The Asia-Pacific Economic Cooperation Secretariat is procuring the following equipment and related installation services and seek quotations from **Singapore-based** vendors for the following: -

S/N	Item	Quantity
1	Dell PowerEdge R660xs	3
2	Dell ME5012 Storage Array + enclosure	1
3	Dell Unity XT 380 + enclosure	1
4	Alcatel-Lucent OmniAccess Stellar Enterprise WiFi system	22 APs
5	Alcatel-Lucent OS6900-T48C6 switch	2
6	Alcatel-Lucent OS6560-P24X3 switch	6
7	Cisco ISR 1100 8P Dual GE SFP router	3
8	Liebert GXT5 16KVA 230V UPS	1
9	Onsite installation and deployment	1

- *The tenderer must be Dell Platinum Tier and above.*
- *Technical specifications detailed in the following pages.*
- *Minimum 3-year support with option for renewals.*
- *APEC Secretariat reserves the right to check with the equipment manufacturers to verify authenticity of equipment.*

Please send detailed quotations and availability or queries to procurement@apec.org by 14th November, 2024. The APEC Secretariat will send out the purchase order for these items and services by the 21st of November, 2024 to the selected vendor.

TECHNICAL SPECIFICATIONS

3 Units of Dell PowerEdge R660xs

Item Description	Quantity per set of equipment
PowerEdge R660xs - 3 units	
Trusted Platform Module 2.0 V3	1
2.5" Chassis with up to 8 Hard Drives (SAS/SATA), 2 CPU, PERC 11	1
Intel® Xeon® Silver 4410Y 2G, 12C/24T, 16GT/s, 30M Cache, Turbo, HT (150W) DDR5-4000	1
Intel® Xeon® Silver 4410Y 2G, 12C/24T, 16GT/s, 30M Cache, Turbo, HT (150W) DDR5-4000	1
Heatsink for 2 CPU configuration (CPU less than or equal to 150W)	1
Performance Optimized	1
4800MT/s RDIMMs	1
64GB RDIMM, 4800MT/s Dual Rank	12
RAID 1 for 2 HDDs or SSDs (Matching Type/Speed/Capacity)	1
Front PERC H755 Front Load	1
600GB Hard Drive SAS ISE 12Gbps 10k 512n 2.5in Hot-Plug	2
Power Saving Dell Active Power Controller	1
UEFI BIOS Boot Mode with GPT Partition	1
Standard Fan X7	1
Dual, Hot-plug, Power Supply Fully Redundant (1+1), 800W, Mixed Mode, NAF	1
Power Cord - C13, 2M, 250V, 10A (UK, Malaysia, Singapore, HK, Brunei, DDD)	2
Jumper Cord - C13/C14, 4M, 250V, 10A (US, EU, TW, APCC countries except ANZ)	2
Riser Config 6, Low Profile, 1x16 LP Slots (Gen5) + 1x8 LP Slot (Gen5), 2CPU	1
PowerEdge R660xs Motherboard with Broadcom 5720 Dual Port 1Gb On-Board LOM	1
Broadcom 57416 Dual Port 10GbE BASE-T Adapter, OCP NIC 3.0	1
Broadcom 57416 Dual Port 10GbE BASE-T Adapter, PCIe Low Profile	1
Standard Bezel for x8 and x10 chassis	1
No Operating System	1
No Media Required	1
iDRAC9, Enterprise 16G	1
No Quick Sync	1
iDRAC,Factory Generated Password	1
iDRAC Service Module (ISM), NOT Installed	1
ReadyRails A11 drop-in/stab-in Slide Combo Rails With Cable Management Arm	1
PowerEdge R660xs, HS5610 Label, CCC Marking, No CE Marking, for below 1300W PSU	1
Basic Next Business Day 36 Months, 36 Month(s)	1
ProSupport with 4-Hour Onsite Service, 36 Month(s)	1

1 unit of Dell ME5012 Storage + 2 sets of enclosure

Item Description	Quantity per set of equipment
Dell ME5012 Storage Array - 1 unit	
10Gb iSCSI Base-T 8 Port Dual Controller	1
24TB Hard Drive SAS 12Gbps 7.2K 512e 3.5in Hot-Plug, AG Drive	12
Rack Rails 2U	1
ME Series 2U Bezel	1
Power Supply, 580W, Redundant, WW	1
Regulatory Label for Dell EMC ME5012/ME4012/ME412, CE Marking - APCC & TW	1
Power Cord - C13, 2M, 250V, 10A (UK, Malaysia, Singapore, HK, Brunei, DDD)	2
Jumper Cord - C13/C14, 4M, 250V, 10A (US, EU, TW, APCC countries except ANZ)	2
Ship Mod for Dell EMC ME5012, APCC and TW	1
Parts Only Warranty 36 Months, 36 Month(s)	1
ProSupport with 4-Hour Onsite Service, 36 Month(s)	1
Dell EMC ME412 Storage Expansion Enclosure - 2 units	
ME Series 2U Bezel	1
24TB Hard Drive SAS 12Gbps 7.2K 512e 3.5in Hot-Plug, AG Drive	12
Rack Rails 2U	1
Power Supply, 580W, Redundant, WW	1
Regulatory Label for Dell EMC ME5012/ME4012/ME412, CE Marking - APCC & TW	1
Power Cord - C13, 2M, 250V, 10A (UK, Malaysia, Singapore, HK, Brunei, DDD)	2
Jumper Cord - C13/C14, 4M, 250V, 10A (US, EU, TW, APCC countries except ANZ)	2
2x12Gb HD Mini-SAS to HD Mini-SAS 2M Cable	1
3Y ProSupport and 4-Hour Onsite Service	1

1 unit of Dell Unity XT 380

Item Description	Quantity per set of equipment
Unity XT 380 DPE 25x2.5 Customer Supplied Rack - 1 unit	
Non TLA Order	1
Unity SYSPACK 4X600GB 10K SAS 25X2.5	1
Unity 1.8TB 10K SAS 25X2.5 DRIVE	10
D4 800GB SAS FLASH 25X2.5 SSD	6
UNITY 2X4 PORT IO 10GBASET	1
Unity CNA 4x10GbE OPT SFPs	1
3M OM4 Fiber Cable QTY 2	2
Pair of C13/C14 cables (Highline Power) or C19/C20 cables (480/680 Lowline Power) included with DPE	1
C13 Power Cord Pair BSI 1363 plugs 2Metr	2
POWER CORD,DD TO-PDU,C14,C13,3M,10FT	4
Unity XT 380 Field Install Kit	1
Parts Only Warranty 36Months, 36 Month(s)	1
Prosupport Plus and 4Hr Mission Critical, 36 Month(s)	1
Unity XT HFA Software Only Virtual Base - SWAAA	1
Unity HFA Base Software+ D@RE=IC	1
Non TLA Order	1
ProSupport Plus Unity Hybrid Sftwr Spt-Maint, 36 Month(s)	1
Unity XT 3U 15x3.5 DAE Customer Supplied Rack (Pair of SAS Cables Included)	1
D4 6TB NLSAS 15X3.5 DRIVE	10
C13 Power Cord Pair BSI 1363 plugs 2Metr	1
Non TLA Order	1
Parts Only Warranty 36Months, 36 Month(s)	1
Prosupport Plus and 4Hr Mission Critical, 36 Month(s)	1
AppSync Unity Hybrid	1
AppSync Basic for Unity 380=IC	1
ProSupport Plus Appsync for Unity Sftwr Spt-Maint, 36 Month(s)	1
RecoverPoint for Unity XT Hybrid	1
RP BASIC LOC AND REM FOR UNITY	1
ProSupport Plus RecoverPoint Basic, Software Support/Maintenance, 36 Month(s)	1

Alcatel-Lucent OmniAccess Stellar Indoor Wifi 6 APs:

- The propose access point should support dual radio with 5 GHz 802.11ax 4x4:4 MU-MIMO and 2.4 GHz 802.11ax 4x4:4 MU-MIMO with Integrated omnidirectional antenna with peak gain of 3.9dBi in 2.4G and 4.6dBi in 5G.

- The propose access point should come with a 3rd dedicated full band antenna dedicated for scanning the air which will inherently improve network security and Wi-Fi quality.

- The propose access point should come with an integrated Bluetooth 5/Zigbee radio enabling location and building automation services.
- The propose access point should support the following:
    a. short guard interval for 20 MHz, 40 MHz, 80 MHz and 160(80+80)MHz channels.
    b. Transmit beam forming (TxBF) for increased signal reliability and range.
    c. 802.11n/ac packet aggregation:
    d. 802.11n high-throughput (HT) support
    e. 802.11ac very high throughput (VHT) support
    f. 802.11ax high efficiency (HE) support
    g. Advanced Cellular Coexistence (ACC) Minimizes interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment
- The propose access point shall come with the following interfaces:
    a. 2x multi-Gigabit 1/2.5/5 Gig autosensing (RJ-45) ports, Eth0-Eth1, Power over Ethernet (PoE) 802.3bt/at compliant
    b. 1x USB 3.0 Type A (5V, 500mA)
    c. Management Console RJ-45
    d. Reset button: Factory reset
- The propose access point shall come with the following security features:
    a. Integrated Trusted Platform Module (TPM 2.0) for secure storage of credentials and keys
    b. 802.11i, WPA2, WPA3, Enterprise with CNSA Option, Personal (SAE), Enhanced Open (OWE)
    c. 802.1X
    d. WEP, Advanced Encryption Standard (AES), Temporal Key Integrity Protocol (TKIP)
    e. Firewall: ACL, wIPS/wIDS and DPI application policy enforcement with OmniVista™
    f. Portal page authentication
- The propose access point shall support up to 16 SSID per radio (total 32 SSID) and support for up to 1024 associated client devices per AP.
- The propose access point should be able to deploy as a standalone cluster for up to 256 units per cluster for simplified plug and play deployment with an AP acting as virtual controller, or be managed by its Network Management System for large enterprise deployment up to 4K AP, or be able to managed from cloud up to 4K AP.
- The propose wireless solution shall be based on controller-less architecture whereby each and every AP is capable of processing control and data traffic instead of having a centralize controller to take care of control and data traffic.

Alcatel-Lucent OS6900-T48C6 10G Switch:

- Campus core switch must be designed for highly scalable 1GE/10GE/25GE/40GE/100GE Gigabit Ethernet networks.

- The switch shall have at least 48 ports of 1GE/10GE BaseT, 6 ports of 100/40/25/10 GE QSFP28.

- The switch shall support the following network virtualization technologies:
    a. The switch must be capable of creating a low latency, virtualization ready fabric architecture that scales to 400Gbps throughput.
    b. The switches are able to form a single virtual switch unit (up to 6 switches) to achieve high resiliency by allowing connecting devices to dual home to the virtual switch unit using standard link aggregation protocol in a non-blocking architecture.
    c. Virtualization technology must support a unified data and management plane with a single IP address for management and communications
    d. Split-chassis mechanism to ensure in the event that the the two switches fail to communicate to each other for some reason, the slave switch to shutdown all the interfaces to prevent network loop/broadcast storm.
    e. When operating in a chassis virtualization environment, the 10G switch must be able to be upgraded individually without requiring every device in the logical chassis to reboot together.

- The switch must support the following high resiliency and availability features:
    a. Unified management, control and fabric-mesh virtual chassis technology
    b. Virtual chassis 1+N redundant supervisor manager
    c. Virtual chassis In-Service Software Upgrade (ISSU)
    d. Smart continuous switching technology
    e. ITU-T G.8032/Y1344 2010: Ethernet Ring Protection
    f. IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree
    g. Protocol (RSTP)
    h. Per-VLAN spanning tree (PVST+) and 1x1 STP mode
    i. IEEE 802.3ad/802.1AX Link Aggregation Control Protocol (LACP) and static LAG groups across modules
    j. Virtual Router Redundancy Protocol (VRRP) with tracking capabilities
    k. IEEE protocol auto-discovery
    l. Bidirectional Forwarding Detection (BFD)
    m. Redundant and hot-swappable power supplies
    n. Redundant fans
    o. Hot-swappable fan tray
    p. Built-in CPU protection against malicious attacks

- The switch must support the following Software Defined Networking (SDN) features:
    a. Programmable RESTful API
    b. Fully programmable OpenFlow 1.3.1 and 1.0 agent for control of native OpenFlow and hybrid ports
    c. OpenStack networking plug-in compatible with Grizzly or higher
    d. Software-controlled VXLAN hardware VTEP gateway

- The switch shall support the following security features:
    a. Per-port broadcast, multicast, and unicast storm control which prevents faulty end stations from degrading overall systems performance.
    b. Build in mechanism which rate limits the traffic to the switching processor CPU and thereby ensuring stability, availability and predictable network performance.

c. TACACS or RADIUS authentication to facilitate centralized control of the switch and restrict unauthorized users from altering the configuration.
d. Controls communication between peer users in a way that each session comprises of a set of user ports and/or a set of network ports. The user ports within a session cannot communicate with each other and can only communicate through network ports

- The switch must support the following Data Center features:
    a. Support seamless VM mobility by classifying the incoming server traffic based on MAC address, IP address or VLAN tag and assign an appropriate profile to the servers. The profile will determine the VLAN, priority, security and rate limiting parameters of that servers.
    b. Support Data center Bridging features including Priority-Based Flow Control (802.1Qbb), Enhanced Transmission Selection(802.1Qaz) and Data Center Bridging Exchange (DCBx) to enable LAN-SAN convergence with iSCSI and FCoE.
    c. Support Multi-hop FCoE transit switching with FCoE Initialization Protocol (FIP) snooping capability
    d. Support 802.1aq Shortest Path Bridging to enable the creation of a fully meshed architecture with all active network path
    e. The switch must offer simplified programmatic management using RESTful web services with XML and JSON support.
    f. The switch must support the implementation of Edge Virtual Bridging (EVB) and Virtual Ethernet Port Aggregator (VEPA – IEEE802.1Qbg)
    g. IEEE 802.1 Converged Enhanced Ethernet (CEE) 1.01
    h. RFC 7843 Virtual eXtensible Local Area Network (VXLAN)

Alcatel-Lucent OS6560-P24X4 POE Access Switch:

- The switch shall have the following options:
    a. 24/48 Power over Ethernet (POE) ports of 10/100/1000 Ethernet, with 4 uplink/stacking ports supporting 1/10GE
- The switch come with a modular external primary power supply for the POE model with an external optional redundant power supply. Both power supplies are actively providing system and POE power to the switch.
- The switch shall support the following security features:
    a. Per-port broadcast, multicast, and unicast storm control which prevents faulty end stations from degrading overall systems performance with capability of shutting down the port or send a trap when such violation happens
    b. Build in mechanism which rate limits the traffic to the switching processor CPU and thereby ensuring stability, availability and predictable network performance
    c. TACACS or RADIUS authentication to facilitate centralized control of the switch and restrict unauthorized users from altering the configuration
    d. Controls communication between peer users in a way that each session comprises of a set of user ports and/or a set of network ports. The user ports within a session cannot communicate with each other and can only communicate through network ports
    e. Provide the following Access Control Lists (ACL) features:
        i. VLAN based ACL (VACL) on all VLANs to prevent unauthorized data flows to be bridged within VLANs and to provide granular control for limited access within a VLAN or subnet.
        ii. Port-based ACL for Layer 2 interfaces to allow security policies to be applied on individual switch ports.
        iii. Time-based ACL to control the switching of data based on the time of day and week. These security settings are implemented automatically during the specific periods of the day or days of the week
    f. Provide the following threat defense:
        i. Port Security secures the access to an access or trunk port based on MAC address. It limits the number of learned MAC addresses to deny MAC address-flooding.
        ii. DHCP snooping so as to prevent malicious users from spoofing a DHCP server and sending out bogus addresses.
        iii. Dynamic ARP Inspection to help ensure user integrity by preventing malicious users from exploiting the insecure nature of the ARP protocol.
        iv. IP source guard prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.
- The switch shall support the following performance and scalability numbers:
    a. Max Raw Switching fabric capacity of at least 168 Gbps.
    b. At least 196mpps and 277mpps forwarding rate for 24 ports and 48 ports switch models respectively.
    c. Hardware-based multicasting replication.
    d. At least 1,000 IGMP groups and 1,000 multicast routes.
    e. At least 16,000 unicast MAC addresses under VLAN
- The propose switch must be able to support FIPS 140-2 standard which provide strong cryptographic algorithms. FIPS 140-2 compliant encryption is used by the devices in the various management interfaces such as SFTP, HTTP, SSH and SSL.