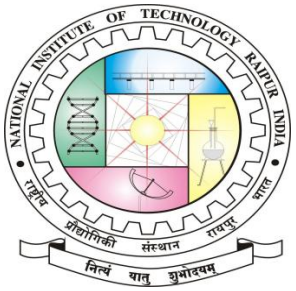
Tender Document for

"Campus Wide Extension of Institute Building LAN (Wired and Wireless) and IP Telephony"



NATIONAL INSTITUTE OF TECHNOLOGY

G.E. ROAD, RAIPUR 492010, CHHATTISGARH, INDIA

Website: www.nitrr.ac.in

INDEX OF DOCUMENTS

CHAPTER – I: INSTRUCTIONS TO BIDDERS

Campus Wide Extension of Institute Building LAN (Wired and Wireless) and IP Telephony Project

S.No.	SHORT SCOPE OF THE TENDER
	Supply, Installation, System Integration, Testing and 03 Years On-Site Comprehensive Warranty Maintenance of UTMs, Network Switching, Wireless, IP Telephony Devices, Structured LAN and Optical Fibre Cabling and Components with Accessories and Deployment of 3 Technical Staff for 3 years

1. This is an open tender enquiry. The bidder has to provide end-to-end solutions to above scope of work of this Tender.
2. The Bidders are advised to study the tender document carefully.
3. Submission of tender shall be deemed to have been done after careful study and examination of the tender documents with full understanding of implications thereof.
4. Contracts made under this tender will be governed by the conditions specified in this document.
5. Bids should be submitted in two parts: techno-commercial bid and price bid.
6. The techno-commercial part consists of the eligibility criteria of the bidder along with necessary documents in support etc. and technical compliance mentioned later in this chapter. **Techno-commercial bid shall contain no price or price related information, either explicit or implicit.**
7. The price bid, also called the financial bid, indicates item-wise price for all the items as mentioned later in this chapter/document.
8. Techno-commercial bid cover shall contain two covers super scribed "**Techno-commercial bid: Part-A**", and "**Techno-commercial bid: Part-B**"
9. Techno-commercial bid Part-A shall contain eligibility related and other required forms as mentioned later in the chapter VI.
10. Techno-commercial bid Part-B shall contain duly filled in technical compliance sheets, hardcopy of the datasheets, and hardcopies/softcopies of other technical literature as mentioned later in this chapter/documents.
11. The techno-commercial and price bids should be placed in separate sealed covers and the two covers should be placed in a single sealed bigger cover.
12. Techno-commercial cover should be super scribed "**Techno-commercial bid for Campus Wide Extension of Institute Building LAN Tender No. NITRR/LAN/7567/2013, dated 01.10.2013**".
13. Price bid cover should be super scribed "**Price bid for Campus Wide Extension of Institute Building LAN Tender No. NITRR/LAN/7567/2013, dated 01.10.2013**".
14. The single sealed bigger cover containing the techno-commercial and price bid covers should be super scribed "**Bid for Campus Wide Extension of Institute Building LAN Tender No. NITRR/LAN/7567/2013, dated 01.10.2013**". The bid envelop must be addressed to "The Registrar, National Institute of Technology, G.E. Road, Raipur 492010 Chhattisgarh".
15. Bids should be submitted by dropping them in a **Tender-box** kept specifically for this tender in the Institute by the Bidder or its representative.
16. Bids should be complete in all respects.
17. All the required forms should be submitted with the bids in the prescribed formats.
18. All pages in a cover should be neatly tied up / tagged / stapled / filed / bound and there should not be any loose pages.

19. All pages submitted with a bid should be signed by an authorized signatory and bear the company's stamp.
20. All signatures should be done in blue colour using ball point pen.
21. All stamps should be in blue colour ink.
22. Entries should be made neatly and legibly by hand or typewriter or computer printing.
23. Corrections, if any, should be done by striking out the entry to be corrected with a single line, encircling it and should bear the initials of an authorized signatory.
24. Use of white fluid is **not** permitted.
25. Overwriting is **not** permitted.
26. Pre-bid clarifications should be sent within 10 days of tender publication via e-mail to nitnet@nitrr.ac.in in the required format given in Chapter VI. Clarifications sent later shall **not** be considered.
27. Subject line of the **e-mail** should be "Pre-bid clarification".
28. Scanned copy of the duly filled pre-bid clarification form with the pre-bid queries and other details should be attached with the mail.
29. Replies to pre-bid clarifications shall be given within 5 days of the last date for pre-bid clarifications by e-mail. Bidders are advised to submit their bids after this.
30. The Institute reserves the right to call a pre-bid conference in case deemed necessary wherein the queries posted by e-mail will be replied to. In case, pre-bid conference is called date, time and venue of pre-bid conference will be published in the Tender section of the Institute's web-site www.nitrr.ac.in. The interested bidders are therefore advised to keep visiting our web-site. The bidders desirous of taking part in the pre-bid conference will have to deposit tender processing fee of Rs.10,000/- in form of a DD in favour of "The Director, National Institute of Technology, Raipur" payable at Raipur before the start of the conference.
31. Only two person carrying the proper identification, etc. as per the format given in the Chapter-VI will be allowed to attend the pre-bid conference.
32. Revisions / amendments / corrections / corrigenda to the tender, if any, due to pre-bid clarifications shall be posted on the institute website.
33. Information / notices of interest to all bidders and revisions / amendments / corrections / corrigenda to the tender, besides those due to pre-bid clarifications shall also be posted on the institute website http://www.nitrr.ac.in .
34. Bidders are advised to check the institute website regularly for updates on this tender.
35. Ignorance of information posted on the website shall not be accepted as reason for non-compliance with tender.
36. Each bidder should submit only one bid. Multiple bids submitted by a bidder will result in disqualification of the bidder.
37. Bidders are advised in their own interest to carry out a basic site survey for an estimation of the quantities and work involved before submitting their bids.
38. Bids submitted along with all documents and media shall remain with NIT Raipur and not be returned to the bidder.
39. NIT Raipur shall not bear any costs associated with the preparation of the tenders including basic site survey by bidder, if any.
40. The price bid should contain the price quoted by the bidder in the format specified in the Price Schedule.
41. Price quoted should be **all-inclusive** price F.O.R. NIT Raipur.
42. **Actual quantities of items and jobs work are subject to variation up to 15% on either side for access switches and 30% for passive and service components. However, only the indicative ballpark quantities mentioned in the price schedule shall be considered by the bidders for preparing the price bids and by NIT Raipur for tender**

evaluation. However, the firms will not be reassessed due to change in quantities.

43. **Payment shall be made strictly on the basis of actual quantities utilized. For the payments, unit prices will be multiplied by actual quantities.**
44. Prices should be quoted in Indian Rupees only.
45. In the Price bid, the quoted price shall include all the duties like excise duty, customs duty, and all the taxes like VAT / sales / service tax, entry tax, octroi, terminal tax, etc. whichever are applicable.
46. Packing and forwarding, freight and insurance are in the contractor's scope i.e., included in the quoted price.
47. Warranty required on different items should also be included in quoted price.
48. Bidder should extend and include the advantage of discounted pricing for education in the quoted price, if such a discount is being offered by an OEM of a certain product.
49. The price quoted shall remain fixed till one month of successful operation of the equipment supplied and installed.
50. The following should be enclosed in a single separate cover within the technical bid cover super scribed "Techno-commercial Bid: Part-A".
    a. tender processing fee demand draft (INR 10,000/-) OR a photo-copy of the DD which they have already submitted before the pre-bid conference.
    b. bid security (EMD) in one of the accepted formats or attested true copy of current DGS&D / NSIC registration
    c. all documents related to bidder's eligibility including but not limited to
        (i) Attested true copies of the audited financial statement / auditor's certificate.
        (ii) Copies of purchase orders and work completion certificates
    d. copy of tender with sign of authorized signatory and company stamp on all pages
    e. Income tax returns for the last three years and copy of the PAN card of the applicant firms and partners / Directors thereof
    f. Following forms:
        (i) form for bidder's self information
        (ii) form for submission of bids
        (iii) form for submission of similar works executed by bidder as proof of eligibility
        (iv) form for OEMs' authorization given to bidder
        (v) form for information on after sales service centres
        (vi) form for warranty
        (vii) form for statement of deviations from tender conditions
        (viii) performance Guarantee bond

51. The following should be enclosed in a single separate cover within the technical bid cover super scribed "Techno-commercial: Part-B".
    a. technical compliance booklet
    b. technical literature
        i. Datasheets (hard copy of datasheets of all items mentioned in technical compliance sheets is mandatory).
        ii. Price schedule with make, and model numbers **without** mentioning the prices (in the format as shown in **Chapter-IV**).
        iii. Softcopy of all literature, which shall establish compliance (arranged in appropriately named folders e.g., UTM/FW, CoreSwitch, DistriT1, DistriT2, AccSw, ResGw, Rack etc. and files e.g., Datasheet.pdf, AdminGuide.pdf, UserGuide.pdf etc.) with a README file containing

the index (Item Name, S.No., Relevant Specification No., Document File Name, and Page No.) for quick reference (so that it is easy for determining compliance).

52. It is advised in his own interest that the softcopies be submitted by the bidder in three copies in different media types for reliability: CD, DVD, pen drive, magnetic tape and in the common file formats.
53. The copy of the tender with sign of authorized signatory and company stamp on all pages implies acceptance of all terms and conditions of this tender by the bidder.
54. Bidders should note that if the date of tender opening is declared a closed holiday by the Government, the tender shall be opened on the next working date.
55. Non-refundable tender processing fee of Rs. 10,000/- (Ten Thousand Indian Rupees Only) has to be submitted as Demand Draft of a nationalised bank in favour of Director, NIT Raipur payable at Raipur before the pre-bid conference (if called) or along with Techno-commercial bid: Part-A.
56. **Last date & time for submission of bids: 19th November 2013 by 1:00 P.M.**
57. Bidders should not send any part / complete bid through post/courier/e-mail / fax.
58. Due Date & Time For Opening:
    a. Part 1: **Techno-Commercial Bid: 19th November 2013 by at 3:00 P.M.**
    b. Part 2: Price/ Financial Bid: Date, time and venue will be informed through email/fax to those bidders only whose technical bids are found qualified at least one week before the date of opening the financial(Price) bid.
59. Place of opening of tenders shall normally be the Conference Room, First Floor, Main Building, NIT Raipur or an alternate venue informed through the website http://www.nitrr.ac.in .
60. Refundable bid security of Rs. 15,00,000/- (Fifteen Lakhs Indian Rupees Only) has to be submitted as account payee demand draft / fixed deposit receipt of a nationalised bank drawn in favour of "**Director, NIT Raipur**" payable at Raipur along with Techno-commercial Bid: Part-A.
61. Bid security (EMD) exemption is applicable to bidders registered with DGS&D and NSIC if all the products quoted are manufactured by them.
62. The bid security should be submitted in its original form and copies shall not be accepted.
63. The bid security should remain valid for a period of forty-five days beyond the final bid validity period (180 days from the last day of bid submission).
64. The validity of the bid should be for a minimum of 180 days from the last day of bid submission.
65. Bid securities of the unsuccessful bidders shall be returned without interest to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.
66. Bids without tender processing fee and /or bid security shall be summarily rejected.
67. During the process of evaluation of tenders, no queries shall be entertained from the Bidders with regard to its status.
68. If the bidder submits false information his bid shall be liable to be rejected.
69. The submission of the bid shall be deemed to imply that the bidder fully understands the scope of work involved.
70. Incomplete or technically deviated or commercially deviated or conditional bids shall be summarily rejected.
71. The names and complete postal addresses of the bidding organization should be mentioned on the other side of all DDs / FDRs.
72. The names and complete postal addresses of the bidding organization should also be mentioned on all covers.

73. **Evaluation Process:** Contract shall be awarded to the lowest evaluated bidder whose bid is found to meet the technical and commercial criteria and who is eligible and qualified to perform the contract satisfactorily as per the terms and conditions of this tender.

    Following shall be the steps followed for evaluation of the tenders:

    (i) **Techno-commercial bid: Part-A** shall be opened first to check the bidder's eligibility which must be submitted as per the format given in condition of contract duly filled in by the bidder.

    (ii) If bidder is found eligible in (i) above, then **Techno-commercial bid: Part-B** shall be opened and the compliances shown in the technical compliance booklet shall be verified against the datasheets and supporting technical documents submitted by the bidder.

    (iii) If bidder is found eligible in (i) and (ii), then his price bid shall be opened and contract will be awarded to the bidder with the overall lowest quoted price against the quantities of active and passive components and services mentioned in the price bid, i.e., for complete end-to-end solution.

    Bids received shall be evaluated only in terms of the conditions already incorporated in the bidding documents; no new condition which is not contained in the bidding documents shall be brought in or considered for the evaluation of the bids. Determination of a bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.

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CHAPTER – II: CONDITIONS OF CONTRACT

S.No.	TENDER NOMENCLATURE
	Supply, Installation, System Integration, Testing and 03 Years On-Site Comprehensive Warranty Maintenance of UTMs, Network Switching, Wireless, IP Telephony Devices, Structured LAN and Optical Fibre Cabling and Components with Accessories and Deployment of 3 Technical Staff for 3 years

1. DEFINITIONS AND INTERPRETATION

In the Contract, unless the context otherwise requires:

(a) **"NIT"** or **"NIT Raipur"** would mean the National Institute of Technology, Raipur.

(b) **"CCC"** would mean the Central Computer Centre, NIT Raipur.

(c) **"Acceptance of Bid"** means the letter / telex / telegram / fax or any memorandum communicating to the bidder as the acceptance of his bid and includes an advance acceptance of his bid.

(d) "**Contract"** means and includes the Notice Inviting Tender, Instructions to Bidders, Acceptance of Bid, Conditions of Contract and other conditions specified in the Acceptance of Bid and includes a formal agreement, if executed.

(e) The **"Contractor**" means the person, firm, bidder or company with whom the purchase order is placed and shall be deemed to include the contractor's successors (approved by the Purchaser), representatives, heirs, executors, administrators and permitted assignees, as the case may be, unless excluded by the terms of the contract. The terms "Contractor" and "Successful Bidder" have been used interchangeably in this bid document.

(f) "**Purchasing Officer"** means the officer signing the acceptance of bid and includes any officer who has the authority to execute the relevant contract on behalf of NIT Raipur.

(g) The **"Purchaser"** means the National Institute of Technology, Raipur.

(h) The **"Bidder"** Shall mean a company/firm in its individual right.

(i) **CCC Committee,** NIT Raipur is authorized to take decisions on behalf of NIT Raipur in respect of the implementation of this project.

(j) **"Bidder's Project Manager"** means a designated representative of Bidder, who is empowered by the authorized signatory of the bidder for delivering the contractual obligations under this contract. He will be the one point interface with NIT Raipur.

(k) **"Service"** means all the services to be rendered by the contractor as stated in contract details

(i) In relation to the supply, transportation to the work site, installation, system integration, commissioning, making operational and testing the hardware including all networking equipment and infrastructure, systems,

servers, software

(ii) In relation to the installation of any accessories like electric wiring, electric boards etc. required to make operational any equipment

(iii) In relation to manpower and annual maintenance contract

(iv) In relation to system / application software supplied by the bidder

(v) Documentation

(vi) Training

(vii) Development and support

(l) **"Personnel"** means Staff, employees, agents, contractors and sub-contractors of either party and also includes the staff, employees, agents and contractors of those subcontractors with qualification, experience and certification.

(m) **"Software"** means system/ application software to be supplied by the contractor, as stated in the contact details.

(n) **"Specifications"** means all the functional, operational, performance or other characteristics required of a Product or Service found in tender document Chapter-IV or any of the annexure or addendum to the tender document.

2. AUTHORIZED SIGNATORY AND ADDRESS OF THE CONTRACTOR

The Authorized Signatory of the Bidder shall be:

(a) The proprietor in case of "Sole Proprietor" firm or constituted attorney of such sole proprietor.

(b) One of the partners in the case of a "Partnership" firm, in which case he must have authority to refer to arbitration disputes concerning the business of the partnership either by virtue of the partnership agreement or a power of attorney. In the absence of such authority all partners shall be authorized signatories and will be required to sign the tender.

(c) A director or the regional head in case of a limited company or in the case of a government organisation an official of requisite authority duly authorized for the purpose by a resolution of the board of directors.

(d) For all purpose of the contract, including arbitration thereafter, the address of the Bidder mentioned in the tender shall be the address to which all communications shall be the addressed.

The contract shall be for the items mentioned in the price bid.

3. BIDDERS ELIGIBILITY CRITERIA (COMMERCIAL)

The bids of the bidders meeting all the following eligibility criteria shall only be considered

S.No.	Eligibility Criteria	Documents Required
1.	Bidder should be authorized by the manufacturer/s of the equipment/s listed in **Annexure-1** for quoting their products in this tender	Duly filled-in authorization forms in the attached format
2.	Bidder should be in the business of computer network system integration at least for the last 5 years and should have successfully executed at least one Ethernet and IP Network Project involving supply, integration and commissioning for reputed organizations in India i.e., Premier national level Institutes like IITs/ IIMs/ NITs/ IIITs/ IISER etc./ Premier R&D Organizations/ Defence Laboratories/ Defence Organizations/ National Laboratories / Universities, Institutes, Colleges, Organizations and Departments / Civil or Defence Public Sector Units or for Listed Corporate Organizations with an annual turnover of Rs. 500 crores or higher.	Copy of registration certificate and self-certification of being in business for the last 5 years should be attached Self attested copy of work order and work completion certificate / client sign-off
3.	Bidder should be a profit-making entity having an annual turnover of at least INR 30 crores per annum during the last 3 financial years ending March 2013.	C.A. attested true copies of the audited financial statements/ auditor's certificate highlighting the turnover from Ethernet and IP networking projects
4.	Bidder should have prior experience in India in the supply, installation and warranty maintenance of the network components and accessories mentioned in **Annexure-1**. The experience could be in a single project or distributed over different projects	Self attested copies of work orders and work completion certificates / client sign-off
5.	The bidder should have completed within the preceding 7 calendar years ending last day of month previous to the one in which this tender has been published a. Three similar completed works each costing not less than 175 lakhs, or, b. Two similar completed works each costing not less than 220 lakhs, or, c. One similar completed work costing not less than 350 lakhs **Similar work means** supply, installation, integration of services for data (wired, wireless), voice & video including warranty maintenance of Ethernet and IP network components and accessories and associated job works towards setting up a converged Ethernet and IP network / network extension and IP Telephony. Orders in the name of consortiums or subcontracts shall not be accepted.	Self attested copies of work orders and work completion certificates / client sign-off

6.	Bidder should have executed the following: [1] A single project involving the laying of 5000m underground OFC [2] A single project involving the laying of 10000m structured UTP cabling. [3] A single project involving ≥1000 switch ports or 2 projects with ≥500 switch ports. [4] A single project involving ≥100 Wireless APs or 2 projects with ≥50 Wireless APs.	Self attested copies of work orders and work completion certificates / client sign-off
7.	Bidder shall submit the technical compliance sheets of the items in **Annexure-1** after vetting and attestation by the respective manufacturers.	Technical compliance sheets of the equipment in Annexure duly vetted by the manufacturer
8.	The bidder shall have office in Raipur / Bhilai or the bidder shall give a written undertaking to open an office in Raipur / Bhilai within 30 days of receipt of the purchase order.	Address proof of office in Raipur / Bhilai or undertaking letter.
9.	The bidder should have experienced, certified Engineers/personnel for all the **active components** being quoted by him.	A certificate in the manufacture's letter head in this regard be attached.
10.	The bidder must not have been blacklisted by any organization during last seven years.	An affidavit of this regard duly notarized by a Notary should be attached by the bidder.

The work orders and work completion certificates / client sign-offs of the same / different projects may be submitted for compliance

4. EARNEST MONEY DEPOSIT (BID SECURITY)

(a) The firms registered with DGS&D and NSIC, if any, are exempted from payment of Earnest Money Deposit provided such registration is for the quoted items being manufactured by them.

(b) All bidders, except those in point (a) above are required to submit EMD of INR 15,00,000/- (Rupees Fifteen Lakhs Only) along with their bids for this tender.

(c) EMD may be in the form of Account Payee Demand Draft / Fixed Deposit Receipt issued by any nationalised bank drawn in favour of "Director, NIT Raipur" payable at Raipur and valid for a period of forty-five days beyond the final bid validity period. The EMD shall be submitted in its original form. Copies will not be accepted.

(d) The names and complete postal addresses of the bidding organization should be mentioned on the other side of the DD / FDR.

(e) EMD is liable to be forfeited if the bidder withdraws or amends or impairs or derogates from the bid in any respect within the validity of the bid and is open for acceptance

whether originally fixed or extended.

(f) EMD shall also be forfeited if bidder fails to execute performance cum warranty guarantee bond within stipulated time after acceptance of bid is communicated to him. Any bid not accompanied by EMD is liable to be summarily rejected.

(g) The EMD shall be returned to the successful bidder on submission of the performance cum warranty guarantee bond of the order value in the prescribed format.

(h) No interest shall be payable by the Purchaser on the Earnest Money/Bid Guarantee to the Bidder.

(i) The Earnest Money shall remain deposited with the Purchaser for the validity period as mentioned, from the date of opening of Tenders. If the validity of the offer is extended, for some reasons, the Earnest Money Deposit extension shall also be furnished failing which the bid after the expiry of the aforesaid period shall not be considered by the Purchaser.

(j) The Earnest Money of all unsuccessful bidders shall be returned without interest to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.

5. **PRE-BID CLARIFICATIONS, OMISSIONS AND DISCREPANCIES, IF ANY, IN THE TENDER DOCUMENT:**

(a) Bidders are expected to go through the tender document thoroughly and carefully. In case a bidder finds any discrepancy or omission in any part of the tender document / has doubts to the meaning / interpretation thereof, or otherwise wishes to seek further clarity on some aspects, he shall seek clarification from NIT Raipur by sending e-mail with the subject line "Pre-Bid Clarification" and attaching a scanned copy of the duly filled-in Pre-Bid Clarification Form to the following e-mail id: nitnet@nitrr.ac.in within 10 days of publication of the tender. No other mode of communication after publication of the tender is allowed.

NIT Raipur shall post the clarifications for the benefit of all the bidders on the institute website and amendments / revisions / corrections / corrigendum etc. shall be issued within 15 days of tender publication. Bidders are advised to submit their bids after this date.

(b) It shall be understood that every endeavour has been made to avoid any error which can materially affect the basis of the bid and the successful bidder shall take upon himself and provide for the risk of any error which may subsequently be discovered and shall make no subsequent claim on account thereof.

(c) The submission of the tender will be deemed to imply that the bidder fully understands the scope of work involved and has read and understood all conditions of the tender document and his liabilities and responsibilities in respect of the tender.

While institute maps available on web mapping service applications or the sketch of the campus plan provided with this tender document may serve as useful guides, bidders are advised in their own interest to visit the institute and get a first hand understanding of the

extent and scope of the work that is involved and to arrive at their own estimates.

6. **AMENDMENTS TO BID INVITATION**

(a) Amendments / Revisions / Corrections / Corrigenda, if any, is issued for the tender, shall form part of the tender document and will be posted on NIT Raipur's website (http://www.nitrr.ac.in) **Bidders are therefore advised requested to visit NIT Raipur's website regularly without fail. NIT Raipur will not be responsible for ignorance of any information posted on the website in respect of this tender.**

(b) At any time, prior to the deadline for submission of bids, the institute may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by amendment. The same would also be hosted on the website of the institute and all prospective bidders are expected to surf the website before submitting their bids to take cognizance of the amendments. Bidders who have submitted the bids before publishing the amendments may revise their bids incorporating the amendments before the last date of the tender.

(c) In order to allow prospective bidders reasonable time in which to take Amendments / Revisions / Corrections / Corrigenda into account in preparing their bids, the institute, at its discretion, may host the changes on the website of the institute and extend the deadline for the submission of bids by such a number of days not less than ten as in the opinion of NIT Raipur will enable the bidders to revise their bids.

7. **PROCESS TO BE CONFIDENTIAL**

(a) After the public opening of the bids, information related to the examination, clarification, evaluation and comparison of bids, and recommendations concerning the award of the purchase order shall be treated strictly confidential and not disclosed to the bidders or other persons not officially concerned with such process.

(b) Any effort by the Bidder to influence the purchaser in the process of examination, clarification, evaluation and comparison of bids, and in the decision concerning the contract, may result in outright rejection of his bid.

8. **BID OPENING**

The sealed bids shall be opened in the presence of such of the bidders or their authorized representatives who may like to be present at the time and date fixed. The representative shall bring the original form of bidder's authorization to representative, the ID card issued by the bidder organization, any photo identity card issued by the Central Government of India. In the absence of any of these documents, the representative shall not be allowed to attend bid opening.

NIT Raipur shall have the right to change the date and time of opening of the bid. The changed date and time shall be notified. In the event the bid opening date / last date for

tender submission etc. mentioned in the tender document is declared as a holiday the next working day at the institute will be considered as the due date for receiving and opening of tenders. The time shall remain the same.

9. CLARIFICATIONS BY NIT RAIPUR

(a) To assist in the examination, evaluation and comparison of bids, NIT Raipur may ask the bidder individually for a clarification on his bid including breakdown of unit rates. The request for clarification and the responses shall be in writing / email / fax but no change in price or substance shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by NIT Raipur during the evaluation of bids. Such reply shall be given within the time limit mentioned in the intimation issued by NIT Raipur, failing which NIT Raipur will be at liberty to conclude that nothing further is to be submitted by the bidder on this matter.

(b) Bidders shall arrange for a demonstration of any product if required by NIT Raipur during evaluation of the bids.

10. VALIDITY OF THE BID

The validity of the bid must be for a minimum of 180 days from the last day of bid submission. Any subsequent extension of validity shall be for a minimum of 30 days. In this case the bid security will need to be extended by the bidder.

11. RIGHT OF ACCEPTANCE

NIT Raipur reserves the right to reject any or all tenders without assigning any reason to the bidders subject to the relevant CVC guidelines in this context.

12. COMPLIANCE WITH STATUTORY PROVISIONS IN RESPECT OF WORKERS / LABOURERS ENGAGED

It shall be the sole responsibility of the contractor to abide by the provisions of all relevant labour laws or legislation for the employment of contract labourers / employees which will govern the nature of the contract.

NIT Raipur shall not be responsible for the payment of wages and or any other emoluments to the personnel / workers deployed by the contractor. It shall be the sole responsibility of the contractor to make payment to the said personnel / workers in time as per the Minimum Wage Act and the contractor shall at all time keep NIT Raipur indemnified against any claim from its personnel / workers in this regard.

The contractor shall be solely responsible for any cost and consequences on account of any breach and / or non-compliance of any of the provisions of the Labour Laws. The

contractor shall indemnify NIT Raipur against any claims / costs / damages and penalties in respect of breach of any of the provisions of the laws in force.

It shall be the sole responsibility of the contractor to obtain license under different labour laws from the concerned authority.

The compliance of all statutory laws with respect to the workers or employees engaged by the contractor and their welfare will be the sole responsibility of the contractor.

It shall be the responsibility of the contractor to comply with all the liabilities arising out of any provisions of Labour Acts / Enactments hitherto in force or enacted from time to time during the execution of this Service Contract.

All records, documents under various statutory provisions maintained by the contractor shall be open for inspection by an authorized representative of NIT Raipur / 3rd party authorized by NIT Raipur / to any law abiding Government Agency and the contractor shall produce the same as and when required for inspection.

It shall be the responsibility of the contractor to provide Canteen, Medical and/or Transport Facility to his personnel if required by any enactments.

It shall be the responsibility of the contractor to pay any compensation or damage for the injury sustained by any contract labour or employee during the performance of their duties. This also applies to any damage or compensation due to any dispute between them.

Any expenditure incurred by NIT Raipur to handle such situations or those arising out of the conduct of deployed personnel or otherwise shall be deducted from the bills / performance guarantee of the contractor.

13. LOCAL CONDITIONS

It will be the sole responsibility of each bidder to fully acquaint him with all the local conditions and factors, which could have any effect on the performance of the contract and/or the cost.

14. INDEMNITIES AND LIABILITIES

(a) The contractor shall indemnify and protect the purchaser from and against all actions, suits, proceedings, losses, costs, damages, charges, claims and demands of every nature and description brought against or recovered from NIT Raipur by reasons of any act or omission of the contractor/his agents or employees, in the execution of the works or in the guarding of the same.

(b) The contractor shall indemnify NIT Raipur against any claims, damages, loss or penalty including costs thereof in case of liability arising out of any accident/incident/theft involving manpower deployed by him.

(c) NIT Raipur will not be responsible in any way for any injury sustained by contractor's personnel during the performance of its/their duties and also any damage or compensation due to any dispute between the contractor and his employees.

(d) Any expenditure incurred by NIT Raipur to handle the situation arising out of injury of contractor's personnel during work or the conduct of the personnel deployed by the contractor will be deducted from Security Deposit/Performance Guarantee/Bills of the contractor/Service Provider.

(e) Contractor shall also indemnify NIT Raipur against enforcement of any acts, laws, rules and/or regulations (including Labour Laws) and amendments enacted from time to time thereto by any Central/State/Local or Municipal Authorities.

(f) Contractor shall indemnify NIT Raipur against third party claims arising out of equipment malfunctioning / mishandling on the part of employees of the contractor.

(g) Contractor shall also indemnify to reimburse any loss or damage by his personnel to NIT Raipur personnel or property including machinery, equipment or buildings. In case, any such amount is not deposited/paid to NIT Raipur, the same shall be deducted from Security Deposit/Performance Guarantee/Bills/Future payments due to the contractor.

(h) Total financial liabilities of the contractor arising out of breach of contractual obligations shall not exceed the value of contract. However, any liabilities arising out of breach of any obligation(s) commonly applicable in Indian or International law or regulation or intellectual property right infringements etc shall not be limited by this agreement and the contractor shall be solely and completely responsible for any such violation on his part and be liable to pay full cost of damage.

15. **INSURANCE**

NIT Raipur shall not arrange for any 'Transit Insurance' and the supplier shall be responsible till the entire goods contracted, arrive in good condition at destination site. Contractor shall, at his own cost, unconditionally replace / rectify the goods lost / damaged / found defective on inspection to the entire satisfaction of NIT Raipur within 30 days from the date of receipt of intimation from NIT Raipur.

16. **EXIT CLAUSE / TERMINATION OF CONTRACT**

In case of non-initiation of work or non-performance / breach of the clauses of this contract, NIT Raipur would issue a written notice of 30 days to the party to perform / rectify the breach failing which NIT Raipur shall be at liberty to terminate the Purchase Order / Work Order / Contract by providing 30 days written notice to the party and arrange procurement from alternate sources at the successful Bidder's risk & cost. In such event, the terminated party shall have no right to claim compensation/damages etc from NIT Raipur on account of early termination

17. **PRICES**

(a) All Prices shall be in Indian Rupees and no foreign exchange / import license shall be provided. The prices should be all inclusive as mentioned in Chapter-I: Instructions to

Bidders.

(b) However, the bidder is advised to explicitly mention tax and duty rate percentages etc. separately. In case of change in any duty or tax on account of change in rules / legislation by the Government, the actual rates as applicable at the time of supply shall be payable only for taxes and duties which are clearly stated as percentages in the offer and firms will not be reassessed for lowest due to change in taxes.

(c) Quoted prices shall remain firm for the period of validity of the offer.

(d) NIT Raipur reserves the right to place order for a part item / combination of the quantity offered. The unit rates offered by the Bidders shall be valid for any such part order.

18. **FIRM PRICES**

The rates quoted by the bidder in the bids shall be fixed till the completion of this project and shall not be subjected to any kind of adjustments. The bid price must be quoted in Indian Rupees.

19. **ACCEPTANCE OF PURCHASE ORDER**

Prior to the expiry of bid validity, the successful bidder shall be notified by post / fax / e-mail. Within 15 days of the award of the contract the successful bidder shall send his / her acceptance of the purchase order along with the performance cum guarantee warranty bond.

20. **ONE BID PER BIDDER**

Each bidder shall submit only one bid in this tender. Bidder submitting more than one bid shall be disqualified from participating in the tender

21. **BIDDING BY CONSORTIUM**

Bidding by consortium is not allowed in this tender.

22. **ON COMMENCEMENT OF JOB / SERVICES**

The contractor shall supply the various items and provide the required service as per the requirement in the schedule of requirements and scope of work section of the tender. The complete responsibility for providing services as per the terms of the tender shall be with the contractor. The contractor shall be solely responsible for the acts and deeds of the personnel deployed by him for the services. NIT Raipur will, in no way, be responsible for violation of any rules / regulations / instructions / laws of the concerned agencies and/ or for any loss or damage caused by the personnel of the contractor, to NIT Raipur and/or third party staff and/or property and any such loss or damage shall have to be compensated/borne by the contractor. The contractor shall be responsible for engaging adequate manpower in accordance with the work defined in the schedule / scope of work so that the continuity of work is maintained and the work is completed within time. Contractor's responsibilities shall include but shall in no way be limited to supervision of

personnel provided by the contractor, verification of antecedents of the contractor's personnel, quality and timely completion of work by the contractor's personnel.

23. **PROBLEM RESOLUTION METHOD**

If the Bidder is notified in writing of a problem he shall act appropriately to resolve the same in reasonable time.

24. **DELIVERY CONDITIONS**

(a) The equipment shall be delivered at NIT Raipur, G.E. Road Campus within 8-12 weeks of placement of Purchase Order.

(b) Supplier shall then proceed to install the equipment at designated locations and commission the network. NIT reserves the right to change the quantity, locations, delivery schedule for the equipment.

25. **LIQUIDATED DAMAGES FOR DELAY IN DELIVERY**

Any delay by the contractor in the performance or the delivery obligations shall render him/her liable to any of the following penalties:

(a) In the event of contractor's failure to supply the said items of acceptable quality and specifications within the original delivery period given in the purchase order, NIT Raipur shall be liberty to recover liquidated damages to be levied @ 0.5% of the order value per week or part thereof subject to a maximum of 10% of the total order value.

(b) Forfeiture/encashment of the performance bank guarantee/earnest money.

(c) Liquidated damages shall be calculated on the total contract value comprising of value of complete equipment and installation & commissioning charges for a site. The supply shall be taken as complete only after the last installment of supply has been made.

(d) After a delay of more than 8 weeks, NIT Raipur reserves the right to cancel the purchase order and buy the items from any other vendor, at bidder's risk and cost. Any losses caused to NIT Raipur on this account shall be recoverable from bidder.

26. **GUIDELINES FOR REASONABLE UNIFORMITY:**

Individual line items of the table in **Annexure-2** shall be from the same manufacturer for reasonable uniformity.

27. **WARRANTY**

All components should be supplied with total of 36 months repair / replacement warranty from the date of supply. Repair/replacement of faulty equipment should be carried out within 7 working

days. The form for offering warranty by the Bidder is enclosed.

28. PERFORMANCE & SLA TERMS

Network has to remain operational on a 24 x 7 basis. Contractor shall make necessary arrangements to ensure that no core / server farm / primary distribution network segment supplied and installed in the present project is down for more than 24 consecutive hours. This should be taken to mean the core, server farm and primary distribution switches, UTM Firewall, IP-PBX, Wireless Controller and the core transport and distribution rings and passive components thereof. Contractor shall make all possible arrangements to ensure that no secondary distribution / access segment of the network supplied and installed by him is down for more than 48 consecutive hours. This segment includes the secondary distribution switches, access switches, the wireless access points, multi-service Switches, the IP and analog telephones and the distribution rings and passive access components. Fine can be imposed by the CCC for non-functioning beyond stated durations at the rate of Rs. 1000/- for each successive 24 hours downtime in the core / server farm network segment and Rs. 500/- for each successive 24 hours downtime in the distribution/access segments.

29. INCOME TAX

(a) Income tax shall be deducted at source by NIT Raipur from all the payments made to bidder according to the Income tax Act, unless the bidder prior to the release of payment submits valid and complete documents for Income tax exemption.

(b) A certificate shall be provided by NIT Raipur to the bidder for any tax deducted at source.

30. VARIATION OF QUANTITIES

Actual quantities of items and jobs work are subject to variation up to 15% on either side for access switches and 30% for passive and service components. However, only the indicative ballpark quantities mentioned in the price schedule shall be considered by the bidders for preparing the price bids as well as for tender evaluation by NIT Raipur.

31. BILL SUBMISSION

Bills shall be submitted in triplicate to the Central Computer Centre. On successful inspection, the CCC Committee shall forward the bills for realisation of payment to the Accounts Section of NIT Raipur.

32. PAYMENT TERMS AND CONDITIONS

(a) **Advance payment to supplier:**
There is no provision for advance payments to the contractor in this project.

(b) **Part payment to suppliers:**

(a) **80% of material cost on completion of supply** of all items after site survey

Physical Inspection and preliminary testing shall be done in the presence of representatives of the supplier and will comprise of the following:

(i) Physical verification of equipment as per the supply contract.

(ii) Physical inspection of the equipment for any physical damage.

(iii) "Power on self test" for all active equipments to ascertain that no equipment is dead on arrival.

(iv) Physical verification of software media and documentation as per purchase order.

Bidder shall provide necessary assistance in this regard.

(b) **80% of services cost on completion of physical installation** (trenching, ducting, laying of UTP and OFC cables, casing, capping, fixing of racks, IO box assemblies, feruling, termination, etc.).

(c) Balance payment (**20% of material cost and 20% of services cost**) on project completion and issue of final commissioning certificate by the CCC Committee.

(d) Payment shall be made within thirty days of submission of bills in triplicate with satisfactory preliminary test certificate(s) [see format] / and issue of handover certificate [see format] by the CCC Committee.

33. PROJECT COMPLETION AND ACCEPTANCE

The contractor will have to complete the entire work as mentioned in this document within 6-8 months from the date signing the agreement. Project shall be treated as complete and ready for handover on the completion of

(a) Supply, Installation, Configuration, System Integration, Structured Cabling Documentation, Test Reports and Configuration Documentation
(b) 15 days Training and Network Functioning Satisfactorily for 1 month after (a)
(c) At the time of handover contractor shall handover:
    (i) All the software media and printed documentation including all kinds of manuals (e.g. administrator's manual, user's manual etc.) and guides (e.g. quickstart guide, administrator's guide, user's guide etc.) of all equipment supplied
    (ii) Structured cabling documentation (computer printouts as well as soft copy) complete with detailed drawings, diagrams, sketches, routes, maps, tables (logical connectivity diagram, backbone connectivity diagram, access connectivity diagram etc.) with switch and port numbering and labeling, identifying switch stacks, physical locations of different switches, switch and port number mapping with building name, residence and room numbers
    (iii) Passive Test reports (computer printouts as well as soft copy), and
    (iv) Detailed configuration documentation including hardcopy printouts and

softcopy backups of the configuration files of all equipment on CD, DVD, pendrive and magnetic tape.

(v) Wireless access point identification scheme, location on map, and configuration details shall also be given.

(vi) The security policy implemented on all UTM firewalls including DMZ UTM firewall, switches and access points and the details of the implementation shall be provided.

(vii) The detailed configuration of the IP-PBX shall also be provided and explained.

34. SETTLEMENT OF DISPUTES THROUGH ARBITRATION AND JURISDICTION

(a) NIT Raipur and the contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

(b) If even after thirty (30) days from the commencement of such informal negotiations, NIT Raipur and the contractor are unable to amicably resolve the dispute, either party may require that the dispute be referred for resolution to The Director, National Institute of Technology, Raipur, as single party Arbitrator in accordance with the Arbitration and Conciliation Act, 1996. Decision of arbitrator shall be final and binding to all parties.

(c) All Arbitration proceedings shall be held at NIT Raipur, Chhattisgarh, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.

(d) **Jurisdiction:** The High Court of Chhattisgarh at Bilaspur has exclusive jurisdiction to determine any proceeding or arbitration award in relation to the Contract.

35. FORCE MAJEURE CONDITIONS

If at any time, during the continuance of this contract, the performance in whole or in part by either party or any obligation under this contract shall be prevented or delayed by reason of any war, or hostility, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restriction, strikes, lockouts or act of God (hereinafter referred to as events) provided notice of happenings of any such eventuality is given by either party to the other within 21 days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate this contract nor shall either party have any such claim for damages against the other in respect of such non-performance or delay in performance, and deliveries under the contract shall be resumed as soon as practicable after such event may come to an end or cease to exist and the decision of the purchaser as to whether the deliveries have been so resumed or not shall be final and conclusive provided further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 90 days either party may at his option, terminate the contract provided also that if the contract is terminated under this clause, the Purchaser shall be at liberty to

take over from the Successful tenderer at a price to be fixed by the purchaser with mutual consent which shall be final all unused, undamaged and acceptable materials bought out components and stores in course of manufacture in possession of the Successful tenderer at the time of such termination of such portions thereof as the purchaser may deem fit excepting such materials bought out components and goods as the Successful tenderer may with the concurrence of the Purchaser select to retain.

36. **RESIDENT ENGINEERS, AMC**

[1] Contractor shall deploy 3 resident engineers at the time of handover for network and IP telephony maintenance services in the Institute initially for three years. Payment for this service by the contractor shall be made at the completion of every 6 months. REs shall be B.E. or Diploma Engineers/ MCA and shall preferably have the vendor neutral CompTIA Network+ certification or CCNA, JNCP, or equivalent.

[2] They shall be provided with PCs /notebooks/ laptops and desks at NIT Raipur, and shall ensure that continuity in network services is maintained on a day-to-day basis. They shall also be the single point of contact for troubleshooting related work, logging complaints to the different manufacturers etc. At the institute, they shall report to the System Administrator, NIT Raipur.

[3] The contractor shall be responsible for warranty of all active and passive components supplied and maintenance of the entire network infrastructure being built under this project.
For the existing institute network, contractor's responsibility shall be limited to the extent of providing manpower services of the on-site technical personnel for ensuring satisfactory operation.

They shall troubleshoot the existing passive and active part, configure new switches provided to them/ restore existing switches from backups, etc.

[4] Contractor shall be provided with documentation of the existing network on an as is where is basis.

[5] Contractor shall also mention the costs of providing AMC services of the entire institute network infrastructure with three resident engineers for three years beyond the warranty period. However, NIT Raipur reserves the right to go for/not to go for AMC at the end of Warranty period (i.e. after three years). Please note that AMC charges will not be included for evaluation of lowest quotes.

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CHAPTER – III: SCHEDULE OF REQUIREMENTS

The scope of work necessarily, but not exclusively, includes the following activities:-

(a) The scope of tender shall include supply, installation, system integration, testing and 03 years on-site comprehensive warranty maintenance of UTMs, network switching, wireless, and IP telephony devices, and structured LAN and optical fibre cabling and components. The warranty would be valid for a period of 03 years from the date of completion of the project.

(b) **SHORT DESCRIPTION**: Wired data network in NIT Raipur campus has to be extended to the different buildings mentioned in **Annexure-3** Wi-Fi hotspots are required in selected indoor and outdoor locations. Voice network is required in the administrative, departmental and staff offices of the main building, staff residences, hostels and other buildings leveraging the benefits of data and voice convergence.

(c) **DETAILED DESCRIPTION**: Supply, installation and commissioning of wired, wireless network and telephony components as per details in the Schedule of Requirements. Services – Installation (all), configuration (configurable devices), testing (all)

(d) **SERVICES SHALL INCLUDE:**

37. Site Survey
38. OFC related Work
39. UTP related Work
40. General requirements for Cabling Work
41. Feruling and Labelling Requirements
42. Structured Cabling Documentation
43. Active Devices Related Work
44. Configuration Related Work
45. System Integration
46. Maintenance Service Related Work

37. **SITE SURVEY**

In the first 30 days after starting work, contractor shall get detailed site survey of the campus carried out including various building premises like hostel buildings, residential blocks, guest house, dispensary, NCC office, sports office, main building etc. which need to be networked. Survey shall result in the following information:

[1] Route map for the OFC trench shall be prepared and finalized
[2] Locations for installing racks shall be identified and designated
[3] Locations for installing IO boxes shall be identified and designated
[4] Wi-Fi Access Point locations shall be identified and designated
[5] Locations for erecting poles for outdoor Wi-Fi Access Points
[6] In the building premises, the routes for casing, capping, piping etc. for UTP cables, and over-ground OFC shall be identified.
[7] The diameters of the pipes, dimensions of casing etc. in different sections shall be finalized.
[8] Exact numbers and quantities of different items (bill of quantities) shall be determined.

[9] Above shall be arrived at in consultation with the CCC.
[10] Gantt Chart for project scheduling will be prepared in consultation with the CCC. Important project milestones will be identified.
[11] Contractor shall start the work after site survey followed by supplying all the items as determined in previous points no. 7 & 8.

38. **OFC RELATED**

[1] Cables shall be ducted and laid in underground trenches which shall be at least 3 feet deep and at least 1.5 feet wide.
[2] Below road ducts shall be HDPE pipes / GI pipes of 1" diameter
[3] Drawing of 6 mm polypropylene rope (P.P. rope) through the HDPE pipes / coils
[4] Sealing of HDPE pipe ends by HDPE end caps of suitable size
[5] Soil shall be filled up to a height of 250mm and covered with warning tape
[6] Back filling and dressing of the excavated trenches with extracted material from the trench after sieving suitably to remove coarse and hard stony material that may damage piping.
[7] Termination of OFC on Fibre Patch Panels with Pigtail Connectors
[8] Use of Fibre Patch Cords of the right type (SC/LC etc) to connect the fibre patch panel and the network / fibre switch
[9] All work on campus roads shall be taken up simultaneously at 9:00 p.m., after necessary safety precautions, barricading and warning signs, and roads shall be restored for public use by 9 a.m. the next day. All materials and manpower required for the work shall be arranged by the contractor concerned
[10] Trenching shall as far as possible be kept ahead of the laying of pipes. Contractor shall exercise due care that the soil from trenching intended to be loose for back filling is not mixed with loose hard debris
[11] While trenching, the contractor should not cause damage to any underground installations belonging to other sections like electricity, telephone, water, etc. and any damage caused should be made good at his own cost and expense
[12] The line up of the trench must be such that HDPE pipe(s) shall be laid in a straight line except at locations where it has to necessarily take a bend because of change in the alignment or gradient of the trench. Minimum bend radius considerations shall be dealt with appropriately
[13] In building premises, OFC shall be taken to racks using PVC pipes and coils clamped to walls. OFC should not be exposed anywhere. Clamps, screws, fillers etc. shall be provisioned by the contractor
[14] Cable bend radius should be as per the norms and concrete OFC cable markers of (20 x 10 x 90) cm should be provided every 100 ft or at bends whichever is less.
[15] **Cable Pits with removable and lockable covers**
Cable Pits made up of reinforced concrete and brick walls with removable and lockable covers (reinforced concrete slabs). Between 4 and 8 maintenance pits with internal area of 1m*1m*1m may be constructed at designated locations for maintenance related work.
[16] Test reports shall be submitted

39. **UTP RELATED**
Structured cabling standards shall be strictly followed.

[1] **Casing and capping**
Casing and capping is to be done neatly. Screws (1.5"), fillers etc. have to be provisioned by the contractor and attached every 3-4 feet.

[2] **Cat 6 UTP cable installation**
Cat 6 UTP cables shall be installed inside casing and capping so that it is not exposed anywhere. Velcro cable ties provisioned by the contractor shall be used for keeping cables bundled.

[3] **IO Box installation**
Complete IO box assemblies shall be installed

[4] **Racks installation**
Racks with necessary accessories like cable managers, patch panels, fans, power strips etc. shall be installed.

[5] **UTP cable termination**
Standards based termination of UTP cables at both ends – patch panel and RJ45 jacks of IO outlets. Use of Patch Cords to connect the patch panel and the network / fibre switch

[6] **Printed IDs for cables and IO boxes**

[7] **Electric switch board installation** for powering the racks and wireless access points with associated electrical wiring shall be installed. Redundancy of electric points shall be N+1, where N is number of components.

[8] This shall also include pole installations, if any, required for outdoor Wi-Fi Access Points and electric switch board installation for powering them with associated electrical wiring.

[9] **UPS systems installation** with UPS wiring and battery installation in battery racks for online UPS

[10] **Pentascan** test reports for Cat 6 nodes will be submitted.

[11] Any additional materials / equipment if needed for the above installations shall be supplied by the contractor.

40. GENERAL REQUIREMENTS FOR CABLING WORK

[1] Cables shall be laid and terminated in accordance with the recommendations made in the TIA/EIA document, manufacturer's recommendations and/or best industry practices.
[2] Removal of armoured core at the termination enclosure / shelf should not be more than the required length for terminations of fibre cores.

[3] Bend radius of the cable including the termination area shall not be less than 20 times the outside diameter of the cable.

[4] Buffer Tubing should be used before the terminations or splicing at the enclosure end.

[5] Cables shall be neatly clamped on the walls near the terminations boxes or shelves in the racks.

[6] Each cable shall be clearly labelled at the enclosure end. Cables labelled within the shelf or wall mount enclosures, where the label is obscured from view shall not be acceptable.

[7] Additional OFC of at least 3m of length should be left at the enclosure end on both sides for future shifting of Rack/Wall enclosures.

[8] It will be the responsibility of the vendor to ensure that the roads should be concreted after the cabling has been done. It is advisable to carry out the digging work in the roads during night hours.

41. **FERULING AND LABELLING REQUIREMENTS**

[1] Lettering and numbering shall be black, longitudinal to cables, shall be typed in readable format, permanent and smudge-proof. Cable labels shall have a white background unless specified elsewhere in this specification. Labels shall have waterproof jackets. Hand-written labels will only be acceptable on a temporary basis during installation.

[2] Labels at the communications rack or cabinet should identify the location, e.g., room number of workplace outlet and to cable number. Labels at workplace outlet should identify the communication cabinet and cable number.

[3] Fibre cables should be labelled at each end with a unique circuit number. The fibre termination panel must also be labelled with the circuit number at both ends.

42. **STRUCTURED CABLING DOCUMENTATION**

The installer must prepare diagrams showing the locations and layout of the concentration points and the routes taken by the trunking and uplink cables. These diagrams should be submitted in electronic AutoCAD format, and on paper. These diagrams should include floor plans, including room numbers, of the buildings with additional layers containing both data and fibre cable routes. They should also contain the cable numbers in relation to room numbers. In addition to the test results for the premises cables, the installer should submit a document identifying the relationship between each cable number used in the installation and the corresponding patch panel numbers and workplace outlet room numbers. It should be trivial to correlate the cable numbers used in this document with the individual cable test results. This document should be submitted in electronic, Excel, format. A hard copy shall be provided by the contractor. Each data point marked on a drawing will individually indicate the port/wire number (at the actual label) in close proximity without being obscured by other information.

43. ACTIVE DEVICES RELATED

[1] All active devices – wired, wireless, telephony, security, servers, etc. shall be installed using necessary accessories and configured to meet network specifications. Mounting of outdoor APs on the poles shall be done at this stage.

[2] Any necessary software would also be installed and configured in this stage.

44. CONFIGURATION RELATED

[1] Details pertaining to configuration related scope of work are mentioned along with Technical Specifications. It must be clearly understood that the configuration has to be to the satisfaction of the Central Computer Centre, NIT Raipur and meet all operational requirements, including security.

[2] All required tools, machines, devices, scanners, meters, etc. and any other small items required for installation etc. shall have to be provisioned by the Bidder.

[3] Configuration plan of active components shall be approved by CCC before start of configuration

45. SYSTEM INTEGRATION

The contractor will ensure smooth & seamless integration of the supplied equipment with the existing Campus LAN at NIT Raipur. An over view of the existing setup of the NIT Raipur Network is given in **Annexure-4** of the tender document for reference.

46. MAINTENANCE SERVICE

(i) Contractor shall deploy 3 on-site technical personnel for extending 3 years network and IP telephony maintenance services. Of these one shall be an Engineering Graduate / MCA with 3 years experience of networking and the other two may be Engineering Graduates / MCA / Diploma holders in Engineering with knowledge of networking.

(ii) They shall be provided with desks and PCs by NIT Raipur and shall ensure that continuity in network services is maintained on a day-to-day basis. They shall also be the single point of contact for troubleshooting related work, logging complaints to the different manufacturers etc. At the institute, they shall report to the System Administrator, NIT Raipur.

(iii) The contractor shall be responsible for maintenance of the entire Institute network (Wired & Wireless, UTM etc.) and IP Telephony services.

47. Schedules of Requirements in tabular format

Details Active Bill of Quantity :

SR. NO.	Type Of Equipment	Qty	UoM
1	L3 Core Chassis/Modular minimum 6/8 universal slots Switch with all network line cards and modules populated , Switch should Work on Active -Active Cluster	2	Nos
2	Server Firm L3 Switch 24 Port 10/100/1000 Base T + 4 Nos SFP+ Port work on Active-Active Cluster	2	Nos
3	Distribution switch Type-1 L3 Switch Chassis/Modular minimum 6/8 universal slots Switch with all network line cards and modules populated	2	Nos
4	Distribution Type-2 Switch with 24 10/100/1000 + 4 SFP+ Slots	7	Nos
5	Managed Access Switch 24 Nos 10/100/1000 Copper + 4 Como SFP Ports	90	Nos
6	1G SM SFP Module	54	Nos
7	10G SM SFP+ Module	36	Nos
8	Network Management software with all software licenses to manage 500 end points and required hardware	1	Nos
9	Radius / AAA security solution	2	Nos
10	Firewall with Content filtering, IPS, IDS with 10G ports	2	Nos
11	Wireless Controller with 44 AP licence	2	Nos
12	Wireless Indoor Access Points	30	Nos
13	Wireless Outdoor Access Points	14	Nos
14	Outdoor Panel 7.5dBi (5.5dBi)135 degrees antenna	6	Nos
15	12 dBi 2.4 – 2.5 GHz OMNI DIRECTIONAL ANTENNA	22	Nos
16	Gigabit High Power POE with IEEE802.3at injection	44	Nos
17	Outdoor Weather Proof Housing with Mounting bracket for external AP's Power supply	14	Nos
18	3 Mtr Pole	14	Nos
SR. NO.	**Type Of Equipment**	**Qty**	**UoM**
19	IP PBX Telephony Server	2	Nos
20	SIP IP Phone	250	Nos
21	Analog Phones	120	Nos
21	Multiservice Switches	54	Nos

Passive Component with Rack & UPS :

FO Cable Details			
SR.	**Type Of Items**	**Qty**	**UoM**
1	Unitube Armoured Cable SM, 6 Core, 9um	9500	Mtrs
2	Unitube Armoured Cable SM, 12 Core, 9um	5500	Mtrs

Fibre Optic Cable Details			
SR.	**Type Of Items**	**Qty**	**UoM**
3	1U,48-Port Fibre Sliding Enclosure, loaded with LC Connectors.19" Rack Mount alog with splicing tray	5	Nos
4	1U,19''12 Port rackmount Fiber Sliding Enclosure loaded with LC Connectors with Splicing tray	37	Nos
5	LC single-mode pigtail 1.5m	684	Nos
6	LC-LC duplex single-mode patch cord 3m	144	Nos
7	Cement Route Makers	200	Nos
UTP Cable Details			
SR.	**Type Of Items**	**Qty**	**UoM**
1	Cat.6 4pr UTP Cable 305m Blue FR PVC	210	Boxes
2	UTP 24-port Patch Panel, loaded	102	Nos
3	SOCKET RJ45 CAT6 SHUTTERED KSTONE BLUE	1400	Nos
4	WALL PLATE 1-PORT N/SHUTTERED	1400	Nos
5	BACK BOX –(Surface Mount Box) For Single and Dual	1400	Nos
6	Cat6 Patch Cord UTP 1M LSZH, Blue	1400	Nos
7	Cat6 Patch Cord UTP 2M LSZH, Blue	1400	Nos
UTP Cable Details (for Residence)			
SR.	**Type Of Items**	**Qty**	**UoM**
1	Cat.6 4pr UTP Cable 305m Blue FR PVC	23	Boxes
2	SOCKET RJ45 CAT6 SHUTTERED KSTONE BLUE – Room Side	400	Nos
3	WALL PLATE 2-PORT N/SHUTTERED	200	Nos
4	BACK BOX –(Surface Mount Box) ForDual	200	Nos
5	Cat6 Patch Cord UTP 1M LSZH, Blue	400	Nos
6	RJ-45 Connector Box of 100 Pic	4	Boxes
Rack			
SR.	**Type Of Items**	**Qty**	**UoM**
1	42U rack with Accessories	1	Nos
2	15U rack with Accessories	30	Nos
3	9U Rack with Accessories	2	Nos
4	Supply & Installation of 25/3 mm Copper Earth Strips run along the wall of various cut-outs complete in all respects including mounting channels, nuts-bolts, etc with all necessary accessories complete. **Approved Make – Standard ISI Marked.**	500	Mtrs
UPS			
SR.	**Type Of Items**	**Qty**	**UoM**
1	On-Line UPS, 4800 Watts / 6000 VA, Input 230V / Output 230V , Interface Port DB-9 RS-232, SmartSlot , Extended runtime model , Rack Height 2 U	2	Nos

UPS			
SR.	**Type Of Items**	**Qty**	**UoM**
2	Battery required for 60 min Backup for 6KVA UPS	2	Sets
3	Battery Rack and Interlink cable for 6KVA UPS and TVSS	2	Nos
4	Online UPS will be offered, 2400 Watts / 3000 VA, Input 230V / Output 230V , Interface Port DB-9 RS-232, SmartSlot, USB. Battery required for 1 hour Back-up, Rack and Cable	9	Nos
5	Online UPS in N+1 Prallel Mode 8 kW / 10 kVA, Input 415V / Output 230V , Interface Port DB-9 RS-232, RJ-45 10/100	2	Nos
6	Battery Bank has to be provided for 60 mins backup for 10KVA UPS	2	Sets
7	Battery Rack & Inter connecting cable for 10KVA and TVSS 50KA	2	Nos
8	500 VA Line Interactive UPS	2	Nos

Note : For Passive items qty finalization will be consider after site survey by selected bidder and That will be verify by CCC committee.

Installation and Commissioning

Services			
SR.	**Type Of Items**	**Qty**	**UoM**
1	Laying of UTP Cable with 1" PVC conduit which includes bends, collars, junction box & fixing hardwires	71065	Mtrs
2	Information Outlet termination	1,500	Nos
3	24 Port Patch Panel Installation & Termination	102	Nos
4	SM Connector - Splicing / Connectorisation	684	Nos
5	42U Network Rack Installation With Fixing All Accessories & Dressing	1.00	Nos
6	9U and 15U Rack Installation With Fixing All Accessories & Dressing	32.00	Nos
7	Laying OFC over head through the designated poles with necessary accessories required to complete the installation.	2,500	Mtrs
8	Outdoor Soil Cutting, Digging and Singlemode O F Cable laying through HDPE Pipe on underground routes including all materials. Excavating trenches of A type with dimensions of trench as Top width 30 cms, bottom width 25 cms and depth upto 60 cms including back filling, Compacting (after laying the cable(s) and removing excess earth from site) – Billing shall be done as per actual	12,500	Mtrs
9	Fixing of Route markers	200	Nos
10	Installation charges for active Switching component, NMS, AAA/RADIUS Server	1	Set

Services			
SR.	**Type Of Items**	**Qty**	**UoM**
11	Installation charges for Firewall Component	1	Set
12	Installation charges for Wireless Controller, Aps , Antenna, Pole etc	1	Set
13	Installation charges for IP PBX Server	1	Set
14	Installation Charges for UPS	1	Set
15	Project Testing, Labeling, Commissioning, Warranty, Certification for passive & Management with on-site Free of Cost Support for One Year	1	Set
16	Residence Engineer (3 nos) for Maintaining Data Voice network for 3Year	1	Set

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Chapter IV : Specification and Allied Technical Details

All Active Hardware (Core, Distribution, Access Switches, Transceiver Modules, NMS) shall be from same OEM. Other Component Wireless/Firewall/ Passive/ UPS/Rack/IP PBX/Multiservice Switches & SIP Phone can be from different OEM.

Detailed Technical Scope:

i) The complete back bone is based on 3-tier architecture with ring design in the core and distribution layers. Detailed required (tentative) architecture of the network is given in **Annexure – 5.**

ii) **Switches and Racks Fixing:** All the switches and data communication accessories are to be housed in appropriate communication racks in conformity with structured cabling & EIA/TIA standards.

iii) 6 / 12 core steel tape armoured gel filled 9/125 single mode (SM) fibre cable should be laid below 100cm depth through HDPE pipes. GI pipes should be used at road crossings. Road cutting and trenches should be restored to original condition by back-filling and ramming.

iv) The complete scope includes laying of new Fiber / Copper infrastructure in accordance with the detailed design parameters mentioned in the points below. It also includes the new design and planning, configurations / commissioning of the Active components according to the specifications mentioned later in this Chapter.

v) The entire proposed solution should offer high availability backbone throughout the design and there should be no single point of failure from the perspective of link disruption at any point of the design.

vi) The backbone of the proposed solution should be at least 10 Gbps

vii) The proposed solution should offer 20 Gbps aggregated link bandwidth traversing through the high availability core switches and distribution switches from day one. The backbone amongst Central Administrative Building to distribution (New Boys and New Girls Hostels) should be offering design such that there is no single point of failure in terms of link and core devices.

viii) For other locations (Other Boys and Girls Hostels), the proposed solution must offer 10 Gbps backbone with no single point of failure in terms of link as the link should take different route directions as input of the switch and output of the switch.

ix) The access layer switches shall be stackable for ease of management and the number of switches in a stack shall depend upon the number of nodes in each building.

x) Daisy chaining of access switches is not allowed and stacked switch members should be directly terminated from the distribution switch on Copper or Fiber based on the distance requirement.

xi) The complete back bone solution offered / designed should have a core transport ring between the Administrative Building , New Boys Hostel , New Girls Hostel etc. and all these locations should be interconnected in a highly available ring based network architecture on dual 10G back bone bandwidth.

xii) The proposed core transport ring should be scalable for future bandwidth requirement of 40G and the equipments should support pay-as-you-grow kind of technology architecture.

xiii) At the time of installation and commissioning of the configuration if it is found that some additional hardware accessories or software items with licenses are required to complete the configuration to meet the operational requirement of the configuration which were not included in the bidder's original list of deliverables then the bidder is required to supply such items to ensure the completeness of the configuration at no extra cost to NIT Raipur.

xiv) Successful bidder shall propose a complete migration plan on the IP addressing scheme, VLAN planning, security architecture, with central management to NIT Raipur and mutually agreed deployment plan should be deployed.

xv) Bidders are expected to adopt only open standards to ensure seamless integration with the existing network / other IT equipments and also the new infrastructure should support all the new emerging technologies without any interoperability issues and should be interoperable with the existing network infrastructure at NIT Raipur.

xvi) The security solution should be in accordance with the specification mentioned later in this chapter; the security solution should be seamlessly integrated with the new infrastructure for Authorization and Accountability of the end points.

xvii) The Data sheets / Cross reference documents and technical documents of network switches should be available on the global websites of the respective switching manufacturer and the **URL links to the respective documentation should be provided in the compliance statement**. Any document which is not available on the Global website of the OEM may be treated as invalid document submitted and noncompliance against the technical specification asked in the tender.

xviii) Contractor shall ensure digging and back-filling of the soil, and ramming to its original position, laying of HDPE/GI pipes, Fixing of LIUs with adapters. All Fibre core should be terminated according to the best industry standards. Cementing / Tarring of road cuttings and refilling of the same with concrete shall be done.

xix) The contractor is responsible for all unpacking, assemblies, wiring, installations, cabling between hardware units and connecting to power supplies. The Supplier will test all hardware operations and accomplish all adjustments necessary for successful and continuous operation of the hardware at all the installation sites.

xx) Supplied equipment installation & commissioning is the sole responsibility of the contractor. The scope of the installation covers the complete installation and commissioning of all the hardware and software items offered including data, voice, wireless and security. The scope includes the installation and configuration of the client / systems wherever required. The scope also includes the supply and installation of the Ethernet network cabling, fiber cabling and associated services including electrical wiring wherever required.

xxi) The contractor shall offer the solution /design in full clarity and understanding indicating the BOM for Active/Passive/software after conducting proper site survey before bidding.

xxii) The contractor will be responsible for fixing pre-cast RCC route / joint markers (20cm x 10cm x 90cm) at every 100 feet distance of fibre laying for traceability of fiber route. Route marker shall be yellow marked with label "OFC". Joint marker shall be red in colour and marked with label "OFC".

xxiii) Installation and commissioning of equipment /components supplied. Testing and Configuration of Switches, Firewall, Wireless, IP PBX, IP Phones, Analog Phones,

I/O nodes, fibre and UTP cable etc. Network should be integrated with the existing old network.

xxiv) The bidders are expected to do the site survey for wireless connectivity as indoor as well as outdoor, and quote accordingly. A table of tentative locations for the hotspots is attached in **Annexure – 6.**

xxv) Central dual high availability wireless controller shall support at least 45 access points with up gradation in future upto 140 APs per controller.

xxvi) The quarters/bungalows shall be provided with voice and data connectivity in accordance with Annexure -3 and as per the technical specification given.

xxvii) The contractor shall be solely responsible for completion of the entire job for data and voice integration on the same backbone with proper quality of service.

xxviii) The contractor shall be responsible for installing the IPPBX with proper electrical grounding arrangement.

xxix) The IP Phones should be provided with DHCP option and remote management.

xxx) The bidder shall provide and install high available firewall / UTM with feature of load balancing between ISP lines.

xxxi) Firewall / UTM will be connected to core switches with 10Gbps and implement Content filtering, IPS, IDS , Antispam, SSL VPN etc. as in the technical specification given later in this chapter.

xxxii) Existing Firewall / UTM will be utilized for making DMZ (for Mail server, DNS Server, Web server and other public facing servers, if any) and provide connection of DMZ to existing core switch.

xxxiii) Contractor shall also provide Radius server in high available mode with no single point of failure. In case of the primary server failure the secondary server should seamlessly take over.

xxxiv) Bidders should be well prepared upon prior notification from NIT Raipur to demonstrate the products quoted against the RFP as per **Annexure -7** (Proof of Concept) and its compliance to the technical specifications during the technical evaluation stage of the tender. All the required hardware / Software and other infrastructure for the proof of concept should be sourced by bidder / OEM at his own cost. Proof of concept shall be conducted at NIT Raipur.

xxxv) At any stage of the process, NIT Raipur reserves the right to call for clarifications, additional technical documents and additional testing, if required, to satisfy itself in respect of the claims made by the bidder / manufacturer.

DETAILED TECHNICAL SPECIFICATIONS

SN.	Specification	Compliance YES/NO	Remarks
A	**Managed Core Switch (URL link: _____)**		
1	**Port Density and Architecture**		
A	Switch should have non-blocking architecture for all ports from day 1 (Chassis/Modular)		
B	Chassis /Modular Switch should have a minimum of 6 universal slots		

C	The Switch should support Active – Active Cluster Switching Technology using VSS or equivalent technology and the Active – Active switching should be supported for both Layer 2 and Layer 3 traffic		
D	The proposed VSS or equivalent technology should support seamless switchover of traffic between the chassis in case of any kind of link or hardware failure ensuring that there is no traffic disruption for real time applications like voice and video		
E	The VSS or Equivalent technology should work in Active - Active mode for IP Multicasting traffic.		
F	The minimum VSS bandwidth between the 2 Chassis Switches should be 40Gbps working in redundant mode with no single point of failure between the links (All the required modules and cables should be proposed by the bidder)		
G	In case of failure of VSS or equivalent module, the switch should have the necessary technology to ensure that no network loop is formed and to avoid both switches from forwarding the network traffic		
H	The HA chassis shall also support an SDN Master controller to support Smart Install or equivalent technology for zero touch replacement of any failed unit at Core Ring / Server Farm and Access Switches		
I	The core master cluster switch shall support single point of management, configuration roll out and troubleshooting with Instant Access or equivalent technology		
J	The SDN master should also provide the functionality of Software and Firmware rollout to the Distribution / Access switches for ease of management and consistent software image across the network switches		
K	The proposed Server Farm / Core Ring and Access Switches should support seamlessly integration with the SDN master chassis VSS (or equivalent) cluster.		
L	Each switch should have flowing interface configuration from day1:		
	a) 24 X GE UTP interface b) 12 X GE SFP interface c) 6 X 10GbE SFP+ interface		
2	**Performance**		
A	350Mpps or higher forwarding rate		
B	Extensive wire-speed traffic classification for ACLs and QoS		
C	Supports 9KB Jumbo frame size		
D	Supports Wire-speed multicasting		
E	620 Gbps or higher Switching Fabric		
F	64K or higher MAC addresses , Supports min. 4096 VLANs		
G	Full environmental monitoring of PSUs, fans, temperature and internal voltages, with SNMP traps to alert network administrators in case of any failures or faults		
3	**Reliability**		
A	MTBF: Min. 90,000 hours or better		
B	Dual hot swappable PSUs with 1 + 1 redundancy (Populated)		
C	Hot swappable modules		
D	Hot swappable fan modules		
4	**IEEE Standards**		
A	Internet Group Management Protocol v2 (IGMPv2), PIM-SM, OSPFv2 & OSPFv3		

B	IEEE 802.1v VLAN classification by protocol & port		
C	IEEE 802.3ac VLAN tagging		
D	IEEE 802.1ad VLAN double tagging (Q-in-Q)		
E	Configurable Guest and Auth-Fail VLANs		
F	RADIUS		
G	RADIUS Attributes for Tunnel Protocol Support		
H	IEEE 802.1p Priority Tagging		
I	DiffServ Precedence for 8 queues/port or equivalent		
J	DiffServ Architecture		
K	IEEE 802.1D Spanning Tree Protocol (STP) - MAC Bridges		
L	IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)		
M	IEEE 802.1w - Rapid Reconfiguration of Spanning Tree protocol		
N	Multiprotocol Extensions for BGP-4		
O	Border Gateway Protocol 4 (BGP-4)		
P	Should Support Traffic monitoring tools sFlow or equivalent		
Q	Should support DHCP Server		
5	**Resiliency**		
A	STP, RSTP, MSTP (IEEE 802.1s)		
B	Link Aggregation (IEEE 802.3ad) groups		
C	Loop Protection and Loop Detection		
D	Sub-50 millisecond resiliency for 10G ring based designs as per IEEE 802.17 (RPR) / ITU-T G.8032 ERPS or equivalent technology to provide sub-50ms protection and recovery switching for ethernet traffic in a ring topology		
6	**Routing**		
A	Should support RIP routes and policy based routing from day 1		
B	Should support VRRP V3 from Day 1		
C	Should support OSPF routes from day 1		
D	IPv6 routing support from day 1, all the necessary software and hardware should be proposed by the bidder.		
E	Support 5K RIP routes or higher and 15K OSPF routes or higher		
F	Support 5K BGP routes or higher and 5K RIPng routes or higher		
G	Support Virtual Routing and Forwarding (VRF) Lite or Equivalent and Equal Cost Multi-Path (ECMP) routing		
7	**IPv6 Features**		
A	IPv4 and IPv6 Dual Stack		
B	IPv6 Management via Ping, TraceRoute, Telnet and SSH		
C	Static Unicast Routes for IPv6		
D	DNS Extensions to support IPv6		
E	Architecture for IPv6 Unicast Address Allocation		
F	Neighbour Discovery for IPv6		
G	Transmission of IPv6 Packets over Ethernet Networks		
H	Should Support IPv6 Router Alert Option		

I	Connection of IPv6 Domains via IPv4 Clouds		
J	Internet Control Message protocol (ICMPv6)		
K	Should support IPv6 Addressing Architecture		
8	**Multicast Support**		
A	Bootstrap Router for PIM-SM, IGMPv3, LLDP-MED		
B	Host extensions for IP multicasting		
C	Interoperability Rules for Multicast Routing Protocols		
D	IGMP & MLD snooping switches, PIM-DM		
9	**Security**		
A	Should Support 802.1x support		
B	Should Support Dynamic & Private VLANs		
C	Support NAC support (Open standards) or Equivalent		
D	BPDU Protection and STP Root Guard		
E	Switch should provide the ability to monitor events and take corrective action proactively		
F	RADIUS / TACACS + and RADIUS accounting		
G	Should support MAC address filtering and MAC limiting functionality.		
H	Should support detection of Denial of Service (DoS) attack.		
10	**Quality of Service**		
A	Policy based QoS features		
B	Highly configurable traffic classification		
C	Mixed scheduling, to support complex traffic queuing requirements		
D	8 QoS queues per port and support for Voice VLAN		
E	Bandwidth metering		
F	Access Control Lists (ACLs) and IEEE 802.1p Priority Tagging		
11	**Management :**		
a	GUI, Telnet, Industry-standard CLI with built-in Help-menu		
b	External memory card / USB or equivalent , allowing switch firmware, configurations to be stored for backup and distribution to other switches		
c	Port mirroring and RMON (4 Groups)		
d	Out of band 10/100/1000 Ethernet management port and console management port		
e	SSH and SNMPv3 for secure management		
f	RADIUS Authentication, NTP and Syslog and sFlow or equivalent		
12	**Electrical Approvals and Compliances**		
b	Restrictions on Hazardous Substances (RoHS) Compliance and Energy Efficient Ethernet compliant (EEE) compliance		
13	**Environmental Specifications :**		
a	Operating Temperature Range: 0°C to 40°C or better		

SN.	Specification	Compliance YES/NO	Remarks
B	**SERVER FARM Switch (URL link: _____)**		
1	**Hardware Specifications**		
a	L3 Managed Switch with 24 Nos 10/100/1000BASE-T with Min 4 Nos. SFP+ ports loaded with 10G LR		
b	Should support Active – Active Clustering VSS or equivalent technology for high availability and quick resiliency.		
c	The VSS links between the 2 HA switches should be of minimum 40 Gbps bandwidth with no single point of failure, all the required modules / other related cards should be proposed from day 1		
d	Should Support Active – Active Clustering VSS or equivalent technology and seamless failover for multicasting Traffic also		
e	For high reliability vendors shall propose dual redundant power supplies, preferably internal redundant PSU		
2	**Performance Specifications**		
a	Min 125 Gbps or higher switching capacity		
b	Min 95 Mpps or higher Switching throughput		
c	Non blocking for all packet sizes		
d	16K MAC addresses or higher		
3	**Resiliency**		
a	Sub-50 millisecond resiliency for 10G ring based designs as per IEEE 802.17 (RPR) / ITU-T G.8032 ERPS or equivalent technology to provide sub-50ms protection and recovery switching for ethernet traffic in a ring topology		
b	Loop Detection and Loop protection		
c	IEEE 802.1D RSTP		
d	IEEE 802.1Q MSTP		
4	**Routing**		
a	Should support RIP,OSPF, OSPFV3, RIPng, Q in Q from Day 1		
b	Should support Internet Protocol (IP), UDP, Equal Cost Multi Path (ECMP) routing		
c	Should support Policy-based Routing and Route Maps from Day 1		
d	Should support RIPng for IPv6, RIP-2 MD5 Authentication		
e	Should support Bootstrap Protocol (BootP) and DNS Client		
5	**VLAN**		
a	VTP or Equivalent		
b	IEEE 802.3ac VLAN Tagging		
c	LLDP – MED , Voice VLAN		
6	**Security**		
a	Private VLANS , IEEE 802.1X, ACL		
b	Authentication fail VLAN		
c	BPDU Protection		
d	Dynamic ARP , IP Source guard and DHCP snooping inspection		
e	Guest VLAN		

f	MAC Based Authentication, Web – based Authentication and Port based learn limits		
g	SSH Remote login		
h	SSL v2 and v3		
i	TACACS + Accounting and Authentication		
j	RADIUS and RADIUS accounting		
k	Open standards NAC or equivalent		
7	**IPv6 Features**		
a	IPv4 and IPv6 Dual Stack		
b	IPv6 to IPv4 Tunneling		
c	DHCP Relay ver 6, DNS ver 6		
d	ICMP v 6 , Telnet v6 and NTP v6		
8	**Quality of service**		
a	Policy base QoS based on VLAN , Port , MAC and general packet classifiers		
b	Extensive remarking capabilities, to fit in with any network's QoS scheme for Voice/Video and other real time applications		
9	**Management**		
a	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring		
b	Supports Telnet, GUI, CLI		
c	A USB or equivalent memory card socket , allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
10	**Certification and Compliances**		
a	Certification: UL, cUL, TUV or Equivalent		
b	RoHS Compliant and Energy Efficient Ethernet compliant (EEE) compliance		
11	**Environmental Specifications**		
a	Operating Temperature Range: 0°C to 40°C or better		

C	**Distribution Switch Type-1 (URL link: _____)**		
1	**Port Density and Architecture**		
a	Switch should be of nonblocking architecture for all ports from day 1 (Chassis/Modular)		
b	Chassis /Modular Switch should have minimum 6/8 universal slots		
c	Each switch should have flowing interface configuration from day1: a) 24 X GE UTP interface b) 36 X GE SFP interface c) 6 X 10GbE SFP+ interface		
2	**Performance**		
a	270Mpps or higher forwarding rate		
b	Extensive wire-speed traffic classification for ACLs and QoS		
c	Supports 9KB Jumbo frame size		

d	Support Wire-speed multicasting		
e	450 Gbps or higher Switching Fabric		
f	64 K or higher MAC addresses , support 4096 VLANs		
g	Full environmental monitoring of PSUs, fans, temperature and internal voltages, with SNMP traps to alert network managers in case of any failure		
3	**Reliability**		
a	MTBF: Min 90,000 hours or better		
b	Dual hot swappable PSUs with 1 + 1 redundancy (Populated)		
c	Hot-swappable modules		
d	Hot swappable fan modules		
4	**IEEE Standards**		
a	Internet Group Management Protocol v2 (IGMPv2), PIM-SM, OSPFv2 & OSPFv3		
b	IEEE 802.1v VLAN classification by protocol & port		
c	IEEE 802.3ac VLAN tagging		
d	IEEE 802.1ad VLAN double tagging (Q-in-Q)		
e	Configurable Guest and Auth-Fail VLANs.		
f	RADIUS		
g	RADIUS Attributes for Tunnel Protocol Support		
h	IEEE 802.1p Priority Tagging		
i	DiffServ Precedence for 8 queues/port or equivalent		
j	DiffServ Architecture		
k	IEEE 802.1D Spanning Tree Protocol (STP) - MAC Bridges		
l	IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)		
m	IEEE 802.1w - Rapid Spanning Tree Protocol (RSTP)		
n	Multiprotocol Extensions for BGP-4		
o	Border Gateway Protocol 4 (BGP-4)		
p	Should Support Traffic monitoring tools sFlow or equivalent		
q	Should support DHCP Server		
5	**Resiliency**		
a	STP, RSTP, MSTP (802.1s)		
b	Link Aggregation (802.3ad) groups		
d	Loop Protection and Loop Detection		
e	Sub-50 millisecond resiliency for 10G ring based designs as per IEEE 802.17 (RPR) / ITU-T G.8032 ERPS or equivalent technology to provide sub-50ms protection and recovery switching for ethernet traffic in a ring topology		
6	**Routing**		
a	Should support RIP routes from day 1		
b	Should support OSPF routes from day 1		
c	IPv6 routing support from day 1 ,all the necessary software and hardware should be proposed by the bidder.		
7	**IPv6 Features:-**		

a	IPv4 and IPv6 Dual Stack		
b	IPv6 Management via Ping, TraceRoute, Telnet and SSH		
c	Static Unicast Routes for IPv6		
d	DNS Extensions to support IPv6		
e	Architecture for IPv6 Unicast Address Allocation		
f	Neighbour Discovery for IPv6		
g	Transmission of IPv6 Packets over Ethernet Networks		
h	Should Support IPv6 Router Alert Option		
i	Connection of IPv6 Domains via IPv4 Clouds		
j	Internet Control Message protocol (ICMPv6)		
k	Should support IPv6 Addressing Architecture		
8	**Multicast Support**		
a	Bootstrap Router for PIM-SM, IGMPv3, LLDP-MED		
b	Host extensions for IP multicasting		
c	Interoperability Rules for Multicast Routing Protocols		
d	IGMP & MLD snooping switches, PIM-DM		
9	**Security**		
a	Support 802.1x support		
b	Should Support Dynamic & Private VLANs		
c	Support NAC support (Open standards) or Equivalent		
d	BPDU Protection and STP Root Guard		
e	Switch should provide the ability to monitor events and take corrective action proactively		
f	RADIUS/ TACACS + and RADIUS accounting		
g	Should support MAC address filtering and MAC limiting functionality.		
h	The switch should support detection of Denial of Service (DoS) attack.		
10	**Quality of Service**		
a	Policy based QoS features		
b	Highly configurable traffic classification		
c	Mixed scheduling, to support complex traffic queuing requirements		
d	8 QoS queues per port and support for Voice VLAN		
e	Bandwidth metering		
f	Access Control Lists (ACLs) and IEEE 802.1p PriorityTagging		
11	**Management :**		
a	GUI, Telnet, Industry-standard CLI with built-in Help-menus		
b	An External memory card / USB or equivalent , allowing switch firmware, configurations to be stored for backup and distribution to other switches		
c	Port mirroring and RMON (4 Groups)		
d	Out of band 10/100/1000 Ethernet management port and console management port		
e	SSH and SNMPv3 for secure management		
f	RADIUS Authentication, NTP and Syslog and sFlow or equivalent		

12	**Electrical Approvals and Compliances**		
a	Certification: UL, cUL, TUV or equivalent		
b	Restriction of Hazardous Substances (RoHS) Compliance and Energy Efficient Ethernet compliant (EEE) compliance		
13	**Environmental Specifications :**		
a	Operating Temperature Range: 0°C to 40°C or better		

SN.	**Specification**	Compliance YES/NO	Remarks
D	**Distribution Switch Type-2 (URL link: _____)**		
1	**Hardware Specifications**		
a	24 Nos 10/100/1000 – T with Min 4 SPF+ Slots populated with 10G LR		
b	For high reliability vendors shall propose for Dual Internal Redundant power supplies		
c	**Performance Specifications**		
d	Min 125 Gbps or higher switching capacity		
e	Min 95 Mpps or higher Switching throughput		
f	Non blocking for all packet sizes		
g	16K MAC addresses or higher		
2	**Resiliency**		
a	Sub-50 millisecond resiliency for 10G ring based designs as per IEEE 802.17 (RPR) / ITU-T G.8032 ERPS or equivalent technology to provide sub-50ms protection and recovery switching for ethernet traffic in a ring topology		
b	Loop Detection and Loop protection		
c	IEEE 802.1D RSTP		
d	IEEE 802.1Q MSTP		
3	**Routing**		
a	Support Static Routing from Day 1		
B	Switch shall be scalable to a full layer 3 switch supporting routing protocols RIP, OSPF, RIPng , PIM and other Layer 3 Multicasting features without changing the base hardware for future scalability		
c	Should be scalable to IPv6 management and routing features for future up gradation without changing the hardware		
4	**VLAN**		
a	VTP or Equivalent		
b	IEEE 802.3ac VLAN Tagging		
c	LLDP – MED , Voice VLAN		
5	**Security**		
a	Private VLANS, IEEE 802.1X, ACL		
b	Authentication-fail VLAN		
c	BPDU Protection		
d	Dynamic ARP , IP Source guard and DHCP snooping inspection		
e	Guest VLAN		

f	MAC Based Authentication, Web – based Authentication and Port based learn limits		
g	SSH Remote login		
h	SSL v2 and v3		
i	TACACS + Accounting and Authentication		
j	RADIUS and RADIUS accounting		
k	Open standards NAC or equivalent		
6	**IPv6 Features**		
a	IPv4 and IPv6 Dual Stack		
b	IPv6 to IPv4 Tunneling		
c	DHCP Relay ver 6, DNS ver 6		
d	ICMP v 6 , Telnet v6 and NTP v6		
7	**Quality of service**		
a	Policy base QOS based on VLAN , Port , MAC and general packet classifiers		
b	Extensive remarking capabilities, to fit in with any network's QoS scheme for voice/video and other real time applications		
8	**Management**		
a	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring		
b	Support Telnet, GUI, CLI		
c	A USB or equivalent memory card socket, allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
9	**Certification and Compliances**		
a	Certification: UL, cUL, TUV or Equivalent		
b	RoHS Compliant and Energy Efficient Ethernet compliant (EEE) compliance		
10	**Environmental Specifications**		
a	Operating Temperature Range: 0°C to 40°C or better		

SN.	**Specification**	Compliance YES/NO	Remarks
E	**Managed Access Switch (URL link: _____)**		
1	**Port Density**		
a	Switch should have 24 X10/100/1000 T Ports and 4 Nos. 1G SFP Combo Ports		
2	**Performance**		
a	Should support minimum 48 Gbps Switching Capacity or higher		
b	Should support minimum 35Mpps Throughput or higher		
c	Should support 8K MAC Address or more and Wirespeed forwarding		
d	Should support 9K jumbo frames		
e	Full environmental monitoring of PSU internal temperature and internal voltages. SNMP traps alert network managers in case of any failure		
3	**VLAN**		

a	Should support IEEE 802.1Q VLAN tagging		
b	Should support Port-based VLAN, Protocol based VLAN		
c	Should support 256 groups		
d	Should support Guest VLAN, Dynamic VLAN, Private VLAN, Voice VLAN and LLDP-MED		
4	**Multicast Support**		
a	Support IGMP query, MLD snooping (v1 and v2) and IGMP Snooping		
5	**Quality Of Service**		
a	Should support IEEE 802.1p tagging		
b	Should support Port-based priority and DiffServ architecture and DiffServ Assured Forwarding (AF)		
c	Should support QoS based on policy which should be implemented upon VLAN, MAC address and port.		
d	Limit bandwidth per port or per traffic class down to 64kbps		
e	Should support minimum four priority queues per port.		
f	Wire speed traffic classification with low latency essential for VoIP and real-time streaming media applications		
g	Support Strict priority, weighted round robin or mixed scheduling		
6	**Security**		
a	Should support ACL (Access Control List), Intrusion Detection, DHCP snooping		
b	Should be protected from BPDU, Support NAC (open platform) or equivalent		
c	Should support SSH remote login, BPDU Protection		
d	Should support Web based authentication and MAC based authentication, 802.1x (TLS, TTLS, PEAP and MD5)		
e	Should Support Dynamic VLAN and Private VLAN provide security and port isolation for multiple customers using the same VLAN		
7	**Resiliency**		
a	Sub-50 millisecond resiliency for 10G ring based designs as per IEEE 802.17 (RPR) / ITU-T G.8032 ERPS or equivalent technology to provide sub-50ms protection and recovery switching for ethernet traffic in a ring topology		
b	Loop Detection and Loop protection and Dynamic Link fail over		
c	IEEE 802.1D RSTP and IEEE 802.1Q MSTP		
d	Control Plane Prioritization (CPP) ensures the CPU always has sufficient bandwidth to process network control traffic		
e	Should Support PVST+ compatibility mode and STP root guard, RRP snooping		
8	**IPV6 Support**		
a	Should support IPV6 management, SNMPv6, TELNETv6, SSHv6& NTPv6		
b	NTPv6, Path MTU discovery for IPv6		
c	DNS extensions to support IPv6		
d	Unique local IPv6 unicast addresses and IPv6 addressing architecture		
e	Internet Control Message Protocol (ICMPv6)		
f	Neighbour discovery for IPv6		
g	Trace Route for IPv4 and IPv6		
9	**Management Feature**		
a	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring		

b	Support Telnet, GUI, CLI with context-sensitive help option and should have console port for management purpose.		
c	Configuration back-up/restore by FTP, Support RMON MIB (groups 1,2,3 and 9)		
d	Support Eco-friendly mode allows ports and LEDs to be disabled to save power		
e	Switch shall support a Text editor function to edit a configuration directly		
10	**Electrical Approvals and Compliances**		
a	Certification: UL, cUL, TUV or Equivalent and RoHS compliant		
11	**Environmental Specifications**		
a	Operating Temperature Range: 0°C to 40°C or better		
b	Should have silent mode operation (Fanless) or equivalent		

SN.	**Specification**	Compliance YES/NO	Remarks
F	**Managed Access Switch (OPTIONAL FOR RESIDENCE)** **(URL link: _____)**		
a	Should have minimum 8 X 10/100/1000BASE-T with 2 SFP Combo ports		
b	Should have min. 16 Gbps switching capacity & 11 Mpps Forwarding rate and 8K MAC address support		
c	Should support 802.1Q Tagged Based VLAN, Port-based VLAN, 256 group VLAN , RSTP, Fan less architecture		
d	IEEE 802.1p tagging, Port-based priority and Four priority queues per port		
e	Support IGMP snooping (v1/v2), IEEE 802.3ad Link Aggregation, Ingress/egress rate limiting, Broadcast storming control and Port mirroring		
f	Support IEEE 802.1x Port-based and MAC-based, authentication through RADIUS, Dynamic VLAN assignment, ACL		
g	Should support firmware up gradation through FTP		
h	Should have Web GUI manageability, SNMP V3,RMON, DHCP Client, LLDP, Syslog, SNMP, Discovery support etc.		
i	Should have 230V A.C power option and wall / rack mount option		
j	Switch should be RoHS and WEEE Compliant		
k	Operating temperature: 0°C to 40°C and Operating humidity 5% to 90% non-condensing or better		

SN.	**Specification**	Compliance YES/NO	Remarks
G	**10G SFP+ Fiber Pluggable Module (Single Mode)**		
a	Data Rate: 10 Gbps, Connector Type: LC, Wave Length: 1310nm,Distance Support: 10 KM		
b	Should support Digital optical Mirroring, Hot Swappable, RoHS Compliant		
	Environment		

c	**Operating Temperature:** -5 To 70 Degree C, Operating Humidity:0% to 85% (non-condensing)		

SN.	**Specification**	Compliance YES/NO	Remarks
H	**1 G SFP Fiber Pluggable Module (Single mode)**		
a	Data Rate: 1 Gbps, Connector Type: LC, Wave Length: 1310nm/1490 nm, Distance Support: 10 KM		
b	Should have self-locking mechanism, RoHS Compliant, Hot Swappable		
	Environment		
c	**Operating temperature:** -5 To 70 Degree C, Operating humidity 0 to 85% (non-condensing)		

SN.	**Specification**	Compliance YES/NO	Remarks
I	**Specifications of NMS software:**		
a	Automatic topology discovery and creation of network maps for Layer 3 and Layer 2 network, All the available VLANs		
b	Should have high level Network Inventory polling capability for IP Network nodes, All available line cards , Modules, ports, Physical links, VLAN interfaces and all the other SNMP capable devices in the network		
c	Should have powerful administration control		
d	Detailed performance monitoring and management		
e	Should have extensive fault management capabilities with Real time Event and Alarm notifications , System Logs and Audit trials		
f	Creation and management of security and QoS policies		
g	Scheduled Device configuration back-up and restore functionality		
h	Automatic Detection of configuration changes for easy trouble shooting and Isolation		
i	Should support 3rd party devices and end points		
j	Should have the functionality of Group provisioning / Scheduled configuration roll out management		
k	Should have the ability to perform scheduled or Unscheduled network wide software or Firmware upgrades		
l	Should have the ability to customize the NMS dash boards as per the requirements of NIT Raipur		
m	Should have the ability to create group of devices for applying same task		
n	Should have extensive Event notification capability		
o	Should provide the flexibility to the network administrator to assign task to an Individual network engineer and assign ownership / track the status of the issue resolution		
p	Should have extensive centralized trouble shooting tools in built		
q	The NMS solution should preferably be from the same Active switching manufacturer, in case a bidder is proposing a 3rd party NMS solution should provide all the interop reports certified by both the NMS vendor and Active switching manufacturer on seamless interoperability		

Read, understood and Complied with

Signature of bidder with seal

r	All the required Hardware / Software for the NMS solution should be proposed by the bidder		

SN.	**Specification**	Compliance YES/NO	Remarks
J	**Specifications of AAA/RADIUS Server:**		
a	Radius server should work in high availability mode with N+1 high-availability and no single point of failure.		
b	Support for 802.1X Based Device Authentication		
c	Support for MAC Based Authentication		
d	Captive portal Access		
e	Support for Certificate based authentication		
f	Native Data base must support minimum 2500 end points scalable to 5000 end points		
g	Should support Encryption based on Digital Signature algorithm or equivalent functional encryption protocols		
h	Should be Unix/Linux/BSD based.		
i	Standards-based and vendor-agnostic, interfacing seamlessly with network access equipment from different vendors		
j	Should adhere strictly to Radius / AAA open standards		
k	Authentication Protocols to support EAP - TLS, TTLS , PAP and MD5		
l	Should be compatible and interoperable with and supporting current and future network configurations		
m	Should seamlessly integrate with the switching solution proposed for AAA and Dynamic VLAN allocation for roaming user profiles		
n	Should support Dynamic Statistics and reports to track / View all the authentication requests / track the duration of user connection with Radius accounting		
o	Provide high level visibility to Administrators to track who logged onto or disconnected from the RADIUS server / network		
p	Should support IPv6		
q	The Radius server proposed shall work in HA mode with no single point of failure. In case of the primary server failure the secondary server shall take over seamlessly without disruptions of any kind.		
r	The Radius server solution should preferably be from the same Network switching manufacturer , in case bidder proposes 3rd party Radius server solution he should provide all the interoperability reports certified by both the RAIDUS server vendor and Network switching manufacturer on seamless interoperability		
s	In case of 3rd party Radius solution, the manufacturer shall have local presence in India and shall authorize the participating bidder		

Technical Specification for Firewall :

S.N.	Specification	Compliance (yes/No)	Remarks
A.	**General Requirements:**		
1	The multi-function Firewall must be appliance based and should facilitate multi-application environment.		
2	The Firewall should be ICSA Labs certified for ICSA 4.0 or EAL4 certified or both		
3	The platform should be based on realtime, secure embedded operating system		
4	Should support minimum 8 virtual firewall or more		
5	The proposed system shall support unlimited IPs/User licenses for Firewall / VPN (IPSec & SSL)/ IPS/WCF/AV		
6	Should provide a Http, Https, SSH, Telnet, SNMP based management console for managing and configuring various components of the appliance		
7	The device should belong to a family of products that attains IPv6 Ready Phase 2 & IPv6 Certification		
8	The Firewall Appliance should be rack mountable and the UTM should have antibot feature		
B.	**Networking & System Performance Requirements:**		
1	The Firewall should support a minimum of 2x10GbE SFP+ interface, 8 x 10/100/1000 interfaces with auto sensing capacity and 4x 1GbE SFP Ports		
2	The platform should support the standards based Link aggregation technology (IEEE 802.3ad) to achieve higher bandwidth.		
3	The Firewall should support IEEE 802.1q VLAN Tagging with about 1024 VLANs supported (in NAT/Route mode)		
4	Should support automatic ISP failover as well as ISP load sharing for outbound traffic		
5	The Firewall should support Dynamic Routing Protocol for RIP1 & 2, OSPF, OSPFv3, BGP4, ISIS, RIPng		
6	The Firewall should support Static, Policy Based, and Multicast routing		
7	The Firewall should support throughputs of 10 Gbps or Better		
8	The firewall should support throughput of atleast 6.0 Gbps of AES - IPSEC VPN		
9	Should support concurrent session atleast 6 Million		
10	Should support new session per second of atleast 1,50,000		
11	Should support IPS throughput of 4.0 GBPS or better		
12	Should support GAV throughput of upto 2 Gbps		
13	Should support client to Site VPN Tunnels up to 10,000		
14	Should support 500 or more SSL VPN users		
C.	**Operating System & Management Requirements:**		
1	Be proprietary to prevent inheriting common OS vulnerabilities		

2	Allow multiple OS firmware image for booting options		
3	Upgradeable via Web UI or TFTP		
4	Should be easy to backup and restore via GUI and CLI to/from local PC, remote centralized management or USB disk		
5	System shall support profile based login account administration, offering gradual access control such as for Policy Configuration or Log Data Access		
6	The proposed system shall be able to limit remote management access from certain trusted networks or hosts with corresponding administrator account		
7	The proposed system should be able to facilitate administration audits by logging detailed activities to event log for management & configuration updates		
8	The administrator authentication shall be facilitated by local database, PKI & remote services such as Radius, LDAP and TACAS+		
9	The Firewall must be capable of clustering multiple firewalls together into a redundant and highly available stateful configuration without any extra license cost for creating HA.		
D.	**Firewall Requirements:**		
1	The Firewall should support deployment modes as; “Stealth Mode” or “Route Mode" or "Transparent Mode” or "Proxy Mode".		
2	The proposed system should have integrated Traffic Shaping / QoS functionality		
3	Should support DHCP server & DHCP Agent functionality		
4	The Firewall should support Stateful inspection with optional Policy based NAT (Static OR Dynamic)		
5	The Firewall should support Inbound Port Forwarding with optional inbound Load Balancing		
6	Should support IPv6 ACL to implement security Policy for IPv6 traffic		
7	All internet based applications should be supported for filtering like Telnet, FTP,SMTP, HTTP, DNS, ICMP, DHCP, RPC,SNMP, BGP, IMAP, NFS etc		
8	Should be able to inspect HTTP and FTP traffic when these are deployed using non standard ports (i.e when HTTP is not using standard port TCP/80)		
E.	**High Availability Requirements:**		
1	The firewall must support Active-Active as well as Active-Passive redundancy.		
2	The Firewall must support stateful clustering of multiple active firewalls, and the firewalls must load balance the traffic between them to share the load.		
3	The cluster should support simple and minimal downtime during upgrade		
F.	**IPSEC VPN Requirements:**		
1	The IPSEC VPN and SSL VPN capability shall minimally attain Internet Computer Security Association (ICSA) Certification or equivalent		
2	The proposed system shall comply/support industry standards, L2TP, PPTP, IPSEC, and SSL VPN without additional external solution, hardware or modules		
3	The device shall utilize inbuilt hardware VPN acceleration supported for:		

3.1	IPSEC (DES, 3DES, AES) encryption/decryption		
3.2	SSL encryption/decryption		
4	The system shall support the following IPSEC VPN capabilities:		
4.1	Multi-zone VPN supports.		
4.2	IPSec, ESP security.		
4.3	Supports Aggressive and Dynamic mode		
4.5	Support perfect forward secrecy group 1 and group 2 configuration		
4.6	MD5 or SHA1 authentication and data integrity.		
4.7	Automatic IKE (Internet Key Exchange) and Manual key exchange.		
4.8	Supports NAT traversal		
4.9	Supports Extended Authentication		
4.10	Supports Hub and Spoke architecture		
4.11	Supports Redundant gateway architecture		
4.12	DDNS support		
G.	**SSL VPN Requirements:**		
1	The Firewall should be integrated solution and there should be no user based licensing for SSL VPN.		
2	The Firewall should support for TWO modes of SSL VPN:		
2.1	Web-only mode for thin remote clients equipped with a web browser only and support web application such as HTTP/HTTPS PROXY, FTP, SMB/CIFS, SSH, VNC, RDP		
2.2	Tunnel mode for remote computers that run a variety of client and server applications		
3	The system shall provide SSL VPN tunnel mode that supports 32 and 64-bit Windows operating systems		
4	The proposed solution shall allow administrators to create multiple bookmarks to add to a group and make these bookmarks available for SSL-VPN users.		
H.	**Network Intrusion Detection & Prevention System Requirements:**		
1	The IPS capability shall minimally attain Internet Computer Security Association (ICSA) NIPS or NSS Certification		
2	Should have a built-in Signature and Anomaly based IPS engine on the same unit		
3	Ability to prevent denial of service and Distributed Denial of Service attacks.		
4	Signature based detection using real time updated database		
5	Anomaly based detection feature should be there		
6	The device shall allow administrators to create Custom IPS signatures		
7	Configurable IPS filters to selectively implement signatures based on severity, target (client/server), protocol, OS and Application types.		
8	Supports automatic security updates directly over the internet. (i.e., no dependency of any intermediate device)		
9	Security check updates do not require reboot of the unit.		
10	Supports attack recognition inside IPv6 encapsulated packets.		
11	Supports user-defined signatures with Regular Expressions.		

12	Supports several prevention techniques including drop-packet, tcp-rst (Client, Server & both) etc. List all prevention options		
I.	**Antivirus System Requirements:**		
1	The Antivirus capability shall minimally attain Internet Computer Security Association (ICSA) AV Certification/ equivalent		
2	The proposed system should be able to block, allow or monitor only using AV signatures and file blocking based on per firewall policy		
3	The System should be able to scan following Protocols:		
3.1	HTTP and HTTPS		
3.2	SMTP		
3.3	POP3		
3.4	IMAP		
3.5	Instant Messenger (AIM, YAHOO!, MSN, ICQ, SIMPLE)		
4	The proposed system shall provide ability to allow, block and intercept (allow but quarantine) attachments or downloads according to file extensions and/or file types		
5	The proposed system should be able to block or allow oversize files based on configurable thresholds for each protocol types and per firewall policy.		
6	The solution should be capable scanning Encrypted VPN tunnel traffic originating from the unit for virus		
J.	**Web & Application Content Filtering System Requirements:**		
1	The proposed system should have integrated Web Content Filtering solution without external solution, devices or hardware modules.		
2	URL database should have at least 40 million + sites and 75 + categories.		
3	The proposed solution should be able to enable or disable Web Filtering per firewall policy or based on firewall authenticated user groups for both HTTP and HTTPS traffic.		
4	Should be able to block web plug-ins such as ActiveX, Java Applet, and Cookies.		
5	Shall include Web URL block		
6	Shall include Web Exempt List		
7	The proposed solution should be able to replace the web page when the web page matches the Web Filtering blocking criteria.		
8	The proposed solution shall be able to identify, retrieve and rate the actual URL of the cache content commonly available in search engines such as Yahoo and Google.		
9	The solution shall allow administrators to create multiple new local URL filtering categories besides dynamic categories		
10	Should have application control feature		
11	Should have the intelligence to identify & control of popular IM & P2P applications like KaZaa,BitTorrent etc.		
12	Should have minimum database of 1500 types of application awareness		
K.	**Data Leak Prevention Requirements:**		
1	Should have the ability to prevent data loss through SMTP, FTP, HTTP,		

	HTTPS & IM		
2	Should have built in pattern database		

TECHNICAL SPECIFICATIONS OF WIRELESS:

SN	Specification	Compliance Yes/No	Deviation if any
	Wireless Controller		
1	System should be ready for min 45 AP's Support from Day one with future scalability for min 140 APs or more support.		
2	Redundancy Features: Controller Must support Active-Active and Active-Standby modes. Same license should be shared by both the controller.		
3	Controller should provide cluster CLI / GUI - ability to synchronize the changes made in the primary controller to all the controllers in the cluster		
4	Client to client traffic on extended VLAN connected to the same access point should be directly forwarded without sending it to the controller - ensuring that controller does not become the bottleneck and thereby reducing the latency for voice applications		
5	Ability to map SSID to VLAN and should support automatic channel selection – interference avoidance (Co-channel management, Adjacent Channel Management, Channel reuse management)		
6	Access points can discover controllers on the same L2 domain without requiring any configuration on the access point. Can also discover controllers across Layer-3 network through DHCP or DNS option.		
7	Built-in ICSA Certified ***Wireless*** Firewall in the Switch		
8	Firewall should support minimum 10000 concurrent sessions.		
9	System should provide L2 / L3 stateful firewall, Role based firewall, DOS attacks and Strom control		
10	Create firewall rules based on MAC / IP Ports		
11	Allow firewall rules to be attached to the following interfaces; WLAN , Port, VLAN, Role		
12	The wireless firewall must be able to take action including allowing the traffic, denying the traffic, rejecting the traffic, routing the traffic, destination or source NAT the traffic, modify the QoS level of the traffic, and blacklist (remove from the network) the client for policy matches.		
13	Should include IPS licensing for 3 years from the date of installation.		
14	Detect and prevent ARP Spoofing; rogue DHCP Servers in the network; can Block DHCP offers from wireless interface		
15	Limit maximum number of broadcast / multicast / unknown unicast / ARP / traffic per second		
16	The limits can be applied to WLAN interface		
17	The limits can be applied to Physical Ethernet LAN interface		
18	Centralized MAC addresses filtering.		
19	Should support onboard and external DHCP server		
20	Controller should support Onboard AAA server.		
21	The proposed architecture shall be controller-based with thin AP deployment. While Encryption / decryption of 802.11 packets should be performed at the		

	AP.		
22	Shall support roaming between access points deployed on same subnet and different subnets.		
23	Specify bandwidth based on RADIUS group attribute; Specify uplink and downlink rate limit per WLAN; Specify uplink and downlink rate limit per User		
24	Should support per user, per device, and per application/TCP-port prioritization		
25	Dynamic load balancing to automatically distribute clients to the least loaded 802.11 channel and AP; load balancing must not require any client specific configurations or software		
26	Adaptive RF management that provides the capability to pause channel scanning / adjust RF scanning intervals based on application and load presence.		
27	Capability to provide preferred access for “fast” clients over “slow” clients (11n vs. 11g) in order to improve overall network performance.		
28	Ability to manually start the calibration process at anytime		
29	Ability to view and audit the results of the calibration process before applying the result of calibration process		
30	Should be able to load balance clients across channels and access points		
31	Should be able to load balance clients based on client count		
32	Should be able to load balance clients based on effective throughput on AP		
33	Should be able to use client and throughput as a measure to load balance between 2.4 GHz and 5 GHZ band		
34	Ability to support Captive Portal authentication with WPA/WPA2 PSK on the same SSID for encrypting guest traffic		
35	Support Captive Portal as fallback if primary EAP authentication fails		
36	Should allow authenticated client devices to roam securely from one access point to another, within or across subnets, without any perceptible delay during re association.		
37	Controller should support DES, 3DES and AES-128 and AES-256		
38	encryption, with site-to-site and client-to-site		
39	VPN capabilities; should have provision to supports IPSEC tunnels.		
40	Ability to mark QoS tags for wired-to-wireless traffic based on 802.1p and DSCP tags		
41	Ability to mark QoS tags for wireless-to-wired traffic based on WMM tags		
42	Should support client aware scanning - stop scanning when the client count exceeds a threshold value		
43	Should support dynamic PSP aware scanning - stop scanning only when the PSP client has traffic to send and continue scanning when there is no traffic		
44	VLAN cache as clients roam from one AP to another in a campus with VLAN pooling		
45	Stateful Firewall session migration when client roams from one AP to another		
46	Support policy based configuration model		
47	Support creation of multiple policies		
48	Automatic policy adoption by the Access Points based on a match condition and support the foll match conditions		

49	CDP Location string, VLAN, Subnet, Serial Number, MAC Number, AP Model		
50	Client to client traffic on extended VLAN connected to the same access point should be directly forwarded without sending it the controller - ensure that controller does not become the bottleneck and reduce latency for voice applications		
51	Client to client traffic on extended VLAN connected to different access points should be directly forwarded without sending it the controller - ensure that controller does not become the bottleneck and reduce latency for voice applications		
52	One radio of an access point can perform dedicated scanning on both the bands (2.4GHz and 5GHz)		
53	A radio of an Access points can be configured to scan all the valid channels on both the band bands		
54	Access Points should be able to increase power to cover any failure of its neighbouring APs - like antenna fall off / AP failure etc		
55	Access Points should be able to increase the power when the data rate at which the client connects to the AP falls below a threshold value or when the client moves away from the coverage area		

SN	Specification	Compliance Yes/No	Deviation if any
	Indoor Access Points		
1	The wireless AP should be based on single radio band unlocked and thin AP		
2	The 802.11 N Access Point 2x2 MIMO , single radio to be configured either in 2.4 /5 or to perform as sensor for IPS		
3	The Access Point should have 10/100/1000 Ethernet interfaces + standards 802.3af POE input,		
4	Ethernet interfaces 802.11n Access Point should be able to power up using standards 802.3af POE input.		
5	The AP should be able to do local forwarding		
6	The AP should be able to perform encryption/decryption, QOS and RF Management at its level without the need of controller		
7	The AP should be able to provide captive portal facility on its self.		
8	802.11a/b/g/n Radio specifications		
9	Operating Frequency :2.4-2.5 GHz and 5.150 GHz - 5.950 GHz as per India country regulatory requirements.		
10	Available Channels: Mobility Controller-managed, dependent upon configured regulatory domain		
11	Modulation: Orthogonal Frequency Division Multiplexing (OFDM) / 802.11 n draft 2.0		
12	Transmit Power: 18-20 dBm / 100 mW* (within country regulations) increments of 1dbm		
13	Association Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 with automatic fallback / MSCO - MSC15 6.5Mbps - 300Mbps		
14	High-Throughput (HT) Support: HT 20/40		
15	Packet Aggregation: A-MPDU		

16	Antenna Characteristics: External Antenna Gain: 2.4 GHz-2.5 GHz / 3 dBi; 5.150 GHz- 5.875 GHz / 5 dBi or better; Integrated or external with 3 dBi on 2.4 Ghz and 5 dBi on 5 GHz.		
17	FCC certified, Industry of Canada and CE Mark		

SN	**Specification**	**Compliance (Yes/No)**	**Deviation if any**
	Outdoor Access Points		
1	Wireless Access Point N Type - Outdoor single radio or dual radio		
2	The 802.11 N Access Point 2x2 MIMO , dual-radio (concurrent 802.11 a/n and b/g/n)wireless access points; Single radio can be configured for 2.4/5Ghz.		
3	The Access Point should have 10/100/1000 Ethernet interfaces + standards 802.3af POE input,		
4	802.11a/b/g/n Radio specifications		
5	Operating Frequency :2.4-2.5 GHz and 5.150 GHz - 5.950 GHz as per India country regulatory requirements.		
6	Available Channels: Mobility Controller-managed, dependent upon configured regulatory domain		
7	Modulation: Orthogonal Frequency Division Multiplexing (OFDM) / 802.11 n draft 2.0		
8	Transmit Power: 18-20 dBm / 100 mW* (within country regulations) increments of 1dbm		
9	Radio: 2x2 Multiple-In, Multiple-Out (MIMO), with two spatial streams		
10	Association Rates (Mbps): 54, 48, 36, 24, 18, 12, 9, 6 with automatic fallback / MSCO - MSC15 6.5Mbps - 300Mbps		
11	High-Throughput (HT) Support: HT 20/40		
12	Packet Aggregation: A-MPDU		
13	External AntennaGain: 2.4 GHz-2.5 GHz / 3.2 dBi & 5.150 GHz- 5.875 GHz / 4 dBi		
14	Regulatory: FCC certified; Industry of Canada; VCCI (Japan); CE Mark		
15	Enclosure: Should be IP66/67 rated if required for outdoor application		
16	802.11 a/b/g/n functionality certified by the WiFi alliance Draft 2.0		
17	Options for dual-band dual-radio APs which can perform dedicated RF scanning using a single radio while serving WLAN clients on the second radio.		
18	32 WLANs, 16 BSSIDs per radio; Also support On Demand Channel Scan,Auto Channel Select		
19	The AP should support Time based WLAN where the WLANs can be turned on/ off at specific times of day. e.g. Guest Access can be provided during working hours only.		
20	The AP should proactively probe other rates to determine if greater throughput is available, intelligently adjusting its selection tables to favor higher performance.		
21	The AP should support mesh backhaul feature in which the root AP will determine if its wired connection is down and take action correspondingly.		
22	AP should support Self Healing, Self forming, dynamic path selection Wireless MESH function. Automatic neighbor detection and route determination		

23	AP will provide make before break handovers.		
24	The wireless meshing AP shall support low hop latency (< 1 ms per hop) under clear channel conditions and high SNR		
25	Support of 802.11s compliance via software upgrade		
26	MESH link should support QoS – WMM		
27	MESH link should support AES encryption on the MESH link		
28	MESH link should support extending corporate network with VLAN Tags and VLAN priority tags to the remote site		
29	The AP shall support Layer 2 routing.		
30	The MESH AP shall be transparent to Layer 3 devices (i.e. embedded router)		
31	A wireless meshing AP with redundant links shall select an alterative route within 100 ms.		
32	AP shall provide external antenna options.		
33	Should support internal RADIUS server to perform local authentication & support local management of user database. Must support EAP-PEAP, and EAP-TLS using EAP-MSCHAPv2 or EAP-GTC.		
34	Should support configuration of WLAN access policies; user based VLAN assignment; integrated Router, gateway, Stateful packet Inspection Firewall; DHCP,AAA Server, Hotspot features; Integrated VPN; IPSec VPN		
35	Should support WMM; separate WLAN for voice applications; DTIM per BSSID configuration for voice/video; Multicast Mask; WMM-UAPSD, 802.1P, Diffserv & TOS		
36	Managements: multiple users with different privileges;HTTP, HTTPS, Telent, SSH, Syslog, SNMPV3		

Technical Specification of IP PBX System :

Sl. No.	Specification	Compliance Yes/No	Deviation if any
1.	**Technical Specification of IP PBX System**		
a	The proposed PBX System shall be state of art, server based technology supporting convergence of Voice, Data, Video and other Value Added Services like Multimedia Call Handling, Voice Fax & E-mail integration.		
b	The Switching system of the PBX should be designed with IP at the core allowing fully distributed IP solutions across data networks. It should support 100% IP or 100% Analog or a hybrid of IP/Analog/Digital technologies.		
c	The System should support IP Communication Devices (wired and wireless) e.g. IP Phones (Hard and Soft phones), Mobile IP Phones, multimedia PCs, SIP phones, Video phones (Hard & soft Phone)		
d	The system should support third party open standard phones like Voice SIP phone, Video SIP phone (Hard & Soft) & Analog phones etc.		

e	The system should be server and media gateway based, scalable, distributable and modular in architecture. The architecture should be capable of seamless migration to its maximum capacity by simply adding peripheral cards with media gateways on the set of control server/ servers without compromising on any functions/ features of this system or any degradation of service.		
f	The media gateways should be modular, 19" Rack mountable		
g	NIT Raipur may expand the network using OFC network by adding Media Gateways at new locations in future. Hence the offered solution should be capable of supporting as a Single Exchange Image Distributed architecture in nature, that will help NIT Raipur to have flexibility in provisioning the extensions (Analog/Digital/IP) wherever the IP network is available (no distance limitation) using the IP network. It should be possible to deploy any functionality of the PBX centrally and the facility should be available to all users across the network. The system should provide 100% feature transparency across the network		
h	It shall be possible to distribute the telephony servers across the IP network to improve the overall resilience of the solution for business continuity and disaster recovery purposes.		
i	The SIP proxy, SIP registrar should be inbuilt in the system and should support any SIP compliant hard phones or soft phones. No external SIP server should be involved.		
j	IP PBX should be designed for contemporary Telecom Technology (IP and SIP) & protects today's investment to future technologies including Unified communication and collaboration, Server Virtualization, Video Telephony integration.		
k	Open Standard Operating System like Linux shall be preferred for PBX mainly for enhanced functionality & rich feature set. 3rd party applications should be able to be seamlessly integrated with the call manager with the help of Open Standard SIP.		
l	The system should be equipped with minimum 300 VoIP (Hardware and Software) resources from the day 1		
m	Apart from present PRI requirement as per BOQ , the system should be additionally equipped with 4 nos. of PRI for future requirement. However, Licences to enable these cards are not to be offered and should be made available as and when required.		
n	The system should be configured in Redundant Duplicated configuration so that when the main server fails the standby server should takeover automatically with out any manual intervention.		
o	Both the Main and Standby Servers shall reside external to the Gateway and shall not be plugged inside the Gateway for better fault isolation and also enhancing redundancy of the system. Minimum Specification of this external server shall be with Dual core processor Min 1.8 Ghz , 160 GB Hard Disk , Min 02 Ethernet ports , 1 VGA Port and 4 USB Port. Bidder to submit documentary evidence for this purpose.		
p	The system must include an administrative console with required software for system maintenance purpose.		
02.	**Basic Telephone Features**		
a	Abbreviated dialling Automatic call-back on busy trunk Automatic DISA, user authentication Call forwarding unconditional on busy/no reply to extension, hunting group, Voice mail, operator, paging, etc.		

b	Immediate forwarding Call pick-up . Call parking		
c	Calling line identification restriction for internal calls Camp on busy telephone/hunting group Controlled private call by Pin code and password		
d	Do not disturb Dynamic call baring General night service Hunting group (fix head, cyclic, longest idle time) Parallel ringing minimum in 3 answering position simultaneously.		
e	Internal/external music on hold Individual hold Instrument locking to prevent the outgoing		
f	Last internal/external number redial Store and redial external number		
g	One touch key for Boss and Secretary Call Screening through Secretary Boss & Secretary busy indication Reminder		
h	Simultaneous 8-party ad-hoc conference calls in any combination (internal & external) and 12 such different conferences should be supported simultaneously. This facility should be available from Day-1		
03.	**Technical Specification of PC Based Operator Console**		
a	The solution shall be provided with highly featured screen based operator's application along with Head Set. This solution shall be capable of being centralized and distributed across multiple locations. This application is required for attendants to manage high volumes of calls, internal and external in a highly efficient manner. The solution shall specifically support the functionality detailed below. All features shall be available from a screen based operator console. Documentary evidence should be submitted for all features and functionalities mentioned below.		
b	The operator's application shall integrate seamlessly with the system directory which shall be accessible in a searchable format from the operator console. A window should pop up automatically where the attendant can see activity and contact profile of the extension being called.		
c	Directory Integration - Multiple Queues (External, Internal, Recall, Emergency etc.) .This feature shall support the prioritization of emergency calls.		
d	Queue Threshold Alarms		
e	Selective Answering		
f	Call Transfer (Supervised and Unsupervised)		
g	Call return on no answer , Call Split and Hold		
h	Intrusions		
i	Serial call		
j	Call Information Display (Calling party and called party)		
k	Display of Extension status		
l	Dial by name from Directory		
m	Directory search by Name, Department , Keyword , Best match		
n	Call return on no answer to operator that originally handled the call		
o	Display of Call handling fields, First-party call field, Routed calls field, Calls on hold field, Waiting queues fields, Context-sensitive soft keys, Station status, Busy lamp field window, System or user programmable keys window,		

	Menu bar		
p	IP EPABX should have Call billing software which can give call details reports like duration of call, Call charges, incoming and outgoing call details etc.		
q	Menu Bar should display Application activate , Activate/Deactivate Microphone , Speaker and switch to hands free		
r	Should display Icons for Phone, Fax, Hunt groups etc to indicate Idle state , including Busy with internal party, Busy with external party , Absent or Do not disturb information		

TECHNICAL SPECIFICATIONS OF IP PHONE: (Same Make of IP EPBX)

Sl. No.	Specification	Compliance Yes/No	Deviation if any
a	Minimum 3 Line Display type phone		
b	Should support SIP RFC 3261 and correlated RFC's		
c	Should support Codec :Codec's: G.711 μ-law / A-law, G.729, G.722		
d	Full duplex hands-free speakerphone		
e	Incoming calls / Outgoing calls / Missing calls.		
f	Shall be equipped with XML browser capabilities allowing access to customized services and applications		
g	Support Message wait indication		
h	Dual 10/100 Mbps switched Ethernet ports (LAN and PC ports)		
I	Minimum 6 line call appearance with LED's		
J	Manual or Dynamic Host Configuration Protocol (DHCP) IP address setup		
k	SIP application: support Call forward/ transfer/holding/ waiting / Call timer		
l	Integrated IEEE 802.3af Power-over-Ethernet		

TECHNICAL SPECIFICATIONS FOR ANALOG PHONES:

Sl. No.	Specification	Compliance Yes/No	Deviation if any
01.	**Technical Specification of Analog Phones**		
a	Should be corded phone		
b	Should have alphanumeric keyboard		
c	Should be able to be mounted on wall as well		
d	Must have LCD display and must be able to show Caller ID		
e	Should have at least 5 (five) redial memory		
f	Should have at least 30 phonebook memory		
g	Should have two-way speakerphone facility		
h	Should have facility to set caller tunes and should support tone /pulse setting		

TECHNICAL SPECIFICATIONS FOR MULTI-SERVICE SWITCH:

SN	Specification	Compliance Yes/No	Deviation if any
1.	**User Ports**		
A	Min. 5 x 10/100/1000TX (RJ45)		
B	Min. 2 x VoIP FXS ports (RJ-11)/ Analog ports		
2.	**FO Connectivity Ports**		
A	Should have min. one no. Single mode Fiber optic connectivity option		
3	**VoIP Feature**		
A	G.711 a-law and μ-law 64kbps		
B	G.729 8kbps		
C	G.726 32kbps		
D	G.168 ECAN		
E	T.38 fax relay		
F	RTP voice packet encapsulation		
G	Automatic fax/modem detection		
H	Voice Activity Detection (VAD)		
I	Comfort Noise Generation (CNG)		
J	Error mitigation / Bad frame interpolation		
K	Adaptive jitter buffer		
4	**VoIP Protocols**		
A	Support SIP/MGCP		
5	**Class 5 Services**		
A	Caller ID / call waiting with caller ID		
B	Call transfer		
C	Call forwarding (unconditional, on busy, on no answer)		
D	Call waiting		
E	Call hold		
F	Message waiting		
G	3-way call		
5	**Security**		
A	The Gateway must support DMZ , NAT, State-full Inspection, PAP/CHAP, ACL		
6	**Others Features**		
A	Should support RoHS compliant		
B	Support QoS and DHCP		
C	Support rate limiting on Ethernet Ports		
D	Support VLAN and IGMP V3		
7	**Management For Ethernet port**		
A	SNMP V1/V2/ GUI, Telnet, CLI and should have console port		
B	Should be managed By IP Address		

Read, understood and Complied with

Signature of bidder with seal

8	**Power Characteristics**		
A	External power supply and Input 100-240V AC, 50-60 Hz		
9	**Environmental Specifications**		
A	Operating temperature 0°C to 40°C		
10	FXS ports, Ethernet ports , FO port functionality should be seamless even in the event of power failure i.e., min 4 hours power backup is required from day 1.(UPS should be quoted for the same)		
11	All the functionalities asked for in the multi-service switch, the bidder can make use of separate devices (Network Access Switch – 8-port managed Optional switch for residence, FO Module, Voice Gateway, UPS etc)		

SPECIFICATION FOR STRUCTURE CABLING SYSTEM :
(All Passive component from same OEM)

Some of the special requirements of the Passive IT Cabling & Connectivity are here under –

- All the Passive Network Cabling Components & Systems must cover a Performance Warranty of minimum 25 Years or Life time. Contractor shall ensure the requirements for providing of Performance Warranty from OEM, Documentation of the Project & Defect Liability Period Warranty (03 Yrs) from OEM.
- All the Passive Network (Cabling, Connectivity etc.) Components shall be from one OEM only. All the Passive Network Cable & components shall be ROHS compliant.
- The complete cabling system offered shall be upgradeable to the intelligent system if required in future by retrofitting of sensors. The OEM of the cabling system should have it's own intelligent solution, not should have any tie-up with third party. OEM Shall Give Written declaration for same
- The OEM should be ISO 9001:2000 & QS: 9000 Certified. ISO 14001 accreditation shall be added advantage.
- CAT 6 UTP components should have independent lab verification like ETL certificates and UL number.
- The cabling should be certified to have application support warranty for next 25 years.

Tender Specification for Cat6 4 Pair UTP Cable: -

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Category 6 Unshielded Twisted Pair 4 pair cable shall be compliant with ANSI/TIA/EIA-568-B.2-1 Additional Transmission Performance Specifications for 4-pair Category 6 Cabling.		
(b)	Category 6 UTP cables shall extend between the work area location and its associated telecommunications closet and consist of 4 pair, 23 AWG, UTP with FR PVC jacket.		
(c)	Supports ultrahigh speed data networks such as Gigabit Ethernet (1000 Base-T and 1000 Base-TX).		
(d)	The cable jacket shall be FR PVC		
(e)	Incorporates central spine maintaining pair separation during installation to ensure premium performance after installation.		

(f)	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, polymer spine / full separator. Half shall not be accepted. Conductor Solid Copper Conductor Diameter 0.56±0.005mm (23 AWG) Insulator Polyolefin Jacket FR PVC Outer Diameter 6.0±0.4mm Max. Temperature 75°C		
(g)	ROHS/ELV Complied		

Tender Specification for Category- 6 Modular Patch Panel/ Jack Panel :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	19 inch 24-port, loaded with Jack, Should be usable in both Category 6 link and channel gigabit Ethernet applications. IDC section shall consist of V-shaped contacts that flex not fatigue when terminated. Each port shall feature spring-loaded shutter and can be colour coded to match jack outlets. Should offer both front and rear labelling options. Patch panel should be constructed of cold-rolled steel for additional strength and durability.		
(b)	Ports : 24		
(c)	Plastic Housing Jack Connector :Polycarbonate, UL94V-0 rated or equivalent		
(d)	Contact Plating: 50µ" Gold/100µ" Nickel		
(e)	Front Connector interface : RJ45		
(f)	Circuit Identification Scheme : Icons on each of 24-ports		
(g)	Port Identification : 9mm or 12mm Labels on each of 24-ports (to be included in supply)		
(h)	Height 1 U (1.75 inches)		
(i)	ROHS/ELV Compliant		

Category 6 Modular Jacks/ Information Outlet:

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Cat 6 Data Gate Plus jack shall be designed to maintain clean and secure connections. RJ-45 jack shall have 'spring-loaded shutter' which protects it from dust and contaminants as well as provides tactile feedback –the spring-loaded shutter shall pop out an improperly seated patch cord–all with single-handed plug-in and removal.		
(b)	Wire terminal : 200 termination cycles		

(c)	Modular Jack : 750 mating cycles		
(d)	Plastic Housing :Polycarbonate, UL94V-0 rated or equivalent		
(e)	IDC Contact Plating : Tin/Lead Plate		
(f)	Faceplate: Square shuttered plate with 1/2/4 port. 86 x 86 mm		
(g)	ROHS/ELV Compliant		

Category 6 UTP Patch Cords :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Cat 6 U/UTP Patch Cords shall be designed to support data networks for 10/100BASE-T and 1000BASE-T amplifications.		
(b)	Conductor : 24 AWG stranded copper wire		
(c)	Length : 1 & 2 Meter		
(d)	RJ45 plug and boot material : Clear polycarbonate		
(e)	Outer Sheath : LS0H		
(f)	RJ45 plug dimensions compliant with : ISO/IEC 60603-7-4 and FCC 47 Part 68		
(g)	Contact material : 0.35mm thick copper alloy		
(h)	MIN operating life :750 insertion cycles		
(i)	Sheath Material : LSZH		
(j)	ROHS/ELV Compliant		

Face Plates:

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Face Plates shall be compatible with 85mm x 85mm requirements. The wall plate/face plate should accept up to 4 Keystone modules. Wall plates/Face Plates should include shuttered or non-shuttered, designation label, clear label cover, mounting screws and screw covers.		
(b)	Face Plate/Wall Plates should have Channel Application identification via colour matched snap-in plastic icons that are pre-printed with symbols or text labels		
(c)	Text icon labels in seven bright colours pre-printed with Category 5e & 6, phone, fax, LAN and ISDN.		
(d)	Image icons shall be available in seven brightly coloured grey, green, purple, blue, yellow, orange and red.		

(e)	The Face/Wall Plates should: a. Accept RJ45 Keystone modular jacks. b. Grid plate with standard white colour surrounds. c. Have protected clear designation label windows. d. be supplied complete with self tapping screws.		
(f)	Face/Wall Plates shall have the following specifications: a. Dimensions (H x W) Grid Plate only b. British Standard 85mm x 85mm		

FIBER OPTICS SINGLE MODE CABLING TENDER SPECIFICATION

A. 6 Core Outdoor Unitube Armored 9/125µm OS1 Type Optical Cable :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Type of Cable : OS1 Single mode 6 Core, Armoured, Unitube, Gel filled cable complying to ISO.IEC 11801 - 2nd Edition, type OS1; AS/ACIF S008; AS/NZS 3080,ITU-T REC G 652D, IEC 60793/60794, TIA 568, EIA 455; suitable for use in direct burial, outdoor ducts and backbone cabling.		
(b)	Corrugated Steel Tape Armour -Thickness more than 0.125mm		
(c)	**Attenuation**		
	at 1310 nm ≤ 0.34 dB/KM		
	at 1550nm ≤ 0.22 dB/KM		
(d)	Maximum Tensile Strength Short term : 1000N or better		
(e)	Maximum Crush resistance Short term : 2000N/10CM or better		
(f)	Operating Temperature : -10° C to + 70°C		
(g)	Numerical Aperture : 0.14 or better		
(h)	Core/Mode-Field (um) : 9.2 or better		
(i)	Max. Bending Radius (during installation) : 20 X Overall diameter or better		
(j)	Two Steel wires should be provided as strength members		
(k)	Sheath : UV Stabilized HDPE		
(l)	Over all Cable Diameter : 9.5-9.9 mm		
(m)	Should provide Fibre protecting tube : Preferably of Polybutylene Terephthalate or better		
(n)	Should provide Water Blocking : Preferably of Thixotropic Gel (Tube), Petroleum Jelly (Interstices) or better		
(o)	Mode Field Diameter @ 1310nm : 9.2 + 0.4 µm		
(p)	Cladding Diameter : 125 ± 1.0µm		
(q)	Bandwidth : > 1GHz-Km at 1310nm		
(r)	Attenuation Discontinuity : Both Windows less than 0.10dB		
(s)	ROHS Complaint		
(t)	ISO/IEC 11801 : 2002 -2nd Edition, Type OS1		
(u)	ITU-T REC G 652D spec for Low Water Peak fiber		
(v)	IEC 60793/60794, TIA 568, EIA 455		

(w)	Life of Cable: The minimum expected life of the cable is not less than 25 years		

B. LC-LC Single Mode Fibre Patch Cords :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Make and Type :LC to LC Duplex/Simplex tuned Fiber Optic Patch Cord 3 Mtr, 9/125 Micron		
(b)	Cable Sheath : LSZH		
(c)	Cable Diameter :1.8 mm twin zip		
(d)	Ferrule : Ceramic		
(e)	Buffer :Tight buffered		
(f)	Insertion Loss : MAX .3 db		
(g)	Return Loss > 45 db		
(h)	Temperature Range : -10 Degree C to +60 Degree C		
(i)	ROHS Compliant		

Rack Mount Fiber Panels (LIUs) :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Should have Fiber Management Shelf with Configurable Fiber drawer in a 1U rack mount unit for storing and terminating incoming fiber cable.		
(b)	Should be able to fit up to four 6 Pak Plates/ Angled 6 Pak plates with LC Duplex 6 Fiber SM adapter panels		
(c)	Should provide management rings within system to accommodate excess fiber cordage behind the trough adapters and maintain fiber bend radius		
(d)	Sliding drawer for ease of reconfiguring fibers		
(e)	Should have rugged steel construction with good finishing		
(f)	Should accommodate 2 x 12 fiber Splice Trays		
(g)	Should have compact size		
(h)	No of Adapter Plate Req : As per Requirement		
(i)	Pigtail : LC, Single mode, 9/125 μm qty depend on Connection		
(j)	ROHS Compliant		

C. Fiber Pigtails :

SN	Specification	Compliance Yes/No	Deviation if any
(a)	Cable - 900Micron Tight Buffered		
(b)	Length - 1.5Mtrs		
(c)	Polishing - 100% Factory Tested and Guaranteed Performance		

(d)	Connector End: 1 X LC Connector S.M Zirconia ceramic ferrule.		
(e)	Operating Temperature -10 Degrees to + 60 ° C		
(f)	Sheath : LSZH		
(g)	Min Bend radius : 30mm		
(h)	Retention Strength : 100N		
(i)	Attenuation: 1310 nm ≤ 0.36 dB/KM		
(j)	Attenuation: 1550nm ≤ 0.22 dB/KM		
(k)	ROHS Complaint		

SPECIFICATION FOR 42U FLOOR STANDING LAN RACK:

SN	Specification	Compliance Yes/No	Deviation if any
1	19" Rack: 42U/800mmwidth/1000mm depth, with Aluminium extruded frame structure design, (Aluminium extruded depth support member, Aluminium extruded width support member joined with special locking keys to the aluminium extruded vertical member to form a robust frame structure. The aluminium frame structure should be chromate treated Powder coated with 80 microns UL listed or better; Matt finish. Top cover and bottom cover should have cable entry provisions.		
2	Side panels should be detachable with slam latches ventilation slot on side panels, full vented top cover & bottom cover with the cable entry provision.		
3	Should have joint Free Gaskets through out the frame on front & back side		
4	Reducing Channel 2 Pairs		
5	Front glass door with vent, lock & key		
6	Rear mesh type perforated door with lock & key		
7	2 pair Castors with brakes and without break		
8	230 V AC 90 CFM fan mounted on top cover – at least 4 nos should be provided with housing units		
9	Front Panel Mounting Hardware (Pack of at least 20) at least 1 packet should be provided		
10	19" Cable Manager – at least 5 nos should be provided		
11	Power Distribution Unit 10x 5/15 amp sockets with 16 amp mcb - at least 2 should be provided.		

SPECIFICATION FOR 15U LAN RACK:

SN	Specification	Compliance Yes/No	Deviation if any
1	15U wall mount rack: 600mm width/500mm depth, 19" fully modular design with UL listed , Top cover & bottom cover with the cable entry provision.		
2	Front tinted vented door. With lock and key		
3	A/c main distribution box with 6 nos.5/15 amp sockets and MCB – 1 No.		

4	19" Cable Manager 1U -4 No.		
5	Front panel mounting hardware.- 1 Pkt.		
6	230V AC 90 CFM Fan – 2 No.		
7	At least 1.5" clear space at the sides between mounting angle and side panels all along height.		
8	Cable entry provision: Shall be provided with 35mm round knock outs in the top and bottom covers which are edge protected by rubber grommets to prevent cable damage.		

SPECIFICATION FOR 9U LAN RACK:

SN	Specification	Compliance Yes/No	Deviation if any
1	9U wall mount rack: 600mm width/500mm depth, 19" fully modular design with UL listed, Top cover & bottom cover with the cable entry provision.		
2	Front tinted glass door. With lock and key		
3	A/c main distribution box with 5 nos.5/15 amp sockets and MCB – 1 No.		
4	19" Cable Manager 1U -1 No.		
5	Front panel mounting hardware.- 1 Pkt.		
6	230V AC 90 CFM Fan – 2 No.		
7	At least 1.5" clear space at the sides between mounting angle and side panels all along height.		
8	Cable entry provision: Shall be provided with 35mm round knock outs in the top and bottom covers which are edge protected by rubber grommets to prevent cable damage		

Notes for all online UPS systems: They shall be supplied with Network monitoring cards and necessary software for remote monitoring/management. Battery make shall be of preferably of Exide / Global & Yuasa (Rocket) / Panasonic / Amararaja (Quanta) or equivalent. Bidder shall propose optimal solution in terms of number of batteries.

TECHNICAL SPECIFICATIONS FOR 10 KVA, 1+1 PARALLEL REDUNDANT UPS SYSTEM

Sl No	Parameters	Tender Requirements	Compliance
1	**Mandatory Features**		
1.1	DSP Based Technology	Should be True On Line UPS with double conversion technology based on **DSP (Digital Signal Processing)**	
1.2	Rectifier	UPS should have **IGBT based Rectifier** and Inverter.	
1.3	Reverse Phase Sequence Operation	UPS should have facility of **Reverse Phase Sequence Operation**.	
1.4	Inbuilt Isolation Transformer	Should have Inbuilt Isolation transformer at output side of UPS system	
1.5	Parallel Redundancy	2 Nos 10 kVA UPS should be able to be used in (1+1) Parallel redudant mode with current sharing facility.	
1.6	Transient Voltage Surge Suppressor	A 50 kA Transient Voltage Surge Suppressor or better has to be used with the UPS system. The TVSS should	

		have a response time of < 0.5 nano seconds or better and should be UL listed. TVSS should have all mode protection. TVSS should be of same make as the UPS.	
2	**INPUT RATINGS**		
2.1	Input to UPS	415V, 3-Phase,4wire	
2.2	Input Voltage Variation	+25%,-30% or better	
2.3	Input Frequency	50 HZ ±5%	
2.4	Power Walk in	Progressive over 10 seconds	
2.5	Power Factor at rated Load	Greater than 0.9	
2.6	Operation with Reverse Phase Sequence	Should be Possible	
3	**Bypass Parameters**		
3.1	Bypass Supply Voltage	220/230/240V AC (selectable)	
4	**DC Parameters**		
4.1	Nominal DC Bus Voltage	356V or better	
4.2	Permissible DC Voltage Variation	260V – 410V or better	
4.3	DC Bus OV trip	410V or better	
4.4	End of Discharge DC Bus	260V or better	
4.5	Types of Batteries	SMF	
4.6	Nominal Battery Float Voltage	356V	
4.7	Max.Batt.Charging Current	7.5A or better	
4.8	DC ripple	<2% rms	
4.9	D.C Voltage Regulation	±1%	
5	**BATTERY DETAILS**		
5.1	Voltage limits for Inv operation	260V DC to 410V DC	
5.2	SMF Batteries	Should have SMF batteries of 12 V each, the bidder should propose optimal solution in terms of number of batteries	
5.3	Backup	2 Hour	
5.4	Battery Make	Exide/ Global & Yuasa (Rocket) / Panasonic / Amararaja (Quanta) or equivalent	
5.5	Total Battery VAH required	2 Sets of Battery Banks of Minimum 31200 VAH. Each Battery Bank has to be provided for 60 minutes backup	
5.6	Float Charge Voltage	356VDC	
5.7	Max Charging Current	7A or better	
6	**Output Parameters**		
6.1	Output Voltage	220/230/240 VAC 1 Phase (selectable)	
6.2	Frequency	50Hz ±2.5% or better	
6.3	Power Rating at 0.8 p.f.	10kVA	
6.4	Overload Rating	110% for 60 minutes 125% for 10 minutes	

		150% for 1 minutes	
6.5	Maximum Non-linear load permissible	100% with Crest Factor of 3:1	
6.6	Output Voltage Regulation	±1% or better	
6.7	Transient response for 100% load change	±10% or better	
6.8	Recovery Time	10 millisecond or better	
6.9	Freq. stability unsynchronized- Synchronized	±0.1% ±1Hz or better	
6.10	Max. Rate of Change of Frequency	0.2/0.4Hz/sec or better	
6.11	Output Voltage Distortion	<3% at Non Linear Load <2% at Linear Load	
6.12	Transfer Time synchronized-	0 millisecond	
6.13	Unsynchronized	20 millisecond or better	
7	**MECHANICAL PARAMETERS**		
7.1	Cooling	Forced Air Cooled	
8	**ENVIRONMENTAL PARAMETERS**		
8.1	Operating Temperature	0°C to 45°C,continuous or better	
8.2	Storage Temperature	0°C to 70°C or better	
8.3	Relative Humidity	95%RH or better	
9	**ELIGIBILITY CRITERION**		
9.1	Manufacturer of the UPS systems should be ISO 9001:2008 certified. Please enclose certificate	Mandatory. Please enclose certificate	
9.2	Manufacturer of the UPS systems should be ISO 14001 certified. Please enclose certificate	Mandatory. Please enclose certificate	

Technical Specification of 6 KVA UPS System:

Sl.No	Parameters	Specifications	Compliance (Yes/No)
2	Capacity	6 KVA / 4800W	
3	Rectifier Type	IGBT	
4	Phase	Should be able to work on Single Phase as well as Three Phase Four Wire AC (selectable)	
5	Input Voltage Range	Single-Phase: 120Vac~276Vac Three-Phase: 204V~470V AC or better	
6	Input Frequency Range	45~55 Hz or better	
7	Input power Factor	>=0.99 Single Phase, >=0.95 Three Phase	
8	Battery Type	SMF / Lead Acid Maintenance Free Battery	
9	Battery Backup Time	30 minutes	

10	Output Rated Power	6 KVA/4.8 Kw	
11	Output Voltage	220 VAC	
12	Output Voltage precision	3% or better	
13	Output frequency precision	0.25% or better	
14	Output Voltage THD	<3% Linear, <5% Non Linear or better	
15	Crest Factor	3:1	
16	Overload rating	125% for 1 Minute or better	
17	System Efficiency	90% or better	
18	Noise	<50 dB or better	
19	Safety	At least IEC/EN62040-1-1	
20	Electro Magnetic Compatibility	At least IEC/EN62040-2, IEC/EN61000-3-11, IEC/EN61000-3-12,YD/T1095-2008	
21	Surge Protection	At least IEC/EN62049-2, meeting IEC/EN61000-4-5	
22	Protection Level	IP 20	
23	Operating Temperature	0-40 Degree C or better	
24	Relative Humidity	0-95% without condensation or better	
25	Transient Voltage Surge Suppressor	A 25 kA Transient Voltage Surge Suppressor or better has to be used with the UPS system. The TVSS should have a response time of < 0.5 nano seconds and should be UL listed. TVSS should have all mode protection. TVSS should be of same make as the UPS.	
26	Manufacturer of the UPS systems should be ISO 9001:2008 certified. Please enclose certificate	Mandatory. Please enclose certificate	
27	Manufacturer of the UPS systems should be ISO 14001 certified. Please enclose certificate	Mandatory. Please enclose certificate	

TECHNICAL SPECIFICATION OF UPS 3KVA:

Batteries make shall be of preferably of Exide / Global & Yuasa (Rocket) / Panasonic / Amararaja (Quanta) or equivalent. Bidder shall propose optimal solution in terms of number of batteries.

S.No.	Parameters	Specifications	Compliance (Yes/No)
	OUTPUT PARAMETER		
1	Capacity	3kVA/ 2400 W	
2	Power Factor	0.8	
3	Wave Form	Pure Sine Wave (Online Double Conversion)	
4	Nominal Voltage	220/230/240 V (selectable)	
5	Voltage THD	<4% Linear Load, <=7% -Non Linear Load or better	
6	Frequency Regulation-Free Run (Unsynchronized with Bypass)	±0.5 Hz or better	
7	Frequency Regulation (Synchronized with Bypass)	47.5 to 52.5 Hz	
8	Crest Factor	3:1 max	
9	AC-AC Efficiency	88% at R-Load, 87%RCD-Load or better	

10	Transfer Time Mains-Battery	0 millisec	
11	Transfer Time Inverter-Bypass	4msec or better	
	INPUT PARAMETERS		
1	Configuration	1Ph,L-N+PE	
2	Nominal Voltage	230 Vac	
3	Voltage Range	160V to 300V at 100% Load, 110V to 300 V at 60% Load	
4	Frequency	50Hz	
5	Freq Range	50Hz ±5% Hz	
6	PF	0.95	
	BATTERY CHARGER		
1	Nominal Float Voltage	82.1Vdc	
2	Max Charging Current	1Amps	
	BATTERY PARAMETERS		
1	Type	SMF	
2	Backup Time	30 minutes	
	ENVIRONMENTAL PARAMETER		
1	Operating Temperature	0 to 40 deg°C or better	
2	Storage Temperature	-20 to 50 deg°C or better	
3	Noise Level	<45db or better	
4	Protection	IP20	
5	Communication Port	RS232, USB	
6	EPO	Yes	
	STANDARDS		
1	EMI	EN62040-2 : 2006	
2	SAFETY	EN62040-1-1 : 2003	
3	PERFORMANCE	IEC / EN 62040-3	

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Chapter-V
Price bid Schedule (to be utilized by the bidder for their quotes)
Format for submission of Price bid (Active Component)

SN	Name Of Equipment	Qty	UoM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned quantity
1	L3 Core Chassis/Modular minimum 6/8 universal slots Switch with all network line cards and modules populated , Switch should Work on Active –Active Cluster	2	Nos							
2	Server Farm L3 Switch 24 Port 10/100/1000 Base T + 4 Nos SFP+ Port work on Active-Active Cluster	2	Nos							
3	Distribution switch Type-1 L3 Switch Chassis/Modular minimum 6/8 universal slots Switch with all network line cards and modules populated	2	Nos							
4	Distribution Type-2 Switch with 24 10/100/1000 + 4 SFP+ Slots	7	Nos							
5	Managed Access Switch 24 Nos 10/100/1000 Copper + 4 Como SFP ports	90	Nos							
6	1G SM SFP Module	54	Nos							
7	10F SM SFP+ Module	36	Nos							
8	Network Management software with all software licenses to manage 500 end points and required hardware	1	Nos							
9	Radius / AAA security solution	2	Nos							
10	Firewall with Content filtering, IPS, IDS with 10G ports	2	Nos							

Read, understood and Complied with

Signature of bidder with seal

SN	Name Of Equipment	Qty	UoM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned quantities
11	Wireless Controller with 44 AP licence	2	Nos							
12	Wireless Indoor Access Points	30	Nos							
13	Wireless Outdoor Access Points	14	Nos							
14	Outdoor Panel 7.5dBi (5.5dBi)135 degrees antenna	6	Nos							
15	12 dBi 2.4 – 2.5 GHz OMNI DIRECTIONAL ANTENNA	22	Nos							
16	Gigabit High Power POE with IEEE802.3at detection	44	Nos							
17	Outdoor Weather Proof Housing with Mounting bracket for external AP's Power supply	14	Nos							
18	3 Mtr Pole	14	Nos							
19	IP PBX Telephony Server	2	Nos							
20	SIP IP Phone	250	Nos							
21	Analog Phones	120	Nos							
22	Multi-service Switch	54	Nos							

Read, understood and Complied with

Signature of bidder with seal

PASSIVE, RACK and UPS Price Format

FIBER OPTIC DETAILS										
SR. NO.	**Name Of Equipment**	**Qty**	**UoM**	**Make**	**Model**	**Part No**	**Unit Rate**	**Taxes**	**Total unit price**	**Cost as per mentioned qty.**
1	Unitube Armoured Cable SM, 6 Core, 9um	9500	Mtrs							
2	Unitube Armoured Cable SM, 12 Core, 9um	5500	Mtrs							
3	1U,48-Port Fibre Sliding Enclosure, loaded with LC Connectors.19" Rack Mount alog with splicing tray	5	Nos							
4	1U,19''12 Port rackmount Fiber Sliding Enclosure loaded with LC Connectors with Splicing tray	37	Nos							
5	LC single-mode pigtail 1.5m	684	Nos							
6	LC-LC duplex single-mode patch cord 3m	144	Nos							
7	Cement Route Makers	200	Nos							

UTP CABLE DETAILS										
SR. NO.	**Name Of Equipment**	**Qty**	**UoM**	**Make**	**Model**	**Part No**	**Unit Rate**	**Taxes**	**Total unit price**	**Cost as per mentioned qty.**
1	Cat.6 4pr UTP Cable 305m Blue FR PVC	210	Boxes							
2	UTP 24-port Patch Panel, loaded	102	Nos							
3	SOCKET RJ45 CAT6 SHUTTERED KSTONE BLUE	1400	Nos							
4	WALL PLATE 1-PORT N/SHUTTERED	1400	Nos							

Read, understood and Complied with

Signature of bidder with seal

SR. NO.	Name Of Equipment	Qty	UoM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned qty
5	BACK BOX –(Surface Mount Box) For Single and Dual	1400	Nos							
6	Cat6 Patch Cord UTP 1M LSZH, Blue	1400	Nos							
7	Cat6 Patch Cord UTP 2M LSZH, Blue	1400	Nos							
UTP CABLE DETAILS (FOR RESIDENCE)										
1	Cat.6 4pr UTP Cable 305m Blue FR PVC	25	Boxes							
2	SOCKET RJ45 CAT6 SHUTTERED KSTONE BLUE – Room Side	400	Nos							
3	WALL PLATE 2-PORT N/SHUTTERED	200	Nos							
4	BACK BOX –(Surface Mount Box) For Dual	200	Nos							
5	Cat6 Patch Cord UTP 1M LSZH, Blue	400	Nos							
6	RJ-45 Connector Box of 100 Pic	4	Boxes							
RACKS										
1	42U rack with Accessories	2	Nos							
2	15U rack with Accessories	30	Nos							
3	9U Rack with Accessories	2	Nos							
4	Supply & Installation of 25/3 mm Copper Earth Strips run along the wall of various cut-outs complete in all respects including mounting channels, nuts-bolts..,etc with all necessary accessories complete. **Standard ISI Marked.**	500	Mtrs							

	UPS									
SR. NO.	**Name Of Equipment**	**Qty**	**UoM**	**Make**	**Model**	**Part No**	**Unit Rate**	**Taxes**	**Total unit price**	**Cost as per mentioned quantities**
1	On-Line UPS, 4800 Watts / 6000 VA, Input 230V / Output 230V , Interface Port DB-9 RS-232, SmartSlot , Extended runtime model , Rack Height 2 U	2	Nos							
2	Battery required for 60 min Backup for 6KVA UPS	2	Nos							
3	Battery Rack and Interlink cable for 6KVA UPS and TVSS	2	Nos							
4	Online UPS will be offered, 2400 Watts / 3000 VA, Input 230V / Output 230V , Interface Port DB-9 RS-232, SmartSlot, USB. Battery required for 1 hour Back-up, with Rack and Cable	9	Nos							
5	Online UPS in N+1 Prallel Mode 8 kW / 10 kVA, Input 415V / Output 230V , Interface Port DB-9 RS-232, RJ-45 10/100	2	Nos							
6	Battery Bank has to be provided for 60 min. backup for 10KVA UPS	2	Nos							
7	Battery Rack & Inter connecting cable for 10KVA and TVSS 50KA	2	Nos							
8	500 VA Line Interactive UPS	2	Nos							

PRICE FORMAT FOR SERVICE COMPONENTS

Sr	Name of the Item		UOM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned quantities
1	Laying of UTP Cable with 1" PVC conduit which includes bends, collars, junction box & fixing hardwires	71065	Mtrs							
2	Information Outlet termination	1,500	Nos							
3	24 Port Patch Panel Installation & Termination	102	Nos							
4	SM Connector - Splicing / Connectorisation	684	Nos							
5	42U Network Rack Installation With Fixing All Accessories & Dressing	2	Nos							
6	9U & 15U Rack Installation With Fixing All Accessories & Dressing	32.00	Nos							
7	Laying OFC over head through the designated poles with necessary accessories required to complete the installation.	2,500	Mtrs							

Read, understood and Complied with

Signature of bidder with seal

Sr	Name of the Item		UOM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned quantities
8	Outdoor Soil Cutting, Digging and Singlemode O F Cable laying through HDPE Pipe on underground routes including all materials. Excavating trenches of A type with dimensions of trench as Top width 30 cms, bottom width 25 cms and depth upto 60 cms including back filling, Compacting (after laying the cable(s) and removing excess earth from site) – Billing shall be done as per actual	12,500	Mtrs							
9	Fixing of Route markers	200	Nos							
10	Installation charges for active Switching component, NMS, AAA/RADIUS Server	1	Set							
11	Installation charges for Firewall Component	1	Set							
12	Installation charges for Wireless Controller, Aps , Antenna, Pole etc	1	Set							
13	Installation charges for IP PBX Server	1	Set							
14	Installation Charges for UPS	1	Set							
15	Project Testing, Labeling, Commissioning, Warranty, Certification for passive & Management with on-site Free of Cost product Support for three Year	1	Set							

Read, understood and Complied with

Signature of bidder with seal

Sr	Name of the Item		UOM	Make	Model	Part No	Unit Rate	Taxes	Total unit price	Cost as per mentioned quantities
16	Residence Engineer (3 nos) for Maintaining Data Voice network for 3 Year	1	Set							

OVERALL QUOTES FOR THE QUANTITIES OF THE ACTIVE, PASSIVE COMPONENTS AND SERVICES MENTIONED IN CHAPTER-III & CHAPTER-IV.

(Please refer point 73 of Chapter-I)

SR	COMPONENTS	COST (INCLUSIVE OF TAXES IN INR)
1.	Total cost of the all the Active components including data, IP Telephony, Wireless devices, security devices, software licenses, etc., and their installation with integration of data, voice services for the quantities mentioned against each item above	
2.	Total cost of Passive devices, racks including laying, fitting, installation, testing, etc, for the quantities mentioned against each item above.	
3.	Total cost of UPSs and their installation the quantities mentioned against each UPS above	
4.	Total Cost for provision of Resident Engineers (3 nos) for Maintaining Data Voice network for 3 Year	
5.	Other charges, if any (please specify in brief)	
	Grand Total of *complete end-to-end solution* comprising of all the components enumerated above	
In words Rs……		

Please note that there must not be any hidden costs later on and no amount other than above mentioned end-to-end solution cost (Grand Total) will be permissible for evaluation purpose.

Read, understood and Complied with

Signature of bidder with seal

ANNUAL MAINTENANCE CONTRACT (AMC) QUOTES FOR THE CAMPUS WIDE LAN, WIRELESS, IP-TELEPHONY AFTER THE COMPLETION OF THREE YEARS ON-SITE WARRANTY PERIOD.
(Please refer Capter-II, point 36-5)

Sr	Description	Quantity	Cost (INR)	Tax (INR)	Total Amount (INR)
a	First Year	**CAMPUS-WIDE**			
b	Second year				
c	Third Year				

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Chapter-VI: Other Forms to be submitted

Form 1: BIDDER'S SELF INFORMATION FORM

S.No.	Information	Details		
1.	Tender Enquiry No. and Date			
2.	Bidder's Reference No. and Date			
3.	Name of firm			
4.	Address of firm			
5.	Telephone No.			
6.	Fax No.			
7.	E-mail Id:			
8.	Website, if any			
9.	*Permanent Account No:			
10.	*Sales Tax Registration No.			
11.	*Service Tax Registration No.			
12.	*Financial turnover of 2010-2011	*In INR in figures as well as words*		
13.	*Financial turnover of 2011-2012	*In INR in figures as well as words*		
14.	*Financial turnover of 2012-2013	*In INR in figures as well as words*		
15.	Details of the authorized signatory of the bidder including name, designation and Postal address with telephone, mobile, fax and email (Add rows to include all authorized signatories)		*(Affix* authorized signatory's *signature in this space)*	*(Affix* authorized signatory's *recent coloured passport size photo in this space)*
17.	Details of the officer (**Bidder's Project Manager** for this project) to whom all references shall be made regarding this tender enquiry including name, designation and postal address with telephone, mobile, fax and email		*(Affix officer's signature in this space)*	*(Affix officer's recent coloured passport size photo in this space)*
18.	Bid Processing fee Details			
19.	EMD Details			

*Attach Attested Copies

Signature: **Seal of the company**

Date:

Name:

Designation:

Place:

Company:

Form 2: FORM FOR SUBMISSION OF BIDS

NIT Raipur Tender Enquiry No: _____

Due to open on: _____ at _____ (time)

Bidder's Ref No:

To
The Registrar
NIT Raipur
Chhattisgarh, India

Dear Sir

Having examined the conditions of the contract as specified in the Bid Documents and the Specifications and Allied Technical Details including revisions / amendments / corrections / corrigenda Nos. _____ the receipt of which is hereby duly acknowledged, we the undersigned offer to supply and deliver **Campus Wide Extension of Institute Building LAN (Wired and Wireless) and IP Telephony Solution** in conformity with the said drawings, conditions of contract, and specifications for the sum of mentioned in the **Price Schedule**, or such other sums as may be ascertained in accordance with the schedule of prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted to complete delivery of all the ordered items by us specified in the contract within 8-12 weeks from the date of issue of your Purchase Order. If our Bid is accepted, we will furnish the performance guarantee of a Nationalised Bank for a sum not exceeding 10 percent, of the contract sum. We agree to abide by this Bid for a period of 180 days from the date fixed for Bid opening and it shall remain binding upon us and may be accepted at any time before the expiration of that period. Until a formal Purchase Order or contract is prepared and executed this Bid together with your written acceptance thereof in your notification of award shall constitute a binding contract between us. Bid submitted by us is properly sealed and prepared so as to prevent any subsequent alteration and replacement.

We understand that you are not bound to accept any or all bids you may receive.

Date this day of _____

Signature _____

(Name in Block Letters of the Signatory)
In capacity of

Witness
Duly authorised to sign the bid for and on behalf of **(Attach Power of Attorney)**

Address: _____

Signature: _____

Form 3: MANUFACTURER'S AUTHORIZATION TO BIDDER

We M/s Manufacturer's Name are Manufacturers of product name marketed and sold under the brand name.

Our main office in India is located at Indian office address.

We hereby authorise M/s Bidder's Name & Office Address to represent us, to bid, negotiate and conclude the contract on our behalf with you.

Our authorized bidder M/s Bidder's Name shall quote the items mentioned in the list below manufactured by us in Tender No. _____ dated _____ of your organization.

List of Items Manufactured

1.
2.
3.
4.
5.

We undertake all of the following:

An authorized representative of the bidding organization and NIT Raipur can log complaints / open support cases directly with us through phone / email / web during the initial and extended warranty periods.

Problems in equipment which cause downtime / degradation of services and resolution of which require development of patches, bug fixes etc. shall be treated by us on urgent basis.

If such equipment has to be taken by us to the factory for repair / replacement we shall arrange an alternative through the bidder, if required, so that service continuity is maintained.

As Manufacturers we shall also be responsible for providing the bidder with necessary products and accessories on time to ensure timely implementation of the project.

We shall ensure that the warranty and service commitments in the tender are met.

We shall ensure the availability of spares for a period of 05 years for the aforementioned items. If applicable, we shall also ensure the availability of software upgrades, if any.

In case of default in execution of the project as per this tender by our authorized bidder M/s Bidder's Name, then we M/s Manufacturer's Name shall initiate necessary actions for successful execution of this project as per this tender through our authorized partner/partners.

Yours faithfully,

(Name)
For and on behalf of
M/s Manufacturer's Name

Signature of Witness
Dated:
Place:

Signature of Manufacturer
Dated:
Place:

Note: This authorization letter should be on the letter-head of the manufacturing concern and should be signed by a person not less than the level of regional head/manager.

Form 4: FORM FOR AFTER SALES SERVICE / TECHNICAL ASSISTANCE CENTRES IN INDIA

The service / technical assistance centres in India listed below are fully functional and equipped with spares and skilled manpower for providing satisfactory after sales services of the equipment supplied by us under this contract.

S.no.	Name of equipment	Name of Manufacturer	Nearest Service Centre address	Service Contact person With tel. no. and E-mail ID
1.				
2.				
3.				

Bidder shall quote only those products whose manufactures have their own after sales service / Technical Assistance centre in India.

Bidder shall provide details of OEM certified engineers in bidder's organization on network switching devices, multi-function firewall devices, wireless, and IP telephony quoted by the bidder and the same shall be on respective OEMs letter head.

S.no.	Name of Certified Engineer	Name of Active OEM	Contact person Name With tel. no. and E-mail ID
1.			
2.			
3.			

Date:

Place:

Signature:

Name:

Designation

Company:

Seal:

Form 5: FORM FOR WARRANTY

We warrant that the equipment to be supplied by us hereunder shall be brand new, free from all encumbrances, defects and faults in material workmanship and manufacture and shall be of the highest grade and equally consistent with the established and generally accepted standards for material of the type ordered shall be in full conformity with the specifications, drawings or samples, if any, and shall operate properly. We shall be fully responsible for its efficient and effective operation. This warranty shall survive inspection of and payment for and acceptance of the goods, but shall expire 30 months (to be called warranty period) from after their successful installation and acceptance by the purchaser or warranty period plus 6 months from the date of completion of supply of material.

We also warrant that the function contained in the system software if any will meet the manufacturer's specification together with any clarifications given by us and that the operation of these firmware will be uninterrupted and error free and all software defects, if any will be corrected by us.

The obligations under the warranty expressed above shall include all costs and taxes relating to labour, spares maintenance (preventive and unscheduled) and transport charges from site to manufacturers works and back and for repair/adjustment or replacement at site of any part of equipment which under normal care and proper use and maintenance proves defective in design, material or workmanship or falls to operate effectively and efficiently or conform to the specifications and for which notice is promptly given by the purchaser to the supplier.

---------- ----------

Signature of the Witness **Signature of the Bidder**

Date:

Seal of the company

Form 6: FORM FOR STATEMENT OF DEVIATIONS FROM TENDER CONDITIONS

The following are the particulars of deviations from the requirements of the tender

Clause of Tender	Deviation from the Clause	Remarks (including justification)

Date:

Place:

Signature:

Name:

Designation

Company:

Seal:

Form 7: FORM OF BANK GUARANTEE FOR 5% OF CONTRACT VALUE FOR CONTRACT PERFORMANCE GUARANTEE BOND FOR CAMPUS WIDE EXTENSION OF INSTITUTE BUILDING LAN (WIRED AND WIRELESS) AND IP TELEPHONY AT NIT RAIPUR

Ref…….. Date ……..
Bank Guarantee No……

To
Director
National Institute of Technology
G.E. Road
Raipur.

1. Against contract vide Advance Acceptance of the Tender No…….. dated ……covering supply/ installation/commissioning of ……hereinafter called the 'Contract'), entered into between the Director, National Institute of Technology, Raipur (hereinafter called the NIT Raipur) and……(hereinafter called the 'Contractor') this is to certify that at the require of the Contractor we ……Bank Ltd., are holding in trust in favour of the Director, NIT Raipur, the amount of ……..(write the sum here in words) to indemnify and keep indemnified the Director, NIT Raipur against any loss or damage that may be caused or likely to be caused to or suffered by Director, NIT Raipur by reason of any breach by the Contractor of any of the terms and conditions of the said contract and/or the performance thereof 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 Contractor and amount of loss or damage that has been caused or suffered by Director, NIT Raipur shall be final and binding on us and the amount of the said loss or damage shall be paid by us forth with on demand and without demur to Director, NIT Raipur.

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 fulfilment in all respects of the said contract by the Contractor i.e. till ……(viz. the date up to 3 months after the last date of warranty on goods/services supplied under the contract) 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. Payment under this letter of guarantee shall be made promptly upon our receipt of notice to that effect from Director, NIT Raipur.

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 Director, NIT Raipur.

4. We ……..Bank Ltd., further agree that the NIT Raipur 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 Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by NIT

Raipur against the said Contractor and to forbear or enforce any of the terms and conditions relating to the said contract and We …….Bank Ltd., shall not be released from our liability under this guarantee by reason of any such variation of extension being granted to the said Contractor or for any forbearance and or omission on the part of NIT Raipur or any indulgence by NIT Raipur to the said Contractor or by any other matter the effect of so releasing us from our liability under this guarantee.

5. We …….Bank Ltd., further agree that the guarantee herein contained shall not be affected by any change in the constitution of the said Contractor.

Date…… **Signature …….**

Place ……. **Printed Name……..**

Witness …… **…….**
(Designation)

…….

(Bank's Common Seal)

Form 8: FORM FOR SUBMISSION OF SIMILAR WORKS EXECUTED BY BIDDER AS PROOF OF ELIGIBILITY

S.No.	Name of the Client Organization	Project Cost (in lakhs)	Nature of Work	Contact Person Of Client Organization with Name, Designation, E-mail and Mobile Number	Remarks	Purchase order & Work Completion Certificate (Yes/No)
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Date:

Place:

Signature:

Name:

Designation

Company:

Seal:

Form 9: FORM FOR PRE-BID CLARIFICATION

Bidder is required to submit e-mail with subject "Pre-bid Clarification" to nitnet@nitrr.ac.in. Bidder should attach two file attachments with this e-mail

(i) duly-filled table below as spreadsheet
(ii) a scanned copy of this form

If bidder does not comply with aforementioned, or sends beyond the last date for pre-bid clarification as mentioned, such pre-bid queries shall be ignored.

S.No.	Chapter No.	Section No.	Page No.	Clause	Query	Remark
1.						
2.						
3.						
4.						
5.						

Date and Time (IST):

Signature:

Name:

Company:

Contact Number:

Address:

Seal:

Form 10: PRELIMINARY TEST CERTIFICATE

SUB: INSPECTION DEMAND NOTE

PURCHASE ORDER NO: **DATED:**

Against the above mentioned purchase order. The items detailed below have been received on _____.

Equipment		Description			
S.No.	Physical Check	Power On Test	Firmware / Software		Remarks

Witnesses:

Bidder's Representatives

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

CCC Committee Members

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

Form 11: FINAL COMMISSIONING CERTIFICATE

Purchase Order No. : _____ Dated: _____

Project Nomenclature :_____

Name and Address of Contractor:_____

Against the above mentioned Purchase Order, the items detailed below have been successfully commissioned after installation and tested. The manuals, documentation, and training as required have also been provided by the vendor as per specification in the PO.

S.No.	Item Description	Quantity

Witnesses:

Bidder's Representatives

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

CCC Members

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

Read, understood and Complied with

Signature of bidder with seal

Annexure—1

Schedule of Equipment for which Technical Compliance Sheets have to be submitted after getting them duly vetted and attested by the Manufacturer

S.No.	Name of Item
1.	Network Switches
2.	UTM Firewalls
3.	Wireless Controllers and Access Points
4.	IP PBX
5.	IP Phones
6.	Passive Network Cabling & Connectivity Components including a) UTP cables and related components, and b) OFC cables and related components
7.	UPS Systems
8.	Network Racks

Annexure-2

Schedule of individual line items whose Manufacturers have to be same

S.No.	Name of Item
1.	Network switches and switch accessories like transceiver modules
2.	UTMs
3.	Wireless controller and access points
4.	IP-PBX
5.	IP Phones
6.	Analog Phones
7.	Multi-Service Switches
8.	Passive Network Cabling & Connectivity Components including a) UTP cables and related components, and b) OFC cables and related components
9.	Electric accessories like switch boards, electric cables, wires, etc.
10.	UPS Systems
11.	UPS Batteries
12.	Battery Racks (if manufactured & not custom fabricated)
13.	Network Racks
14.	Casing and capping (of same dimensions)
15.	HDPE ducts (of same dimensions)
16.	GI pipes (of same dimensions)

Annexure : 3

Schedule of Buildings to be Networked with Tentative Active Ports Count

S.No.	Buildings / Building Blocks to be Networked	No. of Rooms	No. of Occupants per Room	Ports/ Occupant	No. of Ports	Remarks
	Boys Hostels					
1.	Hostel 'A'	52+1	2	1	106	
2.	Hostel 'B'	50+1	2	1	102	
3.	Hostel 'C'	4+1	2	1	150	
		35	4	1		
4.	Hostel 'D'	4+1	2	1	158	
		37	4	1		
6.	Hostel 'F'	4+1	2	1	158	
		37	4	1		
7.	New Boys Hostel	-	-	1	800	UTP cabling done, Feruling and labelling not done
	Girls Hostels					
8.	Hostel 'E'	3+1	2	8	140	
		30	4	120		
		1	12	12		
9.	Hostel 'G'	101	-	1	230	
10.	P.G.	16	3		56	
		4	2			
				Total	1900	

S. No	Staff Residence Type	No. of Staff Residences	No. of Voice Ports/Res.	No. of Data Ports/Res.	Total No. of Voice Ports	Total No. of Data Ports
1.	C	1	2	4	2	4
2.	D	7	1	2	7	14
3.	E	16			16	32
4.	F	28			28	56
	G	24			24	48
				Total	77	154

Buildings:-

S.No.	Building	No. of Voice Ports / Building	No. of Data Ports / Building
1.	Guest House	2	4
2.	Dispensary	2	2
3.	Sports Office	2	2
4.	NCC Office	2	2
	Total	8	10

Provision for variation of 15% data ports keeping in mind common areas, spare ports, port redundancy, ports for indoor and outdoor wireless access points and any other IP based devices, and future scalability. With this in view, total number of data ports is ~2250 including new boys hostel comprising of 800 ports for which access side passive part is complete.

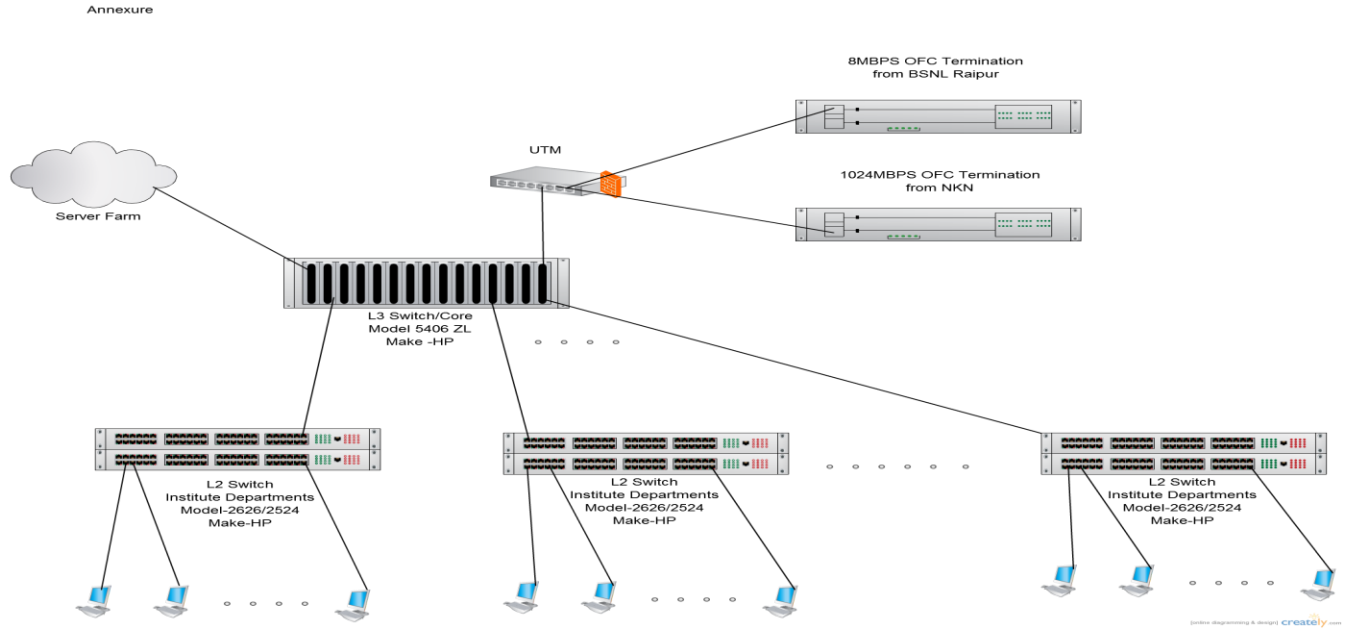
Annexure - 4
Overview of Existing LAN in NIT Raipur

Presently the Institute network caters to two institute instructional buildings, namely the Institute Main Building and the Architecture Building. The current network topology is a STAR configured around a HP ProCurve 5406Zl layer Core Switch, presently supporting eighteen 1 Gbps multimode fiber (backbone) ports with current extension capability of 24 fiber ports. 24 1-GbE Ethernet ports are also being used in addition to fiber ports. A topology of the current network is shown in Figure-1. The address table size of the switch is 10000 entries and switching capacity is 288 Gbps. Further 48 extension slots each for 1-GbE (fiber and copper) can be made available. The Core is fully managed and separate V-LANs have been created for different departments and offices.

About 50 managed layer 2 switches, HP ProCurve 2626/2524 are used as edge switches which are mostly located at different departments and offices at different floors of the Institute building and support nearly 1000 I/O points. 100 Mbps pipe has been ensured at each system connected to the network. The Institute at present uses the network for intranet services like Academic MIS, Software like ANSYS, MATLAB, SPSS, E-Learning, Anti-Virus, and to access the Internet. The entire network is wired and very limited wireless access is currently provided to the users. All HP ProCurve switches are under lifetime warranty.

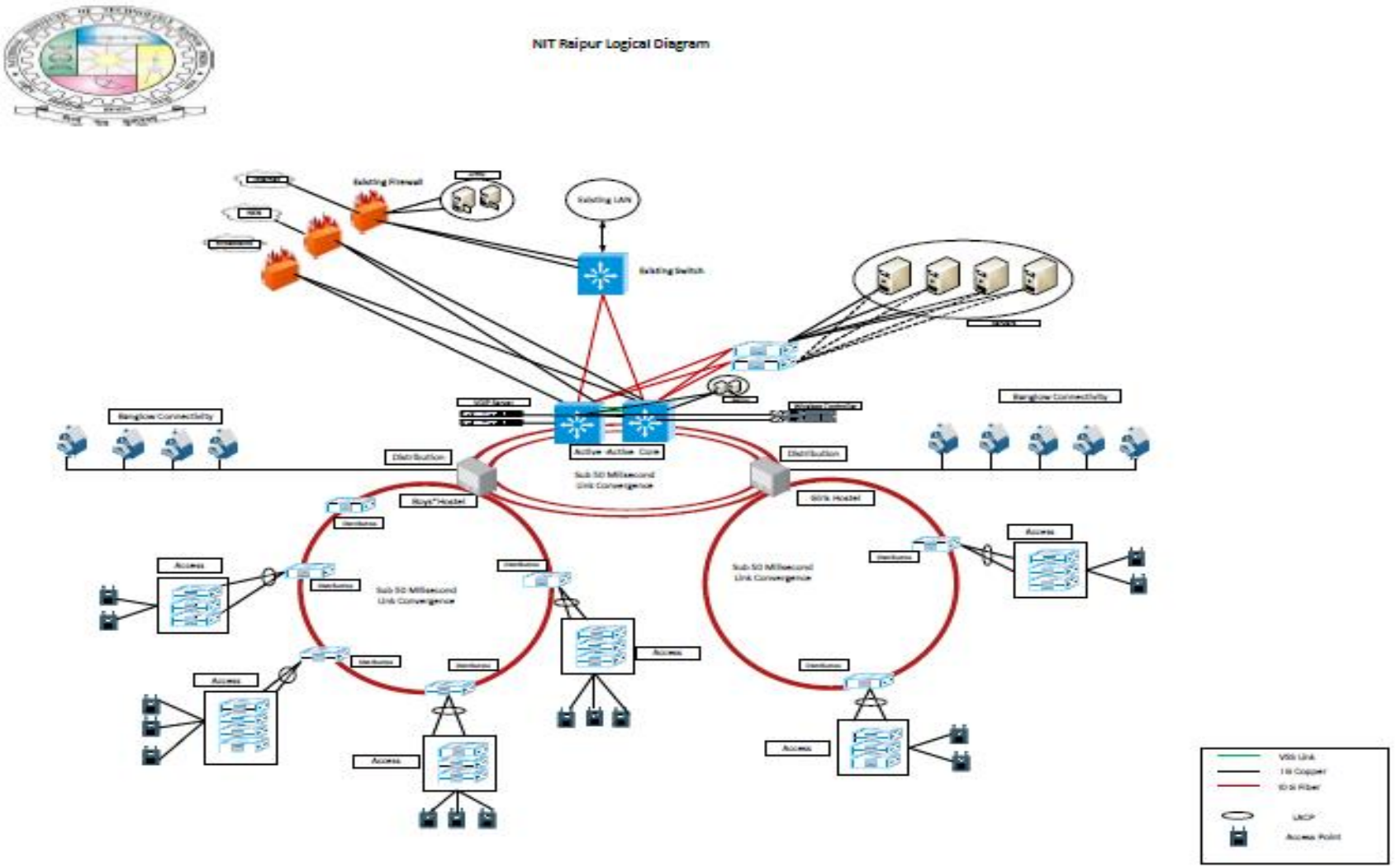
The Institute has two ISPs at present, 8 Mbps leased port from BSNL available through a fiber ring from the main exchange and a nearby sub-exchange, other 1-Gbps link is provided by NIC under National Knowledge Network (NKN) program of Government of India. The Institute Internet traffic is shared among these two through a UTM. The Institute hosts its own web server while the mail server is hosted on the cloud.

Figure-1



Read, understood and Complied with

Signature of bidder with seal



Annexure - 5

Read, understood and Complied with

Signature of bidder with seal

Annexure 6

Table of Tentative locations of outdoor hotspots

Sr	Location/area of the hotspot	# of Access points	Antenna		# of 3 meter poles
			135 deg. 2.4 GHz	Omni 2.4 GHz	
1.	**Boys Hostel:** in front of hostel C and the New boys hostel	5	2	8	5
2.	**Boys Hostel:** Garden area of boys hostel A, B, C, D and F.	6	4	8	6
3.	**Girls Hostel:** Front Garden area	1	---	2	1.
4.	**Institute Building:** Front Garden area	2	---	4	2
	Total	14	6	22	14

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Annexure 7: Proof of Concept

TESTS to be performed (Proof of Concept) – May require before price Bid opening.

For conducting the following tests the vendor/supplier/OEM has to source the required equipment.

(A) Test - Communication ports:

Setup the switch; plug in a lap-top's Gigabit interface and observe LED status indications. Use ping for communication test. See that the port status reported by lap-top matches with that reported by equipment.

Note
: - This is a very “low level" approach to the necessary testing and is the most economic, but, manual way of doing it. However, a contractor can bring in a Network LAN tester (offered by Fluke for example) and just read out those values.

- Outcome:
1. LED status, lap-top port status, port status reported by equipment or LED status, port status reported by equipment and read out of the Network LAN tester.
2. Bandwidth: - Procedure: Setup the switch; plug in a lap-top's Gigabit interface and observe LED status. Check whether it tallies with the default rate. Now program each supported rate and see that LED status and what reported by lap-top are in order. Alternatively, the rates can be read out using Network test equipment also.

- Outcome:
Programmed rate, LED status, status reported by lap-top or read out of the network tester equipment.

(B) Convergence (Sub 50Ms) Test: Failure of the Central Transport Ring

Procedure: Select Minimum 3 * Distribution locations using the Distribution switches as per the specifications specified and connect laptops to the switches at distribution locations. Configure the distribution switches using IEEE 802.17 or equivalent standard in all the distribution switches and create a Video streamer in one of the location. Stream a video of at least 30Min duration and start playing the stream listening side. Now try to create a disaster in the transport layer by creating 2 network disaster scenarios.

Scenario 1 :
: Switch failure – Turn off one of the distribution switch connected in the transport ring

Scenario 2 :
: Back bone fiber failure – Plug out the patch cord coming in from one direction of the transport layer.
In any of the scenarios above observe no connection problem to the videos being played, no play back problems and also observe the convergence of the backup with in 50Ms.

(C) NAC Test / RADIUS Server Test:

Procedure: Configure a Central Radius Server connect the same at the South campus aggregation chassis and demonstrate the below functionalities.

Scenario 1
: Authenticate the user which is already authenticated in the internal database of the RADIUS server using web based authentication.

Scenario 2
: Connect an unauthorized user laptop to one of the port on the access layer switch and demonstrate that the user being not allowed to gain the control of the network.

Scenario 3
: 802.1X RADIUS Authentication: Connect the Device (Probably an Wireless Access point configure the necessary 802.1X settings) and connect to one of the access layer switch port and demonstrate both the access layer switch and the wireless Access point gains the network access and permits the authorized users to access the network services.

Scenario 4
: 802.1X RADIUS Authentication: Connect the Device (Probably a Wireless Access point which does not have 802.1x settings available) and connect to one of the access layer switch port and demonstrate the Rogue device which is not complying with the College policy being not allowed to gain the control of the network.

Scenario 5
: MAC based Authentication: This test is basically for the devices like Printers, scanners and any other network device which does not understand 802.1x Protocol, the RADIUS Server should be capable of managing the database based on MAC address and Authentications for the devices can happen based on MAC address and only devices whose MAC address is pre-described in the RADIUS server database
Should be permitted to gain access to the network.

Any other features which claimed by Bidder as complied, may require to show case infront of the management of NIT Raipur.

Annexure 8

Statement of Deviations from Technical Specifications

To,
The Director,
NIT Raipur

Reference. Tender No. …… Dated…….

Dear Sir,

Following are the deviations and variations from the Technical Specifications of tendered items. These deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be performed as per your specifications and documents.

Sr. No.	Selection No. & Page No	Deviation in the Bid	Brief reason
1			
2			
3			
4			

Date:

Place:

Signature: **Seal of the bidder**

Name:

Designation

Company: