( **Upgradation of LAN and Wi-Fi )**

Guru Nanak Dev Engineering College, Ludhiana an Prestigious Educational Institute, invites sealed tender (s) in two-bid format for  **“Upgradation of LAN and Wi-Fi** at the Institute as per the specification given in the tender document on turnkey basis.

|  |  |
| --- | --- |
| S.No. | DESCRIPTION |
| 01 | Availability of Tender Documents on GNDEC Site : |
| 02 | Cost of Tender Form : Rs. 1000/- |

Director, GNDEC reserves the right to reject any or all tenders without assigning any reasons.

Corrigendum/Addendum or

Cancellation of this advertisement, if any, shall be published on GNDEC Site.

**GNDEC Tender No:**

**Upgradation of LAN and Wi-Fi**

[Guru Nanak Dev Engineering College, Ludhiana](https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.gndec.ac.in%2F&ei=-ay8VLXoKYiR8QXf1IDgCw&usg=AFQjCNGZX6xnWEmuqSXE-Fw8ShoiI81zqg&bvm=bv.83829542,d.dGc)

Gill Road, Gill Park, Ludhiana, Punjab 141006

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**Notice Inviting Tender**

Guru Nanak Dev Engineering College, Ludhiana an Educational Institute invites sealed tender(s) in two-bid format for “Upgradation of LAN and Wi-Fi” at the Institute as per the specification given in the tender as Annexures on turnkey basis.

The tender document can be downloaded from the Institute website at URL Link: www.**gndec**.ac.in

Cost of Tender Form Rs. 1000/-

**Important Dates and Timings Table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Meeting/Opening** | **Date** | **Time** | **Venue** |
| Availability of Tender Documents on Website | **From**  |
| Pre-Bid Meeting | **(All pre BID queries have to be****submitted in writing on or before****by 05:00 PM as per format given in the Instruction to tenderer)** *via email to* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* | Conference Room,**On \_** Upload after addendum, if any **On \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Demonstration /POC by OEMs(Mandatory) | ***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****(during working hours)**POC email to\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* |
| Receipts of Bids( Technical + Commercial) | Date Month Year**\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | Time4:00 p.m. |  |
| Opening of | \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Time | Conference Room, |

|  |  |  |  |
| --- | --- | --- | --- |
| Technical bids | **\_\_\_\_\_\_\_\_\_\_\_\_\_** | 5.00PM |  |

All the pages of the Technical / Financial Bid shall be page numbered and all the relevant supporting documents as required must be enclosed.

Offer in the financial bid should and price should be written in both figures and total should be in both figures and words.

Envelope of technical bid & financial bid should be individually sealed and then placed in a third envelope, to be sealed and super scribed with tender name “Upgradation of

LAN and Wi-Fi” and tender number \_\_\_\_\_\_\_\_\_, due date of submission and address to:

“The Director

Guru Nanak Dev Engineering College

Ludhiana-141006”

Sealed tender should reach the Institute; latest by **(\_ by 04:00 PM)**. Tender(s) received beyond the last date of submission will be rejected. No tender will be entertained by E- mail or FAX.

Technical bid(s) will be opened **on date and Time ( at 03:00 PM)** in the Institute in the presence of the tenderer(s) or their authorized representative(s), who are present at the scheduled date and time.

Date and time of the opening of the financial bid(s) will be decided after the technical bid(s) have been evaluated by the Institute.

The financial bid(s) of only those tenderer(s) will be opened, who qualifies the technical evaluation and POC, on the specified date and time.

 The date, time & place of opening of the financial bid(s) will be intimated in due course of time.

In the event of the due date of receipt and opening of the tender being declared as a holiday for the Institute, then due date of receipt / opening of the tender will be the next working day at the same time.

The tenderer are requested to read the tender document carefully and ensure to compliance with all the instructions herein. Non-compliance of the instructions contained in this document will disqualify the tenderer from the tendering exercise.

The Institute reserves the right to select certain items in single or multiple units and reject the others or all as mentioned in the schedule and to revise or alter the specifications before acceptance of any tender and accept or reject any or all tenders, wholly or partly or close the tender without assigning any reason whatsoever. Corrigendum/Addendum, if any, shall be published on Institute Website only i.e. [www.**gndec**.ac.in](http://www.gndec.ac.in).

**Chapter-1**

**Instructions to Tenderer**

GNDEC has prepared a deployment plan and tentative number of data ports for up-gradation of LAN and Wi-Fi that cover the desired areas as per chapter 2. Tenderer is requested to inspect the sites before quoting for the Tender.

Tender should be submitted in two parts, Part – A (Technical Bid) & Part – B (Financial Bid). Envelope of Part – A should be super scribed as “Tender for Upgradation of LAN and Wi-Fi”, Part – A Technical Bid” and Envelope of Part – B should be super scribed as “Tender Upgradation of LAN and Wi-Fi”, Part – B Financial Bid”.

While POC, the vendor will have to propose the Installation Plan, which should include the upgradation of existing network and number and type of Access Points required. Any other Hardware or item required to implement the total solution should be listed separately in the Bill of Material (BOM). The quantity mentioned in the BOM is approximate and given for working lowest quote. All active network components (switches, wireless controller, Wireless Access Points, NMS) should be from established profitable companies. All passive components should be from the same manufactures except, Rack & Conduit. The tenderer should also submit a detailed un-priced Bill of Material in tabular format with complete product part codes, product description along with page number, quantity, etc. This detailed un-priced BOQ should be attached / enclosed with the technical compliance both in hard copy as well as soft copy.

**1.1 Pre – Qualification Criteria:**

a) Only manufacturer(s) or their sole authorized distributor / authorised partners are eligible to bid.

Authorization letter from Original Equipment Manufacturer (OEM) in favour of authorized Partner to bid / negotiate / conclude the order against this tender, must be enclosed with technical bid.

b) The tenderer shall be required to submit the Earnest Money Deposit (EMD) for an amount of Rs.\_\_\_\_\_\_\_\_ which is refundable and a non- refundable tender fee for an amount of Rs.1,000/- (Rupees One Thousand only) by way of demand drafts only. The demand drafts shall be drawn in favour of “Director, Guru Nanak Dev Engineering College, Ludhiana” payable at Ludhiana. The demand draft for earnest money deposit must be enclosed in the envelope containing the technical bid.

c) The tenderer must be reputed System Integrator/ OEM authorized representative and must have minimum turnover of **10 Crore** (annually) during last three financial years (FY 11-12, FY 12-13, FY 13-14). Financial statement showing annual turnover and net profit duly certified by **Charted Accountants** for the last three financial years should be attached.

d) All Switching Components like Core Switch, Distribution Switches, and Access Switches should be of single OEM (same make) and all Wi-Fi Components like WLAN Controllers, Access Points and POE injectors should be of single OEM (same make). Operating System Software (OS) of all active components should be same for ease of management and upgrades. All active components should be from leaders and visionary manufacturers and their authorized partner/dealers of wired network like Cisco/ HP/ Juniper / Brocade / Extreme/ etc. and Wi-Fi network like Cisco/ HP/Aruba/ Ruckus/ Motorola/etc. All active managed switches and their OS should be NDPP/ EAL Common criteria certified. All passive components should be from same OEM except Racks. The passive components like CAT6 UTP Cable, Patch Panel, Patch Cord and Information Outlets should be from reputed OEM such as AMP/MOLEX/Actassi by Schneider/ PanNet by Panduit/ etc.

e) The tenderer should be in existence for last 10 years and in business of Networking for the last minimum 5 years. The tenderer also should have their own after sales support facilities at least in one place in **and around 200 Km from Ludhiana or NCR**. The support facilities should be fully owned by the tenderer and managed by their permanent employees (company payroll) and not through franchisee(s).(Documentary proof of the same should be attached).

f) The OEM should have two local spares depot in India in order to provide immediate support. (Documentary proof of the same should be attached).

g) The System Integrator/ Tenderer must have successful executed orders in any combination of the below mentioned amounts during last three financial years i.e.

2011, 2012, 2013 for similar (Wired / Wi-Fi System) projects. **(Certificate for**

 **successful installation and project completion from the client should be**

 **enclosed) .**

**1. 1 order of 1 Crore. Or**

**2. 2 order of Rs 50 Lakhs. (Minimum order value of 50 Lakhs.)**

h) The make offered by System Integrator / tenderer should at least have 3 successful deployments of minimum 75 nos. Access Points (AP) per site controller based wireless network installation and commissioning anywhere in India (at least one deployment in Government Organization/PSU/Autonomous Body/University of repute/ Hospitality/ Higher Education Institute of repute) during last 3 years. **(Certificate for successful installation and project completion from the client should be enclosed).**

i) The offered products in the solution against the supply order shall be latest version and should not be end of life for next 5 years, however if any product which is declared end of life product by OEM during the supply period of material, in this case the tenderer should supply replaced model or next higher model/version of the product.

j) The tenderer should not have been debarred or blacklisted by any Central / State Government Departments of India.

k) Signed & stamped compliance sheet of the technical specification of the goods with technical printed literature along with Bill of Material mentioning all the terms & conditions clearly, must be enclosed with the technical bid.

l) The tenderer shall submit the copy of the tender document if any, with each page signed and stamped to confirm the acceptance of the entire term & conditions of the tender.

m) The tender of any tenderer, who has not complied with one or more of the conditions of prequalification criteria and or fail to submit the required documents in prescribed format as mentioned / or required / or conditional tender are liable to be summarily rejected.

 n) The architecture, design & technical specifications of the offered wired and Wi-Fi solution will be evaluated by GNDEC, Ludhiana in terms of their functional requirements using “Proof of Concept” (POC). POC clearly indicates the capabilities & limitations of their offered solution and how it achieves the expectations/requirements of GNDEC. A demonstration / POC will be held \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date and \_\_\_\_\_\_\_\_\_\_\_Time. It is mandatory to participate in POC for further tendering process (subject to minimum scoring of 70% Marks in POC). The POC will be divided into two parts as below:

1. Tenderer will provide the complete Solution Architecture Design and Implementation process along with Node & connectivity details along with delivery and implementation schedule.

II. POC should be done as per details furnished by the SI/OEM with the WLAN Controller and Access points (same make and model as compliance with the specification quoted) for the offered Wi-Fi Solution. The solution should provide -

60 dbm or better RSSI. The whole campus should be covered under same RSSI. Access Points should be capable to deliver Full HD video streams to 15-20 multiple Wi-Fi devices without any jam / jerk in the streaming. The complete deployed system will be evaluated/ tested using various testing tools in terms of RSSI, throughput, download/upload streams etc.

The Technical committee will evaluate the POC with respect to the functional and quality requirements of end user. After evaluating the POC, the committee will decide the list of successful tenderers. The tenderer Scoring 70% or above in the POC will be qualified for further participation in bids. Further, the Technical Committee has right to change the POC procedure or to amend the Test parameters/Test Plan, if felt necessary. Failure in POC leads to rejection of bid.

**1.2 Earnest Money Deposit (EMD):**

The tenderer shall be required to submit the Earnest Money Deposit (EMD) for an amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which is refundable by way of demand draft only. The demand draft shall be drawn in favour of “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”.

The demand draft for earnest money deposit must be enclosed in the envelope containing the technical bid. Any technical bid found without the demand draft of earnest money will be rejected. The Institute will not be liable to pay any interest on such an amount. The earnest money deposited shall be forfeited, if the tenderer withdraws its bid during the period of tender validity.

The earnest money of the tenderer, whose tender has been accepted, will be returned on the submission of the performance security. Earnest money deposit of the successful tenderer shall be forfeited, if it refuses or neglects to execute the order or fails to furnish the required performance security within the time frame as specified by the Institute.

After the award of the contract to the successful tenderer, the earnest money deposit of the unsuccessful tenderer(s) will be refunded within 30 days.

**1.3 Pre-Bid Meeting:**

All pre-bid queries have to be submitted in writing to **Chairman, Wired & Wi-Fi Committee, GNDEC, Ludhiana** on or before \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the format given below on the letter head of the company.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr No | Page No | Clause /Point No. | Subject | ClarificationSought | Remarks(if any) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Only two people (OEM / System Integrator) will be allowed to attend the Pre-bid meeting. Interested tenderer may choose to attend pre-bid meeting at their own cost.

No queries will be entertained after this allotted time frame. As a result of the discussion in the pre-bid meeting, if it is considered necessary to modify the technical specifications or any tender conditions, the same shall be carried out. The modified tender documents will again be uploaded on website.

**1.4 Tender Evaluation:**

The Institute will evaluate the entire tenders, strictly on the basis of the terms & conditions incorporated in the tender document and terms, conditions etc. as stipulated by the tenderer(s) in their tender to determine whether these are compliance in all respects, as specified in the tender document.

During the evaluation / scrutiny of the tenders, at any stage, if it is found that any of the tenderer(s) terms and conditions are not compliance with tender document, Institute may seek the clarification within the specified target time and if the tenderer fails to reply / or not agree / accept the terms and conditions, their tender will be treated as unresponsive and it is liable for rejection. Bids of only POC qualified tenderer will be entertained.

Evaluation of the proposals shall be done in two stages as:

**1.4.1. Stage – I (Technical Evaluation)**

Technical evaluation of the proposals shall be done in two stages as:

**Sub-Stage –1 A (Essential pre-qualification criteria)**

• Institute will examine all the bid(s) to determine whether they qualify the essential prequalification criteria, whether tenderer has submitted the EMD with technical bid along with all the documents as mentioned / or required in the tender document. Further whether all the documents are in prescribed format and have been properly numbered, signed & stamped and complete and generally in order.

• Tender(s) which will not qualify Sub-Stage–A are to be treated as unresponsive and will be rejected.

**Sub-Stage –1 B (Technical Specification)**

a) The tenderer should clearly specify and state the methodology to implement the project. The entire time schedule, with specific landmarks must also be furnished. Approach paper should contain:

• Solution Architecture Design.

• Implementation methodology along with Node & connectivity details.

• Issue, Suggestion & Risks.

• Project time schedule & dependency.

• Integration & Acceptance Test

b) The Institute will examine the detailed technical specification of the quoted model, whether these are complying with the specifications as mentioned in of tender document.

c) The tender which is not compliant with the tender specifications will be rejected.

After the evaluation of technical bid(s), a list of the tenderer(s) who qualify the technical evaluation (Sub – Stage – A & B) shall be made. Shortlisted tenderer(s) shall be informed for the date, time and place of opening of the financial bid(s) and they may depute their representative/s to attend the opening of the financial bid(s). The financial bid(s) of the only technically qualified tenderer(s) will be opened.

**1.4.2Stage – II (Financial Evaluation):**

Financial bid(s) of the only technically qualified tenderer(s) will be opened for financial evaluation. Prices should be inclusive of Taxes & duties as applicable. The financial bid(s) will be evaluated on the basis of the total cost as quoted. The quoted rates should be applicable for Educational Institutions and if any cost advantage received in lieu thereof should be passed on to the Institute.

If there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly and same is to be conveyed to the tenderer with specified target time, if the tenderer does not agree with the observation of the Institute, the tender is liable to be ignored.

The rates should be quoted in Indian Rupees on FOR at destination with complete description. Name of the manufacturer, model number must be indicated clearly in the Performa invoice / quotation, failing which the same shall be liable for rejection..

**1.5 Validity:**

Quoted rates must be valid for a period of 90 days from the date of the closing of the tender. The overall offer for the assignment and tenderer quoted price shall remain unchanged during the period of validity. If the tenderer quotes the validity shorter than the required period, the same will be treated as unresponsive and it may be rejected.

In case the tenderer withdraws, modifies or changes his offer during the validity period, the tender is liable to be rejected and the earnest money deposited shall be forfeited without assigning any reason thereof. The tenderer should also be ready to extend the validity, if required, without changing any terms, conditions etc. of their original tender.

**1.6 Delivery & Installation:**

All the goods ordered should be delivered within 12 weeks from the date of the receipt of the purchase order and satisfactory installation / commissioning and handover of the equipment will be completed within 12 weeks from the date of receipt of the material at the Institute premises and it will be ready to use within 24 weeks on faultless working condition from the date of the issue of the purchase order or within such time as may be extended by the Institute.

**Satisfactory Installation:** Satisfactory installation / commissioning and handing over of the equipment mean the network is working without any delays for more than 30 days.

**Extension of Delivery & Installation Period:** If the supplier is unable to complete the project / order within the stipulated time, for which the supplier is responsible, it is required to request for the extension of the delivery period, it may be extended by competent authority if so desired.

In case the supplier fails to complete the order / project within the stipulated time, Institute reserves the right to cancel the contract / order and performance security / EMD may be forfeited.

 **Extension of Delivery & Installation Period:** If the supplier is unable to complete the

 Project / order within the stipulated time, for which the supplier is responsible, it is required to

 for the extension of the delivery period, it may be extended by competent authority if so desired

In case the supplier fails to complete the order / project within the stipulated time, Institute reserves the right to cancel the contract / order and performance security / EMD may be forfeited.

**1.7 Warranty:**

Tender must be quoted with the three (03) years comprehensive on-site Warranty.

**1.8 Training of Personnel:**

The supplier shall be required to undertake to provide the technical training to the personnel involved in the use of the equipment at the Institute premises on administration and troubleshooting of the network and services, immediately after completing the installation of the equipment for a minimum period of two weeks at the company cost at the campus of GNDEC.

**1.10 Award of Contract:**

After due evaluation of the financial bid(s), the Institute will award the contract to the lowest evaluated responsive tenderer (hereinafter referred to as the “Supplier”) However, the Institute also does not bind itself to accept the lowest or any tender or assign any reason for non-acceptance.

 **1.11 Payment Terms:**

1. 90% payment of the order value shall be released after the receipt of material in good condition at the Institute premises after inspection in phase wise manner.
2. Balance 10% of the order value shall be released after satisfactory installation and Submission of the test report.
3. Payment for all miscellaneous items like pipe, HDPE pipe, Chambers, and PVC Conduit

 shall be made on actual basis on pro-rata basis.

**1.12 Jurisdiction:**

All disputes shall be subject to the jurisdiction of the Court of Law at Punjab.

 **(Signature of the Tenderer)**

**Name:**

**Contact No:**

**E-Mail ID:**

**CHAPTER-2**

**Schedule of Requirements & Scope of the Work**

The scope of work shall consist of supply, installation, up-gradation, and preparation of design, drawings, test and commission of LAN / Wi Fi system in all respects and its maintenance during warranty period to the following (to be extended as per requirement) :

1. Supply and installation of switches, indoor/outdoor access points, Wireless LAN controllers, related accessories and software as per the specifications outlined in the tender document.

3. Be centrally manageable across all sites. All the proposed solution should be managed from a centralized location.

4. The existing OFC must be used where ever possible. All the connectivity to various labs and other areas where existing switches and network are running has to be connected with the campus network.

 5. Solution must support Zero IT Configuration on end-user device

6. The System Integrator / Tenderer shall provide complete end to end solution, configuration, administration and operational documentation of overview, implementation instructions. Network Documentation along with Labelling of Cables, I/Os, Jack Panel, Switches and Access Points. OTDR to be done from both sides of OFC.

7. Design of wireless systems for all the location of access points as to provide coverage as outlined in the documents. The coverage criteria shall be:

a) At least -65dBm at 95% of the intended coverage locations

b) At least -70dBm at 100% of the intended coverage locations.

(If failed, extra access points to be added at their own cost to meet the GURU NANAK DEV ENGINEERING COLLEGE requirements). In hostels and residential area, Wi- Fi must cover all rooms, mess, and common area.

10. Design of multiple VLANs and IP addressing scheme for the wired and wireless network and configure the wired and wireless to implement the design.

11. Design and Implementation of wired and Wireless LAN security and authentication system for providing secure access to students, faculty and guests.

 12. Proper physical protection to be given to all the access points.

13. The firm shall be responsible to draw complete site plan and network layout in the form of diagram or chart of work done and the equipment installed at the site.

14. Records of software licenses and versions of software installed.

15. Be scalable for future expansion without capacity throughput, or other performance constraints. The proposed system should be scalable.

16. The system should be able to provide network and internet access to any device which is Wi-Fi enabled. The user can access the internet on any of their smart devices such as Smart Phones, Laptops and Tablets etc. regardless of software browser and operating system.

17. Testing may also be carried out at the discretion of the Institute, from the lot of finished product brought at site by the supplier. In case such tests have been carried out by the principal manufacturer at its testing facility, the same will be provided by the supplier for consideration. Also provide any certification carried out on the cabling.

18. Penta-scanning should be done at minimum 250 MHz, report less than 250 MHz should not be considered and component should not be accepted. The report should be submitted in .FLW & PDF format.

19. Bidder can suggest changes in existing server room, if required.

**2.1 Network Diagram: Tentative Network Design**

 ****

**2.2 Number of Data Points Building Wise**

|  |  |  |
| --- | --- | --- |
| **Main Locations** | **Sub Locations** | **No. Of Data Points** |
| Computer Centre | Ground Floor | 36 |
| MBA | Ground Floor | 24 |
| First Floor | 24 |
| Second Floor | 10 |
| Record room | Ground floor | 34 |
| Committee Room | Ground floor | 4 |
| Central Library | Ground Floor | 7 |
| First Floor | 34 |
| Consultancy Cell | Ground floor | 20 |
| Model Lab Civil | First Floor | 9 |
| Teachers Sitting Hall (Near Library) | Ground Floor | 24 |
| Auditorium | Ground Floor | 3 |
| Departmental Civil Library | Ground Floor | 30 |
| EDA Lab | First Floor | 10 |
| Computational Lab Electrical | First Floor | 56 |
| Main Block  | Second Floor | 12 |
| Applied Electronics Lab | First Floor | 5 |
| CSK applied Science | First Floor | 22 |
| Microwave Lab Electronics | Ground Floor | 39 |
| Electronics Library | Ground Floor | 12 |
| Heat Engine Lab | Ground Floor | 18 |
| Workshop Store | Ground Floor | 5 |
| Production Lab | Ground Floor | 24 |
| Boys Hostel 1 | Ground Floor + First Floor | 6 |
| Boys Hostel 2 | Ground Floor | 2 |
| Boys Hostel 5 | Ground Floor | 2 |
| Boys Hostel 6 | Ground Floor | 2 |
| Girls Hostel | Ground Floor | 4 |
| Director’s Residence | Ground Floor | 4 |
| Trust Office | First Floor | 8 |
| Alumni Home | Ground Floor | 4 |

**All the Lawns and corridors to be covered with Wi-Fi connectivity**

**BILL OF MATERIAL**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.No** | **Description** | **UoM** | **Unit** | **Unit Price** | **Total** |
| 1 | Core switches as per the specs | Nos | 1 |   |   |
| 2 | Distribution Switch Type 1 as per the specs | Nos | 7 |   |   |
| 3 | Access Switch Type 1 as per the specs | Nos | 10 |   |   |
| 4 | Access Switch Type 2 as per the specs | Nos | 1 |   |   |
| 5 | Access Switch Type 3 as per the specs ( These are as per the wireless Access Point Proposed) Quote as per your design | Nos | Quote as per your design |   |   |
| 6 | Access Switch Type 4 as per the specs (These are as per the wireless Access Point Proposed). Quote as per your design.  | Nos | Quote as per your design |   |   |
| 7 | NMS as per the specs with Real time reporting via Email and SMS. | Nos | 1 |   |   |
| 8 | 10G Lasers SM @1310 nm | Nos | 20 |   |   |
| 9 | 1G Lasers SM @ 1310 nm | Nos | 36 |   |   |
|   | **Wireless** |   |   |   |   |
| 10 | Indoor Access Point 1 as per the specs(Tentative) | Nos | 160 |   |   |
| 10 | Indoor Access Point 2 as per the specs (Tentative) | Nos | 20 |   |   |
| 11 | Outdoor Access Point as per the specs (Tentative) | Nos | 30 |   |   |
| 12 | Wireless Controller with AP License as per proposed Access Point by bidder. (No of license in controller should be No of AP bided + 50 license) | Nos | 2 |   |   |
| 13 | POE injectors Gigabit (Tentative) | Nos | 50 |   |   |
| 16 | Cat 6 cable UTP as per specs .(Bidder to quote as per there design) (Tentative) | Box | 1 |   |   |
| 17 | Cat 6 Patch Panel with rear cable manager as per specifications(Tentative) | Nos | 61 |   |   |
| 18 | Cat 6 Information outlet as per specs(Tentative) | Nos  | 691 |   |   |
| 19 | Cat 6 Patch Cords 0.5 mtrs as per specs(Tentative) | Nos | 210 |   |   |
| 20 | Cat 6 Patch Cords 1.0 mtrs as per specs(Tentative) | Nos | 691 |   |   |
| 21 | Cat 6 Patch Cords 2.0 mtrs as per specs(Tentative) | Nos | 691 |   |   |
| 22 | Face Plate with Back Box 3x3 as per specs(Tentative) | Nos | 691 |   |   |
| 23 | Cable Managers 1 U with plastic rings(Tentative) | Nos | 61 |   |   |
| 24 | Cat 6 Outside plant U/UTP cable roll of 305 mtrs as per specs ( Company to quote as per the design) (Tentative) | Box | 1 |   |   |
|   | **FIBER MATERIAL SM OS2** |   |   |   |   |
| 25 | Fiber cable SM OS2 12 core as per specs. (Bidder to quote as per there design.) | Mtrs | 1 |   |   |
| 26 | Fiber cable SM OS2 6 core as per specs. (Bidder to quote as per there design.) | Mtrs | 1 |   |   |
| 27 | LIU loaded 24 Port Drawer Style with Splice tray | Nos | 3 |   |   |
| 28 | LIU loaded 12 Port Drawer Style with Splice tray | Nos | 22 |   |   |
| 29 | Pigtails SM OS2 as per specs | Nos | 264 |   |   |
| 30 | Patch Cords SC -LC SM OS2 3 mtrs as per Specs | Nos | 40 |   |   |
|   |  **OTHER MISC. ITEMS** |   |   |   |   |
| 31 | HDPE pipe with inside thread with accessories. (Bidder to quote as per there design.) | Mtrs | 1 |   |   |
| 32 | PVC Pipe 32 MM ISI mark with accessories (Bidder to quote as per there design.) | Mtrs | 1 |   |   |
| 33 | Rack 9 U as per specs | Nos | 28 |   |   |
| 34 | Rack 15 U as per specs | Nos | 6 |   |   |
| 35 | Pole as per Specs(tentative) | Nos | 30 |   |   |
|   | **SERVICES**  |   |   |   |   |
| 36 | Installation of Copper point on Cat 6 which includes termination ,jack panel installation, testing ,Feruling ,Labeling ,Dressing ,Rack installation ,switch mounting, AP mounting, Patching , Penta testing ,Site Certification , documentation and conducting.Mounting (Actuals) | Nos | 1 |   |   |
| 37 | Laying Of Fiber (Actuals) | Mtrs | 1 |   |   |
| 38 | Splicing Per Core with OTDR from Both Sides | Nos | 264 |   |   |
| 39 | Laying Of HDPE pipe (Actuals) | Mtrs | 1 |   |   |
| 40 | Trenching Soft/Hard Soil (Actuals) | Mtrs | 1 |   |   |
| 41 | Other charges, if any | No | 1 |   |   |
| 42 | Cost of Resident Engineer for 1 years, if any | No | **1** |   |   |
|  | **Grand Total** |  |  |

**Annexure- Technical Compliance Sheet Switches**

**(All the Switches and OFC/Copper Module Should be of Single OEM)**

**Core Switch**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch architecture should be modular / virtual chassis based with minimum 4 or more line card slots / units. |  |  |
| 2 | Switch should have internal redundant power supplies and fans from day one. |  |  |
| 3 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 4 | The Core Switch should have the following ports from day one in any combination:* 12x 10G SFP+ or more
* 20x 1G SFP or more
* 20x 10/100/1000 BaseT or more
* 6x 40G QSFP or more
 |  |  |
| 5 | Should support minimum 800 Gbps or more backplane capacity. |  |  |
| 6 | Should support minimum forwarding rate 595 Mpps or more |  |  |
| 7 | Support for IPv4 and IPv6 from day one.  |  |  |
| 8 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 9 | Should have Static Routing, RIP, VRRP, ECMP, PIM SM and PIM- SSM from day 1 |  |  |
| 10 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 11 | Should support Hot Standby Router Protocol (HSRP) or equivalent protocol to create redundant topologies. |  |  |
| 12 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 13 | Should support minimum 8 ports or more of Bandwidth aggregation through Ether Channel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 14 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 15 | Should support min 28K MAC addresses and min 4096 active VLANs. |  |  |
| 16 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 17 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 18 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

**Distribution Switch**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 2 | Switch should have minimum of 24x 10/100/1000 RJ45 Ethernet ports plus 2x 10G SFP+ based ports for uplinks and support redundant external / internal power supply. |  |  |
| 3 | Should support stacking up to 6 units or more in a single stack managed by a single IP address and necessary stacking ports should be available from day one. |  |  |
| 5 | Should support minimum 88 Gbps or more switch fabric capacity. |  |  |
| 6 | Should support minimum forwarding rate 65 Mpps or more |  |  |
| 7 | Should Support for IPv4 and IPv6 from day one.  |  |  |
| 8 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 9 | Should have Static Routing, ECMP, IGMP Snooping (v1/v2/v3) from day 1 |  |  |
| 11 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 12 | Should support Hot Standby Router Protocol (HSRP) or equivalent protocol to create redundant topologies. |  |  |
| 13 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 14 | Should support minimum 8 ports or more of Bandwidth aggregation through Ether Channel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 15 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 16 | Should support min 12K MAC addresses and min 2000 active VLANs. |  |  |
| 17 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 18 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 19 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

**Access Switch (Type 1) POE**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 2 | Switch should have minimum of 24x 10/100/1000 RJ45 Ethernet ports plus 4x 1G SFP based ports for uplinks. |  |  |
| 3 | Should support stacking up to 4 units or more in a single stack managed by a single IP address and necessary stacking ports should be available from day one. |  |  |
| 4 | Should support minimum 56 Gbps or more switch fabric capacity. |  |  |
| 5 | Should support minimum forwarding rate 41 Mpps or more |  |  |
| 6 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 7 | Should support IGMP Snooping (v1/v2/v3) from day 1 |  |  |
| 8 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 9 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 10 | Should support minimum 8 ports or more of Bandwidth aggregation through Ether Channel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 11 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 12 | Should support min 8K MAC addresses and min 1000 active VLANs. |  |  |
| 13 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 14 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 15 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

**Access Switch (Type 2) POE**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 2 | Switch should have minimum of 48x 10/100/1000 RJ45 Ethernet ports plus 4x 1G SFP based ports for uplinks. |  |  |
| 3 | Should support stacking up to 4 units or more in a single stack managed by a single IP address and necessary stacking ports should be available from day one. |  |  |
| 4 | Should support minimum 104 Gbps or more switch fabric capacity. |  |  |
| 5 | Should support minimum forwarding rate 77 Mpps or more |  |  |
| 6 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 7 | Should support IGMP Snooping (v1/v2/v3) from day 1 |  |  |
| 8 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 9 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 10 | Should support minimum 8 ports or more of Bandwidth aggregation through EtherChannel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 11 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 12 | Should support min 8K MAC addresses and min 1000 active VLANs. |  |  |
| 13 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 14 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 15 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

**Access Switch (Type 3) NON-POE**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 2 | Switch should have minimum of 24x 10/100/1000 POE/POE+ RJ45 Ethernet ports plus 4x 1G SFP based ports for uplinks. |  |  |
| 3 | Should support stacking up to 4 units or more in a single stack managed by a single IP address and necessary stacking ports should be available from day one. |  |  |
| 4 | Should support minimum 56 Gbps or more switch fabric capacity. |  |  |
| 5 | Should support minimum forwarding rate 41 Mpps or more |  |  |
| 6 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 7 | Should support IGMP Snooping (v1/v2/v3) from day 1 |  |  |
| 8 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 9 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 10 | Should support minimum 8 ports or more of Bandwidth aggregation through EtherChannel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 11 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 12 | Should support min 8K MAC addresses and min 1000 active VLANs. |  |  |
| 13 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 14 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 15 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

**Access Switch (Type 4) NON-POE**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Switch should have wire-speed, non-blocking and distributed forwarding on all the ports. |  |  |
| 2 | Switch should have minimum of 8x 10/100/1000 RJ45 Ethernet ports plus 4x 10/100/1000 POE/POE+ RJ45 based ports. |  |  |
| 3 | Should have 2x SFP ports for uplinks available from day one. |  |  |
| 4 | Should support minimum 28 Gbps or more switch fabric capacity. |  |  |
| 5 | Should support minimum forwarding rate 20 Mpps or more |  |  |
| 6 | Should support Q-in-Q VLAN tagging or equivalent feature.  |  |  |
| 7 | Should support IGMP Snooping (v1/v2/v3) from day 1 |  |  |
| 8 | Should support PVST / PVST+ or equivalent spanning tree protocol  |  |  |
| 9 | Should support Unidirectional Link Detection Protocol (UDLD) or equivalent protocol to allow unidirectional links failure detection |  |  |
| 10 | Should support minimum 8 ports or more of Bandwidth aggregation through EtherChannel or equivalent protocol enhances fault tolerance and offers higher-speed aggregated bandwidth  |  |  |
| 11 | Should support VTP or equivalent protocol for dynamic VLAN registration |  |  |
| 12 | Should support min 8K MAC addresses and min 1000 active VLANs. |  |  |
| 13 | Support management using CLI, GUI, using Web interface. Additionally, management can also be done using NMS.  |  |  |
| 14 | Hardware and Software of the switch should be common criteria EAL / NDPP certified. |  |  |
| 15 | Should be quoted with 3 years direct OEM TAC support and Next Business day hardware shipment. |  |  |

|  |
| --- |
| **Wireless Controller** |
|  | **Essential Features:** |  |  |
| 1 | WLAN Controller should have minimum 2 nos. of10/100/1000 Ethernet Ports and one Console port. It should be 1/2U Rack Mountable. |  |  |
| 2 | Proposed Controller should be ready for supportingExtra 50 AP’s from day one with scalability for 500 AP support in future without adding any new hardware. Each controller (primary and Redundant) should be able to support minimum 6000 devices and 500 campus connected AP’s or more with support of seamless roaming access over L2/L3. Network.**(50 extra licenses means eg if as per bidder survey, no of AP’s required is 250, then bidder will be quotating controller with 300 Access Point License.)** |  |  |
| 3 | Redundancy Features: Controller Must provide Active:Active/Active: Standby with 1+1 and N+1 redundancy. The controllers will be implemented in HA mode so When the primary controller fails secondary controller comes up immediately. There should be 100% redundancy for Primary controller i.e. N: N including Hardware and desired licenses to support AP’s |  |  |
| 4 | Controller should support minimum 256 WLAN’s |  |  |
|  | **General Feature** |  |  |
| 5 | Controller should provide air-time fairness between these different speed clients – slower clients should not be starved by the faster clients and faster clients should not adversely affected by slower clients. |  |  |
| 6 | Controller should support Spectrum Analysis feature toDetect interference from different sources. System Should provide real-time charts showing interference for access point, on a per-radio, per-channel basis. |  |  |
| 7 | Ability to map SSID to VLAN and dynamic VLANsupport for same SSID. |  |  |
| 8 | Controller must support 802.11k and 802.11r. |  |  |
| 9 | Access points can discover controllers across Layer-3 network through DHCP or DNS option |  |  |
|  | **Security & monitoring** |  |  |
| 10 | Controller should support following for security &Authentication: |  |  |
| 11 | WIRELESS SECURITY: WEP, WPA-TKIP, WPA2- AES, 802.11i |  |  |
| 12 | AUTHENTICATION : 802.1X, local databaseExternal AAA servers : Active Directory, RADIUS, LDAP |  |  |
| 13 | System should provide DOS attacks and IntrusionDetection & Prevention and Control for any RoughAccess Points. |  |  |
| 14 | The AP should be able to scan for rogue access points and the controller should be able to locate them on afloor map. The controller/System should be able to send a notification to the administrator when a rogue AP has been detected. |  |  |
| 15 | System must be able to provide L2/L3/L4 AccessControl. |  |  |
| 16 | Controller Should support L2 Client Isolation so Usercannot access each other’s devices. Isolation should have option to apply on AP or SSID's. |  |  |
| 17 | Controller should be able to create local database of upto 5000 users. |  |  |
| 18 | IPv4 & IPv6 support from Day 1 |  |  |
| 19 | Controller should support integrated or External AAAServer including Microsoft AD and Linux based open source AAA servers. |  |  |
| 20 | The proposed architecture should be based onController based Architecture with thick AP deployment. While Encryption / decryption of 802.11 packets should be able to perform at the AP. |  |  |
| 21 | The Controller should support OS/Device identification and device type based policies i.e allow ordeny, Bandwidth rate limit, VLAN mapping. |  |  |
| 22 | When Mesh is enabled the controller should be able to show the mesh topology on floor plans. |  |  |
| 23 | The controller/System should be able to raise critical alarms by sending an email. The email client on the controller should support SMTP outbound authentication and TLS encryption. |  |  |
| 24 | The vendor should specify if all features are availablewith the basic access controller pricing or if the support of some features require the acquisition of some licenses. The vendor should specify which feature requires which type of licensing including its cost. |  |  |
| 25 | Controller should have BYOD features and GuestAccess management procedure where user may use internet without entering to Enterprise SSID and should be time restricted. |  |  |
|  | **QoS features** |  |  |
| 26 | per SSID or dynamic Per user bandwidth Rate Limiting |  |  |
| 27 | Support advanced multicast features and WMMsupport to provide best performance on Video applications. |  |  |
| 28 | Should have Voice Call Admission control |  |  |
|  | **Client Management** |  |  |
| 29 | The controller should provide a Guest Login portal inorder to authenticate users that are not part of the organization. |  |  |
| 30 | The Controller should be able to provide a web-based application that allows non-technical staff to create Guest accounts with validity for fixed duration like hours or days. |  |  |
| 31 | System should be able to send password direct throughEmail and SMS to the user. |  |  |
| 32 | System should be able to generate one click passwordfor single user, multiple users or single user multiple devices. |  |  |
| 33 | System should support user management features likeRate limiting based on time based WLAN Access & User profile per WLAN etc. |  |  |
|  | **Regulatory** |  |  |
| 34 | Wi-Fi Alliance certified |  |  |

|  |
| --- |
| **Indoor Access Point - A** |
| 1 | The Access Point should have minimum 1 Port10/100/1000Mb POE Uplink port. |  |  |
| 2 | 802.11n Access Point should be able to power up usingstandards 802.3af POE input, and at the same timeOperate in full MIMO mode. It must have option to power through 12 VDC power Adaptor also. |  |  |
| 3 | AP should have Dual Radios to support 2.4 GHz &5Ghz concurrent users with 802.11 a/b/g/n/ac capability. AP Must support 2x2 MIMO. |  |  |
| 4 | AP should be able to handle 200 or more Concurrentusers. |  |  |
| 5 | AP should provide minimum 23 dBm Transmit powerfor 2.4Ghz and 21 dBm for 5Ghz radio.(EIRP should be limited as per govt. regulation for indoor AP's). |  |  |
| 6 | AP should have -99 dB or better Receiver Sensitivity. |  |  |
| 7 | Access Points can perform encryption / decryption on itself so as not to bottleneck the controller |  |  |
| 8 | SSID support : 16 BSSID (8 BSSID per Radio) |  |  |
| 9 | AP should support upto 300Mbps datarates in 2.4Ghz 802.11b/g/n and upto 850 Mbps in 5Ghz 802.11/a/n/ac . |  |  |
| 10 | The access point should support 802.1q VLAN tagging |  |  |
| 11 | Antenna: Integrated omni-directional, with min 3 dBGain for 2.4Ghz and 5Ghz both. |  |  |
| 12 | Implement Wi-Fi alliance standards WMM, 802.11d,802.11h and 802.11e |  |  |
| 13 | AP Must support spectrum Analysis to detect RFInterference in indoor area. |  |  |
| 14 | AP should have technique to provide better receptionfor hard to hear clients and consistent performance while clients change their orientation i.e. beamforming/polarization. |  |  |
| 15 | Should support the operating temp 0° to 45° C andHumidity: 15 to 95% non-condensing. |  |  |
| 16 | The access point should support following securitymechanism: WEP, WPA-PSK, WPA-TKIP, WPA2AES, 802.11i. |  |  |
| 17 | System should support Authentication via 802.1X, Local (controller based) authentication database, support for RADIUS and Active Directory. |  |  |
| 18 | • Web User Interface (HTTP/S) • CLI (Telnet/SSH),SNMP v1, 2, 3 |  |  |
| 19 | Should be managed by Controller or standalone if required |  |  |
| 20 | WEEE/RoHS compliance, EN 60601-1-2, Wi-FiAlliance certified, UL 2043 compliant |  |  |
| 21 | Should be WPC approved; ETA certificate to beEnclosed |  |  |

|  |
| --- |
| **Indoor Access Point - B ( For Director’s Office / HODs offices)** |
|  |
| S.No. | Technical specifications | Complied (Y/N) |   |
| 1 | The AP shall be indoor type and can be mounted on wall / ceiling. Required mounting kit should be included with each AP. |   |   |
| 2 | The AP shall have at least one Gigabit Ethernet port supporting 10/100/1000BaseT with 802.3af/at PoE support, 3 port 10/100 including 1 port POE out to power VOIP phone & One Digital PBX Pass through port support. |   |   |
| 3 | It shall support 802.11n standard along with legacy 802.11a/b/g standards. |   |   |
| 4 | It shall have Dual radio to operate in 2.4 GHz and 5 GHz band simultaneously. |   |   |
| 5 | Shall have integrated /external antenna with minimum 2x2 MIMO with 2 spatial streams. |   |   |
| 6 | Shall give throughput of 600 Mbps per AP (300 Mbps/Radio). |   |   |
| 7 | The AP shall have auto channel selection feature to avoid interference. |   |   |
| 8 | The AP shall support indoor wireless mesh configuration. |   |   |
| 9 | It shall provide at least 8 BSSID's per radio. |   |   |
| 10 | Transmit power shall be configurable as per India specific norms for indoor deployment and shall be adjustable within the permissible range. |   |   |
| 11 | Shall be able to optimize capacity and performance using airtime fairness feature. |   |   |
| 12 | Shall provide Radio transmit power of at least 19 dBm for 2.4 GHz and 16 dBm for 5 GHz bands. (Max power should be limited as per Govt EIRP limit for indoor) |   |   |
| 13 | 802.1Q based VLANs to be supported. |   |   |
| 14 | It should provide L2TP/PPoE or equivalent tunnelling support. |   |   |
| 15 | Shall support 802.11e based QoS features. |   |   |
| 16 | It shall provide software queues for prioritization of latency prone traffic like voice & video. |   |   |
| 17 | Shall support ToS and/or VLAN based traffic classification. |   |   |
| 18 | Support for Spectra link Voice or WMM with U-APSD |   |   |
| 19 | Shall support per user or per WLAN based rate limiting. |   |   |
| 20 | Shall have WISPr support for walled garden deployments as well as provisioning Wi-Fi hotspots with time based user access/session control. |   |   |
| 21 | Shall support WEP, WPA2-AES, WPA-PSK, WPA-TKIP. |   |   |
| 22 | Shall support 802.11i, 802.1x based authentication |   |   |
| 23 | Shall support Captive portal for guest user authentication. |   |   |
| 24 | Shall support centralized authentication with external RADIUS, LDAP or Active Directory. |   |   |
| 25 | Operating Temperature: 0 to 50 degree Centigrade. |   |   |
| 26 | Operating Humidity: 15% - 95% non-condensing. |   |   |
| 27 | IPv4, IPv6, dual-stack Should support |   |   |

|  |
| --- |
| **Outdoor Access Point** |
| 1 | The Access Point should have minimum 1 Port10/100/1000Mb POE in Ethernet port. |  |  |
| 2 | 802.11n Access Point should be able to power up usingstandards 802.3af/at POE input, and at the same time operate in full MIMO mode.  |  |  |
| 3 | AP should have Dual Radios to support 2.4 GHz &5Ghz concurrent users with 802.11 a/b/g/n capability. AP Must support 3x3 or 2x3 or 2x2 MIMO with 2Radio Chain |  |  |
| 4 | AP should be able to handle upto 200 Concurrent users. |  |  |
| 5 | AP should provide minimum transmissionpower of 25 dBm in 2.4Ghz and 5 Ghz. |  |  |
| 6 | Wireless Interface: Dual radio; 802.11a/b/g/n/ac; 2.4Ghzand 5Ghz |  |  |
| 7 | SSID support : 16 BSSID (8 BSSID per Radio) |  |  |
| 8 | AP should support 6.5Mbps – 130Mbps (20MHz), upto300Mbps (40MHz) datarates in 802.11n. |  |  |
| 9 | The access point should support 802.1q VLAN tagging |  |  |
| 10 | Antenna: Integrated/External for Sectorial/Omni- directional (as specified in BOQ) coverage, with min 4 dB aggregate Gain for 2.4Ghz and 5Ghz both. |  |  |
| 11 | Should support the operating temp -10° to 55° C andHumidity: 15 to 95% non-condensing. |  |  |
| 12 | AP Must be IP67 certified for outdoor deployment. APmust be outdoor rated and no AP will be accepted which is indoor and installed in outdoor casing. |  |  |
| 13 | The access point should support following securitymechanism: WEP, WPA-PSK, WPA-TKIP, WPA2AES, 802.11i. |  |  |
| 14 | System should support Authentication via 802.1X, Local (controller based) authentication database, support for RADIUS and Active Directory. |  |  |
| 15 | Web User Interface (HTTP/S) • CLI (Telnet/SSH),SNMP v1, 2, 3 |  |  |
| 16 | Should be managed by Controller or standalone ifRequired |  |  |
| 17 | WEEE/RoHS compliance •Wi-Fi Alliance certified |  |  |
| 18 | Should be WPC approved; ETA certificate to beEnclosed |  |  |

**IMPORTANT POINTS.**

1. **FOR WIRELESS SOLUTION**

The quantities mentioned for Wi-Fi Solution is as per our design and survey. Bidders are requested to survey the campus and give their own solution for wireless. The no of POE Switches will be changed as per the bidder design. The payments will be on actual quantities quoted as per bidder design.

1. **FOR LAN AND CAMPUS CONNECTIVITY**

Quantities for Core, Distribution and Access Switches for Data are fixed. For Data Solution no other charges would be payable by the Institute.

1. **FOR SERVICES**

Quantities will be as per actuals for services. Bidder has option to quote unit price or lumsum price. The payment will be made after successful implementation.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | **SPECIFICATIONS FOR PASSIVE AND OTHER MISC. ITEMS** |  |  |
|  |  |  |  |
|  | **ITEM WISE SPECIFICATION** |  |  |
| A | **Category 6 UTP Roll of 305 Mtrs** |  |  |
|  | Category 6 Unshielded Twisted Pair 100W cable shallbe compliant with EIA/TIA 568-C.2 |  |  |
|  | Should be 4 pair, 23 AWG |  |  |
|  | Cable should be CM rated |  |  |
|  | Cable Should Have Internal cross separator |  |  |
|  | Jacket: LSZH (Low smoke zero halogen) |  |  |
|  | Fire Propagation Test:IEC 60332-3-22 (Test CertificateNeed to be provided along with the bid) |  |  |
|  | Should be ETL verified. (Certificate Need to be provided along with the bid) |  |  |
| B | **FACE PLATE** |  |  |
|  | Single Gang square plate, 86mmx86mm |  |  |
|  | Plug in Icons – Icon tree – to be supplied with plate |  |  |
|  | Write on labels in transparent plastic window –supplied with plate |  |  |
|  | Material : ABS Plastic |  |  |
|  |  |  |  |
| C | **INFORMATION OUTLET** |  |  |
|  | Category 6, EIA/TIA 568-C.2 |  |  |
|  | All information outlets for 100 W, 22-24 AWG copper |  |  |
|  | Should have integrated shutter |  |  |
|  | Should be UL Listed and ETL verified |  |  |
|  | Contact Plating: 50 µinches gold over 100 µinchesNickel |  |  |
|  | Operating Life: Minimum 200 Re-terminations |  |  |
|  |  |  |  |
| D | **24 PORT JACK PANEL** |  |  |
|  | Should Be made of cold rolled steel |  |  |
|  | Should conform to TIA / EIA 568-C.2 ComponentCompliant |  |  |
|  | Should terminate 24 UTP CAT 6 (4 pair) Cables |  |  |
|  | Ports should be with individual dust cover and individual replaceable |  |  |
|  | Should confirm to EIA/TIA 568A wiring Pattern |  |  |
|  | Should have labelling strips for identification. |  |  |
|  | Should have integral cable management shelf. |  |  |
|  | Should be ETL verified |  |  |
|  |  |  |  |
| E | **MOUNTING CORDS (0.5 , 1 and 2 METER)** |  |  |
|  | Should be 4 Pairs 24 AWG copper cables. |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | The Outer Jacket should be Low Smoke Zero Halogen. |  |  |
|  | 24 AWG stranded bare copper |  |  |
|  | Should minimum comply with proposedANSI/TIA/EIA-568-C.2 |  |  |
|  | Should Have cross separator |  |  |
|  |  |  |  |
| F | **OPTICAL FIBER CABLE ARMORED SINGLE MODE 12 CORE - OS2** |  |  |
|  | Should be ISO.IEC 11801 - 2nd Edition, type OS2 andITU-T REC G 652D |  |  |
|  | Tube Identification : Single/Multiple tube |  |  |
|  | Fibre protection(Tube) : Polybutylene Terephthalate(PBT) |  |  |
|  | Water Blocking : Thixotropic Gel (Tube) andPetroleum Jelly (Interstices) |  |  |
|  | Core Wrapping : Polyethylene Terephthalate |  |  |
|  | Armouring : Corrugated Steel Tape Armour (ECCS Tape) |  |  |
|  | Sheath : UV Stabilized Polyethylene (HDPE) |  |  |
|  | Tensile Strength : 1500N |  |  |
|  | Mass (Nominal) : 95 kg/km |  |  |
|  |  |  |  |
| G | **FIBER PATCH PANELS – RACK MOUNT 24****PORT UNLOADED** |  |  |
|  | Have sufficient slots to accommodate Four 6 Pak SCadaptor plates |  |  |
|  | Should have fibre management provision inside |  |  |
|  | Have earthing lugs and other accessories. |  |  |
|  | Provide self-adhesive, clear label holders for labelling |  |  |
|  | Should be rack mountable 1U |  |  |
|  | Should have Separate Splice holder for 24 Fiber cores |  |  |
|  | Should be Sliding Drawer Style |  |  |
|  | Should be made of Cold Rolled Steel |  |  |
|  |  |  |  |
| H | **OPTICAL FIBER PIGTAILS SINGLE MODE OS2, 1.5 MTR** |  |  |
|  | Precision ferrule endface geometry |  |  |
|  | Factory polished, tested and serialized. |  |  |
|  | Buffer Diameter: 900um tight buffer |  |  |
|  | Minimum bend radius: install: 30 mm |  |  |
|  | Retention Strength: 100N |  |  |
|  | Cable: 900um Buffered |  |  |
|  |  |  |  |
| I | **OPTICAL FIBER EQUIPMENT CORDS** |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(MINIMUM 3 METER)** |  |  |
|  | All optical fiber patch leads shall comprise of Single mode 9/125µm OS2 fiber SC -LC |  |  |
|  | Jacket should be LSZH sheath |  |  |
|  | Connector: Zirconia ceramic ferrule |  |  |
|  | Cable: 9/125, SM OS 2 Strength member: AramidYarn |  |  |
|  |  |  |  |
| J | **CAT 6 Outside Plant UTP Cable** |  |  |
|  | TYPE: 4 pair CAT 6 UTP Cable outdoor cable withTwo Jackets Primary and secondary |  |  |
|  | CONDUCTORS Wire gauge: 23 AWG solid copper |  |  |
|  | Should have two Overall Jackets Primary Jacket :innerLSZH , Secondary Jacket Outer : Heavy duty UVresistant FRPVC Black |  |  |
|  | CROSS FILLER Star cross fillers to separate theindividual pairs |  |  |
|  | APPLICATION : Outdoor Application |  |  |
|  | OPERATING TEMPERATURE: -40 Deg C to + 60Deg C |  |  |
|  | PERFORMANCE: should meet ISO/IEC11801;TIA/EIA-568.C.2 Standards |  |  |
|  | Minimum Outer Diameter : 8.5 mm |  |  |
|  | Should be suitable for outdoor installation |  |  |

**Annexure-X**

**Proof of Concept (POC)**

The architecture, design & technical specifications of the offered wired and Wi-Fi solution will be evaluated by GNDEC Ludhiana in terms of their functional requirements using “Proof of Concept” (POC). The POC will be divided in two parts as below:-

**Part A.** The tenderer should provide the following for the offered solution

Overview of the Proposed Solution, Overall architecture, Scalability and Redundancy and Delivery and Implementation Schedule

|  |  |  |
| --- | --- | --- |
| **Sr No** | **Activity** | **Schedule in weeks** |
| 1 | LAN and Wi-Fi System Design, Layout diagramand cable route identification and approval of same. |  |
| 2 | Supply of Active & Passive components. |  |
| 3 | Installation of Passive Components like Cable Laying, Termination, IO box fixing, Rack Mounting etc. and testing thereof |  |
| 4 | Installation & Configuration of Active Componentslike, WLAN Controller, AccessPoints (AP) etc. |  |
| 5 | Testing of the entire LAN and Wi-Fi SystemIncluding Integration with Server and other Network devices, Fine-tuning as per best performance and Security polices thereof. |  |
| 6 | A centralized network management system should be supplied along with the hardware, making it possible to manage and monitor the entire network from a single location.**Real time reporting over the network and programmable alarms over e-mail and SMS should be possible in all network switches in the proposed solution IS VERY IMPORTANT.** All network switches should support IPv6 in the proposed configuration, without addition of any hardware, software or license requirement.**SPECIAL POINTS WILL BE GIVEN FOR THE FOLLOWING**• \_Technical rating of the overall proposal:• \_Features related to network management system: • \_Features related to alarms in case of a failure.  |  |
| 7 | Deployment of 1 Resident Network Engineer for the period of 1 years ( Immediately after Final inspection) |  |
| 8 | Training of officials/Users |  |
| 9 | Handover of Installed items providing details ofquantity, Warranty, Escalation Matrix, Network diagrams/Layout, Documentation, Configuration,  |  |
|  |  |

**Part B.** The GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA is expecting that offered Wi-Fi solution will provide following functionalities:-

• Good Coverage

• Sustained Throughputs to the Clients, even in the presence of interference/noise.

• Good AP Performance under load (high density usage).

• Ability to support Multimedia (Multimegabit/Multicast applications).

• Ease of Use.

• The Enterprise class secured Wi-Fi Solution.

During POC, The tenderer should submit Heatmap using Air Magnet along with number and type of tentative access points required. POC will be done using the same make & model which are complying as per the technical specifications mentioned in tender document. All offered Wi- Fi & LAN equipment’s should be as per IEEE standards. All Wi-Fi equipment specifications are subject to Indian Government guidelines and any frequency/transmission power/Antenna Gain shall stand amended automatically to that extent.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Test Description** | **Expected Results** | **Maximum****Marks** | **Marks****Obtained** | **Results Obtained/Re marks** |
| **1** | Run InSSIDer to check the Max Distance with RSSI of -65dB or better. | Note the max distanceCovered by AP with -65dB (on 2.4 GHz or 5GHz) in provided Sheet. Check for AP with Max coverage Location 1 on -65dB RSSI = 10 Marks Location 2 on -65dB RSSI = 12 Marks Location 3 on -65dB RSSI = 15 Marks (locations will be marked by Technical team during POC and will be same for all vendors) | 15 |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **2** | Throughput Test with 20-25Clients usingIperf / Jperf for2.4Ghz and 5GhzClients. | Record the throughputat different locations (inside AP coverage Area at multiple rooms) for TCP Uplink/Downlink and uplink/downlink atsame time. (sheet will be provided for each result capture) Maximum marks will be given to highest throughput provider and therefore 2 marks will be deducted of throughput provider indownwards tendencies. | 15 |  |  |
| **3** | HD VideoStreaming on single AP (at least10 on 2.4 GHz and 15 on 5GHz).Devices will be spread across the Coverage Area of Access Point | All devices shouldwork without disruption or jitter at coverage distance (sheet will be provided to users to provide result) | 15 |  |  |
| **4** | Demonstrate time based, Role based and device based access | Should able to giveAccess on time basis, Role basis and based on device type. For example Android devices should be restricted for limited bandwidth and should connect on a particular VLAN only. | 2.5 |  |  |
| **5** | Rough AP detection and neighbour AP classification. | IDS functionality test | 2.5 |  |  |
| **6** | Demonstrate perUser / per SSID bandwidth control. | Should able to limit theBandwidth as per user as well as per SSID or Not? | 5 |  |  |
| **7** | Integration withActive | Demonstrateintegration of system | 6 |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Directory/Radius | with ActiveDirectory/Radius(2 Marks)Demonstrate 802.1x forValid users (2 Marks) Captive portalAuthentication forGuest User. (2 Marks) |  |  |  |
| **8** | Demonstrateguests Access with password generation and how yourNetwork is secure from Guest Access. Demonstrate customize registration page for guest access. | \*Guest Access withPassword Generation. Restricted access to\*Office data fromGuest Access\*Password sharing to Guest through Email and SMS | 5 |  |  |
| **9** | Demonstrate Dashboard customization and troubleshootingof WLANNetwork. |  | 5 |  |  |
| **10** | Roaming | Does the SUT provide fast secure roaming between Access Points on the SAME VLAN? | 5 |  |  |
| **11** | Demonstrate howyou see the type of devices brought by an individual user. (Device Finger printing) | Should able to see thetype of device user is carrying or Not? | 4 |  |  |
| 12 | NMS Featureset for Wired and Wireless NMS | Real Time ReportingVia SMS and emailFor Wired Network.Guest Login Authentication for Wireless via SMS and email. | 20 |  |  |
| Total |  |  |  |