प्रसार भारती / Prasar Bharati
प्रसार भारती सचिवालय / Prasar Bharati Secretariat
सूचना एवं प्रौद्योगिकी प्रभाग / IT Division
आकाशवाणी भवन, संसद मार्ग / Akashvani Bhawan, Parliament Street
नई दिल्ली-११०००१ / New Delhi-110001

Dated: 11/02/2025

File No: J-16024/29/2023-IT INFRA

Subject: Inviting Industry Feedback on draft technical specification for Supply, Installation, Testing and Commissioning (SITC) of upgradation of LAN and associated network equipment at Doordarshan Directorate, Mandi House

Prasar Bharati, intends to invite bids for **SITC of upgradation of LAN and associated network equipment at Doordarshan Directorate, Mandi House**, **New Delhi** through GeM Portal. Draft technical specifications are hereby published to invite Industry feedback from prospective Bidders/OEMs or their authorized dealers/Sellers on Draft technical specification (attached to this).

Budgetary quote for the **SITC of upgradation of LAN and associated network equipment** is mandatory required to be submitted along with the feedback.

The response along with the feedback on technical specifications as well as budgetary quote for the project may be furnished by 26.02.2025 on following eMail ID :-

ddgit@prasarbharati.gov.in

Signed by Simmi Mittal
Date: 14-02-2025 17:32:57
Reason: Approved

(Simmi Mittal)

Assistant Director (IT)

To

Director (PBNS) for publishing on Prasar Bharati Corporate Website.

TECHNICAL SPECIFICATION DOCUMENT

For

Supply, Installation, Testing and Commissioning (SITC) of upgradation of LAN and associated network equipment at Doordarshan Directorate, Mandi House.

Date: 06/02/2025

PRASAR BHARATI (India's Public service Broadcaster) invites bids through GeM Portal for **SITC of upgradation of LAN and associated network equipment at Doordarshan Directorate, Mandi House**, **New Delhi**.

1. **Scope of Work:**

   The selected bidder shall complete the supply, installation, testing, and commissioning of network switches, wireless controllers, and access points along with associated equipment as per the Bill of Material and specifications. The scope includes all necessary hardware, software licenses, configuration, and installation to ensure seamless integration with the existing IT infrastructure. Additionally, the bidder shall provide training for designated personnel on device operation, troubleshooting, and management. A three-year onsite warranty shall be included, covering hardware replacement, software updates, and technical support. Comprehensive documentation, including installation guidelines, network topology, and user manuals, shall be provided to ensure smooth operation and maintenance.

2. **Eligibility Criteria:**

Sl No.	Criteria	Description	Required Documentary proof
1	All commercials of the bid such as Company Registration, Average Annual Turnover of the Bidder/OEM, work experience etc	As per the standard terms and conditions on GEM.	As per the standard terms and conditions on GEM.

Sl No.	Criteria	Description	Required Documentary proof
2	Non – Blacklisting Certificate	The bidder should not have been blacklisted /debarred by any Governmental / Non – Governmental Organisation in India in last three years.	Self-Declaration certificate is to be attached.
3.	Certification	The Bidder should have valid ISO 9001:2005 and ISO 27001.	Copies of the certificate to be attached.

3. Technical Evaluation

1. The tender shall be technical evaluated on the basis of eligibility of the bidder.
2. Technical Evaluation shall be done on the basis of compliance statement, customer reference certificates, technical literature related to quoted products.
3. If required, bidder may be asked to arrange a demonstration of the offered items.
4. Documents required for Technical Evaluation:
    a. A point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for all the equipment/ items shall be submitted along with the bid by the bidder.
    b. One set of Maintenance/operational manuals of each hardware from OEM shall be provided by the bidder.
    c. Detailed Literature giving complete details of features and performance data on non-returnable basis to facilitate the technical evaluation.
    d. Back to Back Support commitment from OEM for Sr No. 1 & 2of BOM for the period of three years.
    e. A copy of un-priced Bill of Material (BOM) indicating make, model no., and complete configuration details of offered item shall be quoted clearly.

4. Warranty & Maintenance

1. All items shall be warranted for trouble free operation for a minimum period of 3 years from the date of commissioning.
2. In case of failure of any equipment or its part/module, the tenderer will send a replacement. The faulty part shall be sent back to tenderer after rectification of fault.
3. However, if it is not possible to rectify the fault remotely or by replacement of part/module, onsite support for replacement/servicing/debugging of software /reinstallation/reconfiguring of software etc. shall be provided by tenderer free of cost.
4. No separate charges will be paid for the visit of engineers for attending to faults and repairs or supply of spare parts.

5. Delivery Period

All items listed in BOM at Sr. No. 6 including installation shall be supplied within 60 days.

6. Bill of Material

BILL OF MATERIAL			
S.No	**Item**	**Qty**	**Qty**
1	Supply and Installation of Layer 3 Switch	2	Nos
2	Supply and Installation of 48 Port Non PoE Switch	6	Nos
3	Supply and Installation of 24 Port Non PoE Switch	3	Nos
4	Supply and Installation of 24 Port PoE Switch	6	Nos
5	Supply and Installation of Wireless Controller	2	Nos
6	Supply and Installation of Wireless Access Point	40	Nos
7	Supply and Installation of Cat-6A UTP Patch Cord 2Mtr	200	Nos
8	Supply and Installation of 12U Rack with all accessories	6	Nos
9	Supply and Installation of 1 KVA UPS	4	Nos
10	Supply and Installation of 12 Port LIU loaded with 1M LSZH pigtail	3	Nos
11	Supply and Installation of CAT 6A Loaded Patch Panel - 24 Port	12	Nos
12	Supply and Installation of Cat-6A UTP Patch Cord 1Mtr	250	Nos
13	Supply and Installation of Fiber Patch Cord 1M LSZH Single mode	36	Nos
14	Supply and Installation of Surface Mount Box, Single Port Faceplate and Cat-6A Information Outlet	230*	Nos
15	Supply and laying of 6 Core Armoured Fiber Cable Single-mode	800*	Mtr
16	Supply and Laying of Cat 6A UTP Cable (1 roll= 305 Mtr)	30*	Rolls
17	Cable laying charges including casing, conducing and capping	9150*	Mtr

- This is estimated quantity which may very however, Payment will be made as per actual *.
- The estimate quantity will also be used for deciding L1.

7. The Detailed Technical Specifications are as below:

Itemise detailed requirement and technical specification as per BOM are given below:

Item No.1: Supply and Installation of Layer 3 Switch

Sr No	Technical Specifications
1	**Architecture & Port Density**
1.1	The Switch shall have minimum 24x10G SFP+ ports and 2x 40G/100G QSFP+ Ports, fully populated with 24x10G SM module and 2x40G SM Modules from Day 1. Also each switch should be supplied with 40G DAC cable. Transceivers and DAC cable should be from the same OEM as switch.
1.2	The Core Switch shall support Virtual Switching System (VSS) or Virtual Chassis (VC) or equivalent Switch Clustering/Stacking feature 12 Switches or More, where the Switch Clustering feature shall combine multiple switches into a single network

	element. Switch should support aggregated stacking bandwidth of up to 2.4Tbps
1.3	The Switch shall have management ports separately along with the console cable.
2	**Performance**
2.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of 880 Gbps or more.
2.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of 803 MPPS or more.
3	**Layer 2 features: it shall support from day 1**
3.1	Shall support 4K vlan Id with Minimum 1000 active VLANs
3.2	Shall support 100K MAC addresses or more
3.3	IP multicast snooping IGMP v1, v2, v3
3.4	Jumbo Frames (up to 9216 bytes)
4	**Layer 3 features: it shall support from day 1**
4.1	Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1
4.2	IPv4 & IPv6 Routing protocols & multicast routing available from day 1. such as RIP v1 or v2, RIPng, OSPFv2, OSPFv3, BGP4, BGP4+, Multi-VRF, VRRP for both IPV4 and IPV6 protocol ,VRRPv2 & VRRPv3 ,VRRP-E (IPv4, IPv6),GRE,PIM Dense, PIM Anycast RP, PIM passive IPv4 multicast routing, PIM-SSM, PIM Sparse, PIM Anycast RP, MSDP and PIM6-SM Snooping IPv6 multicast routing
5	**Security features**
5.1	RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords
5.2	Secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
5.3	IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection
5.4	IPv4 and IPv6 ACLs: with up to 8000 rules / ACL per system
5.5	Switch shall support Flexible Authentication with 802.1x Authentication and MAC Authentication
5.6	Switch shall support MACsec
5.7	Switch shall support Protection against Denial of Service (DoS) attacks Authentication, Authorization, and Accounting (AAA)
6	**Manageability**
6.1	Should support manageability using on prem Centralized Management platform using Web based Graphical User Interface (GUI) and also should be remotely manageable from the Cloud.
6.2	It shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch for management/monitoring
6.3	It should also support NetFlow or sFlow or equivalent
7	**Physical Attributes, Memory, Power Supply and Fans**
7.1	The Switch shall be compatible with 19" Universal rack.
7.2	The Switch shall be configured with hot swappable, redundant load sharing AC power supplies to provide 1:1 or N+1 power supply redundancy or better
7.3	The Switch shall have minimum 4GB of Main Memory and minimum 4GB Flash Memory and 6MB packet buffer or more
8	**Mandatory Compliance:**
8.1	OEM shall have ISO 9001:2015 certification, Certificate needs to be enclosed along with the bid.

8.2	All switches and Transceivers should be from the same OEM for better interoperability, management and support
8.3	Switch OS shall be EAL3 certified or equivalent certification such as NDPP etc. Certificate needs to be enclosed along with the bid.
8.4	Switch must be MTCTE Certified and TEC certificate shall be submitted
8.5	The Switching System shall come with 3 years Hardware warranty with advance hardware replacement and 3 years OEM TAC support.

Item No.2: Supply and installation of 48 Port Non POE Switch

48 Port Non POE Switch	
S.No	**Technical Specifications**
1	**Architecture & Port Density**
1.1	The Switch shall have minimum Forty Eight (48) 10/100/1000Mbps ports , should have Four (4) 1G/10G SFP+ ports and 2× 10/100/1000 Mbps uplink RJ-45 ports from day 1. All 4 SPF+ port shall be fully populated with 4 10G SPF+ SM module.
1.2	The Switch shall support stacking of 12 switches or more with aggregated Stacking bandwidth of 480 Gbps . PoE & Non PoE Access Switch should be stackable with each other.
3	**Performance**
3.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of 180 Gbps or more.
3.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of 130 Mpps or more.
3.3	The switch shall support at least 16 MB of Flash memory at least 512 MB of DRAM.
4	**Layer 2 features**
4.1	Shall support 4K vlan Id with Minimum 1000 active VLANs
4.2	Shall support 16K MAC addresses or more.
4.3	Shall support IP multicast snooping IGMP v1, v2, v3 and spanning tree
4.4	Shall support Jumbo Frames (up to 9K bytes)
4.5	The switch shall support SP, WRR, Traffic Shaping
5	**Layer 3 features**
5.1	Shall support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP-E, VRRP for IPV4 and IPV6 protocol, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets
5.3	shall support Dynamic IPv4 & IPv6 Routing protocols OSPFv2 and above and Multicast Routing Protocols
5.4	Switch shall support PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4, IPv6)
6	**Security**
6.1	Shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Shall support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.

6.5	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	**Manageability**
7.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Shall support NetFlow or sFlow or equivalent.
8	**Physical Attributes**
8.1	The Switch shall be compatible with 19" Universal rack.
8.2	The switch shall not be more than 1 U.
9	**Mandatory Compliance:**
9.1	Switch shall be supplied with at least 3 years OEM 24x7 remote TAC support and limited lifetime warranty with advance hardware replacement
9.2	All switches and Transceivers shall be from the same OEM for better interoperability, management and support
9.3	Switch OS shall be EAL certified or equivalent certification such as NDPP etc. Certificate needs to be enclosed along with the bid.
9.4	Switch must be MTCTE Certified and TEC certificate shall be submitted
9.5	Bidder needs to submit bid specific MAF from the OEM.
9.6	OEM shall be ISO 9001:2015 certified. Certificate to be enclosed

Item No.3: Supply and installation of 24 Port Non POE Switch

24 Port Non POE Switch	
S.No	**Technical Specifications**
1	**Architecture & Port Density**
1.1	The Switch shall have minimum Twenty Four (24) 10/100/1000Mbps RJ45 ports , should have Four (4) 1G/10G SFP+ ports and 2× 10/100/1000 Mbps uplink RJ-45 ports from day 1. All 4 SPF+ port shall be fully populated with 4 10G SPF+ SM module.
1.2	The Switch shall support stacking of 12 switches or more with aggregated Stacking bandwidth of 480Gbps
1.3	All components required for stacking shall be provided along with the switch, to ensure 40Gbps of stacking bandwidth per switch.
2	**Performance**
2.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of 132 Gbps or more.
2.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of 98 Mpps or more.
3	**Layer 2 features**
3.1	Shall support 4K vlan Id with Minimum 1000 active VLANs
3.2	Shall support 16K MAC addresses or more.
3.3	Shall support IP multicast snooping IGMP v1, v2, v3, spanning tree
3.4	Shall support Jumbo Frames (up to 9K bytes)
3.5	Switch shall support Metro Ring Protocol v1 and v2.
4	**Layer 3 features from day 1**
4.1	Shall support minimum 1K IPv4 routes and 1K IPv6 route or more
4.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, VRRP for IPV4 and IPV6 protocol, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and

	Routing between directly connected subnets
4.3	Shall support Dynamic IPv4 & IPv6 Routing protocols OSPFv2 and above and Multicast Routing Protocols
4.4	Switch shall support PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4, IPv6)
5	**Security**
5.1	Shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
5.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
5.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
5.4	Shall support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
5.5	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.
6	**Manageability**
6.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).
6.2	Shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
6.3	Shall support NetFlow or sFlow or equivalent.
7	**Physical Attributes**
7.1	The Switch shall be compatible with 19" Universal rack.
7.2	The switch shall not be more than 1 U.
8	**Mandatory Compliance:**
8.1	All Switches, Transceivers & Switch OS shall be from same OEM.
8.2	Switch shall be supplied with at least 3 years OEM 24x7 remote TAC support and limited lifetime warranty with advance hardware replacement
8.3	Switch OS shall be EAL certified or equivalent certification such as NDPP etc. Certificate needs to be enclosed along with the bid.
8.4	Switch must be MTCTE Certified and TEC certificate shall be submitted
8.5	Bidder needs to submit bid specific MAF from the OEM.

Item No.4: Supply and installation of 24 Port POE Switch

24 Port POE Switch	
S.No	**Technical Specifications**
1	**Architecture & Port Density**
1.1	The Switch shall have minimum Twenty Four (24) 10/100/1000Mbps PoE+ ports , should have Four (4) 1G/10G SFP+ ports and 2× 10/100/1000 Mbps uplink RJ-45 ports from day 1. All 4 SPF+ port shall be fully populated with 4 10G SPF+ SM module.

1.2	The Switch shall support stacking of 12 switches or more with aggregated Stacking bandwidth of 480Gbps
2	**Performance**
2.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of at least 132 Gbps.
2.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of at least 98 Mpps.
3	**Layer 2 features**
3.1	Shall support 4K vlan Id with Minimum 1000 active VLANs
3.2	Shall support 16K MAC addresses or more.
3.3	Shall support IP multicast snooping IGMP v1, v2, v3 and spanning tree.
3.4	Shall support Jumbo Frames (up to 9K bytes)
4	**Layer 3 features**
4.1	Shall support minimum 1K IPv4 routes and 1K IPv6 route or more
4.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP-E, VRRP for IPV4 and IPV6 protocol, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets
4.3	Shall support Dynamic IPv4 & IPv6 Routing protocols OSPFv2 and above and Multicast Routing Protocols
4.4	Switch Shall support PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4, IPv6)
5	**Security**
5.1	Shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
5.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
5.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
5.4	Shall support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
5.5	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.
6	**Manageability**
6.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).
6.2	Shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
6.3	Shall support NetFlow or sFlow or equivalent.
7	**Physical Attributes**
7.1	The Switch shall be compatible with 19" Universal rack.
7.2	PoE Budget: 370W
8	**Mandatory Compliance:**
8.1	Switch shall be supplied with at least 3 years OEM 24x7 remote TAC support and limited lifetime warranty with advance hardware replacement
8.2	All switches, Transceivers shall be from the same OEM for better interoperability, management and support
8.3	Switch OS shall be EAL certified or equivalent certification such as NDPP etc. Certificate needs to be enclosed along with the bid.
8.4	Switch must be MTCTE Certified and TEC certificate shall be submitted
8.5	Bidder needs to submit bid specific MAF from the OEM.
8.6	OEM shall be ISO 9001:2015 certified. Certificate to be enclosed

Item No.5: Supply and installation of Wireless Controller

S.No	Technical Specifications
1	**Architecture and scalability**
1.1	The Controller shall have minimum two 1G Ethernet ports. It should support at least 150 AP and 2000 Clients from day 1.
1.2	The controller shall support HA in active-standby mode wherein if one controller is unavailable, the other controller becomes active.
1.3	The controller shall also support an internal database of minimum 1000 local users.
1.4	The controller shall support L2 and L3 discovery of Access Point.
1.5	The solution shall support both local bridging of data at AP as well tunnelling it to the controller.
1.6	The controller shall support AP grouping to apply multiple configuration profiles to different groups of APs.
1.7	The controller shall have the capability to support Multiple-BSSID Set
	The solution shall support zero touch mesh in which non root AP get connected to the mesh network by powering on first time and without connecting to the wired network.
2	**Security & Authentication**
2.1	The Solution shall support the below encryption/authentication options:
2.2	Shall support Web & MAC Authentication.
2.3	802.1X.
2.3	WPA2- AES.
2.4	WPA2-PSK.
2.5	The Solution shall have the capability to provide unique PSK for each client.
2.6	The Solution shall support creating L2 and L3 ACL
2.7	The Controller shall support Rogue Detection.
2.8	The Solution shall support Client Fingerprinting and Device Access Policies. The minimum station cache number that is used for recording a client's fingerprinting data should be 8,000.
3	**Network Management & Monitoring**
3.1	The controller or solution shall easily on board customers or employees onto the Wi-Fi network through a simple, self-service portal.
3.2	The controller shall support Management IP Interface, WLAN Prioritization, Dynamic VLANS
3.3	The solution shall have the capability to monitor the entire network through a mobile APP that can be installed on android and apple devices.
4	**Wi-Fi Optimization**
4.1	The Solution shall support application recognition and control, application based rate limiting and QOS traffic shaping.
4.2	The Solution shall support Wi-Fi Calling to improve handling and overall quality of Wi-Fi Calling voice calls in the network.

4.3	The Solution shall support Guest and Hotspot WLANs, HTTP based captive portal and HTTP/HTTPS redirect. It should support Self-service guest access where guests can come on to the network without much IT intervention. The solution should also support login of guest users through social media credentials like Facebook.
4.4	The solution shall have troubleshooting tool for speed testing and client connectivity. The client connectivity tool should provide a visual view of client connectivity and the troubleshooting data should be able to export and save it to a local computer.
5	**Support & Warranty**
5.1	Controller shall be TEC certified. Certificate needs to be enclosed along with the bid.
5.2	Controller shall be supplied with 3 years warranty and TAC support

Item No.6: Supply and installation of Wireless Access Point

Wireless Access Point	
S.No	**Technical Specifications**
1	**Radio Specifications**
1.1	Access Point shall be dual-band, dual-radio indoor access point
1.2	AP shall have 2x2 MIMO on 2.4GHz and 2x2 on 5GHz antennas for transmission and receiving. Should support MU-MIMO.
1.3	AP shall support IEEE 802.11 a/b/g/n/ac/ax amendments.
1.4	AP shall provide 23dBm transmit power on both radios as per TRAI-WPC regulatory norms. AP shall have -96 dBm or lower receive sensitivity. It shall have adaptive antenna technology for performance optimization and interference mitigation features. Antenna shall provide better coverage and performance utilizing multi-directional antenna patterns and polarization diversity with maximal ratio combining.
1.5	It shall dynamically choose antenna patterns in real-time environment to establish the best possible connection with every device.
3	**Interface and Power Requirements**
3.1	AP's shall have One(1) 1GbE Ethernet ports
4	**Networking Requirements**
4.1	AP shall have capacity to handle minimum 250 Concurrent devices.
4.2	AP shall be flexible hardware to be deployed as Standalone, Controller-less (Cluster), Controller-based, Cloud-based.
4.3	shall have IPv6 support, IEEE 802.1Q, Band balancing, airtime fairness, QoS, L2/L3/L4 ACL
4.4	Configuration shall be possible to configure as such if controller goes down, still APs should be able to handle client traffic.
5	**Security & Monitoring**
5.1	AP shall support AES encrypted GRE-based tunnel for data forwarding.
5.2	AP shall support auth/encryption methods for WLAN configuration: WPA2-AES, Dynamic PSK, WPA3, IEEE 802.1X/EAP . It should also support Role-Based Access Control, rate-limiting, device fingerprinting
6	**Management Features**
6.1	AP shall be having administration access through HTTPS GUI, SSH CLI. It should provide WLAN configuration for standalone operation and provisioning tools for controller/cloud operations. If controller config disallows GUI/CLI access it should follow same.
6.2	AP shall have recovery SSID for easy access to CLI console when AP is unreachable

	through network.
7	**Mandatory Compliance:**
7.1	AP shall be supplied with 3 years OEM 24x7 remote TAC support and 3 years warranty.
7.2	All switches, WiFi, WLC, Transceivers shall be from the same OEM for better interoperability, management and support
7.3	AP shall be EAL/NDPP. Certificate needs to be enclosed along with the bid.
7.4	AP must be MTCTE Certified and TEC certificate shall be submitted
7.5	Bidder needs to submit bid specific MAF from the OEM.
7.6	OEM shall be ISO 9001:2015 certified. Certificate to be enclosed

Item No.7: Supply and installation of Cat-6 A UTP Patch Cord 2Mtr

Cat-6 A UTP Patch Cord 2Mtr	
S No.	**Technical Specifications**
1	Category 6 A patch cords with four pair twisted cable terminated with RJ45 modular plugs at both the ends.
2	Category 6 A patch cord length requires – 1 meter
3	Insulation material shall be high density polyethylene with LSZH sheath

Item No.8: Supply and installation of 12U Rack with all accessories

12U Rack with all accessories	
S.No	**Technical Specifications**
1	Supply of Wall Mount Rack 12U (500 mm) section deep 19" DRWM-12U500- Fixed Structure with .8MM CRCA Sheet, CKD if required, L- Shape Vertical Mounting Rail 1.2 MM with 'U' Marking, Minimum two Cooling Fan Provision, 12U should be excluding cooling fan mounting space .
2	Minimum 2 cable entry/exit provision at top and bottom with rubber protection Front 5MM GSC Make Toughened Glass with lock, wall mounting kit, Powder coated Colour- RAL- 7035

Item No.9: Supply and installation of 1 KVA UPS

	1 KVA UPS
S.No	**Technical Specifications**
1	1 KVA On-Line UPS (Internal Battery)

2	Output Capacity (KVA)1 Kva
3	Output Capacity (KW) 0.8 Kw
4	Output Power Factor 0.8 Power Factor
5	Output Phase 1 Phase
6	Output Voltage 230 Volt
7	Other Output Voltage 220 Or 240 Volt
8	Power Backup - 5 Minutes

Item No.10: Supply and installation of 12 Port LIU loaded with 1M LSZH pigtail

12 Port LIU loaded with 1M LSZH pigtail	
S.No	**Technical Specifications**
1	Shall be Rack Mountable and LIU shall be loaded with 1M LSZH pigtail
2	Can manage both splices and terminations
3	Rubber fiber slotted bracket built-in, metal splice shelf to protect the fibers
4	Space saving with its compact & small design of enclosure
5	Shall be Multi mode SC Type fully loaded.

Item No.11: Supply and installation of CAT 6 A Loaded Patch Panel - 24 Port

	CAT 6 A Loaded Patch Panel - 24 Port
S No.	**Technical Specifications**
1	Category 6 A Patch Panel shall be 24 Port 1U Size loaded with 24 port RJ-45 IO/Jack.
2	Mounts in standard 19 inch racks.
3	Patch panel shall have rear cable manager for improvement management.
4	Patch panel suitable for Category 6 A keystone.

Item No.12: Supply and installation of Cat-6 A UTP Patch Cord 1Mtr

Cat-6 A UTP Patch Cord 1Mtr	
S No.	**Technical Specifications**
1	Category 6 A patch cords with four pair twisted cable terminated with RJ45 modular plugs at both the ends.
2	Category 6 A patch cord length requires – 1 meter
3	Insulation material shall be high density polyethylene with LSZH sheath

Item No.13: Supply and installation of Fiber Patch Cord 1M LSZH single mode

S.No	Technical Specifications
1	Cable Type 0.9mm buffer
2	Corning Single-Mode OS2 with LSZH Sheath
3	Connector: Zirconia ceramic ferrule
4	Pre-radiuses and pre-polished ferrule
5	Type—SC-LC SM Duplex
6	Length -- 1 Mtr

Item No.14: Supply and installation of Surface Mount Box, Single Port Faceplate and Cat-6A Information Outlet

	Surface Mount Box, Single Port Faceplate and Cat-6 A Information Outlet
S No.	**Technical Specifications**
1	Category 6 A keystone jacks are RJ45, 8 position 8 contact socket.
2	Face plate shall be single port with Back box.
3	Face Plate shall have shutter to protect from dust.
4	It shall have write on labels in transparent plastic window – supplied with plate.
5	Screw shall be supplied with face plate.

Item No.15: Supply and laying of 6 Core Armoured Fiber Cable Single Mode

6 Core Armoured Fiber Cable Single Mode	
S No.	**Technical Specifications**
1	Fiber shall be Unitube with jelly compound, Outer Sheath HDPE/LSZH, Corrugated Steel Tape Armouring, suitable for Indoor / Outdoor (duct) Local Area network system.
2	Standards:- Single-Mode OS2
3	Mode-filed/Cladding Diameter:-50+/- 2.5, 125+/- 1.0
4	Wavelength :-1310 or 1550nm
5	No. of Fibers -6

Item No.16: Supply and laying of Supply and Laying of Cat 6A UTP Cable (1 roll= 305 Mtr)

	Cat 6 A UTP Cable
S No.	**Technical Specifications**

1	Category 6A (Cat 6A) Unshielded Twisted Pair (UTP)
2	Shall support **10GBASE-T** (10 Gigabit Ethernet) standard, ensuring compliance with performance requirements for **10 GbE** over distances up to 100 meters.
3	Conductor shall be 23 AWG solid bare copper.
4	Conductor Insulation material shall be HDPE.
5	The conductors shall be twisted in pairs with four pairs contained in PVC jacket
6	Four twisted pairs separated by internal X shaped, full separator. Half shall not be accepted.
7	Sheath material should be LSZH

Item No.17: Supply and Cable laying charges including casing, conduit and capping.

25mm PVC Conduit	
S.No	**Technical Specifications**
1	Type Conduit -PVC Conduit
2	The bidder will supply 25mm PVC conduit

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