



B BOM & TECHNICAL SPECIFICATIONS

2 BOM & Technical Specifications of main deliverables of the Controller based Wi-Fi System Supply and Installation with 3 Years O&M shall be as follows:

24 Port Non PoE Switch (Active Component)

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
1	Switch	Brand & Model Number		
2	Hardware			
	Interfaces	1GbE RJ45 Ports - Min 24 or more 10GbE SFP+ Uplink Ports - Min 2 or more 10GbE RJ45 Uplink Ports – Min 2 or more Fixed Ports (with up to 90mtr distance support on CAT6A Cable) Min 2 Stacking Ports in addition to above Uplink Ports 1 USB 2.0 port 1 RS-232 / RJ45 console port Management port: 1 x RJ-45 ports Dedicated OOB port All Ports, Stacking, Modules, Cables & Necessary Licenses to be quoted, supplied / enabled from day one		
	Power Supply & Fans	Power Input: 110-240 V AC power Redundant Power Supply support Max Power Consumption should be less than 75W		
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit		
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,62,800 Hours or Higher		
3	Performance			



	CPU, Memory & Packet Buffer	CPU – Min 1.2GHz or Higher Memory – Minimum 2 GBytes (GB) or Higher Packet Buffer – Minimum 2 MBytes (MB) or Higher		
	Switching & Stacking Capacity	Packet Switching Capacity - Min 128 Gbps or higher Layer 2/Layer 3 throughput - Min 95 Mpps or higher Additional Stacking Bandwidth – Min 40Gbps or higher (in addition to above switching capacity)		
4	Software Features			
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.		
	Features	MAC addresses per system: Min 16K or Higher Number of VLANs supported: 4K or Higher Range of VLAN IDs: 4K Jumbo frames: 9K or Higher STP-IEEE 802.1D, RSTP-IEEE 802.1w, MSTP-IEEE 802.1s Port & VLAN Mirroring VLAN - IEEE 802.1Q, Port-based, MAC-Based Voice VLAN Q-in-Q tunnelling (Double VLAN) – Port & Selective Q-in-Q Loopback Detection & Protection (Independent of STP) IEEE 802.3ad: Link Aggregation Control Protocol (LACP) ITU-T G.8032 ERPS Protocol with sub-50ms convergence Address Resolution Protocol (ARP) Dynamic Host Configuration Protocol (DHCP) IPv4 & IPv6 DHCP Server & Relay DHCPv6 Prefix Delegation (PD) Minimum 128 or more IPv6 SVI / VLAN Interfaces		



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		<p>Static Routing, Virtual Router Redundancy Protocol (VRRPv3)</p> <p>RIP v1/v2, RIPng, OSPF v2 & v3 (IPv4 & v6)</p> <p>Bidirectional Forwarding Detection (BFD) protocol</p> <p>Policy Based Routing (PBR)</p> <p>Equal-Cost Multipath (ECMP)</p>		
	Access Security IPv4	<p>MAC, IPv4 Access control list (ACL)</p> <p>Port-based ACL, VLAN-based ACL, L2-L4 ACL</p> <p>802.1X Radius Authentication – Port & Host based</p> <p>RADIUS, RADIUS CoA, TACACS+</p> <p>Port Security, DAI, DHCP Snooping, IPSG</p> <p>Storm control</p> <p>SSH v1, v2</p>		
	Access Security IPv6	<p>IPv6 Access control list (ACL)</p> <p>IPv6 Source Guard, DHCPv6 Snooping, DHCPv6 Prefix Delegation (PD) snooping, IPv6 RA Guard, DHCPv6 Guard, IPv6 ND Inspection</p> <p>SSH (IPv6)</p> <p>SSL (IPv6)</p> <p>RADIUS Server (IPv6)</p> <p>Web-UI (IPv6)</p>		
	High Availability	<p>Physical Stacking upto 6 switches in a stack as a single unit with a single IP address</p> <p>Cross stack member link aggregation</p> <p>IEEE 802.3ad / 802.1AX LACP</p> <p>Number of link aggregation groups (LAGs) supported: 32</p> <p>Maximum number of ports per LAG: 8</p> <p>Redundant Power Supply support</p>		
	Operations, Administration and Maintenance	<p>OAM / IP SLA / Equivalent</p> <p>IEEE 802.3ah Ethernet Link OAM</p> <p>IEEE 802.1ag Connectivity Fault Management (CFM)</p> <p>Y.1731 OAM</p> <p>Dying Gasp</p> <p>Digital Diagnostic Monitoring (DDM)</p>		



	Quality of Service (QoS)	<p>Layer 2 QoS, Layer 3 QoS, Hardware queues per port: 8</p> <p>Strict-priority queuing (PQ), Weighted Round Robin / shaped-deficit weighted round robin (WDRR/SDWRR)</p> <p>802.1p remarking, Rate limiting,</p> <p>L2-L4 classification criteria: Interface, MAC address, EtherType, 802.1p, VLAN, IP address, DSCP/IP precedence, TCP/UDP port numbers</p>		
	Multicast Features	<p>IGMP snooping: v1, v2, and v3, IGMP Filter</p> <p>MLD Snooping</p> <p>Multicast VLAN Registration (MVR)</p> <p>IGMP v1/v2/v3, PIM-SM</p>		
	Device Management and Operations	<p>On-Premise Management</p> <p>Role-based Full Featured CLI management</p> <p>Full Featured Web-UI (IPv4 & IPv6)</p> <p>HTTPS (TLS 1.2 or Better)</p> <p>SNMP IPv4 & IPv6</p> <p>SNMP v1/v2/v3</p> <p>SNMP Traps – Link, STP, Loop, Storm, Power, Fan, New MAC</p> <p>Remote monitoring (RMON)</p> <p>IPv4 & IPv6 DHCP Server, Client & Relay</p> <p>Network Time Protocol (NTP) / SNTP</p> <p>SSH v2 (IPv4 & v6)</p> <p>IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)</p> <p>sFlow, IPv4/v6 Dual Stack</p> <p>Dual Image & Dual Configurations</p>		
	NMS Integration & Monitoring Support	<p>CPU Utilization</p> <p>Memory Utilization</p> <p>Port Status & Utilization</p> <p>SNMP Traps</p> <p>Syslog Monitoring</p> <p>sFlow analysis</p> <p>ARP Table & FDB Table Monitoring</p> <p>Private MIB</p>		



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5	Certifications / Compliance	<p>Safety (ICT) – UL / EN 62368-1 or Better</p> <p>EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024</p> <p>RoHS – EN/IEC 63000 or equivalent</p> <p>Power Saving - Energy-Efficient Ethernet (EEE)</p> <p>REACH Compliance</p> <p>UL, CE & FCC</p> <p>MTCTE / TEC Certified</p> <p>IEC or ISA or equivalent Indian Cyber Security compliance</p> <p>Necessary certificates should be attached</p>		
6	OEM / Bidder Criteria	<p>Offered Brand should have direct presence in India</p> <p>Offered Brand should have own Tech support center (TAC) in India</p> <p>Offered Brand should have own service/repair/support center across India</p> <p>Offered Brand & Models should be reputed & field proven</p> <p>Bidder should have Registered office & qualified technical support team locally</p>		
7	Country of Origin	Non-MIC		
8	Compatibility	All Switches, Modules, Cables should be from same Brand		
9	PoC / Demo	PoC / Demo needs to be arranged during technical evaluation stage (if required). Bidder should have qualified Manpower to demonstrate		
10	Warranty, Services and Support	<p>Min 3 years Warranty with material and service</p> <p>On-site Installation, Configuration and troubleshooting support</p> <p>The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 1 year should not be quoted</p>		
11	Documentation	<p>Technical Compliance sheet with Cross Reference in OEM letter head</p> <p>Technical Datasheet</p> <p>OEM MAF with complete contact details of authorised signatory</p>		



		Detailed Technical BoQ of Switch & Accessories with ordering code in OEM letter head for technical evaluation In complete information will be treated as non-responsive bids		
12	Package Contents	24 Ports 1GbE SFP Switch + 2 x 10GbE SFP+ Uplink Ports + 2 x 10GbE RJ45 Uplink Ports + Stacking Modules / Cables with required warranty Necessary Port, Feature & OS License (If applicable) 1U Rack Mount Kit Console Cable AC Power Cords Installation Guide		

24 port PoE Access Switch (Active Component)

S/N	Particulars	Specifications	Compliance (Yes/No)	Cross Reference
			Make	
			Model	
1	I/O ports and slots	<ul style="list-style-type: none"> • Min 24 or more RJ-45 auto-negotiating 100 / 1000 Mbps Ports • Min 4 or more 1/10GbE SFP+ Uplink Ports with port license 		
2	Additional ports	<ul style="list-style-type: none"> • 1 RJ-45 / Serial console port 		
3	Throughput	<ul style="list-style-type: none"> • Min 95 Mpps or higher 		
4	Switching Bandwidth	<ul style="list-style-type: none"> • Min 128 Gbps or higher 		
5	POE	<ul style="list-style-type: none"> • IEEE 802.3af/at • 24 PoE ports • Min. 370 W • 15.4 W per port 		
5	Connectivity	<ul style="list-style-type: none"> • Auto-MDI/MDIX • IEEE 802.3X flow control 		



6	Layer 2 switching	<ul style="list-style-type: none"> • Minimum 16K or Higher MAC Address • IEEE 802.3ad Link Aggregation • Minimum 4K Active VLANs with 4K VID support • IEEE 802.1s MSTP with min 16 Instances • Loop Detection in downstream switches • Port Mirroring • IGMP & MLD Snooping 		
7	Layer 3 services	<ul style="list-style-type: none"> • Address Resolution Protocol (ARP) • IPv4 and IPv6 DHCP Relay • IPv6 Neighbor Discovery (ND) • Min 4 or More IPv4 & v6 SVI Interfaces • IPv4 & IPv6 Static & Default routing 		
8	QoS	<ul style="list-style-type: none"> • Min 8 Hardware Queues • CoS based on Ether type, MAC, IP, Protocol, Port & IPv6 • Priority – Strict, WRR • Rate Limiting / Bandwidth Control 		
9	Security	<ul style="list-style-type: none"> • MAC, IPv4 & v6 Access Control Lists (ACLs) upto 500 rules • IEEE 802.1X and RADIUS network logins – Port & Host based • RADIUS & TACACS+ IPv4 & IPv6 • Authentication for Management Access, Password Encryption • ARP attack protection, STP root guard, Port Security, DAD • DHCP Server Screening, DoS Attack Prevention • IP Source Guard, DHCP Snooping, Dynamic ARP Inspection (DAI) • IPv6 - RA Guard, ND inspection & Snooping, DHCPv6 Guard & Snooping • IEC or equivalent Indian Cyber Security compliance 		
10	Management features	<ul style="list-style-type: none"> • Full featured Industry-Like CLI • Web browser-based management • Secure Web-management sessions with HTTPS(TLS1.2) or better • SNMPv1, v2c, and v3 (IPv4 & v6), RMON, Syslog (IPv4 & v6) • SSH v2 (IPv4 & v6) • Network Time Protocol (NTP/SNTP), DDM for Optics • IEEE 802.1AB Link Layer Discovery Protocol (LLDP) • IPv4 / v6 Dual Stack • Dual Software images & Dual Configuration support 		
11	Electrical	<ul style="list-style-type: none"> • Voltage 100 - 240 VAC, 50/60 Hz 		



12	Environment	<ul style="list-style-type: none"> Operating temperature 32°F to 113°F (0°C to 45°C) Operating relative humidity 10% to 90%, noncondensing 		
13	Certifications & Conformance	<ul style="list-style-type: none"> Safety - EN 62368-1 or Better EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024 RoHS – EN/IEC 63000 or equivalent CE, FCC, UL IEEE802.3az (EEE) 		
14	Accessories	<ul style="list-style-type: none"> 19 Inch Rack Mounting Brackets and Power Cord 		
15	COO	<ul style="list-style-type: none"> Non-MIC 		
16	Documentation	<ul style="list-style-type: none"> Compliance sheet with Cross Reference and Datasheet All Switches & Transceivers should be from single OEM and MAF from OEM to be submitted 		
17	Warranty, Services and Support	<ul style="list-style-type: none"> OEM should have direct & own service/repair center in India Min 3 years Warranty with material and service On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 1year should not be quoted 		

10GbE SM SFP+ (LC Duplex) Transceiver (Active Component)

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
		Brand & Model Number		
1	Type	10G Base LR (SM) Transceiver		
2	Form Factor	SFP+, Duplex LC Connectors, Hot Pluggable		
3	Standard Compliance	IEEE 802.3ae compliant RoHS		
4	Distance	Upto 10Km		



5	Operating Temperature	upto 70°C or better		
7	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 1 year should not be quoted		
8	Compatibility	All Switches & Transceivers should be from same Brand		
9	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter		

10GbE SFP+ to SFP+ Direct Attach Cable (Active Component)

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
		Brand & Model Number		
1	Type	10GbE SFP+ to SFP+ DAC Cable		
2	Length	1m		
3	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted		
4	Compatibility	All Switches, Modules, Transceivers & Wireless should be from same Brand		
5	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter Detailed Technical BoQ for technical evaluation		



Wi-Fi 6 Ceiling Mount Indoor PoE Access Point (Active Component)

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
	Access Point	Brand & Model Number		
1	AP type	Indoor, dual radio, AP access rate 1.8GBPS (1800 GBPS) Or more 5GHz and 2.4GHz 802.11ax 2x2 MIMO or better		
2	Standards	802.11ax (Wi-Fi 6) on both 2.4-Ghz and 5-GHz bands		
3	WFA Certified Features	Wi-Fi CERTIFIED™ Certificate (Wi-Fi Alliance) Wi-Fi CERTIFIED 6, ac, n and Wi-Fi Enhanced Open Wi-Fi CERTIFIED WMM & Wi-Fi Agile Multiband WPA, WPA2, WPA3 Personal & Enterprise DL and UL OFDMA Individual Target Wake Time WPA3 192-bit security MU-MIMO Cellular Data aware		
	Performance			
4	Radio MIMO type	2x2 MU-MIMO with Dual spatial streams (2x2:2) or higher on both 2.4GHz and 5GHz simultaneously		
5	Data Rate	5GHz radio: Dual spatial stream HE80 MIMO for up to 1.2Gbps wireless data rate or higher 2.4GHz radio: Dual spatial stream HE40/20 MIMO for up to 574Mbps wireless data rate or higher		
6	Modulation	1024-QAM		
7	Antennas	Integrated dual band omni-directional antennas for 2x2 MIMO Min 3dBi or higher for 2.4GHz & 4dBi or higher for 5GHz		
8	Transmit Power	2.4GHz band: 23 dBm or better, 5 GHz band: 26 dBm or better		
9	Network interfaces	1GbE RJ45 PoE Port or higher speed		



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10	PoE PD power	≤ 16W or Better		
11	System Memory	Min 512 MB DDR3 or higher memory		
12	Wireless Features	Airtime Fairness Band Steering User Limit Multi-SSID Bandwidth Optimization (UL/DL) QoS (Quality of Service) Traffic Priority (Web/Mail/FTP) DHCP Server		
13	Security	ARP Spoofing Prevention MAC ACL WPA, WPA2, WPA3 Personal & Enterprise WPA3 192-bit security User / Client Isolation		
14	Authentication	802.1x Radius Authentication Extensible Authentication Protocol (EAP) MAC/IP		
15	Management	Management console port (RJ-45/Serial) for CLI SNMP v1, v2, v3 Standalone Mode Hardware WLC Software WLC Mobile App AP should support SNMP based monitoring. Vendor has to provide MIB if required for NMS integration		
16	Temperature range	0 °C ~ 40 °C (32 °F to 104 °F)		
17	Certifications / Compliance standards	MTCTE / TEC approved Wi-Fi 6 Certified by WFA CE, FCC Emissions and immunity – EN 301 489-1, EN 301 489-17, EN 55032, EN 55024, EN 55035 Safety – IEC/UL/EN 60950-1 / 62368-1 Spectrum & Health - EN 50385, EN 300 328, EN 301 893 Brand / OS / Model should have Cyber Security or equivalent compliance Required Documents to be submitted		



18	Country of Origin	Non-MIC		
19	OEM / Brand	Offered Brand should be OEM / ODM Access Point & WLC should be from single OEM		
20	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted		
21	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter		
22	Package Contents	Access Point Necessary Mount Kit Console Cable Installation Guide		

Wi-Fi 6 Outdoor PoE Access Point (Active Component)

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
	Access Point	Brand & Model Number		
1	AP type	Outdoor, dual radio, 5GHz and 2.4GHz 802.11ax 2x2 MIMO or better		
2	Standards	802.11ax (Wi-Fi 6) on both 2.4-Ghz and 5-GHz bands		
	Performance			
3	Radio MIMO type	2x2 MU-MIMO with Dual spatial streams (2x2:2) or higher on both 2.4GHz and 5GHz simultaneously		
4	Data Rate	5GHz radio: Dual spatial stream HE160 MIMO for up to 2.4Gbps wireless data rate or higher 2.4GHz radio: Dual spatial stream HE40/20 MIMO for up to 574Mbps wireless data rate or higher		
5	Modulation	1024-QAM		
6	Antennas	Integrated dual band		



		omni-directional antennas for 2x2 MIMO Min 5dBi or higher for 2.4GHz Min 7dBi or higher for 5GHz		
8	Transmit Power	2.4GHz band: 22 dBm or better, 5 GHz band: 22 dBm or better		
7	Network interfaces	1 x 2.5GbE RJ45 PoE Port		
8	PoE PD power	≤ 18W or Better		
11	System Memory	Min 512 MB DDR3 or higher memory		
12	Wireless Features	Airtime Fairness Band Steering User Limit Multi-SSID Bandwidth Optimization (UL/DL) QoS (Quality of Service) Traffic Priority (Web/Mail/FTP) DHCP Server		
13	Security	ARP Spoofing Prevention MAC ACL WPA, WPA2, WPA3 Personal & Enterprise WPA3 192-bit security User / Client Isolation		
14	Authentication	802.1x Radius Authentication Extensible Authentication Protocol (EAP) MAC/IP		
15	Management	Management console port (RJ-45/Serial) for CLI SNMP v1, v2, v3 Standalone Mode Hardware WLC Software WLC Mobile App AP should support SNMP based monitoring. Vendor has to provide MIB if required for NMS integration		
16	Environmental	Operating Temperature -20 °C ~ 60 °C or higher IP68 or higher rated enclosure		



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17	Certifications / Compliance standards	<p>CE, FCC</p> <p>Emissions and immunity – EN 301 489-1 EN 301 489-17, EN 55032, EN 55024, EN 55035</p> <p>Safety – IEC/UL/EN 60950-1 / 62368-1</p> <p>Spectrum & Health - EN 50385, EN 300 328, EN 301 893</p> <p>Brand / OS / Model should have IEC or ISA or equivalent Indian Cyber Security compliance</p> <p>Required Documents to be submitted</p>		
18	Country of Origin	Non-MIC		
19	Compatibility	All Switches, Modules, Transceivers & Wireless should be from same Brand		
20	Documentation	<p>Technical Compliance sheet with Cross Reference in OEM letter head with seal & signature</p> <p>Technical Datasheet</p> <p>OEM MAF with complete contact details of authorised signatory</p> <p>Detailed Technical BoQ of Switch & Accessories with ordering code in OEM letter head for technical evaluation</p> <p>Product details & Datasheet should be available in OEM website</p> <p>In complete information will be treated as non-responsive bids</p>		
21	OEM / Bidder Criteria	<p>Offered Brand should have direct presence in State</p> <p>Offered Brand should have direct & own service/repair center in India</p> <p>Offered Brand should have Tech support center (TAC) in India</p> <p>Offered Brand & Models should be reputed & field proven</p> <p>Bidder should have Registered office in State</p> <p>Bidder should have qualified technical support team locally</p>		
22	Warranty, Services and Support	<p>Min 3 years Warranty</p> <p>On-site Installation, Configuration and troubleshooting support</p> <p>The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted</p>		



23	Package Content	Access Point, Mount Kit, Console Cable, Installation Guide		
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WLAN Controller

S/N	Parameter	Specification / Value	Compliance (Yes/No)	Cross Reference
	Wireless Controller	Brand & Model Number		
1	WLC Type	On-premises Software / Appliance based with required licenses Should be bundled with access points		
2	Number of Access Point Supported from Day One	Upto 1024 or higher APs management with necessary licenses AP License should be Perpetual		
3	AP Management	Should support Local APs and Remote APs Management		
4	Data Forwarding	Local / Distributed Forwarding		
5	Supported Wi-Fi Standards	Compatible with 802.11ac Wave 2, 802.11ax & 802.11be access points 2.4GHz, 5GHz and 6 GHz bands		
6	Architecture	Multi-tenant with different sites / locations		
7	Discovery and Configuration	Layer 2 & Layer 3 discovery of Access Points Mobile APP based provisioning / configuration Template / Profile based configuration - SSID, VLAN, Band, Channel Width, Security, Scheduling, MAC/IP Access Control, Guest Wi-Fi, User Authentication, RF / Bandwidth optimization		
8	RF Optimization / Performance Configuration	Auto channel, Auto RF & output Power, fast roaming, Rogue/Neighbour AP detection, support for 11k/v/r, Band steering and Airtime Fairness WMM, 20/40/80/160 Coexistence, IGMP Snooping, Spanning Tree, Multicast Bandwidth Control		



		Bandwidth Optimization – Client/SSID/Band		
9	Authentication and Security config options	Internal / External Captive Portal with Radius Auth WPA 2 and WPA3 Personal & Enterprise Enhanced Open Encryption Type (Auto/AES/TKIP) Primary and Backup Radius Servers config SSL Certificate Hotspot 2.0 Payment Gateway		
10	Monitoring / Reporting	Dashboard based Monitoring, Overview – Sites, AP, Clients, Traffic etc Access Point - status, IP address, MAC address, channel, network, firmware version, model name Wireless Client - IP address, MAC address, authentication type, channel, associated SSID Floor Plan / Topology based monitoring Top N Devices details Syslog, Device Logs, Audit Logs		
11	User Management	Role-Based Access Control (RBAC)		
12	Management	Web based management (HTTPS) Config Backup and restore Should support on-line firmware upgradation / FOTA Single Sign-On (SSO) Alerts / Email Notification, SMTP REST API		
13	Compatibility	All Switches, Modules, Transceivers & Wireless should be from same Brand		
14	Documentation	Technical Compliance sheet with Cross Reference in OEM letter head with seal & signature Technical Datasheet OEM MAF with complete contact details of authorised signatory Detailed Technical BoQ of Switch & Accessories with ordering code in OEM letter head for technical evaluation Product details & Datasheet should be available in OEM website		



		In complete information will be treated as non-responsive bids		
15	OEM / Bidder Criteria	<p>Offered Brand should have direct presence in State</p> <p>Offered Brand should have direct & own service/repair center in India</p> <p>Offered Brand should have Tech support center (TAC) in India</p> <p>Offered Brand & Models should be reputed & field proven</p> <p>Bidder should have Registered office in State</p> <p>Bidder should have qualified technical support team locally</p>		

Structured Cabling
6 Core Single Mode Armoured Fibre Cable:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
1	6 fiber Single Mode, Armored, Unitube, Gel filled cable complying to ISO/IEC 11801, ITU-T G 652.D, Telcordia GR-20	
2	Electro Chromium Coated Corrugated Steel Tape (ECCS)	
3	Core/Mode-Field Diameter@1310 nm(μm) - 9.2+/- 0.4 μm	
4	Cladding Diameter - 125 + - 1 μm	
5	Coating Diameter - 245 + - 10 μm	
6	Attenuation: 1310 nm: ≤ 0.38 dB/Km, 1550 nm: ≤ 0.25 dB/Km	
7	Chromatics Dispersion: Maximum at 1285-1330nm ≤ 3.5 ps/nm.Km Maximum at 1270-1340nm ≤ 5.3 ps/nm.Km Maximum at 1550 nm ≤ 18 ps/nm.Km	
8	Cable cut-off wavelength - ≤ 1260 nm	
9	Cladding non circularity - ≤ 1.0 %	
10	Core/ clad concentricity error - ≤ 0.8 μm	
11	Loose tube material - PBTP Loose tube filled	
12	Jacket – HDPE Black	
13	Tensile Strength – Min 1000N or Better	
14	Crush Resistance - 2000N/100 mm or Better	
15	Nominal Cable Diameter - 12mm nominal	
16	Bending Radius - 20 X Overall diameters	
17	Operating Temperature - -20 Degree C to +70 Degree C	
18	Storage Temperature -20 Degree C to +70 Degree C	
19	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	
20	Structured cabling products should be of reputed make & field proven	



	<p>Structured Cabling Solution (Copper & Fiber) should be from one single OEM/Brand to achieve optimum performance. OEM should be member of International Structured Cabling Standards related Organization. Certificates need to be submitted The quoted Brand & OEM should have direct presence in India Market for atleast 10+ Years OEM should have ISO 9001:2015, ISO 14001:2015</p>	
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12 Ports LIU:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
1	Standard 19" Rack mountable	
2	LIU should be constructed of 16-gauge steel, powder-coated loaded with 06 LC SM Duplex Ports (12P)	
3	Should have at least 2 fiber spools	
4	Removable front and top covers for better access	
5	Mounting & termination accessories to be supplied	
6	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	

Pigtail:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
1	Single-Mode Fiber pigtail with LC connectors	
2	Should meet all applicable standards	
3	Compliant with TIA/EIA-568- C, IEC standards	
4	Insertion Loss – Max 0.3dB	
5	Return Loss - ≥ 50 dB	
6	Length: 1m	
7	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	

Fiber Patch Cord:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
1	Single-Mode Fiber Patch cord with LC-to-LC connectors	
2	Should meet all applicable standards	
3	Compliant with TIA/EIA-568- C, IEC standards	
4	Insertion Loss – Max 0.3dB	
5	Return Loss - ≥ 50 dB	



6	Length: 1m, 3m	
7	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	

Category 6 UTP Cable:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
1	Category 6 Unshielded Twisted Pair 4 pair 305 meters' cable	
2	23 AWG Solid Bare Copper Wire UTP Cable	
3	Should Support ANSI/TIA-568-C.2 Standard	
4	ETL Verified 4-Connector Channel to ANSI/TIA-568-C.2 Category 6 and ISO/IEC 11801 Class E upto 100 Mtrs (Reports / Certificates need to be attached)	
5	Separator / Cross Filler	
6	Sheath – Flame Retardant PVC	
7	Conductor Resistance: $\leq 9.38 \Omega/100m$ or better	
8	Characteristics Impedance: $100 \pm 15 \Omega$ or better	
9	Mutual Capacitance: $< 5.6nF/100m$ or better	
10	Delay Skew: $< 45ns/100m$ or better	
11	Operating Temperature: $-20^{\circ}C \sim 70^{\circ}C$ or higher	
12	UL Listed, ETL Verified, RoHS Compliant	
13	Zero-bit error test by Intertek (Reports / Certificates need to be attached)	
14	UL and RoHS Compliant	
15	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	
16	Structured cabling products should be of reputed make & field proven Structured Cabling Solution (Copper & Fiber) should be from one single OEM/Brand to achieve optimum performance. OEM should be member of International Structured Cabling Standards related Organization. Certificates need to be submitted The quoted Brand & OEM should have direct presence in India Market for atleast 10+ Years OEM should have ISO 9001:2015, ISO 14001:2015	

24 Ports Category 6 Patch Panel:

S/N	Specifications	Compliance (Yes/No)
Brand & Model Number		
Model		
1	Powder coated steel in 24 port configurations	
2	Should support port identification numbers on the panel	
3	Rear Cable Management Bar support	
4	Should be loaded with Category 6 Keystones	
5	Contact Bracket - PC, UL 94V-2	



6	IDC Housing - PC+ Glass Fiber, UL 94V-2, 50 μinches gold on plug contact area, Phosphor bronze with Nickel plated IDC Contact	
7	Documentation – Technical Compliance Sheet, Datasheet Manufacturer Authorization Form (MAF)	

Category 6 Patch Cord:

S/N	Specifications	Compliance (Yes/No)
	Make	
	Model	
1	Cat-6 UTP Patch Cord	
2	24AWG stranded bare copper conductor	
3	Snag less Semi-Transparent Moulded Boot	
4	Phosphor bronze Contact with Nickel Plated	
5	Jacket – Flame Retardant PVC	
6	Insulation Resistance: 150M Ω/Km	
7	Contact Resistance: 20 mΩ,	
8	Insertion: 750 Mating Cycles,	
9	ETL Verified 4-Connector Channel to ANSI/TIA-568-C.2 Category 6 and ISO/IEC 11801 Class E upto 100 Mtrs (Reports / Certificates need to be attached)	
10	Length – 1m	
11	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	

RJ45 Plug / Connector:

S/N	Specifications	Compliance (Yes/No)
	Brand & Model Number	
1	RJ45 modular plug supports 4 twisted pairs, 8 positions, 8 connectors.	
2	PC, UL94V-2, transparent brown color	
3	Contact terminal should be copper alloy	
4	Gold plating of 30U' or more	
5	Operating temperature: -40°C to +75°C or more	
6	Should meet wiring scheme T568A/T568B	



22U Floor Mount Rack:

S/N	Specifications	Compliance (Yes/No)
	Brand & Model Number	
1	22U - 600X600- Floor Mount Rack	
2	Construction - All Welded construction	
3	Casters Set of 4 Adjustable Levellers set of 4	
4	19" Reduced Channel - Loop Type	
5	Top and Bottom Cover - Welded to Frame, Vented and Field Cable entry exit cut outs	
6	Front Door - Lockable Toughened Glass	
7	Finish - Powder Coated	
8	Vertical Power Distribution Unit with 12 x 5/15 sockets Round Pin, 230 Volts AC 32 Amp with Plug	
9	Horz. Cable Managers -1U-Loop	
10	Grounding and Bonding	
11	Rack Standard - DIN 41494 or better	
12	Accessories - Cable Manager, Fan, Hardware mounting kit	
13	Documentation – Technical Compliance Sheet, Datasheet & MAF from OEM	