better
 - 2.3.2. Form Factor: Low-profile
 - 2.3.3. Ports: Dual SFP+
 - 2.3.4. Supported Expansion Slot: PCI-E 2.0 x8 (up to 5GT/s)
 - 2.3.5. Cables Support: LC-LC fiber-optic cables and NC-SI cable
 - 2.4. I/O:
 - 2.4.1. Intel® QuickData Technology: DMA engine that enhances data acceleration and lowers CPU usage
 - 2.4.2. Direct Cache Access (DCA) to avoid cache misses
 - 2.4.3. MSI-X support to minimize the overhead of interrupts and allows load-balancing between multiple cores/CPUs
 - 2.4.4. Tx/Rx IP, SCTP, TCP and UDP checksum offloading capabilities (IPv4, IPv6)
 - 2.4.5. Scalable I/O for Linux environments

2.5. Virtualization:

2.5.1. Supports virtualization features such as VMDq, Next-generation VMDq (64 queues per port) and PC-SIG SR-IOV implementation

2.5.2. Advanced Packet Filtering

2.5.3. VLAN support to allow creation of multiple VLAN segments

2.5.4. VXLAN through Software

2.6. Management:

2.6.1. Preboot eXecution Environment (PXE) support

2.6.2. Simple Network Management Protocol (SNMP) and Remote Network Monitoring (RMON) statistics counters

2.6.3. iSCSI remote boot

2.6.4. NC-SI for remote management

2.7. Compatibility:

2.7.1. OS Support: RedHat EL, SUSE SLES and FreeBSD

2.7.2. Item/s should be compatible to Supermicro X9DRT-P Motherboard

2.8. Certifications:

2.8.1. Manufacturer of the hardware platform must possess and

Present documentary proof of active and valid certifications of

compliance issued by accredited registrars for the following

international management systems:"

2.8.1.1. ISO 9001 (Quality Management Systems); &

2.8.1.2. ISO 14001 (Environmental Management System)

2.8.1.3. The scope of the certifications should cover the design,

development, production, distribution and service of computing

solutions and data storage equipment/systems for Commercial and Industrial applications"

2.9. Warranty & Technical Support

2.9.1. At least three (3) years hardware warranty with advanced parts replacement

2.9.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.

3. Firewall/Router

3.1. Quantity: 2

3.2. Technical Specifications:

3.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.

3.3. Barebone:

3.3.1. Form Factor: 1U (Rackmount)

3.3.2. Memory Technology: DDR4 ECC UDIMM

3.3.3. Memory Slots: At least 4x 288-pin DDR4 DIMM slots

3.3.4. Graphics: Aspeed AST2400 BMC

3.3.5. Ethernet:

At least 2 RJ45 of at least Gigabit Ethernet LAN ports

- or better,
- 1 RJ45 Dedicated Out-of-bound Management LAN port"
- 3.3.6. Power: 200W AC-DC with PFC 80-Plus Platinum Level (include Verification and Testing Report)"
- 3.3.7. Drive Bays: At least 2x 2.5" SATA2/SATA3 internal
- 3.3.8. Expansion Slots: At least 1x PCI-E 3.0 x8
- 3.3.9. SATA: At least 2x SATA3 (6.0Gbps)
- 3.3.10. Operating Environment/Compliance: RoHS Compliant
- 3.3.11. Accessories: 1x C14 to C13 power cord (0.5-meter), rail rack mounting Kit
- 3.4. Processor:
- 3.4.1. Product Line: Intel® Xeon® D Family
- 3.4.2. Clock Speed: At least 2.00GHz
- 3.4.3. Smart Cache: At least 8MB
- 3.4.4. Cores/Threads: At least 8C/16T
- 3.4.5. Intel VT-x Technology: Yes
- 3.4.6. Intel Hyper-Threading Technology: Yes
- 3.4.7. Socket: FCBGA2518/FCBGA13
- 3.5. Memory:
- 3.5.1. Technology: DDR4 ECC
- 3.5.2. Type: 288-pin DIMM
- 3.5.3. Capacity: At least 2x 16GB or equivalent/better
- 3.5.4. Speed: At least 2133MHz
- 3.5.5. Signal Processing: Registered
- 3.6. Boot Drive:
- 3.6.1. Type: SSD
- 3.6.2. Capacity: At least 2x of at least 64GB
- 3.6.3. Interface: 6.0Gbps SATA
- 3.6.4. Endurance: At least 0.62 PBW
- 3.6.5. Max Sequential Read: At least 500 MB/s
- 3.6.6. Max Sequential Write: At least 160 MB/s
- 3.7. Network Card
- 3.7.1. Transmission Speed: 10-Gbps Ethernet
- 3.7.2. Port Interface: LC
- 3.7.3. Host Interface: PCI Express 2.0/3.0 x 8
- 3.7.4. Cable Medium: Fiber
- 3.7.5. VT for Connectivity (VT-c): VMDc
- 3.7.6. VT for Directed I/O (VT-d): Yes
- 3.7.7. Ports: At least 2x
- 3.8. Operating System
- 3.8.1. No Operating System (Hardware Warranty Only, No Software Support)
- 3.9. Warranty & Technical Support
- 3.9.1. At least three (3) years hardware warranty with advanced parts replacement
- 3.9.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.
- 3.9.3. Assembly and installation of the server hardware into the rack cabinets specified by ASTI."
- 3.10. Compatibility:
- 3.10.1. All devices under specifications should be compatible with each other.

4. Front end Server

- 4.1. Quantity: 2
- 4.2. Technical Specifications:
 - 4.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.
- 4.3. Barebone:
 - 4.3.1. Memory Technology: DDR4 ECC or better
 - 4.3.2. Form Factor: 1U/2U (Rackmount)
 - 4.3.3. Memory Slots: At least 8x 288-pin DDR4 DIMM
 - 4.3.4. Graphics: Aspeed AST2400 BMC
 - 4.3.5. Network:
 - At least 2x Port of at least 1GbE, Dedicated Out-of-Band Management Port"
 - 4.3.6. Power:
 - 500W Redundant with PMBus, or equivalent/better, 80-plus Platinum (include Verification and Testing Report)"
 - 4.3.7. Drive Bays:
 - At least 4x 3.5" Hot-swap SAS/SATA Drive Bays, At least 2x SATADOM port or equivalent Flash Memory Drive Technology"
 - 4.3.8. Expansion Slots:
 - At least 1x PCI-E 3.0 x16 or at least 2x PCI-E 3.0 x8"
 - 4.3.9. USB: At least 2x of 2.0/3.0
 - 4.3.10. VGA: Dedicated VGA port
 - 4.3.11. Operating Environment/Compliance: RoHS Compliant
 - 4.3.12. Accessories:
 - 2x C14 to C13 power cord (0.5-meter), Quick-release mounting rails for standard-depth rack"
- 4.4. Processor:
 - 4.4.1. Product Line: Intel® Xeon® E3 Family or equivalent/better
 - 4.4.2. Clock Speed: At least 3.00GHz
 - 4.4.3. Smart Cache: At least 8MB
 - 4.4.4. Cores/Threads: At least 4C/8T
 - 4.4.5. Intel VT-x Technology: Yes
 - 4.4.6. Intel Hyper-Threading: Yes
- 4.5. Memory:
 - 4.5.1. Technology: DDR4 ECC
 - 4.5.2. Type: 240-pin DIMM
 - 4.5.3. Capacity: At least 8x 4GB or equivalent/better
 - 4.5.4. Speed: At least 2400MHz
- 4.6. Boot Drive:
 - 4.6.1. Type: SATA Disk-on-Module (DOM) or equivalent
 - 4.6.2. Capacity: At least 2x of at least 100GB
 - 4.6.3. Interface: 6.0Gbps SATA
 - 4.6.4. Endurance: At least 0.62 PBW
 - 4.6.5. Max Sequential Read: At least 500 MB/s
 - 4.6.6. Max Sequential Write: At least 160 MB/s
- 4.7. Network Card:
 - 4.7.1. Transmission Speed: 10-Gbps Ethernet
 - 4.7.2. Port Interface: LC
 - 4.7.3. Host Interface: PCI Express 2.0/3.0 x 8
 - 4.7.4. Cable Medium: Fiber
 - 4.7.5. VT for Connectivity (VT-c): VMDc
 - 4.7.6. VT for Directed I/O (VT-d): Yes
 - 4.7.7. Ports (per Card): At least 2x

4.7.8. Card: 2x

4.8. Certifications:

4.8.1. Manufacturer of the hardware platform must possess and

Present documentary proof of active and valid certifications of compliance issued by accredited registrars for the following

international management systems:"

4.8.1.1. ISO 9001 (Quality Management Systems); &

4.8.1.2. ISO 14001 (Environmental Management System)

4.8.1.3. The scope of the certifications should cover the design, development, production, distribution and service of computing

solutions and data storage equipment/systems for Commercial and Industrial applications"

4.9. Warranty & Technical Support

4.9.1. At least three (3) years hardware warranty with advanced parts replacement

4.9.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.

4.9.3. Assembly and installation of the server hardware into the rack cabinets specified by ASTI.

4.10. Compatibility:

4.10.1. All devices under specification should be compatible with each other.

5. Metadata & Management Server

5.1. Quantity: 5

5.2. Technical Specifications:

5.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.

5.3. Barebone:

5.3.1. Chipset

5.3.1.1. Intel C612 or better

5.3.2. SATA

5.3.2.1. Ten (10) SATA3 (6Gbps) with RAID 0, 1, 5, 10

5.3.2.2. Two (2) SATA DOM (Disk-on-Module) ports

5.3.3. SAS

5.3.3.1. SAS3 (12Gbps) via LSI 3008 or equivalent

5.3.3.2. IT mode firmware

5.3.4. IPMI

5.3.4.1. Support for Intelligent Platform Management Interface v.2.0

5.3.4.2. IPMI 2.0 with virtual media over LAN and KVM-over-LAN

Support"

5.3.5. Network Controllers

5.3.5.1. Intel @ X540 Dual Port 10GbE or equivalent

5.3.5.2. Virtual Machine Device Queues reduce I/O overhead

5.3.5.3. Supports 10GBASE-T, 100BASE-TX, and 1000BASE-T, RJ45 output

5.3.5.4. One (1) Realtek RTL8201N PHY (dedicated

IPMI LAN
 port) or equivalent"

5.3.6. Graphics: ASPEED AST2400 BMC or equivalent

5.3.7. USB

5.3.7.1. Two (2) USB 3.0 ports (rear)

5.3.8. JBOD: Two (2) port External Mini-SAS HD (SFF-8644)

5.3.9. VGA: One (1) VGA port

5.3.10. Form Factor: 2U Rackmount

5.3.11. Front Panel

5.3.11.1. Power On/Off button

5.3.11.2. System Reset button

5.3.12. LEDs

5.3.12.1. Power status LED

5.3.12.2. Hard drive activity LED

5.3.12.3. Network activity LEDs

5.3.13. PCI-Express Expansion Slots

5.3.13.1. 1x PCI-E 3.0 x16 slot

5.3.13.2. 6x PCI-E 3.0 x8 slots

5.3.13.3. Slot 1 & 2 occupied by controller and JBOD Expansion Port

5.3.14. Drive Bays

5.3.14.1. 12x 3.5" Hot-swap SAS3/SATA3 drive bays

5.3.14.2. 2x 2.5" Hot-swap HDD bays (rear)

5.3.15. Backplane: SAS3/SATA3 single expander per backplane

5.3.16. Power Supply

5.3.16.1. 920W (maximum) high-efficiency (94%+) AC-DC Redundant power supplies with PMBus and I2C

5.3.16.2. 100-240 V, 50-60 Hz, 11-4.5 A

5.3.16.3. 80-plus Platinum Certified (submit Test Report)

5.3.17. BIOS Type: At least 32Mb SPI Flash EEPROM with AMI BIOS

5.3.18. BIOS Features

5.3.18.1. Plug and Play (PnP)

5.3.18.2. APM 1.2

5.3.18.3. PCI 2.2

5.3.18.4. ACPI 1.0 / 2.0

5.3.18.5. USB Keyboard support

5.3.18.6. SMBIOS 2.3

5.3.18.7. UEFI

5.3.19. Operating Environment/Compliance: RoHS compliant

5.4. Processor:

5.4.1. Product Line: Intel® Xeon® E5 Family or equivalent/better

5.4.2. Clock Speed: At least 3.50GHz

5.4.3. Smart Cache: At least 15MB

5.4.4. Cores/Threads: At least 4C/8T

5.4.5. Intel VT-x Technology: Yes

5.4.6. Intel Hyper-Threading: Yes

5.4.7. Quantity: 2x CPU

5.4.8. QuickPath Interconnect

5.4.8.1. Speed: 9.6 GT/s

5.4.8.2. QPI Links: 2

5.5. Memory:

5.5.1. Technology: DDR4 ECC or better

5.5.2. Type: 288-pin DIMM

5.5.3. Capacity: At least 8x 8GB or equivalent/better

5.5.4. Speed: At least 2133MHz

5.5.5. Signal Processing: Registered

5.6. Boot Drive:

5.6.1. Type: SATA Disk-on-Module (DOM) or equivalent

5.6.2. Capacity: At least 2x of at least 64GB

5.6.3. Interface: 6.0Gbps SATA

5.6.4. Endurance: At least 150 TBW

5.6.5. Max Sequential Read: At least 500 MB/s

5.6.6. Max Sequential Write: At least 160 MB/s

5.7. Storage Drive:

5.7.1. Type: SSD

5.7.2. Capacity: At least 8x of at least 400GB

5.7.3. Interface: 6.0Gbps SATA

5.7.4. Endurance: At least 0.62 PBW

5.7.5. Read Speed: At least 500 MB/s

5.7.6. Write Speed: At least 400 MB/s

5.7.7. NAND: 20nm MLC HET

5.8. Controller Card:

5.8.1. Product Type: RAID Controller

5.8.2. Data Transfer Rate: Up to 12Gbps per port

5.8.3. Internal Ports: At least 8x

5.8.4. Processor: LSI SAS3108 dual core RAID on Chip (ROC) or equivalent/better"

5.8.5. RAID Levels: 0, 1, 5, 6, 10 and 50

5.8.6. Max Devices: Up to 128 SATA or SAS drives in JBOD mode or 32 drives in RAID mode

5.8.7. Host Bus Type: PCI-E 3.0 x8 compliant

5.8.8. Cache Memory: 1GB 1866MHz DDRIII SDRAM

5.8.9. SSD Optimization

5.8.9.1. MegaRAID CacheCade Pro 2.0 or equivalent

5.8.9.2. MegaRAID Fast Path Software or equivalent

5.8.10. Cache Protection: CacheVault Flash Module or equivalent

5.8.11. Accessories:

5.8.11.1. PCI-E Remote Mounting Board (for remotely mounting CacheVault Power Module in an adjacent server PCI Slot)

5.8.11.2. One (1) 0.5m Internal Cable SFF8643 to x4 SATA HDD (mini SAS HD to SATA data port)"

5.9. Network Card:

5.9.1. Transmission Speed: 10-Gbps Ethernet

5.9.2. Port Interface: LC

5.9.3. Host Interface: PCI Express 2.0/3.0 x 8

5.9.4. Cable Medium: Fiber

5.9.5. VT for Connectivity (VT-c): VMDc

5.9.6. VT for Directed I/O (VT-d): Yes

5.9.7. Ports: At least 2x

5.9.8. Supported Slot Heights: Low profile and Full Height

5.10. Certifications:

5.10.1. Manufacturer of the hardware platform must possess and Present documentary proof of active and valid certifications of compliance issued by accredited registrars for the following international management systems:"

5.10.1.1. ISO 9001 (Quality Management Systems); &

5.10.1.2. ISO 14001 (Environmental Management

	<p>System)</p> <p>5.10.1.3. The scope of the certifications should cover the design, development, production, distribution and service of computing solutions and data storage equipment/systems for Commercial and Industrial applications"</p> <p>5.11. Warranty & Technical Support</p> <p>5.11.1. At least three (3) years hardware warranty with advanced parts replacement</p> <p>5.11.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.</p> <p>5.11.2. Assembly and installation of the server hardware into the rack cabinets specified by ASTI.</p> <p>5.12. Compatibility:</p> <p>5.12.1. All devices under specification should be compatible with each other.</p> <p>5.13 Accessories:</p> <p>5.13.1 2x C14 to C13 power cord (0.5m),</p> <p>5.13.2 Quick -release, tool -less mounting rail kit</p>				
2	<p>Storage Server/s</p> <p>1. Block Storage Servers</p> <p>1.1. Quantity: 2</p> <p>1.2. Technical Specifications:</p> <p>1.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.</p> <p>"1.3.3. SAS: SAS3 (12Gbps) via LSI 3008 (RAID) or equivalent, IT/IR mode firmware"</p> <p>1.3.4. Out-of-bound Management: IPMI 2.0 with virtual media over LAN & KVM-over-LAN or equivalent</p> <p>"1.3.5. Network: At least 2x port of at least 1GbE, Dedicated Out-of-Band Management Port"</p> <p>1.3.6. Graphics: Aspeed AST2400 BMC or equivalent</p> <p>1.3.7. USB: At least 1x USB 3.0 ports & 1x USB 2.0 ports or better</p> <p>1.3.8. JBOD: At least 2x port External Mini-SAS HD (SFF-8644) or equivalent</p> <p>1.3.9. VGA: Dedicated VGA port</p> <p>1.3.10. Form Factor: 2U (Rackmount)</p> <p>"1.3.11. Expansion Slots: At least 1x PCI-E 3.0 x16 slot, At least 3x PCI-E 3.0 x8 slots, 3 of the slots will be occupied by JBOD Expansion Port & Controllers"</p> <p>"1.3.12. Drive Bays: At least 12x 3.5"" Hot-swap SAS3/SATA3, At least 2x 2.5"" Hot-swap HDD/SSD bays"</p> <p>1.3.13. Backplane: SAS3/SATA3 single expander per backplane</p> <p>"1.3.14. Power: 920W AC-DC Redundant power supplies with PMBus and I2C or equivalent, 80-Plus Platinum Level (include Verification and</p>	1	lot	9800000.00	9,800,000.00

Testing Report),"

- 1.3.15. Operating Environment/Compliance: RoHS Compliant
- 1.3.16. Accessories:
 - 2x C14 to C13 power cord (0.5-meter), Quick-release, tool-less mounting rail kit"
- 1.4. Processor:
 - 1.4.1. Product Line: Intel® Xeon® E5 Family
 - 1.4.2. Clock Speed: At least 3.00GHz
 - 1.4.3. Smart Cache: At least 8MB
 - 1.4.4. Cores/Threads (per CPU): At least 4C/8T
 - 1.4.5. CPU: At least 2x
 - 1.4.6. Intel VT-x Technology: Yes
 - 1.4.7. Intel Hyper-Threading Technology: Yes
 - 1.4.8. Intel QPI Speed: At least 8GT/s
 - 1.4.9. # of QPI Links: 2
- 1.5. Memory:
 - 1.5.1. Technology: DDR4 ECC
 - 1.5.2. Type: 288-pin DIMM
 - 1.5.3. Capacity: At least 8x 8GB or equivalent/better
 - 1.5.4. Speed: At least 2133MHz
 - 1.5.5. Signal Processing: Registered
- 1.6. Boot Drive:
 - 1.6.1. Solid State Drive:
 - 1.6.1.1. Capacity: At least 2x of at least 100GB
 - 1.6.1.2. Form Factor: 2.5"
 - 1.6.1.3. Interface: 6.0Gbps SATA
 - 1.6.1.4. Read IOPS: At least 60,000 IOPS
 - 1.6.1.5. Write IOPS: At least 15,000 IOPS
 - 1.6.1.6. Read Speed: At least 500MB/s
 - 1.6.1.7. Write Speed: At least 440MB/s
 - 1.6.1.8. NAND: 16nm MLC or equivalent/better
 - 1.6.1.9. Lifetime Endurance: At least 275 TBW
 - 1.6.2. Flash Memory Module:
 - 1.6.2.1. Type: SATA Disk-on-Module (DOM) or equivalent
 - 1.6.2.2. Capacity: At least 2x of at least 64GB
 - 1.6.2.3. Interface: 6.0Gbps SATA
 - 1.6.2.4. Endurance: At least 150 TBW
 - 1.6.2.5. Max Sequential Read: At least 500 MB/s
 - 1.6.2.6. Max Sequential Write: At least 160 MB/s
- 1.7. Storage Drive:
 - 1.7.1. Capacity: At least 12x of at least 8.0TB
 - 1.7.2. Interface: 12.0Gbps SAS
 - 1.7.3. Rotational Speed: At least 7.2k RPM
 - 1.7.4. Cache: At least 256MB
 - 1.7.5. Format: 512e
 - 1.7.6. Max Sustained Transfer Rate: At least 200 Mbps
 - 1.7.7. Average Latency: 4.16 ms
 - 1.7.8. Life Expectancy: 2 Million Hours MTBF
- 1.8. Controller Card:
 - 1.8.1. Product Type: Host Bus Adapter
 - 1.8.2. Data Transfer Rate: Up to 12Gbps per port
 - 1.8.3. Internal Ports: At least 8x
 - 1.8.4. Processor: Broadcom 3008 SAS or equivalent/better
 - 1.8.5. Max Devices: Up to 122 SAS and/or SATA devices
 - 1.8.6. Host Bus Type: At least PCI-E 3.0 x8 compliant
 - 1.8.7. Processor Speed: At least 1.2GHz
 - 1.8.8. Accessories: 1x 0.5m Internal Cable SFF8643 to

x4 SATA HDD (mini SAS HD to SATA data port)

1.9. Network Card:

1.9.1. Transmission Speed: 10-Gbps Ethernet

1.9.2. Port Interface: LC

1.9.3. Host Interface: PCI Express 2.0/3.0 x 8

1.9.4. Cable Medium: Fiber

1.9.5. VT for Connectivity (VT-c): VMDc

1.9.6. VT for Directed I/O (VT-d): Yes

1.9.7. Ports: At least 2x

1.9.8. Supported Slot Heights: Low profile and Full Height

1.10. Certifications:

"1.10.1. Manufacturer of the hardware platform must possess and

Present documentary proof of active and valid certifications of

compliance issued by accredited registrars for the following

international management systems:"

1.10.1.1. ISO 9001 (Quality Management Systems); &

1.10.1.2. ISO 14001 (Environmental Management System)

"1.10.1.3. The scope of the certifications should cover the design,

development, production, distribution and service of computing

solutions and data storage equipment/systems for Commercial and Industrial applications"

1.11. Warranty & Technical Support

1.11.1. At least three (3) years hardware warranty with advanced parts replacement

1.11.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.

1.11.3. Assembly and installation of the server hardware into the rack cabinets specified by ASTI.

1.12. Compatibility:

1.12.1. All devices under specification should be compatible with each other.

2. Object Storage Servers

2.1. Quantity: 8

2.2. Technical Specifications:

2.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.

2.3. Barebone:

2.3.1. Chipset: Intel C612 chipset or better

"2.3.2. SATA:

At least 12x SATA3 (6Gbps) with RAID (0, 1, 5, 10), 2x SATA DOM (Disk-on-Module) ports or any equivalent Flash Memory Module ports"

"2.3.3. SAS:

SAS3 (12Gbps) via LSI 3008 (RAID) or equivalent, IT/IR mode firmware"

2.3.4. Out-of-bound Management: IPMI 2.0 with virtual media over LAN & KVM-over-LAN or equivalent

"2.3.5. Network:

At least 2x Port of at least 1GbE,

Dedicated Out-of-Band Management Port"

2.3.6. Graphics: Aspeed AST2400 BMC or equivalent

2.3.7. USB: At least 1x USB 3.0 ports & 1x USB 2.0 ports or better

2.3.8. JBOD: At least 2x port External Mini-SAS HD (SFF-8644) or equivalent

2.3.9. VGA: Dedicated VGA port

2.3.10. Form Factor: 2U (Rackmount)

"2.3.11. Expansion Slots:
At least 1x PCI-E 3.0 x16 slot,
At least 3x PCI-E 3.0 x8 slots,
3 of the slots will be occupied by JBOD Expansion Port & Controllers"

"2.3.12. Drive Bays:
At least 12x 3.5" Hot-swap SAS3/SATA3,
At least 2x 2.5" Hot-swap HDD/SSD bays"

2.3.13. Backplane: SAS3/SATA3 single expander per backplane

"2.3.14. Power:
920W AC-DC Redundant power supplies with PMBus and I2C or equivalent,
80-Plus Platinum Level (include Verification and Testing Report)"

2.3.15. Operating Environment/Compliance: RoHS Compliant

"2.3.16. Accessories:
2x C14 to C13 power cord (0.5-meter),
Quick-release, tool-less mounting rail kit"

2.4. Processor:

2.4.1. Product Line: Intel® Xeon® E5-2623 v3 Processor

2.4.2. Clock Speed: 3.00GHz

2.4.3. Smart Cache: 10MB

2.4.4. Cores/Threads (per CPU): 4C/8T

2.4.5. CPU: At least 2x

2.4.6. Intel VT-x Technology: Yes

2.4.7. Intel Hyper-Threading Technology: Yes

2.4.8. Intel QPI Speed: At least 8GT/s

2.4.9. # of QPI Links: 2

2.5. Memory:

2.5.1. Technology: DDR4 ECC

2.5.2. Type: 288-pin DIMM

2.5.3. Capacity: At least 8x 8GB or equivalent/better

2.5.4. Speed: At least 2133MHz

2.5.5. Signal Processing: Registered

2.6. Boot Drive:

2.6.1. Solid State Drive:

2.6.1.1. Capacity: 2x 480GB

2.6.1.2. Form Factor: 2.5"

2.6.1.3. Interface: 6.0Gbps SATA

2.6.1.4. Read IOPS: At least 65,000 IOPS

2.6.1.5. Write IOPS: At least 15,000 IOPS

2.6.1.6. Read Speed: At least 500MB/s

2.6.1.7. Write Speed: At least 440MB/s

2.6.1.8. NAND: 16nm MLC or equivalent/better

2.6.1.9. Lifetime Endurance: At least 275 TBW

2.6.2. Flash Memory Module:

2.6.2.1. Type: SATA Disk-on-Module (DOM) or equivalent

2.6.2.2. Capacity: At least 2x of at least 64GB

2.6.2.3. Interface: 6.0Gbps SATA

2.6.2.4. Endurance: At least 68 TBW

2.6.2.5. Max Sequential Read: At least 500 MB/s

2.6.2.6. Max Sequential Write: At least 160 MB/s

2.7. Storage Drive:

2.7.1. Capacity: At least 12x of at least 8.0TB

2.7.2. Interface: 12.0Gbps SAS

2.7.3. Rotational Speed: At least 7.2k RPM

2.7.4. Cache: At least 256MB

2.7.5. Format: 512e

2.7.6. Max Sustained Transfer Rate: At least 200 Mbps

2.7.7. Average Latency: 4.16 ms

2.7.8. Life Expectancy: 2 Million Hours MTBF

2.8. Controller Card:

2.8.1. Product Type: RAID Controller

2.8.2. Data Transfer Rate: Up to 12Gbps per port

2.8.3. Internal Ports: At least 8x

2.8.4. Processor: LSI SAS3108 dual core RAID on Chip (ROC)

2.8.5. RAID Levels: 0, 1, 5, 6, 10, 50, and 60

2.8.6. Max Devices: Up to 128 SAS and/or SATA devices

2.8.7. Host Bus Type: PCI-E 3.0 x8 compliant

2.8.8. SSD Optimization

2.8.8.1. MegaRAID CacheCade Pro 2.0 or equivalent

2.8.8.2. MegaRAID FastPath Software or equivalent

2.8.9. Cache Memory: 1GB 1866MHz DDRIII SDRAM

"2.8.10. Accessories:

PCI-E Remote Mounting Board (for remotely mounting CacheVault Power Module in an adjacent server PCI slot),

1x 0.5m Internal Cable SFF8643 to x4 SATA HDD (mini SAS HD to SATA data port)"

2.9. Network Card:

2.9.1. Transmission Speed: 10-Gbps Ethernet

2.9.2. Port Interface: LC

2.9.3 Host Interface: PCI Express 2.0/3.0 x 8

2.9.4. Cable Medium: Fiber

2.9.5. VT for Connectivity (VT-c): VMDc

2.9.6. VT for Directed I/O (VT-d): Yes

2.9.7. Ports: At least 2x

2.9.8. Supported Slot Heights: Low profile and Full Height

2.10. Certifications:

"2.10.1. Manufacturer of the hardware platform must possess and Present documentary proof of active and valid certifications of compliance issued by accredited registrars for the following international management systems:"

2.10.1.1. ISO 9001 (Quality Management Systems); &

2.10.1.2. ISO 14001 (Environmental Management System)

"2.10.2. The scope of the certifications should cover the design, development, production, distribution and service of computing solutions and data storage equipment/systems for Commercial and Industrial applications"

2.11. Warranty & Technical Support

	<p>2.11.1. At least three (3) years hardware warranty with advanced parts replacement</p> <p>2.11.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.</p> <p>2.11.3. Assembly and installation of the server hardware into the rack cabinets specified by ASTI.</p> <p>2.12. Compatibility:</p> <p>2.12.1. All devices under specification should be compatible with each other.</p>				
3	<p>Network Equipments & Accessories</p> <p>1. Core Switches:</p> <p>1.1. Quantity: 4</p> <p>1.2. Allocation:</p> <p>1.2.1. Four (4) units 48 ports of 1/10Gb SFP+ with 4 ports of 10/40Gb QSFP+ Network Switch with Dual 550W AC PS with Front to Back (FB) airflow</p> <p>1.2.2. Four (4) units 40 Gigabit Ethernet QSFP+ passive copper cable assembly, 0.5m length</p> <p>1.2.3. One-hundred ninety two (192) units 15-meter 10Gb OM3 DUPlex Multimode 50/125 LSZH Fiber Patch Cable LC/LC</p> <p>1.3. Technical Specifications</p> <p>1.3.1. CPU & Memory</p> <p>1.3.1.1. AT least 64-bit MIPS Processor, 1GHz clock</p> <p>1.3.1.2. At least 1GB ECC SDRAM</p> <p>1.3.1.3. At least 1GB Compact Flash</p> <p>1.3.2. QOS, Rate Limiting & Policies</p> <p>1.3.2.1. 1280 Gbps switch bandwidth</p> <p>1.3.2.2. 952 Mpps forwarding rate</p> <p>1.3.2.3. 9216 Byte maximum packet size (Jumbo Frame)</p> <p>1.3.2.4. Store-and-Forward and Cut-Through switching support</p> <p>1.3.2.5. Less than 1 microsecond latency (64-byte packet)</p> <p>1.3.2.6. 128 load sharing trunks, up to 8 members per trunk</p> <p>1.3.2.7. 4,094 VLANs (Port, Protocol, IEEE 802.1Q)</p> <p>1.3.2.8. 2,048 ingress bandwidth meters Ingress and egress bandwidth policing/rate limiting per flow/ACL and 1,024 egress ACL rules per switch</p> <p>1.3.2.9. 8 QoS egress queues/port</p> <p>1.3.2.10. Egress bandwidth rate shaping per egress queue and per port</p> <p>1.3.2.11. Rate Limiting Granularity: 8 Kbps – 1 Mbps</p> <p>1.3.3. Forwarding Tables</p> <p>1.3.3.1. Layer 2/MAC Addresses: At least 128K</p> <p>1.3.3.2. IPv4 Host Addresses: At least 6K</p> <p>1.3.3.3. IPv4 LPM Entries: At least 16K</p> <p>1.3.3.4. IPv6 Host Addresses: At least 3K</p> <p>1.3.3.5. IPv6 LPM Entries: AT least 8K</p> <p>1.3.4. Hardware Status Indicators:</p> <p>1.3.4.1. Per port status LED including power status or equivalent</p> <p>1.3.4.2. System Status LEDs: management, fan and power or equivalent</p> <p>1.3.4.3. Motion Detection LED or equivalent</p> <p>1.3.5. External Ports:</p>	1	lot	5150000.00	5,150,000.00

- 1.3.5.1. 48 port 10GBASE-X SFP+ (1G/10G dual speed)
- 1.3.5.2. 4-port 40GBASE-X QSFP+ (10G/40G dual speed)
- 1.3.5.3. One RJ-45 RS-232c Serial port (control port)
- 1.3.5.4. One 10/100/1000BASE-T out-of-band management port
- 1.3.6. Airflow:
 - 1.3.6.1. FRONT-to-BACK
- 1.3.7. Power Supply:
 - 1.3.7.1. 450W AC PSU w/ Redundancy
 - 1.3.7.2. 450W DC PSU w/ Redundancy
- 1.3.8. Operating Specifications:
 - 1.3.8.1. Operating Temperature Range: 0°C to 45°C (32°F to 113°F)
 - 1.3.8.2. Operating Humidity: 10% to 95% relative humidity, non-condensing
 - 1.3.8.3. Operating Altitude: 0-3,000 meters (9,850 feet)
 - 1.3.8.4. Operational Shock (Half Sine): 30m/s² (3g), 11ms, 60
 - 1.3.8.5. Shocks Operational Random Vibration: 3-500 MHz @ 1.5g rms
 - 1.3.8.6. Storage & Transportation Conditions (Packaged)
 - 1.3.8.7. Transportation Temperature: -40° C to 70° C (-40°F to 158°F)
- 1.3.9. Storage Transportation Specifications:
 - 1.3.9.1. Packaged Shock (Half Sine): 180 m/s² (18 g), 6ms, 600shocks
 - 1.3.9.2. Packaged Sine Vibration: 5-62 Hz @ Velocity 5mm/s, 62-500 Hz @ 0.2G
 - 1.3.9.3. Packaged Random Vibration: 5-20 Hz @ 1.0 ASD w/-3dB/oct. from 20-200 Hz
 - 1.3.9.4. 14 drops min on sides & corners @ 42" (<15 kg box)
- "1.3.9. Acoustic:
 - 1.3.9.1. Acoustic Noise: 56.6 dB(A) – 68.8dB(A)"
- 1.3.10. Regulatory/Safety
 - 1.3.10.1. North American Safety Of ITE
 - 1.3.10.1.1. UL 60950-1 1st Ed., Listed Device (U.S.)
 - 1.3.10.1.2. CSA 22.2#60950-1-03 1st Ed. (Canada)
 - 1.3.10.1.3. Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
 - 1.3.10.1.4. CDRH Letter of Approval (U.S. FDA Approval)
 - 1.3.10.2. European Safety Of ITE
 - 1.3.10.2.1. EN60950-1:2006 EN 60825-1+A2:2001 (Lasers Safety)
 - 1.3.10.2.2. TUV-R GS Mark by German Notified Body
 - 1.3.10.2.3. 2006/95/EC Low Voltage Directive
 - 1.3.10.3. International Safety Of ITE
 - 1.3.10.3.1. CB Report & Certificate per IEC 609501:2006 + National Differences
 - 1.3.10.3.2. AS/NZS 60950-1 (Australia/New Zealand)
- 1.3.11. EMI/EMC Standards
 - 1.3.11.1. North American EMC For ITE
 - 1.3.11.1.1. FCC CFR 47 part 15 Class A (U.S.A.)
 - 1.3.11.1.2. ICES-003 Class A (Canada)
 - 1.3.11.2. European EMC Standards
 - 1.3.11.2.1. EN 55022:2006 Class A
 - 1.3.11.2.2. EN 55024:A2-2003 Class A includes IEC

61000-4-2, 3, 4, 5, 6, 11

1.3.11.2.3. EN 61000-3-2,8-2006 (Harmonics)

1.3.11.2.4. EN 61000-3-3 1995+A2:2005 (Flicker)

"1.3.11.2.5. ETSI EN 300 386 v1.3.3, 2005-04 (EMC Telecommunications)"

1.3.11.2.6. 2004/108/EC EMC Directive

1.3.11.3. International EMC Certifications

1.3.11.3.1. CISPR 22: 2006 Ed 5.2, Class A (International Emissions)

1.3.11.3.2. CISPR 24:A2:2003 Class A (International Immunity)

1.3.11.3.3. EC/EN 61000-4-2:2001 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A

1.3.11.3.4. EC/EN 61000-4-3:2006 Radiated Immunity 10V/m, Criteria A

1.3.11.3.5. EC/EN 61000-4-4:2005 Transient Burst, 1 kV, Criteria A

1.3.11.3.6. IEC/EN 61000-4-5:2005 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A

1.3.11.3.7. IEC/EN 61000-4-6:2005 Conducted Immunity, 0.15-80MHz, 10V/m unmod. RMS, Criteria A

1.3.11.3.8. EC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria

1.3.12. Telecom Standards:

1.3.12.1. EN/ETSI 300 386:2001 (EMC Telecommunications)

1.3.12.2. EN/ETSI 300 019 (Environment for Telecommunications)

1.3.12.3. MEF9 and MEF14 certified for EPL, EVPL and ELAN

1.3.12.4. NEBS Level 3 compliant to portions of GR-1089 Issue 4 & GR-63 Issue 3 as defined in SR3580 with exception to filter requirement

1.3.13. IEEE 802.3 Media Access Standards

1.3.13.1. IEEE 802.3ab 1000BASE-T

1.3.13.2. IEEE 802.3z 1000BASE-X

1.3.13.3. IEEE 802.3ae 10GBASE-X

1.3.13.4. IEEE 802.3ba 40GBASE-X

1.3.14. Environmental Standards

1.3.14.1. EN/ETSI 300 019-2-1 v2.1.2 (2000-09) - Class 1.2 Storage

1.3.14.2. EN/ETSI 300 019-2-2 v2.1.2 (1999-09) - Class 2.3 Transportation

1.3.14.3. EN/ETSI 300 019-2-3 v2.1.2 (2003-04) - Class 3.1e Operational

1.3.14.4. EN/ETSI 300 753 (1997-10) - Acoustic Noise

1.3.14.5. ASTM D3580 Random Vibration Unpackaged 1.5G

1.3.15. Protocols & Standards

1.3.15.1. IEEE 802.1D - 1998 Spanning Tree Protocol (STP)

1.3.15.2. IEEE 802.1D - 2004 Spanning Tree Protocol (STP and RSTP)

1.3.15.3. IEEE 802.1w - 2001 Rapid Reconfiguration for STP, RSTP

1.3.15.4. IEEE 802.1Q - 2003 (formerly IEEE 802.1s) Multiple Instances of STP, MSTP

1.3.15.5. EMISTP, Extreme Multiple Instances of Spanning Tree Protocol

1.3.15.6. PVST+, Per VLAN STP (802.1Q interoperable)

1.3.15.7. Draft-ietf-bridge-rstpmib-03. Txt - Definitions of Managed Objects for Bridges with Rapid Spanning Tree Protocol

1.3.15.8. IEEE 802.1Q – 1998 Virtual Bridged Local Area Networks

1.3.15.9. IEEE 802.3ad Static load sharing configuration and LACP based dynamic configuration

1.3.15.10. Software Redundant Ports

1.3.15.11. Multi-Switch Link Aggregation Groups (MLAG)

1.3.15.12. IEEE 802.1AB – LLDP Link Layer Discovery Protocol

1.3.15.13. LLDP Media Endpoint Discovery (LLDP – MED), ANSI/TIA-1057, draft 08

1.3.15.14. IEEE 802.1ag L2 Ping and traceroute, Connectivity Fault Management

1.3.15.15. ITU-T Y.1731 Frame Delay Measurements

1.3.15.16. ITU-T Y.1731 Frame Delay

1.3.15.17. ITU-T Y.1731 Frame Loss

1.3.15.18. IEEE 802.3ah Ethernet OAM - Unidirectional Link Fault Management

1.3.15.19. RFC 3619 Ethernet Automatic Protection Switching (EAPS) Version 1 and Version 2

1.3.15.20. ITU G.8032 Ethernet Ring Protection Switching

1.3.15.21. OpenFlow Protocol 1.0

1.3.15.22. RFC 2030 SNMP, Simple

1.3.15.23. Network Time Protocol v4

1.3.15.24. RFC 5905 1 - Network Time Protocol Version 4: Protocol and Algorithms Specification

1.3.15.25. RFC 854 Telnet client and server

1.3.15.26. RFC 783 TFTP Protocol (revision 2)

1.3.15.27. RFC 951, 1542 BootP

1.3.15.28. RFC 2131 BOOTP/DHCP relay agent and DHCP server

1.3.15.29. RFC 3315, Dynamic Host Configuration Protocol for IPV6 (DHCPv6), Client and Relay Function (Secondary IP address only) support

1.3.15.30. RFC 1591 DNS (client operation)

1.3.15.31. RFC 6106, IPv6 Router

1.3.15.32. Advertisement Options for DNS Configuration

1.3.15.33. RFC 1155 Structure of Management Information (SMIv1)

1.3.15.34. RFC 1157 SNMPv1

1.3.15.35. RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-Like MIB & TRAPs

1.3.15.36. RFC 1573 Evolution of Interface

1.3.15.37. RFC 1650 Ethernet-Like MIB (update of RFC 1213 for SNMPv2)

1.3.15.38. RFC 1901 - 1908 SNMPv2c, SMIv2 and Revised MIB-II

1.3.15.39. RFC 2576 Coexistence between SNMP Version 1, Version 2 and Version 3 of the Internet standard Network Management Framework

1.3.15.40. RFC 2578 - 2580 SMIv2 (update to RFC 1902 - 1903)

1.3.15.41. RFC 3410 - 3415 SNMPv3, user based security, encryption and authentication

1.3.15.42. RFC 3416 - Protocol Operations for Version 2 of SNMP

1.3.15.43. RFC 2418 - Management Information Base for SNMP

1.3.15.44. RFC 3826 - The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model

1.3.15.45. IEEE 802.1AB LLDP Basic MIB, LLDP-EXT-DOT1-MIB, LLDP-EXT-DOT3-MIB

1.3.15.46. RFC 1757 RMON 4 groups: Stats, History, Alarms and Events

1.3.15.47. RFC 2021 RMON2 (probe configuration)

1.3.15.48. RFC 2613 SMON MIB

1.3.15.49. RFC 2925 Ping/Traceroute MIB

1.3.15.50. RFC 2665 - Definitions of Managed Objects for the Ethernet-like Interface types

1.3.15.51. RFC 2668 802.3 Medium Attachment Units (MAU) MIB draft-ietf-hubmib-mau-mib-v3-02.txt

1.3.15.52. RFC 1643 Ethernet MIB

1.3.15.53. RFC 1493 Bridge MIB

1.3.15.54. RFC 2096 IPv4 Forwarding Table MIB

1.3.15.55. RFC 2737 Entity MIB v2

1.3.15.56. RFC 2233 Interface MIB

1.3.15.57. RFC 3621 PoE-MIB

1.3.15.58. PIM MIB draft-ietf-pim-mib-v2-01.txt

1.3.15.59. IEEE-8021-PAE-MIB

1.3.15.60. IEEE-8021x-EXTENSIONS-MIB

1.3.15.61. EAPS MIB supports get functions

1.3.15.62. Secure Shell (SSH-2) client and server

1.3.15.63. Secure Copy (SCP-2) client and server

1.3.15.64. Secure FTP (SFTP) server

1.3.15.65. sFlow version 5

1.3.15.66. Configuration logging

1.3.15.67. Multiple Images, Multiple Configs

1.3.15.68. RFC 3164 BSD Syslog Protocol with Multiple Syslog Servers - 999 Local Messages (criticals stored across reboots)

1.3.15.69. MIBs (includes statistics, FDB, PoE, CPU, Memory, ACL, CLEAR-Flow etc MIBs)

1.3.15.70. XML APIs over Telnet/SSH and HTTP/HTTPS

1.3.15.71. IP Route Compression

1.3.15.72. IPv6 Router Advertisement Filtering

1.3.15.73. SFF-8472 DDMI (Digital Diagnostics Monitoring Interface)

1.3.15.74. RFC 3014 Notification Log MIB

1.3.15.75. draft-ietf-bfd-mib-14 BFD MIB

"1.3.15.76. draft-ietf-bfd-tc-mib-02 Definitions of Textual Conventions (TCs) for BFD Management"

1.3.15.77. MEF-36 Y.1731 Compliant Performance Monitoring SNMP MIB

1.3.15.78. Secure Shell (SSH-2), Secure Copy (SCP-2) and SFTP client/server with encryption/authentication

"1.3.15.79. SNMPv3 user based security, with encryption/authentication"

1.3.15.80. RFC 1492 TACACS+

1.3.15.81. RFC 2138 RADIUS Authentication

1.3.15.82. RFC 2139 RADIUS Accounting

1.3.15.83. RFC 3579 RADIUS EAP support for 802.1x

1.3.15.84. RADIUS Per-command Authentication

1.3.15.85. Access Profiles on All Routing Protocols

1.3.15.86. Access Policies for Telnet/SSH-2/SCP-2

1.3.15.87. Network Login - 802.1x, Web and

MAC-based Mechanisms

- 1.3.15.88. IEEE 802.1x - 2001 Port-Based Network Access Control for Network Login
- 1.3.15.89. Multiple supplicants with multiple VLANs for Network Login (all modes)
- 1.3.15.90. Fallback to local authentication database (MAC and Web-based methods)
- 1.3.15.91. Guest VLAN for 802.1x
- 1.3.15.92. RFC 1866 HTML - used for Web-based Network Login
- 1.3.15.93. SSL/TLS transport - used for Web-based Network Login
- 1.3.15.94. MAC Security - Lockdown and Limit
- 1.3.15.95. IP Security - RFC 3046 DHCP Option 82 with port and VLAN ID
- 1.3.15.96. IP Security - Trusted DHCP Server
- 1.3.15.97. Layer 2/3/4 Access Control Lists (ACLs)
- 1.3.15.98. RFC 2267 Network Ingress Filtering
- 1.3.15.99. RPF (Unicast Reverse Path Forwarding) Control via ACLs
- 1.3.15.100. Wire-speed ACLs
- 1.3.15.101. Rate Limiting/Shaping by ACLs
- 1.3.15.102. IP Broadcast Forwarding Control
- 1.3.15.103. ICMP and IP-Option Response Control
- 1.3.15.104. SYN attack protection
- 1.3.15.105. CPU DoS Protection with traffic rate-limiting to management CPU
- 1.3.15.106. IP Security - DHCP enforcement via Disable ARP Learning
- 1.3.15.107. IP Security - Gratuitous ARP Protection
- 1.3.15.108. IP Security - DHCP Secured ARP/ARP Validation
- 1.3.15.109. Routing protocol MD5 authentication
- 1.3.15.110. Identity Manager
- 1.3.15.111. RFC 1122 Requirements for internal hosts - Communication Layers
- 1.3.15.112. RFC 768 User Datagram Protocol (UDP)
- 1.3.15.113. RFC 791 Internet Protocol (IP)
- 1.3.15.114. RFC 792 Internet Control Message Protocol (ICMP)
- 1.3.15.115. RFC 793 Transmission Control Protocol (TCP)
- 1.3.15.116. RFC 826 Address Resolution Protocol (ARP)
- 1.3.15.117. RFC 894 IP over Ethernet
- 1.3.15.118. RFC 1027 Proxy ARP
- 1.3.15.119. RFC 2068 HTTP server
- 1.3.15.120. IGMP v1/v2 Snooping with Configurable Router Registration Forwarding
- 1.3.15.121. IGMP v3 Snooping with Configurable Router Registration Forwarding
- 1.3.15.122. IGMP Filters
- 1.3.15.123. PIM Snooping
- 1.3.15.124. Static IGMP Membership
- 1.3.15.125. Multicast VLAN Registration (MVR)
- 1.3.15.126. Static Unicast Routes
- 1.3.15.127. Static Multicast Routes
- 1.3.15.128. RFC 1112 IGMP v1
- 1.3.15.129. RFC 2236 IGMP v2
- 1.3.15.130. RFC 3376 IGMP v3
- 1.3.15.131. RFC 2933 IGMP MIB

1.3.15.132. RFC 1812 Requirements for IP Version 4 Routers
1.3.15.133. RFC 1519 An architecture for IP Address allocation with CIDR
1.3.15.134. RFC 1256 IPv4 ICMP Router Discovery (IRDP)
1.3.15.135. RFC 1058 RIP v1
1.3.15.136. RFC 2453 RIP v2
1.3.15.137. Static ECMP
1.3.15.138. RFC 2096 IPv4 Forwarding Table MIB
1.3.15.139. RFC 1724 RIPv2 MIB
1.3.15.140. RFC 2338 Virtual Router Redundancy Protocol
1.3.15.141. RFC 3768 VRRPv2
1.3.15.142. RFC 2787 VRRP MIB
1.3.15.143. RFC 2328 OSPF v2 (Edge-mode)
1.3.15.144. OSPF ECMP
1.3.15.145. OSPF MD5 Authentication
1.3.15.146. RFC 1587 OSPF NSSA Option
1.3.15.147. RFC 1765 OSPF Database Overflow
1.3.15.148. RFC 2370 OSPF Opaque LSA Option
1.3.15.149. RFC 3623 OSPF Graceful Restart
1.3.15.150. RFC 1850 OSPFv2 MIB
1.3.15.151. RFC 2362 Protocol Independent Multicast - Sparse Mode PIM-SM (Edge-mode)
1.3.15.152. RFC 2934 Protocol Independent Multicast MIB
1.3.15.153. RFC 3569, draft-ietf-ssm-arch-06.txt PIM-SSM PIM Source Specific Multicast
1.3.15.154. draft-ietf-pim-mib-v2-o1.txt
1.3.15.155. Mtrace, a "traceroute" facility for IP Multicast: Draft-ietf-idmr-traceroute-ipm-07
1.3.15.156. Mrinfo, the multicast router information tool based on Appendix-B of draft-ietf-idmr-dvmrp-v3-11
1.3.15.157. RFC 3587, Global Unicast Address Format
1.3.15.158. Ping over IPv6 transport
1.3.15.159. Traceroute over IPv6 transport
1.3.15.160. RFC 5095, Internet Protocol, Version 6 (IPv6) Specification
1.3.15.161. RFC 4861, Neighbor Discovery for IP Version 6, (IPv6)
1.3.15.162. RFC 2463, Internet Control Message Protocol (ICMPv6) for the IPv6 Specification
1.3.15.163. RFC 2464, Transmission of IPv6 Packets over Ethernet Networks
1.3.15.164. RFC 2465, IPv6 MIB, General Group and Textual Conventions
1.3.15.165. RFC 2466, MIB for ICMPv6
1.3.15.166. RFC 2462, IPv6 Stateless Address Auto configuration - Host Requirements
1.3.15.167. RFC 1981, Path MTU Discovery for IPv6, August 1996 - Host Requirements
1.3.15.168. RFC 3513, Internet Protocol Version 6 (IPv6) Addressing Architecture
1.3.15.169. Telnet server over IPv6 transport
1.3.15.170. SSH-2 server over IPv6 transport
1.3.15.171. RFC 4193, Unique Local IPv6 Unicast Addresses
1.3.15.172. RFC 5722, Handling of Overlapping IPv6
1.3.15.173. RFC 2462, IPv6 Stateless Address Auto Configuration - Router Requirements

- 1.3.15.174. RFC 1981, Path MTU Discovery for IPv6, August 1996 – Router Requirements
- 1.3.15.175. RFC 2710, IPv6 Multicast Listener Discovery v1 (MLDv1) Protocol
- 1.3.15.176. RFC 3810, IPv6 Multicast Listener Discovery v2 (MLDv2) Protocol
- 1.3.15.177. RFC 4541, Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discover (MLD) Snooping Switches
- 1.3.15.178. Static Unicast routes for IPv6
- 1.3.15.179. RFC 6164, Using 127-Bit IPv6 Prefixes on Inter-Router Links
- 1.3.15.180. RFC 2080, RIPng
- 1.3.15.181. RFC 2740 OSPF v3 for IPv6 (Edge-mode)
- 1.3.15.182. RFC 5798 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6
- 1.3.15.183. draft-ietf-vrrp-unified-mib-08.txt - Definitions of Managed Objects for VRRPv3
- 1.3.15.184. EAPS multiple rings
- 1.3.15.185. IEEE 802.1D - 1998 (802.1p) Packet Priority
- 1.3.15.186. IEEE 802.1Q VLAN Tagging
- 1.3.15.187. IEEE 802.1v: VLAN classification by Protocol and Port
- 1.3.15.188. IEEE 802.3ad Static Load sharing configuration & LACP based dynamic configuration
- 1.3.15.189. Port-based VLANs
- 1.3.15.190. Protocol-based VLANs
- 1.3.15.191. MAC-based VLANs
- 1.3.15.192. Multiple STP domains per VLAN
- 1.3.15.193. Upstream Forwarding Only/Disable Flooding
- 1.3.15.194. VLAN Translation
- 1.3.15.195. IEEE 802.1ad Provider Bridge Network, virtual MANs (vMANs)
- 1.3.15.196. vMAN Ethertype
- 1.3.15.197. Translation/Secondary vMAN Ethertype
- 1.3.15.198. Multicast Support for PVLAN
- 1.3.15.199. Multicast Support for VLAN Aggregation
- 1.3.15.200. VLAN Aggregation
- 1.3.15.201. VLAN Bridging
- 1.3.15.202. IEEE 802.1AK MVRP and MRP
- 1.3.15.203. RFC 2474 DiffServ Precedence, including 8 queues/port
- 1.3.15.204. RFC 2598 DiffServ Expedited Forwarding (EF)
- 1.3.15.205. RFC 2597 DiffServ Assured Forwarding (AF)
- 1.3.15.206. RFC 2475 DiffServ Core and Edge Router Functions
- 1.3.15.207. Weighted Random Early Detection (WRED)
- 1.3.15.208. Data Center Bridging eXchange (DCBX) (IEEE P802.1Qaz/D2.3)
- 1.3.15.209. SDN OpenStack

- 1.3.16. Warranty & Technical Support
- 1.3.16.1. At least three (3) years hardware warranty with advanced parts replacement
- 1.3.16.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday,

excluding local holidays.
1.3.16.3. Assembly and installation of the switch hardware into the rack cabinets specified by ASTI.

1.3.17. Compatibility:

1.3.17.1. All devices/accessories under allocations and technical specifications should be compatible with each other.

1.3.17.2. Item/s should be compatible for stacking to Extreme Summit x670v-48x-FB

1.3.18 Accessories:

1.3.18.1 2x C13/C14 Power Cord 0.5 meter

1.3.18.2 Mounting Rail Kit (front and back)

2. Core Switches Transceivers

2.1. Quantity: 298

2.2. Technical Specifications:

2.2.1. The following specifications shall include minimum requirements, unless otherwise stated, to include all genuine parts, accessories, equipment and features considered standard whether mentioned herein or not.

2.2.2. Module:

2.2.2.1. Form Type: SFP+

2.2.2.2. Form Factor: Plug-in

2.2.2.3. Wavelength: 850nm

2.2.2.4. Interface: LC duplex

2.2.2.5. Max Cable Distance: 300m over OM3 MMF

2.2.2.6. Max Data Rate: 10Gbps

2.2.3. Warranty & Technical Support

2.2.3.1. At least three (3) years hardware warranty/ replacement

2.2.3.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.

2.2.4. Compatibility:

2.2.4.1. Item/s should be compatible to Extreme Summit x670v-48x-FB

3. Out-of-band Switches

3.1. Quantity: 4

3.2. Allocation:

3.2.1. Four (4) units of 48 ports of 10/100/1000Mbps Ports Network Switch with 23W AC PS

3.3. Technical Specification:

3.3.1. Features

3.3.1.1. External Ports: 10/100/1000Mbps

3.3.1.2. Enclosure: Metal

3.3.1.3. Connector-Type: Metal

3.3.1.4. Performance:

3.3.1.4.1. Bandwidth: At least 96Gbps

3.3.1.4.2. Buffer Memory: 1.5MB

3.3.1.4.3. Jumbo Frames: 9216 bytes

3.3.1.4.4. Forwarding Rate (64-byte packets): At least 1448000 pps

- 3.3.1.4.5. Latency (64-byte): At most <4 microseconds
- 3.3.1.4.6. MAC Address Table Size: At least 16K
- 3.3.1.5. Form Factor: Rack-Mountable

3.3.2. Energy Efficiency

- 3.3.2.1. Energy Efficient Ethernet (EEE) IEEE 802.3az: Yes
- 3.3.2.2. Auto Power Down
- 3.3.2.3. Short Cable Detection
- 3.3.2.4. Power Supply: Internal (AC: 110-240V, 50-60Hz, 1.0A max)
- 3.3.2.5. Power Consumption (Max and Standby): 23.0W / 8.81W
- 3.3.2.6. Heat Dissipation (Max and Standby): 78.66 BTU / 33.13 BTU

3.3.3. Port LEDs: Power, Link/Activity

3.3.4. Environmental Specifications

- 3.3.4.1. Operating Temperature: 0° to 50°C
- 3.3.4.2. Storage Temperature: -20° to 70°C
- 3.3.4.3. Operating Humidity: 90% maximum relative humidity, non-condensing
- 3.3.4.4. Storage Humidity: 5% to 95% relative humidity

3.3.5. Standards

- 3.3.5.1. 802.3x Flow Control
- 3.3.5.2. 802.1p Priority QoS (all models)
- 3.3.5.3. 802.3 CSMA/CD
- 3.3.5.4. 802.3az Energy Efficient Ethernet

3.3.6. Warranty & Technical Support

- 3.3.6.1. At least three (3) years hardware warranty with advanced parts replacement
- 3.3.6.2. Technical support service is available 8 hours per day within standard business hours (8:00 AM - 6:00 PM Philippine Standard Time), Monday to Friday, excluding local holidays.
- 3.3.6.3. Assembly and installation of the switch hardware into the rack cabinets specified by ASTI.
- 3.3.7 Accessories:
 - 3.3.7.1 1xC13/C14 Power Cord, Mounting rail Kit

4. Rack PDU Power Cords

4.1. Quantity: 24

4.2. Technical Specification

4.2.1. Output

- 4.2.1.1. Total Current Draw (Max): At least 12A
- 4.2.1.2. Connector Type: C13

4.2.2. Input

- 4.2.2.1. Maximum Input Current: At least 12A
- 4.2.2.2. Maximum Line Current: At least 12A

4.2.3. Physical

- 4.2.3.1. Length: At least 1 meter
- 4.2.3.2. Color: Black

4.2.4. Environmental

4.2.4.1. Operating Temperature: 0 - 70 °C 4.2.4.2. Operating Relative Humidity: 20 - 80 % 4.2.4.3. Storage Temperature: -25 - 75 °C 4.2.4.4. Storage Relative Humidity: 20 - 80 % 4.2.4.5. RoHS Compliant 4.2.5. Warranty & Technical Support 4.2.5.1. At least three (3) years warranty				
TOTAL APPROVED BUDGET FOR THE CONTRACT (ABC):				Php 28,690,000.00
RESERVATION CLAUSE				
The Advanced Science and Technology Institute reserves the right to accept or reject any proposal, to annul the bidding process, and to reject all proposals at any time prior to contract award, without thereby incurring any liability to the affected proponent or proponents.				