Indian Institute of Technology, Kharagpur
Kharagpur 721 302, WB, India

Sub: UPGRADATION OF WIRELESS INFRASTRUCTURE AT SELECTED HALLS OF RESIDENCES

Ref: Tender Notice No. IIT/CIC/Hall/NETWORK/WIRELESS/2018-19/27 dated 27th September 2018

Indian Institute of Technology Kharagpur, an Institute of National Importance, invites sealed bids from reputed **Original Equipment Manufacturers (OEMs)** OR **their Authorized System Integrators** who have adequate credential for supplying, installing and maintaining similar product in IITs or similar Autonomous Institutions /Universities, Government/Public Sector Undertakings or large private organizations, etc., for upgradation of wireless infrastructure at selected halls of residences

Interested bidders are requested to send their sealed bids under a **two cover system** as per requirement mentioned in tender document, along with the Technical Specifications & Compliance Certificate (as mentioned in **Specification Annexure-1 to 9)** and the quantity as specified in tender document.

Details are also mentioned in the Institute website **www.iitkgp.ac.in** [link: tenders].

The proposal has to be sent in a sealed packet, containing two separate sealed envelopes (**Technical Bid** and **Price Bid**) duly superscripted with Reference Number (Tender Notice No. **IIT/CIC/NETWORK/WIRELESS/2018-19/27 dated 27th September 2018),** to the Office of the **Head, Computer & Informatics Centre, Indian Institute of Technology, Kharagpur, P.O. Kharagpur Technology, PIN: 721 302** ***on or before 26th October 2018 at 3:00 pm.***

The **technical bids (should also contain detailed un-priced bill of material mentioning the make, part nos. of individual part items and quantities based on Table – 1 and specifications specified in Annexure 1 to 9) which will be opened on 26th *October 2018* at 3:45 PM** in the presence of the bidders and their authorized representatives and price bids will be opened (to be notified separately), only of those firms, who will be found technically qualified/shortlisted, after evaluation of their technical bids.

Head
Computer & Informatics Centre

Copy to:
1. Institute website
2. Notice Board
3. CPPP

UPGRADATION OF WIRELESS INFRASTRUCTURE AT SELECTED HALLS OF RESIDENCES

Introduction

Indian Institute of Technology Kharagpur has its own state-of-the-art campus wide network where numerous number of Managed Wireless Access Points with various capacities have been deployed at different locations to extend the campus network in departments/centres/schools/sections and halls of residences. The institute now plans to upgrade the wireless infrastructure at selected halls of residences by increasing the number of managed APs. The work will involve procuring new Lightweight Wireless Access points with centralized management facility along with POE switches, UPS and passive components as well as installation and integration of the same with the existing wireless infrastructure as defined in the Scope of Works.

1. Scope of work:

I. At present the halls of residences already have a number of Wireless APs installed and operational. CIC has a deployment plan for newly purchased APs and associated equipment in the selected halls. The scope of the work includes supply, installation, commissioning and integration of the procured Centrally Managed Lightweight Wireless Access Points, POE switches, UPS and passive network components (specified in Table 1) as per the institute's requirement

II. All components must have 5 years comprehensive onsite OEM warranty. In addition, the bidder should depute at least one dedicated person onsite at IIT Kharagpur for troubleshooting and maintaining the bidder-installed infrastructure for a period of 5 years. The engineer should be graduate/Diploma holder with 2-3 years of experience in Wired and Wireless Network.

III. For existing APs, the bidder needs to replace the existing installed APs (around 250 numbers) with the newly procured APs and return the existing APs to CIC. For newly installed APs bidder need to do the passive cabling from the AP to the rack for terminating the connection to switch through jack panel. APs should be mountable both on walls and ceiling; the exact deployment will be specified by CIC. Estimated length of cable to be laid and associated termination work is shown in Table-1. Note that the quantities shown are tentative and final payment to the selected bidder for the same will be made based on actual measurement of work done after completion of work. **However, L1 bidder will be decided based on the grand total of all the items and their quantities as specified in the price bid format shown in Table-1.**

IV. The new APs must be fixed to the wall/celling firmly by AP mounting bracket to prevent easy uprooting of the devices from the walls and roofs. AP and its mounting bracket should have locking mechanism from day one using pad lock or Kensington lock or both so that AP can be secured with the mounting bracket using locking mechanism. Securing the AP with the mounting bracket using necessary locking arrangement is a part of the successful installation; all necessary accessories of this must be quoted as part of the tender. Installation will be treated incomplete in case AP is not secured with locking arrangement.

V. AP should be installed in Lightweight mode. In case AP is also supporting autonomous / standalone mode, then for the conversion of AP from Lightweight mode to autonomous / standalone mode, should be possible only by loading new software.

VI. To provide power to the new APs, in each rack the bidder needs to replace one 24/48 port non-POE switch and power injectors providing power to the existing APs, and install one newly procured 24/48 POE switch as per the deployment plan. Thus, all new APs will be powered by 24/48 port POE switches procured in this tender and all necessary termination work for the same has to be done by the bidder. The bidder will also reconnect any non-AP devices connected to the existing switch being replaced to the new switch. The old switches and the power injectors are to be returned to CIC.

VII. UPS for network switches has to be fixed beside the network rack by fabricating a wall mount stand termed as cage in this tender (two U shaped brackets) made of galvanized steel to hold one 1 KVA UPS firmly. The bidder will need to install the newly purchased UPS inside the cage near to the rack hosting the switches in all these selected halls. Bidder need to make all necessary arrangement by providing suitable connectors for integration of the UPS to connect internal and external power.

VIII. Institute is already having centralized Wireless Controllers to provide control, management and troubleshooting in hot redundancy mode for existing lightweight access points. The existing system has all the features as mentioned in Annexure-2. The bidder may access the spare capacity of the present Wireless controller and accordingly may integrate the APs with the existing centralized system without any adverse effect on the existing system or any performance degradation. Documentary evidence of compatibility of supplied AP with existing wireless controller must be submitted. However, all required licenses for integration to centralized Wireless Management System need to be supplied by the bidder. Alternately they may propose and supply new wireless controllers with all applicable licenses to provide control, management and troubleshooting of the lightweight APs in hot redundancy mode (1:1) and the system should have the equivalent features mentioned in Annexure-2. All required licenses for integration to centralized Wireless Controller need to be supplied by the bidder. In addition, the supplied wireless infrastructure must be integrated with the existing Wireless authentication system of the Institute.

IX. All Active components (AP, WLC, POE switch) must be from the same OEM.

X. All passive components must be from the same OEM.

XI. Bidder needs to do a site survey immediately after the receipt of the purchase order to identify the location of wireless access points to be installed and suggest the implementations perquisites related to site if any in a consolidated site survey report to CIC within one week of receipt of purchase order and get it approved by CIC. Any delay or missed out item in the site survey will not be entertained and bidder needs to arrange the missing item for the implementation without any additional financial charges to the institute.

XII. Based on the deployment plan provided by CIC, bidder needs to submit a project plan and submit to CIC within 7 days from the receipt of the purchase order. The plan should consist of hall wise deployment schedule in detail by adhering the timeline of implementation specified.

XIII. Complete delivery of all materials has to be accomplished within eight weeks of receipt of the purchase order, failing which Liquidation Damage (LD) @ 1% per month of 100% of total order value will be imposed as per Institute purchase rules.

XIV. Complete installation of all equipment and integration of the same with the existing infrastructure must be completed within 12 weeks of receipt of the purchase order, failing which Liquidation Damage (LD) @ 1% per month of 50% of the total order value will be imposed as per Institute purchase rules. This is in addition to liquidated damage mentioned for complete delivery in clause number XIII.

XV. In any case total liquidated damage will be capped at 5% of the PO value.

XVI. The installation would be deemed as complete, after the delivery, implementation and Integration of all active and passive components and final acceptance and certification by Head, CIC, IIT Kharagpur. The warranty period will start after the final acceptance and certification by Head, CIC, IIT Kharagpur.

XVII. Replacement of defective equipment and shipment of the same should be the responsibility of the selected bidder without any financial commitment from IIT Kharagpur. The same has to be completed within five working days after reporting the problem.

XVIII. In case any future expansion / up-gradation of network takes place within the warranty period, necessary changes in the configuration have to be done by the selected bidder for smooth integration / migration at no additional cost.

XIX. The bidder will be liable for any hardware and software up-gradation for maintenance without any extra cost during warranty period.

XX. The bidder should supply all required hardware and software to meet the technical specifications. Part bid will not be entertained. The technical bid must contain model and part numbers of all supplied components failing which bid will be rejected.

XXI. The bidder should provide onsite comprehensive warranty for five years on all items as mentioned in Table-1. All active Networking products should have 5 years 8 x 5 x NBD (Next Business Day) support commitment with back-to-back agreement with OEM. In case of equipment failure, IIT Kharagpur should be able to log case with the OEM both through the bidder and directly without bidder intervention. Emergency response team should be available from OEM directly in case of any critical failures. For the entire warranty period, latest software updates for all products should be available free of any additional cost. Declaration from OEM that the above conditions will be satisfied if the bidder is selected have to be submitted.

2. Pre-Qualification Criteria:

I. The bidder should have minimum 10 years of working experience in India in the domain of network infrastructure, with sales and support office in Eastern India. The bidder should have at least 3 orders (each of minimum Rs.25 lacs for supplying Network equipment in the last 3 years. Copies of purchase orders to be submitted as supporting documents.

II. The bidder should be a profit making entity for each of the last 3 years. Audited P & L reports to be submitted as supporting document.

III. The bidder should not have been blacklisted by any IITs or similar Autonomous Institutions /Universities, Government /Public Sector Undertakings on the date of submission of this bid. A declaration from the bidder must be submitted.

IV. The bidder should have a minimum turnover of Rs. 20 Crores per annum during each of last three financial years. Audited balance sheet must be provided.

V. The bidder should have valid ISO 27001 Certification or ISO 9001 Certification. Valid certificate need to be produced along with the bid.

VI. The quoted active Networking products should not be under end of support in next five years from the date of submission. Declaration from OEM to be submitted.

VII. OEM of active components should have office and spare depot in India. Documentary proof from OEM must be submitted.

VIII. OEM of active networking components should be a leader or challenger in Gartner Magic Quadrant for Wired and Wireless Lan for last 3 years. Documentary evidence must be submitted.

IX. OEM of active components should have Industry presence in India for more than 10 years. Declaration from OEM must be submitted.

X. OEM of active components should have 24 x7 toll free call center for providing technical assistance. Documentary proof from OEM must be submitted.

XI. OEM of passive cabling components should be a member of Telecommunications Industry Association (EIA/TIA) Information. Supporting documents to be submitted.

XII. All passive components offered should be ROHS compliant as mentioned in Data Sheet. Supporting documents to be submitted

XIII. All passive products should be from single OEM & should have 25 years of channel performance and component warranty. Certificate from OEM to be submitted.

XIV. UPS should be RoHS complaint as safety standard. Documentary evidence to be submitted

XV. Bidder need to mention in their technical bid the support mechanism in detail to provide comprehensive onsite warranty at IIT Kharagpur for this project during the warranty period.

3. General Terms & Conditions:

I. **Last Date of Submission of Sealed Bids: *26th October 2018* by 3:00 pm** (In the Office of the Head, Computer & Informatics Centre, Indian Institute of Technology Kharagpur).

II. **Date of opening of the Technical Bids *26th October 2018* at 3:45 pm (**In the Office of the Head, Computer & Informatics Centre, Indian Institute of Technology Kharagpur).

III. **Payment Terms:** 50% (value of the purchase order) payment will be made after the successful delivery and testing certified by Head, CIC. Remaining 40% will be released after complete implementation and final successful acceptance and certification by the Head, CIC, IIT Kharagpur as mentioned in clause number XVI in scope of work. Balance 10% of the payment will be made on submission of Bank Guarantee of 10% of the total purchase value valid for a period of five years plus three months.

IV. **Price**: The price must be quoted in the price bid format specified, showing the unit rates, total price, and all applicable taxes clearly and separately. **Price must be quoted in Indian Rupees (INR) only for delivery at IIT Kharagpur**.

V. **Tender Fee:** An amount of **Rs. 10,000.00** (Rupees ten thousand only) as tender fee (nonrefundable) has to be paid. The payment shall be made by Demand Draft from any Bank in favour of “Indian Institute of Technology Kharagpur”, payable at “Kharagpur”. **Quotation**

will not be accepted without the Tender Fee. Tender fee should be enclosed separately in an envelope and stapled with the Technical Bid.

VI. **Earnest Money Deposit (EMD):** An amount of **Rs. 6,00,000.00** (Rupees Six Lakhs only) (Refundable) in the form of Demand Draft drawn in favour of "**Indian Institute of Technology Kharagpur"**, payable at Kharagpur or Bank Guarantee as per format at Annexure 10. E.M.D. should be enclosed separately in an envelope and stapled with the Technical Bid **document** superscribing EMD**.** The validity of the EMD should be 6 (six) months from the date of issue. **Any bid without EMD will summarily be rejected. No interest is payable on EMD.** EMD will be refunded to the unsuccessful bidder, finalization of the tender process. The EMD of bidder awarded with the contract will be treated as part of security deposit towards Performance Guarantee. No interest is payable on security deposit. Security deposit shall be forfeited if the selected bidder after award of contract fails to execute the same.

NOTE: IIT Kharagpur will give exemption for submission of tender fee and EMD who are registered with MSME or Central Purchase Organization or startups as recognized by DIPP as per revised rule 170 of GFR -2017 only. However proper and valid document in this regard must be submitted by the bidders in support of their claim.

VII. Conditional offer will not be accepted.

VIII. **Period of Validity:** Bids shall remain valid for acceptance for a period of 120 days from the date of opening of the price bid but any benefit for downward revision of prices should be extended to the IIT Authority.

IX. Past Performance of the bidders will be judged at the time of Technical evaluation.

X. Complete delivery of the material has to be accomplished within eight weeks of receipt of the purchase order, failing which Liquidation Damage (LD) will be imposed as per Institute purchase rules (refer clause XIII of Scope of work).

XI. The bidder should provide comprehensive onsite OEM warranty for **five years** on all supplied items.

XII. Replacement of defective equipment and shipment of the same should be the responsibility of the selected bidder without any financial commitment from IIT Kharagpur. The same has to be completed within **five working days.**

XIII. Technical bid (should also contain the detailed un-priced bill of material) and price bid should be sealed and quoted separately. The technical bid will be evaluated first for technical suitability. Only technically qualified bids would be considered for price comparison. Price bid should be quoted in the given format (Table-1) indicating the tax components. In case of ambiguity between total price quoted and that calculated from unit price for each line item, unit price will be taken as final.

XIV. The authorization letter issued by the OEM (specifically against this tender) should be enclosed in original (if OEM is not the bidder). Separate OEM authorizations are needed from the OEM of the active components, the OEM of the passive components and OEM of the UPS.

XV. The technical bid should contain the technical solution as per the requirement (Table-1). Bill of Materials should mention model number indicating relevant part numbers for each component.

XVI. BOM with model and part numbers of the component and the capabilities, operating characteristics and other technical details of the hardware and software offered should be furnished together with product brochures, literature, etc. in the technical bid. The bidder should ensure that the software versions being quoted if any are latest.

XVII. Technical bid should contain all relevant technical details; printed technical leaflet of models quoted and other details, which may be necessary to ensure that offer is complete in all, respect e.g. technical specification, delivery period, guarantee period, validity, etc.

XVIII. Technical bid should also contain a signed "compliance certificate" (Specification Annexure – 1 to 9) duly counter signed by the manufacturer or bidder.

XIX. **Validity of licenses**: Software's licensing price or policy (if any) shall be clearly mentioned. All licenses should be perpetual with free upgrade during warranty period.

XX. Bidders should also enclose the following documents in the technical bid as proof of their credential:

- Tender fee
- Earnest Money Deposit (EMD)
- Certificate of Registration
- Income Tax Certificate of last three years, PAN Number and GST Number.
- Banker's Solvency Certificate.
- Summary of Audited Statement of Accounts for the last three years.
- Three order copies for computer networking as specified in Pre-Qualification Criteria.
- Copy of ISO Certifications.
- Signed Tender document as a token of acceptance for the Terms & Conditions specified in various sections of the Tender Document

4. Acceptance of Tender

I. The Institute does not bind itself to offer any explanation to those bidders whose technical bids have not been found acceptable by the evaluation.

II. The Institute does not bind itself to accept the lowest tender and reserves the right to reject any or the entire tender received without assigning any reason thereof.

III. The bids (technical and price bids) once submitted shall be the property of the Institute and shall not be returned to the bidder in future.

IV. A bid submitted with false information will not only be rejected but the bidder may also be debarred from participation in future tendering processes.

V. Canvassing in any form not only invites disqualification in this tender but also debar the bidder from participating in future tendering processes.

VI. **Opening of Price Bids:** The Price Bid(s) of only those bidders who are found technically qualified will be opened. The date and time will be informed separately.

VII. Authorized representative (with proper authorization letter to attend opening of technical bids and also for opening of price bids) may choose to be present at the time of opening of Technical Bids/Price Bids.

VIII. Director may accept or reject any or all the bids in part or in full without assigning any reason and does not bind himself to accept the lowest bid. The Institute at its discretion may change the quantity/upgrade the criteria/drop any item or part thereof at any time before placing the Purchase Order. In case of any dispute, the decision of the Director of this Institute shall be final and binding on the bidders.

IX. This tender document and the contract shall be governed by and interpreted in accordance with Laws in force in India. The Courts at Midnapur shall have exclusive jurisdiction in all matters arising under the contract.

For any query pertaining to this tender, correspondence may be addressed to:

The Head, Computer & Informatics Centre
Indian Institute of Technology,
Kharagpur-721 302
Email: head@cc.iitkgp.ac.in

In case the due date for submission and/or opening of the tender happens to be a holiday, the same will be accepted on the next working day. The timings will however remain unchanged. Please note that the Institute remains closed during Saturdays & Sundays.

5. Price Bid Format

Table 1: List of Items

S/N	Description	Specification	Qty.	Unit Price (Rs.)	Tax (Rs.)	Total Price (Rs.) with 5 year warranty
	Material					
1.	**Lightweight Indoor Access Points along with centralized wireless controller (if required) with 1:1 hot redundancy**	As per Annexure-1 and 2	565 nos.(AP)			
2	**48 port 10/100/1000 Gbps POE switch with 1 Gbps SMF fiber uplink (1 fiber module loaded)**	As per Annuxure-3	55 nos.			
3	**24 port 10/100/1000 Gbps POE switch with 1 Gbps SMF fiber uplink (1 fiber module loaded)**	As per Annexure-4	35 nos.			
4	**CAT-6 UTP cable**	As per Annexure-5	41 Boxes			
5	**UTP Patch Cord(1-meter)**	As per Annexure-6	962 nos.			
6	**Single Port I/O with Face Plate, Connector and Back Box**	As per Annexure-7	490 nos.			
7	**24 port preloaded Jack Panel**	As per Annexure-8	60 nos.			
8	**UPS (1 KVA)**	As per Annexure-9	93 nos.			
	Services					
9	**UTP Cable Laying**		12250 meters			
10	**Fixing of Single Port I/O with Face Plate, Connector and Back Box**		490 nos.			
11	**Fixing of Jack Panel**		60 nos.			
12	**Fixing of UPS with Cage and required power connection to rack**		88 nos.			
13	**AP fixing on the wall/celling**		490 nos.			
Total Price including all Taxes with 5 years comprehensive onsite warranty						

Note: Please note point number 9 to 13 in table 1 will be paid as per actuals after installation certification of Head CIC. **However, L1 bidder will be decided based on the grand total of all the items and their quantities as specified in the price bid format shown in Table-1.**

ANNEXURE-1

Wireless Access Point

	Indoor Access Point	Compliance (Yes/No)
Sr. No	**Specifications**	
	Indoor Access Points 802.11a/b/g/n/ac Wave 2	
	Description	
1	Access Point radio should be minimum 3x3 MU-MIMO with 2 spatial streams on 5ghz.	
2	Access Point should be 802.11ac Wave 2 ready from day one supporting 1300 Mbps in 5GHz and 400 Mbps in the 2.4GHz band.	
3	AP should have 1x10/100/1000 Ge LAN port.	
4	802.11 a/b/g/n/ac functionality certified by the Wi-Fi alliance.	
5	Access Point can have integrated or external Antenna.	
6	The Max transit power of the AP + Antenna should be as per WPC norms for indoor Access Points. OEM to give a undertaking letter stating that the AP will configured as per WPC guidelines for indoor AP and also submit the WPC certificate showing approval.	
7	Should support 8x BSSID per AP radio.	
8	Access point should support 802.11ac beamforming for 802.11ac.	
9	The access point should be capable of performing security scanning and serving clients on the same radio. It should be also capable of performing spectrum analysis and security scanning using same radio.	
10	Should support BPSK, QPSK, 16-QAM, 64-QAM and 256 QAM (256 QAM for 802.11ac only) modulation types	
11	Access point should support 802.3af/at POE standard.	
12	Access point should have option of external power adaptor as well.	
13	Access point should have console port.	
14	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.	
15	AP model proposed must be able to be both a client-serving AP and a monitor-only AP for Intrusion Prevention services	
16	The Access Point should have the technology to improve downlink performance to all mobile devices.	
17	Access point must incorporate radio resource management for power, channel, coverage hole detection and performance optimization	
18	AP mounting kit should be with locking mechanism so that AP cannot be removed without using special tools.	
19	AP should have Kensington lock slot / pad lock slot or both.	
20	AP should support Lightweight mode. In case AP is also supporting autonomous / standalone mode, then for the conversion of AP from Lightweight mode to autonomous / standalone will possible only by loading new software.	
21	Mount Bracket should be provided along with the APs and all these accessories make must be from same OEM as that of the Access Point. APs must be fixed to the wall/celling firmly by AP mounting bracket to prevent easy uprooting of the devices from the walls and cellings. AP and its mounting bracket should have locking mechanism from day one using pad lock or Kensington lock or both so that AP can be secured with the mounting bracket using locking mechanism.	
22	AP should be UL 2043 certified	

ANNEXURE-2

Wireless Controller

Sr. No	Specifications	Compliance (Yes/No)
1	WLC must be compliant with IEEE CAPWAP or equivalent for controller-based Wireless LANs(WLANs)	
2	WLC should be dedicated appliance with support for upto 1500 Access points. Should be Single/multiple appliance in High Availability mode. Should have 4 nos. 10 Gig SFP+ ports to connect to LAN with at least 2 multimode 10G SFP+ modules preloaded.	
3	WLC should support minimum 15000 concurrent devices.	
4	Should support multiple redundancy models like 1+1	
4	Should support an ability to dynamically adjust channel and power settings based on the RF environment.	
5	Should have internal hot swappable redundant power supplies	
6	Radio coverage algorithm must allow adjacent WAPs to operate on different channels, in order to maximize available bandwidth and avoid interference	
7	Should support interference detection and avoidance.	
8	Should support coverage hole detection and correction that can be adjusted on a per WLAN basis.	
9	Should support RF Management with 40/80 MHz channels	
10	WLC performance should remain the same if encryption is on or off for wireless SSIDs.	
11	WLC Should support Rogue AP detection, classification and standard WIPS signatures.	
12	Should adhere to the strictest level of security standards, including 802.11i Wi-Fi Protected Access 2 (WPA2), WPA, Wired Equivalent Privacy (WEP), 802.1X with multiple Extensible Authentication Protocol (EAP) types, including Protected EAP (PEAP), PEAP-MSCHAPV2, EAP with Transport Layer Security (EAP-TLS), EAP with Tunneled TLS (EAP-TTLS).	
13	Should support Access Control Lists (ACLs).	
14	Should support built-in web authentication. Should also support web-based authentication with PAP based back end to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant.	
15	Should be able to set a maximum per-user bandwidth limit on a per-SSID basis.	
16	Must support user load balancing across Access Points.	
17	Should provide Mesh capability for Mesh supported AP	
18	Must support client roaming across controllers separated by a layer 3 routed boundaries.	
19	Must support AP over-the-air packet capture for export to a tool such as Wireshark/equivalent	

20	Should be able to classify different types of interference.	
21	Should provide real-time charts/log showing interferers per access point, on a per- radio, per-channel basis.	
22	Should support 802.11e WMM	
23	Support for configuring media streams with different priority to identify specific video streams for preferential quality-of-service treatment.	
24	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.	
25	Should support IPv4 & IPv6.	
26	Should support Internet Group Management Protocol (IGMP) snooping and access point should transmits multicast packets only if a client associated to the access point is subscribed to the multicast group.	
27	For smooth, seamless and easy manageability, operation, interoperability and maintenance, the bidder should offer/quote WLC & WAPs of the same make (OEM).	
28	Controller should support deep packet inspection for all user traffic across Layer 4-7 network to analyses information about applications usage, peak network usage times for all access points from day one	
29	The WLAN solution should have advance WIDS & WIPS from day 1.	
30	WIPS solution should Automatically blacklist clients when it attempt any attack.	
31	WIPS solution should be capable of wireless intrusion detection & prevention. The WLAN should be able to detect Rogue AP and take corrective action to prevent the rogue AP. The system should detect and prevent an organization's wireless client connecting to rogue AP and also prevent an outside client trying to connect to organizational WLAN.	
32	WIPS solution should detect & prevent an Ad-hoc connection (i.e. clients forming a network amongst themselves without an AP) as well as windows bridge (client that is associated to AP is also connected to wired network and enabled bridging between two interfaces)	
33	The system should detect an invalid AP broadcasting valid SSID and should prevent valid clients getting connected from these AP's.	
34	WIPS Solution should track the location of interferer objects.	
35	For advance forensic WIPS solution should perform spectrum analysis to detect and classify sources of interferences. System should provide chart displays and spectrograms for real-time troubleshooting and visualization.	
36	The WIPS solution should able to detect and locate the rogue access point on floor maps once detected.	
37	The WIPS solution should able to detect and prevent if a client use FATA-Jack 802.11 DoS tool (Available free on internet) and tries to disconnect other stations using spoofed authentication frames that contain an invalid authentication algorithm number.	

38	The WIPS solution should detect and protect if a client probe-request frame will be answered by a probe response containing a null SSID to crash or lock up the firmware of any 802.11 NIC.	
39	The WIPS solution should detect and protect if a client/tool try to flood an AP with 802.11 management frames like authenticate/associate frames which are designed to fill up the association table of an AP.	
40	The WIPS solution should detect and protect if a client/tool keep on sending disassociation frames to the broadcast address (FF:FF:FF:FF:FF:FF) disconnect all stations on a network for a widespread DoS.	
41	The WIPS solution should detect and protect if somebody try to spoof mac address of client or AP for unauthorized authentication.	
42	The WIPS solution should detect and protect if a client/tool try deauthentication broadcast attempts to disconnect all clients in range rather than sending a spoofed deauth to a specific MAC address.	
43	The WIPS solution should detect and protect if an attacker attempts to lure a client to a malicious AP using SSID on fake AP in close proximity of the premises. It should detect When the Valid Client probes for Valid SSID and these malicious APs respond and invite the client to connect to them.	
44	when client radio is in sleep mode to save battery and AP then begins buffering traffic bound for that client until it indicates that it is awake. The WIPS solution should detect and protect if intruder try sending spoofed frames to the AP on behalf of the original client to trick the AP into believing the client is asleep to buffer the AP beyond limit.	

ANNEXURE-3

48 PORT POE SWITCH

S/N	Minimum Specification	Compliance(Yes/No)
1.	The switch shall be a 1 RU device with rack mountable options from day one.	
2.	The switch shall have 48 * 10/100/1000 BASE-T POE/POE+ interfaces along with 2 numbers 1G BASE-X uplink ports providing option to connect over both copper and fiber based links using transceiver. The switch should be loaded with 1 number of 1G SMF module for uplink from day one.	
3.	Shall have switching capacity of 100 Gbps switching throughput and forwarding capability of 70 Mpps (64 byte packet size)	
4.	Shall support Layer 2 switching, DHCP support, VLAN support, IGMP , syslog support, DoS attack prevention, port mirroring, DiffServ support, weighted round-robin (WRR) queuing, broadcast storm control, IPv6 support, firmware upgradable, Spanning Tree Protocol (STP) support, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, Trivial File Transfer Protocol (TFTP) support, access control list (ACL) support, quality of service (QoS), jumbo frames support, MLD snooping	
5.	Should support 500 active vlans	
6.	Support for minimum 16k MAC addresses	
7.	Should have atleast 256MB RAM with 128MB flash memory	
8.	Configuration through the console, Telnet, SSH, Web Management, SNMP and Remote monitoring (RMON) support	
9	Should have MTBF of atleast 300,000 Hours	
10.	Operating temperature of 0°C to 40°C	
11.	Each POE switch must be capable of providing full power to at least 10 APs	

ANNEXURE-4

24 PORT POE SWITCH

S/N	Specification	Compliance (Yes/No)
1.	The switch shall be a 1 RU device with rack mountable options from day one	
2.	The switch shall have 24 * 10/100/1000 BASE-T POE/POE+ interfaces along with 2 numbers 1G BASE-X uplink ports providing option to connect over both copper and fiber based links using transceiver. The switch should be loaded with 1 number of 1G SMF module for uplink from day one.	
3.	Shall have switching capacity of 52 Gbps switching throughput and forwarding capability of 35 Mpps (64 byte packet size)	
4.	Shall support Layer 2 switching, DHCP support, VLAN support, IGMP, syslog support, DoS attack prevention, port mirroring, DiffServ support, weighted round-robin (WRR) queuing, broadcast storm control, IPv6 support, firmware upgradable, Spanning Tree Protocol (STP) support, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, Trivial File Transfer Protocol (TFTP) support, access control list (ACL) support, quality of service (QoS), jumbo frames support, MLD snooping	
5.	Should support 500 active vlans	
6.	Support for minimum 16k MAC addresses	
7.	Should have atleast 256MB RAM with 128 MB flash memory	
8.	Configuration through the console, Telnet, SSH, Web Management, SNMP and Remote monitoring (RMON) support	
9	Should have MTBF of atleast 300,000 Hours	
10.	Operating temperature of 0°C to 40°C	
11.	Each POE switch must be capable of providing full power to at least 10 APs	

Annexure-5:

CAT6 UTP CABLE

Parameters	Specification for 4-pair, Cat6 UTP LSZH Cable	Compliance (Yes / No)
Type	23 AWG Solid Bare Copper, Unshielded Twisted 4 Pair, Category 6, TIA / EIA 568 C.2, ISO/IEC 11801 & UL 444 standard. NEMA WC-63.1 Category 6	
Applications	Premise Horizontal Cable, Gigabit Ethernet, 100BaseTX, 100BaseVG ANYLAN, 155ATM, 622ATM, NTSC/PAL Component or Composite Video, AES/EBU, Digital Video, RS-422, 250MHz Category 6	
Conductors	Solid Bare Copper	
Insulation	Polyethylene/Polyolefin Nominal Diameter of 1.0 mm	
Jacket	LSZH jacket complying to: Test Report needs to be submitted along with bid for · Fire rating IEC 60332-3-22 (Category A) · Halogen Content per IEC 60754-1 : ≤ 5 mg/g · Acid Gas Emission pH per IEC 60754-2 : ≥ 4.3 · Acid Gas Conductivity per IEC 60754-2 : ≤ 10µs/mm · Smoke density IEC 61034-2 : ≥ 60% Light Transmittance	
Pair Separator	Cross-member **(+)** fluted Spline.	
Approvals	ETL verified to ANSI/TIA-568-C.2 Cat 6 horizontal cable ETL verified to ISO/IEC 11801 Cat 6 horizontal cable	
Frequency tested up to	600 MHz; ETL Test Reports of ANSI/TIA-568-C.2 & ISO/IEC 11801 of cable performance upto 600 MHz to be provided.	
Third Party Verification	ETL Verified (4 Connector ETL Test Report to be submitted with 600 Mhz tested for both ANSI/TIA-568-C.2 & ISO/IEC 11801 Standard.	
Packing	Box of 305 meters	
Cable Outer Diameter	5.8 mm	
Delay Skew	45 ns @ 100Mhz	

Bend Radius	4 * Cable Diameter	
Impedance	100 Ohms + / - 15 ohms,	
Mutual Capacitance	5.6 NF MAX /100 Mtr.	
Conductor Resistance	9.38 Ohms Max /100 mtr	
Velocity of Propagation Delay	65%	
Performance characteristics @ 250 MHz **ROHS Compliant**	Max. Attenuation : 33 dB/100m Min. NEXT : 39.3 dB Min. PS NEXT : 36.3 dB Min. Return Loss : 17.3 dB Min. ACRF : 20.0 dB Min. PSACRF : 17.0 dB ROHS/ELV Compliant	
Operating Temperature Range	-20 to + 60 deg C	
Test Report	Third Party Test Report as per IEC 60332-3-22 Flame Retardancy to be submitted along with quote. ETL Test Report at 600Mhz of 4 connector Channel to be submitted.	

Annexure-6:

UTP PATCH CORDS

Cat 6 Unshielded Patch Cords, LSZH, 1 MT		
Details	**Specification**	**Compliance(Y/N)**
Type	Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801, IEC 60603-7, FCC Part 68 Subpart F Specifications.	
Conductor	Cat6 Patch Cord should be 4 Twisted Pair, 24 AWG Stranded Bare Copper Conductors. Contact Blade should be Phosphor bronze plated with 50u'' gold over 100u'' nickel undercoat.	
Length	2 MT , 3 MT	
Plug Protection	Factory fitted Strain relief boots on either side	
Performance Characteristics	Max. Current Rating should be 1.5 Amp Min. Insulation Resistance should be 100MOhm Max. Contact Resistance should be 20mOhm Dielectric Strength should be 1000 VAC (RMS) Voltage Rating should be 30 VAC Maximum.	
Jacket	LSZH	
Color	Dark Blue	
Operating Environment Range	The patch cord should have Insertion Life of 750 mating cycles Pull force of min. 89 Newton, Humidity 10% to 90% R.H., Temperature range of -10 Deg C to +60 Deg C	
Third Party Verification	ETL Test Report 600 Mhz for ISO/IEC 11801-1 and ANSI/TIA-568-C.2 standard needs to be submitted along with bid	

Annexure-7:

Single Port I/O

CAT6 Unshielded Modular Jack, Keyconnect Style		
Parameters	**Specifications**	**Compliance(Y/N)**
Type	Cat6 Modular Jacks shall meet and exceed channel specification of Category 6 transmission requirements for connecting hardware, as specified in Commercial building telecommunications Cabling standard and ISO/IEC 11801:2002 second edition. when used as a component in a properly installed UTP channel.	
Front Connection	Copper Alloy with 50u inch Gold over Nickel	
Rear Connection	IDC: Copper Allow with Nickel Plating	
Connector Body	Plastic: UL940V-0	
Housing	Encapsulated Lead Frame technology/ polycarbonate 94V-0	
Accessories	Jack should support uniform hassle free termination technology and be able to ensure performance in each termination without dependency on expertise of technician. Integrated bend-limiting strain-relief unit for cable entry with locking facility at IDC contact point Support cable pair termination process on the jacks at 90 degree angle.	
Termination Interface	Front Mated Connection: 750 Cycles(minimum)	
	Rear Mated Connection: 20 Cycles minimum (Gas Tight IDC Connection)	
Jack Details	Connector/hardware retention of at least 88.5 N Plug /connector retention of at least 50N Storage temperature range of -40 Deg C to +70 Deg C.	
IEEE Specification (PoE)	IEEE 802.3at type 1 and 2 (up to 30W). CoC to be provided.	
Termination Pattern	TIA / EIA 568 A and B	
Guaranteed Bandwidth	300 Mhz Guaranteed Bandwidth for 100 MT Channel Link	
Approvals (Proof to be provided along with Bid)	UL Listed	
	ETL verified to TIA / EIA Cat 6. Should be part of the registered 4 connector channel as per Intertek / ETL report	
UL Rating	UL 94V-0	
Other Specifications	UL 1863, IEC 60603-7, FCC part 68-F	
RoHS	Compliant	
Operating Temperature	-10° to 60°C	
Dielectric Strength	1,000 V RMS @ 60 Hz for 1 minute (Signals to Ground)	
Performance Characteristics to be provided with bid for 1 – 300 MHz	Technical Datasheet should have Worst Case Performance parameters for IL, NEXT, FEXT, Return Loss and Balanced TCL	
Electrical Performance @ 300 Mhz	Insertion Loss: Max. 0.31 dB NEXT: Min. 44.5 dB FEXT: Min. 37.6 dB RL: Min. 18.5 dB Balanced TCL: Min 22.5 dB	

Face Plate, UK Style, Color matched with back box, Square with Shutters		
Details	**Specification**	**Compliance(Y/N)**
Type	**Simplex/Duplex/Quad**	
Material	Fire -retardant Plastic, ABS, Almond color, UK Style with Shutters	
Acceptability	Should be able to accept Cat6A, Cat6 and Cat5e information outlets	
Approvals	UL94V0	
No. of plates	2 Plates/Pieces Face Plate, Mounting Frame and Cover Plate with write on labels in transparent plastic window – supplied with plate for better aesthetic look (Premium Type)	
Mounting screws	2 pcs, M3.5 x 25mm, with covers, Elegant : hidden-screw design	
Compliant	RoHS	
Dimensions	(H x W x D) 86 x 86 x 14.42 mm	

Annexure-8:

Jack Panel

24 PORT STRAIGHT PRELOADED JACK PANEL, 1U		
Parameters	**Specifications**	**Compliance(Y/N)**
Type	-24 Port 1U Preloaded Straight Patch Panel (Loaded with 24 Cat6 Modular Jacks Black) -Patch panels IDC (IDC of Information Outlet) Connectivity should be at rear end & RJ-45 jack on front panel, 19" rack mountable. -Patch panels Ports should be individually replaceable & Consistent port-to-port performance.	
Availability	Patch Panel should be available with 48 Port in 1U	
Cable management	Patch Panel to be supplied with a cable support bar/kit.	
Telecommunication Standard	ISO/IEC 11801:2002 Ed.2	
Height	1U (1.75”)	
Storage Temperature Range	-40Deg C to +70 Deg C	
Operating Temperature range	-10Deg C to +60 Deg C	
Color and Material	Black & Steel	
Included Parts	4 Screws (10x32); 4 Screws (12x24); 2 Velcro Straps; 2 Rear Cable Management Bracket, 1 Management Bar, 1 Label Holder, 2 Installation Guides, 1 kit Termination Bar	
Applicable Standards & Environmental Programs	RoHS complied and ACA, Bi-national Standard	
Verification	ETL Verified Category 6	
Electrical Performance @ 300 Mhz	Insertion Loss: Max. 0.31 dB NEXT: Min. 44.5 dB FEXT: Min. 37.6 dB RL: Min. 18.5 dB Balanced TCL: Min 22.5 dB Technical Datasheet to be provided with all above values in it at time of bid	

Annexure-9:

UPS

SN	Minimum Specifications	Complied (Yes/No)	Remarks
1	**1KVA UPS:** Input voltage: 230V AC single phase Input Frequency: 50Hz (±3) Input Connection: 3-pin 6A Indian type Input voltage range: 150V – 270V Output power: 600watts Output voltage: 230V AC Efficiency at full load: >80% Output Frequency: 50Hz (±1) Topology: Line Interactive Waveform type: Sine wave Output connections: 4 nos. 3-pin 6A Indian types (battery backup) & 2 nos. 3-pin 6A Indian types (surge protected) Transfer time: 10ms (±2) Backup time: 30 minutes Battery Type: Leak proof Maintenance Free Lead-Acid type Charging time: less than 8 hrs Battery VAH capacity: minimum 215 Interface port: USB, RJ45 Network (optional) Control panel: Standard Audible Alarm: Alarm when overload or battery low condition Height x Width x Depth: 30cm x 15cm x 40cm (approx.) Weight: less than 15Kg (approx.) Safety standard: RoHS compliant		**MAKE & MODEL OF UPS TO BE SPECIFIED**

Annexure-10

MODEL BANK GUARANTEE FORMAT FOR FURNISHING EMD

Whereas…… (thereinafter called the "tenderer") has submitted their offer dated ……for the supply of …… (hereinafter called the "tender") against the purchaser's tender Notice No. …… KNOW ALL MEN by these presents that WE……..……of ……having our registered office at …… are bound unto …….. (hereinafter called the "Purchaser") in the sum of ……for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this ……Day of …… 20 ……

THE CONDITIONS OF THIS OBLIGATION ARE

(1) If the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.
(2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:
    (a) If the tenderer fails to furnish the Performance Security for the due performance of the contract.
    (b) Fails or refuses to accept/execute the contract.

WE undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or both the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including 45 days after the period of tender validity and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the authorized officer of the Bank)

Name and designation of the officer

Seal, name & address of the Bank and address of the Branch