

1. Centralized UPS

SI #	Technical Specification for UPS	Compliance (Yes/No)
1	True Online Double Conversion UPS with zero transfer time to battery for high reliability	
2	Should have cold-start capability with temporary battery power when the utility power is out	
3	Should be minimum 10kVA/10kW from day 1	
4	Built in automatic bypass	
5	Minimum of 20x 65Ah/ 12V SMF battery form day 1 to provide minimum 1 hours backup at half load	
6	External battery cabinet with locking facility for safe keeping of the battery	
7	LCD Display and Control Panel for configuration and monitoring of UPS	
8	Power Input: <ul style="list-style-type: none"> - Normal Input Voltage: 230 Vac - Voltage range: 110 ~ 280 Vac - Frequency: 40 ~ 70 Hz - Power Factor: > 0.99 @ nominal voltage (input voltage) 	
9	Power Output: <ul style="list-style-type: none"> - Normal Input Voltage: 230/240Vac - Voltage Harmonic Distortion: \leq 2% (linear load) - Crest factor: 3:1 	
10	<ul style="list-style-type: none"> - Efficiency Mode AC-AC: Up to 95% - Efficiency ECO mode: Up to 98% 	
11	Warranty: <ul style="list-style-type: none"> ● Vendor should submit Manufacturer's Authorization letter from OEM. ● Vendor should submit detailed Bill of Materials specifying each and every component. 	

2. Unified Threat Management (UTM)

Sl #	Technical Specification for UTM	Compliance (Yes/No)
1	<p>OEM Selection Criteria:</p> <ul style="list-style-type: none"> • The OEM should be having “recommended rating” by NSS Labs for consecutive three years in the last six years. OEM should have scored minimum 97% in Exploit Block rate in the last NSS Lab for NGFW report (2019) 	
2	<p>Physical Requirement:</p> <ul style="list-style-type: none"> • Firewall should come along with accessories for standard 19” rack mounting. • Minimum 120GB SSD of internal storage for logging and reporting. • Firewall Should have redundant power supplies from day one. 	
3	<p>Connectivity:</p> <ul style="list-style-type: none"> • Solution should support multiple WAN connectivity mediums such as MPLS, ILL, Broadband, 3G – 4G on USB port, Point to Point lease line. • Supported WAN medium when used should support load balance of traffic simultaneously. 	
4	<p>Interfaces:</p> <ul style="list-style-type: none"> • Minimum 2x 1G SFP slots, 8x 1G RJ45 for data communications from day one. • 1 RJ45 Console port for direct connectivity and 1x USB port. 	
5	<p>Performance:</p> <ul style="list-style-type: none"> • Minimum 10Gbps of Firewall Throughput. • 1000 Mbps of IPS throughput. • Solution should be capable to handle minimum 40,000 new sessions per second. 	
6	<p>Security Features:</p> <ul style="list-style-type: none"> • Solution should have SDWAN feature ready from day one with all the NGFW security functionality enabled. • Web filtering feature category based, URL based, custom category creation. • Category based application filter, custom application category creation. • IPS, Anti DDoS, Anti BOT. • Perimeter level Anti virus, Anti Malware. • Flexible bandwidth management user/group wise. • Firewall can be logically separated in to multiple virtual systems for different departments for more granular secured environment and each partition should be capable of performing all security features. • Should support traffic flow visibility, L7 Application identification features. It should have at least 4000 applications database such as Youtube, Facebook, Gmail, AWS, Microsoft Azure etc. • Firewall Should support TLS 1.3 from day one. • Solution should have build in 2FA server. • 100 SSL VPN license for Client-Site connectivity from day one. • 100 IPSEC VPN license for Site-to-Site connectivity from day one. 	
7	<p>Accessibility:</p> <ul style="list-style-type: none"> • Firewall should have simple web-based management console in addition with Telnet, SSH. 	
8	<p>Details of the Firewall Policies for the Firewall provided with the License:</p> <ul style="list-style-type: none"> • Web Security Essentials / URL & Web Filtering,IPS License,Application Visibility License,APT (Advance Persistent Threat) License (Anti Malware Protection , C& C attacks, Geo IP Protection, Zero Day Threat Protection),Gateway Anti virus,Gateway Anti spam 	
9	<p>Warranty:</p> <ul style="list-style-type: none"> • Solution should have 3 years license and support for the hardware & all features update 	

	<ul style="list-style-type: none"> The proposed solution must not be declared as End of sale within next year form the date of bid submission. 	
10	Mandatory: <ul style="list-style-type: none"> Vendor should submit Manufacturer’s Authorization letter from OEM. Vendor should submit detailed Bill of Materials specifying each and every component. 	

3. Core Switch

SI#	Minimum Required Specification for Core Switch	Compliance (Yes/No)
A	Architecture and Port Density:	
1	24x 10/100/1000BaseT stackable switch with dual power supply. Stack ports are not required in day 1 but should have option to add in future. Also switch should have option to add 4 SFP+ ports in future.	
2	1x USB interface for connecting external USB drives to centrally store/backup the firmware/software release files and configuration files of all switches in the network.	
3	Should support stacking of min of 5 units of switches in a fully meshed stack.	
4	Flexible management – Supports both cloud-based Central and on-premise management without ripping and replacing switching infrastructure	
B	Performance Specifications:	
1	Should support min of 160Gbps of switch fabric speed.	
2	Should have min of 160Gbps of routing/switching capacity & 95Mpps of throughput	
3	Should have min of 1GB DDR3 RAM and 256MB Flash Memory	
4	Should support min 64K MAC Address Table	
5	Should support both IPv4 and IPv6.	
6	Latency should be less than 2.8micro seconds across all ports for 1Gbps speed.	
C	Resiliency:	
1	Switch should support Virtual Router Redundancy Protocol (VRRP) to allow groups of two routers to back each other up dynamically to create highly available routed environments in IPv4 and IPv6 networks	
2	Switch should support nonstop switching and routing to improve network availability to better support critical applications, such as unified communication and mobility; traffic will continue to be forwarded during failovers, when the backup member of the stack becomes the commander.	
3	Switch should support Distributed trunking to enable loop-free and redundant network topology without using Spanning Tree Protocol; which allows a server or switch to connect to two switches using one logical trunk for redundancy and load sharing.	
D	VLAN support:	
1	Should support VLAN support and tagging to support the IEEE 802.1Q standard and 4096 VLANs simultaneously.	
2	Should support IEEE 802.1v protocol and mac based VLANS	
3	Should support IEEE 802.1ad QinQ in day 1.	
E	Routing functions:	
1	Should have Static Routing and RIPv1, RIPv2 and RIPv6 from day 1.	

2	Should have OSPFv2 and OSPFv3 and BGP from day 1.	
3	Should support policy-based routing from day 1.	
F	Quality of Services:	
1	Should support advanced classifier-based QoS which classifies traffic using multiple match criteria based on Layer 2, 3, and 4 information; applies QoS policies such as setting priority level and rate limit to selected traffic on a per-port or per-VLAN basis	
2	Should support Layer 4 prioritization based on TCP/UDP port numbers	
3	Should support Class of Service (CoS) which sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ	
G	Security:	
1	Should support Control Plane Policing sets rate limit on control protocols to protect CPU overload from DOS attacks	
2	Should support Source-port filtering allows only specified ports to communicate with each other	
3	Should support RADIUS/TACACS+ eases switch management security administration by using a password authentication server	
4	Should support Detection of malicious attacks monitors 10 types of network traffic and sends a warning when an anomaly that potentially can be caused by malicious attacks is detected	
5	Should support Secure FTP which allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file	
6	Should support Dynamic ARP protection blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data	
7	Should support Dynamic IP lockdown works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing	
8	Should support STP BPDU port protection blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks	
9	Should support STP root guard protects the root bridge from malicious attacks or configuration mistakes	
H	Management:	
1	GUI, Telnet/SSH, Industry-standard CLI with built-in Help-menu.	
2	Built-in programmable and easy to use REST API interface provides configuration automation for campus networks	
3	Dual flash images provide independent primary and secondary operating system files for backup while upgrading	
4	Out-of-band Ethernet management port to enable management over a separate physical management network; and keeps management traffic segmented from network data traffic	
5	Should support Zero Touch Provisioning (ZTP) that simplifies installation of the switch infrastructure.	
I	Warranty:	
	Solution should have 3 years support for the hardware & all features update.	
J	Mandatory:	
	<ul style="list-style-type: none"> ● Vendor should submit Manufacturer's Authorization letter from OEM or from Distributor having dealership from respective OEM. ● Vendor should submit detailed Bill of Materials specifying each and every component. 	

4. Distribution Switch, PoE

SI #	24-Port L2 PoE+ Managed Switch Specification	Compliance (Yes/No)
A	Architecture and Port Density	
1	24x 10/100/1000BaseT POE+ and 4x 1Gig SFP ports	
2	1x Console port for CLI management	
3	All Ports should be PoE+ enabled from day1.	
4	Minimum PoE budget should be 195W	
B	Performance Specifications	
1	Switching Capacity: Min of 56Gbps and throughput of 41.6Mpps	
2	Should support both IPv4 and IPv6	
3	Latency per port should not be more than 2.3 micro seconds for 1G.	
4	MAC Address table size should be minimum of 16,000 entries.	
C	Resiliency	
1	Switch should support Port trunking and link aggregation; Trunking supports up to eight links per trunk to increase bandwidth and create redundant connections; and supports L2, L3, and L4 trunk load-balancing algorithm (L4 trunk load balancing is supported only on Gigabit Ethernet and 48-port models.) - IEEE 802.3ad Link Aggregation Control Protocol (LACP) eases configuration of trunks through automatic configuration	
2	Should support IEEE 802.1s Multiple Spanning Tree provides high link availability in multiple VLAN environments by allowing multiple spanning trees; provides legacy support for IEEE 802.1d and IEEE 802.1w •	
3	Should support SmartLink provides easy-to-configure link redundancy of active and standby links	
D	VLAN support	
1	Support for 512 VLANs and 4,094 VLAN IDs	
2	Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9,220 bytes; 8- and 24-port Fast Ethernet models automatically support up to 2,000-byte frames with no configuration needed	
3	GARP VLAN Registration Protocol allows automatic learning and dynamic assignment of VLANs	
4	Rapid Per-VLAN Spanning Tree (RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+	
E	Security	
1	Supports Access control lists (ACLs) accommodate IPv4/IPv6 port and VLAN-based ACLs (IPv6 ACL is supported only on Gigabit Ethernet and 48-port models.)	
2	Supports Source-port filtering allows only specified ports to communicate with each other	
F	Management	
1	GUI, Telnet, Industry-standard CLI with built-in Help-menu	
G	Warranty: Solution should have 3 years support for the hardware & all features update.	
H	Mandatory:	

	<ul style="list-style-type: none"> • Vendor should submit Manufacturer’s Authorization letter from OEM or from Distributor having dealership from respective OEM. • Vendor should submit detailed Bill of Materials specifying each and every component. 	
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5. Distribution Switch, None PoE

SI #	24-Port L2 PoE+ Managed Switch Specification	Compliance (Yes/No)
A	Architecture and Port Density	
1	24x 10/100/1000BaseT and 4x 1Gig SFP ports	
2	1x Console port for CLI management	
B	Performance Specifications	
1	Switching Capacity: Min of 56Gbps and throughput of 41.6Mpps	
2	Should support both IPv4 and IPv6	
3	Latency per port should not be more than 2.3 micro seconds for 1G.	
4	MAC Address table size should be minimum of 16,000 entries.	
C	Resiliency	
1	Switch should support Port trunking and link aggregation; Trunking supports up to eight links per trunk to increase bandwidth and create redundant connections; and supports L2, L3, and L4 trunk load-balancing algorithm (L4 trunk load balancing is supported only on Gigabit Ethernet and 48-port models.) - IEEE 802.3ad Link Aggregation Control Protocol (LACP) eases configuration of trunks through automatic configuration	
2	Should support IEEE 802.1s Multiple Spanning Tree provides high link availability in multiple VLAN environments by allowing multiple spanning trees; provides legacy support for IEEE 802.1d and IEEE 802.1w •	
3	Should support SmartLink provides easy-to-configure link redundancy of active and standby links	
D	VLAN support	
1	Support for 512 VLANs and 4,094 VLAN IDs	
2	Jumbo packet support improves the performance of large data transfers; supports frame size of up to 9,220 bytes; 8- and 24-port Fast Ethernet models automatically support up to 2,000-byte frames with no configuration needed	
3	GARP VLAN Registration Protocol allows automatic learning and dynamic assignment of VLANs	
4	Rapid Per-VLAN Spanning Tree (RPVST+) allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+	
E	Security	
1	Supports Access control lists (ACLs) accommodate IPv4/IPv6 port and VLAN-based ACLs (IPv6 ACL is supported only on Gigabit Ethernet and 48-port models.)	
2	Supports Source-port filtering allows only specified ports to communicate with each other	
F	Management	
1	GUI, Telnet, Industry-standard CLI with built-in Help-menu	
G	Warranty: Solution should have 3 years support for the hardware & all features update.	
H	Mandatory:	

	<ul style="list-style-type: none"> • Vendor should submit Manufacturer’s Authorization letter from OEM or from Distributor having dealership from respective OEM. • Vendor should submit detailed Bill of Materials specifying each and every component. 	
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6. Indoor Wireless Access Point with embedded controller.

SI#	Minimum Specification Requirement for Wireless Access Point	Compliance (Yes/No)
A	Architecture & Performance	
1	Enterprise-Class WiFi Access Point with PoE enabled Gigabit Ethernet LAN port	
2	IEEE 802.11ac Wave-2 standard with simultaneous d IEEE 802.11ac wave-2 standard with an assured throughput of 1.75Gbps.	
3	Dual band 3x3 MU-MIMO support.	
4	Embedded antenna with 3dBi gain on 2.4GHz & 5GHz	
5	Coverage Range upto 175 Metres	
6	Should supports 32 SSIDs in total (16 per radio)	
7	Transmit power of 2.4G: 26 dBm 5G: 24 dBm	
8	QOS: Support for 802.11e/WMM, VLAN, TOS	
9	Embedded controller which can manage up to 50 local APs	
B	Warranty: Solution should have 3 years support for the hardware & all features update.	
C	Mandatory: <ul style="list-style-type: none"> • Vendor should submit Manufacturer’s Authorization letter from OEM. • Vendor should submit detailed Bill of Materials specifying each and every component. 	

7. Network Rack

SI #	Specification For Network Rack	Compliance (Yes/ No)
1	19” rack – 9U, 600mm W, 800mm D	
2	Front door with Lock & Key	
4	Top Cover & Bottom Cover with Cable Entry Provision	
5	PDU with Universal Socket and Exhaust Fan	
6	Vertical Cable Management at Rear	

8. Patch Panel

SI #	Specification For Patch Panel	Compliance (Yes/No)
1	19-inch rack mountable	
2	24 ports in 1U space	
3	Universal wiring blocks for easy termination	
4	Colour coded wiring blocks for easy cable lacing	

5	Integral label feature	
6	Individual port identification	
7	Rear cable management bar	

9. Server

SL #	Minimum Specification Requirement for Server	Compliance (Yes/No)
1	16x SAS HDD supported chassis	
2	Intel Chipset or higher	
3	2x Intel Xeon Silver 4215R, 8 Core, 3.20 GHz, 11 MB Cache	
4	128GB (2x 64GB) 2Rx4 DDR4-2933 Memory	
5	2x 240 GB SSD, 6x2.4TB 12G SAS 10K RPM HDD	
6	Integrated RAID Controller supporting RAID 1, 5, 6, 10 and 50 with 4GB Cache	
7	4x 1Gb Network Interface Card	
8	1x 10/100/1000 Mbit/s dedicated management LAN port for Remote Management	
9	2x Modular Redundant 800W Power Supply	
10	Internal DVD+/-RW Optical Drive	
11	TPM 2.0 Module	
12	Microsoft Windows Server 2019, Standard Edition	
13	<ul style="list-style-type: none"> ● Vendor should submit Manufacturer's Authorization letter from OEM or from Distributor having dealership from respective OEM. ● Vendor should submit detailed Bill of Materials specifying each and every component. 	

10. Cable Manager

SI #	Service Requirement	Compliance (Yes/No)
1	2U, 19-inch horizontal rack mount cable manager	
2	Should have removable front cover	
3	Should have minimum of 8.6-inch depth (5.6-inch depth and 3.0-inch slotted finger)	
4	Should be made of non-conducting molded plastic	
5	Fixed finger duct to route the cable	
6	Ventilated storage compartment to store the excess cables	
7	Should manage up to 48 patch cords	
8	Should have 4 nos of cable entry knockouts with grommets for even easier cable management	
9	Comply with bend radius compliance	

11. Service Eligibility Requirement

SI #	Service Requirement	Compliance (Yes/No)
1	Comprehensive network design and management plan	
2	Installation, configuration, testing and commissioning of centralized UPS system including all the required electrical works, cables, sockets and accessories.	
3	Laying of electrical cable, termination and testing of centralized backup power to all the distribution switch located in each floor including all the required accessories.	
4	Installation, testing, configuration of Core Switch, Distribution Switch, Wireless Access Point and UTM	
5	Fixing of 9U rack, patch panel, switch, AP, crimping, termination of UTP cable to patch panel side including testing and shifting of existing rack	
6	Documentation and technical training for operation, maintenance and troubleshooting.	
7	Vendor should have OEM certified Engineer for Network & Servers.	