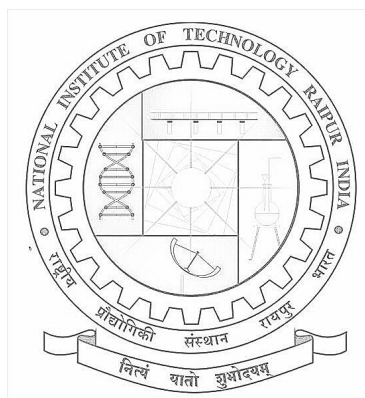
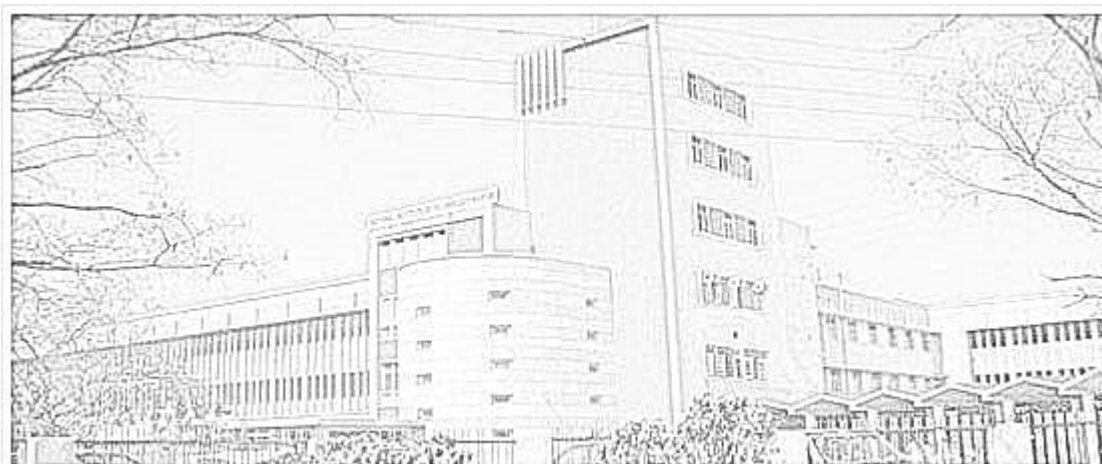




NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR

CHHATTISGARH, INDIA

<http://www.nitr.ac.in>



NOTICE INVITING TENDER

National Institute of Technology, Raipur invites bids in two-bid format for “EXTENSION OF EXISTING NETWORK TO CENTRAL COMPUTER CENTER AND UPGRADATION OF SOME OLDER SEGMENTS” for the Central Computer Centre at its G.E. Road Campus.

Detailed information to the bidders including Instructions, Terms and Conditions, Schedule of Requirements, Specifications and Allied Technical Details, Price Schedule, Contract Form, and some other forms are available in the tender document which may be downloaded from the Institute Website <http://www.nitr.ac.in>

IMPORTANT INFORMATION

1	Name of Work	EXTENSION OF EXISTING NETWORK TO CENTRAL COMPUTER CENTRE AND UPGRADATION OF SOME OLDER SEGMENTS
2	Notice Inviting Tender Reference	NITRR/Central Store/CCC/OT/2017/487 Dated 29/05/2017
3	Tender Processing Fee, Non-refundable	INR 10,000/-
4	Earnest Money Deposit (EMD), Refundable	The bidder should furnish, as part of its bid, an Earnest Money Deposit (EMD) of INR 14,00,000/-
5	Time Period for sending pre-bid queries over e-mail	Upto 02/06/2017 (till 6:00 P.M.)
6	Date of Mandatory Site Survey & Pre-bid Meeting	06/06/2017 (3:00 P.M. Onwards)
7	Reporting Venue for Site Survey & Pre-bid Meeting	Central Switch & Server Room, NIT Raipur
8	Last Date and Time for Posting Clarifications on Institute Website and CPPP portal	10/06/2017
9	Last date and time for submission of bids	20/06/2017 upto 3:00 P.M.
10	Date & Time of opening of Techno-commercial Bid Part-A	20/06/2017 at 3:30 P.M.
11	Date and Time of opening of Techno-commercial Bid Part-B	To be informed to technically successful bidder later
12	Venue of Opening Bids	Central Store National Institute of Technology, G.E. Road, Raipur 492010, Chhattisgarh
13	E-mail ID for tender related queries	cccnet1@nitr.ac.in
14	Institute Website	http://www.nitr.ac.in
15	CPPP Website	https://eprocure.gov.in/epublish/app

CHAPTER I: INSTRUCTIONS TO BIDDERS

1. This is an open tender enquiry. The bidder has to execute the project on turn-key basis and provide end-to-end solutions to the scope of work of this Tender. The requirements, necessary design inputs and baseline technical specifications have been provided by the institute in this document. The implementation shall be subject to the supervision and quality control of the institute.
2. The Bidders are advised to read and understand 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 the 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. The techno-commercial bid is further classified into the following two parts: Techno-commercial bid: Part-A", and "Techno-commercial bid: Part-B"
6. The techno-commercial bid consists of the eligibility criteria of the bidder along with necessary documents in support etc. and technical compliance mentioned later in this chapter. No part of the Techno-commercial bid should contain any price or price related information, either explicit or implicit; otherwise the bid will be summarily disqualified.
7. The price bid or 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 Chapter VI.
10. Techno-commercial bid Part-B shall contain duly filled in technical compliance sheets, hardcopy of the datasheets, hardcopies and 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 <<MENTION TENDER NAME AND ENQUIRY NUMBER HERE>>"
13. Price bid cover should be super scribed "PRICE BID FOR <<MENTION TENDER NAME AND ENQUIRY NUMBER HERE>>"

14. The single sealed bigger cover containing the techno-commercial and price bid covers should be super scribed "BID FOR <<MENTION TENDER NAME AND ENQUIRY NUMBER HERE>>". The bid envelops must be addressed to "The Registrar, National Institute of Technology, G.E. Road, Raipur 492010 Chhattisgarh" and should also include the name and address of the bidding firm.
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. The order in which the documents are submitted shall be the same as asked in the tender document with proper indexing and document labels.
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 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 the date and time mentioned in the notice inviting tender via e-mail to ccnet1@nitrr.ac.in in the required format given in Form-9. Clarifications sought later or not in proper format shall not be considered.
27. Subject line of the e-mail should be "Pre-bid clarification" along with Tender Ref No.
28. Scanned copy of the duly filled pre-bid clarification form and an editable copy of the table therein in MS Excel © format containing the pre-bid queries and other details should be attached with the mail.
29. Only the technical queries submitted over e-mail shall be taken up during the pre-bid meeting for clarification. Other queries arising from the site survey shall also be taken up during the pre-bid meeting. A clarification shall be issued on the institute website and the CPPP portal within five working days of the last date for submitting pre-bid clarifications by e-mail. The clarification shall be issued after due consideration of the pre-bid queries raised by the bidders. Please note that the bidders shall not be individually replied to and the clarification issued shall be final and binding on all bidders. The clarification along with the original bid

document shall be necessary for preparing the bids. Bidders are therefore advised to submit their bids after the clarification has been issued.

30. Potential bidders should note that the site survey and the pre-bid meeting is mandatory to apprise the bidders of the actual site conditions and for understanding the scope of work in detail prior to submitting their bids and for resolving pre-bid queries. Bids shall not be accepted from the bidders who have not attended the site survey and the pre-bid meeting.
31. Only one duly authorized employee of the bidding firm carrying the proper identification, etc. and duly filled-in Form – 1 can attend the site survey and the pre-bid meeting.
32. Revisions / amendments / corrections / corrigenda to the tender, if any, due to pre-bid clarifications or at the institute's own decision shall be posted on the institute website and the CPPP portal.
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 from time to time on the institute website <http://www.nitr.ac.in> and the CPPP portal.
34. Bidders are advised to check the institute website and the CPPP portal regularly for updates on this tender.
35. Ignorance of information posted on the website and the CPPP portal shall not be accepted as valid reason for non-compliance with tender terms and conditions or technical specifications, etc.
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 proper 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 on either side for all components, subject however to a maximum price impact of 10% on the work order value. However, only the indicative ballpark quantities mentioned in the price schedule shall be considered by the bidders for preparing their price bids and by NIT Raipur for award of work. The bidding firms shall not be reassessed due to change in quantities.
43. Payment shall be made strictly on the basis of the actual quantities utilized. For the payments, unit prices shall be multiplied by the actual quantities.

44. Prices should be quoted in Indian Rupees only.
45. In the Price bid, the quoted price shall include all duties and taxes like VAT / sales / service tax, entry tax, octroi, terminal tax, etc. whichever are applicable.

It is understood that individual line items of the tender may be assemblies of / made up of sub-components on which different government duties and tax percentages are applicable individually. Thus, for example, a computer comprises of a base electronic hardware sub-component, a software license sub-component (e.g. operating system, application software) and a service sub-component (e.g. installation and commissioning). In some cases these sub-components may be further comprised of other sub-components (e.g., base electronic hardware sub-component may comprise of CPU, monitor, printer, IO devices etc.).

Therefore the Bidder is required to carefully mention the sub-components making up an assembly, the unit prices of the sub-components making up the assembly and added to form the unit price of the assembly, and the government duty and tax percentages included in the unit prices of all sub-components making up the assembly so that any variation in these duty and tax percentages can be accounted for later.

Bidders should be careful not to repeat a sub-component if the same is already mentioned separately in the price bid.

In case of an upward variation in the tax/duty percentages between the date of submission of bid and the date of actual supply, the difference will be paid by NIT Raipur. Likewise, in case of a downward variation in these percentages, the bidder must agree to supply the items at the lower prices.

Bidders may note that for this project, Institute cannot provide any customs and excise duty exemptions certificate.

46. Packing and forwarding, freight and insurance are in the bidder'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 the manufacturer of a certain product.
49. The price quoted shall remain fixed till three months 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".
- (i) Tender processing fee demand draft shall be submitted along with Technical Bid
 - (ii) Bid security (EMD) in one of the accepted formats or attested true copy of current DGS&D / NSIC registration
 - (iii) All documents related to bidder's eligibility including but not limited to

1. Attested true copies of the audited financial statement / auditor's certificate.
 2. Copies of purchase orders and work completion certificates
 - (iv) Copy of tender with sign of authorized signatory and company stamp on all pages
 - (v) Income tax returns for the last three years and copy of the PAN card of the applicant firms and partners / Directors thereof
 - (vi) Following forms:
 - (a) Form for bidder's self information
 - (b) Form for submission of bids
 - (c) Form for submission of similar works executed by bidder as proof of eligibility
 - (d) Form for OEMs authorization given to bidder
 - (e) Form for information on after sales service centres
 - (f) Form for warranty
 - (g) Form for statement of deviations from tender conditions
 - (h) 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".
- (i) technical compliance booklet (all product compliance tables filled)
 - (ii) technical literature
 - (a) Datasheets (hard copy of datasheets of all items mentioned in technical compliance sheets is mandatory).
 - (b) Unpriced price schedule with make, and model numbers without mentioning the prices (in the format as shown in Chapter-IV).
- Softcopy of all technical literature e.g., Datasheet.pdf, AdminGuide.pdf, UserGuide.pdf etc., which shall establish compliance (arranged in appropriately named folders for each line item, e.g., Switches, UTP Cables, FOC Cables, Racks, Servers, etc.).
- Include 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, SD card, magnetic tape and in the common file formats for handling situations where the media becomes corrupt for some reason.
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 value mentioned in the Notice Inviting Tender has to be submitted as Demand Draft in favour of Director, NIT Raipur payable at Raipur along with Techno-commercial bid: Part-A

56. Last date & time for submission of bids: As mentioned in the Notice Inviting Tender
57. Bidders should not send any part / complete bid through post/courier/e-mail / fax.
58. Due Date & Time For Opening:
- (i) Part 1: Techno-Commercial Bid: As mentioned in the Notice Inviting Tender
 - (ii) 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
59. Place of opening of tenders shall normally be as mentioned in the Notice Inviting Tender
60. Refundable bid security as mentioned in the Notice Inviting Tender has to be submitted as account payee demand draft / fixed deposit receipt/Bank Guarantee of a nationalized 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 bid validity period (180 days from the last day of bid submission).
64. The bid validity 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 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 rejected.
71. The names and complete postal addresses of the bidding organization should be mentioned on all covers

72. 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.
73. 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 grand total price for complete end-to-end solution including all supplies, installation and services.
74. 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

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" or "CCC NIT Raipur" would mean the Central Computer Centre, NIT Raipur.
- (c) "Letter of Intent" 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 (if any) specified in the "Letter of Intent" 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 Letter of Intent 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, NIT Raipur implying the Central Computer Centre of NIT Raipur comprising of all its members. The CCC, NIT Raipur is authorized to take decisions on behalf of NIT Raipur in respect of the implementation of this project and to handle communications and clarifications in respect of this project.
- (j) "Project Manager" in the case of bidder means a designated representative of the 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 for the technical implementation of the project. The Senior Technical Officer (IT), or the System Administrator, NIT Raipur shall be the "Project Manager" from the Institute side. The project engineers deputed on the site by the bidder shall consult him from time to time for technical and other clarifications related to the project to ensure smooth and timely technical implementation.
- (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 or corrigendum 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 or person of equivalent designation and rank in case of a limited company or in the case of a government organization an official having 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	System Integrators of Wired and/or Wireless Networks are eligible to bid.	Authorization letter from manufacturers to bid / negotiate / conclude the order specifically against this tender (Tender Ref. No. and Date must be mentioned) must be enclosed with the technical bid, as per format enclosed. Manufacturers' authorization must be provided for wired and wireless, ups, racks and passive components
2	Refundable Earnest Money Deposit (EMD) and Non-refundable tender processing fee for the amount mentioned in the Notice Inviting Tender	The tenderer shall be required to submit the Earnest Money Deposit (EMD) as Banker's cheque / Demand Draft / Bank Guarantee which is refundable and a non-refundable tender processing fee by way of Demand Draft/ Banker's Cheque only.

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

		The Banker's Cheque / Demand Drafts shall be drawn in favour of the Director, NIT Raipur, payable at Raipur, from any Scheduled Bank. The earnest money deposit & tender fee must be enclosed in a separate envelope and submitted along with the Techno-commercial bid Part - A.
3	The bidder should be an Indian Company registered under Companies Act and in the IT Business for more than five (05) years.	Certificate of Incorporation / Memorandum of Association.
4	The bidder should possess the following : Trade License VAT / TIN Registration CST Registration Permanent Account Number (PAN) Service Tax Registration	Bidder must submit self-attested copies of each of the following License / Registrations along with the technical bid.
5	PF & ESIC registration	Bidder must submit self-attested copies of PF & ESIC registration along with proof of payment (challans).
6	Professional Tax Registration	Bidder must submit self-attested copies of Professional Tax registration along with proof of payment.
7	Income Tax return for last three years	Bidder must submit self attested copies of IT returns for the last three years.
8	Average Annual Turnover	The average annual turnover of the bidder for last three financial years should not be less than Rs. 30.0 Crores (Rupees Thirty Crores). The bidder must submit a certificate from the Auditor / Chartered Accountant in this respect.
9	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. One similar completed works each costing not less than 500 lakhs, or, b. Two similar completed works each costing not less than 312.5 lakhs, or, c. Three similar completed work costing not less than 250 lakhs Similar projects should include supply, installation, integration of services for IP Networks - wired and/or wireless, including warranty maintenance of Ethernet and IP network components and accessories and associated job works towards setting up an Ethernet	Self attested copies of work orders and work completion certificates / client sign-off

	and IP network / network extension. Orders in the name of consortiums or subcontracted work orders are not acceptable.	
10	Bidder's Undertaking	The bidder must submit a Notarized Undertaking that the bidder is not blacklisted, barred from taking part in any tender, as on date of this bid submission. The bidder must also not be referred or under BIFR. (This affidavit should be done in Rs. 100/- Stamp Paper)
11	Technical Compliance	The bidder must submit a line-item-wise compliance of the technical specifications, as per the compliance tables with reference in the data sheet or any other authentic document of the respective manufacturer.
12	Bidders Acceptance of the RFP Clauses	Bidder should submit the RFP, signed and stamped, as a token of acceptance of the RFP clauses. All the documents submitted by the bidder must be signed by Authorized Signatory having valid Power of Attorney.

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 along with their bids for this tender.
- (c) EMD may be in the form of Account Payee Demand Draft / Fixed Deposit Receipt/Bank Guarantee (Format enclosed) 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.

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 the successful 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 last date of bid submission. 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 and an editable copy of the table therein in MS Excel (c) format to the following e-mail id: cccnet1@nitrr.ac.in in the period mentioned in the Notice Inviting Tender. The potential bidder shall also bring a copy of these queries with him when he / she comes for attending the site survey which shall also serve as pre-bid meeting. The reply to these queries shall be given through reply mail or taken up in person during the site survey which shall also serve the requirement of the pre-bid meeting. No other mode of communication after publication of the tender is allowed.

If any clarification is of interest to all bidders, NIT Raipur shall post them on the institute website and further any amendments / revisions / corrections / corrigendum etc. shall be issued 05 working days from the last date of seeking pre-bid clarifications. Bidders are advised to submit their bids after this date..

- (b) It shall be understood that while every endeavour has been made to avoid any error which can materially affect the basis of the bid, 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 some building drawings / sketches can be provided, on request and may serve as useful guides, potential bidders must attend the site survey cum pre-bid meeting and are advised to seek to get a detailed 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 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 all possible 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 five 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 and connected 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 award of 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, 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 through the website. 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) Bidder shall have to arrange for a demonstration of any product if NIT Raipur determines it is in its best interests to do so, 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 guidelines in this context.

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

- (a) 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.
- (b) 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.
- (c) 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.
- (d) It shall be the sole responsibility of the contractor to obtain license under different labour laws from the concerned authority(ies).
- (e) 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.
- (f) 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.
- (g) 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.
- (h) It shall be the responsibility of the contractor to provide Canteen, Medical and/or Transport Facility to his personnel if required by any enactments.
- (i) 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.
- (j) 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 the 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 45 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 for a period of 12 months from the date of submission of bids. The bid price must be quoted in Indian Rupees. 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 05 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

All supply items in the work order must be delivered within 120 days.

NIT reserves the right to change the quantity, locations, delivery schedule for the equipment without imposing LD.

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 (120 days) 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.
- (e) In case of delay due to site not ready condition / delay in customs etc. which cannot be reasonably attributable to the bidder then in such condition LD shall not be imposed. However, prior written information has to be provided for the same.

26. GUIDELINES FOR REASONABLE UNIFORMITY

All network switches supplied shall be from the same manufacturer and must work seamlessly with the recently installed core and distribution switches in the institute. All access points supplied shall be from the same manufacturer. Passive items, UPS and Racks must individually be from the same manufacturer.

27. WARRANTY

All Active 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 x 365 basis. Contractor shall make necessary arrangements to ensure that no server farm / 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 server farm and distribution switches and passive components and accessories thereof. Contractor shall make all possible arrangements to ensure that no access segment of the network supplied and installed by him is down for more than 48 consecutive hours. 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 server farm / distribution network segments and Rs. 250/- for each successive 24 hours downtime in the access segments. For other active components, if any, the fine shall be Rs. 1000/- for each successive 24 hours downtime.

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 on either side for all components, subject however to a total price impact of 10% on the work order value. 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. The payment for this variation in supply and installation quantities shall be made on a proportional (pro-rata) basis. No separate work order or supplementary order or amendment etc. shall be issued by NIT Raipur for any additional items over and above the initial work order supplied and installed under this contract subject to the ceiling mentioned herein. However, the written approval / concurrence of the CCC through e-mail / hardcopy shall be required before supplying and installing any additional items under this contract.

31. BILL SUBMISSION

Bills shall be submitted in triplicate to the Central Computer Centre. On successful inspection, the CCC shall forward the bills with appropriate payment recommendation to the accounts section for realization of payment.

32. PAYMENT TERMS AND CONDITIONS

- (i) Payment shall be made in the running bill format. The number of running bills for the entire project shall not ordinarily exceed five.

A random sample of the active devices shall be POST tested for payment recommendation during supply. However, if any active device is found not working at any stage till issue of commissioning certificate, it shall be replaced by the successful bidder free of cost. During the warranty period, the item may be replaced / repaired as needed free of cost in terms of the warranty.

All the payments shall normally be made by the Accounts Section of NIT Raipur within 15 days of payment recommendation of CCC.

33. PROJECT COMPLETION AND ACCEPTANCE

The contractor will have to complete the project as per the initial work order in accordance with the scope as mentioned in this document within 150 days from the date of issue of the work order. Project shall be treated as complete on the completion of

- (a) Supply, Installation, Configuration, System Integration, Structured Cabling Documentation, Test Reports and Configuration Documentation
- (b) Training and Network Functioning Satisfactorily for 3 days 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. quick start 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 softcopy backups of the configuration files of all equipment on DVD

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. CONTRACT FORM:

- (a) A suitable contract agreement shall be signed before starting the work.
- (b) Successful bidder shall be required to enter into a contract with the Institute after the issue of the work order.
- (c) Submission of the bid against this open tender enquiry by a bidder implies that the bidder is in full agreement with the terms and conditions mentioned in this tender document.
- (d) The successful bidder shall be required to affix his signature and seal on each page of this tender document and submit the same as proof of having accepted the terms and conditions mentioned herein.
- (e) The contract with the successful bidder will be on Rs. 100/- stamp paper and shall contain the terms and conditions mentioned under the different chapters and sections of this tender document.

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CHAPTER – III: SCHEDULE OF REQUIREMENTS
(Including Scope of Work)

S. No.	Description	Qty	UoM
Section I : ACTIVE COMPONENTS			
10G Switch			
1	10G Aggregation Switch with 48-port SFP+ slot, 4-port QSFP slot and redundant Power Supply with all accessories , as per mentioned technical specifications	2	Nos
Distribution POE+ Switch			
2	24 Port Gigabit Distribution PoE+ Switch , with redundant Power Supply , with all accessories as per mentioned technical specifications	25	Nos
48-Port Gigabit Switch			
3	48-port 10/100/1000T stackable switch with 4 SFP+ ports, with all accessories as per mentioned technical specifications	28	Nos
4	48-port 10/100/1000T PoE+ stackable switch with 4 SFP+ ports with all accessories as per mentioned technical specifications	4	Nos
24-Port FO Switch			
5	24-port 100/1000X SFP stackable switch with 4 SFP+ ports with all accessories as per mentioned technical specifications	4	Nos
Gigabit Access Switch			
6	24-port 10/100/1000T stackable switch with 2 combo ports (10/100/1000T or 100/1000X SFP) and 2 SFP+ stacking/user ports as per mentioned technical specifications	70	Nos
7	24-port 10/100/1000T PoE+ stackable switch with 2 combo ports (10/100/1000T or 100/1000X SFP) and 2 SFP+ stacking/user ports as per mentioned technical specifications	35	Nos
Multiservice Access Switch			
8	Multiservice access Switch with 6 Giga LAN ports, 1 FO Ports, 2 FXS Ports , with all accessories as per mentioned technical specifications	25	Nos
Center-of-Row Switch			
9	12-Slot chassis with all accessories as per mentioned technical specifications	2	Nos
Wireless Access Point (Indoor)			
10 (a)	Enterprise-class Indoor Wireless Access Point with IEEE 802.11ac dual-band radios as per mentioned technical specifications	175	Nos
Wireless Access Point (Outdoor)			
10 (b)	Enterprise-class Outdoor Access Point with IEEE 802.11ac dual-band radios as per mentioned technical specifications	25	Nos
Wireless Controller			
11	Wireless controller as per mentioned technical specifications	2	Nos
FO Module			
12	10km 1310nm 10GBase-LR SFP+ module as per mentioned technical specifications	86	Nos
13	10km Bi-Directional GbE SMF SFP as per mentioned technical specifications	56	Nos
10G NIC & Cable			
14	2 x 10 Gigabit SFP+ Network Interface Card as per mentioned technical specifications	30	Nos
15	7m SFP+ "Twinax" direct attach cable as per mentioned technical specifications	60	Nos
10G Expansion Card for Existing Core Switch			
16	2 x 10GbE SFP+ slots (unpopulated) expansion module as per mentioned technical specifications	4	Nos

Up-gradation of Existing Network Provisioning & Management Technology			
17	Up-gradation of existing SDN based provisioning and mgmt tech for supporting additional nodes of this project as per mentioned technical specifications	1	Nos
Server for NMS			
18.	Server as per mentioned technical specifications	1	Nos
Section II : UPS & Rack			
1	On-Line UPS, 4800 Watts / 6000 VA, Input 230V / Output 230V , Interface Port DB-9 RS-232, SmartSlot , Extended runtime model , Rack Height 2U	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	On-line UPS 1KVA with 30 Min Back-up	75	Nos
5	15U Rack with Accessories	60	Nos
PASSIVE COMPONENT (Fiber)			
1	6-core Single Mode Fiber Optic Cable	5000	Mtrs
2	LIU 12 Port with SM LC Connector loaded	28	Nos
3	LIU 24 Port with SM LC Connector Loaded	6	Nos
4	LC-LC duplex single-mode patch cord 3m	125	Nos
5	LC single-mode pigtail 1.5m	500	Nos
6	Wall Mount 12 Port LIU loaded	24	Nos
7	LC-LC Simplex Single Mode Patch Cord 3m	48	Nos
8	LC-SC Fiber Patch Cord 3m	50	Nos
PASSIVE COMPONENT (UTP)			
9	CAT6 24 Port Patch panel loaded	150	Nos
10	CAT6 Patch cord	1 Mtrs x 5400	Nos
		2 Mtrs x 150	Nos
11	Single Information Outlet with Back Box	600	Nos
12	CAT6 Cable Box 305 Mtrs Box	155	Nos
SECTION III : SERVICE COMPONENT			
1	SM LC FO Connector - Splicing / Connectorization	600	Nos
2	Rack Installation and PVC Glanding with Accessories (may require removing existing rack & shifting accessories from existing to new racks)	80	Nos
3	FOC Laying with ISI Mark HDPE Pipe with digging and refilling (underground)	1000	Mtrs
4	FOC Laying with ISI Mark HDPE Pipe along wall with U-clamps every 1m (overhead)	4000	Mtrs
5	UTP Cat-6 Cable Laying with ISI Mark PVC casing and capping	45000	Mtrs
6	Installation charge for information outlet and panel site	600	Nos
7	Installation charges for active switching and wireless component	1	Lot
8	Installation charges for up-gradation of existing network provisioning & mgmt tech	1	Lot
9	Installation Charge for UPS including battery setup etc.	1	Lot
10	Project Testing, Labeling, Commissioning, Warranty, Certification & Management with on-site free of cost support for one year	1	Lot
11	Resident Engineer (2 nos) in CCC for Maintaining Network of this project for 3 Years	1	Nos

Quantities of passive items especially cables are subject to variation in accordance with the variation clause. Resident Engineers shall have 1-2 years past experience and be proficient in managing networks.

SCOPE OF WORK

Potential bidders should note that the purpose of the current project is mainly extension and up-gradation. In a recent major networking project the institute has setup a state-of-art network with a resilient 20Gbps fiber optic core ring backbone (upgradeable to 40Gbps) and a sub-50ms convergence time. This network extends to hostels and staff residences and seamlessly supports convergence i.e., data, voice and video applications. The management and operation of this network is completely automated via SDN controller based centralized zero-touch provisioning, upgrade, recovery, and backups enabling a plug-n-play network. Experience tells us that some of these themes and patterns are very useful in our campus environment. In the current extension and up-gradation project also, Institute intends to seamlessly extend these themes and patterns to its newer and older segments.

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

- (a) The scope of this tender shall include supply, installation, system integration, testing and 03 years on-site comprehensive warranty maintenance of network switches, server(s) (if required), wireless, software, and passive fiber optic & UTP cables and accessories used in the installation.
- (b) **SHORT DESCRIPTION:** Recently installed core data network in NIT Raipur campus has to be extended to the computer centre with 10G uplinks and 1G at the access level for high bandwidth access to the hosted software, server farm and various other resources. The distribution layer in the older network i.e., main and architecture blocks has to be upgraded as per requirement. The access layer in the older network i.e., main and architecture blocks has to be connected to the upgraded distribution layer and also upgraded as per requirement. The access layer up-gradation shall also involve provisioning indoor/outdoor wireless access in the computer centre, main, architecture building and H-hostel (limited). The servers in the older server farm network have to be upgraded to 20G network connectivity. The servers in the older cluster network have to be upgraded to 20G network connectivity. Access network is to be extended to 24 quarters in G+6 staff block from the recently installed residential distribution switch with 10G uplinks and 1G at the access level. The DC core network is to be established. This core should connect to the top-of-rack switches of the server room using 10G/40G uplinks as per requirement.
- (c) **DETAILED DESCRIPTION:** In the computer centre, network switches have to be installed in the main distribution switch room where patch panels connecting the end points shall be available. In the main block, the distribution layer shall be upgraded by installing six new switches in each floor connected in ring topology. In the architecture block, two new distribution switches are planned on each floor. The four switches shall be connected in ring topology. Wall mount network racks with online uninterruptible power supply need to be installed for the installation of the switches. The access layer in the older network i.e., main and architecture blocks has to be connected to the upgraded distribution layer and the 100 Mbps access switches upgraded with 1Gbps switches as per requirement. The older access racks shall be replaced with new network racks wherever required. The access layer upgradation shall also involve provisioning indoor/outdoor wireless access in the computer centre, main, architecture building and H-hostel (limited). The servers of the server farm which are having 1 Gbps network connectivity at present has to be upgraded to 20 Gbps network connectivity. The servers of the cluster network which is having 1 Gbps network connectivity at present has to be upgraded to 20 Gbps network connectivity. Access network is to be extended to 24 quarters in G+6 staff block from the recently installed residential distribution switch with 10G uplinks and 1G at the access level. The DC core network is to be established.

This core should connect to the top-of-rack switches of the server room using 10G/40G uplinks as per requirement.

(d) SERVICES SHALL INCLUDE:

1. Cabling
 - (a) OFC Cabling Work
 - (b) UTP Cabling Work
2. General requirements for Cabling Work
3. Ferruling and Labeling Requirements
4. Structured Cabling Documentation
5. Active Devices Related Work
6. Configuration Related Work
7. System Integration

1. CABLING

a. OPTIC FIBER CABLING WORK RELATED GENERAL REQUIREMENTS

- [1] Cables shall be ducted and laid in underground trenches which shall be 75 cm deep and at least 36 cm wide and should be adequate for proper installation of HDPE pipes, GI pipes, etc..
- [2] Below road ducts shall be HDPE pipes within G.I. 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] OFC trench shall be provided with a layer of clean, dry sand cushion of not less than 7.5 cm in depth, before laying the pipes and cables therein. Above this suitably sieved soil shall be filled to level the trench with the ground. In an intermediate step, warning tape shall be laid at 45 cm as measured from the bottom of the trench.
- [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 60) cm should be provided every 100 ft or at bends.
- [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

b. UTP CABLING WORK RELATED GENERAL REQUIREMENTS

Structured cabling standards shall be strictly followed.

- [1] **Casing and capping** 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: 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.
- [7] This shall also include pole installations, if any, required for outdoor Wi-Fi. Outdoor access points shall be clamped to the wall or mounted on approximately 5 meter painted GI pipes. Necessary foundation, tethering etc. is in the scope of the bidder.
- [8] 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.

2. GENERAL REQUIREMENTS FOR CABLING WORK

[1] Cables shall be laid and terminated in accordance with the recommendations 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.

3. FERRULING 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.

4. 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.

5. ACTIVE DEVICES RELATED

- [1] All active devices wired, wireless, 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.

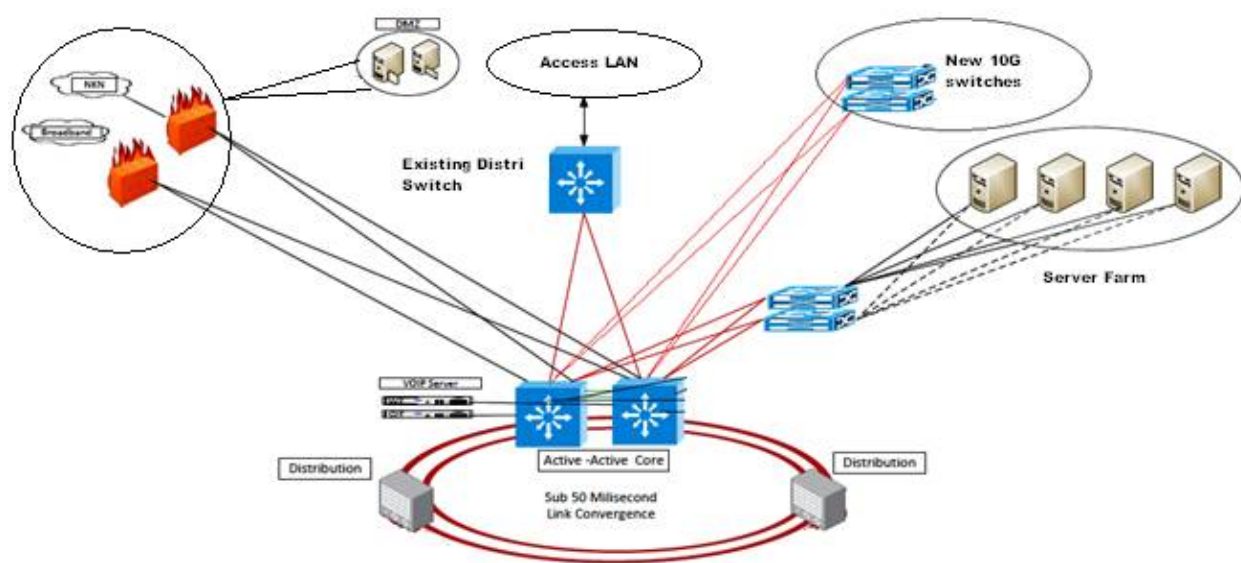
6. CONFIGURATION RELATED

- [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.
- [4] The bidder shall get experienced engineer(s) of the manufacturer of active networking devices to do the configuration tasks on the site.

7. SYSTEM INTEGRATION

The contractor will ensure smooth & seamless integration of the supplied equipment with the existing Campus LAN at NIT Raipur. An overview of the existing setup of the NIT Raipur Network is given below for reference.

Overview of Existing LAN in NIT Raipur



The new system shall connect to the existing system / LAN Core network to be placed in F8-Block by 10G fiber optic links and make use of link aggregation.

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CHAPTER IV: SPECIFICATION AND ALLIED TECHNICAL DETAILS

Detailed Technical Scope:

This tender specifies the requirement for extension from the recently installed institute core network to the computer centre, main, and architecture blocks, and extension from the recently installed residential distribution switch to the G+6 staff quarter block.

The tender also specifies the requirement for providing indoor/outdoor 802.11ac wireless access in the CCC, main, architecture and H-hostel (limited).

Wired access connectivity has to be done in the computer centre and may be required in limited quantities for certain segments in the older access network in the main and architecture buildings.

In the case of the main and architecture building blocks, the work involves up-gradation of the existing distribution layer and the access layer switching.

Distribution and access switches shall be housed in wall mounted network racks equipped with uninterruptible power from 1KVA online UPS systems.

Supply and installation of the racks and their installation where required is in the scope of the present work.

Proper housing of UPS to prevent tampering and theft is in the scope of the bidder.

In the access layer, the existing components and accessories shall be used to the maximum possible extent. In such cases the older rack may require to be unmounted (say, if U-space is not sufficient). It is also possible to consider the deployment in the existing rack. However the same shall be decided on a case-by-case basis.

The work involves laying of OFC to connect the distribution switches on each floor of the main building in a ring configuration. The work involves connecting these distribution switches to the recently installed core switch which is presently housed in Residential Quarter No. F-8 and may be temporarily housed in the main distribution switch room of the computer centre.

The four distribution switches on the two floors of the architecture building block are to be connected to each other in a ring configuration and these have to be further connected to the recently installed core switch which is presently housed in Residential Quarter No. F-8 and may be temporarily placed in the main distribution switch room of the computer centre.

The access switches have to be upgraded from 100Mbps to 1Gbps as per requirement and in accordance with the technical specifications laid out in this tender document. The access level up-gradation also involves indoor/outdoor wireless access connectivity in the computer centre, main, architecture buildings and H-hostel (limited). All access switches shall be connected with the distribution switches using UTP cable. Access racks are also planned to have power from online UPS systems.

The bidders are required to propose a solution which should seamlessly integrate with the existing network infrastructure and seek to build on it.

The CCC building is planned to have racks wherein the access switches will be installed. The access switches will be deployed in active-active cluster configuration which will work as one virtual switch. In CCC building, each desktop is planned to have dual NIC cards, to ensure higher availability, the desktops shall be dual homed over two different switches of cluster.

In CCC building, the switches in the racks will be connected in 2 x 10G fibre rings which will be dual homed over existing core switches at F8 Block / main distribution switch room of CCC with sub 50ms ring protection.

Main building will have 6 Number of distribution switches on each floor which will be connected in 10G fibre ring and dual homed on aggregation switches with sub 50ms ring protection. Individual floor distribution switches would be connected to other floors to create a resilient back bone across building over 10G backbone.

The access switches would be connected to the distribution switches using UTP. Architecture building access switches will be connected in one 10G ring which will terminate on aggregation switches with sub 50ms ring protection. The DC core network is to be established. This core should connect to the top-of-rack switches of the server room using 10G/40G uplinks as per current and future requirements.

The servers of the server farm which are having 1 Gbps network connectivity at present has to be upgraded to 20 Gbps network connectivity. The servers of the cluster network which is having 1 Gbps network connectivity at present has to be upgraded to 20 Gbps network connectivity.

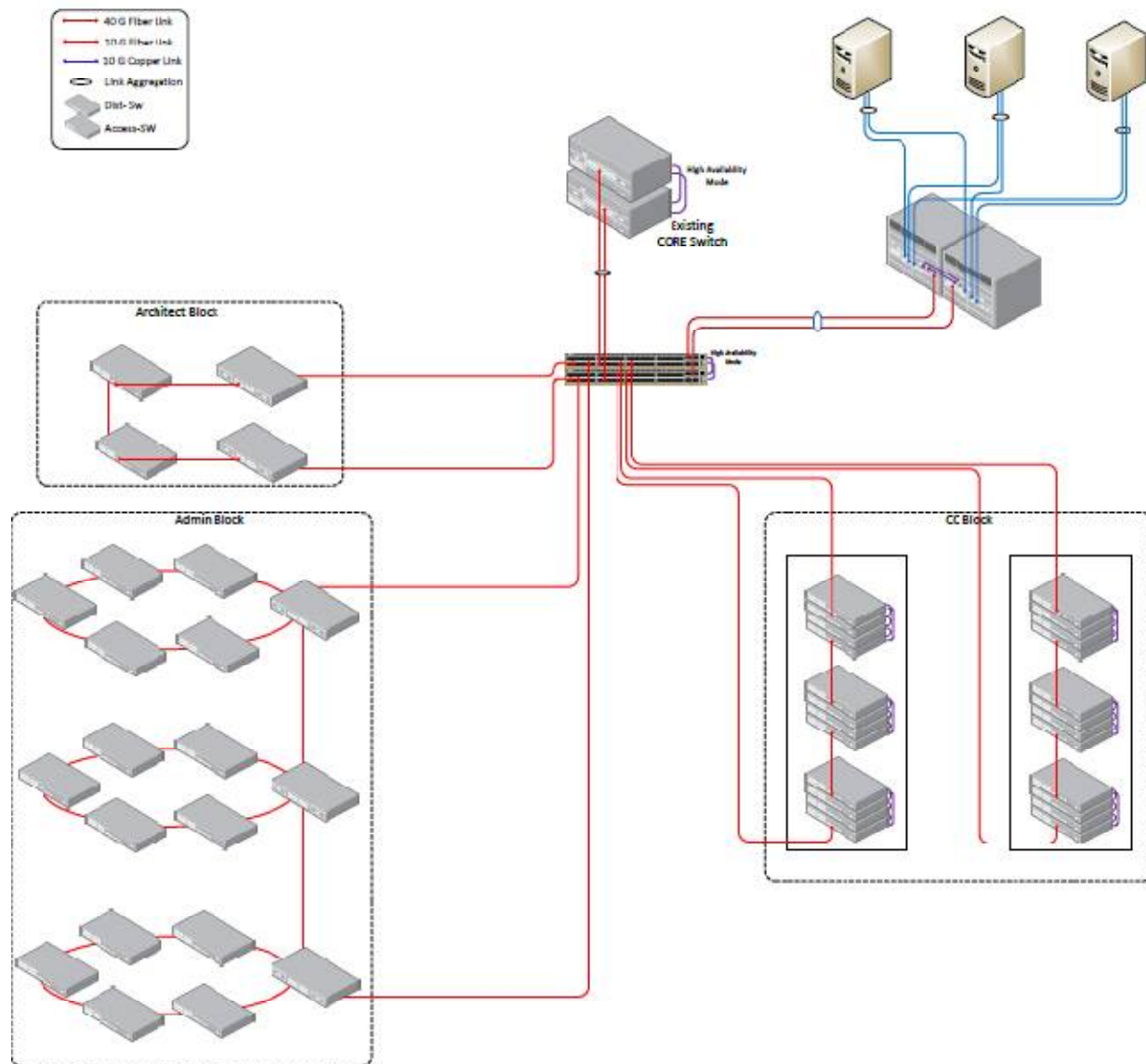
Access network is to be extended to 24 quarters in G+6 staff block from the recently installed residential distribution switch with 10G uplinks and 1G at the access level.

CCC Block, Main building Block and Architecture Block switches would be connected on resilient backbone to the aggregation switches in F-8 Block / main distribution switch room of CC so that there won't be any disruption from the perspective of fiber distribution across building.

The work in the CCC block shall involve following sub-tasks

- Installation of switches and patch cords.
- Separate VLANs shall be configured in the core switch for traffic and network management along with the QoS and Security/ACL policies.
- Bidder shall test and ensure the quality of the network connectivity to the end points

Topology



CHAPTER IV: SPECIFICATION AND TECHNICAL DETAILS

Note to the Bidder:

All network switches and their accessories shall be from the same manufacturer.
 All indoor and outdoor wireless components shall be from the same manufacturer.
 Racks shall be from the same manufacturer.
 All UPS systems shall be from the same manufacturer.
 Passive cables and cable accessories shall be from the same manufacturer.

1. 10G Switch:

Global Weblink/Internet Reference link: _____

S. No.	Specification	Compliance YES/NO	Remarks
1	Port Density and Architecture		
A	Switch Should have 48 Port SFP+ Slots and Min 4* QSFP+ port		
B	Switch should come with Redundant Power Supply and FAN from Day 1		
C	Support hot-swappable PSU's, FAN modules .		
2	Performance		
A	The switch have min 1 Tbps or higher Switching capacity		
B	The switch have min 900 Mpps or higher forwarding rate		
C	Supports jumbo frames		
D	Support min 32 K MAC addresses or higher		
E	Support 4K VLANs or higher		
3	Essential Feature		
A	Support MAC Based VLAN and Port Based VLAN		
B	IEEE 802.1Q Tagged based VLANs		
C	Link Aggregation on Static and Port Trunking		
D	IEEE 802.3ad LACP and Dynamic LACP as well IP Option		
E	Should support Broadcast Storm Protection		
F	Should Support Port Mirroring , ingress Rate limit , PVST+ compatibility mode		
G	Should support VRRP V3, RSTP and MSTP		
H	The Switch should support Active – Active Cluster switching technology using VSS or equivalent technology. The proposed VSS or equivalent technology should support high availability for both Layer 2 and Layer 3 (RIP, RIPng, OSPF, OSPF v3) Including for IP Multicasting (PIM v4, PIM v6).		
I	The Virtual Switching System (VSS) / equivalent technology shall support virtualization of switch locally or over geographically diversified locations		
J	The switch should support VSS/ equivalent clustering bandwidth of min 160Gbps. Vendors should offer required cables/modules from day-1		
K	This Switches also need to connect with Data centre Core Switch by 20G link and required Cable with other accessories need to supply from Day 1		

L	The Switch must support IEEE 802.17 or equivalent Ring resiliency / Ring protection technology for Sub 50Ms convergence time		
M	The High available aggregation switches also should seamlessly integrate with automated LAN Infrastructure to achieve centralized management / provisioning using SDN or equivalent technology.		
N	The switch should seamlessly integrate with existing core switch		
4	Quality of Service		
A	Eight Egress Queues per port		
B	Head -of-line Blocking prevention		
C	IEEE 802.1p class of service with Strict and Weighted round robin scheduling/Strict priority scheduling		
5	Security		
A	Should support ACLs, DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)		
B	MAC address filtering and MAC address lock-down		
C	Tri-authentication: MAC-based, web-based and IEEE 802.1x, DHCPv4 (server, relay and client)		
D	Should Support DoS Attack Protection		
6	Routing (From Day one)		
A	Should support BGP4, OSPF, RIP, RIPng, VRF, OSPFv3, PIM-SM, PIM-DM,MLDv1,MLDv2 ,ECMP, Policy based routing from day 1.		
7	Management		
A	Should Support SNMPv3, GUI, Telnet, Industry standard Command Line Interface		
B	Should Support RMON , Syslog Client, DHCP Client		
C	Support Environmental monitoring, TFTP, NTP and HTTP		
D	Should support SSHv2 for secured log in		
E	Should have USB or equivalent port for taking backup of software release files configurations		
F	DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent standards		
G	Should support Unidirectional Link Detection (UDLD) or equivalent to detect unidirectional links caused by incorrect fibre optic wiring or port faults and disable on fibre optics interfaces		
H	The switch should support in built Layer 1 monitoring capability for end to end security monitoring to avoid any eve drops or security breach on the Fiber uplink links.		
8	Compliances		
D	RoHS and IEEE 802.3z Energy Efficient Ethernet(EEE) Compliance and UL, CE and TUV or equivalent certifications.		

2. Distribution PoE+ Switch:

Global Weblink/Internet Reference link: _____

SN.	Specification	Compliance YES/NO	Remarks
1	Hardware Specifications		
A	24 Nos 10/100/1000 Base-T PoE/PoE+ Ports with Min 4 SPF+ Slots populated with 10G LR Modue		
B	For high reliability, vendors shall propose for Dual Internal Redundant power supplies		
C	PoE and PoE + capability based on IEEE 802.3at and IEEE 802.3af and power budget should be minimum 370W or better		
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	Should support PVST+ compatibility mode		
E	Up to 16K MAC addresses or higher		
F	Should support Active – Active Clustering Virtual Chassis or equivalent technology for high availability and quick resiliency.		
G	The proposed Virtual chassis or Equivalent technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting optimized for Real time applications like Voice and Video IP traffic		
H	The Min Virtual chassis bandwidth between the switches shall be min of 40Gbps and should support the redundancy across the geographically diversified locations(min 800 Mtrs), Vendors should offer required cables/modules from day-1		
I	The Distribution switches also seamlessly integrated with SDN or centralized management platform .		
3	Resiliency		
A	Sub 50Ms Resiliency for 10G ring based design as per the IEEE 802.17/RPR / ERPS/ERP or equivalent technology		
B	Loop Detection and Loop protection		
C	Control Plane Prioritization (CPP)		
D	IEEE 802.1D RSTP and IEEE 802.1Q MSTP		
E	Dynamic link failover and VRRP V3		
4	Routing		
A	Support Static Routing and Policy based routing from Day 1		
B	switch should also support routing protocols RIP V2, RIPng, OSPFv3, PIM v4 SM, DM and SSM, PIMv6-SM from day 1		
5	VLAN and L2 Feature		
A	VTP or Equivalent		
B	IEEE 802.3ac VLAN Tagging , Q In Q		
C	LLDP – MED , Voice VLAN		
D	Should support 4K VLAN id's and 4K active VLANs		
E	IGMP v1/v2,v3, IGMP/ MLD proxy		

6	Security		
A	Private VLANS , IEEE 802.1X, ACL		
B	Authentication fail VLAN and Guest VLAN		
C	BPDU Protection		
D	Dynamic ARP Inspection(DAI) , IP Source guard and DHCP snooping and DHCPv4 (server, relay and client)		
E	MAC Based Authentication, Web – based Authentication and Port based learn limits		
F	SSH Remote login , SSL v2 and v3		
G	TACACS + Accounting and Authentication		
H	RADIUS and RADIUS accounting		
I	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-based QoS based classifying traffic based on MAC , Port , VLAN , Protocol , L3 and L4 Parameters		
B	Extensive remarking capabilities, to fit in with any network's QoS scheme for voice/Video and other real time applications		
C	DSCP Prioritization, 64 Kbps bandwidth limiting per port or per traffic class, Policy-based storm protection and support Strict priority, weighted round robin or mixed scheduling		
9	Management		
A	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring, IPv6 Logo Ready from Day-1		
B	Support Telnet, GUI, CLI		
C	An USB or equivalent memory card socket , allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
D	DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent standards and		
E	Should support Unidirectional Link Detection (UDLD) or equivalent to detect unidirectional links caused by incorrect fibre optic wiring or port faults and disable on fibre optics interfaces		
F	The switch should support in built Layer 1 monitoring capability for end to end security monitoring to avoid any eve drops or security breach on the Fiber uplink links.		
10	Certification and Compliances		
A	Certification: UL, cUL, TUV or Equivalent		
B	RoHS Compliant and Energy Efficient Ethernet compliant (EEE) compliance		

3. 48-port Gigabit Switch (Type 1) &

4. 48-port Gigabit Switch (Type 2)

Global Weblink/Internet Reference link: _____

S. No.	Specification	Compliance YES/NO	Remarks
1	Hardware Specifications		
A	Type1: L2 Managed Switch with 48 Nos 10/100/1000 Base-T Ports with Min 4 SFP+ Slots populated with 10G LR /1G LX Type2: L2 Managed Switch with 48 Nos 10/100/1000 Base-T PoE+ Ports with Min 4 SFP+ Slots populated with 10G LR /1G LX		
B	For high reliability, vendors shall propose for Dual Internal Redundant power supplies		
C	Type 2 PoE Switch based on IEEE 802.3at and IEEE 802.3af and power budget should be minimum 370W or better		
2	Performance Specifications		
A	Min 220 Gbps or higher switching capacity		
B	Min 130 Mpps or higher Switching throughput		
C	Non blocking for all packet sizes		
D	Up to 16K MAC addresses or higher		
E	Should support PVST+ compatibility mode		
F	Should support Active – Active Clustering Virtual Chassis or equivalent technology for high availability and quick resiliency.		
G	The proposed Virtual chassis or Equivalent technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting optimized for Real time applications like Voice and Video IP traffic		
H	The Min Virtual chassis bandwidth between the switches shall be min of 40Gbps and should support the redundancy across the geographically diversified locations(min 800 Mtrs) , also Vendors should offer required cables/modules from day-1		
I	The switches also seamlessly integrated with SDN or centralized management platform .		
3	Resiliency		
A	Sub 50Ms Resiliency for 10G ring based design as per the IEEE 802.17/RPR / ERPS/ERP or equivalent technology		
B	Loop Detection and Loop protection		
C	Control Plane Prioritization (CPP)		
D	IEEE 802.1D RSTP and IEEE 802.1Q MSTP		
E	Dynamic link failover and VRRP V3		
4	Routing		
A	Support Static Routing from Day 1		
B	switch shall be scalable to a full layer 3 switch supporting routing protocols RIP, OSPF, RIPv2, 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		
5	VLAN		
A	VTP or Equivalent		
B	IEEE 802.3ac VLAN Tagging , Q In Q		
C	LLDP – MED , Voice VLAN		
D	Should support 4K VLAN id's and 4K active VLANs		
E	IGMP v1/v2,v3, IGMP/ MLD proxy		
6	Security		
A	Private VLANs , IEEE 802.1X, ACL		
B	Authentication fail VLAN and Guest VLAN		
C	BPDU Protection		
D	Dynamic ARP Inspection(DAI) , IP Source guard and DHCP snooping and DHCPv4 (server, relay and client)		
E	MAC Based Authentication, Web – based Authentication and Port based learn limits		
F	SSH Remote login , SSL v2 and v3		
G	TACACS + Accounting and Authentication		
H	RADIUS and RADIUS accounting		
I	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-based QoS based classifying traffic based on MAC , Port , VLAN , Protocol , L3 and L4 Parameters		
B	Extensive remarking capabilities, to fit in with any network's QoS scheme for voice/Video and other real time applications		
C	DSCP Prioritization, 64 Kbps bandwidth limiting per port or per traffic class, Policy-based storm protection and support Strict priority, weighted round robin or mixed scheduling		
9	Management		
A	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring, IPv6 Logo Ready from Day-1		
B	Support Telnet, GUI, CLI		
C	An USB or equivalent memory card socket , allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
D	DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent standards and		
E	Should support Unidirectional Link Detection (UDLD) or equivalent to detect unidirectional links caused by incorrect fibre optic wiring or		

	port faults and disable on fibre optics interfaces		
F	The switch should support in built Layer 1 monitoring capability for end to end security monitoring to avoid any eve drops or security breach on the Fiber uplink links.		
G	Technology Functionality to visual way to quickly identify the desired physical switch for maintenance or other purposes, by causing its LEDs to flash in a specified pattern , where similar switches are deployed in a rack for easy management and identification		
10	Certification and Compliances		
A	Certification: UL, cUL, TUV or Equivalent		
B	RoHS Compliant and Energy Efficient Ethernet compliant (EEE) compliance		

5. 24-Port Fiber Switch:

Global Weblink/Internet Reference link: _____

S. No.	Specification	Compliance YES/NO	Remarks
1	Hardware Specifications		
A	24* 100/1000 Base-X SFP Slots + Min 4 * SFP + Ports to accommodate 1G or 10 G fiber module (single mode /multimode) for flexibility to choose. Simultaneously active port should be min 28 Nos		
B	For high reliability, vendors shall propose for Dual Internal Redundant power supplies		
C	SFP Slots will support with Bi-directional or uni-directional SM FO Module depend on connectivity		
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	Should support PVST+ compatibility mode		
E	Up to 16K MAC addresses or higher		
F	Should support Active – Active Clustering Virtual Chassis or equivalent technology for high availability and quick resiliency.		
G	The proposed Virtual chassis or Equivalent technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting optimized for Real time applications like Voice and Video IP traffic		
H	The Min Virtual chassis bandwidth between the switches shall be min of 20Gbps and should support the redundancy across the geographically diversified locations(min 800 Mtrs)		
I	The Distribution switches also seamlessly integrated with SDN or centralized management platform .		
3	Resiliency		
A	Sub 50Ms Resiliency for 10G ring based design as per the IEEE 802.17/RPR / ERPS/ERP or equivalent technology		

B	Loop Detection and Loop protection		
C	Control Plane Prioritization (CPP)		
D	IEEE 802.1D RSTP and IEEE 802.1Q MSTP		
E	Dynamic link failover and VRRP V3		
4	Routing		
A	Support Static Routing and Policy based routing from Day 1		
B	switch should also support routing protocols RIP V2, RIPng, OSPFv3, PIM v4 SM, DM and SSM, PIMv6-SM from day 1		
5	VLAN and L2 Feature		
A	VTP or Equivalent		
B	IEEE 802.3ac VLAN Tagging , Q In Q		
C	LLDP – MED , Voice VLAN		
D	Should support 4K VLAN id's and 4K active VLANs		
E	IGMP v1/v2,v3, IGMP/ MLD proxy		
6	Security		
A	Private VLANs , IEEE 802.1X, ACL		
B	Authentication fail VLAN and Guest VLAN		
C	BPDU Protection		
D	Dynamic ARP Inspection(DAI) , IP Source guard and DHCP snooping and DHCPv4 (server, relay and client)		
E	MAC Based Authentication, Web – based Authentication and Port based learn limits		
F	SSH Remote login , SSL v2 and v3		
G	TACACS + Accounting and Authentication		
H	RADIUS and RADIUS accounting		
I	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-based QoS based classifying traffic based on MAC , Port , VLAN , Protocol , L3 and L4 Parameters		
B	Extensive remarking capabilities, to fit in with any network's QoS scheme for voice/Video and other real time applications		
C	DSCP Prioritization, 64 Kbps bandwidth limiting per port or per traffic class, Policy-based storm protection and support Strict priority, weighted round robin or mixed scheduling		
9	Management		
A	IEEE 802.1ab LLDP , sFlow or equivalent, SNMP V3, Port Mirroring, IPv6 Logo Ready from Day-1		
B	Support Telnet, GUI, CLI		

C	An USB or equivalent memory card socket , allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
D	DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent standards and		
E	Should support Unidirectional Link Detection (UDLD) or equivalent to detect unidirectional links caused by incorrect fibre optic wiring or port faults and disable on fibre optics interfaces		
F	The switch should support in built Layer 1 monitoring capability for end to end security monitoring to avoid any eve drops or security breach on the Fiber uplink links.		
10	Certification and Compliances		
A	Certification: UL, cUL, TUV or Equivalent		
B	RoHS Compliant and Energy Efficient Ethernet compliant (EEE) compliance		

6. Access Switch (Type 1) &

7. Access Switch (Type 2):

Global Weblink/Internet Reference link: _____

S. No.	Technical Specifications	Compliance Yes/No	Remarks
1.	Type 1 : The switch should have 24 x 10/100/1000 BaseT port with additional 2x SFP Combo giga ports for uplink and 2 nos. SFP+ Stack/ User Ports Type 2: The switch should have 24 x 10/100/1000 BaseT PoE + port with additional 2x SFP Combo giga ports for uplink and 2 nos. SFP+ Stack/ User Ports		
2.	Type 2 switch Should support PoE as per 802.3at with PoE budget of min 370W or more as well Min PoE+ port should be 12 Nos.		
3.	Should have Minimum 90 Gbps switching bandwidth and Min. 68 Mpps Switch- forwarding rate . The switch should work Wire speed forwarding from day 1.		
4.	Layer 2 Features: Should support STP, RSTP, MSTP, IGMP v1/v2/v3 snooping, loop protection, STP root guard, Voice VLAN, MLD snooping (MLDv1 and v2), IEEE 802.3ac, IEEE 802.1v, 16k MAC Table or more, PVST+ compatibility mode, Support min 4K VLAN IDs, VLAN classification by protocol and port, IEEE 802.3ac VLAN tagging.		
5.	Resiliency: Should support IEEE 802.17/equivalent for sub 50ms ring protection in following scenario : single, dual fibre cuts in ring , Control Plane Prioritization (CPP), Loop Detection and Loop protection.		
6.	Security: Should support ACL, DHCP(relay and snooping), IP Source guard, DAI, Private VLAN, AAA, Authentication (MAC, Web and IEEE 802.1x), BPDU Protection, Port-based learn limits (intrusion detection) or equivalent, SSLv2, TACACS+, guest VLANs, IP precedence etc.		

7.	Qos : Policy-based QoS based classifying traffic based on MAC , Port , VLAN , Protocol, Tail drop for queue congestion control, Strict priority/ weighted round robin.		
8.	Management :CLI, GUI, USB interface for taking backup of software release files configurations, DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent, UDLD or equivalent , Device management over IPv6 networks with SNMPv6, Telnetv6, SSHv6 etc, RMON 4 groups, SNMPv3, LLDP-MED, IEEE 802.3az, IPv4 and IPv6 support		
9.	The switch shall have pro-active intelligence to create an ICMP polling for service reachability based on IP address and configure pro-active action upon loss or re-establishment of the service reachability		
10.	Should support Static Routing and RIP from Day 1		
11.	The switches also seamlessly integrated with SDN or centralized management platform .		
12.	Event-based triggers allow user-defined scripts to be executed upon selected system events based on Time , Date , day and Event based		
13.	Should inherently support operating temperature range of 0-50C		
14.	Switch Certifications: CE, cUL, TUV, RCM or equivalent		

8. Multiservice Access Switch:

Global Weblink/Internet Reference link: _____

S. No.	Technical Specifications	Compliance Yes/No	Remarks
1	User Ports		
A	1GE SFP WAN		
B	6 x 10/100/1000 LAN		
D	2 x VOIP FXS POTS (RJ11)/Analog Ports		
E	USB Ports for Management		
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, IPSec etc.		
6	Others Features		
A	IEC/EN60950-1,EN60825-1,CAN/CSA-C22.2,FCC Part 15 Class B,EMC Directive 2004/108/EC,EN 55024		
B	Support QoS, IP routing, RIP V2, DNS Proxy		
C	Support rate limiting on Ethernet Ports		
D	Support VLAN and IGMP V3, IGMP snooping		
E	802.1Q VLANs and DHCP client as well server		
F	IEEE 802.1p prioritization and Four QoS queues per port		
7	Management For Ethernet port		
A	SNMP V1/V2, GUI, Telnet, CLI and Dual boot facility		
B	Should be managed by IP Address		
8	Power Characteristics		
A	External power supply and Input 100-240V AC, 50-60 Hz		
9	Environmental Specifications		
A	Operating temperature -40°C to 60°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)		

9. Centre-of-Row Switch:

Global Weblink/Internet Reference link: _____

S. No.	Technical Specifications	Compliance (Yes/No)	Remark
1	Hardware Specifications		
1.1	Min 12 Slots Chassis populated with Dual Redundant , Hot Swappable Active - Active Supervisor Engines		
1.2	IEEE 802.3x Flow control - full duplex operation		
1.3	Should support Active – Active Clustering Virtual Chassis or equivalent technology for high availability and quick resiliency.		
1.4	The Virtual chassis links between the 2 Chassis should be min of 80Gbps bandwidth with no single point of failure , all the required modules / other related cards should be proposed from day 1		
1.5	The proposed Virtual chassis technology should support high availability for both Layer 2 and Layer 3 Including for IP Multicasting applications		
1.6	The switch shall have the technology functionality to shut down the packet forwarding in the secondary Virtual chassis switch in a disastrous failure situation of both the interconnecting links between the 2 chassis , ensuring seamless network connectivity across the back bone		
1.7	The High available chassis shall also act as an Centralized management / SDN provisioning console for managing the management plane of all the switches for dynamic policy roll out across the switches or for selected switches in the network. The benchmark technology for centralized provisioning of management plane shall be of Instant Access or Equivalent.		
1.8	The High available chassis shall support automated scheduled back up of running configuration files from all the network switches ensuring ease of management.		
1.9	The High available chassis shall also act as an Centralized management / provisioning console to ensure Zero touch replacement of field switches using Instant access /SDN or equivalent technology .		
1.10	vendors proposing for external SDN controller based solution should ensure there is no single point of failure with the SDN provisioning controller and should be proposed in high availability working in Active - Active cluster mode.		
1.11	Proposed SDN controller / provisioning solution should seamlessly integrate with the existing deployed and up - coming network infrastructure.		
1.12	Shall be populated with Dual Hot-swappable Supervisor engines from Day 1		
1.13	Shall support Hot swappable Network modules and PSU's for high reliability		

1.14	Shall have Dual AC Power Supply from day 1		
1.15	Switch Should Have min. 16 Nos. 10G (SFP+) port from Day 1		
2	Performance Specification		
2.1	Min1.9 Tbps of Switching Fabric or better		
2.2	Min 32K or better MAC address		
2.3	Should support In service software upgrade in chassis.		
3	Resiliency		
3.1	Rapid Ring protection / Resiliency technology providing the convergence of Sub 50ms in accordance to IEEE 802.17 or equivalent.		
3.2	The proposed Ring protection technology shall have the high reliability functionality to handle dual failures and ensure the convergence of less than 50ms in case of more than one link broken in the ring.		
3.3	The proposed Ring protection technology shall be capable of handling data loop whose path traverse more than a single ring and the loop occurs when there is a break in a physical segment that is shared by two rings		
3.4	Loop Detection and Loop protection		
3.5	Control Plane Prioritization (CPP)		
3.6	Dynamic link failover		
3.7	Loop protection: loop detection		
3.8	RSTP , MSTP		
4	VLAN		
4.1	VTP / GVRP		
4.2	VLAN creation based on protocol and port based		
4.3	IEEE 802.1Q Virtual LAN (VLAN) bridges		
4.4	IEEE 802.1v VLAN classification by protocol and port		
4.5	IEEE 802.3ac VLAN tagging		
4.6	Q In Q		
4.7	Up to 4K configurable VLAN 's		
5	Layer 3 Features (from Day 1)		
5.1	Equal Cost Multi Path (ECMP) routing		
5.2	Policy-based routing		
5.3	Route redistribution (OSPF, RIP)		
5.4	UDP broadcast helper (IP helper)		
5.5	ICMP router discovery messages		
5.6	Classless Inter-Domain Routing (CIDR)		
5.7	Domain Name System (DNS)		
5.8	RIPng for IPv6		

5.9	OSPF v3		
5.1	BGP / BGP 4		
5.11	VRF Lite or equivalent		
6	Security		
6.1	Access Control Lists (ACLs)		
6.2	Authentication - fail and Guest VLANs for enforcing security policies		
6.3	BPDU protection		
6.4	DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI)		
6.5	Dynamic VLAN assignment Per Supplicant dynamic allocation of multiple VLAN s on one port		
6.6	Network Access and Control (NAC) features manage end point security		
6.7	Port-based learn limits (intrusion detection)		
6.8	MAC address filtering and MAC address lock-down		
6.9	Private VLANs provide security and port isolation		
6.1	Secure Copy (SCP)		
6.11	Strong password security and encryption		
6.12	Tri-authentication: MAC-based, web-based IEEE 802.1x		
6.13	IEEE 802.1x with Web Authentication specific DHCP server		
6.14	IEEE 802.1x with Web Authentication client monitoring		
6.15	SSH , SSLv2 ,SSLv3 , SCP		
6.16	TACACS+ accounting and authentication		
6.17	DoS attack protection		
6.18	RSTP Root Guard		
7	Quality of service		
7.1	IEEE 802.1p		
7.2	DSCP Prioritization		
7.3	64 Kbps bandwidth limiting per port or per traffic class		
7.4	Wirespeed traffic classification with low latency essential for VOIP and real time streaming media applications		
7.5	Policy-based QoS based classifying traffic based on MAC , Port , VLAN , Protocol , L3 and L4 Parameters		
7.6	Policy-based storm protection		
7.7	Extensive remarking capabilities		
7.8	Taildrop for queue congestion control		
7.9	Strict priority, weighted round robin or mixed scheduling		
8	IPv6 Features		
8.1	Path MTU discovery for IPv6		

8.2	IPv6 Router Discovery		
8.3	IPv6 Router Advertisement		
8.4	IPv6 Router Advertisement Guard		
8.5	Transmission of IPv6 packets over Ethernet networks		
8.6	Default address selection for IPv6		
8.7	DNS extensions to support IPv6		
8.8	Unique local IPv6 unicast addresses		
8.9	Internet Control Message Protocol (ICMPv6)		
8.1	Neighbor discovery for IPv6		
8.11	IPv6 Stateless Address Auto-Configuration (SLAAC)		
8.12	IPv6 Router Advertisement (RA) flags option		
8.13	IPv6 Router Advertisement (RA) guard		
8.14	IPv4 and IPv6 Dual stack		
8.15	DHCP Client / Relay for IPv6		
8.16	DHCP server for IPv6		
9	Management Features		
9.1	SNMPv1, v2c and v3		
9.2	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)		
9.3	Web GUI		
9.4	sFlow: a method for monitoring traffic in switched and Routed networks or equivalent		
9.5	Industry-standard CLI with context-sensitive help and GUI, console management port		
9.6	Powerful CLI scripting engine		
9.7	text editor		
9.8	The switch should support in built Layer 1 monitoring capability for end to end security monitoring to avoid any eve drops or security breach on the Fiber uplink links.		
9.9	Port mirroring locally with in switch and across Virtual chassis cluster		
9.10	TFTP and NTP as well Syslog		
9.11	An USB or equivalent memory card socket , allowing software release files, configuration and other files to be stored for backup and distribution to other switches		
9.12	DDM – Optical digital diagnostic monitoring as per SFF – 8472 or equivalent standards and UDLD or equivalent.		
9.13	Built in Self Test and Cable Fault Locator.		
10	IPv6 Management features		
10.1	SNMP v6 , Telnet v6 , SSH v6 , NTP v6 and Trace Route v6		
11	Multicast Support		
11.1	IGMP query solicitation		

11.2	IGMP snooping v1 , v2 and v3		
11.3	IGMP Querier and IGMP Snooping Querier		
11.4	MLD Querier		
11.5	IGMP/MLD multicast forwarding (IGMP/MLD proxy) , IGMP Snooping Fast - leave , IGMP Filtering , IGMP snooping mrouter ports, IGMP snooping report suppression , IGMP source address check , IGMP static entries		
11.6	PIM neighbor filtering		
11.7	PIM for IPv6 , MLD Filtering , MLD Snooping fast leave , MLD snooping static mrouter ports , MLD snooping report suppression		
11.8	PIM - SSM		
12	Pro Active Intelligence features		
12.1	Event-based triggers allow user-defined scripts to be executed upon selected system events based on Time , Date , day and Event based		
12.2	The switch shall have pro active intelligence to create an ICMP polling for service reach ability based on IP address and configure pro active action upon loss or re establishment of the service reachability		
12.3	Eco-friendly mode allows ports and LEDs to be disabled to save power		
12.4	Full environmental monitoring of PSU internal temperature and internal voltages along with reporting functionalities		
13	Voice over IP		
13.1	LLDP-MED ANSI/TIA-1057		
13.2	Voice VLAN		
14	Compliances		
14.1	ROHS compliant is must		
14.2	IEEE 802.3az Energy Efficient Ethernet (EEE)		
14.3	UL, cUL, TUV or equivalent		

10. (a) Wireless Access Point (Indoor):

Global Weblink/Internet Reference link: _____

SN.	Specification	Compliance (Yes/No)	Remarks
1	The access point should be capable to offer IEEE 802.11ac standard with an assured through put 1750 Mbps.		
2	Should support dual band as 2.4 or 5GHz with embedded antenna		
3	The AP should be operated in standalone as well as controller based environment.		

4	AP should be offering automatic channel selection to restrict interference		
5	Should support Multiple BSSIDs, VLAN tagging		
6	Should have mechanism to detect the rogue AP		
7	Should have MIMO or equivalent technology for reliability		
8	Management		
A	Support for GUI (HTTP /HTTPS),SNMPv1,SNMPv2c		
9	Security		
A	Should support AAA (Authentication, Authorization, and Accounting.)		
B	Should support 128 bit based AES encryption		
C	Should support WPA/ TKIP, WPA2/CCMP, EAP, PEAP,802.1x, ACL, 4VLAN, Dynamic VLAN		
10	Standards Support		
A	IEEE 802.11a/b/g/n/ac 3x3 MIMO		
B	IEEE 802.11e ,IEEE 802.11d,IEEE 802.11h,(EAP-AKA)		
C	Should support EAP-SIM, Transport layer security (TLS-EAP)		
D	Support EAP-MSCHAPv2, Microsoft CHAP v2		
E	Should support the mechanism to Hide and ignore/restrict for specific SSID		
F	Should have option for scanning for user list for monitoring		
G	Should support for strong interface tuning mechanism as client isolation, Beacon, IEEE 802.11b fall back control, short Radio preamble.		
11	Other wireless services as Controller based application		
A	Should support Captive portal Dynamic channel planning, Should support IDS, Media access control protocol		
B	Plug and play solution from the perspective of authentication and configuration.		
12	Important certificates		
A	CE, TUV, FCC, Wi-Fi certification, EAC		
13	Safety		
A	UL60950-1,CSA,EN 60601-1-2,CISPR 11,EN 61000-3-2, EN 61000-3-3,EN 301 489-1,EN 61000-3-3,EN 61000-4-2,EN 61000-4-6,EN 61000-4-11,ICES-003		
14	Reliability		
A	MTBF 600,000 Hrs or better (Should be provided with authenticate document or datasheet which clearly mentioning the same)		
15	Power Over Ethernet		
A	Should be operated as 802.3at -Powered device (PD)		

10 (b) Wireless Access Point (Outdoor)

S. No.	Specification	Compliance YES/NO
1	The access point should be capable to offer IEEE 802.11ac standard with an assured through put min. 1150 Mbps. Or better. Access point Should Support IPv6 from Day 1.	
2	Should support dual band as 2.4 or 5GHz with Dual external antenna	
3	The AP should be operated in standalone as well as controller based environment. APs Should Support Cluster upto 16 Members.	
4	AP should be offering automatic channel selection to restrict interference	
5	Should support Multiple BSSIDs, VLAN tagging, 4K VLANs	
6	Should have mechanism to detect the rogue AP	
7	Should have MIMO or equivalent technology for reliability	
8	Modulation technique on 802.11a/g/n/ac: OFDM	
9	Protection rating: IP67 or better	
10	Management : Support for GUI (HTTP /HTTPS),SNMPv1,SNMPv2c	
11	Security : Should support AAA (Authentication, Authorization, and Accounting.), Should support 128 bit based AES encryption or equivalent, WPA/ TKIP, WPA2/CCMP, EAP, PEAP,802.1x, ACL, RADIUS Server, Dynamic VLAN Etc.	
12	Standards Support	
a	IEEE 802.11a/b/g/n/ac 2x2: 2SS MIMO	
b	IEEE 802.11e ,IEEE 802.11d,IEEE 802.11h,(EAP-AKA)	
c	Should support EAP-SIM, Transport layer security (EAP-TLS)	
d	Support EAP-MSCHAPv2, Microsoft CHAP v2	
e	Should support the mechanism to Hide and ignore/restrict for specific SSID	
f	Support Multiple SSID, VLAN to SSID mapping	
g	Should have option for scanning for user list for monitoring	
h	Should support for strong interface tuning mechanism as client isolation, Beacon, IEEE 802.11b fall back control, short Radio preamble.	
13	Other wireless services as Controller based application	
a	Should support Captive portal , Dynamic channel planning, Should support IDS, Media access control protocol, Dynamic RF coverage optimization etc.	
b	Plug and play solution from the perspective of authentication and configuration.	
13	Important certificates : CE, TUV, FCC, Wi-Fi certification, EAC or equivalent	
14	Safety and Electro Magnetic Compatibility	
a	EN 60950-1, IEC 60950-1,EN 60950-22, FCC 47 CFR Part 15, ICES-003, EN 61000-4-3,EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 301 489-1, EN 301 489-17, EN 50385, EN 55022, Class B, EN 55024 Etc.	
15	Reliability : MTBF 286,269 Hrs or better (Should be provided with authenticate document or datasheet which clearly mentioning the same)	
16	Power Over Ethernet and Operating Temperature:	
a	Should be operated as 802.3at -Powered device (PD).	
b	Operating temperature: -40° to 65°C (-40° to 149°F)	
17	All the Access Points should be offered with min 5 years replacement warranty with proper back-up on respective-OEM letter Head. The switches, Firewall, FO Modules. Wireless Component, NMS should be from the same OEM.	

11. Wireless Controller:

S. No.	Specification	Compliance (Yes/No)	Remarks
1	The wireless solution should be based on centralized WLAN Controller/Switch with thin AP controller that is responsible for configuration, control, WIPS/WIDS and Access Control Policies.		
2	The Central WLAN Controller should have 200 AP's support and shall have the ability to scale to support upto 2000 or more APs via grouping of controllers		
3	The controller should be capable of being deployed in the institute and must be under the full administrative control of the institute. It should be hosted on hardware which is 19" rack mountable or provided with necessary accessories for rack mount		
4	The WLAN Controller should have the ability to provide redundancy support, by seamless addition of one or more additional WLAN Controller has to form a CLUSTER.		
5	Should support the active: active redundancy mode and active: standby mode.		
6	Should support thin-AP and Spectrum load balancing across Controllers in the Cluster		
7	Support 802.11n, 802.11 b/g and 802.11ac		
8	The Central WLAN Controller should have the ability to upgrade by adding licenses to support 50 or more APs.		
9	Should support RF healing in the event of thin AP failure.		
10	Should support two firmware images, and two configurations to be stored.		
11	Support up to 256 different SSID , VLAN assignment to individual SSID , Up to 16 SSID per port		
12	Should support dynamic VLAN assignment to individual users based on configurable rules, automatic channel selection – interference avoidance		
13	Should support seamless L3 roaming of wireless clients, without need for adding any client s/w, automatic RF self-healing , Access Control Lists		
14	The controller should be Wi-Fi CERTIFIED: WPA-Personal and WPA-Enterprise		
15	Encryption WEP 64 / WEP 128, WPA – TKIP / AES, WPA2 – TKIP / AES		
16	Should support 802.1x authentication mechanisms- PEAP , EAP-TLS, EAP-TTLS,		
17	Should support user based VLAN assignment via "dynamic VLAN assignment"		
18	Should support a Utility for administrators to configure Guest users with time duration of the access desired		
19	Rogue AP and client detection, DoS protection, IEEE 802.11e (WMM),		
20	Should support DTIM per BSSID configuration for voice/video , Band steering, Client load balancing		
21	HTTP, HTTPS, SNMP V1.2, Syslog, primary& secondary firmware management		
22	Capability to store historical data flowing across the wireless network		

23	Should support following Views on the controller - Summary Dashboard, Rogue, Exploits, Vulnerability, Alarms, Policy, Reporting, Reconnaissance, Performance, Location, Notification, Admin, Lock Down, Access, Control List		
24	Vendor must provide a band unlocked radio or where one radio can be leveraged as a full time sensor for both 2.4 and 5 GHz or scan on the same frequency while servicing the client		
25	Vendor's wireless intrusion prevention system must detect more number of wireless network and security threats while WPA-2 AES is enabled.		

12. 10G FO Module:

S.No.	Specification	Compliance YES/NO	Remarks
1	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 and MSA Compliant		
2	Environment		
a	Operating Temperature: -0 To 70 Degree C, Relative Humidity:0% to 80% (non-condensing)		
3	10G FO Module Should be same make of Switch , wireless Component, NMS etc		

13. 1G FO Module:

S. No.	Specification	Compliance YES/NO	Remarks
1	Single Strand (core)(Bi-Di) Single Model gigabit FO module support wave length 1310 Tx /1490 Rx or 1490 Tx /1310 Rx		
2	Support Min 10 Km and data rate 1.25 Gbps		
3	Support Self-locking mechanism		
4	Operating Temperature : 0°C to 70°C		
5	Storage temperature: -40°C to 85°C		
6	Operating humidity: 5% to 85%		
7	Transmit Parameter : Min -9 dBm to Max -3dBm		
8	Receiving Sensitivity : -30 to -20 dBm		
9	Supports hot-swappable and digital diagnostics		

14. 10G NIC Cards:

Global Weblink/Internet Reference link: _____

SN.	Specification	Compliance YES/NO	Remarks
A	Should have min. 2 *SFP+ port		
b	Should be compatible with PCI-Express v2.0 / PCIe x 8		
c	Should support IEEE 802.1P		
d	Should support IEEE 802.1Q		
e	Should support IEEE 802.3x, IEEE 802.2 LLC, PXE remote boot support		
f	Should support IEEE 802.3ad, VLAN, LACP, Failover, IEEE 802.1Qbb, IEEE 801.1Qau.		
g	Should support SNMP, WMI, Jumbo Frame, IPv6, Datacentre Bridging technology, Adapter Fabric Extender		
h	Should support Windows 2008, Windows 2012, HyperV, VMware, Linux, Citrix XenServer		
i	Should have indication for Link and Activity		
J	Should be certified for RoHS, UL, TUV, CE, VCCI		
k	Network interface card should be from the same OEM as the OEM of the switches; otherwise it should be submitted with interoperability test report from the vendors i.e., switch manufacturer and the NIC Card manufacturer for seamless interoperability.		

15. TwinaX / DAC:

S.No.	Specification	Compliance YES/NO	Remarks
1.	TwinaX / DAC should have a length of 7 meters		
2.	It must be of SFP+ type		
3.	It should be from the same OEM as the OEM of the switches.		

16. 10G Expansion Card:

S. No.	Specification	Compliance YES/NO	Remarks
1	The 10G expansion module should support existing Core Switch and it should have min 2 Nos. 10G SFP+ ports.		
1	The expansion module should support min 64K Mac address, Next HOPS min 8K, Qos Traffic classes 4K, min 128 Link Aggregation group and min. 4K ACL lists.		
1	The expansion module should be RoHS complied and UL, CUL and TUV or equivalent certified.		

17. Up-gradation of Existing Network Provisioning and Management Technology:

Global Weblink/Internet Reference link: _____

Sr.No.	Technical Specifications	Compliance (yes/No)	Remark
1	NIT Raipur intends to scale up the current NMS software to support newly created switches/switch stacks/access points etc.		
2	NMS is a graphical network monitoring and management tool for all components under Centralized management / SDN or equivalent technology networks.		
3	Automatically creates a complete topology map from a centralized management / SDN or equivalent technology for a network of switches and wireless Access Points (APs) etc.		
4	Facilitates simple management of many or all network devices at once. It will monitor up-to-date network status, and provide actionable reporting for the timely resolution of any network problems		
5	Should support creation of wireless floor maps, which create a comprehensive visual display of the physical layout of network APs		
6	Should support intuitive usability, with an overview dashboard, simplified navigation and comprehensive network information		
7	Should automatically generate a network topology map showing a device list, and give the ability to search for specific devices		
8	Should support status display for all devices alerting users of any problems		
9	Should support direct connectivity to one, many, or all devices for configuration updates		
10	Should support management of device backups and firmware upgrades		
11	Wireless deployment map should show AP layout, with color-coded channel information		
12	Should support the registration and configuration of additional wireless APs		
13	Should support comprehensive log management		
14	Should support easy and accessible user and system management		
15	Should support comprehensive event logs for network issue resolution		

18. NMS Server

S. No	Description	Qty
1.	Standard 19" rack mountable supplied with all accessories	
2.	Dual Socket and Single Hexa Core processor loaded	
3.	16 GB RAM	
4.	Windows 2012 Server (64 bit)	
5.	500 GB SAS-10K RAID-1	
6.	Redundant Power Supplies loaded from Day1	

7.	DVD-W/R loaded	
8.	2x Gigabit Ethernet Port	
9.	Standard Display VGA/HDMI with Keyboard & Mouse Ports USB/PS-II	
10.	Certified for Virtualization platform supports Hyper-V, VMware, Citrix etc	

Section II

1. 6KVA UPS:
2. Battery Bank for 60 mins backup
3. Battery Rack and Interlink cable for 6kVA UPS and TVSS

S. No.	Feature	Specification	Compliance (Yes / No)	Remarks
1	Configuration	UPS should configure in Active-Idle model.		
2	Capacity	6 KVA / 4800W		
3	Rectifier Type	IGBT with Power factor correction.		
4	Input Voltage	208/220/230/240VAC		
5	Input Voltage Range	Single-Phase 160Vac- 300VAC at 100% load		
6	Input Frequency Range	46-54 Hz		
7	Input power Factor	>=0.99 Single Phase.		
8	Battery Type	Lead Acid maintenance Free Battery		
10	No. of batteries	20nos		
11	Rating of the Battery	12V		
12	Battery Backup	For 60mins backup req. minimum VAH should be 1512 VAH. Battery make shall preferably be of Exide / Global & Yuasa (Rocket) / Panasonic / Amara Raja (Quanta)/ Base / Okaya or equivalent. Bidder shall propose optimal solution in terms of number of batteries which shall be approved by CCC before final deployment. The batteries must be placed in appropriate racks. All interlink cables and other accessories must be supplied for a functional setup.		
12	Output Rated Power	6 KVA/4.8 Kw		
13	Output Voltage	208/220/230/240VAC		
14	Output Voltage regulation	1%		
15	Output frequency precision	50Hz		
16	Output Voltage THD	<3% Linear, <7% Non Linear		
17	Crest Factor	3:1		
18	Overload	125% for 1 Minute		

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

19	System Efficiency	91%		
20	ECO MODE Efficiency	97%		
20	Noise	<55 dB		
21	Certificate	CE & ROHS		
24	Protection Level	IP 20		
25	Dimension(mm)	369x190x318(mm)		
27	Operating Temperature	0-50 Degree C with Dust Free Environment.		
28	Relative Humidity	0-95% without condensation		
30	Transient Voltage Surge Suppressor	A 25 kA Transient Voltage Surge Suppressor 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		
31	Manufacturer of the UPS systems should be ISO 9001:2008 certified.	Mandatory. Please enclose certificate		
32	Manufacturer of the UPS systems should be ISO 14001 certified.	Mandatory. Please enclose certificate		

4. Online UPS (1KVA):

S. No.	Feature	Description	Compliance (Yes / No)	Remarks
1	UPS Rating	1kVA / 800 W		
2	UPS Type	True Online Double Conversion UPS system with IGBT based rectifier.		
3	Input Voltage	UPS having Single phase input with the Voltage Range 110V to 280VAC based on load.		
4	Input Power Factor	>= 0.99 for 100% load.		
5	Input Frequency	40Hz to 70Hz		
6	Output Voltage	200/208/220/230/240 V Single Phase with $\pm 1\%$		
7	Output Frequency	50 Hz or 60Hz +/- 0.1 Hz		
8	Output vTHD	<= 3% for Linear Load		
9	LCD Display	UPS Should be LCD Status Display		
10	Efficiency	88% AC Mode		
11	Crest Factor	3:1		

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

12	Waveform	Pure Sine Wave		
13	Over Voltage Cut off Device	Should be inbuilt into the UPS System		
14	Battery Block	3 nos SMF battery		
15	Battery Bank	Minimum 216 VAH. Battery type will be SMF VRLA only and shall provide a backup of 30 mins.		
16	Alarm	Battery Mode, Low Battery, Overload, Fault.		
17	Environment	Humidity 20-90% RH @ 0-40°C (Non Condensing) . Noise level : < 50dB @ 1mtrs.		
18	Intelligent Monitoring Slot	UPS should have option with Smart RS-232 / USB along with option for SNMP module.		
19	Certificates Required.	i. UPS Manufacturer's ISO 9001:2008 certificate		
		ii. UPS Manufacturer's ISO 14001 certificate		

5. 15U LAN RACK:

S. No.	Specification	Compliance (Yes/No)	Remarks
1.	15U wall mount rack: 600mm width / 500mm width. 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 Nos.		
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.		

PASSIVE COMPONENT

1. 6/12-Core Single Mode F.O.C.

S. No.	Specification	Compliance (Yes/No)	Remarks
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Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

1.	OS2 Type, Single Mode, 6/12-Core, 9/125µm, Armored, Unitube, Gel Filled Cable complying to ISO/IEC 11801:2002 – 2 nd Edition, ITU-T REC G 652D, suitable for use in direct burial, outdoor ducts and backbone cabling		
2.	Corrugated Steel Tape Armour of thickness > 0.125mm		
3.	Attenuation ≤0.34 dB/km at 1310 nm ≤0.22 dB/km at 1550 nm		
4.	Max. Tensile Strength Short Term: 1000N or Better		
5.	Max. Crush Resistance Short Term: 2000N/10CM or Better		
6.	Operating Temperature: -10 to +70°C		
7.	Numerical Aperture: 0.14 or Better		
8.	Core/Mode Field (µm): 9.2 or Better		
9.	Max. Bending Radius (During Installation): 20 x Overall Diameter or Better		
10.	Two Steel Wires OR FRP Rod OR Aramid Yarns Beneath Corrugated Steel Tape may be provided as strength members		
11.	Sheath: UV stabilized HDPE		
12.	Overall Cable Diameter: 9.5-9.9mm		
13.	Should provide fiber protecting tube preferably of Polybutylene Terephthalate or Better		
14.	Should provide water blocking preferably of thixotropic gel (tube), petroleum jelly (interstices) or better		
15.	Mode Field Diameter at 1310nm: 9.2±0.4 µm		
16.	Cladding Diameter: 125±1.0 µm		
17.	Bandwidth: >1GHz-km at 1310nm		
18.	Attenuation Discontinuity: Both Windows <0.1 dB		
19.	ROHS compliant		
20.	ISO/IEC 11801: 2002 – 2 nd Edition, Type: OS2		
21.	ITU-T REC G652D specifications for low water peak fiber		

Rack Mount Fiber Panels (LIUs) :

2. 12-port LIU &

3. 24-port LIU

S. No.	Specification	Compliance Yes/No	Deviation if any
1.	Fiber Management Shelf: Configurable Fiber drawer is a 1U rack mount unit for storing and terminating incoming fiber cable.		
2.	Using range of 6 Pak Plates fiber system can be configured to suit all fiber		

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	applications.		
3.	Configurable. Fits up to four 6 Pak Plates/ Angled 6 Pak plates		
4.	Management rings within system to accommodate excess fiber cordage behind the trough adapters and maintain fiber bend radius		
5.	Sliding drawer for ease of reconfiguring fibers		
6.	Rugged steel construction finished in attractive		
7.	Accommodates 2 x 12 fiber Splice Trays		
8.	Weight :5KG		
9.	Size (mm) : 45mm H x 485mm W x 255mm D		
10.	Optical Fiber Adapter Plates Loded : LC Duplex 6 Fiber SM Adapter Plate		
11.	LIU Should be provided with Lock & Key		
12.	No of Adapter Plate Req : As per Requirement		
13.	Pigtail : LC, Single mode, 9/125 μ m qty depend on Connection		
14.	ROHS Compliant		

4. LC-LC Duplex Single Mode Fiber Patch Cords:

S.No.	Specification	Compliance (Yes/No)	Deviation if any
1.	Make and Type :LC to LC Duplex/Simplex tuned Fiber Optic Patch Cord 3 Mtr, 9/125 Micron		
2.	Cable Sheath : LSZH		
3.	Cable Diameter :1.8 mm twin zip		
4.	Ferrule : Ceramic		
5.	Buffer :Tight buffered		
6.	Insertion Loss : MAX .3 db		
7.	Return Loss > 45 db		
8.	Temperature Range : -10 Degree C to +60 Degree C		
9.	ROHS Compliant		

5. Fiber Pigtails:

SN	Specification	Compliance Yes/No	Deviation if any
1.	Cable - 900Micron Tight Buffered		
2.	Length - 1.5Mtrs		

3.	Polishing - 100% Factory Tested and Guaranteed Performance		
4.	Connector End: 1 X LC Connector S.M Zirconia ceramic ferrule.		
5.	Operating Temperature -10 Degrees to + 60 ° C		
6.	Sheath : LSZH		
7.	Min Bend radius : 30mm		
8.	Retention Strength : 100N		
9.	at 1310 nm $\leq$ 0.36 dB/KM		
10.	at 1550nm $\leq$ 0.22 dB/KM		
11.	ROHS Complaint		

6. Wall Mount LIU (12-port, Loaded)

S. No.	Description	Specifications	Compliance (Yes/No)	Deviation if any
1	Fiber Management Shelf	The LIU-24 should be constructed of heavy gauge steel with a graphite grey powder coat finish.		
		Configurable. Fits up to four 6 Pak Plates/ Angled 6 Pak plates		
		Management rings within system to accommodate excess fibre cordage behind the trough adapters and maintain fibre bend radius		
		Accommodates Splice Tray		
2	Weight	2Kg		
3	Compact size (mm)	203mm H x 251mm W x 76mm D		
4	Optical Fibre Adapter Plates Loaded	SC / LC Duplex Adapter, as per requirement		
5	No. of Adapter Plates Required	As per Requirement		
6	Pigtail	SC / LC, Multimode / Singlemode		
7	No of Pigtail Req	As per Requirement		

7. LC-LC Simplex Single Mode Fiber Patch Cords:

S.No.	Specification	Compliance (Yes/No)	Deviation if any
1.	Make and Type :LC to LC Duplex/Simplex tuned Fiber Optic Patch Cord 3 Mtr, 9/125 Micron		
2.	Cable Sheath : LSZH		
3.	Cable Diameter :1.8 mm twin zip		
4.	Ferrule : Ceramic		
5.	Buffer :Tight buffered		

6.	Insertion Loss : MAX .3 db		
7.	Return Loss > 45 db		
8.	Temperature Range : -10 Degree C to +60 Degree C		
9.	ROHS Compliant		

8. LC-LC Simplex Single Mode Fiber Patch Cords:

S.No.	Specification	Compliance (Yes/No)	Deviation if any
1.	Make and Type :LC to LC Duplex/Simplex tuned Fiber Optic Patch Cord 3 Mtr, 9/125 Micron		
2.	Cable Sheath : LSZH		
3.	Cable Diameter :1.8 mm twin zip		
4.	Ferrule : Ceramic		
5.	Buffer :Tight buffered		
6.	Insertion Loss : MAX .3 db		
7.	Return Loss > 45 db		
8.	Temperature Range : -10 Degree C to +60 Degree C		
9.	ROHS Compliant		

PASSIVE COMPONENT (UTP)

9. CAT6 Modular Patch Panel / Jack Panel:

S. No.	Specification	Compliance Yes/No	Remarks
1.	19" 24-port, loaded with jack, A key product used in both Category 6 link and channel gigabit Ethernet applications. The IDC section consists of V-shaped contacts that flex not fatigue when terminated. Each port features spring-loaded shutter and can be colour coded to match jack outlets. Offering both front and rear labeling options, the patch panel is constructed of cold-rolled steel for additional strength and durability.		
2.	Ports : 24 and 48		
3.	Plastic Housing Jack Connector :Polycarbonate, UL94V-0 rated or equivalent		
4.	Contact Plating: 50μ" Gold/100μ" Nickel		
5.	Front Connector interface : RJ45		
6.	Circuit Identification Scheme : Icons on each of 24-ports		
7.	Port Identification : 9mm or 12mm Labels on each of 24-ports (to be included in supply)		
8.	Height 1 U (1.75 inches)		
9.	ROHS/ELV Compliant		

10. CAT6 Patch Cords:

S.No.	Specification	Compliance Yes/No	Remarks
(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		

11. Single Information Outlet with Backbox

S. No.	Specification	Compliance Yes/No	Remarks
(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		

12. CAT 6 UTP CABLE:

S.No.	Specification	Compliance	Remarks
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Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

		(Yes/No)	
1.	Category 6 Unshielded Twisted Pair 4-pair cable shall be compliant with ANSI/TIA/EIA-568-C.2 Transmission Performance Specifications for 4-Pair Category 6 Cabling		
2.	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 or LSZH.		
3.	Supports ultra-high speed data networks such as Gigabit Ethernet (1000 Base T and 1000 Base-TX)		
4.	Cable jacket shall be FR PVC or LSZH		
5.	Incorporates Central Spine maintaining pair separation during installation to ensure premium performance after installation		
6.	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 or LSZH Outer Diameter: 6.0±0.4mm Max. Temperature: 75°C		
7.	ROHS/ELV compliant		

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CHAPTER 5: PRICE SCHEDULE

(To be utilised by the bidders for quoting their prices)

Section A: Format for submission of Price bid (Active & Passive Supply)

S. No.	Type Of Equipment	Qty	UoM	Make	Model	Part No.	Unit Rate	Taxes	Total Unit Price	Total Cost
Section I: Active Components										
1	10G Aggregation Switch with 48-port SFP+ slot, 4-port QSFP slot and redundant Power Supply with all accessories, as per mentioned technical specifications	2	Nos							
2	24 Port Gigabit Distribution PoE+ Switch , with Redundant Power Supply , with all accessories as per mentioned technical specifications	25	Nos							
3	48-port 10/100/1000T stackable switch with 4 SFP+ ports , with all accessories as per mentioned technical specifications	28	Nos							
4	48-port 10/100/1000T PoE+ stackable switch with 4 SFP+ ports with all accessories as per mentioned technical specifications	4	Nos							
5	24-port 100/1000X SFP stackable switch with 4 SFP+ ports with all accessories as per mentioned technical specifications	4	Nos							
6	24-port 10/100/1000T stackable switch with 2 combo ports (10/100/1000T or 100/1000X SFP) and 2 SFP+ stacking/user ports as per mentioned technical specifications	70	Nos							
7	24-port 10/100/1000T PoE+ stackable switch with 2 combo ports (10/100/1000T or 100/1000X SFP) and 2 SFP+ stacking/user ports as per mentioned technical specifications	35	Nos							
8	Multiservice access Switch with 6 Giga LAN ports, 1 FO Ports, 2 FXS Ports , with all accessories as per	25	Nos							

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

	mentioned technical specifications									
9	12 slot chassis switch with all accessories as per mentioned technical specifications	2	Nos							
10 (a)	Enterprise-class Wireless Access Point (Indoor) with IEEE 802.11ac dual-band radios as per mentioned technical specifications	175	Nos							
10 (b)	IEEE 802.11ac Enterprise-class Wireless Access Point (Outdoor) as per mentioned technical specifications	25	Nos							
11	Wireless controller as per mentioned technical specifications	2	Nos							
12	10km 1310nm 10GBase-LR SFP+ module as per mentioned technical specifications	86	Nos							
13	10km Bi-Directional GbE SMF SFP as per mentioned technical specifications	56	Nos							
14	2 x 10 Gigabit SFP+ Network Interface Card as per mentioned technical specifications	30	Nos							
15	7m SFP+ "Twinax" direct attach cable as per mentioned technical specifications	60	Nos							
16	2 x 10GbE SFP+ slots (unpopulated) expansion module as per mentioned technical specifications	4	Nos							
17	Up-gradation of Existing SDN based provisioning and Management Technology for supporting Additional Nodes of this project as per mentioned technical specifications	1	Nos							
18	Server for NMS as per mentioned technical specifications	1	Nos							

Section II : UPS and Rack

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 bank required for 60 min Backup for 6KVA UPS	2	Nos							

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

3	Battery Rack and Interlink cable for 6KVA UPS and TVSS	2	Nos							
4	On-line UPS 1KVA with 30 Min Back-up	75	Nos							
5	15U Wall Mount Rack with Accessories	60	Nos							

SECTION III: Passive Component (Fiber)

1	6-core Single Mode Fiber Optic Cable	5000	Mtrs							
2	LIU 12 Port with SM LC Connector loaded	28	Nos							
3	LIU 24 Port with SM LC Connector loaded	6	Nos							
4	LC-LC duplex single-mode patch cord 3m	125	Nos							
5	LC single-mode pigtail 1.5m	500	Nos							
6	Wall Mount 12 Port LIU loaded	24	Nos							
7	LC-LC Simplex Single Mode Patch Cord 3m	48	Nos							
8	LC-LC Simplex Single Mode Fiber Patch Cord 3m	50	Nos							

SECTION IV: Passive Component (UTP)

9	Cat-6 24 Port Patch panel loaded	150	Nos							
10	CaT-6 Patch cord	1mtrs x 5400	Nos							
		2mtrs x 150 (Equal Nos, in 2 different colors)	Nos							
11	Single Information Outlet with Back Box	600	Nos							
12	Cat-6 Cable Box 305 Mtrs Box	155	Nos							

Section B: Format for submission of Price bid (Services)

S. No.	Description/Type Of Service	A/U	Qty	Unit Rate	Taxes	Total Unit Price	Total Cost
1	SM LC FO Connector - Splicing / Connectorisation	600	Nos				
2	Rack Installation and PVC Glanding with Accessories	80	Nos				

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Signature of Bidder With Seal

Tender for Extension of Existing Network to Central Computer Centre and Upgradation of Some Older Segments

3	FO Cable Laying with ISI Mark HDPE Pipe with digging and refilling (Underground)	1000	Mtrs				
4	FO Cable Laying with ISI Mark HDPE Pipe clamped to wall with U-clamps at every 1m (Overhead)	4000	Mtrs				
5	UTP Cat-6 Cable Laying with ISI Mark PVC pipe	45000	Mtrs				
6	Installation charges for Information outlet and Panel Site	600	Nos				
7	Installation charges for active Switching and Wireless component	1	Lot				
8	Installation charges for Upgradation of Existing Network Provisioning & Mgmt Tech	1	Lot				
9	Installation Charges for UPS including battery setup etc.	1	Lot				
10	Project testing, labeling, commissioning, warranty, certification & management with on-site free of cost support for one year	1	Lot				
11	Resident Engineer (2 nos) in CCC Block for Maintaining Data network installed under this project for 3 Years	1	Nos				

OVERALL QUOTE FOR THE QUANTITIES OF THE ACTIVE, PASSIVE & SERVICE COMPONENTS MENTIONED IN CHAPTER – III & IV

S.No.	Components	Cost Inclusive of Taxes in INR
1	Total Cost of all the Active Components including Installation & fitting Accessories and Existing LAN Integration Hardware-Software	
2	Total Cost of UPS and Installation	
3	Total Cost of All the Passive equipments and Racks	
4	Total Cost of Services inclusive of Handover & Training	
5	Other Charges (if any), please specify in brief	
6	Grand Total of Complete End to End Solution Comprising of all the components enumerated above	
In Words: Rupees “ ” only.		

Note: The price bid evaluation of the technically qualified bidders shall be done on the basis of the Grand Total of Complete End to End Solution i.e., S.No. 6 of the above table.

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CHAPTER 6: CONTRACT FORM

CONTRACT FORM:

- (a) A suitable contract agreement shall be signed before starting the work.
- (b) Successful bidder shall be required to enter into a contract with the Institute after the issue of the work order.
- (c) Submission of the bid against this open tender enquiry by a bidder implies that the bidder is in full agreement with the terms and conditions mentioned in this tender document.
- (d) The successful bidder shall be required to affix his signature and seal on each page of this tender document and submit the same as proof of having accepted the terms and conditions mentioned herein.
- (e) The contract with the successful bidder will be on Rs. 100/- stamp paper and shall contain the terms and conditions mentioned under the different chapters and sections of this tender document.

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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 2013-2014	<i>In INR in figures as well as words</i>		
13.	*Financial turnover of 2014-2015	<i>In INR in figures as well as words</i>		
14.	*Financial turnover of 2015-2016	<i>In INR in figures as well as words</i>		
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

Date: _____ **Signature:** _____ **Seal of the company**

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 "EXTENSION OF EXISTING NETWORK TO CENTRAL COMPUTER CENTER AND UPGRADATION OF SOME OLDER SEGMENTS" 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 provide all necessary assistance for successful completion of this project as per this tender.

Yours faithfully,

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

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Read, Understood and Complied With

Signature of Witness

Manufacturer

Dated:

Place:

Signature of

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.

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% CONTRACT VALUE FOR CONTRACT PERFORMANCE GUARANTEE BOND

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 ofhereinafter 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 usBank 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.

WeBank 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 WeBank 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

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Read, Understood and Complied With

effect of so releasing us from our liability under this guarantee.

5. WeBank 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)

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 ccnet@nitrr.ac.in. Bidder should attach two file attachments with this e-mail

- (i) duly-filled table below in editable MS Excel © Spreadsheet, and
- (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**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

Note: A random sample of the active devices shall be POST tested for payment recommendation at this stage. However, if any active device is found not working at any stage till issue of commissioning certificate, it shall be replaced by the contractor free of cost. During the warranty period, the item may be replaced / repaired as needed free of cost or in terms of the warranty.

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.				

ANNEXURE 1: 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:

ANNEXURE 2: BANK GUARANTEE FORMAT FOR EARNEST MONEY DEPOSIT

To

.....
.....
.....
.....

WHEREAS _____ (Name of Bidder) (hereinafter called "the Bidder" has submitted its Bid dated _____ (Date) for the execution of contract " EXTENSION OF EXISTING NETWORK TO CENTRAL COMPUTER CENTER AND UPGRADATION OF SOME OLDER SEGMENTS" (hereinafter called "the Bid") in favour of National Institute of Technology Raipur hereinafter called the "Employer";

KNOW ALL MEN by these presents that we, _____ (name of the issuing Bank), a body corporate constituted under the _____ having its Head Office at _____ amongst others a branch/office at _____ (hereinafter called "the Bank" are bound unto the employer for the sum of Rs. 10,00,000/- (Rupees Ten lacs only) for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents;

THE CONDITION of this obligation is: If the bidder withdraws or amends their quotation before the issue of work-order to the successful bidder by the employer, or fails to submit PBG within stipulated time, (in case he becomes the successful Bidder), We undertake to pay to the Employer up to the above amount upon receipt of his first written demand without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of any of the above conditions. Notwithstanding anything contained herein

i)Our liability under this Bank Guarantee shall not exceed Rs10,00,000/- (Rupees Ten lacs only)

ii)This Bank Guarantee is valid up to _____ (date) and

iii) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand On or before _____ (mention period of guarantee as found under clause (ii) above plus claim period)

Dated _____ day of _____ 20_____

SIGNATURE AND SEAL OF THE BANK