

TENDER DOCUMENT

Empanelment of System Integrators for Supply, Installation & commissioning of Local Area Networking (LAN) under SWAN in Chandigarh



Tender No. SPIC/2022/66604

Date. 26/02/2022

Society for Promotion of IT in Chandigarh (SPIC)

Under the aegis of Department of IT, Chandigarh Administration

**Entrepreneur Development Centre (EDC) Building, Plot No: 20, Rajiv
Gandhi Chandigarh Technology Park (RGCTP), Chandigarh 160101.**

Tele : +91 172 2970450; +91 172 2970451. E-Mail: info@spicindia.com.

Website: www.spicindia.com.

SECTION I

Invitation for Bids

1. This invitation of Bids is for empanelment of System Integrators for Supply and installation/laying of active and passive components/equipment for local area networking under SWAN scheme in Chandigarh with the objective of interconnecting all the desktop personal computers/Servers/Other IT Infrastructure to harness the benefit of latest developments of Information Technology.
2. This Tender document can be downloaded from e-tendering website of Chandigarh Administration - <https://etenders.chd.nic.in> and the non-refundable Tender fee of Rs.2000/- in the form of bank draft in favour of 'Society for Promotion of IT in Chandigarh (SPIC)' payable at Chandigarh, must be paid in the form mentioned above at the time of submission of bid. Interested bidders can also download the tender document from SPIC's website <http://www.spicindia.com>.
3. Tenderers are advised to study the Tender Document carefully. Submission of Tender shall be deemed to have been done after careful study and examination of the Tender Document with full understanding of its implications.
4. Sealed offers prepared in accordance with the procedure described in Clause 1 of Section II should be submitted to the **Chief Executive Officer, Society for Promotion of IT in Chandigarh (SPIC), EDC Building, Plot No:20, RGCTP, Chandigarh-160101.**
5. The Tenderer must be a company registered under the Indian Companies Act, 1956/2013.
6. The Tender comprises of two bid systems - the Technical Bid and Price Bid. The Tenderer has to submit a Bid Security /Earnest Money Deposit (EMD) of Rs. 50,000/- along with the Technical Bid.
7. Period for completion of work: It has been targeted that the work of LAN installation covering supply, installation, Testing and commissioning should be completed within time frame mentioned in the notification of award.
8. The bidders would have to quote the prices in Indian Rupees only covering the total scope of work.
9. The purchaser reserves the right of accepting and/or rejecting any/all Tenders without assigning any reasons thereof.
10. Key Dates etc.:
 - A. Name of the Purchaser: SPIC for departments of Chandigarh Administration.
 - B. Location where the work of LAN Installation would take place:
 - C. Addressee and Address at which Bids are to be submitted:
**Chief Executive Officer,
Society for Promotion of IT in Chandigarh (SPIC),
EDC Building, Plot No: 20 ; RGCTP; Chandigarh-160101.**

- D. Last date for sale of Tender document: **10-03-2022.**
- E. Latest time and date for receipt of Bids: **10-03-2022 up to 12:00 PM.**
- F. Place, Time and Date of opening of Technical Bids: **10-03-2022 at 12:30 PM.**

**Society for Promotion of IT in Chandigarh (SPIC),
EDC Building, Plot No: 20 ; RGCTP; Chandigarh-160101**

The date, time and venue for opening Price bids will be intimated separately to those successful in technical bids.

- G. Bid Validity: 180 days from the date of opening of the Technical Bids.
- H. Validity of the Price Validity:

Validity of the Amount specified in the price bid should be valid for Two year from the date of opening of the price BID. Additional Works in the form of similar networking in other departments may also be assigned to the selected vendor in the same terms & conditions and in the same price within Two year.

I. Period of empanelment: 2 Years

Note: The Purchaser shall not be responsible for non-receipt/ non-delivery of the Bid document due to any reason whatsoever.

SECTION II

INSTRUCTIONS TO TENDERERS

1. Procedure for Submission of Bids

- 1.1 It is proposed to have a Two Cover System for this tender.
 - a) Technical Bid cum Qualification Bid in one cover.
 - b) Price Bid in one cover. **(NO PRICE BID TO BE SUBMITTED IN PHYSICAL FORM)**
- 1.2 Sealed Tenders in 'two part' are being invited from reputed vendors for supply, installation & commissioning of Local Area Networking (LAN) under SWAN in the form of e-Tender as well as sealed hard copy of the same tender for the following job from reputed organizations having sufficient experience and credentials for successful supply, installation and commissioning of Networking and peripherals preferably in government / quasi-government organizations. Vendor should be capable of supplying, Installation & Commissioning of the LAN under this tender.
- 1.3 e-Tender to be submitted electronically through the e-tendering site of Chandigarh administration (<https://etenders.chd.nic.in>). e-tender to be uploaded in two parts – 1. Technical cum Qualification Bid and 2. Financial Bid.
- 1.4 Physical copy of Technical Bid of the Tender should be covered in a separate sealed cover super scribing the wordings "Technical Bid". Please Note that Prices Should Not be indicated in the Technical Bid.
- 1.5 **No Physical copy of Price Bid of the Tender to be submitted in cover.**
- 1.6 Both the Technical Bid cover prepared as above, along with Tender Fee & EMD are to be kept in a single sealed cover super scribed with Tender Number, Due Date, Item and the wordings "DO NOT OPEN BEFORE".
- 1.7 The cover thus prepared should also indicate clearly the name and address of the tenderer, to enable the Bid to be returned unopened in case it is declared "Late".
- 1.8 A letter, in a separate sealed cover, enclosing Bid security and describing the pre-qualifying technical competence and experience of the Tenderer and also certifying the period of validity of Bids for 180 days from the date of opening of the Technical Bids, should also be submitted with the Bid (Refer Clause 7.1(c) and Clause 20).

2. Cost of Tender

- 2.1 The Tenderer shall bear all costs associated with the preparation and submission of its bid, including cost of presentation for the purposes of clarification of the bid, if so desired by the Purchaser and the Purchaser, will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

3. Contents of the Tender Document

- 3.1 The broad specifications of the Scope of Work, Tender procedures and contract terms are prescribed in this Tender Document comprising of:

- (a) Section-I - Invitation for Bids
- (b) Section II - Instructions to Tenderers;
- (c) Section III - General Conditions of Contract;
- (d) Section IV - Technical Specification
- (e) Section V – Bid Schedules
- (f) Appendices, sketch and Checklist

3.2 The Tenderer is expected to examine all instructions, forms, terms and requirements in the Tender Document. Failure to furnish all information required by the Tender Document or submission of a bid not substantially responsive to the Tender Document in every respect will be at the Tenderer's risk and may result in the rejection of the bid.

4. Clarification of Tender Document

4.1 A prospective Tenderer requiring any clarification on the Tender Document may notify the Purchaser in writing at the Purchaser's mailing address or through e-mail indicated in Clause 9(c) of Section I. The Purchaser will respond in writing or through e-mail, to any request for clarification of the Tender Document, received not later than 4 days prior to the last date for the receipt of bids prescribed by the Purchaser. Written copies of the Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be posted on SPIC's website.

5. Amendment of Tender Document

5.1 At any time prior to the last date for receipt of bids, the Purchaser, may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, modify the Tender Document by an amendment.

5.2 The amendment will be notified/ published in e-tendering site & SPIC's website only.

5.3. In order to afford prospective Tenderers reasonable time in which to take the amendment into account in preparing their bids, the Purchaser may, at its discretion, extend the last date for the receipt of Bids if required.

6. Language of Bids

6.1 The Bids prepared by the Tenderer and documents relating to the bids exchanged by the Tenderer and the Purchaser, shall be written in the English language, provided that any printed literature furnished by the Tenderer may be written in another language so long as the same is accompanied by an English translation in which case, for purposes of interpretation of the bid, the English translation shall govern.

7. Documents Comprising the Bids

7.1 The bids prepared by the Tenderer shall comprise of the following components :

(a) Technical Bid comprising of the followings:

- a. Bid Particulars
- b. Bid Letter
- c. Detailed technical Proposal
- d. Vendor Profile
- e. Pre-qualifying Technical Competence such as proven experience in providing Similar Services for determining pre-qualification conditions and Bid Security.

(b) Price Bid comprising of the following:

- a. Bid Letter
- b. Price Schedule

8. Bid Prices

8.1 The bidders would have to quote the prices in Indian Rupees only for the total scope of work.

9. Firm Prices

9.1 Prices quoted must be firm and final and shall remain constant throughout the period of the contract and shall not be subject to any upward modifications, whatsoever.

10. Discount

10.1 The Tenderers are advised not to indicate any separate discount. Discount, if any, should be merged with the quoted prices. Discount of any type, indicated separately, will not be taken into account for evaluation purpose. However, in the event of such an offer, without considering discount, is found to be the lowest, the Purchaser shall avail such discount at the time of award of contract.

11. Tenderer

11.1 The "Tenderer" as used in the tender documents shall mean the one who has submitted the Tender. The Tenderer may be either the Principal or his duly Authorized Representative, in which case he/she shall submit a certificate of authority.

12. Bid Security

12.1 Pursuant to Clause 7.1(c) of Section II the Tenderer shall furnish, as part of its bid, a bid security of the amount mentioned in Clause 6 of Section I.

12.2 The bid security is required to protect the Purchaser against the risk of Tenderer's conduct that would warrant the security's forfeiture, pursuant to Clause 12.8.

12.3 The bid security shall be denominated in Indian Rupees, and shall be in the form of a bank guarantee issued by a Nationalized / Scheduled Bank, in the proforma provided at Appendix A in the Tender Document and shall be valid for 45 days beyond the validity of

the Bid.

- 12.4 Any bid not secured in accordance with Clauses 12.1 and 12.3 will be rejected by the Purchaser as non-responsive.
- 12.5 Unsuccessful Tenderer's bid security will be discharged/ returned as promptly as possible but not later than 30 days after the expiration of the period of bid validity prescribed by the Purchaser, pursuant to Clause 13.
- 12.6 The successful Tenderer's bid security will be discharged upon the Tenderer executing the Contract, pursuant to Clause 35 and furnishing the performance security, pursuant to Clause 36.
- 12.7 No interest will be payable by the Purchaser on the amount of the Bid Security.
- 12.8 The bid security may be forfeited:
 - (a) if a Tenderer withdraws its bid during the period of bid validity specified by the Tenderer in the Bid; or
 - (b) in the case of a successful Tenderer, if the Tenderer fails:
 - (i) to sign the Contract in accordance with Clause 35; or
 - (ii) to furnish performance security in accordance with Clause 36.

13. Period of Validity of Bids

- 13.1 Bids shall remain valid for 180 days after the date of opening of Technical Bids prescribed by the Purchaser. A bid valid for a shorter period may be rejected by the Purchaser as non responsive.
- 13.2 In exceptional circumstances, the Purchaser may solicit the Tenderer's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (or by fax). The validity of bid security provided under Clause 12 shall also be suitably extended. A Tenderer may refuse the request without forfeiting its bid security. A Tenderer accepting the request will not be required nor permitted to modify its bid.

14. Format and Signing of Bid

- 14.1 The Tenderer shall prepare two copies of the Bid (One for uploading on the e-Tendering Site and Physical copy of the same to be submitted at the above mentioned Bid submission place), as appropriate in accordance with Clause 1. In the event of any discrepancy between them, the original e-Tendering copy shall govern.
- 14.2 The all copies of the bid shall be typed or written in indelible ink and shall be signed by the Tenderer or a person or persons duly authorized to bind the Tenderer to the Contract in pursuant to Clause 11. The letter of authorization shall be indicated by Company Letterhead accompanying the bid. All pages of the bid, except for un-amended printed literature, shall be initialed by the person or persons signing the bid.
- 14.3 The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the Tenderer in which case such corrections shall be initialed by the person or persons signing the bid.

15. Revelation of Prices

- 15.1 Prices in any form or by any reason before opening the Price Bid should not be revealed, failing which the offer shall be liable to be rejected. If price change is envisaged due to any clarification, supplementary Bid in a separate sealed cover shall be accepted prior to price bid opening with prior written permission of the Purchaser.

16. Terms and Conditions of Tendering Firms

- 16.1 Printed terms and conditions of the tenderers will not be considered as forming part of their tenders. In case terms and conditions of the contract applicable to this Invitation of Tender are not acceptable to any Tenderer, he should clearly specify deviation in its tender. However no deviation in technical specification would be allowed.
- 16.2 Similarly in case the Services being offered has deviations from the specifications laid down in Section V, the tenderer shall describe in what respects and to what extent the Services being offered differ/deviate from the specifications, even though the deviations may not be very material. Tenderer must state categorically whether or not his offer conforms to tender specifications and indicate deviations, if any.

17. Site Conditions

- 17.1 It will be imperative on each tenderer to fully acquaint himself with the site conditions and factors which would have any effect on the performance of the contract and / or the cost.

18. Conditions for Pre-Qualification of Tenderers

- 18.1 Pursuant to Clause 7.1(c) of Section II, the Tenderer should clearly indicate, giving explicit documentary evidence along with the letter of pre-qualification, in respect of the Services offered, the following:
- i. Bid Security of the prescribed amount and validity pursuant to Clause 12.
 - ii. Domain Experience: The Tenderer should be in the business of supply, installation & commissioning of LANs for at least three years. The Tenderer should have proven experience of successfully completing at least two projects with total value of each project being at least Rs. 25 lakhs during last two financial years preferably in Punjab, Haryana or Chandigarh region. Out of these two projects, one project should have been done with similar components quoted in the offer in any Govt./Quasi Govt. org.. Proof of satisfactory completion along with scope of these works to be submitted with the bid.
 - iii. Technical Support Facility: The Tenderer should have technical support office in the Chandigarh/Mohali/Panchkula region. Details & proof of service facilities for Technical Support on services, maintenance and availability of hardware components and manpower be attached.
 - iv. Company Turnover: The Tenderer should have a minimum turnover of Rs.3 crores (Rupees Three crore only) in each of the last two years on account of supply, installation and commissioning of Networks. Relevant proof in the form of audited annual report or balance sheet duly certified by Chartered Accountant certifying the turnover in the field of Networking should be submitted.
 - v. The Tenderer must be a company registered under the Indian Companies Act, 1956/2013 (Attach Memorandum of Association or Articles of Association along with commencement of business certificate) and should have Sales Tax registration.
 - vi. The Tenderer should be authorized partner/distributor or have Authorization from concerned Original Equipment Manufacturers (OEMs) for supply and support for all active and passive components quoted for at least five years (Authorization Certificates to be attached).
 - vii. The Bidder MUST NOT have been banned by any Government Agencies / Govt. Department / Quasi Govt. Dept / PSU / Board / Council or similar organization. The

Bidder MUST give a declaration that they have not been banned by any such organization. If any Government Agencies / Govt. Department / Quasi Govt. Dept / PSU / Board / Council or similar organization has banned the Bidder, this fact must be clearly stated.

19. Sealing and Marking of Bids

19.1 The Tenderers shall seal and mark the Bid strictly in accordance with Clause 1.

19.2 If the outer cover of the bid is not sealed and marked as required by Clause 1, the Purchaser will assume no responsibility for the bid's misplacement or premature opening.

20. Last Date for Receipt of Bids

20.1 Bids must be received by the Purchaser at the address specified under Clause 9(c) of Section I not later than the time and date specified in Clause 9(e) of Section I. In the event of the specified date for the receipt of Bids being declared a holiday for the Purchaser, the Bids will be received up-to the appointed time on the next working day.

20.2 The Purchaser may, at its discretion, extend the last date for the receipt of bids by amending the Tender Document in accordance with Clause 5, in which case all rights and obligations of the Purchaser and Tenderers previously subject to the last date will thereafter be subject to the last date as extended.

21. Late Bids

21.1 Any bid received by the Purchaser after the appointed time on the last date for receipt of bids prescribed by the Purchaser, pursuant to Clause 9 Section I, will be rejected and/or returned unopened to the Tenderer.

22. Modification and Withdrawal of Bids

22.1 The Tenderer may withdraw its bid after the bid's submission, provided that written notice of the modification or withdrawal is received by the Purchaser prior to the last date prescribed for receipt of bids.

22.2 The Tenderer's modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions.

22.3 A withdrawal notice may also be sent by telex or cable or fax but followed by a signed confirmation copy, post marked not later than the last date for receipt of bids.

22.4 No bid may be modified subsequent to the last date for receipt of bids.

22.5 No bid may be withdrawn in the interval between the last date for receipt of bids and the expiry of the bid validity period specified by the Tenderer in the Bid. Withdrawal of a bid during this interval may result in the Tenderer's forfeiture of its bid security.

23. Address for Correspondence

23.1 The Tenderer shall designate the official mailing address, place and fax number to which all correspondence shall be sent by the Purchaser.

24. Opening of Bids by Purchaser

24.1 On the basis of information given in the letter of pre-qualification, as mentioned at Clause 20, Tenderers will be pre-qualified.

24.2 Price Bids of only pre-qualified tenderers will be opened.

24.3 The Purchaser will open the Bids, in the presence of the representatives of the Tenderers who choose to attend, at the time and date, as mentioned in Section I of this Document.

24.4 The Tenderers' names, modifications, bid withdrawals and the presence or absence of the requisite Bid Security and such other details as the Purchaser, at its discretion, may consider appropriate will be announced at the bid opening.

25. Clarifications

25.1 When deemed necessary, the Purchaser may seek clarifications on any aspect from the tenderer. However, that would not entitle the Tenderer to change or cause any change in the substance of the tender submitted or price quoted.

26. Preliminary Examination

26.1 The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required bid security has been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

26.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If the Tenderer does not accept the correction of the errors, its bid will be rejected. If there is a discrepancy between words and figures, the amount in words will prevail.

26.3 A bid determined as not substantially responsive will be rejected by the Purchaser and may not subsequently be made responsive by the Tenderer by correction of the non-conformity.

26.4 The Purchaser may waive any minor informality or non-conformity or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Tenderer.

27. Contacting the Purchaser

27.1 No Tenderer shall contact the Purchaser on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded.

27.2 Any effort by a Tenderer to influence the Purchaser's bid evaluation, bid comparison or contract award decisions may result in the rejection of the Tenderer's bid.

28. Evaluation Criteria

28.1 Bids will be evaluated on, including but not limited to the content of technical experience, managerial competence, proposed scope of the proposal and cost. The selection may be made without discussion and/or price negotiation. Therefore, the proposal should be submitted complete and on the most favorable terms.

28.2 Only successful Tenderers of technical bid would be considered for evaluation of Price bid.

29. Award Criteria

29.1 The Purchaser will award the Contract to the successful Tenderer whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated Price bid, provided further that the Tenderer is determined to be qualified to perform the Contract satisfactorily. The Purchaser shall however not bind itself to accept the lowest or any bid and reserves the right to accept any bid, wholly or in part.

30. Purchaser's Right to Vary Scope of Contract

- 30.1 The Purchaser may at any time, by a written order given to the Vendor pursuant to Clause 12 of Section III, make changes within the general scope of the Contract.
- 30.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Vendor's performance of any part of the work under the Contract, whether changed or not changed by the order, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Vendor for adjustment under this Clause must be asserted within thirty(30) days from the date of the Vendor's receipt of the Purchaser's changed order.

31. Purchaser's Right to Accept Any Bid and to Reject Any or All Bids

- 31.1 The Purchaser reserves the right to accept any bid, and to annul the Tender process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for the Purchaser's action.
- 31.2 Tenders that are not accompanied with Earnest Money Deposit (EMD)/Bid Security and Tender fees shall be rejected outright

32. Notification of Award

- 32.1 Prior to the expiration of the period of bid validity, the Purchaser will notify the successful Tenderer in writing by registered letter or by cable or telex or fax, to be confirmed in writing by registered letter, that its bid has been accepted.
- 32.2 The notification of award will constitute the formation of the Contract.
- 32.3 Upon the successful Tenderer's furnishing of performance security pursuant to Clause 36, the Purchaser will promptly notify each unsuccessful Tenderer and will discharge its bid security, pursuant to Clause 12.

33. Signing of Contract

- 33.1 At the same time as the Purchaser notifies the successful Tenderer that its bid has been accepted, the Purchaser will send the Tenderer the Contract Form provided in the Tender Document, incorporating all agreements between the parties.
- 33.2 Within 7 days of receipt of the Contract Form, the successful Tenderer shall sign and date the Contract and return it to the Purchaser.

34. Performance Security

- 34.1 Within 7 days of the receipt of notification of award from the Purchaser, the successful Tenderer shall furnish the performance security in accordance with the Conditions of Contract, in the Contract Performance Guarantee Bond prescribed at Appendix.
- 34.2 Failure of the successful Tenderer to comply with the requirement of Clause 33 or Clause 34 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security.

SECTION III
GENERAL CONDITIONS OF CONTRACT

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated:

- (a) "The Client" or "The Purchaser" means the Departments of Chandigarh Administration, Chandigarh through the Society for Promotion of IT in Chandigarh (SPIC).
- (b) "Purchase Officer" means the officer signing the acceptance of tender and includes any officer who has authority to execute the relevant contract on behalf of the Client.
- (c) The "Contract" means the agreement entered into between the Client and the Contractor as recorded in the Contract Form signed by the Client and the Contractor, including all attachments and annexes thereto and all documents incorporated by reference therein.
- (d) The "Contractor " or "Vendor" means the firm or the company selected through tendering process and shall be deemed to include the Contractor's successors, representatives (approved by the Client), heirs, executors, administrators and permitted assigns, as the case may be, unless excluded by the terms of the contract.
However more than one Vendor may be empaneled for different OEMs.
- (f) "The Contract Price" means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations;
- (g) "Service" means services to be provided by the Contractor as per the requirements specified in Section IV of this document and any other incidental services, such as setting up of necessary infrastructure, implementation, provision of technical assistance, training and other such obligations of the Contractor covered under the Contract;
- (h) "Acceptance of Tender" means the letter/telex/e-mail/ fax or any memorandum communicating to the Tenderer the acceptance of his tender and includes an advance acceptance of his tender.

2. Application

- 2.1 These General Conditions shall apply to the extent that provisions in other parts of the Contract do not supersede them.

3. Standards of Performance

- 3.1 The Contractor shall perform the Services and carry out its obligations under the Contract with due diligence, efficiency and economy, in accordance with generally accepted techniques and practices used in the industry and with professional engineering and consulting standards recognized by international professional bodies and shall observe sound management, engineering practices. It shall employ prudent technical and engineering practices. It shall employ advanced technology and safe and effective equipment, machinery, material and methods. The Contractor shall always act, in respect of any matter relating to this Contract, as faithful advisors to the Client and shall, at all times, support and safeguard the Client's legitimate interests in any dealings with Third Parties.

4. Use of Contract Documents and Information

- 4.1 The Contractor shall not, without the Client's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Client in connection therewith, to any person other than a person employed by the Contractor in the Performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far, as may be necessary for purposes of such performance.
- 4.2 The Contractor shall not, without the Client's prior written consent, make use of any document or information except for purposes of performing the Contract.
- 4.3 Any document, other than the Contract itself, shall remain the property of the Client and shall be returned (in all copies) to the Client on completion of the Contractor's performance under the Contract, if so required by the Client.

5. Performance Guarantee

- 5.1 Within 7 days after the receipt of notification of award of the Contract from the Client, the successful Tenderer shall furnish Performance Guarantee to the Client, which shall be equal to 10% of the value of the Contract and shall be in the form of a Guarantee Bond from a Nationalized / Scheduled Bank in the Proforma given at Appendix.
- 5.2 The validity of the Performance guarantee submitted should be for a period of Three years Sixty days from the date of receipt of notification of award from the client.
- 5.3 The performance guarantee shall be deemed to govern the following guarantees from the successful tenderer, in addition to other provisions of the guarantee:
- The hardware/Software supplied under the contract shall be free from all defects/bugs and upon written notice from the client, the successful Tenderer shall fully remedy, free of expense to the client, all such defects/bugs as developed under the normal use of the said hardware/software.
 - To fulfill the conditions of work contract/purchase order.
 - The performance guarantee is intended to secure the performance of the entire system. However, it is not to be construed as limiting the damages stipulated in any other clauses.
 - The SLA for the maintenance support for Three years.

6. Inspections and Tests

- 6.1 The Purchaser or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. The Purchaser shall notify the Supplier in writing in a timely manner of the identity of any representatives retained for these purposes.
- 6.2 The inspections and tests may be conducted on the premises of the Supplier or, at point of delivery and/or at the Goods final destination. If conducted on the premises of the Supplier, all reasonable facilities and assistance, including access to drawings and production data – shall be furnished to the inspectors at no charge to the Purchaser. The testing/ inspection shall be done at the site at the time of delivery of the equipment against any physical damage on delivery.
- 6.3 Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject the goods and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Purchaser.
- 6.4 The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival at Project Site shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods shipment.
- 6.5 Nothing in Clause 6 shall in any way release the Supplier from any warranty or other obligations under this Contract.
- 6.6 It will be the responsibility of the Tenderer to submit the system test procedure for conducting the post installation site acceptance testing. The procedure submitted by the Tenderer should be drafted in line with the standard practices followed in the industry and should be in accordance with the test procedure and practices specified by the OEM. The draft of Acceptance Testing Procedure should be submitted to the Purchaser for approval at least 15 days before the schedule site acceptance date. The acceptance test procedure on approval by the purchaser shall become the document for acceptance of the equipment after installation at the site.

7. Warranty

- 7.1 The Tenderer warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. This warranty shall remain valid for a period of a minimum 36 months after the Goods or any portion thereof as the case may be, have been delivered, commissioned and accepted at the final destination indicated in the Contract.
- 7.2 The Tenderer shall post a well-qualified, and experienced Service Engineer full time at the site at his own expense and get the defects/bugs removed in the system as detected by the Purchaser during the period of warranty.
- 7.3 The Purchaser shall promptly notify the Tenderer in writing of any claims arising under this warranty.
- 7.4 Upon receipt of such notice, the Tenderer shall, within 48 hours and with all reasonable speed, repair or replace the defective Goods or parts thereof, without cost to the Purchaser.
- 7.5 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in 7.4 above, the Purchaser may proceed to take such remedial action as may be necessary, at the Tenderer's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

8. Documentation

8.1 The Tenderer shall supply the following documents at the time of Acceptance Test:

- Complete set of Technical/Operation and Maintenance Manual
- An inventory of items delivered.
- Rack wise inventory
- Node & connectivity details
- Switch installation Report
- UTP/OFC Wiring diagram
- Certification details for UTP & OFC connections.

9. Project Schedule &Monitoring

9.1 The Tenderer shall plan various activities and submit the execution schedule and bar chart along with signing of the contract. The execution schedule should clearly indicate all activities and the time required for completion of each activity taking the total project time as mentioned above. Parallel and dependent activities for each activity need to be specified in the schedule. This will form the basis for Monitoring of execution of the project and any delay/slippage from the schedule will be reviewed by both parties in review meetings from time to time and remedial measures decided to complete the project as per the schedule.

10. Training

10.1 The Tenderer shall provide necessary training to the persons authorized by the client for using/maintaining the Networking facility. Training for 10 man-days (2 persons 5 days) shall be included.

11. Currency of Payment

11.1 Payment shall be made in Indian Rupees only.

12. Change Orders

12.1 The Client may at any time, by a written order given to the Contractor pursuant to Clause 32 of Section II, make changes within the general scope of the Contract.

12.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Vendor's performance of any part of the work under the Contract, whether changed or not changed by the order, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this Clause must be asserted within thirty(30) days from the date of the Vendor's receipt of the Purchaser's changed order.

13. Contract Amendments

13.1 No variation in or modification of the terms of the Contract shall be made except by written amendment signed by both the parties i.e. the Contractor and the Client.

14. Assignment

14.1 The Tenderer shall not assign or sub contract, in whole or in part, its obligations to perform under the Contract.

15. Terms of Payment

15.1 The payment to the vendor shall be made as under:

80% of the total Bill Amount (without project management & support charges for 3 Years) would be released on successful completion of the installation & testing process. 20% (without project management & support charges for 3 Years) of the total Bill Amount would be released after completion of 1-month service. Project management & support charges for 3 Years would be equally divided into 3 parts and one part would be release on completion of the a Year.

15.2 No Advance payment will be made.

15.3 Payment will be made only after submission of following documents by the Tenderer:

- Delivery Challan.
- Installation Report duly signed.
- Testing certificate.

15.4 No amount would accrue to the Contractor in failure to furnish Performance Security.

16. Delays in the Contractor's Performance

16.1 An unexcused delay by the Contractor in the performance of its Contract obligations shall render the Contractor liable to any or all of the following sanctions:

- (i) Forfeiture of its performance security;
- (ii) Imposition of Liquidated Damages
- (iii) Termination of the Contract for default.

16.2 If at any time during performance of the Contract, the Contractor should encounter conditions impeding timely completion of the services under the contract and performance of the services, the Contractor shall promptly notify the Client in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable, after receipt of the Vendor's notice, the Client shall evaluate the situation and may at its discretion extend the Vendor's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

16.3 Liquidated Damages : Subject to clause 16. if the Tenderer fails to complete the project within the time period specified in the contract, the purchaser shall without prejudice to its other remedies under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to the 0.5% per week (seven days) or part there of the contract price of unperformed services for each week(seven days) or part thereof of delay subject to maximum deduction of 10% of the contract price. Once the maximum is reached, the purchaser may consider termination of the contract pursuant to clause 17.

17. Termination for Default

17.1 The Client may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor, terminate the Contract in whole or in part if:

- (a) the Contractor fails to deliver any or all of the obligations within the time period(s) specified in the Contract, or any extension thereof granted by the

- Client pursuant to Clause 16; or
- (b) the Contractor fails to perform any other obligation(s) under the contract.

18. Force Majeure

- 18.1 Notwithstanding the provisions of Clauses 16 and 17, the Contractor shall not be liable for forfeiture of its performance security, or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.
- 18.2 For Purposes of this Clause, "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor and not involving the Vendor's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Client either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- 18.3 If a force Majeure situation arises, the Contractor shall promptly notify the Client in writing of such conditions and the cause thereof. Unless otherwise directed by the Client in writing, the Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all prevention by the Force Majeure event.

19. Termination for Insolvency

- 19.1 The Client may at any time terminate the Contract by giving written notice to the Contractor, without compensation to the Contractor, if the Contractor becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Client.

20. Arbitration

- 20.1 The Client and the Contractor shall make every effort to resolve amicably by direct informal negotiations, any disagreement or disputes, arising between them under or in connection with the Contract.
- 20.2 If, after Thirty(30) days from the commencement of such direct informal negotiations, the Client and the Contractor have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanism specified in Clauses 20.3 and 20.4.
- 20.3 In the event of such arbitrator to whom the matter is originally referred to vacates his office on resignation or otherwise or refuses to do works or neglecting his work or being unable to act as arbitrator for any reason whatsoever, the Finance Secretary, Chandigarh Administration or any other person appointed by him or Chief Executive Officer, SPIC, shall appoint another person to act as arbitrator in the place of outgoing arbitrator and the person so appointed shall be entitled to proceed further with the reference from the stage at which it was left by the predecessor. The vendor will have no objection in any such appointment that arbitrator so appointed is employee of Department/SPIC.
- 20.4 The Arbitration & Conciliation Act 1996, the rules there under and any statutory modification or re-enactments thereof, shall apply to the arbitration proceedings.
- 20.5 The venue of arbitration shall be Chandigarh.
- 20.6 The Client may terminate this contract, by giving a written notice of termination of minimum 30 days, to the Contractor, if the Contractor fails to comply with any decision reached consequent upon arbitration proceedings pursuant to Clause 20.

21. Governing Language.

21.1 The Agreement shall be written in English language. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in English language.

22. Applicable Law

22.1 The contract shall be interpreted in accordance with the Indian laws.

23. Notices

23.1 Any notice by one party to the other pursuant to the Contract shall be sent in writing or by e-mail or by telex and confirmed in writing to the address specified for that purpose in the contract.

23.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

24. Taxes

24.1 The successful Tenderer shall be entirely responsible for all taxes, duties, octroi, license fees, demurrage charges etc., in respect of this contract and provisions of Income tax Act regarding deduction of tax at source shall apply.

25. EMPANELMENT PROCESS

Empanelment of the System Integrators would be done based on OEM. For each OEM – one System Integrator would be empaneled. Order to the empaneled vendors would be placed as per the preference of the OEM received from the departments. Lowest Bidder (L1) would be selected among the different OEMs (one L1 party for each OEM).

SECTION-IV

TECHNICAL SPECIFICATION

1. Intent of Specification

This tender document pertains to implementation of local area networking. The proposed Local area network of different offices/departments under Chandigarh Administration

2. SCOPE OF WORK

2.1 The scope of work in this tender covers networking of desktop computers/IT Peripherals .

2.2 The scope covers design/development of a suitable architecture/layout of the proposed networking system, preparation of bill of materials, pre-despatch inspection / testing, packing and forwarding, transportation, insurance and carrying out further activities at sites viz. unloading, storage, (space to be provided by the owner) further handling, erection, testing and commissioning including successful completion of acceptance tests and any other services specified.

2.3 Detailed Bill of material included in this tender is given at Clause 4.0. However, purchaser reserves the right for quantity variation due to increase/decrease in requirements. The bidder shall also provide all required equipment which may not be specifically stated herein but are required to meet the intent of ensuring completeness, maintainability and reliability of the total system covered under this specification, including integration and interoperability with the existing network.

2.4 Scope of Work shall also include:

- A. Powering on equipment after ensuring correctness of terminations interfaces and power supply and making the system ready for testing and commissioning.
- B. Testing of LAN Cables after laying, terminations and ferruling at both the ends. All testing tools and instruments shall be brought by the bidder and taken back after the testing. Cabling work shall also be got certified from OEM.
- C. Configuration of the equipment as per the requirements of department including Network segmentation and Network Monitoring
- D. Field testing and commissioning of system, including integration with existing Network for Internet connectivity.
- E. Site acceptance tests to establish satisfactory performance of the equipment's as per specs.
- F. Assistance for familiarization and operation of the installed system & services for 6 months after acceptance of system.
- G. Training to Owner's personnel as stipulated at clause 10 , Section-III.
- H. Onsite Maintenance support(**on call basis**) for all Hardware/software delivered for three years.

2.5 In case, the quantity of laying cables or fixing wall mount sockets etc. exceeds or is less than the quantity in bid price schedule, the payment for the executed quantity shall be paid on pro-rata basis, for the actual quantities for which the installation is carried out through the Bidder on Certification by Site Engineer.

3. General Technical Requirements

- 3.1 All active LAN components such as switches, wireless equipment's offered shall be of the same Make/manufacturer and shall be covered under same back-up guarantee from the same OEM, to ensure full compatibility, inter-working and inter-operability.
- 3.2 Equipment furnished shall be complete in every respect with all mountings, fittings, fixtures and standard accessories normally provided with such equipment's and/or needed for erection, completion and safe operation of the equipment's as required by applicable codes though they may not have been specifically detailed in the technical specification, unless included in the list of exclusions. All similar standard components/parts of similar standard equipment's provided, shall be inter-changeable with one another.
- 3.3 The methodology of cabling an installation work, to be adopted, has to ensure minimum damage to the existing finish and no loss to the aesthetic beauty of the floors. Any damage to the existing flooring/ walls/paint etc. shall be made good by the Contractor. It is advised that tenderer should visit site before submitting the tender to get apprised about the site conditions.
- 3.4 The Bidder shall be responsible for providing all materials, equipment's, and services, specified or otherwise, which are required to fulfill the intent of ensuring operability, maintainability, and reliability of the complete equipment covered under this specification within his quoted price. This work shall be in compliance with all applicable standards, statutory regulations and safety requirements in force of the date of award of this contract.
- 3.5 The bidder shall also be responsible for deputing qualified personnel for installation, testing, commissioning and other services under his scope of work as per this specification. All required tools and tackles for completing the scope of work as per the specification is also the responsibility of the bidder.
- 3.6 The bidders proposal shall not include the list of tools (such as; crimping tool, Krone punch tool) and accessories which shall be furnished with the equipment. These are to be clearly brought out with itemized price in the bid. However the prices of these special tools and tackles shall be included in the lump sum Project Management cost not as a separate bid price.
- 3.7 The Bidder shall furnish one complete sets of system and equipment instruction manuals and detailed installation operating and maintenance documentation along with the CDs for the same. Manuals shall describe system operation, shall include detailed system and components description and shall cover the installation, operation, care and maintenance of all system components including diagnostics. Complete parts lists including detailed instructions for ordering shall be furnished. Complete documentation for operating, system software, application programs, software selectable functions, shall be provided. After installation "as built" drawings shall be provided by the bidder indicating the cable routes, termination & termination details, actual configuration & parameters, etc.
- 3.8 The exact siting of equipment's and cable routing shall be determined by the contractor in consultation with department. The contractor shall prepare his proposed cable routing diagram and estimate the quantities for cable, conduit and channels.
- 3.9 The Bidder shall perform the Services and carry out their obligations with all due diligence, efficiency, and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advance technology and safe methods. The Bidders shall always act, in respect of any matter relating to this Contract or to the

Services, as faithful advisers to the Client and shall at all times support and safeguard the Client's legitimate interests in any dealings with Sub-bidders or third parties.

- 3.10 The Bidder shall furnish complete, well-fabricated and reliably operating and secure systems as described in this document. Design and selection of equipment and software shall be consistent with the requirements of long term trouble free operation with highest degree of reliability and maintainability. All equipment shall be constructed to operate safely without undue heating, vibration, wear, corrosion, electromagnetic interference or similar problems and all software shall be proven, tested and reliable.
- 3.11 All interconnecting cables required to connect the communication equipment shall be furnished. All cables shall be fully assembled connector pre-terminated and factory tested as part of overall system checkout. Cables shall be neatly & properly tied up and dressed using appropriate cable hangers and Velcro bands. All the cables, connectors, sockets, panels etc. shall be labeled for identification purpose.
- 3.12 All equipment, accessories and cables supplied under this contract shall be in accordance with the latest applicable recommendations, regulations and standards of:
- CCITT/ITU
 - ANSI
 - IEC
 - IEEE
 - IETF
 - EIA/TIA 568 Standards
 - International Electro-technical Commission (IEC)
 - cable (OFC and Cat 6) and cable accessories (OFC and Cat6) UL Listed and verified

For parameters not covered under the above codes, internationally acceptable standards shall be accepted. The bidder shall furnish a complete list of all standards and codes under which his equipment is designed, manufactured and assembled along with the bids.

- 3.13 The equipment's to be supplied shall operate without any deviation in quality or degradation of system performance and all the parameters detailed in these specifications shall be guaranteed over the following environmental conditions.

Operating Temperature	: 0 degree C to 45 degree C.
Humidity	: 95% RH (non condensing)

- 3.14 Reliable over voltage and over current protection circuits shall be provided in the equipment power supply units. The equipment power supply units shall be self-protecting and also protect connected equipment's against interference, noise, voltage dips and surges & impulses that may be present in the mains power supply sources.

Equipment shall be guaranteed for operation over the following AC power range to be made available by the owner:

240 V AC +/-10%, 50 Hz +/- 5%

The owner shall provide suitable AC power at a single power point at each of the locations and distribution of this power to the various equipment's shall be responsibility of the bidder for which necessary distribution board, cable etc. shall be provided by the bidder.

4. List of Equipment /Services

Bill of material included is given below:

LAN Active Components	
1	Managed Layer 3, 24 Port 1/10G SFP+ Ports, 2 x 40/100 Ports and 2 x Power Supplies
2	Managed Layer 3, 48x 1/10/25 GbE SFP28 ports, 8x 40/100 GbE QSFP28 ports and 2x hot-swappable load sharing power supplies
3	Managed Layer 3, 24x1 G Copper Ports with 4 x 10G SFP+ Ports and 2 x Power Supplies
4	Managed Layer 2 Switch with 24 Port with 4 x 10G uplink
5	Managed Layer 2 Switch with 24 Port with 4 x 10G uplink, 370 W PoE budge
6	Managed Layer 2 Switch with 48 Port with 4 x 10G uplink
7	Managed Layer 2 Switch with 48 Port with 4 x 10G uplink, 740 W PoE budge
8	Managed Layer 2, 24x10/100/1000 Mbps ports, 4x1 GbE SFP uplink-ports
9	Managed Layer 2, 24x10/100/1000 Mbps PoE+ ports, 4x1 GbE SFP uplink ports, 370W PoE Budget
10	Managed Layer 2, 48x10/100/1000 Mbps ports, 4x1 GbE SFP uplink-ports
11	Managed Layer 2, 48x10/100/1000 Mbps PoE+ ports, 4x1 GbE SFP uplink ports, 740W PoE Budget
12	12x10/100/1000 Mbps PoE+ ports, 2x1 GbE SFP uplink-ports, 124 W PoE budget
13	1G Multimode Transceiver
14	1G Singlemode Transceiver
15	10G Multimode Transceiver
16	10G Singlemode Transceiver
17	25G SFP28-SR Multimode Transceiver
18	25G SFP28-LR Singlemode Transceiver
19	Appliance based Wireless Controller with support upto 200 Access Points (without License)
20	Wireless Controller License for Access Point (Per AP License)
21	Outdoor Access Points Wi-Fi 6 (2x2:2 MIMO)
22	Indoor Access Point Wi-Fi 6 (2x2:2 MIMO)
23	Outdoor Access Points Wi-Fi 6 (4x4:4 MIMO)
24	Indoor Access Point Wi-Fi 6 (4x4:4 MIMO)
Security Appliances	

25	Security Appliance (UTM) for 100 Users with 3 years subscription (As per Specifications)
26	Security Appliance (UTM) for 300 Users with 3 years subscription (As per Specifications)
27	Security Appliance (UTM) for 500 Users with 3 years subscription (As per Specifications)
28	Security Appliance (UTM) for 1000 Users with 3 years subscription (As per Specifications)
29	Security Appliance (UTM) for 1500 Users with 3 years subscription (As per Specifications)
30	Virtual Authenticator for 100 User with 3 years support
31	Virtual Authenticator for 300 User with 3 years support
32	Virtual Authenticator for 500 User with 3 years support
33	Authenticator Hardware for 1000 - 1500 User with 3 years support
Passive Components - OFC	
34	6 Core Multimode OM4 Optical Fiber Cable
35	12 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Multimode)
36	24 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Multimode)
37	LC-LC Multimode Fiber Patch Cord - 3 Meter
38	6 Core Singlemode OS2 Optical Fiber Cable
39	12 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Singlemode)
40	24 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Singlemode)
41	LC-LC Singlemode Fiber Patch Cord - 3 Meter
Passive Components - Copper Cat6	
42	Cat6 UTP LSZH Cable Box (305 Meter)
43	Cat6 24 Port Patch Panel-Unloaded
44	Cat6 Information Outlet - Jack (For Patch Panel)
45	Cat6 UTP Patch Cord - 1 Meter
46	Cat6 UTP Patch Cord - 2 Meter
47	Cat6 Information Outlet - Jack (User End)
48	Face Plate - Single Port
49	Surface Mount Box (SMB)
Passive Components - Copper Cat6A	
50	Cat6A S/FTP LSZH Cable Box (305 Meter)

51	Cat6A S/FTP 24 Port Patch Panel-Unloaded
52	Cat6A S/FTP Information Outlet - Jack (For Patch Panel)
53	Cat6A S/FTP UTP Patch Cord - 1 Meter
54	Cat6A S/FTP UTP Patch Cord - 2 Meter
55	Cat6A S/FTP Information Outlet - Jack (User End)
56	Face Plate - Single Port
57	Surface Mount Box (SMB)
Networking Racks	
58	42U Floor Standing Rack with Accessories (Fan Tray with 4 Fans = 1, Power Distribution Unit 5 Socket = 3, Cable Manager = 5, Mounting Hardware (set of 10 cage nuts) = 5
59	24U Floor Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)
60	15U Wall Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)
61	12U Wall Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)
62	9U Wall Mount Rack with Accessories (Cable Manager = 1, PDU 3 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 1, 2 Fans Top Mount)
Miscellaneous Items	
63	PLB HDPE Pipe 32 x 26mm
64	PLB HDPE Pipe 40 x 33mm
65	PVC Wiring Channel (30 x 25mm)
66	PVC Wiring Channel (45 x 25mm)
67	1" PVC Conduit (ISI) - LMS
68	1.5" PVC Conduit (ISI) - LMS
69	PVC Flexible Pipe 32mm
70	PVC Flexible Pipe 40mm
71	Pole for Outdoor Access Point
Services	
72	Laying of UTP Cat6 Cable

73	Laying of UTP Cat6A Cable
74	Laying of PVC Conduit 1"
75	Laying of PVC Conduit 1.5"
76	Laying of PVC Channel (30 x 25mm)
77	Laying of PVC Channel (45 x 25mm)
78	Laying of Fiber
79	Laying of HDPE Pipe (32 x 26mm)
80	Laying of HDPE Pipe (40 x 33mm)
81	Digging of Soft Soil
82	Digging/Mouling of Hard Soil
83	Splicing of Pigtail
84	Fixing & Termination of I/O Cat6/Cat6A
85	Fixing & Termination of Patch Panel Cat6/Cat6A
86	Fixing of Rack
87	Fixing of Indoor/Outdoor Access Point
88	Fixing of Pole for Outdoor Access Point
89	Penta Scanning of LAN Points
90	OTDR of Fiber, Per Core
91	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 50 Nodes
92	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 100 Nodes
93	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 500 nodes
94	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 1000 nodes
95	Add on support services beyond 8 x 5 calls

5. Specifications of Components

Technical Specifications for 24 Port 1/10G Layer 3 Switch	
S. No	Specification Required
1	<u>Product details- Please specify</u>
1.1	Please mention Make, Model No. and Part Code
2	<u>Architecture & Port Density</u>
2.1	Switch should offer Wire-Speed Non-Blocking Switching & Routing Performance at Layer 2 & Layer 3.
2.2	The Distribution Switch shall have Twenty-Four (24) 1GbE/10GbE SFP+ Slots and Two (2) 40 QSFP+ Port.
2.3	Distribution Switch should support Stacking 8 Switches or More with more than 160 Gbps stacking bandwidth per Switch.
3	<u>Performance</u>
3.1	Switching Bandwidth: Should provide Non-Blocking switch fabric capacity of 880 Gbps or more.
3.2	Forwarding Capacity: Should provide wire-speed packet forwarding of 650 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Shall support 4K active VLANs
4.2	Shall support 30K MAC addresses or more.
4.3	Shall support IP multicast snooping IGMP v1, v2, v3
4.4	Shall support Jumbo Frames (up to 12K bytes)
5	<u>Layer 3 features</u>
5.1	Shall support minimum 17K IPv4 routes and 17K IPv6 routes or more
5.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1.
5.3	Shall support OSPFv2, OSPFv3, BGP4 and BGP4+, VRRP for both IPv4 & IPv6 Routing protocols and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Switch shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Shall support IPv4 and IPv6 ACLs with up to 8K
6.5	Shall support Byte and packet-based broadcast, multicast, and unknown-unicast limits with suppression port dampening.
6.6	Shall support IPv6 Router Advertisement (RA) Guard.
6.7	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring
7.3	Shall support Net Flow or sFlow or equivalent

8	<u>Physical Attributes, Power Supply and Fans</u>
8.1	Mounting Option: 19" Universal rack mount ears
8.2	Shall be configured with Dual Hot Swappable Internal AC power supply and Fan from Day 1.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 48 Port 1/10/25G Layer 3 Switch	
S. No	Specification Required
1	Product details -
1.1	Make, Model No. /OEM Part Code. (Please specify)
2	Architecture & Port Density
2.1	The Core Switch shall have 48x 1G/10G/25G SFP+ Ports and 8x 40G/100G QSFP28 Port from Day 1.
2.1.1	10G Multimode (SR) LC Transceivers support
2.1.2	10G Single Mode (LR) LC Transceivers Support
2.1.3	1G Multimode (SX) LC Transceivers support
2.1.4	1G Single Mode (LX) LC Transceivers
2.1.5.	1G Copper (TX) RJ45 Transceivers support
2.2	The Core Switch shall be configured with 400Gbps or more virtual stacking bandwidth between Core Switches. All the passive infrastructure should be part of supply
2.3	The Core Switch shall support Virtual Switching System (VSS) or Virtual Chassis (VC) or equivalent Switch Clustering/Stacking feature 2 Switches or More, where the Switch Clustering feature shall combine multiple switches into a single network element.
3	Performance
3.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of 3.8Tbps or more.
3.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of 1.99 BPPS or more.
4	Layer 2 features: it shall support from day 1
4.1	4000 or more active VLANs
4.2	80000 MAC addresses or more
4.3	IP multicast snooping IGMP v1, v2, v3
4.4	Jumbo Frames (up to 9216 bytes)
5	Layer 3 features: it shall support from day 1
a	Up to 100K IPv4 routes and up to 7000 IPv6 routes or more
b	Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1
c	IPv4 & IPv6 Routing protocols & multicast routing available from day 1.

d	such as RIP v1 or v2, RIPng, OSPFv2, OSPFv3, BGP4, BGP4+, Multi-VRF, VRRP for both IPV4 and IPV6 protocol ,VRRPv2 & VRRPv3
e.	PIM-SSM, PIM Sparse, PIM Dense, PIM Anycast RP, and PIM passive IPv4 multicast routing.
f	PIM-SSM, PIM Sparse, PIM Anycast RP, MSDP and PIM6-SM Snooping IPv6 multicast routing
6	Security features
6.1	RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords
6.2	secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection
6.4	IPv4 and IPv6 ACLs: with up to 8000 rules / ACL per system
e.	Flexible Authentication with 802.1x Authentication and MAC Authentication
7	Manageability
7.1	It shall be manageable using Network Management Software with Web based Graphical User Interface (GUI)
7.2	It shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch for management/monitoring
7.3	It should also support NetFlow or sFlow or equivalent
8	Physical Attributes, Memory, Power Supply and Fans
8.1	The Switch shall be provided with 19" Universal 4 post rack mount kit
8.2	The Switch should have minimum 32MB Buffers, 4GB Main Memory and 16GB Flash Memory or More
8.3	The Switch shall be configured with hot swappable, redundant load sharing AC power supplies to provide 1:1 or N+1 power supply redundancy or better
8.4	The Switch shall be configured with hot swappable, redundant fans to provide 1:1 or N+1 fan redundancy or better
9	Mandatory Compliance:
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 24 Port 1G Layer 3 Switch

S. No	Specification Required
1	<u>Product details- Please specify</u>
1.1	Please mention Make, Model No. and Part Code
2	<u>Architecture & Port Density</u>
2.1	Switch should offer Wire-Speed Non-Blocking Switching & Routing Performance at Layer 2 & Layer 3.
2.2	The Switch should be configured with 24 x 10M/100M/1G RJ45 ports and 4 x 1G/10G SFP+ Slots from Day 1.

2.3	Distribution Switch should support Stacking 8 Switches or More with more than 160 Gbps stacking bandwidth per Switch. The stacking bandwidth should be aprt from common Switching Bandwidth
3	<u>Performance</u>
3.1	Switching Bandwidth: Should provide Non-Blocking switch fabric capacity of 128 Gbps or more.
3.2	Forwarding Capacity: Should provide wire-speed packet forwarding of 95 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Shall support 4K active VLANs
4.2	Shall support 30K MAC addresses or more.
4.3	Shall support IP multicast snooping IGMP v1, v2, v3
4.4	Shall support Jumbo Frames (up to 12K bytes)
5	<u>Layer 3 features</u>
5.1	Shall support minimum 17K IPv4 routes and 17K IPv6 routes or more
5.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1.
5.3	Shall support OSPFv2, OSPFv3, BGP4 and BGP4+, VRRP for both IPv4 & IPv6 Routing protocols and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Switch shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Shall support IPv4 and IPv6 ACLs with up to 8K
6.5	Shall support Byte and packet-based broadcast, multicast, and unknown-unicast limits with suppression port dampening.
6.6	Shall support IPv6 Router Advertisement (RA) Guard.
6.7	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring
7.3	Shall support Net Flow or sFlow or equivalent
8	<u>Physical Attributes, Power Supply and Fans</u>
8.1	Mounting Option: 19" Universal rack mount ears
8.2	Shall be configured with Dual Hot Swappable Internal AC power supply and Fan from Day 1.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 24 Port 1G with 4 x 10G Layer 2 Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply
2.3	The Switch Must Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv2, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.

8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 24 Port 1G with 4 x 10G Layer 2 PoE Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply
2.3	The Switch Must Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv2, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.

6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
8.3	The Switch should have a PoE Power Budget of 370W.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 48 Port 1G with 4 x 10G Layer 2 Switch	
S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply
2.3	The Switch Must Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more

5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 48 Port 1G with 4 x 10G Layer 2 PoE Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply
2.3	The Switch Must Support Long distance Stacking up to 2Kms.

3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
8.3	The Switch should have a PoE Power Budget of 740W.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be IPv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 24 Port 1G with 4 x 1G SFP Layer 2 Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.
2.4	The Switch Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
9	<u>Mandatory Compliance:</u>

9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 24 Port 1G with 4 x 1G SFP Layer 2 PoE Switch	
S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.
2.4	The Switch Must Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv2, OSPFv2 and OSPFv3) and Multicast Routing Protocols.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.

6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
8.3	The Switch should have a PoE Power Budget of 370W.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

<u>Technical Specifications for 48 Port 1G with 4 x 1G SFP Layer 2 Switch</u>	
S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.
2.4	The Switch Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more

5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDCPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 48 Port 1G with 4 x 1G SFP Layer 2 PoE Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.
2.4	The Switch Must Support Long distance Stacking up to 2Kms.

3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
8.3	The Switch should have a PoE Power Budget of 740W.
9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for 12 Port 1G with 2 x 1G SFP Layer 2 PoE Switch

S. No	Specification Required
1	<u>Product details - Please specify</u>
1.1	Please mention Make, Model No. and Part Code.
2	<u>Architecture & Port Density</u>
2.1	The Switch should have minimum Twelve (12) 10/100/1000Mbps PoE+ RJ45 ports and should have Two (2) 10M/100M/1G SFP Slots, from Day 1.
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.
2.3	The Switch should support Stack up to 8 Switches with more than 20Gbps stacking bandwidth per Switch.
2.4	The Switch Must Support Long distance Stacking up to 2Kms.
3	<u>Performance</u>
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 64 Gbps or more.
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 42 Mpps or more.
4	<u>Layer 2 features</u>
4.1	Should support 4K active VLANs
4.2	Should support 16K MAC addresses or more.
4.3	Should support IP multicast snooping IGMP v1, v2, v3
4.4	Should support Jumbo Frames (up to 9K bytes)
5	<u>Layer 3 features</u>
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.
6	<u>Security</u>
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.
7	<u>Manageability</u>
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.
7.3	Should support NetFlow or sFlow or equivalent.
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.
8.3	The Switch should have a PoE Power Budget of 124W.

9	<u>Mandatory Compliance:</u>
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding
10	<u>Warranty</u>
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Multi Mode fiber (1 Gig)	
S. No	Specification Required
1	1000Base-SX Fiber SFP with Digital Optical Monitoring
2	LC duplex connector
3	850 nm, for distances up to 550 Meter
4	Multi Mode Fiber
5	ROHS Compliant
6	Compliant with SFP Transceiver MSA specification
7	Compliant with Specifications for IEEE 802.3z/Gigabit Ethernet
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of FDA 21CFR, 1040.10, Class 1, CSA, 60950-1-03/ UL 60950-1 and EN 60825-1
Single Mode Fiber (1 Gig)	
S. No	Specification Required
1	1000Base-LX Fiber SFP with Digital Optical Monitoring
2	LC duplex connector
3	1310 nm, for distances up to 10 km
4	Single Mode Fiber
5	ROHS Compliant
6	Compliant with SFP Transceiver MSA specification
7	Compliant with Specifications for IEEE 802.3z/Gigabit Ethernet
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of FDA 21CFR, 1040.10, Class 1, CSA, 60950-1-03/ UL 60950-1 and EN 60825-1
Multi Mode fiber (10 Gig)	
S. No	Specification Required
1	10,000Base-SX Fiber SFP+ with Digital Optical Monitoring
2	LC duplex connector
3	850 nm, for distances up to 300 Meter.
4	Multi Mode Fiber
5	ROHS Compliant
6	Compliant with SFP Transceiver MSA specification and Hot-swappable.
7	Compliant with Specifications for IEEE 802.3ae/10 Gigabit Ethernet
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of IEC FDA 21CFR, 1040.10, Class 1 and CSA 60950-1-03/ UL 60950-1

Single Mode Fiber (10 Gig)	
S. No	Specification Required
1	10,000Base-LX Fiber SFP+ with Digital Optical Monitoring
2	LC duplex connector
3	1310 nm, for distances up to 10 km
4	Single Mode Fiber
5	ROHS Compliant
6	Compliant with SFP Transceiver MSA specification and Hot-swappable.
7	Compliant with Specifications for IEEE 802.3ae/10 Gigabit Ethernet
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of IEC FDA 21CFR, 1040.10, Class 1 and CSA 60950-1-03/ UL 60950-1
Multi Mode fiber (25 Gig)	
S. No	Specification Required
1	25,000Base-SX Fiber SFP+ with Digital Optical Monitoring
2	LC duplex connector
3	850 nm, for distances up to 100 Meter.
4	Multi Mode Fiber
5	ROHS Compliant
6	Hot-swappable and High-Performance Computing (HPC) interconnects.
7	Compliant with Specifications for IEEE 802.3by/ 25 GbE SFP28 FIBER
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of North America: UL/CSA 60950, CDRH Class 1 and European Union: EN 60950, EB 60825 Class 1
Single Mode Fiber (25 Gig)	
S. No	Specification Required
1	25,000Base-LX Fiber SFP+ with Digital Optical Monitoring
2	LC duplex connector
3	1310 nm, for distances up to 10 km
4	Single Mode Fiber
5	ROHS Compliant
6	Hot-swappable and High-Performance Computing (HPC) interconnects
7	Compliant with Specifications for IEEE 802.3BM/25 GbE SFP28 FIBER.
8	Compliant with Industry Standard RFT Electrical Connector and Cage
9	Laser Class 1 Product which comply with the requirements of North America: UL/CSA 60950, CDRH Class 1 and European Union: EN 60950, EB 60825 Class 1.

Technical Specifications for WLAN Controller	
S. No	Specification Required
1	Product details- Please specify
A	Please mention Make, Model No. and Part Code
2	Essential Features
A	The WLC Management can be in physical appliance/virtual appliance or Cloud based management platform.
B	WLC should have Easy Setup through UPnP Network Discovery and Installation Wizard.

C	Controller should supply with Zero AP License from day 1 and should be scalable up to 6000 APs in single hardware/in clustered configuration. If not cloud, Each WLC (primary and Redundant) should be able to support minimum 1024 campus connected AP's or more with support of seamless roaming access over L2/L3 network.
D	each Controller should have capacity to handle minimum 20,000 or more Concurrent devices.
E	each controller should support integrated user authentication capability of minimum 20,000 users without the need for any external database servers (AD/LDAP).
F	Controller should support minimum 1000 WLAN's.
G	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.
H	Ability to map SSID to VLAN and dynamic VLAN support for same SSID.
I	support automatic channel selection for interference avoidance.
J	The WLAN solution should support client troubleshooting feature that allows an administrator to focus on a specific client device and its connectivity status. The tool should track the step-by-step progress of the client's connection, through 802.11 stages, RADIUS, EAP authentication, captive portal redirects, encryption key setup, DHCP, roaming, and more (depending on WLAN type).
K	The WLAN solution should support in built spectrum analysis feature.
L	The controller should support the ability to create different zones in which AP can be grouped logically or physically based on location eg different buildings in a campus can be configured as different zones so that each zone will have different configuration and policies.
M	External Captive Portal Integration - Web-services based API for external web-portals to integrate with the controller
N	should have the capability to limit/prevent clients from using static IP addresses thereby enhancing network efficiency and preventing network conflicts.
O	WLC should support Hotspot 2.0 (passpoint).
3	Auto Deployment of AP's at different locations
A	Access points can discover controllers on the same L2 domain without requiring any configuration on the access point.
B	Access points can discover controllers across Layer-3 network through DHCP or DNS option
4	Security & Monitoring
A	Controller should support following for security & Authentication:
B	WIRELESS SECURITY & Authentication: Open, 802.1x/EAP, PSK, WISPr, WPA, WPA2-AES, WPA-TKIP, WEP, EAP-SIM, EAP-AKA over WLAN for 802.1x, Authentication through external Radius /Directory services.
C	WLC should support WIDS/WIPS for security including Rogue AP detection and prevention, Evil-twin/AP spoofing detection and Ad-Hoc detection.
D	WLC Should support L2 Client Isolation so User cannot access each other's devices. Isolation should have option to apply on AP or SSID's.
E	Support for Walled garden "Walled Garden" functionality to allow restricted access to select destinations by unauthorized wireless users.
F	The proposed architecture should be based on controller based Architecture with thick AP deployment. While Encryption / decryption of 802.11 packets should be able to perform at the AP.

G	WLC should support OS/Device finger printing, Bandwidth rate limit, VLAN mapping.
H	WLC should support Mesh.
I	WLC should be able to present a customizable dashboard with information on the status of the WLAN network.
J	WLC 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.
K	WLC or integrated solution should provide customized reporting with minimum 15 days of historical WLAN information.
L	Filtering of Alarms and event Log based on APs, SSID or Zones
M	Syslog support towards external syslog server
5	QoS features
A	per SSID or dynamic Per user bandwidth Rate Limiting
B	Self-healing (on detection of RF interference or loss of RF coverage) and vendor should provide their Interference mitigation techniques.
C	System must support Band Steering where 5 Ghz clients are forced to connect over 5Ghz Radio to provide better load balancing among 2.4Ghz and 5Ghz Radios.
D	WLC shall support Quality of Service features like 802.11e based QoS enhancements, WMM or equivalent and U-APSD to provide best performance on Video applications.
6	Client/Guest Management
A	WLC should provide a Guest Login portal in order to authenticate users that are not part of the organization.
B	WLC 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.
C	Social Login Support: OAuth 2.0 WLAN allows end-user to access the Internet if its authentication by the OAuth 2.0 provider (Facebook, Google, LinkedIn, Microsoft
7	Other Requirements
A	Controller should be FCC certified. Should comply to certifications EN55022, EN61000, EN60950, LVD.
B	reports by OS and device manufacturer
C	Customizable Dashboards with Data Explorer
8	The analytics system has a combination of attributes:
A	Automated data baselining and machine-learning-driven insights
B	Health and SLA monitoring
C	Powerful, holistic troubleshooting
D	Automatic classification of incident severity
E	No requirement for an on-site data collector or overlay sensors
F	Granular access to raw data with deep exploration and custom dashboards
H	12 months of storage with flexible data reporting
9	Network Health Monitoring: Incident Analytics, Connectivity, user experience diagnostics and Reports and Dashboards
A	View metrics in specific health categories, Connection, Performance, Infrastructure, AP service uptime, time to connect, connection success rate and client throughput
B	client operating system types, access point models, firmware versions, WLANs, client impact and Presentation of the underlying data that drives the incident

C	Successful, slow and failed connections, Disconnect events, Roaming events and failed roams Connection quality (RSSI, MCS, client throughput), Network incidents affecting users and with links to see incident details
D	traffic and client trends, top devices, top SSIDs, traffic distribution and reports by OS and device manufacturer Customizable Dashboards with Data Explorer
10	<u>Warranty</u>
10.1	The WLAN Controller shall be quoted with Three (3) years Hardware warranty.
11	<u>Product brochure</u>
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.

Technical Specifications for Indoor Access Point (2x2:2)

S. No	Specification Required
1	The APs should support the IEEE 802/11a/b/g/n/ac/ax with dual radio capabilities conforming to Wi-Fi 6 standard.
2	The AP should support 2x2:2 MIMO on both the bands. It should support minimum 1200 Mbps data rates on 5 GHz and minimum 570 Mbps data rates on 2.4GHz.
3	The AP shall have two 1Gbps Ethernet port. Additionally, it should have an USB port for hosting Internet-of-Things (IoT) devices such as Bluetooth Low Energy (BLE) smart beacons.
4	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.
5	The access point should be able to operate in full MIMO mode and the necessary power POE/POE+ should be provided.
6	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
7	The AP should have an option to be powered up through DC power in addition to POE.
8	The AP should have a receive sensitivity of -96dBm.
9	The AP should provide an antenna gain of minimum 3dBi on both the bands.
10	The AP should support 20, 40,80,160/80+80 MHz channelization.
11	The access point should be able to detect clients that have dual band capability and automatically steer those clients to use the 5GHz band instead of the 2.4GHz band.
12	The AP should provide minimum Tx Power of 22dBm on both the bands
13	The access point should support 802.1q VLAN tagging
14	The access point should support WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i security.
15	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.
16	The Access Point should support WMM, Power Save, Tx Beamforming, LDPC, STBC,
17	802.11r/k/v.
18	The AP should have the capability to support minimum 15 BSSID
19	Should support 500 or more clients per AP.
20	Should support IPv6 dual stack from day one
21	The Access Point should support mesh configuration either directly or through the controller.

22	The Access Point should support rate limiting, application recognition and control, Access Control lists and device fingerprinting.
23	Operating Temperature: 0°C to 50°C. Operating Humidity: up to 95% non-condensing.
24	Should be plenum rated and comply to RoHS
25	Should be WI-FI certified and WPC approved.
26	Mechanism for physical device locking using padlock /Kensington lock / equivalent
27	The Access Point shall be quoted with Three (3) years hardware warranty.

Technical Specifications for Outdoor Access Point (2x2:2)

S. No	Specification Required
1	The APs should support IEEE 802/11a/b/g/n/ac/ax standards with Dual Band Concurrent 2x2:2 streams (2.4GHz) + 2x2:2 streams (5GHz)
2	The proposed access point should be 802.11ax (Wi-Fi 6) and Operate in dual band radio.
3	The AP Should supports on both bands for the capacity of 2.4GHz 802.11b/g/n/ac/ax 574 Mbps and 5 GHz 802.11b/g/n/ac/ax 1200 Mbps
4	The AP shall have 1 ports, auto MDX, auto-sensing 10/100/1000 Mbps, RJ-45 port and 1 USB 2.0 port
5	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.
6	The access point shall support Link Aggregation (LACP) to maximize the backhaul bandwidth using both Ethernet ports.
7	The Outdoor AP should support 40 MHz channelization on 2.4GHz and 20/40/80 MHz channelization on 5 GHz. It should also support MU-MIMO.
8	The access point should be able to operate in full MIMO mode with 802.3af/at POE.
9	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
10	Since most radio interference come from the WLAN network itself the vendor should specify what mechanisms such as beam steering/ adaptive antenna technology/ beamforming are available in combination to focus the energy on the destination STA and minimize radio interference with the surrounding of the AP. The vendor should specify if the activation of such feature is still compatible with 802.11n spatial multiplexing.
11	Since the WLAN network will be using an unlicensed band the solution should have mechanisms that reduce the impact of interference generated by other radio equipment operating in the same band. Please Describe techniques supported.
12	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.
13	The antennas to be dual polarised and should be integrated inside the access point enclosure to minimize damage and create a low profile unit that does not stand out visually. The antennas could be omnidirectional or directional as per the requirement or site survey done by the vendor.
14	The access point should support 802.1q VLAN tagging
15	The access point should support WPA2/3 enterprise authentication. AP should support Authentication via 802.1X and Active Directory.
16	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e

17	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.
18	Channel selection based on measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method.
19	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards
20	Device antenna gain (integrated) must be at least 3dBi.
21	Up to 161BSSIDs on 2.4G radio and 5G radio for multiple differentiated user services (e.g. voice).
22	Should support 500 or more clients per AP and SSID up to 31 per AP
23	Should support IPv6 from day one
24	For troubleshooting purposes, the administrator should have the ability to remotely capture 802.11 and / or 802.3 frames from an access point without disrupting client access.
25	Operating Temperature
26	-20°C to 65°C
27	. Operating Humidity: up to 95% non-condensing.
28	The Outdoor AP should be IP67 rated & Wind Survivability Up to 266km/h (165 mph)
29	Should be WiFi certified and WPC approved; ETA certificate to be enclosed
30	Mechanism for physical device locking using padlock /Kensington lock / equivalent
31	The Access Point shall be quoted with Three (3) years hardware warranty.

Technical Specifications for Indoor Access Point (4x4:4)

S. No	Specification Required
1	The APs should support the IEEE 802/11a/b/g/n/ac/ax with dual radio capabilities conforming to Wi-Fi 6 standard.
2	The AP should support 4x4:4 MIMO on 5 GHz and 2x2:2 on 2.4 GHz bands. It should support minimum 2400 Mbps data rates on 5 GHz and minimum 570 Mbps data rates on 2.4GHz.
3	The AP shall have One 2.5Gbps Ethernet port and one 1Gbps Ethernet port. Additionally it should have an USB port for hosting Internet-of-Things (IoT) devices such as Bluetooth Low Energy (BLE) smart beacons.
4	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.
5	The access point should be able to operate in full MIMO mode and the necessary power POE/POE+ should be provided.
6	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
7	The AP should have an option to be powered up through DC power in addition to POE.
8	The AP should have a receive sensitivity of -96dBm.
9	The AP should provide an antenna gain of minimum 3dBi on both the bands.
10	The AP should support 20, 40, 80, 160/80+80MHz channelization.

11	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.
12	The AP should provide minimum Tx Power of 23dBm on both the bands
13	The access point should support 802.1q VLAN tagging
14	The access point should support WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i security.
15	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.
16	The Access Point should support WMM, Power Save, Tx Beamforming, LDPC, STBC,
17	802.11r/k/v.
18	Should support 500 or more clients per AP.
19	Should support IPv6 dual stack from day one
20	The Access Point should support mesh configuration either directly or through the controller.
21	The Access Point should support rate limiting, application recognition and control, Access Control lists and device fingerprinting.
22	Operating Temperature: 0 °C to +40 °C (+32 °F to +104 °F). Operating Humidity: up to 95% non-condensing.
23	Should be plenum rated and comply to RoHS
24	Should be WiFi certified and WPC approved.
25	Mechanism for physical device locking using padlock /Kensington lock / equivalent
26	The Access Point shall be quoted with Three (3) years hardware warranty.

Technical Specifications for Outdoor Access Point (4x4:4)

S. No	Specification Required
1	The APs should support IEEE 802/11a/b/g/n/ac/ax standards with Dual Band Concurrent 4x4:4 streams (2.4GHz) + 4x4:4 streams (5GHz)
2	The proposed access point should be 802.11ax (Wi-Fi 6) and Operate in dual band radio.
3	The AP Should supports eight spatial streams on both bands for the capacity of 2.4GHz 802.11b/g/n/ac/ax 1148 Mbps and 5 GHz 802.11b/g/n/ac/ax 2400 Mbps
4	The AP shall have 2 ports, auto MDX, auto-sensing 10/100/1000 Mbps, RJ-45 and 100/1000/2500 Mbps RJ-45. It should also have a SFP+ Interface – alternate to Ethernet, providing an integrated high speed backhaul. The second Ethernet port can be used for PoE Output to daisy chain and power APs (ideal for a mesh AP).
5	The access points should be centrally managed capacity as well to work as standalone.
6	The access point shall support Link Aggregation (LACP) to maximize the backhaul bandwidth using both Ethernet ports.
7	The Outdoor AP should support 40 MHz channelization on 2.4GHz and 20/40/80+80/160 MHz channelization on 5 GHz. It should also support MU-MIMO and OFDMA
8	The access point should be able to operate in full MIMO mode with 802.3af/at POE. Alternatively, the AP should also support AC Input: 100-240 Vac.

9	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
10	Since most radio interference come from the WLAN network itself the vendor should specify what mechanisms such as beam steering/ adaptive antenna technology/ beamforming are available in combination to focus the energy on the destination STA and minimize radio interference with the surrounding of the AP. The vendor should specify if the activation of such feature is still compatible with 802.11n spatial multiplexing.
11	Since the WLAN network will be using an unlicensed band the solution should have mechanisms that reduce the impact of interference generated by other radio equipment operating in the same band. Please Describe techniques supported.
12	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.
13	The antennas to be dual polarised and should be integrated inside the access point enclosure to minimize damage and create a low profile unit that does not stand out visually. The antennas could be omnidirectional or directional as per the requirement or site survey done by the vendor.
14	The access point should support 802.1q VLAN tagging
15	The access point should support WPA2/3 enterprise authentication. AP should support Authentication via 802.1X and Active Directory.
16	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e
17	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.
18	Channel selection based on measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method.
19	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards
20	Device antenna gain (integrated) must be at least 3dBi.
21	Up to 31BSSIDs on 2.4G radio and 5G radio for multiple differentiated user services (e.g. voice).
22	Should support 500 or more clients per AP.
23	Should support IPv6 from day one
24	For troubleshooting purposes, the administrator should have the ability to remotely capture 802.11 and / or 802.3 frames from an access point without disrupting client access.
25	Operating Temperature
26	-40°F (-40°C) to 149°F (65°C)
27	. Operating Humidity: up to 95% non-condensing.
28	The Outdoor AP should be IP67 rated.
29	Should be WiFi certified and WPC approved; ETA certificate to be enclosed
30	Mechanism for physical device locking using padlock /Kensington lock / equivalent
31	The Access Point shall be quoted with Three (3) years hardware warranty.

Specifications For Firewall/UTM - 100 Users	
Performance Specifications:	
Interface	8x GE RJ45, 2x Shared Port Pairs
Firewall throughput	Minimum 10 Gbps

NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 1 Gbps
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 900 Mbps
IPS Throughput	Minimum 1.4 Gbps
IPSec Throughput	Minimum 6.5 Gbps
New Session	Minimum 45,000
Concurrent Session	Minimum 1.5 Million
Log Retention	Minimum 3 Year
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN
Firewall Features:	
	Traffic Shaping
	IPS AND DOS
	Gateway Anti-virus
	Anti-spam
	WEB & VIDEO FILTERING
	Application Filtering
	Cloud Sandboxing
	AntiBot
	Advance Threat Protection (ATP)
	VPN- SSL and IPSec
	SDWAN ()
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6
	Virtual Firewall
	Device Identification
	SSL Inspection
	DNS Protection
	IPV6 Support
	Policy Management
	Data leak prevention
	Web application firewall
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution

Specifications For Firewall/UTM - 300 Users	
Performance Specifications:	
Interface	2x 10 GE SFP+, 22x GE RJ45, 8x GE SFP

Firewall throughput	Minimum 20 Gbps
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 1.6 Gbps
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 1 Gbps
IPS Throughput	Minimum 2.6 Gbps
IPSec Throughput	Minimum 11.5 Gbps
New Session	Minimum 56,000
Concurrent Session	Minimum 1.5 Million
Log Retention	Minimum 3 Year
Power Supplies	Redundant
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN
Firewall Features:	
	Traffic Shaping
	IPS AND DOS
	Gateway Anti-virus
	Anti-spam
	Web & Video Filtering
	Application Filtering
	Cloud Sandboxing
	AntiBot
	Advance Threat Protection (ATP)
	VPN- SSL and IPSec
	SDWAN ()
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6
	Virtual Firewall
	Device Identification
	SSL Inspection
	DNS Protection
	IPV6 Support
	Policy Management
	Data leak prevention
	Web application firewall
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution

Performance Specifications	
Interface	18 x GE RJ45 , 8 x GE SFP , 4 x 10GE SFP+ slots
Firewall throughput	Minimum 27 Gbps
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 3.5 Gbps
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 3 Gbps
IPS Throughput	Minimum 5 Gbps
IPSec Throughput	Minimum 13 Gbps
New Session	Minimum 280000
Concurrent Session	Minimum 3 Million
Log Retention	Minimum 3 Year
Power Supplies	Redundant
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN
Firewall Features	
	Traffic Shaping
	IPS AND DOS
	Gateway Anti-virus
	Anti-spam
	WEB & VIDEO FILTERING
	Application Filtering
	Cloud Sandboxing
	AntiBot
	Advance Threat Protection (ATP)
	VPN- SSL and IPSec
	SDWAN ()
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6
	Virtual Firewall
	Device Identification
	SSL Inspection
	DNS Protection
	IPV6 Support
	Policy Management
	Data leak prevention
	Web application firewall
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution

Specifications For Firewall/UTM - 1000 Users	
Performance Specifications	
Interface	18x GE RJ45, 16x GE SFP
Firewall throughput	Minimum 32 Gbps
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 6 Gbps
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 5 Gbps
IPS Throughput	Minimum 7.8 Gbps
IPSec Throughput	Minimum 20 Gbps
New Session	Minimum 400000
Concurrent Session	Minimum 4 Million
Log Retention	Minimum 3 Year
Power Supplies	Redundant
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN
Firewall Features	
	Traffic Shaping
	IPS AND DOS
	Gateway Anti-virus
	Anti-spam
	WEB & VIDEO FILTERING
	Application Filtering
	Cloud Sandboxing
	AntiBot
	Advance Threat Protection (ATP)
	VPN- SSL and IPSec
	SDWAN ()
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6
	Virtual Firewall
	Device Identification
	SSL Inspection
	DNS Protection
	IPV6 Support
	Policy Management
	Data leak prevention
	Web application firewall

Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS, Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support, RMA & Advance hardware Replacement should be quoted with the solution
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Specifications For Firewall/UTM - 1500 Users	
Performance Specifications	
Interface	2x 10 GE SFP+, 10x GE RJ45, 8x GE SFP
Firewall throughput	Minimum 36 Gbps
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 9.5 Gbps
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 7 Gbps
IPS Throughput	Minimum 10 Gbps
IPSec Throughput	Minimum 20 Gbps
New Session	Minimum 450000
Concurrent Session	Minimum 8 Million
Log Retention	Minimum 3 Year
Power Supplies	Redundant
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN
Firewall Features	
	Traffic Shaping
	IPS AND DOS
	Gateway Anti-virus
	Anti-spam
	WEB & VIDEO FILTERING
	Application Filtering
	Cloud Sandboxing
	AntiBot
	Advance Threat Protection (ATP)
	VPN- SSL and IPSec
	SDWAN ()
	Routing, NAT, NAT46, NAT64, NAT66 DNS64 & DHCPv6
	Virtual Firewall
	Device Identification
	SSL Inspection
	DNS Protection
	IPV6 Support
	Policy Management

	Data leak prevention
	Web application firewall
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS, Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam, Sandboxing, 24*7 Support, RMA & Advance hardware Replacement should be quoted with the solution

Specifications For Authenticator - 100, 300, 500 Users	
Sr. No.	<u>General Features</u>
1	Standards-based secure authentication which works in conjunction with soft/hard tokens to deliver secure two-factor authentication to any third-party device capable of authentication via RADIUS or LDAP
2	Virtual option that can be deployed in minutes to secure access to your existing network infrastructure
3	The System should support minimum 100 and more
5	Should support minimum 200 soft/hard tokens or more
6	Should support atleast 10 User Groups or more
7	Number of supported CA Certificates should be 5 or more
8	Should support atleast 100 User Certificate Bindings
10	Should have atleast 2 x 10/100/1000 (copper, RJ-45) interfaces
11	Should have minimum 60 GB of local-storage
12	Should have a managability over CLI and Console and HTTPS.
13	The system should support SNMP v1 / v2c / v3.
14	Should support atleast SYSLOG Servers.
15	The system should support Static-Routes
16	Integrates with existing solutions such as LDAP or AD servers to lower the cost and complexity of adding strong authentication to your network
17	Support for E-mail and SMS tokens enables rapid deployment of two-factor authentication without the need for additional dedicated hardware
18	Should support User self-servicing and password management to allow users to manage their own registrations and passwords without administrator intervention
19	Support for Certificate Authority functionality to simplify the CA management and to deliver user certificate signing, VPN, or server x.509 certificates for use in certificate-based two-factor authentication
20	Single Sign-On (SSO) Transparent User Identification with zero impact for enterprise users
21	SSO Portal based authentication with tracking widgets to reduce the need for repeated authentications

Specifications For Authenticator - 1000 to 1500 Users
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<u>Sr. No.</u>	<u>General Features</u>
1	Standards-based secure authentication which works in conjunction with soft/hard tokens to deliver secure two-factor authentication to any third-party device capable of authentication via RADIUS or LDAP
2	Hardened appliance that can be deployed in minutes to secure access to your existing network infrastructure
3	The System should support minimum 1500 Local Users or more.
4	The Appliance should have support for minimum 3500 Remote Users or more
5	Should support minimum 3000 soft/hard tokens or more
6	Should support atleast 150 User Groups or more
7	Number of supported CA Certificates should be 10 or more
8	Should support atleast 7500 User Certificate Bindings
9	Applinance must have redundant power supply
10	The appliance should have atleast 4 x 10/100/1000 (copper, RJ-45) interfaces
11	The appliance should have minimum 1TB of local-storage
12	The appliance should have a managability over CLI and Console and HTTPS.
13	The system should support SNMP v1 / v2c / v3.
14	Should support atleast SYSLOG Servers.
15	The system should support Static-Routes
16	Integrates with existing solutions such as LDAP or AD servers to lower the cost and complexity of adding strong authentication to your network
17	Support for E-mail and SMS tokens enables rapid deployment of two-factor authentication without the need for additional dedicated hardware
18	Should support User self-servicing and password management to allow users to manage their own registrations and passwords without administrator intervention
19	Support for Certificate Authority functionality to simplify the CA management and to deliver user certificate signing, VPN, or server x.509 certificates for use in certificate-based two-factor authentication
20	Single Sign-On (SSO) Transparent User Identification with zero impact for enterprise users
21	SSO Portal based authentication with tracking widgets to reduce the need for repeated authentications

1	All Copper cable and components should be from the same OEM.OEM should submit ISO 9001 and 14001 certificates for the manufacturing facilities related to all products involved in tender.
2	All Passive Components should be RoHS (Restriction of Certain Hazardous Substances) compliant. Declaration to be provided for RoHS Compliance
3	OEM for passive should have incorporated in India from Last 10 years. Incorporation certificate to be attached along with the bid. OEM should have its own manufacturing Unit in India (Proof of same to be attached)
4	OEM Should provide Application Assurance warranty for for end -to-end channel for 25 years.
5	Desired ETL/3P certificates should be present on respective Lab website with quoted part codes /series/family of product line.
6	Passive OEM should have minimum 80 crore turnover in last three consecutive years or cumulative for last three years should be 200 crores. OEM needs to submit the valid audited certificate by Chartered Accountant.
7	OEM should submit the unpriced BOQ for offered products with its Model No/Part codes and country of origin

Technical Specifications for OFC and Components	
FIBER CABLE OUTDOOR MM OM4	
1	Please mention Make and Part Code
2	Should be ISO/IEC 11801:2002; Uni-tube
3	Should Have 0.155 mm corrugated steel Armor
4	Type: Single Mode OS2
5	Cable Jacket material: 1.8 mm LSZH sheath
6	Minimum Cores 6

LIU 12/24 Port Rack Mountable 19" Loaded with LC Duplex adaptors, Pigtails and Splice holders	
1	Please mention Make and Part Code
2	Metal sliding style Loaded as per design for 12/24 Fiber with Easily removable Top plate with push buttons
3	12/24 Port LC type 1U
4	Should include Single Mode OS2/Multi Mode OM4 pigtails and adaptors as per design and BOQ.
5	Tray Material should be ABS
6	Adaptors in LIU should have valid type test approval from labs such as DNV GL Lab/ETL verified
7	Adaptors of Pigtail should have valid type test approval from labs such as DNV GL Lab/ETL verified
8	Adaptors should have integral self-closing metal laser protection flaps and semi-transparent plastic dust covers which allows optical testing with test lasers without removing the covers
9	Should have option for Visual coding, mechanical coding, and lock protection.

FIBER CABLE OUTDOOR SM OS2	
1	Please mention Make and Part Code

2	Should be ISO/IEC 11801:2002; Uni-tube
3	Should Have 0.155 mm corrugated steel Armor
4	Type: Single Mode OS2
5	Cable Jacket material: 1.8 mm HDPE sheath
6	Minimum Cores 6

Patch Cord LC – LC OM4 3 meter	
1	Please mention Make and Part Code
2	Patch Cord Should be Multi Mode OM4
3	Type of Connector LC-LC
4	Jacket Material: LSZH
5	Should have option for Visual coding, mechanical coding and lock protection for security purpose .

Patch Cord LC – LC SM 3 meter	
1	Please mention Make and Part Code
2	Patch Cord Should be Single Mode OS2
3	Type of Connector LC-LC
4	Jacket Material: LSZH
5	Should have option for Visual coding, mechanical coding and lock protection for security purpose .

Technical Specifications for Copper Cat6 Cable and Components	
CAT6 U/UTP CABLE	
1	Please mention Make and Part Code
2	Cat 6 U/UTP Cable
3	Transmission frequency of 250 MHz (Minimum)
4	Should be 4 pair with cross separator
5	Cable should be of 23 AWG copper conductor
6	Jacket: LSZH
7	Cable should be verified by ETL/3P/UL Listed

24 PORT JACK PANEL UNLOADED	
1	Please mention Make and Part Code
2	Should be 19" 1U straight Patch Panel, 24-port
3	Should have integral cable management Metal shelf.
4	Should accept Shielded as well as Unshielded jacks
5	Should have rear cable management shelf metallic .
6	Jack panel should have option to accept different color snap in coding clips
7	Jack panel should have zig zag jack placement.
8	Panel should be UL listed

INFORMATION OUTLET - FACE PLATE AND PATCH PANEL SIDE	
1	Please mention Make and Part Code
2	Category 6, EIA/TIA 568-C.2
3	information outlets Should accept cables from 22-24 AWG copper
4	Should be PCB free and Tool less
5	Material should be halogen-free and heavy-metal free in acc. with EU directives RoHS 2.
6	Should support 950 mating cycles
7	Jack should be optimised for 4PpoE (IEEE 802.3bt)
8	Should support 10GBase-T applications in acc. with IEEE 802.3an up to 500 MHz and 55 m
9	Panel side IO should have five different options for color coding clips
10	Should be Certified/verified in four connector channel by independent labs like ETL/GHMT/3P/GL for compliance

MOUNTING CORDS CAT 6 U/UTP(1 and 2 meter)	
1	Please mention Make and Part Code
2	Should be Compliant with Cat.6 requirements of ISO/IEC 11801, EN 50173, EN 50168 and EIA/TIA 568.C.2
3	The Outer Jacket should be LSZH
4	Patch cord should be optimised for 4PpoE (IEEE 802.3bt)
5	Patch cord should be terminatd using insulation displacement connections
6	Should have Option for different color coding clips.
7	Same Patch cords should be able to accept locking arrangement in future
8	Patch Cord Should be verified/certified in Four Connector channel by ETL/3P/DNV-GL/GHMT .(certificate to be enclosed with the bid)

FACE PLATE	
1	Please mention Make and Part Code
2	Square plate, 86mmx86mm
3	Write on labels in transparent plastic window – supplied with plate
4	Material : ABS Plastic
5	Face plate should have option to attach Hinged dust cover in different colors
6	Face Plate dust cover should be replacable without removing patch cord

Passive Specs for Cat 6A cables and components	
CAT6A, 4 PAIR SHIELDED S/FTP CABLE	
1	Please mention Make and Part Code
2	Cable Should be Cat 6A S/FTP or higher
3	Conductor Size: 23 AWG Solid type
4	Cable should Foil shielding of pairs individually and overall tin-plated copper braid shield.

5	Cable should be ETL verified /or 3P Lab Tested for Category 6A performance requirements of edition 1.0 of ISO/IEC 11801-1:2017, CENELEC EN 50173-1:2018, the Category 6A requirements of ANSI/TIA-568.2-D:2018 (Certificate to be available online on Intertek or 3ptest website) hard copy to be submitted along with Bid
6	Cable Flame safety is to be verified by Labs such as 3P, Intertek (ETL verified) according to IEC 60332-1-2, IEC 61034-1, IEC 61034-2, including amendment.1 and IEC 60754-2. (Certificate should be available on respective Lab website for authenticity) hard copy to be submitted along with Bid

24 PORT CAT6A JACK PANEL UNLOADED	
1	Please mention Make and Part Code
2	Patch panel should be with integrated cable tie shelf.
3	Panel should supply with 19" fastening kit, labelling field, accepting the snap-in type colour coding clips in 8 colours.
4	Should have self-adhesive, clear label holders (transparent plastic window type) and white designation labels with the panel, with optional colour labels / icons.
5	Material: sub-rack made of sheet steel 1.5 mm, colour blue chromated/Black/grey , screen made of plastic (ABS), halogen-free.
6	Each port / jack on the panel should be individually removable on field from the panel.
7	Patch Panel Should be UL listed

SHIELDED CAT 6A INFORMATION OUTLET (PANEL AND FACE PLATE SIDE)	
1	Please mention Make and Part Code
2	Connection module should be Cat 6A, die-cast, shielded with Reliable insulation displacement contacting (IDC) and dust cover
3	Module should Supports PoE (IEEE 802.3af), PoEP (IEEE 802.3at), 4Ppoe (IEEE 802.3bt) and is compatible to IEC 60512-99-001/002
4	Module should be Suitable for 10GBASE-T applications in acc. with IEEE 802.3 Section Four up to 500 MHz and 100 m.
5	Each module should have a Label with colour wiring chart, integrated production date and serial number for quality tracing
6	Should have Gold-plated contact area and tin-plated insulation displacement contact area.
7	Material Should be Halogen-free materials
8	Patch Side Module should have option for colour coding clip to make it easy to differentiate different services.
9	Shielded/screened four connector channel has been tested and verified by 3P/ETL verified and complies with the 10 Gigabit Ethernet requirements of IEEE 802.3an, Class EA requirements of Edition 1.0 of ISO/IEC 11801-1:2017 and CENELEC EN 50173-1:2018, and Category 6A requirements of ANSI/TIA 568.2- D:2018. (Certificate to be available online on Intertek or 3ptest website)
10	Module should be independently certified/verified by Labs such as DNV-GL, GHMT ,3P,ETL verified etc

MOUNTING CORDS – S/FTP Cat 6A (1 and 2 Meter)	
1	Please mention Make and Part Code
2	Flexible cable should be S/FTP, 4 x 2 x AWG 26/7
3	Patch should be mounted on both sides with RJ45 connector compliant with Cat. 6A ISO component standard: IEC 60603-7-51 RJ45 category 6A ISO (500 MHz)
4	Patch cord should be insulation displacement contacting (IDC) wire terminated according to IEC 60352-3
5	Should Supports PoE (IEEE 802.3af), PoEP (IEEE 802.3at), 4PpoE (IEEE 802.3bt) and is compatible to IEC 60512-99-001/002
6	Sheath Should be LSFRZH
7	Patch cord should be independently verified by ETL/3P/GHMT as per ISO/IEC 11801 (Certificate to be available online on relevant lab website)

FACE PLATE 86x86	
1	Please mention Make and Part Code
2	Dimensions:86.0 mm x 86.0 mm / 3.386 in x 3.386 in (W x H)
3	Should include Label strips
4	Material: plastic: PC + ABS

All Active Components must be from same OEM, All passive components must be from same OEM and all wireless components must be from same OEM. All Active, Passive & Wireless components must be compatible for inter-working and inter-operability.

6. Service Level Agreement

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service to be provided by the selected vendor to the department under the inclusive support as mentioned in this tender. SLA defines the terms of selected vendors responsibility in ensuring the timely delivery of deliverables and correctness of the same based on the agreed Performance Indicators as detailed in the agreement. The Vendor has to comply with all Service Level Agreement (SLA) defined below to ensure adherence to the project timelines, Quality and availability of services.

6.1 Service Levels during Maintenance Support

The Bidder should provide the required maintenance support to the Department. The Bidder should enter into a Service Level Agreement (SLA) with Department/SPIC and should adhere to the following service levels and accept the penalties as specified for non-compliance:

SEVERITY			
	PROBLEM DESCRIPTION	RESOLUTION TIME	PENALTY FOR NONCOMPLIANCE
Severity 1	The problem identified is making unavailable the entire system or any modules thereof, hence stoppage of entire or part of operations.	Bidder must provide a resolution within 4 (four) hours from the time of reporting the problem.	1 % of the Performance Guarantee Security per hour beyond 4 hours
Severity 2	The problem identified is affecting the business causing undue delays or malfunctioning of any functionality.	Bidder must provide resolution in 3 (three) calendar days.	0.5 % of the Performance Guarantee Security per day beyond 3 days
Severity 3	The problem identified is not affecting the business but an irritant.	Bidder must provide a solution within 1 calendar week.	0.1 % of the Performance Guarantee Security per week beyond 1 week

The categorization of Severity is at SPIC's/Department's discretion and Bidder must provide the service as agreed in the service contract.

6.2 System Availability: The Bidder must ensure system availability during the warranty period as per the following requirements and accept the penalties as specified for non-compliance:

SYSTEM	REQUIRED AVAILABILITY (COMPUTED QUARTERLY)	PENALTY FOR NONCOMPLIANCE
Active Components at Data Center /Department	99 %	@1 % of the Performance Guarantee Security per %age point below 99 %
Other Items supplied by the Bidder	98 %	@0.1 % of the Performance Guarantee Security per %age point below 98 %

- I. Systems / sub-systems for which the availability is 99 % shall not be down for more than 4 hours in a month, non-compliance of which will attract a monthly penalty of 1 % of the Performance Guarantee Security.
- II. Systems / sub-systems for which the availability is 98 % shall not be down for more than 16 hours in a month, non-compliance of which will attract a monthly penalty of 0.5 % of the Performance Guarantee Security

SECTION-V
BID SCHEDULES

Annexe 5.1.1
(Technical Bid)

BID PARTICULARS

1. Name of the Tenderer -----
2. Full Address of the Tenderer -----
3. Name of the actual signatory -----
4. Tenderer's proposal number and date -----
5. Name & address of the officer to whom all references shall be made regarding
this tender:

Name -----

Address-----

Telephone -----Mobile-----

Fax No. ----- e-mail -----

Witness:

Tenderer:

Signature -----

Signature -----

- Name -----

Name -----

Address -----

Designation -----

Company -----

Date -----

Date -----

Company Seal

Technical Bid Letter

To,

The Chief Executive Officer
Entrepreneur Development Centre (EDC) Building, Plot No: 20,
Rajiv Gandhi Chandigarh Technology Park (RGCTP), Chandigarh 160101

Ref : Tender No:

Sir,

We declare that:

1. We are an established Contractor in the area of supply and installation of Networking equipment/ components on turnkey basis.
2. We hereby offer to provide the material and services in line with tender document at the prices and rates mentioned in the Price Bid.
3. We do hereby undertake, that, in the event of acceptance of our bid, the Services shall be provided as stipulated in the Tender document and that we shall perform all the incidental services.
4. We enclose herewith the complete Technical Bid as required by you. This includes:
 - Bid Particulars (Annexe 5.1.1)
 - Bid Letter (Annexe 5.1.2)
 - Proposed Methodology (Annexe 5.1.3)
 - Vendor Profile (Annexe 5.1.4)
 - Technical Compliance Sheet (Annexe 5.1.5)
5. We agree to abide by our offer for a period of 180 days from the date fixed for opening of the Technical Bids.
6. We have carefully read and understood the terms and conditions of the tender and the conditions of the contract applicable to the tender and we do hereby undertake to provide services as per these terms and conditions. We also understand that no deviations from the Technical Specifications are allowed under this tender.
7. Certified that the tenderer is a company constituted under the Companies Act, 1956 and the person signing the tender is the constituted attorney.
8. Bid Security (Earnest Money) for an amount equal to Rs. 50,000 (Rupees Fifty Thousand only) is enclosed in the Cover containing the letter for Pre-qualifying Requirements in the form specified in Clause 12 of Section II.
9. We do hereby undertake, that, until a formal contract is prepared and executed, this bid, together with your written acceptance thereof and placement of letter of intent awarding the contract, shall constitute a binding contract between us.

Dated this day of 2022

Signature of Tenderer Name
& Designation: Company
Seal

DETAILED TECHNICAL PROPOSAL

(Detailed technical proposal giving clause-wise compliance to Tender Documents, Bill of Material, make, model, technical data sheets, methodology of cabling and installation work etc. to be given along with all Documentary Proof for pre-Qualification Criteria – Section II Clause No. 18)

Dated this day of 2022

Signature of Tenderer
Name & Designation:
Company Seal

VENDOR PROFILE

1	Name of the Firm/Company	
2	Year Established	
3	Address of Office	
4	Telephone No.	
5	Fax No.	
6	E-mail Address	
7	Website	
8	Names of Govt. Deptt/Public Sector/Pvt. Sector/International clients to whom the tenderer has provided similar services to	
8.A		
8.B		
8.C		
8.D		
8.E		
9	No. of full time Tech. personnel currently on roll	
10	No. of years of Proven experience of providing similar Services in India.	
11	Infrastructure facilities in tri-city Including Manpower & Hardware etc.	
12	Annual turnover Audited Annual turnover of the company in Rs. During last two years	
12.A	Turnover 2019-2020 FY	
12.B	Turnover 2020-2021 FY	
13	List of customers in India and also international customers, as on date, to whom the Tenderer is currently providing Similar services	
14	Any accreditation / rating from an internationally reputed third party rating agency.	
15	Various Certifications (ISO Certification/Six Sigma/ Nasscom/ DOT Registered)	

Dated this day of 2022

Signature of Tenderer
Name & Designation:
Company Seal

Technical Specifications for 24 Port 1/10G Layer 3 Switch

S. No	Specification Required	Compliance (Yes/No)
1	<u>Product details- Please specify</u>	
1.1	Please mention Make, Model No. and Part Code	
2	<u>Architecture & Port Density</u>	
2.1	Switch should offer Wire-Speed Non-Blocking Switching & Routing Performance at Layer 2 & Layer 3.	
2.2	The Distribution Switch shall have Twenty-Four (24) 1GbE/10GbE SFP+ Slots and Two (2) 40 QSFP+ Port.	
2.3	Distribution Switch should support Stacking 8 Switches or More with more than 160 Gbps stacking bandwidth per Switch.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: Should provide Non-Blocking switch fabric capacity of 880 Gbps or more.	
3.2	Forwarding Capacity: Should provide wire-speed packet forwarding of 650 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Shall support 4K active VLANs	
4.2	Shall support 30K MAC addresses or more.	
4.3	Shall support IP multicast snooping IGMP v1, v2, v3	
4.4	Shall support Jumbo Frames (up to 12K bytes)	
5	<u>Layer 3 features</u>	
5.1	Shall support minimum 17K IPv4 routes and 17K IPv6 routes or more	
5.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1.	
5.3	Shall support OSPFv2, OSPFv3, BGP4 and BGP4+, VRRP for both IPv4 & IPv6 Routing protocols and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Switch shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Shall support IPv4 and IPv6 ACLs with up to 8K	
6.5	Shall support Byte and packet-based broadcast, multicast, and unknown-unicast limits with suppression port dampening.	
6.6	Shall support IPv6 Router Advertisement (RA) Guard.	
6.7	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring	

7.3	Shall support Net Flow or sFlow or equivalent	
8	<u>Physical Attributes, Power Supply and Fans</u>	
8.1	Mounting Option: 19" Universal rack mount ears	
8.2	Shall be configured with Dual Hot Swappable Internal AC power supply and Fan from Day 1.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

<u>Technical Specifications for 48 Port 1/10/25G Layer 3 Switch</u>		
S. No	Specification Required	Compliance (Yes/No)
1	Product details -	
1.1	Make, Model No. /OEM Part Code. (Please specify)	
2	Architecture & Port Density	
2.1	The Core Switch shall have 48x 1G/10G/25G SFP+ Ports and 8x 40G/100G QSFP28 Port from Day 1.	
2.1.1	10G Multimode (SR) LC Transceivers support	
2.1.2	10G Single Mode (LR) LC Transceivers Support	
2.1.3	1G Multimode (SX) LC Transceivers support	
2.1.4	1G Single Mode (LX) LC Transceivers	
2.1.5.	1G Copper (TX) RJ45 Transceivers support	
2.2	The Core Switch shall be configured with 400Gbps or more virtual stacking bandwidth between Core Switches. All the passive infrastructure should be part of supply	
2.3	The Core Switch shall support Virtual Switching System (VSS) or Virtual Chassis (VC) or equivalent Switch Clustering/Stacking feature 2 Switches or More, where the Switch Clustering feature shall combine multiple switches into a single network element.	
3	Performance	
3.1	Switching Bandwidth: The Switch shall provide Switch Fabric Bandwidth Capacity of 3.8Tbps or more.	
3.2	Forwarding Capacity: The Switch shall provide Packet Forwarding Capacity of 1.99 BPPS or more.	
4	Layer 2 features: it shall support from day 1	
4.1	4000 or more active VLANs	
4.2	80000 MAC addresses or more	
4.3	IP multicast snooping IGMP v1, v2, v3	
4.4	Jumbo Frames (up to 9216 bytes)	
5	Layer 3 features: it shall support from day 1	
a	Up to 100K IPv4 routes and up to 7000 IPv6 routes or more	
b	Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1	

c	IPv4 & IPv6 Routing protocols & multicast routing available from day 1.	
d	such as RIP v1 or v2, RIPv6, OSPFv2, OSPFv3, BGP4, BGP4+, Multi-VRF, VRRP for both IPV4 and IPV6 protocol ,VRRPv2 & VRRPv3	
e.	PIM-SSM, PIM Sparse, PIM Dense, PIM Anycast RP, and PIM passive IPv4 multicast routing.	
f	PIM-SSM, PIM Sparse, PIM Anycast RP, MSDP and PIM6-SM Snooping IPv6 multicast routing	
6	Security features	
6.1	RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords	
6.2	secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection	
6.4	IPv4 and IPv6 ACLs: with up to 8000 rules / ACL per system	
e.	Flexible Authentication with 802.1x Authentication and MAC Authentication	
7	Manageability	
7.1	It shall be manageable using Network Management Software with Web based Graphical User Interface (GUI)	
7.2	It shall support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch for management/monitoring	
7.3	It should also support NetFlow or sFlow or equivalent	
8	Physical Attributes, Memory, Power Supply and Fans	
8.1	The Switch shall be provided with 19" Universal 4 post rack mount kit	
8.2	The Switch should have minimum 32MB Buffers, 4GB Main Memory and 16GB Flash Memory or More	
8.3	The Switch shall be configured with hot swappable, redundant load sharing AC power supplies to provide 1:1 or N+1 power supply redundancy or better	
8.4	The Switch shall be configured with hot swappable, redundant fans to provide 1:1 or N+1 fan redundancy or better	
9	Mandatory Compliance:	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	Warranty	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	Product brochure	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 24 Port 1G Layer 3 Switch		
S. No	Specification Required	Compliance (Yes/No)
1	Product details- Please specify	
1.1	Please mention Make, Model No. and Part Code	
2	Architecture & Port Density	
2.1	Switch should offer Wire-Speed Non-Blocking Switching & Routing Performance at Layer 2 & Layer 3.	

2.2	The Switch should be configured with 24 x 10M/100M/1G RJ45 ports and 4 x 1G/10G SFP+ Slots from Day 1.	
2.3	Distribution Switch should support Stacking 8 Switches or More with more than 160 Gbps stacking bandwidth per Switch. The stacking bandwidth should be apart from common Switching Bandwidth	
3	<u>Performance</u>	
3.1	Switching Bandwidth: Should provide Non-Blocking switch fabric capacity of 128 Gbps or more.	
3.2	Forwarding Capacity: Should provide wire-speed packet forwarding of 95 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Shall support 4K active VLANs	
4.2	Shall support 30K MAC addresses or more.	
4.3	Shall support IP multicast snooping IGMP v1, v2, v3	
4.4	Shall support Jumbo Frames (up to 12K bytes)	
5	<u>Layer 3 features</u>	
5.1	Shall support minimum 17K IPv4 routes and 17K IPv6 routes or more	
5.2	Shall support Basic IPv4 and IPv6 Static Routing, ECMP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from Day 1.	
5.3	Shall support OSPFv2, OSPFv3, BGP4 and BGP4+, VRRP for both IPv4 & IPv6 Routing protocols and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Switch shall support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Shall support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Shall support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Shall support IPv4 and IPv6 ACLs with up to 8K	
6.5	Shall support Byte and packet-based broadcast, multicast, and unknown-unicast limits with suppression port dampening.	
6.6	Shall support IPv6 Router Advertisement (RA) Guard.	
6.7	Shall support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Shall support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring	
7.3	Shall support Net Flow or sFlow or equivalent	
8	<u>Physical Attributes, Power Supply and Fans</u>	
8.1	Mounting Option: 19" Universal rack mount ears	
8.2	Shall be configured with Dual Hot Swappable Internal AC power supply and Fan from Day 1.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	

11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

<u>Technical Specifications for 24 Port 1G with 4 x 10G Layer 2 Switch</u>		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.	
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply	
2.3	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	

7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

<u>Technical Specifications for 24 Port 1G with 4 x 10G Layer 2 PoE Switch</u>		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.	
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply	
2.3	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	

6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
8.3	The Switch should have a PoE Power Budget of 370W.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 48 Port 1G with 4 x 10G Layer 2 Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.	
2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply	
2.3	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	

4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

<u>Technical Specifications for 48 Port 1G with 4 x 10G Layer 2 PoE Switch</u>		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 1G/10G SFP+ Slots, from Day 1.	

2.2	The Switch should have Capability to Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch. All the Accessories required for Stacking should be part of supply	
2.3	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols from Day 1.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
8.3	The Switch should have a PoE Power Budget of 740W.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	

11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	
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Technical Specifications for 24 Port 1G with 4 x 1G SFP Layer 2 Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.	
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.	
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.	
2.4	The Switch Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	

7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 24 Port 1G with 4 x 1G SFP Layer 2 PoE Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Twenty four (24) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.	
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.	
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.	
2.4	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 128 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 95 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	

6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
8.3	The Switch should have a PoE Power Budget of 370W.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 48 Port 1G with 4 x 1G SFP Layer 2 Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.	
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.	
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.	
2.4	The Switch Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	

4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPv6, OSPFv2 and OSPFv3) and Multicast Routing Protocols.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 48 Port 1G with 4 x 1G SFP Layer 2 PoE Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	

2.1	The Switch should have minimum Forty eight (48) 10/100/1000Mbps PoE+ RJ45 ports and should have Four (4) 10M/100M/1G SFP Slots, from Day 1.	
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.	
2.3	The Switch should support Stack up to 8 Switches with more than 40Gbps stacking bandwidth per Switch.	
2.4	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 176 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 130 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	
7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
8.3	The Switch should have a PoE Power Budget of 740W.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	

10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for 12 Port 1G with 2 x 1G SFP Layer 2 PoE Switch		
S. No	Specification Required	Compliance (Yes / No)
1	<u>Product details - Please specify</u>	
1.1	Please mention Make, Model No. and Part Code.	
2	<u>Architecture & Port Density</u>	
2.1	The Switch should have minimum Twelve (12) 10/100/1000Mbps PoE+ RJ45 ports and should have Two (2) 10M/100M/1G SFP Slots, from Day 1.	
2.2	All the SFP port should be upgradable to SFP+ (10G) in future when ever required.	
2.3	The Switch should support Stack up to 8 Switches with more than 20Gbps stacking bandwidth per Switch.	
2.4	The Switch Must Support Long distance Stacking up to 2Kms.	
3	<u>Performance</u>	
3.1	Switching Bandwidth: The Switch should provide Switch Fabric Bandwidth Capacity of 64 Gbps or more.	
3.2	Forwarding Capacity: The Switch should provide Packet Forwarding Capacity of 42 Mpps or more.	
4	<u>Layer 2 features</u>	
4.1	Should support 4K active VLANs	
4.2	Should support 16K MAC addresses or more.	
4.3	Should support IP multicast snooping IGMP v1, v2, v3	
4.4	Should support Jumbo Frames (up to 9K bytes)	
5	<u>Layer 3 features</u>	
5.1	Should support minimum 1K IPv4 routes and 1K IPv6 route or more	
5.2	Should support Basic IPv4 and IPv6 Static Routing, ECMP, VRRP, Host Routes, Virtual Interfaces, Routed Interfaces, Route Only and Routing between directly connected subnets from day 1.	
5.3	Should support Dynamic IPv4 & IPv6 Routing protocols (RIP, RIPng, OSPFv2 and OSPFv3) and Multicast Routing Protocols.	
6	<u>Security</u>	
6.1	Should support RADIUS, TACACS/TACACS+ and username/password for Authentication, Authorization and Accounting (AAA) with Local User Accounts and Local User Passwords.	
6.2	Should support secure communications to the management interface and system through SSL, Secure Shell (SSHv2), Secure Copy and SNMPv3	
6.3	Should support IP Source Guard, DHCP snooping, DHCPv4, DHCPv6 and Dynamic ARP Inspection.	
6.4	Should support IPv4 and IPv6 ACLs with up to 1K rules per ACL and a minimum of 2K rules per system.	
6.5	Should support Flexible Authentication with 802.1x Authentication and MAC Authentication.	
7	<u>Manageability</u>	

7.1	Should support manageability using Network Management Software with Web based Graphical User Interface (GUI).	
7.2	Should support Integrated Standard based Command Line Interface (CLI), Telnet, TFTP, HTTP access to switch management/monitoring.	
7.3	Should support NetFlow or sFlow or equivalent.	
8	<u>Physical Attributes, Memory, Power Supply and Fans</u>	
8.1	The Switch should be provided with 19" Universal 2 post rack mount kit.	
8.2	The Switch should have minimum 1GB of Main Memory and minimum 2GB Flash Memory.	
8.3	The Switch should have a PoE Power Budget of 124W.	
9	<u>Mandatory Compliance:</u>	
9.1	All categories of Switches, Transceivers & Switch OS should be from same OEM	
9.2	All categories of Switches, Transceivers & Switch OS should be from same OEM & Switch / Switch OS should be Ipv6 logo , ROHS and common criteria / NDPP / NDcPP certified at the time of bidding	
10	<u>Warranty</u>	
10.1	The Switching System shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Multi Mode fiber (1 Gig)		
S. No	Specification Required	Compliance (Yes / No)
1	1000Base-SX Fiber SFP with Digital Optical Monitoring	
2	LC duplex connector	
3	850 nm, for distances up to 550 Meter	
4	Multi Mode Fiber	
5	ROHS Compliant	
6	Compliant with SFP Transceiver MSA specification	
7	Compliant with Specifications for IEEE 802.3z/Gigabit Ethernet	
8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of FDA 21CFR, 1040.10, Class 1, CSA, 60950-1-03/ UL 60950-1 and EN 60825-1	
Single Mode Fiber (1 Gig)		
S. No	Specification Required	Compliance (Yes / No)
1	1000Base-LX Fiber SFP with Digital Optical Monitoring	
2	LC duplex connector	
3	1310 nm, for distances up to 10 km	
4	Single Mode Fiber	
5	ROHS Compliant	
6	Compliant with SFP Transceiver MSA specification	
7	Compliant with Specifications for IEEE 802.3z/Gigabit Ethernet	
8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of FDA 21CFR, 1040.10, Class 1, CSA, 60950-1-03/ UL 60950-1 and EN 60825-1	
Multi Mode fiber (10 Gig)		

S. No	Specification Required	Compliance (Yes / No)
1	10,000Base-SX Fiber SFP+ with Digital Optical Monitoring	
2	LC duplex connector	
3	850 nm, for distances up to 300 Meter.	
4	Multi Mode Fiber	
5	ROHS Compliant	
6	Compliant with SFP Transceiver MSA specification and Hot-swappable.	
7	Compliant with Specifications for IEEE 802.3ae/10 Gigabit Ethernet	
8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of IEC FDA 21CFR, 1040.10, Class 1 and CSA 60950-1-03/ UL 60950-1	
Single Mode Fiber (10 Gig)		
S. No	Specification Required	Compliance (Yes / No)
1	10,000Base-LX Fiber SFP+ with Digital Optical Monitoring	
2	LC duplex connector	
3	1310 nm, for distances up to 10 km	
4	Single Mode Fiber	
5	ROHS Compliant	
6	Compliant with SFP Transceiver MSA specification and Hot-swappable.	
7	Compliant with Specifications for IEEE 802.3ae/10 Gigabit Ethernet	
8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of IEC FDA 21CFR, 1040.10, Class 1 and CSA 60950-1-03/ UL 60950-1	
Multi Mode fiber (25 Gig)		
S. No	Specification Required	Compliance (Yes / No)
1	25,000Base-SX Fiber SFP+ with Digital Optical Monitoring	
2	LC duplex connector	
3	850 nm, for distances up to 100 Meter.	
4	Multi Mode Fiber	
5	ROHS Compliant	
6	Hot-swappable and High-Performance Computing (HPC) interconnects.	
7	Compliant with Specifications for IEEE 802.3by/ 25 GbE SFP28 FIBER	
8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of North America: UL/CSA 60950, CDRH Class 1 and European Union: EN 60950, EB 60825 Class 1	
Single Mode Fiber (25 Gig)		
S. No	Specification Required	Compliance (Yes / No)
1	25,000Base-LX Fiber SFP+ with Digital Optical Monitoring	
2	LC duplex connector	
3	1310 nm, for distances up to 10 km	
4	Single Mode Fiber	
5	ROHS Compliant	
6	Hot-swappable and High-Performance Computing (HPC) interconnects	
7	Compliant with Specifications for IEEE 802.3BM/25 GbE SFP28 FIBER.	

8	Compliant with Industry Standard RFT Electrical Connector and Cage	
9	Laser Class 1 Product which comply with the requirements of North America: UL/CSA 60950, CDRH Class 1 and European Union: EN 60950, EB 60825 Class 1.	

Technical Specifications for WLAN Controller

S. No	Specification Required	Compliance (Yes/No)
1	Product details- Please specify	
A	Please mention Make, Model No. and Part Code	
2	Essential Features	
A	The WLC Management can be in physical appliance/virtual appliance or Cloud based management platform.	
B	WLC should have Easy Setup through UPnP Network Discovery and Installation Wizard.	
C	Controller should supply with Zero AP License from day 1 and should be scalable up to 6000 APs in single hardware/in clustered configuration. If not cloud, Each WLC (primary and Redundant) should be able to support minimum 1024 campus connected AP's or more with support of seamless roaming access over L2/L3 network.	
D	each Controller should have capacity to handle minimum 20,000 or more Concurrent devices.	
E	each controller should support integrated user authentication capability of minimum 20,000 users without the need for any external database servers (AD/LDAP).	
F	Controller should support minimum 1000 WLAN's.	
G	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.	
H	Ability to map SSID to VLAN and dynamic VLAN support for same SSID.	
I	support automatic channel selection for interference avoidance.	
J	The WLAN solution should support client troubleshooting feature that allows an administrator to focus on a specific client device and its connectivity status. The tool should track the step-by-step progress of the client's connection, through 802.11 stages, RADIUS, EAP authentication, captive portal redirects, encryption key setup, DHCP, roaming, and more (depending on WLAN type).	
K	The WLAN solution should support in built spectrum analysis feature.	
L	The controller should support the ability to create different zones in which AP can be grouped logically or physically based on location eg different buildings in a campus can be configured as different zones so that each zone will have different configuration and policies.	
M	External Captive Portal Integration - Web-services based API for external web-portals to integrate with the controller	
N	should have the capability to limit/prevent clients from using static IP addresses thereby enhancing network efficiency and preventing network conflicts.	
O	WLC should support Hotspot 2.0 (passpoint).	
3	Auto Deployment of AP's at different locations	
A	Access points can discover controllers on the same L2 domain without requiring any configuration on the access point.	

B	Access points can discover controllers across Layer-3 network through DHCP or DNS option	
4	Security & Monitoring	
A	Controller should support following for security & Authentication:	
B	WIRELESS SECURITY & Authentication: Open, 802.1x/EAP, PSK, WISPr, WPA, WPA2-AES, WPA-TKIP, WEP, EAP-SIM, EAP-AKA over WLAN for 802.1x, Authentication through external Radius /Directory services.	
C	WLC should support WIDS/WIPS for security including Rogue AP detection and prevention, Evil-twin/AP spoofing detection and Ad-Hoc detection.	
D	WLC Should support L2 Client Isolation so User cannot access each other's devices. Isolation should have option to apply on AP or SSID's.	
E	Support for Walled garden "Walled Garden" functionality to allow restricted access to select destinations by unauthorized wireless users.	
F	The proposed architecture should be based on controller based Architecture with thick AP deployment. While Encryption / decryption of 802.11 packets should be able to perform at the AP.	
G	WLC should support OS/Device finger printing, Bandwidth rate limit, VLAN mapping.	
H	WLC should support Mesh.	
I	WLC should be able to present a customizable dashboard with information on the status of the WLAN network.	
J	WLC 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.	
K	WLC or integrated solution should provide customized reporting with minimum 15 days of historical WLAN information.	
L	Filtering of Alarms and event Log based on APs, SSID or Zones	
M	Syslog support towards external syslog server	
5	QoS features	
A	per SSID or dynamic Per user bandwidth Rate Limiting	
B	Self-healing (on detection of RF interference or loss of RF coverage) and vendor should provide their Interference mitigation techniques.	
C	System must support Band Steering where 5 Ghz clients are forced to connect over 5Ghz Radio to provide better load balancing among 2.4Ghz and 5Ghz Radios.	
D	WLC shall support Quality of Service features like 802.11e based QoS enhancements, WMM or equivalent and U-APSD to provide best performance on Video applications.	
6	Client/Guest Management	
A	WLC should provide a Guest Login portal in order to authenticate users that are not part of the organization.	
B	WLC 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.	
C	Social Login Support: OAuth 2.0 WLAN allows end-user to access the Internet if its authentication by the OAuth 2.0 provider (Facebook, Google, LinkedIn, Microsoft	
7	Other Requirements	
A	Controller should be FCC certified. Should comply to certifications EN55022, EN61000, EN60950, LVD.	

B	reports by OS and device manufacturer	
C	Customizable Dashboards with Data Explorer	
8	The analytics system has a combination of attributes:	
A	Automated data baselining and machine-learning-driven insights	
B	Health and SLA monitoring	
C	Powerful, holistic troubleshooting	
D	Automatic classification of incident severity	
E	No requirement for an on-site data collector or overlay sensors	
F	Granular access to raw data with deep exploration and custom dashboards	
H	12 months of storage with flexible data reporting	
9	Network Health Monitoring: Incident Analytics, Connectivity, user experience diagnostics and Reports and Dashboards	
A	View metrics in specific health categories, Connection, Performance, Infrastructure, AP service uptime, time to connect, connection success rate and client throughput	
B	client operating system types, access point models, firmware versions, WLANs, client impact and Presentation of the underlying data that drives the incident	
C	Successful, slow and failed connections, Disconnect events, Roaming events and failed roams Connection quality (RSSI, MCS, client throughput), Network incidents affecting users and with links to see incident details	
D	traffic and client trends, top devices, top SSIDs, traffic distribution and reports by OS and device manufacturer Customizable Dashboards with Data Explorer	
10	<u>Warranty</u>	
10.1	The WLAN Controller shall be quoted with Three (3) years Hardware warranty.	
11	<u>Product brochure</u>	
11.1	Vendor shall provide printed technical catalogues/brochures for the quoted model containing technical specifications, features.	

Technical Specifications for Indoor Access Point (2x2:2)		
S. No	Specification Required	Compliance (Yes / No)
1	The APs should support the IEEE 802/11 a/b/g/n/ac/ax with dual radio capabilities conforming to Wi-Fi 6 standard.	
2	The AP should support 2x2:2 MIMO on both the bands. It should support minimum 1200 Mbps data rates on 5 GHz and minimum 570 Mbps data rates on 2.4GHz.	
3	The AP shall have two 1Gbps Ethernet port. Additionally, it should have an USB port for hosting Internet-of-Things (IoT) devices such as Bluetooth Low Energy (BLE) smart beacons.	
4	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.	
5	The access point should be able to operate in full MIMO mode and the necessary power POE/POE+ should be provided.	
6	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.	
7	The AP should have an option to be powered up through DC power in addition to POE.	

8	The AP should have a receive sensitivity of -96dBm.	
9	The AP should provide an antenna gain of minimum 3dBi on both the bands.	
10	The AP should support 20, 40,80,160/80+80 MHz channelization.	
11	The access point should be able to detect clients that have dual band capability and automatically steer those clients to use the 5GHz band instead of the 2.4GHz band.	
12	The AP should provide minimum Tx Power of 22dBm on both the bands	
13	The access point should support 802.1q VLAN tagging	
14	The access point should support WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i security.	
15	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.	
16	The Access Point should support WMM, Power Save, Tx Beamforming, LDPC, STBC,	
17	802.11r/k/v.	
18	The AP should have the capability to support minimum 15 BSSID	
19	Should support 500 or more clients per AP.	
20	Should support IPv6 dual stack from day one	
21	The Access Point should support mesh configuration either directly or through the controller.	
22	The Access Point should support rate limiting, application recognition and control, Access Control lists and device fingerprinting.	
23	Operating Temperature: 0°C to 50°C. Operating Humidity: up to 95% non-condensing.	
24	Should be plenum rated and comply to RoHS	
25	Should be WI-FI certified and WPC approved.	
26	Mechanism for physical device locking using padlock /Kensington lock / equivalent	
27	The Access Point shall be quoted with Three (3) years hardware warranty.	

Technical Specifications for Outdoor Access Point (2x2:2)		
S. No	Specification Required	Compliance (Yes / No)
1	The APs should support IEEE 802/11a/b/g/n/ac/ax standards with Dual Band Concurrent 2x2:2 streams (2.4GHz) + 2x2:2 streams (5GHz)	
2	The proposed access point should be 802.11ax (Wi-Fi 6) and Operate in dual band radio.	
3	The AP Should supports on both bands for the capacity of 2.4GHz 802.11b/g/n/ac/ax 574 Mbps and 5 GHz 802.11b/g/n/ac/ax 1200 Mbps	
4	The AP shall have 1 ports, auto MDX, auto-sensing 10/100/1000 Mbps, RJ-45 port and 1 USB 2.0 port	
5	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.	
6	The access point shall support Link Aggregation (LACP) to maximize the backhaul bandwidth using both Ethernet ports.	
7	The Outdoor AP should support 40 MHz channelization on 2.4GHz and 20/40/80 MHz channelization on 5 GHz. It should also support MU-MIMO.	

8	The access point should be able to operate in full MIMO mode with 802.3af/at POE.	
9	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.	
10	Since most radio interference come from the WLAN network itself the vendor should specify what mechanisms such as beam steering/ adaptive antenna technology/ beamforming are available in combination to focus the energy on the destination STA and minimize radio interference with the surrounding of the AP. The vendor should specify if the activation of such feature is still compatible with 802.11n spatial multiplexing.	
11	Since the WLAN network will be using an unlicensed band the solution should have mechanisms that reduce the impact of interference generated by other radio equipment operating in the same band. Please Describe techniques supported.	
12	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.	
13	The antennas to be dual polarised and should be integrated inside the access point enclosure to minimize damage and create a low profile unit that does not stand out visually. The antennas could be omnidirectional or directional as per the requirement or site survey done by the vendor.	
14	The access point should support 802.1q VLAN tagging	
15	The access point should support WPA2/3 enterprise authentication. AP should support Authentication via 802.1X and Active Directory.	
16	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e	
17	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.	
18	Channel selection based on measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method.	
19	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards	
20	Device antenna gain (integrated) must be at least 3dBi.	
21	Up to 161BSSIDs on 2.4G radio and 5G radio for multiple differentiated user services (e.g. voice).	
22	Should support 500 or more clients per AP and SSID up to 31 per AP	
23	Should support IPv6 from day one	
24	For troubleshooting purposes, the administrator should have the ability to remotely capture 802.11 and / or 802.3 frames from an access point without disrupting client access.	
25	Operating Temperature	
26	-20°C to 65°C	
27	. Operating Humidity: up to 95% non-condensing.	
28	The Outdoor AP should be IP67 rated & Wind Survivability Up to 266km/h (165 mph)	
29	Should be WiFi certified and WPC approved; ETA certificate to be enclosed	
30	Mechanism for physical device locking using padlock /Kensington lock / equivalent	
31	The Access Point shall be quoted with Three (3) years hardware warranty.	

Technical Specifications for Indoor Access Point (4x4:4)

S. No	Specification Required	Compliance (Yes / No)
1	The APs should support the IEEE 802/11a/b/g/n/ac/ax with dual radio capabilities conforming to Wi-Fi 6 standard.	
2	The AP should support 4x4:4 MIMO on 5 GHz and 2x2:2 on 2.4 GHz bands. It should support minimum 2400 Mbps data rates on 5 GHz and minimum 570 Mbps data rates on 2.4GHz.	
3	The AP shall have One 2.5Gbps Ethernet port and one 1Gbps Ethernet port. Additionally it should have an USB port for hosting Internet-of-Things (IoT) devices such as Bluetooth Low Energy (BLE) smart beacons.	
4	The access points should manage as standalone, Hardware/virtual controller/Controller less and Cloud based.	
5	The access point should be able to operate in full MIMO mode and the necessary power POE/POE+ should be provided.	
6	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.	
7	The AP should have an option to be powered up through DC power in addition to POE.	
8	The AP should have a receive sensitivity of -96dBm.	
9	The AP should provide an antenna gain of minimum 3dBi on both the bands.	
10	The AP should support 20, 40, 80, 160/80+80MHz channelization.	
11	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.	
12	The AP should provide minimum Tx Power of 23dBm on both the bands	
13	The access point should support 802.1q VLAN tagging	
14	The access point should support WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i security.	
15	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.	
16	The Access Point should support WMM, Power Save, Tx Beamforming, LDPC, STBC,	
17	802.11r/k/v.	
18	Should support 500 or more clients per AP.	
19	Should support IPv6 dual stack from day one	
20	The Access Point should support mesh configuration either directly or through the controller.	
21	The Access Point should support rate limiting, application recognition and control, Access Control lists and device fingerprinting.	
22	Operating Temperature: 0 °C to +40 °C (+32 °F to +104 °F). Operating Humidity: up to 95% non-condensing.	
23	Should be plenum rated and comply to RoHS	
24	Should be WiFi certified and WPC approved.	
25	Mechanism for physical device locking using padlock /Kensington lock / equivalent	

26	The Access Point shall be quoted with Three (3) years hardware warranty.	
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Technical Specifications for Outdoor Access Point (4x4:4)		
S. No	Specification Required	Compliance (Yes / No)
1	The APs should support IEEE 802.11 a/b/g/n/ac/ax standards with Dual Band Concurrent 4x4:4 streams (2.4GHz) + 4x4:4 streams (5GHz)	
2	The proposed access point should be 802.11ax (Wi-Fi 6) and Operate in dual band radio.	
3	The AP Should supports eight spatial streams on both bands for the capacity of 2.4GHz 802.11b/g/n/ac/ax 1148 Mbps and 5 GHz 802.11b/g/n/ac/ax 2400 Mbps	
4	The AP shall have 2 ports, auto MDX, auto-sensing 10/100/1000 Mbps, RJ-45 and 100/1000/2500 Mbps RJ-45. It should also have a SFP+ Interface – alternate to Ethernet, providing an integrated high speed backhaul. The second Ethernet port can be used for PoE Output to daisy chain and power APs (ideal for a mesh AP).	
5	The access points should be centrally managed capacity as well to work as standalone.	
6	The access point shall support Link Aggregation (LACP) to maximize the backhaul bandwidth using both Ethernet ports.	
7	The Outdoor AP should support 40 MHz channelization on 2.4GHz and 20/40/80+80/160 MHz channelization on 5 GHz. It should also support MU-MIMO and OFDMA	
8	The access point should be able to operate in full MIMO mode with 802.3af/at POE. Alternatively, the AP should also support AC Input: 100-240 Vac.	
9	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.	
10	Since most radio interference come from the WLAN network itself the vendor should specify what mechanisms such as beam steering/ adaptive antenna technology/ beamforming are available in combination to focus the energy on the destination STA and minimize radio interference with the surrounding of the AP. The vendor should specify if the activation of such feature is still compatible with 802.11n spatial multiplexing.	
11	Since the WLAN network will be using an unlicensed band the solution should have mechanisms that reduce the impact of interference generated by other radio equipment operating in the same band. Please Describe techniques supported.	
12	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.	
13	The antennas to be dual polarised and should be integrated inside the access point enclosure to minimize damage and create a low profile unit that does not stand out visually. The antennas could be omnidirectional or directional as per the requirement or site survey done by the vendor.	
14	The access point should support 802.1q VLAN tagging	
15	The access point should support WPA2/3 enterprise authentication. AP should support Authentication via 802.1X and Active Directory.	
16	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e	

17	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.	
18	Channel selection based on measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method.	
19	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards	
20	Device antenna gain (integrated) must be at least 3dBi.	
21	Up to 31BSSIDs on 2.4G radio and 5G radio for multiple differentiated user services (e.g. voice).	
22	Should support 500 or more clients per AP.	
23	Should support IPv6 from day one	
24	For troubleshooting purposes, the administrator should have the ability to remotely capture 802.11 and / or 802.3 frames from an access point without disrupting client access.	
25	Operating Temperature	
26	-40°F (-40°C) to 149°F (65°C)	
27	. Operating Humidity: up to 95% non-condensing.	
28	The Outdoor AP should be IP67 rated.	
29	Should be WiFi certified and WPC approved; ETA certificate to be enclosed	
30	Mechanism for physical device locking using padlock /Kensington lock / equivalent	
31	The Access Point shall be quoted with Three (3) years hardware warranty.	

Specifications For Firewall/UTM - 100 Users		
Performance Specifications:		Compliance (Yes/No)
Interface	8x GE RJ45, 2x Shared Port Pairs	
Firewall throughput	Minimum 10 Gbps	
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 1 Gbps	
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 900 Mbps	
IPS Throughput	Minimum 1.4 Gbps	
IPSec Throughput	Minimum 6.5 Gbps	
New Session	Minimum 45,000	
Concurrent Session	Minimum 1.5 Million	
Log Retention	Minimum 3 Year	
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN	
Firewall Features:		
	Traffic Shaping	
	IPS AND DOS	
	Gateway Anti-virus	

	Anti-spam	
	WEB & VIDEO FILTERING	
	Application Filtering	
	Cloud Sandboxing	
	AntiBot	
	Advance Threat Protection (ATP)	
	VPN- SSL and IPSec	
	SDWAN ()	
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6	
	Virtual Firewall	
	Device Identification	
	SSL Inspection	
	DNS Protection	
	IPV6 Support	
	Policy Management	
	Data leak prevention	
	Web application firewall	
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution	

Specifications For Firewall/UTM - 300 Users		
Performance Specifications:		Compliance (Yes/No)
Interface	2x 10 GE SFP+, 22x GE RJ45, 8x GE SFP	
Firewall throughput	Minimum 20 Gbps	
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 1.6 Gbps	
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 1 Gbps	
IPS Throughput	Minimum 2.6 Gbps	
IPSec Throughput	Minimum 11.5 Gbps	
New Session	Minimum 56,000	
Concurrent Session	Minimum 1.5 Million	
Log Retention	Minimum 3 Year	
Power Supplies	Redundant	

Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN	
Firewall Features:		
	Traffic Shaping	
	IPS AND DOS	
	Gateway Anti-virus	
	Anti-spam	
	Web & Video Filtering	
	Application Filtering	
	Cloud Sandboxing	
	AntiBot	
	Advance Threat Protection (ATP)	
	VPN- SSL and IPSec	
	SDWAN ()	
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6	
	Virtual Firewall	
	Device Identification	
	SSL Inspection	
	DNS Protection	
	IPV6 Support	
	Policy Management	
	Data leak prevention	
	Web application firewall	
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution	

Specifications For Firewall/UTM - 500 Users		
Performance Specifications		Compliance (Yes/No)
Interface	18 x GE RJ45 , 8 x GE SFP , 4 x 10GE SFP+ slots	
Firewall throughput	Minimum 27 Gbps	
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 3.5 Gbps	
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 3 Gbps	
IPS Throughput	Minimum 5 Gbps	

IPSec Throughput	Minimum 13 Gbps	
New Session	Minimum 280000	
Concurrent Session	Minimum 3 Million	
Log Retention	Minimum 3 Year	
Power Supplies	Redundant	
Certification	ICSA Labs for Firewall, IPSec, IPS, Antivirus, SSL-VPN	
Firewall Features		
	Traffic Shaping	
	IPS AND DOS	
	Gateway Anti-virus	
	Anti-spam	
	WEB & VIDEO FILTERING	
	Application Filtering	
	Cloud Sandboxing	
	AntiBot	
	Advance Threat Protection (ATP)	
	VPN- SSL and IPSec	
	SDWAN ()	
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6	
	Virtual Firewall	
	Device Identification	
	SSL Inspection	
	DNS Protection	
	IPV6 Support	
	Policy Management	
	Data leak prevention	
	Web application firewall	
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution	

Specifications For Firewall/UTM - 1000 Users		
Performance Specifications		Compliance (Yes/No)
Interface	18x GE RJ45, 16x GE SFP	
Firewall throughput	Minimum 32 Gbps	

NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 6 Gbps	
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 5 Gbps	
IPS Throughput	Minimum 7.8 Gbps	
IPSec Throughput	Minimum 20 Gbps	
New Session	Minimum 400000	
Concurrent Session	Minimum 4 Million	
Log Retention	Minimum 3 Year	
Power Supplies	Redundant	
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN	
Firewall Features		
	Traffic Shaping	
	IPS AND DOS	
	Gateway Anti-virus	
	Anti-spam	
	WEB & VIDEO FILTERING	
	Application Filtering	
	Cloud Sandboxing	
	AntiBot	
	Advance Threat Protection (ATP)	
	VPN- SSL and IPSec	
	SDWAN ()	
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6	
	Virtual Firewall	
	Device Identification	
	SSL Inspection	
	DNS Protection	
	IPV6 Support	
	Policy Management	
	Data leak prevention	
	Web application firewall	
Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS,Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support,RMA & Advance hardware Replacement should be quoted with the solution	

Specifications For Firewall/UTM - 1500 Users		
Performance Specifications		
Interface	2x 10 GE SFP+, 10x GE RJ45, 8x GE SFP	Compliance (Yes/No)
Firewall throughput	Minimum 36 Gbps	
NGFW Throughput (Mix / Production/ Enterprise traffic)	Minimum 9.5 Gbps	
TPT Throughput (Mix / Production/ Enterprise traffic)	Minimum 7 Gbps	
IPS Throughput	Minimum 10 Gbps	
IPSec Throughput	Minimum 20 Gbps	
New Session	Minimum 450000	
Concurrent Session	Minimum 8 Million	
Log Retention	Minimum 3 Year	
Power Supplies	Redundant	
Certification	ICSA Labs for Firewall, IPsec, IPS, Antivirus, SSL-VPN	
Firewall Features		
	Traffic Shaping	
	IPS AND DOS	
	Gateway Anti-virus	
	Anti-spam	
	WEB & VIDEO FILTERING	
	Application Filtering	
	Cloud Sandboxing	
	AntiBot	
	Advance Threat Protection (ATP)	
	VPN- SSL and IPSec	
	SDWAN ()	
	Routing, NAT, NAT46, NAT64,NAT66 DNS64 & DHCPv6	
	Virtual Firewall	
	Device Identification	
	SSL Inspection	
	DNS Protection	
	IPV6 Support	
	Policy Management	
	Data leak prevention	
	Web application firewall	

Subscription License	3 year license of Firewall, VPN (Ipsec), SSL VPN, IPS, Application Control, URL filtering, Anti-Bot, ATP, Gateway Antivirus etc, Antispam , Sandboxing, 24*7 Support, RMA & Advance hardware Replacement should be quoted with the solution	
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Specifications For Authenticator - 100, 300, 500 Users		
<u>Sr. No.</u>	<u>General Features</u>	<u>Compliance (Yes/No)</u>
1	Standards-based secure authentication which works in conjunction with soft/hard tokens to deliver secure two-factor authentication to any third-party device capable of authentication via RADIUS or LDAP	
2	Virtual option that can be deployed in minutes to secure access to your existing network infrastructure	
3	The System should support minimum 100 and more	
5	Should support minimum 200 soft/hard tokens or more	
6	Should support atleast 10 User Groups or more	
7	Number of supported CA Certificates should be 5 or more	
8	Should support atleast 100 User Certificate Bindings	
10	Should have atleast 2 x 10/100/1000 (copper, RJ-45) interfaces	
11	Should have minimum 60 GB of local-storage	
12	Should have a managability over CLI and Console and HTTPS.	
13	The system should support SNMP v1 / v2c / v3.	
14	Should support atleast SYSLOG Servers.	
15	The system should support Static-Routes	
16	Integrates with existing solutions such as LDAP or AD servers to lower the cost and complexity of adding strong authentication to your network	
17	Support for E-mail and SMS tokens enables rapid deployment of two-factor authentication without the need for additional dedicated hardware	
18	Should support User self-servicing and password management to allow users to manage their own registrations and passwords without administrator intervention	
19	Support for Certificate Authority functionality to simplify the CA management and to deliver user certificate signing, VPN, or server x.509 certificates for use in certificate-based two-factor authentication	
20	Single Sign-On (SSO) Transparent User Identification with zero impact for enterprise users	
21	SSO Portal based authentication with tracking widgets to reduce the need for repeated authentications	

Specifications For Authenticator - 1000 to 1500 Users		
<u>Sr. No.</u>	<u>General Features</u>	<u>Compliance (Yes/No)</u>
1	Standards-based secure authentication which works in conjunction with soft/hard tokens to deliver secure two-factor authentication to any third-party device capable of authentication via RADIUS or LDAP	
2	Hardened appliance that can be deployed in minutes to secure access to your existing network infrastructure	
3	The System should support minimum 1500 Local Users or more.	
4	The Appliance should have support for minimum 3500 Remote Users or more	
5	Should support minimum 3000 soft/hard tokens or more	
6	Should support atleast 150 User Groups or more	
7	Number of supported CA Certificates should be 10 or more	
8	Should support atleast 7500 User Certificate Bindings	
9	Appliance must have redundant power supply	
10	The appliance should have atleast 4 x 10/100/1000 (copper, RJ-45) interfaces	
11	The appliance should have minimum 1TB of local-storage	
12	The appliance should have a managability over CLI and Console and HTTPS.	
13	The system should support SNMP v1 / v2c / v3.	
14	Should support atleast SYSLOG Servers.	
15	The system should support Static-Routes	
16	Integrates with existing solutions such as LDAP or AD servers to lower the cost and complexity of adding strong authentication to your network	
17	Support for E-mail and SMS tokens enables rapid deployment of two-factor authentication without the need for additional dedicated hardware	
18	Should support User self-servicing and password management to allow users to manage their own registrations and passwords without administrator intervention	
19	Support for Certificate Authority functionality to simplify the CA management and to deliver user certificate signing, VPN, or server x.509 certificates for use in certificate-based two-factor authentication	
20	Single Sign-On (SSO) Transparent User Identification with zero impact for enterprise users	
21	SSO Portal based authentication with tracking widgets to reduce the need for repeated authentications	

	TECHNICAL SPECIFICATION FOR PASSIVE MATERIAL	Compliance (Yes/No)
	General Passive Specifications	
1	All Copper cable and components should be from the same OEM.OEM should submit ISO 9001 and 14001 certificates for the manufacturing facilities related to all products involved in tender.	
2	All Passive Components should be RoHS (Restriction of Certain Hazardous Substances) compliant. Declaration to be provided for RoHS Compliance	
3	OEM for passive should have incorporated in India from Last 10 years. Incorporation certificate to be attached along with the bid. OEM should have its own manufacturing Unit in India (Proof of same to be attached)	
4	OEM Should provide Application Assurance warranty for for end -to-end channel for 25 years.	
5	Desired ETL/3P certificates should be present on respective Lab website with quoted part codes /series/family of product line.	
6	Passive OEM should have minimum 80 crore turnover in last three consecutive years or cumulative for last three years should be 200 crores. OEM needs to submit the valid audited certificate by Chartered Accountant.	
7	OEM should submit the unpriced BOQ for offered products with its Model No/Part codes and country of origin	

	Technical Specifications for OFC and Components	Compliance (Yes/No)
	FIBER CABLE OUTDOOR MM OM4	
1	Please mention Make and Part Code	
2	Should be ISO/IEC 11801:2002; Uni-tube	
3	Should Have 0.155 mm corrugated steel Armor	
4	Type: Single Mode OS2	
5	Cable Jacket material: 1.8 mm LSZH sheath	
6	Minimum Cores 6	

	LIU 12/24 Port Rack Mountable 19" Loaded with LC Duplex adaptors, Pigtails and Splice holders	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Metal sliding style Loaded as per design for 12/24 Fiber with Easily removable Top plate with push buttons	
3	12/24 Port LC type 1U	
4	Should include Single Mode OS2/Multi Mode OM4 pigtails and adaptors as per design and BOQ.	
5	Tray Material should be ABS	
6	Adaptors in LIU should have valid type test approval from labs such as DNV GL Lab/ETL verified	
7	Adaptors of Pigtail should have valid type test approval from labs such as DNV GL Lab/ETL verified	
8	Adaptors should have integral self-closing metal laser protection flaps and semi-transparent plastic dust covers which allows optical testing with test lasers without removing the covers	
9	Should have option for Visual coding, mechanical coding, and lock protection.	

	FIBER CABLE OUTDOOR SM OS2	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Should be ISO/IEC 11801:2002; Uni-tube	
3	Should Have 0.155 mm corrugated steel Armor	
4	Type: Single Mode OS2	
5	Cable Jacket material: 1.8 mm HDPE sheath	
6	Minimum Cores 6	

	Patch Cord LC – LC OM4 3 meter	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Patch Cord Should be Multi Mode OM4	
3	Type of Connector LC-LC	
4	Jacket Material: LSZH	
5	Should have option for Visual coding, mechanical coding and lock protection for security purpose .	

	Patch Cord LC – LC SM 3 meter	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Patch Cord Should be Single Mode OS2	
3	Type of Connector LC-LC	
4	Jacket Material: LSZH	
5	Should have option for Visual coding, mechanical coding and lock protection for security purpose .	

	Technical Specifications for Copper Cat6 Cable and Components	
	CAT6 U/UTP CABLE	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Cat 6 U/UTP Cable	
3	Transmission frequency of 250 MHz (Minimum)	
4	Should be 4 pair with cross separator	
5	Cable should be of 23 AWG copper conductor	
6	Jacket: LSZH	
7	Cable should be verified by ETL/3P/UL Listed	

	24 PORT JACK PANEL UNLOADED	Compliance (Yes/No)
1	Please mention Make and Part Code	

2	Should be 19" 1U straight Patch Panel, 24-port	
3	Should have integral cable management Metal shelf.	
4	Should accept Shielded as well as Unshielded jacks	
5	Should have rear cable management shelf metallic .	
6	Jack panel should have option to accept different color snap in coding clips	
7	Jack panel should have zig zag jack placement.	
8	Panel should be UL listed	

	INFORMATION OUTLET - FACE PLATE AND PATCH PANEL SIDE	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Category 6, EIA/TIA 568-C.2	
3	information outlets Should accept cables from 22-24 AWG copper	
4	Should be PCB free and Tool less	
5	Material should be halogen-free and heavy-metal free in acc. with EU directives RoHS 2.	
6	Should support 950 mating cycles	
7	Jack should be optimised for 4PpoE (IEEE 802.3bt)	
8	Should support 10GBase-T applications in acc. with IEEE 802.3an up to 500 MHz and 55 m	
9	Panel side IO should have five different options for color coding clips	
10	Should be Certified/verified in four connector channel by independent labs like ETL/GHMT/3P/GL for compliance	

	MOUNTING CORDS CAT 6 U/UTP(1 and 2 meter)	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Should be Compliant with Cat.6 requirements of ISO/IEC 11801, EN 50173, EN 50168 and EIA/TIA 568.C.2	
3	The Outer Jacket should be LSZH	
4	Patch cord should be optimised for 4PpoE (IEEE 802.3bt)	
5	Patch cord should be terminatd using insulation displacement connections	
6	Should have Option for different color coding clips.	
7	Same Patch cords should be able to accept locking arrangement in future	
8	Patch Cord Should be verified/certified in Four Connector channel by ETL/3P/DNV-GL/GHMT .(certificate to be enclosed with the bid)	

	FACE PLATE	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Square plate, 86mmx86mm	
3	Write on labels in transparent plastic window – supplied with plate	
4	Material : ABS Plastic	
5	Face plate should have option to attach Hinged dust cover in different colors	
6	Face Plate dust cover should be replacable without removing patch cord	

	Passive Specs for Cat 6A cables and components	
	CAT6A, 4 PAIR SHIELDED S/FTP CABLE	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Cable Should be Cat 6A S/FTP or higher	
3	Conductor Size: 23 AWG Solid type	
4	Cable should Foil shielding of pairs individually and overall tin-plated copper braid shield.	
5	Cable should be ETL verified /or 3P Lab Tested for Category 6A performance requirements of edition 1.0 of ISO/IEC 11801-1:2017, CENELEC EN 50173-1:2018, the Category 6A requirements of ANSI/TIA-568.2-D:2018 (Certificate to be available online on Intertek or 3ptest website) hard copy to be submitted along with Bid	
6	Cable Flame safety is to be verified by Labs such as 3P, Intertek (ETL verified) according to IEC 60332-1-2, IEC 61034-1, IEC 61034-2, including amendment.1 and IEC 60754-2. (Certificate should be available on respective Lab website for authenticity) hard copy to be submitted along with Bid	

	24 PORT CAT6A JACK PANEL UNLOADED	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Patch panel should be with integrated cable tie shelf.	
3	Panel should supply with 19" fastening kit, labelling field, accepting the snap-in type colour coding clips in 8 colours.	
4	Should have self-adhesive, clear label holders (transparent plastic window type) and white designation labels with the panel, with optional colour labels / icons.	
5	Material: sub-rack made of sheet steel 1.5 mm, colour blue chromatinized/Black/grey , screen made of plastic (ABS), halogen-free.	
6	Each port / jack on the panel should be individually removable on field from the panel.	
7	Patch Panel Should be UL listed	

	SHIELDED CAT 6A INFORMATION OUTLET (PANEL AND FACE PLATE SIDE)	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Connection module should be Cat 6A, die-cast, shielded with Reliable insulation displacement contacting (IDC) and dust cover	
3	Module should Supports PoE (IEEE 802.3af), PoEP (IEEE 802.3at), 4Ppoe (IEEE 802.3bt) and is compatible to IEC 60512-99-001/002	
4	Module should be Suitable for 10GBASE-T applications in acc. with IEEE 802.3 Section Four up to 500 MHz and 100 m.	
5	Each module should have a Label with colour wiring chart, integrated production date and serial number for quality tracing	
6	Should have Gold-plated contact area and tin-plated insulation displacement contact area.	
7	Material Should be Halogen-free materials	

8	Patch Side Module should have option for colour coding clip to make it easy to differentiate different services.	
9	Shielded/screened four connector channel has been tested and verified by 3P/ETL verified and complies with the 10 Gigabit Ethernet requirements of IEEE 802.3an, Class EA requirements of Edition 1.0 of ISO/IEC 11801-1:2017 and CENELEC EN 50173-1:2018, and Category 6A requirements of ANSI/TIA 568.2-D:2018. (Certificate to be available online on Intertek or 3ptest website)	
10	Module should be independently certified/verified by Labs such as DNV-GL, GHMT, 3P, ETL verified etc	

	MOUNTING CORDS – S/FTP Cat 6A (1 and 2 Meter)	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Flexible cable should be S/FTP, 4 x 2 x AWG 26/7	
3	Patch should be mounted on both sides with RJ45 connector compliant with Cat. 6A ISO component standard: IEC 60603-7-51 RJ45 category 6A ISO (500 MHz)	
4	Patch cord should be insulation displacement contacting (IDC) wire terminated according to IEC 60352-3	
5	Should Support PoE (IEEE 802.3af), PoEP (IEEE 802.3at), 4Ppoe (IEEE 802.3bt) and is compatible to IEC 60512-99-001/002	
6	Sheath Should be LSFRZH	
7	Patch cord should be independently verified by ETL/3P/GHMT as per ISO/IEC 11801 (Certificate to be available online on relevant lab website)	

	FACE PLATE 86x86	Compliance (Yes/No)
1	Please mention Make and Part Code	
2	Dimensions: 86.0 mm x 86.0 mm / 3.386 in x 3.386 in (W x H)	
3	Should include Label strips	
4	Material: plastic: PC + ABS	

Dated this day of 2022

Signature of
Tenderer Name &
Designation:
Company Seal

Price Bid Letter

To,

The Chief Executive Officer
Entrepreneur Development Centre (EDC) Building, Plot No: 20,
Rajiv Gandhi Chandigarh Technology Park (RGCTP), Chandigarh 160101

Ref : Tender No:

Sir,

Having examined the Tender Document, we, the undersigned, offer to provide material and services in conformity with the Tender Document No. _____ for the sum of.....(Total bid amount in words and figures) or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this bid.

2. We undertake, if our bid is accepted, to deliver the goods in accordance with the delivery schedule specified in the Tender Documents.
3. If our bid is accepted, we will obtain the guarantee of a bank in a sum equivalent to 10% percent of the Contract Price for the due performance of the Contract, in the form prescribed by the Purchaser.
4. We understand that you are not bound to accept the lowest or any bid you may receive.
5. We enclose herewith the Price Schedule in the prescribed form
6. We agree to abide by our offer for a period of 180 days from the date fixed for opening of the Technical Bid
7. We have carefully read and understood the terms and conditions of the tender and the conditions of the contract applicable to the tender and we do hereby undertake to provide services as per these terms and conditions without any deviations.
8. Certified that the tenderer is a company and the person signing the tender is the constituted attorney/authorized identity.
9. We do hereby undertake, that, until a formal contract is prepared and executed, this bid, together with your written acceptance thereof and placement of letter of intent awarding the contract, shall constitute a binding contract between us.

Dated this day of 2022

Signature of
Tenderer Name &
Designation:
Company Seal

PRICE SCHEDULE						
ALL QUANTITIES MENTIONED BELOW ARE INDICATIVE FOR TENDERING PURPOSE ONLY ACTUAL QUANTITIES WOULD BE AS PER SITE CONDITIONS & REQUIREMENTS						
#	Item Description	UoM	Qty (A)	Unit Price (B)	GST @ 18% (C)	Total Amount E=(B+C) X A
LAN Active Components						
1	Managed Layer 3, 24 Port 1/10G SFP+ Ports, 2 x 40/100 Ports and 2 x Power Supplies	Nos	1		₹ 0.00	₹ 0.00
2	Managed Layer 3, 48x 1/10/25 GbE SFP28 ports, 8x 40/100 GbE QSFP28 ports and 2x hot-swappable load sharing power supplies	Nos	1		₹ 0.00	₹ 0.00
3	Managed Layer 3, 24x1G Copper Ports with 4 x 10G SFP+ Ports and 2 x Power Supplies	Nos	1		₹ 0.00	₹ 0.00
4	Managed Layer 2 Switch with 24 Port with 4 x 10G uplink	Nos	5		₹ 0.00	₹ 0.00
5	Managed Layer 2 Switch with 24 Port with 4 x 10G uplink, 370 W PoE budge	Nos	5		₹ 0.00	₹ 0.00
6	Managed Layer 2 Switch with 48 Port with 4 x 10G uplink	Nos	5		₹ 0.00	₹ 0.00
7	Managed Layer 2 Switch with 48 Port with 4 x 10G uplink, 740 W PoE budge	Nos	5		₹ 0.00	₹ 0.00
8	Managed Layer 2, 24x10/100/1000 Mbps ports, 4x1 GbE SFP uplink-ports	Nos	5		₹ 0.00	₹ 0.00
9	Managed Layer 2, 24x10/100/1000 Mbps PoE+ ports, 4x1 GbE SFP uplink ports, 370W PoE Budget	Nos	5		₹ 0.00	₹ 0.00
10	Managed Layer 2, 48x10/100/1000 Mbps ports, 4x1 GbE SFP uplink-ports	Nos	5		₹ 0.00	₹ 0.00
11	Managed Layer 2, 48x10/100/1000 Mbps PoE+ ports, 4x1 GbE SFP uplink ports, 740W PoE Budget	Nos	5		₹ 0.00	₹ 0.00
12	12x10/100/1000 Mbps PoE+ ports, 2x1 GbE SFP uplink-ports, 124 W PoE budget	Nos	5		₹ 0.00	₹ 0.00
13	1G Multimode Transceiver	Nos	10		₹ 0.00	₹ 0.00
14	1G Singlemode Transceiver	Nos	10		₹ 0.00	₹ 0.00
15	10G Multimode Transceiver	Nos	10		₹ 0.00	₹ 0.00
16	10G Singlemode Transceiver	Nos	10		₹ 0.00	₹ 0.00
17	25G SFP28-SR Multimode Transceiver	Nos	10		₹ 0.00	₹ 0.00
18	25G SFP28-LR Singlemode Transceiver	Nos	10		₹ 0.00	₹ 0.00
19	Appliance based Wireless Controller with support upto 200 Access Points (without License)	Nos	1		₹ 0.00	₹ 0.00
20	Wireless Controller License for Access Point (Per AP License)	Nos	1		₹ 0.00	₹ 0.00
21	Outdoor Access Points Wi-Fi 6 (2x2:2 MIMO)	Nos	10		₹ 0.00	₹ 0.00
22	Indoor Access Point Wi-Fi 6 (2x2:2 MIMO)	Nos	10		₹ 0.00	₹ 0.00
23	Outdoor Access Points Wi-Fi 6 (4x4:4 MIMO)	Nos	10		₹ 0.00	₹ 0.00

24	Indoor Access Point Wi-Fi 6 (4x4:4 MIMO)	Nos	10		₹ 0.00	₹ 0.00
Security Appliances						
25	Security Appliance (UTM) for 100 Users with 3 years subscription (As per Specifications)	Nos	1		₹ 0.00	₹ 0.00
26	Security Appliance (UTM) for 300 Users with 3 years subscription (As per Specifications)	Nos	1		₹ 0.00	₹ 0.00
27	Security Appliance (UTM) for 500 Users with 3 years subscription (As per Specifications)	Nos	1		₹ 0.00	₹ 0.00
28	Security Appliance (UTM) for 1000 Users with 3 years subscription (As per Specifications)	Nos	1		₹ 0.00	₹ 0.00
29	Security Appliance (UTM) for 1500 Users with 3 years subscription (As per Specifications)	Nos	1		₹ 0.00	₹ 0.00
30	Virtual Authenticator for 100 User with 3 years support	Nos	1		₹ 0.00	₹ 0.00
31	Virtual Authenticator for 300 User with 3 years support	Nos	1		₹ 0.00	₹ 0.00
32	Virtual Authenticator for 500 User with 3 years support	Nos	1		₹ 0.00	₹ 0.00
33	Authenticator Hardware for 1000 - 1500 User with 3 years support		1		₹ 0.00	₹ 0.00
Passive Components - OFC						
34	6 Core Multimode OM4 Optical Fiber Cable	Meter	1000		₹ 0.00	₹ 0.00
35	12 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Multimode)	Nos	15		₹ 0.00	₹ 0.00
36	24 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Multimode)	Nos	5		₹ 0.00	₹ 0.00
37	LC-LC Multimode Fiber Patch Cord - 3 Meter	Nos	10		₹ 0.00	₹ 0.00
38	6 Core Singlemode OS2 Optical Fiber Cable	Meter	1000		₹ 0.00	₹ 0.00
39	12 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Singlemode)	Nos	10		₹ 0.00	₹ 0.00
40	24 Fiber Rack Mount LIU Loaded with LC Adapter and LC Pigtails (Singlemode)	Nos	10		₹ 0.00	₹ 0.00
41	LC-LC Singlemode Fiber Patch Cord - 3 Meter	Nos	10		₹ 0.00	₹ 0.00
Passive Components - Copper Cat6						
42	Cat6 UTP LSZH Cable Box (305 Meter)	Meter	10		₹ 0.00	₹ 0.00
43	Cat6 24 Port Patch Panel-Unloaded	Nos	10		₹ 0.00	₹ 0.00
44	Cat6 Information Outlet - Jack (For Patch Panel)	Nos	240		₹ 0.00	₹ 0.00
45	Cat6 UTP Patch Cord - 1 Meter	Nos	350		₹ 0.00	₹ 0.00
46	Cat6 UTP Patch Cord - 2 Meter	Nos	300		₹ 0.00	₹ 0.00
47	Cat6 Information Outlet - Jack (User End)	Nos	300		₹ 0.00	₹ 0.00
48	Face Plate - Single Port	Nos	300		₹ 0.00	₹ 0.00
49	Surface Mount Box (SMB)	Nos	300		₹ 0.00	₹ 0.00
Passive Components - Copper Cat6A						
50	Cat6A S/FTP LSZH Cable Box (305 Meter)	Meter	10		₹ 0.00	₹ 0.00
51	Cat6A S/FTP 24 Port Patch Panel-Unloaded	Nos	10		₹ 0.00	₹ 0.00
52	Cat6A S/FTP Information Outlet - Jack (For Patch Panel)	Nos	240		₹ 0.00	₹ 0.00
53	Cat6A S/FTP UTP Patch Cord - 1 Meter	Nos	350		₹ 0.00	₹ 0.00
54	Cat6A S/FTP UTP Patch Cord - 2 Meter	Nos	300		₹ 0.00	₹ 0.00
55	Cat6A S/FTP Information Outlet - Jack (User End)	Nos	300		₹ 0.00	₹ 0.00
56	Face Plate - Single Port	Nos	300		₹ 0.00	₹ 0.00

57	Surface Mount Box (SMB)	Nos	300		₹ 0.00	₹ 0.00
Networking Racks						
58	42U Floor Standing Rack with Accessories (Fan Tray with 4 Fans = 1, Power Distribution Unit 5 Socket = 3, Cable Manager = 5, Mounting Hardware (set of 10 cage nuts) = 5	Nos	1		₹ 0.00	₹ 0.00
59	24U Floor Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)	Nos	10		₹ 0.00	₹ 0.00
60	15U Wall Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)	Nos	10		₹ 0.00	₹ 0.00
61	12U Wall Mount Rack with Accessories (Cable Manager = 2, PDU 5 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 2, 2 Fans Top Mount)				₹ 0.00	₹ 0.00
62	9U Wall Mount Rack with Accessories (Cable Manager = 1, PDU 3 Socket 5 Amp = 1, Mounting Hardware (set of 10 cage nuts) = 1, 2 Fans Top Mount)	Nos	10		₹ 0.00	₹ 0.00
Miscellaneous Items						
63	PLB HDPE Pipe 32 x 26mm	Meter	100		₹ 0.00	₹ 0.00
64	PLB HDPE Pipe 40 x 33mm	Meter	100		₹ 0.00	₹ 0.00
65	PVC Wiring Channel (30 x 25mm)	Meter	100		₹ 0.00	₹ 0.00
66	PVC Wiring Channel (45 x 25mm)	Meter	100		₹ 0.00	₹ 0.00
67	1" PVC Conduit (ISI) - LMS	Meter	100		₹ 0.00	₹ 0.00
68	1.5" PVC Conduit (ISI) - LMS	Meter	100		₹ 0.00	₹ 0.00
69	PVC Flexible Pipe 32mm	Meter	100		₹ 0.00	₹ 0.00
70	PVC Flexible Pipe 40mm	Meter	100		₹ 0.00	₹ 0.00
71	Pole for Outdoor Access Point	Nos	10		₹ 0.00	₹ 0.00
Services						
72	Laying of UTP Cat6 Cable	Meter	3050		₹ 0.00	₹ 0.00
73	Laying of UTP Cat6A Cable	Meter	3050		₹ 0.00	₹ 0.00
74	Laying of PVC Conduit 1"	Meter	100		₹ 0.00	₹ 0.00
75	Laying of PVC Conduit 1.5"	Meter	100		₹ 0.00	₹ 0.00
76	Laying of PVC Channel (30 x 25mm)	Meter	100		₹ 0.00	₹ 0.00
77	Laying of PVC Channel (45 x 25mm)	Meter	100		₹ 0.00	₹ 0.00
78	Laying of Fiber	Meter	100		₹ 0.00	₹ 0.00
79	Laying of HDPE Pipe (32 x 26mm)	Meter	100		₹ 0.00	₹ 0.00
80	Laying of HDPE Pipe (40 x 33mm)	Meter	100		₹ 0.00	₹ 0.00
81	Digging of Soft Soil	Meter	100		₹ 0.00	₹ 0.00
82	Digging/Mouling of Hard Soil	Meter	100		₹ 0.00	₹ 0.00
83	Splicing of Pigtail	Nos	100		₹ 0.00	₹ 0.00
84	Fixing & Termination of I/O Cat6/Cat6A	Nos	300		₹ 0.00	₹ 0.00
85	Fixing & Termination of Patch Panel Cat6/Cat6A	Nos	10		₹ 0.00	₹ 0.00
86	Fixing of Rack	Nos	31		₹ 0.00	₹ 0.00
87	Fixing of Indoor/Outdoor Access Point	Nos	10		₹ 0.00	₹ 0.00
88	Fixing of Pole for Outdoor Access Point	Nos	10		₹ 0.00	₹ 0.00
89	Penta Scanning of LAN Points	Nos	300		₹ 0.00	₹ 0.00

90	OTDR of Fiber, Per Core	Nos	300		₹ 0.00	₹ 0.00
91	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 50 Nodes	Nos	1		₹ 0.00	₹ 0.00
92	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 100 Nodes	Nos	1		₹ 0.00	₹ 0.00
93	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 500 nodes	Nos	1		₹ 0.00	₹ 0.00
94	Project Management Charges including installation & configuration of Active Components and Project Documentation & 3 Years 8 x 5 support services up to 1000 nodes	Nos	1		₹ 0.00	₹ 0.00
95	Add on support services beyond 8 x 5 calls	Nos	1		₹ 0.00	₹ 0.00
	GRAND TOTAL					₹ 0.00

OPTIONAL ITEMS						
1	1 Year comprehensive Annual Maintenance (CAMC) Rates per Year basis	Year	1			

All Figures in Rupees

Total Bid Price In Indian Rupees

(In Words Rupees -----)

Note: In case of discrepancy, unit rate will prevail

Dated this day of 2022

Signature of Tenderer
Name & Designation:
Company Seal

BID SECURITY FORM

Whereas ----- (hereinafter called 'the Tenderer') has submitted its bid dated ----- for Local Area Networking (LAN) empanelment for Networking in various departments under Chandigarh Administration (hereinafter called "the Bid").

KNOW ALL MEN by these presents that WE ----- of - ---
----- having our registered office-----
----- (hereinafter called "the Bank") are bound unto SPIC (hereinafter called "the Purchaser") in the sum of Rs./- for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this----- day of ----- 2022.

THE CONDITIONS of this obligation are:

1. If the Bidder, withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity.
 - a. fails or refuses to execute the Contract Form, if required; or
 - b. fails or refuses to furnish the Performance Security, in accordance with the instructions to Bidders;

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

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

(Authorized Signatory of the Bank)

PROFORMA OF BANK GUARANTEE FOR CONTRACT PERFORMANCE GUARANTEE BOND

Ref: _____

Date: _____

Bank Guarantee No. _____

To

1. Against contract vide Advance Acceptance of the Tender No : -----
covering -----
(hereinafter called the said 'contract') entered into between the SPIC, EDC Building; RGCTP, Chandigarh (hereinafter called the Client) and _____ (hereinafter called the Vendor) this is to certify that at the request of the Vendor we _____ Bank Ltd., are holding in trust in favour of the Purchaser, the amount of (write the sum here in words) to indemnify and keep indemnified the Purchaser against any loss or damage that may be caused to or suffered by the Purchaser by reason of any breach by the Vendor of any of the terms and conditions of the said contract and/or in the performance thereof. We agree that the decision of the Purchaser, whether any breach of any of the terms and conditions of the said contract and/or in the performance thereof has been committed by the Vendor and the amount of loss or damage that has been caused or suffered by the Purchaser, shall be final and binding on us and the amount of the said loss or damage shall be paid by us forthwith on demand and without demur to the Purchaser.
2. We _____ Bank Ltd, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for satisfactory performance and fulfillment in all respects of the said contract by the Vendor i.e till _____ hereinafter called the said date and that if any claim accrues or arises against us _____ Bank Ltd, by virtue of this guarantee before the said date, the same shall be enforceable against us _____ Bank Ltd, notwithstanding the fact that the same is enforced within six months after the said date, provided that notice of any such claim has been given to us _____ Bank, by the Purchaser before the said date. Payment under this letter of guarantee shall be made promptly upon our receipt of notice to that effect from the Purchaser.
3. It is fully understood that this guarantee is effective from the date of the said contract and that we _____ Bank Ltd, undertake not to revoke this guarantee during its currency without the consent in writing of the Purchaser.
4. We undertake to pay to the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the Vendor in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present bond being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Vendor shall have no claim against us for making such payment.
5. We _____ Bank Ltd, further agree that the

Purchaser shall have the fullest liberty, without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said contract or to extend time of performance by the Vendor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Purchaser against the said Vendor and to forebear or enforce any of the terms and conditions relating to he said contract and we, _____

_____Bank Ltd., shall not be released from our liability under this guarantee by reason of any such variation or extension being granted to the said Vendor or for any forbearance by the Purchaser to the said Vendor or for any forbearance or omission on the part of the Purchaser or any other matter or thing whatsoever, which under the law relating to sureties, would, but for this provision, have the effect of so releasing us from our liability under this guarantee.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Vendor.

7. This guarantee will be valid up to three years & sixty days from the date of issue .

Date _____

Place _____

Signature

Witness _____

Printed name

(Bank's common seal)

CONTRACT FORM

THIS AGREEMENT made the..... day of., 2022
 Between (Name of purchaser) (hereinafter called "the Purchaser") of
 the one part and(Name of Supplier) of.....
 (hereinafter called "the Supplier") of the other part:

Whereas the purchaser is desirous that -----

(Brief Description of Goods and Services) and has accepted a bid by the Supplier for
 the supply of those goods and services in the sum of..... (Contract
 Price in Words and Figures) (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - (a) the Bid and the Price Schedule submitted by the Bidder;
 - (b) the Tender Document including the Technical Specifications and the General Conditions of Contract;
 - (c) the Purchaser's Notification of Award.
 - (d) Correspondence (.....)
3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Brief particulars of the goods and services which shall be supplied/ provided by the Supplier are as under:

	Brief description of goods & services	Quantity to be supplied	Unit price	Total price	Delivery terms	Any other

TOTAL VALUE:

DELIVERY SCHEDULE:

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written. Signed,
 Sealed and Delivered by the said..... (For the Purchaser) in the
 presence of:.....

Signed, Sealed and Delivered by the said..... (For the Supplier) in
 the presence of:.....

Check list

Please check whether following have been enclosed in the respective covers, namely, letter of Pre-qualification, Technical Bid and Price Bid:

A Pre-Qualification Letter

- | | | | |
|----|--|--------|----------------------|
| 1. | Bid Security valid up to (date.....) | Yes/No | <input type="text"/> |
| 2. | Evidence for experience (Clause 20.1 (ii), Section II) | Yes/No | <input type="text"/> |
| 3. | Evidence of Turn over
(Clause 20.1 (iv) Section II) | Yes/No | <input type="text"/> |
| 4. | Technical Support facility
details (Clause 20.1 (iii) Section
II) | Yes/No | <input type="text"/> |
| | | Yes/No | <input type="text"/> |
| 5. | MOA, AOA and commencement of Business
Certificate. (Clause 20.1 (v) Section II) | Yes/No | <input type="text"/> |
| 6. | Authorization certificates from
OEM (Clause 20.1 (vi) Section II) | | |

B. Technical Bid

- | | | | |
|----|--|--------|----------------------|
| | | Yes/No | <input type="text"/> |
| 1. | Bid Particulars (Annexe 5.1.1) | Yes/No | <input type="text"/> |
| 2. | Technical Bid Letter (Annexe 5.1.2) | Yes/No | <input type="text"/> |
| 3. | Detailed Technical Proposal (Annexe 5.1.3) | Yes/No | <input type="text"/> |
| 4. | Vendor Profile (Annexe5.1.4) | Yes/No | <input type="text"/> |
| 5. | Pre-qualifying Technical Competence such as
proven experience in providing Similar Services for
determining pre-qualification conditions and Bid
Security | | |
| 6. | Technical Compliance Form (5.1.5) | Yes/No | <input type="text"/> |

C. Price Bid

- | | | | |
|----|---------------------------------|--------|----------------------|
| 1. | Price Bid letter. (Annexe5.2.1) | Yes/No | <input type="text"/> |
| 2. | Price Schedule. (Annexe5.2.2) | Yes/No | <input type="text"/> |

