



No. AUD/17-31/2016 -17/WLC /1354 - 1364

Dated: 22 July 2016

To,

Subject: Notice Inviting Tender for supply and installation of Wireless LAN Controller (WLC) with Access Points at Ambedkar University Delhi

The Ambedkar University Delhi (AUD) invites sealed quotations from competent & reputed manufacturers/ authorized distributors/ dealers for supply and installation of Wireless LAN Controller (WLC) with Access Points at Ambedkar University Delhi.

Technical & Financial bids are required to be submitted in separate sealed covers addressed to the Registrar, Ambedkar University Delhi, Lothian Road, Kashmere Gate, Delhi-110006 so as to reach us on or before 05-08-2016 up to 3.00 pm, duly super scribing the work i.e. "Technical Bid for supply and installation of Wireless LAN Controller with Access Points" and "Financial Bid for supply and installation of Wireless LAN Controller with Access Points" on top of the cover.

Tenderers should read the tender document carefully as enclosed and comply strictly with the conditions, while sending their bids. Clarifications, if any, may be sought from the AUD Admin Division on Telephone No 23863655. Tender format can be downloaded from our website 'www.aud.ac.in'.


Deputy Registrar (Admin)

Copy forwarded to:-

1. Registrar, Ambedkar University Delhi
2. Controller of Finance, Ambedkar University Delhi
3. Director (IT Services), Ambedkar University Delhi

AMBEDKAR UNIVERSITY DELHI

TENDER DOCUMENT FOR SUPPLY AND INSTALLATION OF WIRELESS CONTROLLER WITH ACCESS POINTS AT AMBEDKAR UNIVERSITY DELHI

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|----|------------|---|--------------------------------------|
| 1. | Appendix A | : | Schedule of requirement |
| 2. | Appendix B | : | Technical Bid form |
| 3. | Appendix C | : | Financial Bid form |
| 4. | Appendix D | : | Undertaking |
| 5. | Appendix E | : | Detailed specifications of Equipment |

Ambedkar University Delhi
Lothian Road, Kashmere Gate
Delhi – 110 006

SUPPLY AND INSTALLATION OF WIRELESS CONTROLLER WITH ACCESS POINTS AT AMBEDKAR UNIVERSITY DELHI

1. Parties:

The parties to the Contract are the Tendering Firm and Ambedkar University Delhi (AUD).

2. Scope of Work

Supply and installation of Wireless Controller with Access Points at Ambedkar University Delhi as described in Appendix A. Detailed specifications of equipments are given in Appendix E.

3. Eligibility Criteria:

- (a) The Tenderer should be either itself a manufacturer or authorized distributor/ dealer of the manufacturer.
- (b) The Tenderer should have PAN No., TIN No. and VAT No. and should submit legible attested copies of these documents with Technical Bid, failing which the Technical Bid would be summarily rejected.
- (c) OEM warranty for 5 years should be provided for all the equipments with necessary technical support.
- (d) Successful Tenderer will have the responsibility to provide training to AUD IT Services staff.
- (e) AUD reserves the right to make any changes in the Bill of Quantities of this Tender.
- (f) The Tenderer should clearly mention the make, model of the items & enclose relevant datasheet/ brochures.
- (g) Wireless controller and access point with PoE injector should be compatible with each other.
- (h) WLAN should be from the OEM to have TAC for Active components.
- (i) The OEM should have done at least 3 controller based WLAN deployments with more than 300 Aps.
- (j) OEM should have hardware spare depots in India covering major cities.
- (k) OEM should have presence in India at least from the last 10 years and making no losses in Networking business in the last 5 years.

- (l) OEM should not be ready for sale or under acquisition.
- (m) OEM services should be made available through the web portal, accessible by Log in ID with the appropriate entitlements OR provided by the Partner. The secure web portal should assist in solving the support challenges like – installed base management, contract management, proactive product alerts etc.
- (n) Wireless OEM should be in the top 3 vendors/ or Leaders quadrant as per Gartner/ IDC/ Forrester/ Del'Oro publicly available reports in the last 1 year.
- (o) The OEM should have an office/ certified partner in Delhi/ NCR with 3 certified engineers trained on this technology.
- (p) All wi-fi components should be from single OEM.
- (q) The Tenderer must specify item-wise compliance to the technical specifications. This compliance should also be countersigned by the respective OEM official. The make and model of the quoted item must be clearly specified.
- (r) Complete technical specifications and pamphlets should be sent along with the bid. Quotations without proper technical specifications will be rejected.

4. Preparation and Submission of Tender:

- (a) A Tenderer has to submit the bid containing all the items mentioned in Appendix A.
- (b) Tender shall be submitted in official tender form only. If submitted in any other form, the same shall be summarily rejected.
- (c) The tender should be submitted in two parts viz. Technical Bid and Financial Bid in the proforma given in Appendix B and Appendix C respectively with each Bid kept in a separate sealed cover.
- (d) Each cover must contain the address of the Bidder, and should be super scribed with the statement “**Technical Bid for supply and installation of Wireless LAN Controller with Access Points**” and “**Financial Bid for supply and installation of Wireless LAN Controller with Access Points**”, as the case may be.
- (e) These two covers should then be **kept in another sealed cover** addressed to Registrar, Ambedkar University Delhi, Lothian Road, Kashmere Gate, Delhi-110006, duly superscribed with the statement “**Tender for supply and installation of Wireless LAN Controller with Access Points**”.

(f) The tender will be submitted **before 3:00 PM on 05-08-2016**. The Technical Bid (Part-I) will be opened at 3:30 PM on 05-08-2016 in the presence of intending tenderers, if any. The Financial Bid (Part-II) of the tender will be opened after evaluation of the Technical Bids and only such Bidders, whose Bids are qualified in technical evaluation, shall be called for opening of their commercial Bids.

(g) Any tender form with any correction, amendments, overwriting etc. shall be considered invalid and shall be rejected, except if duly initialed with seal of the tenderer.

(h) The tender is liable to be ignored if complete information is not given there-in, or if the particulars and data (if any) asked for in the schedule to the tender are not filled in.

5. Site Inspection:

The tenderer can inspect the site after taking prior approval between 10 am to 5 pm on all working days. IT Services Division may be contacted on Tele No. 23865083 for this purpose. AUD will not be responsible for unawareness of facts.

6. Technical Bid :

(a) The Technical Bid, having details of the Firm along with the EMD, should be submitted in the form given in Appendix B.

(b) The Bidder is required to fill the details in column Nos 4, 5 & 6 of the table given in Appendix A and submit it along with the Technical Bid.

(c) Copies of necessary certificates will be enclosed with the Technical Bid.

(d) The vendor should also submit an undertaking as given in Appendix D with the Technical Bid.

7. Financial Bid:

(a) The Financial Bid should be submitted in the form given in Appendix C for all the items listed in Appendix A. Bid submitted only for one item shall not be accepted.

(b) The consolidated price quoted shall be firm and final and payable for the items delivered, installed and commissioned in the Office/ Class Room/ Lab.

(c) The quoted rates shall include all taxes, duties, VAT etc. as applicable and no extra shall be payable on this account.

(d) TDS as per rule shall be deducted. The tenderer must enclose copy of PAN No supported by copy of PAN Card of the company.

(e) Rates and amount should be written in figure and words cleanly for each item.

8. Validity:

The Bids submitted by the tenderers shall be valid for a minimum period of 90 days, computed from the date of award of the contract.

9. Earnest Money Deposit (EMD):

(a) The tenderer will submit Earnest Money Deposit for a sum of Rs 15000/- with the Technical Bid.

(b) The Technical Bid must be accompanied by Earnest Money Deposit to be submitted in the form of Demand Draft/ Banker's Cheque drawn on any Scheduled Bank in favour of "Registrar, Ambedkar University Delhi" payable at Delhi.

(c) The EMD of other Bidders will be returned after placing of the order to the successful vendor.

(d) Earnest Money is required to protect the purchaser against the risk of the Bidder's conduct, which would warrant the forfeiture of the EMD. Earnest money of a Bidder will be forfeited, if the Bidder withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender or if it comes to notice that the information/documents furnished in its tender is incorrect, false, misleading or forged without prejudice to other rights of the purchaser.

(e) The successful Bidder's EMD will be forfeited without prejudice to other rights of the purchaser, if it fails to furnish the required performance security within the specified period.

10. Performance Security:

(a) The successful vendor would be required to furnish a Performance Security equal to 5% of the cost of the supply order in the form of Demand Draft/ FDR/ Bank Guarantee from any Scheduled Bank in favour of "Registrar, Ambedkar University Delhi" payable at Delhi.

(b) In case the Performance Security is submitted in the form of Bank Guarantee, the same should be valid for a period of 3 (three) months beyond the date of expiry of the contract. AUD reserves the right to ask for performance guarantee extension if contractual obligations are not fulfilled.

11. Criterion for Evaluation of Tenders:

- (a) The evaluation of the tenders will be made first on the basis of technical information furnished in form given in Appendix B and then on the basis of commercial information furnished in form given in Appendix C.
- (b) The Committee will have the right to either call for a sample of the item(s) being procured or inspect the office/ warehouse/ godown of the bidder to ascertain the quality related aspects at the time of opening of technical bids. The bidder should facilitate the same.
- (c) As a part of the process to evaluate the tenders, the Tender Evaluation Committee may invite the bidders to make a presentation before it.
- (d) AUD will award the contract to the Bidder whose tender has been determined to be substantially responsive and has been determined as the lowest evaluated bid based on the total price of all the items listed in Appendix A, provided further that the Bidder is determined to be competent to perform the contract satisfactorily. AUD shall however not bind itself to accept the lowest or any tender bid, wholly or in part.
- (e) It must be kept in view that no decision will be given by the Tender Evaluation Committee. Any inferences drawn during the meeting of this Committee by the Bidders or their representatives will be their own view and the University will not be responsible and will not abide by the same.

12. Right of Acceptance and Other Provisions:

- (a) The acceptance of the tender rests with AUD. The university is not bound to accept the lowest tender bid and reserves the right to accept or reject any or all the Bids without assigning any reasons thereof. AUD also reserves the right to modify and/ or relax, any terms & conditions of this tender document to safeguard its interest.
- (b) The University reserves the right to cancel the supply order if it is found that the items produced for inspection/ supplied do not meet the specifications. Nothing will be payable in this case and the EMD and / or performance security of such vendor may be forfeited.
- (c) The rates shall be valid for a period of one year. AUD reserves the right to increase or decrease quantity of the items given in the enclosed Annexure - A depending on the prevailing requirement.
- (d) AUD reserves the right to black list a defaulting vendor.
- (e) Any inquiry after submission of the tender will not be entertained.

(f) Any failure on the part of the Bidder to observe the prescribed procedure and any attempt to canvas for the purchase order will prejudice the Firm's quotation.

(g) AUD reserves the right to cancel the tender process without assigning any reason whatsoever, at any stage.

(h) The tender document is valid for a period of six months from the date of issue. If Supply order is not issued within this period, the process will have to start afresh.

13. Time Schedule for Completing of work:

The work must be completed within 30 (thirty) days from date of issue of the supply order.

14. Warranty:

(a) The vendor **will provide 5 year comprehensive Onsite Warranty including technical support etc.**

(b) In case of any claim arising out of this warranty, the Purchaser/ Consignee shall promptly notify the same in writing to the vendor.

(c) Upon receipt of such notice, the vendor shall, within 48 hours respond to take action to repair or replace the defective equipment or parts thereof, free of cost, at the ultimate destination. The vendor shall take over the replaced parts/ equipment after providing their replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/ equipment thereafter. The penalty clause for non-replacement will be applicable as per the penalty clause.

(d) In the event of replacement of defective equipment during the warranty period, the warranty for the replaced equipment shall be extended for a further period.

(e) If the vendor, having been notified, fails to respond to take action to replace the defect(s) within 48 hours, the purchaser may proceed to take such remedial action(s) as deemed fit by the purchaser, at the risk and expense of the vendor and without prejudice to other contractual rights and remedies, which the purchaser may have against the vendor, including forfeiture of the performance security/ bank guarantee.

15. Delay in the Vendor's Performance:

(a) The time and the date schedule of delivery of the equipment mentioned in the Supply order/ Incorporated in Contract shall be deemed to be of the essence of the contract and the

delivery must be completed no later than the date (s) as specified in the contract / supply order.

(b) Subject to the provisions of the tender, any unexcused delay by the vendor in maintaining its contractual obligations towards delivery of the equipment and performance of services shall render the vendor liable to any or all of the following sanctions:

- i) Imposition of liquidated damages,
- ii) Forfeiture of its performance security and
- iii) Termination of the contract for default.
- iv) Blacklisting the vendor.

16. Penalty:

In the event of the Firm failing to:

- (i) Observe or perform any of the conditions of the work order as set out herein; or
- (ii) Execute the order in good condition to the satisfaction of AUD or by the time fixed by AUD.

(a) It shall be lawful for AUD, in its discretion, in the former event to remove or withhold any part of the order, until such times as it may be satisfied that Firm is able to do and will duly observe the said conditions and in the latter event to reject or remove as the case may require any order executed otherwise than in a good condition and to the satisfaction of AUD and by the time fixed by it and in both or either of the events aforesaid to make such arrangements as it may think fit for the execution of the order so removed or order in lieu of that so rejected or removed as aforesaid on account and at the risk of the Firm.

(b) Provided further that if in either event any excess cost be incurred by reason of the difference between the prices paid and the accepted rates, AUD may charge the amount of such excess cost to the Firm and the same may at any time thereafter be deducted from any amount that may become due to the Firm under this or any other contract, or maybe demanded of him to be paid within fourteen days to the credit of the AUD.

(c) In the event of discovery of any error or defect due to the fault of the Firm/ vendor at any time after the delivery of items ordered, the Firm/ vendor shall be bound, if called upon to do so, to rectify such error or defect at his own cost to the satisfaction of and within the time fixed by AUD. In the event of the delivery of any defective work, which owing to urgency or for any other reason cannot be wholly rejected AUD shall have the power to deduct from any payment due to the Firm such sum as it may deem expedient.

(d) If the vendor fails to deliver any or all of the equipment or fails to perform the services within the time frame(s) incorporated in the contract, the Purchaser/ Consignee shall, **without**

prejudice to other rights and remedies available to the Purchaser/ Consignee under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to 0.50% per week of delay or part thereof on delayed supply of equipment/ replacement parts and/ or services until actual delivery or performance, subject to a maximum of 5% of the contract price. Once the maximum liquidated damages/ or a period of 45 days, whichever is earlier, are reached, the Purchaser/ Consignee may consider termination of the contract.

- (e) In the event of work being wholly rejected, AUD may at its discretion may either:
 - (i) Permit the Firm/vendor to re-do the same within such time as it may specify at Firm's own cost of all sorts i.e. materials, labour, equipments, overheads, transportation etc;
 - or
 - (ii) Arrange to get the additional work done elsewhere and by any other person or from any other source than the Firm/vendor in which case the amount of extra cost, if any, shall be recovered from the contractor in the manner provided in sub-clause(b) of this clause.

17. Statutory Obligations:

- (a) All statutory obligations under various laws from time to time shall be borne by vendor for which no extra payment shall be made at any time during the contractual period.
- (b) The vendor shall at all times indemnify and keep indemnified the owner and its officers, employees, agents and students from and against all third party claims whatsoever (including time and shall not be limited to property loss and damages, personal accidents, injury or death of persons or servants or agents of any vendor/sub- vendor(s) and the vendor shall at his own cost and initiative at all time, maintain all liabilities under Workman's Compensation Act, Fatal Accident Act, Personal Injuries, Insurance Act and/or any other relevant Industrial Legislation, which is in force from time to time).

18. Breach of Terms and Conditions:

AUD may terminate the contract without any notice in case the vendor commits a breach of any of the terms of the contract. AUD's decision that a breach has occurred will be final and shall be accepted without demur by the vendor.

19. Subletting of Work:

The vendor shall not assign or sublet the work or any part of it to any other person or party.

20. Right to Call upon Information Regarding Status of work:

AUD has the right to call upon information regarding status of work at any point of time.

21. Terms of Payment:

(a) Material is to be supplied by the tenderer at AUD Kashmere Gate campus on specified address.

(b) Payment shall be made through NEFT transfer only and TDS as applicable will be deducted, after satisfactory supply, installation and commissioning of the said items.

(c) AUD shall be at liberty to withhold any of the payments in full or in part subject to recovery of taxes including TDS as applicable and recovery of penalties mentioned in preceding para.

22. Force Majeure:

(a) For purposes of this clause, Force Majeure means an event beyond the control of the vendor and not involving the vendor's fault or negligence and which is not foreseeable.

(b) Such events may include, but are not restricted to, acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, and freight embargoes.

(c) If a Force Majeure situation arises, the vendor shall promptly notify the purchaser in writing of such conditions and the cause thereof within fourteen days of occurrence of such event. Unless otherwise directed by the purchaser in writing, the vendor shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

23. Arbitration:

(a) If dispute or difference of any kind shall arise between the AUD and the vendor in connection with or relating to the contract, the parties shall make every effort to resolve the same amicably by mutual consultations.

(b) If the parties fail to resolve their dispute or difference by such mutual consultation, the same shall be referred to the sole arbitrator, to be appointed by the Vice Chancellor, AUD at Delhi as per the provisions of the Indian arbitration and Conciliation Act, 1996 and the rules

framed there under. His/ Her decision will be final & binding on both the parties. The venue of arbitration shall be Delhi, India

(c) All legal disputes shall be subject to the jurisdiction of Delhi courts only.

SCHEDULE OF REQUIREMENT

Bidder is required to fill the details in column Nos 4, 5 & 6 of the table given below and submit this form with the technical bid:

Sl. No. (1)	Name & Specification of the items (2)	Qty Reqd (3)	Offered Specification, make & model (4)	Whether offered items meeting the tender specifications (5)	Deviation from tender specification if any. (6)	EMD Amount in Rs. (7)
1.	Wireless LAN Controller	01 Nos.				Rs 15,000/-
2.	Access Points with PoE Injectors	25 Nos.				

Note:

Detailed specifications of Equipments are given in Appendix E.

Seal of the OEM/ Authorized Supplier/ Distributor/ Channel Partner

Name : _____

Designation _____
Of Authorized signatory

Dated _____

TECHNICAL BID

The technical bid shall contain following information in a sealed cover super scribed "Technical Bid for Supply & Installation of Wireless Controller with Access Points". It shall consist of the following documents/ information:

1. Name & Postal address of Vendor:

Telephones Nos.

E-mail:

Mobile Nos:

Fax Nos :

2. Name & address of Owners/ Partners/ Directors :

3. If Registered, Regn No with validity of registration with appropriate authority (Attach Copy of Certificate):

4. TIN/ Sales/ Service Tax Regn No. (Attach Copy of Certificate):

5. PAN No. (Attach Copy of Certificate):

6. Details of the turnover for the last three years (**indicate year-wise and attach audited document**) :

- (a) FY 2013-14 -
- (b) FY 2014-15 -
- (c) FY 2015-16 -

7. Attach Work order/ Certificate in support of experience for having undertaken Supply and installation of Wireless Controller with Access Points in the last three years (at least one proof for each year).

8. List of 3 reputed clients, with at least one client belonging to GOI/ State Govt. Dept./ PSU/ reputed private institutions with telephone No.:

- (a) Client 1 -
- (b) Client 2 -
- (c) Client 3 -

9. Has your organization been placed in defaulter category by any Govt. Department/ PSU/ Reputed Educational Institution? If not, please submit a self attested certificate to this effect.
10. Are you related in any way with any staff member of the AUD : Yes/ No.
11. Details of Earnest Money Deposit (DD No.):
12. The tender document should be **duly signed on each page.**

Check list

S. No.	Check list of documents/ Undertakings ?	YES/ NO	Remarks (Give explanation if answer is No)
1.	Is demand draft/ banker's cheque of EMD attached?		
2.	Is the bidder original equipment manufacturer (OEM)/authorised dealer?		
3.	If authorised dealer, recent dated certificate to this effect from OEM, attached or not?		
4.	Is copy of Sales/ Service Tax Regn certificate attached?		
5.	Is copy of PAN No. attached?		
6.	Is copy of TIN/ VAT No. attached?		
7.	Is audited accounts statement of the last three years attached?		
8.	Is one purchase order given by Govt organizations/ PSU/ reputed Private Institutions in the last three years attached?		
9.	Whether list of three reputed users (along with telephone numbers of contact persons) attached?		
10.	Is undertaking certifying that the Firm is not black listed signed as per Appx D?		
11.	Does the equipment comply with all the specifications given at Appx E?		
12.	Whether five year comprehensive onsite warranty offered?		

Place :

Signature of the Proprietor/ Authorized Signatory

Date :

Rubber Seal indicating complete address

Financial Bid

I/We of hereby agree, subject to acceptance of this tender by AUD, to supply and installation of Wireless Controller with Access Points in accordance with the specifications, terms and conditions of the contract as stated in the tender document at the rates and prices given below:

Sl. No. (1)	Name of the Item (2)	Brand Name & Model No. (3)	Rate per item (Rs.) (4)	VAT, Other Taxes (Rs.) (5)	Final Price per Item (Rs.) (6 = 4+5)	Qty Reqd (7)	Final amount (Rs.) (8)
1.	Wireless LAN Controller					01 Nos.	
2.	Access Point with PoE Injector					25 Nos.	
Total Amount (Rs.)							
Total Amount (in words)							

Note : The quoted rates shall include all taxes, duties, VAT, insurance, custom duty etc. as applicable and no extra shall be payable on this account. Vague offers such as custom duty extra, cartage extra, tax extra etc shall not be accepted. Any extra taxes, duties, levies not written in the above table but written separately at any other place in the bid document shall not be considered and the bidder shall bear it.

Details of other items/other accessories offered.....

Signature

Name & Designation

Name of the Firm/ Agency

Date

Seal of tenderer

UNDERTAKING

It is certified that I/ my Firm/ Agency/ Company has never been **black listed** by any of the Departments/ Autonomous Institutions/ Reputed Educational Institution/ Public Sector Undertakings of the Government of India or Government of NCT of Delhi or any other State Government and no criminal case is pending against the said Firm/ agency as on _____.

Signature of the Tenderer _____

Name of the Signatory _____

Name of the Firm/Agency _____

Seal of the Firm/Agency _____

Place:

Date: _____

Detailed Specifications of Equipments

Sr. NO.	<u>WLAN Controller based on the following key requirements:</u>		Compliance (Yes/No)	
1	Hardware and Standards:	Must be compliant with IEEE CAPWAP/LWAPP for controller-based WLANs.		
2		WLAN Controller should support up to 75 Access points in a single 1 RU/2RU chassis. Must support 25 AP licenses form day1.		
3		WLAN controller must have at least 2/4 x 1Gbps of uplink interface.		
4		Should be rack-mountable. Required accessories for rack mounting to be provided.		
5		WLC should support AP license Migration from one WLC to another		
6		Must not require a separate controller for Wireless Intrusion Prevention Access Points.		
7		Compatibility	Must support switchover between active and standby controller in a minimum time frame.	
8			Must have feature for auto recovery with auto synchronization of the client in the event of LAN and WLAN infrastructure disruption to deliver a non-stop client session	
9	RF Management:	Must support an ability to dynamically adjust channel and power settings based on the RF environment.		
10		Radio coverage algorithm must allow adjacent APs to operate on different channels, in order to maximize available bandwidth and avoid interference		
11		Must have Automatic 802.11 interference detection, Interference identification, classification, and mitigation. should dynamically updatable.		
12		Must support coverage hole detection and correction on all WLAN		
13		Must support RF Management with 40 MHz and 80 Mhz channels with 802.11n & 802.11ac		
14	IPv6 feature	WLC should support Guest-access functionality for IPv6 clients		
15	Performance:	Controller performance must remain the same if encryption is on or off for wireless SSIDs.		
16		Should support client load balancing to balance the number of clients across multiple APs to optimize AP and client throughput.		

17		Should support policy based forwarding to classify data traffic based on ACLs	
18	Security:	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), EAP with Transport Layer Security (EAP-TLS), EAP with Tunneled TLS (EAP-TTLS)	
19		Should support Management frame protection for the authentication of 802.11 management frames by the wireless network infrastructure.	
20		The Controller should support integration with wired IPS on detecting malicious client traffic.	
21		The Controller should support a capability to shun / block WLAN client in collaboration with wired IPS on detecting malicious client traffic.	
22		Controller should have rogue AP detection, classification and automatic containment feature	
23		Controller should be able to detect attacks like Broadcast deauthentication, NULL probe, from day one for all access points	
24		Controller should have profiling of devices based on protocols like HTTP, DHCP and more to identify the end devices on the network	
25		WLC should be able to exclude clients based on excessive/multiple authentication failure	
26		Shall support AES or TKIP encryption to secure the data integrity of wireless traffic	
27		Shall able to provide an air quality index for ensuring the better performance	
28	Guest Wireless	Must support internal and external web authentication.	
29	Functionality	Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.	
30		Must support user load balancing across Access Points.	
31		Must Support Bonjour Services Directory in both centralised and distributed switching architecture.	
32		Must have the capability to support the bridged/Mesh AP.	
33		Must be able to restrict the no. of Devices/logins per user	
34	Monitoring	AP must be able to monitor for Intrusion Prevention Services.	
35	Roaming:	Must support client roaming	

36	Operational:	Solution proposed must support clients roaming across all APs.		
37		Must support AP over-the-air packet capture for export to a tool such as Wireshark.		
38		Should be able to classify different types of interference within minimum time frame		
39		Should provide a snapshot of air quality in terms of the performance and impact of interference on the wireless network identifying the problem areas.		
40		Automatically adjust transmit power levels and RF channel assignment as needed to avoid interference, prevent adjacent APs from interfering and enable redundant coverage in the event of on AP failure.		
41		Should provide real-time charts showing interferers on per access point.		
42		Should support AP location-based user access to control the locations where a wireless user can access the network		
43		Should support Public Key Infrastructure (PKI) to control access		
44		Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.		
45		Should support encrypted mechanism to securely upload/download software images to and from wireless controllers		
46		Management & QOS	Must support 802.11e WMM	
47			Should have Voice and Video Call Admission and Stream prioritization for preferential QOS	
48			Controller should have Deep Packet Inspection for Layer 4-7 traffic for user for all traffic across the network to analyses information about applications usage and prioritization	
49	Should have rate limiting per user and per SSID basis for encrypted tunnel mode			
50	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.			
51	Should support AP Plug and Play (PnP) deployment with zero-configuration capability			
52	Should support AP grouping to enable administrator to easily apply AP-based or radio-based configurations to all the APs in the same group			
53	Should support selective firmware upgrade APs, typically to a group of APs minimize the impact of up-gradation			

54	Should have a suitable serial console port.	
55	Should be able to do application visibility for application running behind HTTP proxy.	
56	Controller should support Time based WLAN support to avoid after hours WLAN threats.	
57	Controller must support 802.11k and 802.11r.	
58	Should support 802.11e and WMM.	
59	Solution should have scalable and provide seamless authentication across all multiple campuses and need not re-authenticate	

Sr. NO.	<u>Indoor Access Point with 802.11ac based on the following key requirements:</u>	Compliance (Yes/No)
1	Access Points proposed must include radios for both 2.4 GHz and 5 GHz.	
2	Access point must have two ethernet ports.	
3	Access point should have serial/console port	
4	An access point must include a standard OEM provided Mounting brackets for mounting on Ceiling or Roof top.	
5	Must support 3X3 multiple-input multiple-output (MIMO)	
6	Must support simultaneous 802.11ac on 5 GHz radios (providing 1300Mbps or better data-rate) and 802.11n on 2.4Ghz Radio (providing 450Mbps or better data-rate).	
7	Access point must support a minimum of 1.6 Gbps user throughput including both the radios	
8	Must support 40 and 80 MHz wide channels in 5 GHz.	
9	Must support minimum of 22dbm of transmit power in both 2.4Ghz and 5Ghz radios. And should follow the WPC norms.	
10	The AP must be capable of optimizing the SNR exactly at the position where 802.11a/g/n/ac client is placed (beamforming) without requiring any support from clients, hence it should work with all 802.11a/g/n/ac clients.	
11	Should have capability to detect and classify non-Wi-Fi wireless interferences while simultaneously serving network traffic	
12	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.	

13	Must have -90 dB or better Receiver Sensitivity.	
14	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization	
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	
16	Must support Management Frame Protection.	
17	Must operate as a sensor for wireless IPS	
18	Must support Spectrum analysis	
19	Same model AP that serves clients must be able to monitoring the RF environment.	
20	Should support bridge/Mesh capabilities for temporary connectivity in areas with no Ethernet cabling.	
21	When operated in remote AP mode, the AP must not disconnect any clients when the connection to the controller fails.	
22	Must be plenum-rated (UL2043/EC)	
23	The APs must support centralized wireless mode with the use of a controller, but the APs must also support operation in autonomous mode without the presence of any controller, when needed.	
24	Must support 16 WLANs per AP for SSID deployment flexibility.	
25	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.	
26	Must support Power over Ethernet, power adaptor, and power injectors.	
27	802.3af (15.4W) - The access point can be powered by any 802.3af/802.3at - compliant device	
28	WiFi Alliance Certification and WPC certificate	
29	The wireless infrastructure should support intelligent multicast handling mechanisms. The APs shall support IGMP snooping and IGMP pruning. APs should not broadcast multicast packets if no multicast client is present. The controller shall support unicast and multicast delivery methods for delivering the multicast traffic down to the APs.	
30	Should have built in with kinsington compatible security lock	
31	Must support QoS and Video Call Admission Control capabilities.	
32	Should support more than 100 client devices	