



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

**Subject: PROCUREMENT OF NETWORK EQUIPMENT FOR DIAMOND JUBILEE
COMPLEX**

**Tender Notice No.: IIT/CIC/NETWORK/DIAMOND JUBILEE/2018-19/26 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 procurement of Network Equipments with five years comprehensive onsite warranty for Networking of Diamond Jubilee Complex.

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 **Annexure- 1 to 7**) 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/ DIAMOND JUBILEE /2018-19/26 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 7**) which will be opened **on 26th October 2018 at 4:00 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**

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1. Institute website
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PROCUREMENT OF NETWORK EQUIPMENT FOR DIAMOND JUBILEE COMPLEX

Institute has decided to procure network equipment as mentioned in Table-1 to extend its network facility to a new academic complex. The details of the scope of work are as follows.

1. Scope of work:

- I. The scope of the work includes supply, installation, commissioning and integration of the active components as per the institute's requirement and maintenance of the same for a period of five years. All items supplied must have a comprehensive onsite OEM warranty for a period of five years.
- II. Complete delivery of the material has to be accomplished within eight Weeks of receipt of the purchase order, failing which Liquidation Damage (LD) @ 1% per month of the total order value will be imposed as per Institute purchase rules. Total liquidated damage will be capped at 5% of the PO value.
- III. The installation would be deemed as complete, after the delivery, installation, commissioning and integration of all equipment with Institute network along with the submission of installation document needed for regular operation and maintenance thereafter. Final acceptance and certification will be done by Head, CIC, IIT Kharagpur. The warranty period will start after the final acceptance and certification by Head, CIC, IIT Kharagpur. After delivery of items if it is found that new site is not ready for installation then bidder has to perform power-on self-test for all the equipment and a declaration has to be given stating installation, commissioning and integration of all equipment will be done by the bidder at no additional cost as soon as site will be ready for the same.
- IV. Selected bidder has to integrate the proposed network equipment over the existing fiber system without disturbing the hierarchy and architecture of the existing campus network.
- V. Selected bidder has to integrate aggregation switches and wireless controller with the existing core switches in high availability mode. Necessary modules at the wireless controller end and core switch end to be supplied along with the item no. 4 of Table 1 for the connectivity with the existing core switches (2 x Cisco Nexus 7010) in high availability mode (both SMF and MMF modules are supported in the core switches but appropriate modules need to be provided for both controllers and core switches ends).
- VI. Wireless solution should be integrated with the existing wireless authentication system of the Institute.
- VII. All network equipment (except s/n no. 6 and 7 of Table-1) must be from the same OEM. Item no. 6 will be used for connecting aggregation switches with existing core switches. Item no. 7 will be used to integrate existing Cisco make APs (part no: AIR-AP-1815I-D-K9) with non-PoE ports for future need.
- VIII. The selected bidder will ensure the availability of services from professionally qualified team during implementation of the project and to provide the onsite comprehensive warranty for **FIVE YEARS** on all items as mentioned in **Table-1**. All 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. Bidder has to ensure the

availability of onsite engineer within hours after reporting the fault to rectify the fault with in six hours (including Saturday, Sundays and Public Holidays).

- IX. 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 complete within five working days after reporting the problem.
- X. In case of 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.
- XI. The bidder will be liable for any hardware and software up-gradation for maintenance without any extra cost during warranty period. For the entire warranty period, latest software updates for all products should be available free of any additional cost.
- XII. All necessary documentation related to time-to-time configuration has to done by the selected bidder.
- XIII. The bidder should supply all required hardware and software to meet the technical specifications. Part bid will not be entertained.

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 for supplying network equipment (each of minimum Rs. 25 Lakhs 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. Supporting documents must be provided.
- VI. The quoted products should not be under end of support in next five years from the date of submission. A declaration from OEM to be submitted.
- VII. OEM of active components should be a leader or challenger in Gartner Magic Quadrant for Wired and Wireless Lan for the last 3 years.
- VIII. OEM should have office and spare depot in India. Documentary proof from OEM must be submitted.
- IX. OEM should have Industry presence in India for more than 10 years. Documentary evidence must be submitted.

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

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 by 4:00 pm** (In the Office of the Head, Computer & Informatics Centre, Indian Institute of Technology Kharagpur).
- III. **Payment Terms:** 90% (value of the purchase order) payment will be made after the successful delivery, installation, commissioning and acceptance of the materials (or against self-test and a declaration in case site is not ready) as mentioned in clause no. 1.III of 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.** L1 bidder will be decided based on the grand total price of all the items and their quantities as specified in the price bid format shown in Table-1.
- 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 lakh 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 8. E.M.D. should be enclosed separately in an envelope and stapled with the Technical Bid document super scribing 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 to 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. **Delivery:** 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 1.II of Scope of work).
- XI. **Warranty:** The bidder should provide comprehensive onsite 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 mentioning the make and part nos. of individual part items and quantities based on Table – 1 and specifications specified in Annexure 1 to 7) 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. But total price quoted in the given price bid format as per tender should match the total price calculated from the unit price and quantity. In case of any ambiguity, the price calculated based on the unit rate quoted in the priced bill of material will be considered as the final price.
- XIV. The authorization letter issued by the OEM (specifically against this tender) should be enclosed in original (if OEM is not the bidder).
- 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. Technical bid should contain the tender document signed by authorized signatory of the bidder as a token of acceptance of specifications, requirements and terms and conditions.
- XVII. 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.
- XVIII. 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.
- XIX. Technical bid should also contain a signed “compliance certificate” (Specification Annexure – 1 to 7) duly counter signed by the manufacturer or bidder.
- 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
 - ❖ Current Income Tax, 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.

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 participation in the future tendering processes.
- VI. The price bid(s) of only those bidder(s) 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 (Interfaces should be populated from day-1 as mentioned)	Specification	Qty. (no.)	Unit Price (Rs.) with 5 years warranty	Tax (Rs.)	Total Price (Rs.) with 5 year warranty
1	Aggregation switch with following port configuration should be available from day-1 <ul style="list-style-type: none"> • 2 x 10G LR • 46 x 1000 Base LX 	As per Annexure-1	2			
2	Type-1 Access switch with following port configuration should be available from day-1 <ul style="list-style-type: none"> • 2 x 1000 Base LX • 26 x 10/100/1000 Base T 	As per Annexure-2	4			
3	Type-2 Access switch with POE interfaces to support 20 nos. of existing type APs and following port configuration should be available from day-1 <ul style="list-style-type: none"> • 2 x 1000 Base LX • 50 x 10/100/1000 Base T 	As per Annexure-3	32			
4	Wireless Controller <ul style="list-style-type: none"> • 350 AP support provisioned from day-1 which can be extended up to 1500 AP maximum • Hardware Redundancy in controller for high availability • Necessary modules at the controller end and at the existing core switch end to be included 	As per Annexure-4	1 set (2 nos.)			
5	Controller based Indoor wireless access point with license	As per Annexure-5	340			
6	Cisco Make Transceiver (Part no: SFP-10G-LR=) for existing Core switches (Cisco Nexus 7010)	As per Annexure-6	4			
7	Cisco make Power Injector (Part no: AIR-PWRINJ6=) for existing Cisco Make indoor access points (Part no: AIR-AP1815I-D-K9)	As per Annexure-7	100			
Total Price including all taxes with 5 years comprehensive onsite warranty						

Annexure-1

Specification of Aggregation Switch

S/N	Specification	Compliance (Yes/ No)
1	General	
1.1	The Switch should be 19" rack mountable, have at least 48 x 1/10Gbps SFP+ ports loaded with 46 x 1000BaseLX and 2x10G LR Transceivers from day-1	
1.2	The switch should support MTBF of 200,000 hours (minimum)	
1.3	Should have internal Redundant Power supply	
1.4	Support for configuration and image rollback	
1.5	IPv4 & IPv6 Layer 3 forwarding in hardware	
1.6	Should have 4GB DRAM & 2GB Flash memory	
2	Performance	
2.1	Should have stacking facility with dedicated stacking port and support minimum total stacking bandwidth of 400 Gbps. Should support stacking of eight switches into a virtual switch.	
2.2	Should have 960 Gbps switching capacity & 900 Mpps forwarding rate	
2.3	Fully non-blocking backplane and wire-speed throughput with minimal latency	
2.4	MAC Address table : 32000	
2.5	Should support 24000 routes	
3	Layer 3 feature	
3.1	Basic IP unicast routing protocols (static, RIPv1, and RIPv2) should be supported from day 1.	
3.2	Should have support for advanced routing support including OSPF, IS-IS, BGP, policy based routing & Multicast routing, Protocol-independent multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM), PIM dense mode (PIM-DM), PIM sparse-dense mode, and source-specific multicast (SSM),PBR,BGPv4, and IS-ISv4, OSPFv3 etc	
4	Layer 2 feature	
4.1	IEEE 802.1Q VLAN encapsulation. At least 1000 VLANs should be supported. Support for 4000 VLAN IDs.	
4.2	Centralized VLAN Management. VLANs created on the Core Switches should be propagated automatically.	
4.3	IEEE 802.1d, 802.1s, 802.1w, 802.3ad standard support from day-1	
4.4	Link Aggregation Protocol (LACP)	
4.5	Support for Multicast VLAN registration (MVR) to continuously send multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.	
5	Network Security Features	
5.1	IEEE 802.1x to allow dynamic, port-based security, providing user authentication.	
5.2	Support for Network Admission Control, IP source guard, MAC limiting	
5.3	RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.	
5.4	MAC address notification to allow administrators to be notified of users added to or removed from the network.	
5.5	Security ACL entries – At least 1000.	

6	Quality of Service (QoS) & Control	
6.1	Standard 802.1p CoS and DSCP	
6.2	Control- and Data-plane QoS ACLs	
6.3	Eight egress queues per port to enable differentiated management of up to four traffic types across the stack.	
6.4	Switch should support at least 1000 aggregate polices.	
7	Management	
7.1	For enhanced traffic management, monitoring, and analysis, upto four RMON groups (history, statistics, alarms, and events) must be supported.	
7.2	Domain Name System (DNS) support to provide IP address resolution with user-defined device names.	
7.3	Network Timing Protocol (NTP) based on RFC 1305 to provide an accurate and consistent timestamp to all intranet switches.	
7.4	SNMP v1, v2c, and v3 and Telnet interface support delivers comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management.	
7.5	RMON I and II standards	
7.6	SNMPv1, SNMPv2c, and SNMPv3	
8	Certification	
8.1	The switch should be common criteria EAL2 or NDPP certified from day 1	
8.2	Switch should have Ipv6 phase2 certification from day 1	

Annexure-2

Specification of Type-1 Access Switch

S/N	Specification	Compliance (Yes/ No)
1	Architecture	
1.1	The switch shall be a 1 RU device with rack mountable options	
1.2	The switch shall have 26 * 10/100/1000 BASE-T interfaces with 2* 10/100/1000 BASE-X uplink ports(should be populated with 1000 Base LX transceiver from day-1) providing option to connect over both copper and fiber based links	
1.3	Shall have switching capacity of 56 Gbps switching throughput and forwarding capability of 38 Mpps (64 byte packet size)	
2	Resiliency	
2.1	Shall support Layer 3 switching, Layer 2 switching, DHCP support, VLAN support, IGMP snooping, syslog support, DoS attack prevention, port mirroring, DiffServ support, weighted round-robin (WRR) queuing, broadcast storm control, IPv6 support, multicast storm control, unicast storm control, 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	
3	Layer 2 Features (any additional licenses required shall be included)	
3.1	Should support 4000 active vlans	
3.2	Support for minimum 16k MAC addresses	
3.3	Should have at least 512MB RAM with 256MB flash memory	
4	Management Features	
4.1	Configuration through the console, Telnet, SSH, Web Management, SNMP and Remote monitoring (RMON) support	
5	Environmental Features	
5.1	Should have MTBF of at least 300,000 Hours	
5.2	Operating temperature of 0°C to 40°C	

Annexure-3

Specification of Type-2 Access Switch

S/N	Specification	Compliance (Yes/ No)
1	Architecture	
1.1	The switch shall be a 1 RU device with rack mountable options	
1.2	The switch shall have 48* 10/100/1000 BASE-T interfaces with 2* 100/1000/10000 BASE-X SFP+ uplink ports (should be populated with 1000 Base LX transceiver from day-1) providing option to connect over both copper and fiber based links	
1.3	Shall have switching capacity of 176 Gbps switching throughput and forwarding capability of 130 Mpps (64 byte packet size)	
1.4	Shall have support for RPS	
1.5	Shall have support for PoE, PoE+ and 60W PoE . It shall also have at least 740W POE budget	
2	Resiliency	
2.1	Shall support Layer 3 switching, Layer 2 switching, DHCP support, VLAN support, IGMP snooping, syslog support, DoS attack prevention, port mirroring, DiffServ support, weighted round-robin (WRR) queuing, broadcast storm control, IPv6 support, multicast storm control, unicast storm control, 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	
3	Layer 2 Features (any additional licenses required shall be included)	
3.1	Should support 4000 active vlans	
3.2	Support for minimum 16k MAC addresses	
3.3	Should have atleast 512MB RAM with 256MB flash memory	
3.4	Shall have support for IPv6 security features like RA guard,ND inspection and DHCPv6 guard	
4	Management Features	
4.1	Configuration through the console, Telnet, SSH, Web Management, SNMP and Remote monitoring (RMON) support	
5	Environmental Features	
5.1	Operating temperature of 0°C to 40°C	

Annexure-4

Specification of Wireless Controller

S/N	Specification	Compliance (Yes/ No)
1	Must be compliant with IEEE CAPWAP or equivalent for controller-based WLANs.	
2	Should have at least 2 x 10 Gigabit Ethernet interface.	
3	Should support both centralized as well as distributed traffic forwarding architecture with L3 roaming support from day 1. Should have IPv6 ready from day one.	
4	Controller should have hot-swappable internal redundant power supplies.	
5	Controller should support minimum 20000 concurrent devices.	
6	WLAN controller should have scalability to support 1500 Access points from day 1 without any hardware change. License as per requirement.	
7	Should be rack-mountable. Required accessories for rack mounting to be provided.	
8	WLC should support AP License Migration from one WLC to another	
9	Should support minimum 4000 VLANs	
10	Must support stateful switchover between active and standby controller in a sub second time frame.	
11	WLC should support L2 and L3 roaming for IPv4 and IPv6 clients	
12	WLC should support guest-access functionality for IPv6 clients.	
13	Should support IEEE 802.1p priority tag.	
14	Should ensure WLAN reliability by proactively determining and adjusting to changing RF conditions.	
15	Should provide real-time radio power adjustments based on changing environmental conditions and signal coverage adjustments.	
16	Should support automatic radio channel adjustments for intelligent channel switching and real-time interference detection.	
17	Should support client load balancing to balance the number of clients across multiple APs to optimize AP and client throughput.	
18	Should support policy based forwarding to classify data traffic based on ACLs	
19	Should support flexible DFS to prevent additional 20/40 Mhz channels from going unused	
20	Should support dynamic bandwidth selection among 20Mhz, 40 Mhz and 80Mhz channels, ensuring one access point on 20Mhz and another on 80 Mhz channel connected on the same controller at same WLAN group.	
21	Should support minimum 500 WLANs	
22	Should support dynamic VLAN assignment	
23	Should support Hot Spot 2.0	
24	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.	
25	Should able to do dynamic channel bonding based on interference detected on particular channel.	
26	Must support coverage hole detection and correction that can be adjusted on a per WLAN basis.	
27	Must support RF Management with 40 MHz and 80 Mhz channels with 802.11n & 802.11ac	
28	Should provide visibility to Network airtime in order to set the airtime policy enforcement	
29	Must support dynamic Airtime allocation on per WLAN, per AP, Per AP group basis.	
30	Must be able to restrict the number of logins per user.	
31	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.	

32	Should support port-based and SSID-based IEEE 802.1X authentication. Should adhere to the strictest level of security standards, including 802.11i Wi-Fi Protected Access 2 (WPA2 Enterprise), 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).	
33	Should support MAC authentication to provide simple authentication based on a user's MAC address.	
34	WLC should be able to exclude clients based on excessive/multiple authentication failure.	
35	Shall support AES or TKIP encryption to secure the data integrity of wireless traffic	
36	Shall support the ability to classify over 20 different types of interference with in 5 to 30 seconds.	
37	Shall able to provide an air quality index for ensuring the better performance	
38	Shall able to provide real time chart showing interference per access point on per radio and per-channel basis.	
39	Should support AP location-based user access to control the locations where a wireless user can access the network	
40	Should support Public Key Infrastructure (PKI) to control access	
41	Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.	
42	WLC Shall support WIDS/WIPS, and spectral analysis from day 1.	
43	WLC should detect if someone connect a Rogue Access Point in network and able to take appropriate action to contain rogue Access point.	
44	Should support SNMPv3, SSHv2 and SSL for secure management.	
45	Should support encrypted mechanism to securely upload/download software image to and from Wireless controller.	
46	Should provide visibility between a wired and wireless network using IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and sFlow/equivalent.	
47	Should support AP Plug and Play (PnP) deployment with zero-configuration capability	
48	Should support AP grouping to enable administrator to easily apply AP-based or radio-based configurations to all the APs in the same group	
49	Should support selective firmware upgrade APs, typically to a group of APs minimize the impact of up-gradation	
50	Should have a suitable serial console port.	
51	Should have Voice and Video Call Admission and Stream prioritization for preferential QOS	
52	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 with different traffic forwarding modes i.e. central switching with WLC and local switching when traffic move locally from AP to connected switch.	
53	Integrated/ External Solution must provide Self registration based Guest access workflow for minimum 4000 users. Bidder must quote necessary compute for external solution.	
54	Should support sponsored based Guest access workflow.	
55	Should Support different custom branding of captive portal for Laptop and mobile.	
56	Should support RADIUS authentication.	
57	Necessary 10G optical fiber modules at the controller end for connecting to existing core switches (2 x Cisco Nexus 7010) in high availability mode	
58	Necessary 10G modules for existing core switches (2 x Cisco Nexus 7010) to connect the controller in high availability mode (both SMF and MMF modules are supported in the existing core switches but appropriate modules need to be provided)	

Annexure-5

Specification of Wireless Access Point

S/N	Specification	Compliance (Yes/ No)
1	The access point must be controller based	
2	Each access point should be supplied with AP licenses	
3	The access point should be 802.11ac, Wave 2	
4	The Access Point should have at least 1 Port 10/100/1000Mb POE Uplink port, with Additional console port	
5	Access Point shall support Console port that uses Standard Port (RJ-45) type connection	
6	Access Point shall be able to perform as Wireless Controller, running standard-based, CAPWAP Protocol and act as controller for other 11n, 11ac Aps	
7	Access point must have integrated BLE with Minimum of 2 dBi of antenna gain.	
8	AP should have Dual Radios to support 2.4 GHz & 5Ghz concurrent users with 802.11 a/b/g/n capability.	
9	An access point must include a standard OEM provided metallic Mounting brackets for mounting on Ceiling or Roof top.	
10	Must support at least 2X2 multiple-input multiple-output (MIMO) with two spatial streams	
11	Must support minimum of 20 dbm of transmit power in both 2.4Ghz and 5Ghz radios. And should follow the WPC norms for indoor WAP.	
12	Must support AP enforce load-balance between 2.4Ghz and 5Ghz band.	
13	AP should have -98 dB or better Receiver Sensitivity.	
14	AP should have technique to provide better reception for hard to hear clients and consistent performance while clients change their orientation i.e. beamforming.	
15	The APs shall provide fast roaming for data and voice clients. There will be no deterioration of voice for clients roaming from one AP to another, roaming from one controller to another.	
16	At least 2 number of Integrated antenna, with min 2 dBi Gain for 2.4Ghz and 4 dBi antenna gain for 5Ghz both.	
17	Access point must support a minimum of 867 Mbps user throughput on 80Mhz in 5Ghz Or 1Gbps aggregate data rate of both the Radios	
18	Must support Management Frame Protection.	
19	Must support as a sensor for wireless IPS.	
20	Must support 16 WLANs per AP for SSID deployment flexibility.	
21	The access point should support 802.1q VLAN tagging.	
22	System should support authentication via 802.1X, Local (controller based) authentication database, support for RADIUS and Active Directory.	
23	The access point should support following security mechanism: WEP, WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i, EAP-TLS.	
24	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.	
25	Must be plenum-rated (UL2043).	

Annexure-6

Specification of Transceiver

S/N	Product Description	Compliance (Yes/ No)
1	Transceiver for existing Core Switches (Cisco Nexus 7010). Transceiver Part no: SFP-10G-LR=	
1.1	Support warranty documents for five Years from the OEM should be submitted to IIT KGP	

Annexure-7

Specification of Power Injector

S/N	Product Description	Compliance (Yes/ No)
1	Cisco make Power Injector (Part no: AIR-PWRINJ6=) for existing Cisco Make indoor access points (Part no: AIR-AP1815I-D-K9)	
1.1	AC Power cable for the above Injector (Cisco Part no: AIR-PWR-CORD-UK)	

Annexure-8

MODEL BANK GUARANTEE FORMAT FOR FURNISHING EMD

Whereas.....(thereinafter called the "tenderer") has submitted their offer datedfor the supply of(hereinafter called the "tender") against the purchaser's tender Notice No. KNOW ALL MEN by these presents that WE.....ofhaving our registered office atare bound unto (hereinafter called the "Purchaser") in the sum offor 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 thisDay 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