148

ERNET India
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Tender Enquiry No.: EI-D/Tech/51-16/13
Dated: 01.08.2013
Due Date: 04.09.2013
Opening of Bids: 04.09.2013

To

Subject : Invitation of Bids for supply, Installation, commissioning & Integration of Campus Network & other IT Infrastructure– reg.

Sir,

ERNET India, an Autonomous Scientific Society under Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Govt. of India, is a Class 'A' Internet Service Provider for the Education and Research community in India.

2. **ERNET India** is a nodal network for integrating education & research institutions in the country. An Internet service is one of the services being provided by ERNET India to these institutions. The services are provided through 15 Points of Presence (PoPs) located at the premier education & research institutions in the country. All these PoPs are connected on high-speed backbone with international connectivity. Each PoP is connected to other PoPs through scalable multiple Gigabit links.

3. ERNET India facilitates implementation of number of projects by commissioning Campus Network, video conference & other IT infrastructure for various ministries, departments, academic & research institutions under central and state Governments. ERNET India is also providing Internet & video conference services to various Institutions, departments and organizations. Therefore, ERNET India intends to enter into rate contract through empanelment of one reputed manufacturer/authorized supplier for supply, installation, commissioning & integration of Campus Network, IP surveillance system, video conferencing & other IT Infrastructure and related systems, accessories, services, etc. at ERNET locations/user sites to be specified by ERNET India and providing comprehensive maintenance of the equipment during the free warranty period of three years from the date of installation at site and two years AMC services after warranty.

(147)

4. Sealed tenders are, therefore, invited from the reputed manufacturers or their authorized representatives for the supply, Installation & Commissioning of items as per **Annexure-I** in conformity with Technical Specifications as at **Annexure-II**. Interested parties who wish to be empanelled to provide the required equipments/services may collect Tender Document in person against a Demand Draft or Banker's Cheque of Rs.15,000/- drawn in favour of **"ERNET India", New Delhi from Shri Narendar Namrani, Section Officer, ERNET India** as per the schedule detailed below:

1	Issue of Tender Document	01.08.2013
2	Receipt of Queries	07.08.2013 (Queries after 07.08.2013 will not be entertained)
3	Pre-bid meeting Response to Queries	14.08.2013 (at ERNET India) 26.08.2013 (on CPP Portal/ERNET Website only)
4	Receipt of Bids	04.09.2013
5	Opening of Bids	04.09.2013

Note : The Tender Document can also be download from CPP portal/ERNET Web site. In such case, an amount of Rs.15,000/- in the form of Demand Draft/Banker's cheque drawn in favour of ERNET India would be required to be furnished along with the Part – I of the bid.

Any inquiries regarding clarification/interpretation/contents in connection with this Tender should be sent only in writing to the undersigned. The prospective Bidders must take acknowledgement of all inquiries/queries given to the undersigned.

ERNET India shall organize a Pre-Bid meeting on the queries submitted (by stipulated date & Time) by the Bidders on the scheduled date and time at ERNET India. ERNET India may incorporate any changes in the Tender based on acceptable suggestions received during the interactive Pre-Bid meeting. The decision of the ERNET India regarding acceptability of any suggestion shall be final in this regard and shall not be called upon to question under any circumstances. Only two persons for each intending bidder's organization, who will buy the tender, will be allowed to attend the Pre Bid Meeting. The Bidder will have to submit the photocopy of the receipt of payment made against tender fee at the time of Pre-Bid conference.

Response/reply to Queries/clarifications received within time frame as stated above shall be uploaded at CPP portal/ERNET India website. No reply in this regard shall be sent to individual bidders. Bidders are advised to keep visiting CPP Portal/ERNET India Website to get the details in this regard, if any, before submission of their bids on the due date/time.

ERNET India may, for any reason, whether at its own initiative or in response to a clarification requested by prospective bidders, modify the Tender Document by an amendment. The same will be posted on CPP/ERNET India's website.

The following instructions should be carefully noted:

5. ELIGIBILITY CRITERIA

a) For Bidders

i) The bidder should have ISO 9001:2008 or any other equivalent or better quality certification. Supporting documentary proof should be enclosed.

ii) The bidder must have ISO 27001 certificate or any other equivalent or better quality certification. Supporting documentary proof should be enclosed.

iii) The quoted products should be of latest versions. The products being quoted by the bidder should not be declared as at "end-of-sale" and "end-of-support" by the respective OEM/manufacturer. Undertaking to this effect must be submitted from OEM. The bidder should also submit valid letter from the OEMs confirming following:

- Authorization for bidder to bid against this tender specifically
- Undertake that the support including spares, patches, upgrades, updates, etc. for the quoted products/softwares shall be available for next 5years from the date of acceptance of the project.

iv) The bidder must enclose relevant copies of the customer purchase orders, scope of work, deliverables, time period of execution, project value and satisfactory work completion certificate from client for at-least One Campus LAN (Passive & Active components) project of minimum Rs. 8 Cr. in single order executed in last five financial years for any Government Institutes/University/Organizations/PSU or Two Campus LAN (Passive & Active components) projects of minimum Rs. 5 Cr. in each order executed in last five financial years for any Government Institutes/University/Organizations/PSU or Three Campus LAN (Passive & Active components) projects of minimum Rs. 4Cr. in each order executed in last five financial years for any Government Institutes/University/Organizations/PSU.

v) The bidder must enclose a copy of at least one Campus LAN work order having minimum of 10Kms of Fibre optical cable with at least 500 Fibre Terminations and 1000 UTP nodes in any of the last five financial years for any Govt. educational institutes / University / Govt. entity / PSU.

vi) The bidder must enclose a copy of at least one campus LAN work order having 1000 ports on data network switches and at least one chassis based layer 3 switch in a single order in any of the last five financial years for any Govt. Institute/University/Govt. entity/PSU.

vii) The Bidder should have been in the business of Campus Networks & IT infrastructure implementation and integration related activities for at least past 5 years. The Bidder shall submit the declaration duly signed and stamped by Bidder's authorized signatory regarding these along with the documentary proofs in the bid. A copy of the purchase orders should be submitted as a proof.

viii) The bidder may be asked to demonstrate the offered product(s) at a short notice of three days during the technical evaluation. An undertaking confirming the same should be submitted in this respect.

ix) The bidder should not have been barred or black-listed by any of the central/state govt. departments/organizations/PSUs. A self-declaration certificate from the authorized signatory should be submitted.

x) The bidder should have annual average turnover of Rs. 100 Crores each year during the last three financial years. Attested & audited copies of the company's annual reports for the years 2010-11, 2011-12 and 2012-13 have to be attached along with the bid, duly certified by the Charted Accountant. The Bidder should be profit making company in last three year with positive net worth.

xi) The Bidder should be a company registered in India under the Companies Act, 1956 since last 5 years and should have a valid Sales Tax Registration certificate and a valid Service Tax Registration number in India. Attested copies of Certificate of incorporation and Articles of Association (in case of Registered firm), Byelaws and certificates of registration (in case of registered co-operative Societies), partnership deed (in case of partnership firm) should be submitted.

xii) The bidder should have an office in the Delhi state/ NCR with support centers manned with their own qualified engineers across India with a Toll Free number.

xiii) The bidder should give unconditional compliance & undertaking in respect of the following clause for all equipment / service / software which would be procured & installed by ERNET specifically in its own ERNET network only: "All the equipment & devices should be properly configured. There should not be any deliberated vulnerability left in the equipment. In case, any deliberate vulnerability is observed in the equipment later on, the bidder/OEM of the equipment/systems should be liable to penalty as per DoT Amendment of ISP license agreement for security related concern no. 820-01/2006-LR (Vol.II) Pt. dated 03.06.2011. An undertaking to this effect should be given by the bidder/OEM".
However, all equipment / service / software to be procured by ERNET for its customer institutions / organization may not require above arrangement.

xiv) The Bidder should have a country wide support infrastructure with direct presence in Delhi, Mumbai, Bangalore, Kolkatta; Chennai & Hyderabad.

xv) The bidder should be able to provide support services for the faultysystem/subsystem of equipments in conformity with the SLA as defined in this tender document.

xvi) All offered products; softwares & components should support seamless inter-operability among them. There should be no compatibility issue among the supplied products, software & components etc. All offered products, softwares & components should be as per IEEE standards. An undertaking to this effect should be submitted by the bidder.

xvii) All wireless equipment specifications are subject to Indian Government guidelines and any frequency/transmission power/Antenna Gain shall stand amended automatically to that extent. An undertaking to this effect should be submitted by the bidder.

xviii) The bidders should give clause-by-clause compliance for the technical specification of the equipments as in the tender in their technical bids. Also give unconditional compliance of all the terms & conditions as mentioned in the Tender document.

b) **For OEM(s)/Manufacturer**(s)

i) OEMs whose products have been offered in the bid shall have Technical Assistance Centre(TAC) and shall have Toll Free Number for TAC to support the equipment. OEM(s) should have direct presence with their own office in India manned with their own engineers for minimum of last 5 years. Relevant documentary proof should be submitted.

ii) The OEM should have good global reference for their products. Documentary proof should be submitted.

iii) There should be at-least 2 installations of each OEM equipment of data network switching(with minimum 2000 ports on data network switches and at least one chassis based layer 3 switch), passive components (with minimum of 10Kms of Fibre optical cable with at least 500 Fibre Terminations and 2000 UTP nodes, Video Conferencing equipment (with one HD MCU (hardware) and with minimum 20 HD hardware codecs/endpoints and IP surveillance systems(with atleast 100 IP cameras) in any Government Institute/University/Organizations in India. Documentary proof should be submitted.

iv) The OEM vendor should be profit making company in last three years with positive net worth. The OEM should have minimum turnover of Rs. 100.00 Crores(or equivalent in US Dollars) each year during the last three financial years. Attested & audited copies of the company's annual reports for the last three financial years should be attached along with the bid, duly certified by the Charted Accountant. Relevant documents confirming the above should be submitted.

v) The OEM (s) should be an established industry player in its respective domain like security, network, storage etc. and should form a part of any of the four quadrants of the Industry standard on the likes of Gartner, Forrester, IDC etc.

vi) The OEM/bidder must have spares depots in the India with local logistics support and adequate spares for the equipment supplied. This is to ensure immediate delivery of spares parts. The bidder should furnish the details of the physical address and telephone number (s) of the Spares Depot (s)

Note: The Bidders are requested to furnish documents to establish their eligibility for each of the above clauses. Relevant portions, in the documents submitted in pursuance of eligibility criterion mentioned above, may be highlighted. If tender were not accompanied by all the above documents mentioned, the same would be rejected. Undertaking for subsequent submission of any of the above document will not be entertained under any circumstances. However, ERNET India reserves the right to seek fresh set of documents or seek clarifications on the already / submitted documents.

Upon verification, evaluation / assessment, if in case any information furnished by the Bidder is found to be false / incorrect, their bid shall be summarily rejected and no correspondence on the same shall be entertained.

THE BID SUBMITTED BY ANY BIDDER NOT FULFILLING THE ELIGIBILITY CONDITIONS / CRITERIA STIPULTED ABOVE, WILL NOT BE CONSIDERED.

6. GENERAL CONDITIONS

1. The bidder must be an authorized representative of the products offered. The authority from the manufacturer/OEM must be submitted along with the bid. **The bids received without authority will be rejected outrightly.**

2. Quotations should be submitted in two separate **sealed** covers. First cover indicating **"COVER FOR TECHNICAL BID"** should consist of only Bidder's profile, Compliance sheets with supporting documents, all the documents as asked in support of Eligibility Criteria, technical solution, specification, design, configurations of the system offered, un-priced bill of material along with literature, pamphlets, drawing etc. This cover should contain complete technical specifications, make, model, names of supplier/manufacturer and commercial terms etc. of the system offered. Price column in this cover should be kept blank. Second cover indicating, **"COVER FOR PRICE BID"** should consist the same details of first cover as well as the price details. **All the two covers should first be sealed separately**, and then should be kept **in a single sealed bigger cover**. This cover addressed by name to the officer signing this enquiry should be submitted before due date and time. All the covers should be clearly marked "**Bids for supply, Installation, commissioning & Integration of Campus Network & other IT Infrastructure".**

Please Note that Prices should not be indicated in the Technical Bid and should only be indicated in the Price Bid.

3. Bids should be valid for a minimum period of 180 days after the due date. In exceptional circumstances, the ERNET may request the Bidder(s) for an extension of the period of validity of the bid. The request and the responses thereto shall be made in writing (or by fax). The validity of EMD shall also be suitably extended.

4. Envelope should bear the inscription

"Quotation for supply, Installation, commissioning & Integration of Campus Network & other IT Infrastructure"
"Tender Enquiry No. : EI-D/Tech/51-16/13
"Due Date & Time: 04.09.2013 at 3.00 P.M."
"Due Date & Time for Opening of Bids: 04.09.2013 at 3.30 P.M.

5. The Bids must reach the undersigned on or before the due date, i.e., on 04.09.2013 **by 3.00 P.M**. Bids received after the due date & time are liable to be rejected. In the event of due date being a closed holiday or declared Holiday for Central Government offices, the due date for submission of the bids will be the following working day at the appointed time & venue.

6. All imported items are to be quoted in **US$** and other items/services/charges are to be quoted in INR for delivery at the premises of ERNET India/sites free of charge. All prices shall be fixed and shall not be subject to escalation of any description. The rates must be quoted as per the Performa provided in **Annexure-III.**

6a. ERNET India and its customer/user institutes/organizations/ministries/deptts. would like to avail custom duty exemptions by providing customs duty exemption certificate. Exemption Letter for Customs Duty, if required, shall be issued by concerned organization/institutes/ERNET India as and when required/asked for by the bidder. The Custom Duty, if any, shall be paid by the bidder and reimbursement will be taken from ERNET India, subsequently by submitting the relevant documents. All import of equipment will be facilitated by the bidder only.

7. Govt. Levies like sales tax, octroi, service tax, WCT etc., if any, shall be paid at actual rates applicable on the date of delivery. Rates should be quoted accordingly giving the basic price, Sales Tax etc., if any.

8. It may specifically be mentioned whether the quotation is strictly as per tender specifications/conditions. If not, deviations must be spelt out specifically. **In the absence of this, the quotation may be rejected.** Deviation on lower side of specifications will not be considered. **No deviations in terms & conditions** of the tender document will be accepted in any case.

9. Please give the Registration number of the firm along with the LST/CST/WCT No. allotted by the concerned authorities in your quotation.

10. ERNET India reserves the right to accept or reject any bid or cancel the tender proceedings without assigning any reason whatsoever.

11. The bidders should quote the products strictly as per the tendered specifications giving models, make and exact specifications. All the technical literature for the products offered by the bidder may be enclosed in the bid. **Quotations with incomplete technical details shall be rejected.**

12. **Incomplete quotations are liable to be rejected.**

(147)

13. Bidder shall sign all pages of quotation and drawings forwarded with the quotation.

14. The price shall be for delivery at desired destination in India including installation/commissioning and complete operationalization. In case of any discrepancy between rates mentioned in figures and words, the latter shall prevail. The selected bidders shall be empanelled with ERNET India for a period of 24 months, which can be extended for a further period as decided through mutual consent. Rates quoted shall be valid for the period of empanelment and the extended period. The empanelled bidder shall have to enter into a written agreement with ERNET India for honoring all tender conditions and warranty maintenance support, in executing the purchase orders placed by ERNET India.

15. The bidder must quote for all the items of the Package as mentioned in the **Annexure-I.** The bidder not quoting all the items of **Annexure-I** will be summarily rejected. Quantities can be varied (i.e. decreased or increased) vis-a-vis budget constraints and requirements. The price comparison shall be made package-wise.

16. ERNET India may waive any minor infirmity or non-conformity or irregularity in a bid or may seek any clarification on the bids, if so desired.

17. Any attempt of negotiation direct or indirect on the part of the bidder with the authority to whom he has submitted the tender or authority who is competent finally to accept it after he has submitted his tender or any endeavor to secure any interest for an actual or prospective bidder or to influence by any means the acceptance of a particular tender will render the tender liable to be excluded from consideration.

18. The bidders will have to arrange for all the testing equipment and tools required for installation, testing, maintenance etc.

19. ERNET India will have the right to reject the components/equipment supplied if it does not comply with the specifications at any point of installation/ inspection.

20 The bidders should give clause-by-clause compliance for the technical specification of the equipments in their technical bids. Also give compliance of all the terms & conditions as mentioned in the Tender document. Conditional tenders shall not be accepted on any ground and shall be rejected straightway. If any clarification is required, the same should be obtained before submission of the bids.

21. **INSPECTION**

ERNET India or its representative shall have the right to inspect or to test the items to confirm their conformity to the ordered specifications. The supplier shall provide all reasonable facilities and assistance to the inspector at no charge to ERNET India. In case any inspected or tested goods fail to conform to the specifications, ERNET India may reject them and supplier shall either replace the rejected goods or make all alterations necessary to meet specification required free of cost to ERNET India.

22. **EARNEST MONEY DEPOSIT**

i) Each quotation must be accompanied by Earnest Money Deposit (EMD) of Rs.20,00,000/- (Rupees Twenty Lakhs only) shall be in the form of Demand

Draft/Pay Order/Bank Guarantee of any Nationalized/Scheduled Bank taken in the name of Chief Finance officer, ERNET India, New Delhi. Bank Guarantee should be valid minimum for a period of 180 days from due date of the quotation. **Quotations received without Earnest Money Deposit are liable to be rejected**

ii) Earnest Money is liable to be forfeited and bid is liable to be rejected, if the bidder withdraw or amends, impairs or derogates from the tender in any respect within the period of validity of the tender.

iii) If the successful bidder fails to furnish the performance Security within 15 days of the placement of the purchase order, the earnest money shall be liable to be forfeited by ERNET India.

iv) The earnest money of all the unsuccessful bidders will be returned after placement of order on the selected vendor. No interest will be payable by ERNET India on the Earnest Money Deposit.

v) The Earnest Money of successful bidder shall be returned after furnishing of Performance Security.

23. **PAYMENT TERMS:**

In case of any discrepancy between rates mentioned in figures and words, the later shall prevail.

The payment for Items quoted in US$ would be released through irrevocable Letter of Credit(LC) after acceptance of the Purchase Order by the firm and subject to submission of Proforma Invoice and a Performance Security in conformity with Para 25 below.

Payment in respect of rupee value components, 90% payment shall be made by ERNET India after delivery and satisfactory completion of installation, commissioning, testing and acceptance of the equipment as well as receipt of pre-receipted bill in duplicate. 10% payment would be released after expiry of the warranty period or 100% on satisfactory completion of installation, commissioning, testing and acceptance of the equipment if the firm submits the Performance Bank Guarantee of the amount equivalent to 10%, which should be valid for the period of warranty as well as receipt of pre-receipted bill in triplicate. The payments will be made as per actual supplied/installed/consumed quantities/items.

The eligible payments will be released to the bidders subject to the receipt of the funds from customer institutes/organizations/departments, etc.

24. **WARRANTY**

(i) The bidder should have all India presence. Onsite warranty/AMC services shall be provided at the specified locations of installation of equipment supplied.

(ii) Warranty shall include free maintenance of the whole equipment supplied including free replacement of parts free software upgrades/updates/renewals. The defects, if any shall be attended to on immediate basis but in no case any defect should prolong for more than 24 hours. The comprehensive warranty shall be for a

minimum period of **three years** from the date of acceptance of the equipment by ERNET India. **The bidders are also required to quote for Comprehensive AMC of two years after warranty period is over.** The Comprehensive AMC includes onsite warranty with parts and software updates/upgrades/renewals. The bids received without quotes for Comprehensive AMC would be out rightly rejected. AMC cost for two years will also be taken into account for commercial evaluation.

24.1 **Service Level Agreement (SLA):** After commissioning & acceptance, during warranty & AMC, the bidder shall be responsible for the uptime of the equipment and shall enter into a contract with a SLA of maintaining the setup for 99% uptime on 24x7 basis. The uptime will be calculated over a twelve (12) month time frame.

Example: (One Year with eighty four hours of unscheduled down time and 12 hours of scheduled down time)

1- {(Unscheduled downtime in hours)/ (service time in hours – scheduled down time in hours)}

1- {(84) / (8760-12)} = 99.00 %

Penalty clause for non conformance to above SLA: ERNET India / End user may deduct Rs. 10000/- from the Quarterly payments due during that quarter for every 1 hours of down time at a stretch or in parts up to total down time of 10 hours. This down time shall be calculated over and above the total hours of downtime permissible. Beyond 10 hours of down time, ERNET India / End user may deduct Rs. 20000/- from the Quarterly payments due during that quarter for every 1 hour of down time at a stretch or in parts.

In any case, if the equipment is not made operational for 08 days from the time of reporting of fault, the Bank/Performance Guarantee submitted by the Bidder to ERNET India shall be forfeited. Any payments (payable to Bidder) shall not be paid too. This will be deemed to be an event of default and ERNET India may terminate the contract.

25. **PERFORMANCE SECURITY:**

25.1 For US Dollar Value Equipments/goods: In addition to Bank Guarantee required as per para 25.2 below, the successful vendor would also submit Bank Guarantee of equivalent amount of Dollar Value Equipments valid for a period of six months before opening of LC.

25.2 The successful bidder shall submit a Performance Security of 10% of the cost of the purchase order within 15 days of the placement of purchase order. The Performance Security may be in the form of Demand Draft/Pay Order/Bank Guarantee of any nationalized/scheduled bank. The Bank Guarantee should be valid for a minimum period of 42 months extendable to cover warranty period. In case supplier fails to deliver the items within delivery period or provide satisfactory after sales service within the warranty period, the Performance Security submitted by the firm is liable to be forfeited. Performance Security shall be released immediately after the warranty is over. No interest will be payable by ERNET India on the Performance Security.

The Performance Security may be in the form of Demand Draft/Pay Order/Bank Guarantee of any Indian Nationalized/ Scheduled Bank In case supplier fails to deliver the items within delivery period or provide satisfactory after sales service within the warranty period, the Performance Security submitted by the firm is liable to be forfeited.

26. DELIVERY PERIOD

The Delivery is required within 6-8 weeks from the date of opening of LC/placement of the purchase order. Any delay by the supplier in the performance of delivery of items shall render the supplier liable to any or all of the following sanctions-forfeiture of its Earnest Money Deposit, imposition of liquidated damage as per para 27 below or/and cancellation of the purchase order for default.

Equipment/goods will be directly supplied at specified sites for installation. All the expenses involved in shipping the equipment to the ERNET India sites will be borne by the bidder. All aspects of safe delivery shall be the exclusive responsibility of the bidder. ERNET India will have the right to reject the component/equipments supplied, if it does not comply with the specifications at any point of installation/inspections. The work related with laying & installation of passive components, cabling, etc. should be completed within three months after delivery of the same.

27. LIQUIDATED DAMAGES

In the event of the Bidder's failure to have the stores ready for shipment/delivery by the date/dates specified in this Purchase Order, ERNET India may at its discretion withhold any payment, until the whole of the stores have been supplied by the contractor, as liquidated damages and not by way of penalty at the rate of 1% of the consignment value per week or a part of a week subject to a maximum of 10%. The amount towards Liquidated Damage would be recovered from the amount of Bank Guarantee as required vide para 25 above.

28. Rates quoted by the bidder shall be final and no negotiation will be held. However, it would be subject to the discretion of the Competent Authority in ERNET India.

29. CANCELLATION of TENDER

ERNET India reserves the right to cancel the tender or modify the requirement without assigning any reason. ERNET India will not be under any obligation to give clarifications for doing the aforementioned.

30. ERNET India also reserves the right to modify/relax any of the terms & conditions of the tender by declaring / publishing such amendments in a manner that all prospective vendors / parties to be kept informed about it.

31. ERNET India in view of projects requirement may reject any tender(s), in which any prescribed condition(s) is/are found incomplete in any respect and at any processing stage.

32. EMPANELMENT OF BIDDERS

(i) The empanelment under this tender, with all its terms & conditions, can be used by ERNET India for its own as well as for its customers' requirements.

(ii) Keeping in view the ERNET India's project commitments, ERNET India reserves the right to evolve a super-set of technically qualified accepted systems and subsystem, items of their brands and models for the entire range of systems covered by the Annexure-I of this tender so as to take care of the service delivery related aspects concerning the suitability of configuration needs matching the project requirements from time to time.

(iii) ERNET India would empanel only one bidder to cater it's users'/customers' and own requirements. The panel will be valid for a period of Twenty-Four (24) Months in the first instance from the date of empanelment. It may be extended for a further period as decided through mutual consent (at ERNET's Option and mutual agreement with bidder and depending upon the need for continuity of the hardware technology/architecture). The empanelled bidder will supply, install & commission different types of Campus Network, Video Conferencing, and IT Infrastructure Systems, accessories, services and related equipment at the rates finalized through this tender during the period of empanelment /extended empanelment.

(iv) The empanelled bidder shall have to provide acceptance to the empanelment offer issued by ERNET India for honoring all tender conditions and adherence to all aspects of fair trade practices in executing the purchase orders placed by ERNET on behalf of its customer/users.

(v) In the event of an empanelled Company or the concerned division of the Company is taken over /bought over by another company, all the obligations and execution responsibilities under the agreement with the ERNET India, should be passed on for compliance by the new company in the negotiation for their transfer.

(vi) If the name of the product is changed for describing substantially the same in a renamed form; then all techno-fiscal benefits agreed with respect to the original product, shall be passed on to ERNET India and the obligations with ERNET India taken by the empanelled bidder with respect to the product with the old name shall be passed on along with the product so renamed.

(vii) If any product which is declared end of life product by OEM during the period of empanelment /extended empanelment, in this case the bidder should supply replaced model or next higher model/version of the product without additional cost.

(viii) In case of empanelled bidder is found in breach of any condition(s) of tender or supply order, at any stage during the course of supply / installation or warranty period, the legal action as per rules/laws, shall be initiated against the bidder and EMD/Security Deposits shall be forfeited, besides debarring and blacklisting the bidder concerned for at least three years, for further dealings with ERNET India.

(ix) The empanelled bidder should not assign or sublet the empanelment or any part of it to any other agency in any form. Any such eventuality shall result in termination of empanelment and forfeiture of Security Deposit/EMD concerning such bidder.

(x) ERNET India may, at any time, terminate the empanelment by giving written notice to the empanelled bidder without any compensation, if the empanelled

bidder becomes bankrupt or otherwise insolvent, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to ERNET India.

(xi) No deviations from these terms and conditions will be accepted; violation thereof will lead to rejection of the bid and forfeiture of EMD/Security Deposit.

32. EVALUATION of TENDER

i) The evaluation process of the tender proposed to be adopted by the ERNET India is indicative only and to provide the Bidders an idea of the evaluation process that the ERNET India may adopt. However, the ERNET India reserves the right to modify the evaluation process at any time during the Tender process, without assigning any reason, whatsoever, and without any requirement of intimating the Bidders of any such change.

ii) When deemed necessary, during the evaluation process, the ERNET India may seek clarifications or ask the Bidders to make Technical presentations/demonstrations on any aspect from any or all the Bidders. However, that would not entitle the Bidder to change or cause any change in the substance of the tender submitted or price quoted.

iii) A duly constituted Technical Evaluation Committee (TEC) will first select eligible Bidders on the basis of eligibility criteria of this tender. The Bids conforming to the eligibility criterion will be considered for further evaluation.

iv) A duly constituted Technical Evaluation Committee (TEC) will shortlist Technical Bids on the basis of technical solution, design, conformity of technical specifications, parameters and features offered vis-à-vis tendered specifications requirements. If required, the short listed Bidders may be asked for a detailed technical presentation/discussion on the solution and products offered in the bid. Further, TEC may ask the bidder to bring any selected items/sub items of their quoted products for technical evaluation at ERNET India or any other location decided by TEC in specified time limit. In case, vendor fails to bring their quoted products within the stipulated time, for whatever reasons, their bid will not be considered for further evaluation. The names of technically short listed bidders will be announced to only those bidders who's bids will qualify for opening the Price/Commercial Bids.

v) **In their own interest the bidders are advised to ensure that the equipments quoted by them should conform to all tendered technical parameters/specifications and are functional. Equipments quoted and not meeting complete tender specifications or lower in specification will not be considered for evaluation.**

vi) The Price Bids of only those Bidders short listed from the Technical Bids by TEC will be opened in the presence of their representatives on a specified date and time to be intimated to the respective Bidders by ERNET India, and the same will be evaluated by a duly constituted Commercial Evaluation Committee (CEC).

v) A sample Bill of Material as in Annexure-I has been prepared & enclosed herewith. The technically short listed bids will be evaluated on the basis of price quoted by bidders as per Bill of Material (BOM) as in Annexure-I enclosed in the tender. The bidder should quote for attached BOM covering following points :-

- All the items as at Annexure-I.
- Wherever required, Module wise breakup is to be provided
- Support on 24X7X365 basis
- Comprehensive Warranty of three years
- Quote for comprehensive AMC of two years (on per year basis) after warranty period is over.

The items & quantities provided are only for calculation purposes, actual quantity and/or items may vary during installation as per ERNET's own/customer requirements:

ii) The commercial evaluation of the bids will be done on the basis of ownership of solution for period of five years.

iii) The Bidder must quote for all the items of the Package as mentioned in the **Annexure-I.** The bidder not quoting all the items of **Annexure-I** will be summarily rejected. The price comparison shall be made package-wise. ERNET India has the right to choose any subset of the tender items for placement of purchase orders. During the period of empanelment, the purchase orders will be placed as per the actual requirements of ERNET/its customers for the items/sub-items & quantities on the unit rates finalized against this tender.

33. SCOPE OF WORK

i) The bidder will carryout the work at user sites/locations as specified by ERNET India across India and will be responsible for total system integration and execution of project.

ii) The bidder will carryout the feasibility sites surveys, prepare the drawings, cable route plans, node placement, etc. for the Campus Network & other IT infrastructure in consultation with ERNET/end-user.

iii) The bidder will design, supply, install, commission, integrate and does maintenance of Campus Network, Video Conferencing & other IT Infrastructure as per requirement in conformity with Schedule of Requirement (Annexure-I)(any subset of items & quantities), Technical Specifications (Annexure-II) and terms & conditions of the tender. The bidder will ensure to install the supplied systems and make it operational on the network and provide maintenance for Five years.

iv) The bidder shall deliver and implement the technologies in conjunction with a set of best practices guidelines & industry standards.

v) The bidder will ensure smooth integration of the offered equipment with any existing equipment/network at User sites/locations specified.

vi) The bidder will provide user manual to end-user detailing operations of the video conference equipment and on-site user level training at the time of installation.

vii) The bidder will submit project plan after consultation with ERNET/End-user within one week from the date of purchase order.

viii) The Bidder has to ensure that during the execution of the project they do not damage or disrupt the existing services under and above the ground.

ix) The Bidder has to comply with the security policy of the ERNET/End-user and non-disclosure agreement.

x) The methodology of conduiting & cabling and installation work, to be adopted, has to ensure minimum damage to the existing finish and no loss to the aesthetic beauty of the floors & Walls. Any damage to the existing flooring / walls etc. shall be made good by the bidder.

xi) The bidder shall organise technical training about the Campus Network equipment after installation and commissioning has been completed. Training will be provided on no additional cost for a batch of 10-12 people for 5 days at the place of installation. All the training material will be provided by the bidder.

xii) The bidder will ensure the availability of services from professionally qualified team during implementation of the project and to provide the required on-site warranty & maintenance for a period of five years.

xiii) The Bidder will be liable for any hardware and software up-gradation for maintenance without any extra cost during warranty period.

xiv) On completion of the work the bidder shall submit the detailed diagram/drawings & documentation of the project to the end user/ERNET and obtain a certificate, which will be submitted to ERNET along with the bills.

34. INDEMNITY

The selected bidder shall indemnify the ERNET India/End-user departments against all third party claims of infringement of patent, trademark/copyright or industrial design rights arising from the use of the supplied items and related services or any part thereof. ERNET India/End-user department stand indemnified from any claims that the bidder's manpower may opt to have towards the discharge of their duties in the fulfillment of the purchase orders. ERNET India/End-user department also stand indemnified from any compensation arising out of accidental loss of life or injury sustained by the bidder's manpower while discharging their duty towards fulfillment of the rate contract and purchase orders.

35. FORCE MAJEURE

If at any time, during the continuance of the empanelment, the performance in whole or in part by either party of any obligation under the empanelment is prevented or delayed by reasons of any war, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics quarantine restrictions, strikes, lockouts or acts of God (hereinafter referred to as "events"), provided notice of happenings of any such event is duly endorsed by the appropriate authorities/chamber of commerce in the country of the party giving notice, is given by party seeking concession to the other as soon as practicable, but within 21 days from the date of occurrence and termination thereof and satisfies the party adequately of the measures taken by it, neither party shall, by reason of such event, be entitled to terminate the empanelment, nor shall either party have any claim for damages against the other in respect of such nonperformance or delay in performance, and deliveries under the empanelment shall be resumed as soon as practicable after such event has come to an end or ceased to exist and the decision of the purchaser as to whether the deliveries have so resumed or not, shall be final and conclusive, provided further, that if the performance in whole or in part or any obligation under the empanelment is prevented or delayed by reason of any such event for a period exceeding 60 days, the purchaser may at his option, terminate the empanelment.

36. TERMINATION FOR DEFAULT

i) Default is said to have occurred

a. If the bidder fails to deliver any or all of the services within the time period(s) specified in the purchase order or any extension thereof granted by ERNET India.

b. If the bidder fails to perform any other obligation(s) under the empanelment

ii) If the bidder, in either of the above circumstances, does not take remedial steps within a period of 30 days after receipt of the default notice from ERNET India (or takes longer period in-spite of what ERNET India may authorize in writing), ERNET India may terminate the empanelment / purchase order in whole or in part. In addition to above, ERNET India may at its discretion also take the following actions:

ERNET India may procure, upon such terms and in such manner, as it deems appropriate, goods similar to the undelivered items/products and the defaulting bidder shall be liable to compensate ERNET India for any extra expenditure involved towards goods and services to complete the scope of work in totality or 10% of the total value of purchase order as cancellation charges whichever is higher.

iii) ERNET India may at any time terminate the purchase order / empanelment by giving one month written notice to the bidder, without any compensation to the bidder, if the bidder becomes bankrupt or otherwise insolvent

37. ARBITRATION

i) Incase any dispute or difference arises out of or in connection with or the carrying out of works (whether during the progress of the works or after their completion & whether before or after the termination, abandonments or breach of contact) except as any of the accepted matters, provided hereunder, the parties hereto, shall first endeavor to settle such disputes of differences amicably.

ii) If both the parties fail to reach such amicable settlement, then either party (The Purchaser or Contractor) may (within 20 days of such failure) give a written notice to the other party requiring that all matter in dispute or difference be arbitrated upon. Such written notice shall specify the matters which are in difference or differences of which such written notice has been given and no other shall be reoffered to the arbitration of a single arbitrator, to be appointed by both the parties or in case of disagreement as to the appointment of a single arbitrator, to that of two arbitrators, one to be appointed by each party or incase of said arbitrators not agreeing then, to the umpire to be appointed by the arbitrators in writing before entering upon the references. Provisions of Indian Arbitration & Conciliations Act, 1996 or any statutory modification or reenactment thereof and rules framed there under from time to time shall apply to such arbitration.

iii) Venue of arbitration shall be New Delhi.

iv) The arbitrators or arbitrators appointed under this Article shall have the power to extend the time to make the award with the consent of parties.

v) Pending reference to arbitration, the parties shall make all endeavors to complete the work in all respect. Disputes, if any, will finally be settled in the arbitration.

vi) Upon every or any such references to the arbitration, as provided herein the cost of and incidental to the reference and Award respectively shall at the discretion of the arbitrator, or the umpire, as case may be.

vii) The award of arbitrator or arbitrators, as the case may be, Shall be final and binding on the parties. It is agreed that the Contractor shall not delay the carrying out of the works by reason of any such matter, question or dispute being referred to arbitration, but shall proceed with the works with all due diligence. The Purchaser and the Contractor hereby also agree that arbitration under this clause shall be the condition precedent to any right of action under the contract except for as provided for in the Tender.

38. APPLICABLE LAW

i) The bidder shall be governed by the laws and procedures established by Govt. of India, within the framework of applicable legislation and enactment made from time to time concerning such commercial dealings/processing.

ii) All disputes in this connection shall be settled in Delhi jurisdiction only.

iii) ERNET India reserves the right to cancel this tender or modify the requirement without assigning any reasons. ERNET India will not be under obligation to give clarifications for doing the aforementioned.

iv) ERNET India also reserves the right to modify/relax any of the terms & conditions of the tender.

v) ERNET India, without assigning any further reason can reject any tender(s), in which any prescribed condition(s) is/are found incomplete in any respect.

vi) ERNET India also reserves the right to award works/supply order on quality/technical basis, which depends on quality/capability of the system and infrastructure of the firm. Bidder(s) are, therefore, directed to submit the tender carefully along with complete technical features of the products/systems as well as other documents required to access the capability of the firm.

39. Care of work

From the commencement to the completion of the works, the bidder should ensure to take full responsibility for the care thereof and of all temporary works and in case any damages loss or injury happens to the works or to any part thereof or to any temporary works due to lack of precaution or negligence on the part of Bidder, it shall be got made good at its own cost.

40. Damage to person and property

The bidder /contractor shall (except, if and so far as this agreement provides otherwise), indemnify and keep indemnified the ERNET & its all customers against all losses and claims for injuries or damage to any person or property arising out of or in

consequence of the construction and maintenance of the works by them and against all claims demands, proceedings, damages, loss charges and excesses whatsoever in respect of or in relation thereof.

41. Preference to Domestic manufactures

ERNET may give Purchase preference to domestically manufactured electronic products specifically in procurement of those electronic products which have security implications as per govt. of India / DoT / DeitY notifications. However for obtaining such preferences, bidder has to provide relevant documentation in support of bidder's claim of quoting domestically manufactured product. The above preference will be subject to satisfying eligibility criteria, technical specifications / technically qualified bid and matching the L1 price by the bidder (s), etc.

42. Third Party Insurance

Before commencing the execution of the works, the bidder/contractors shall arrange insurance against any damage, loss or injury which may occur to any property or to any person by or arising out the execution of the works or temporary works or in carrying out of the contract otherwise than due to the matters referred to in this agreement hereinbefore.

43. Defect Liability period

The bidder shall arrange for maintenance for a period of warranty from the date/dates of completion (when the project is completed in all respects and duly handed over to the owner) of the project with regard to rectification/removal of defects if any observed during this period. If the bidder does not arrange to rectify the defects observed during the maintenance period within a reasonable time, the owner shall be at liberty to get such defects rectified at the cost and risk of the bidder.

44. Pert/CPM/Time schedule Chart

At the outset of the works, the bidder will submit a Pert/CPM/Time schedule chart bringing out completion of various activities in the project for approval of ERNET/its customers. Thereafter, the bidder will submit monthly report indicating physical and financial progress. While getting the project executed, apart from adherence to time schedule the bidder shall strictly adhere to quality norms applicable.

45. The bidder would ensure for observance of all labor and other laws applicable in the matter and shall indemnify and keep indemnified the ERNET/its customers against the effect of nonobservance of any such laws.

46. MISCELLANEOUS

i) The empanelment under this tender is not assignable by the selected bidder. The selected bidder shall not assign its contractual authority to any other third party. The selected bidder shall be obliged to render services /supplies to ERNET India and its

customer organisations. Any default or breach in discharging obligations under this tender by the selected bidder while rendering services / supplies to ERNET India or its customers, shall invite all or any actions / sanctions, as the case may be, including forfeiture of EMD, security deposit, invocation of performance guarantee stipulated in this tender document.

ii) The decision of ERNET India arrived at as above will be final and no representation of any kind will be entertained on the above. Any attempt by any Bidder to bring pressure of any kind, may disqualify the Bidder for the present tender and the Bidder may also be liable to be debarred from bidding for ERNET India tenders in future for a period of at least three years.

iii) Any conditions mentioned in their tender bids by the bidders which are not in conformity to the conditions set forth in the tender will not be accepted by ERNET India. All the terms and conditions for the supply, testing and acceptance, payment terms penalty etc. will be as those mentioned herein and no change in the terms and conditions set by the bidders will be acceptable. Alterations, if any, in the tender bid should be attested properly by the bidders, failing which the bid will be rejected.

iv) ERNET India may use this tender for executing any projects anywhere in India during the validity of this tender empanelment.

v) ERNET India reserves the right to modify and amend any of the above-stipulated condition/criterion depending upon Project priorities vis-à-vis urgent commitments. ERNET India also reserves the right to accept /reject any bid, to cancel / abort tender process and / or reject all bids at any time prior to award of empanelment, without thereby incurring any liability to the affected agencies on the grounds of such action taken by the ERNET India.

vi) Any default by the bidders in respect of tender terms & conditions will lead to rejection of the bid & forfeiture of EMD/Security Deposit.

47. This Tender document is not transferrable. Bidders are advised to study the tender document carefully. Submission of bid shall be deemed to have been done after careful study and examination of the tender document with full understanding of its implications. The response to this tender should be full and complete in all respects. Incomplete or partial bids shall be rejected. Bidders shall bear all costs associated with the preparation and submission of the bid, including cost of presentation and demonstration for the purposes of clarification of the bid, if so desired by ERNET. ERNET shall in no event be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

Yours faithfully,

Director & Head Projects & Training

Annexure I

Schedule of Requirement(Bill of Material)

A. Active Equipment & Components

S.No.	Description	Quantity
1	Core Switch	
i	Core1 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports, Redundant Switch Fabric/CPU and RPS along with all other accessories and following modules/components:	1
a	10GBaseLR single mode Fiber ports	7
b	10Gigabit Ethernet Copper Port	10
c	1000BaseLx ports	15
d	48 port 10/100/1000Base-T module	1
ii	Core2 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports, Redundant Switch Fabric/CPU and RPS along with all other accessories and following modules/components:	1
a	10GBaseLR single mode Fiber ports	8
c	1000BaseLx ports	15
d	48 port 10/100/1000Base-T module	1
2	Zonal Switch	
i	Zonal1 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	11
b	10 GBaseLR Single mode fiber port	11
d	1 Gigabit Copper port(RJ45)	11
ii	Zonal2 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	8
b	10 GBaseLR Single mode fiber port	8
d	1 Gigabit Copper port(RJ45)	8
iii	Zonal3 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/ components:	1
a	1000Base-Lx fiber ports	10
b	10 GBaseLR Single mode fiber port	10
d	1 Gigabit Copper port(RJ45)	10
iv	Zonal4 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	6
b	10 GBaseLR Single mode fiber port	4

d	1 Gigabit Copper port(RJ45)	6
v	Zonal5 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	16
b	10 GBaseLR Single mode fiber port	4
d	1 Gigabit Copper port(RJ45)	16
vi	Zonal6 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	16
b	10 GBaseLR Single mode fiber port	4
d	1 Gigabit Copper port(RJ45)	16
vii	Zonal7 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	8
b	10 GBaseLR Single mode fiber port	4
d	1 Gigabit Copper port(RJ45)	8
viii	Zonal8 Switch: Gigabit layer2 and Layer3 switch with console/auxiliary ports and RPS alongwith all other accessories and following modules/components:	1
a	1000Base-Lx fiber ports	11
b	10 GBaseLR Single mode fiber port	4
d	1 Gigabit Copper port(RJ45)	11
3	Access Switch - Layer2 with console/auxiliary ports along with all other accessories and required modules/components:	
i	24 port PoE 10/100/1000 Mbps (Ethernet-RJ45) switch with 4 1Gig/2 10Gig uplinking Ports	39
ii	24 port 10/100/1000 Mbps (Ethernet-RJ45) switch with 4 1Gig/2 10Gig uplinking Ports	25
a	1000BaseT SFP	118
b	1000BaseLX SFP	118
c	10 Gigabit ports (Single mode fiber optic)	10
4	Network Management Software(NMS) for 100 switches	1
a	Additional licenses for 50 switches for above NMS	2
5	Wireless Access System(WLAN)	
i	Wireless LAN Controller/switch with 2 Gigabit Ethernet uplinks for 100 802.11a/b/g/n Access Points provided in high availability with all accessories and Management software	2
a	Additional licenses for 50 Access Points	2
ii	Wireless Access Points supporting 802.11a/b/g/n and with dual antenna	150
iii	Wireless Access Points supporting 802.11a/b/g/n and with dual antenna (outdoor with necessary environment protections)	30
6	Routers	
i	Router1 with 10 WAN serial ports and 2 10/100/1000Base-T(RJ-45 Ethernet) ports	1
ii	Router2 with 2 WAN serial ports and 2 10/100/1000Base-T(RJ-45 Ethernet) ports	8

7	Firewall: Appliance based Hardware firewall with minimum 3x 1Gigabit & 2 x 10Gigabit Ethernet ports	1
8	IPS: Appliance based Hardware IPS with minimum 3x 1Gigabit & 2 x 10Gigabit Ethernet ports	1
9	IT Infrastructure- Central site	
i	Latest Servers with Windows server 2008 or latest	4
ii	Latest Servers with Enterprise Linux Server	4
iii	KVM switch, Keyboard & display	1
iii	Storage 100TB with 2 SAN switches	
iv	Hardware & software for Backup	1
v	Racks for above with fans, power strips, doors, cable managers, accessories, etc	1
10	Uninterrupted Power Supply (UPS)	
i)	10KVA online UPS with 1 hour battery backup	4
ii)	5KVA online UPS with 1 hour battery backup	6
iii)	1KVA UPS with 30 minutes battery backup	42
11	Resident Engineer for facility management for 8 hours shift per day with 3 years Diploma/degree in the relevant field and atleast 2 years experience in the configuration, management and troubleshooting of LAN, IT infrastructure and VC being provided under the project.(per year basis)	2
12	Full time Project Manager (PM) to handle various ICT Infrastructure & Networking projects, having a Degree in Engineering/Technology in the relevant field with minimum four years experience in LAN/WAN, ICT and project management. (per year basis)	1
13	Annual comprehensive maintenance charges after three years of warranty(unit in year)	2
14	Any other item-please specify	

B. Passive Components

S.No.	Description	Denomination	Qty
1	Feasibility Study, Site Survey, project plan specifying layout plan of Network components and Bill of Material of the Network devices & equipment, etc.	per site	1
2	Supply & Fixing of 1", 1.5" PVC duct (Pipe) for UTP cables – AKG/Modi/flex(ISI Marked)		
i)	1 inch	per meter	4940
ii)	1.5 inch	per meter	2470
3	Supply & Fixing of PVC duct (Channel) for UTP cables - Modi/Flex/AKG		
i)	1 inch	per meter	7410
ii)	1.5 inch	per meter	3458
iii)	2 inch	per meter	1482
4	UTP Cable Laying	per meter	49400
5	Installation of 24 Port Jack Panels & termination of UTP Cat6 cable on Jack Panel	per unit	64
5a	Labeling of jack panels 24 ports) and nodes		64

6	Installation & termination of information outlets(includes termination Cat 6 cables on I/O)	per node	1000
7	Testing of laid cables for the nodes(UTP)	per node	1000
8	Supply & installation of 19" Surface & Wall Mount Racks with platform& proper support for brackets, Racks filled with Casters, Front & rear doors, Power distribution unit & Fans. Cable Manager (Horizontal & Vertical) and all accessories-veropresident/Rittal/HCL/Valrack		
i)	12U	per unit	51
ii)	27U	per unit	6
iii)	42U	per unit	5
9	Installation & termination of single mode fiber optic cable (Armored12 core) and cabling components		
i)	Fiber Optic cable laying with cable root marker and with route survey and documentation	per meter	19030
ii)	Supply, Installation and fixing of GI pipe underground and on the surface Jindal/Prakash, Class B Type		
	I) 1 inch	per meter	571
	2) 2 inch	per meter	190
iii)	Excavation & resurfacing of soil upto 1 meter depth		
	Hard Soil/concrete	per meter	1903
	Soft Soil	per meter	7612
v)	Supply & Installation of HDPE Pipe – ISI/TEC Approved		
	40/33mm HDPE Duct Pre lubricated	per meter	13321
	120mm dia DWC pipe across the road by trench less method	per meter	1903
vi)	Cable pulling pit made of reinforced concrete & brick walls with removable covers (stone/slab)	per unit	200
vii)	SC connector/pigtail splicing/termination on fiber optic cable (with support of proper buffer tubing & termination of fibers in Fiber Termination/Interconnection unit with SC couplers)	per connector	1272
viii)	Performance testing of laid Fiber optic cable (per core) for continuity, length, & optical power loss as per EIA/TIA 568 & EIA-TIA - 455-60 or latest and documentation of the results.	per core	636
10	Supply of UTP Cable & components		
i)	Cat6 Cable	per meter	49400
ii)	Cat6 I/O Surface Mount	per unit	1000
iii)	Cat6 Jack Panel 24 Ports, 19" Rack Mount	per unit	64
iv)	Cat6 Patch cords (1 mtrs)	per unit	1536
v)	Cat6 Patch cords (2 mtrs)	per unit	1536
11	Supply of Single Mode Fiber optic Cable & components		
i)	Outdoor fibre cable - 12 core		
	Armored fiber cable single mode (12 Cores)	per meter	19030
ii)	Fibre LIUs, 19" rack mount		
	12 port LIU with SC couplers	per unit	106
	24 port LIUs with SC Couplers	per unit	10
iii)	Fibre Connectors		
	SC Connector/pigtail - Single mode (SM)	per unit	1272
iv)	Fibre Duplex patch cords		
	Patch Cord single mode Fiber SC - SC Single mode(suitable	per unit	106

	connector as per active device) (3m)		
12	Site certification for minimum 20 yrs. Warranty from OEM of 10 & 11 above		1
13	**Analog Telephone Extension cable & components**		
a	Supply & Fixing of Cable 50 pair armoured jelly filled		6000
b	M.D.F 500 pair		1
c	M.D.F. 100Pair(water proof)		4
d	Supply & fixing of cable 3pair in PVC pipe/ channel		9000
e	Gang box with faceplate RJ11 connector		150
f	Telephone set		150
14	Annual comprehensive maintenance charges after three years of warranty(unit in year)	per year	2
15	Any other item-please specify		

C Video Conference System

S. No.	Item Description	Quantity
1	VIDEO CONFERENCING Multipoint Control Unit (MCU)	
i	High Definition Modular Chassis based rack mountable Multipoint Control Unit (HD-MCU) with 20 ports scalable to 60 ports on High Definition, 4 ISDN PRI ports scalable to 6 and management & scheduling software, and all other accessories. Each MCU should have the necessary modules/components etc for the following.	
a	Modular Chassis based rack mountable Multipoint Control Unit (MCU) 20 participants on IP with full transcoding	2
b	4 ISDN PRI ports	1
ii	Management & scheduling software/hardware and all other accessories	2
iv	Upgradation from 20 to 40 ports on High Definition in the same chassis	1
v	Upgradation from 4 ISDN PRI ports to 6 ports	1
2	Telepresense Solution	
i	Telepresense solution with at least 6 seats With 3 nos High Definition 65 inch or higher LCD/Plasma Displays, 3 nos. Cameras, 3 nos. Codecs. Conference Table, Chairs, suitable capacity UPS with 1 hour backup and all other facilities as per specifications.	1
3	VIDEO CONFERENCING Endpoints/Codecs	
i	Type-1: HD Video Conferencing End points/ Codec	7
a	1+3 MCU software	2
b	Content Sharing (Hardware/Software)	7
c	ISDN PRI Module	2
ii	Type-2: HD Video Conferencing End points/ Codec (desktop type with 24" display)	5
a	1+3 MCU software	2

b	Content Sharing (Hardware/Software)	5
iii	Type- 3: Video Phone for conferencing	10
4	HD Recording & Streaming Solution:	
i	Hardware based Video Conferencing Recording & Streaming Solution	2
ii	FTP Server (Intel based) with operating Software and accessories	2
5	NAT Traversal Device with all accessories	2
6	65" Full HD display	4
7	40" Full HD display	3
8	Annual comprehensive maintenance charges after three years of warranty(unit in year)	2
9	Any other item-please specify	

D IP Surveillance System

S. No.	Description	UOM	Quantity
1 (i)	IP based CCTV Camera with all other components & accessories	unit	15
1(ii)	Outdoor PTZ Camera with all other components & accessories	unit	8
1(iii)	FixDome indoor camera with all other components & accessories	unit	261
2	32" LCD display with wall mounting bracket & all other accessories	unit	8
3	Network Disk Recorder system with 35 TB Storage for Recording with all hardware, software & other accessories	unit	1
4	Media Convertors Managed 10/100/1000 Ethernet(Fiber optic to Copper)	unit	36
5	Desktop Workstations with latest Intel processor 4-GB RAM, minimum 500 GB HDD USB OEM display, Std Keyboard Optical Scroll Mouse, interfaces, ports, etc.	unit	8
6	Metal Poles for Outdoor CCTV camera 6mtr high and dia.5.5 inches with iron hut (9"x8"x14") & all other accessories	unit	10
7	Shifting of existing Analog cameras within the Campus	unit	1
8	Annual comprehensive maintenance charges after three years of warranty(unit in year)	per year	2
9	Any other item-please specify		

Annexure-II

Technical Specifications

A. Active Equipment & Components

1. Core Switches

S. No	Technical Specifications
1	Should be a modular chassis based switch having minimum 9 slots with redundant CPU/Switch fabric and redundant power supply
2	Should have centralized/distributed switching architecture, each module should be provisioned with adequate hardware/software to support the same.
3	**Performance:**
4	Dual Redundant Switch Fabric/CPU should offer minimum 2 Tbps switch fabric capacity per switch. There should not be any performance degradation in case of any switching/routing engine failure
5	In the event of failure of one switching/routing engine, forwarding should not stop and failover from one engine to other should be statefull
6	Switch should support simplify the changes through In-Service OS upgrade mechanism with a minimal disruption of traffic through upgrade process.
7	Switch should support Netflow or J-flow or equivalent. If it is given as services on a module, at least two of those modules shall be quoted to ensure redundancy of the solution.
8	Minimum 720 Mpps forwarding rate should be supported.
9	Should have hardware based unicast, multicast and broadcast suppression.
10	Should support multi-layer switching, Layer 2 (MAC), Layer 3 (IP address) and Layer 4 (TCP UDP port) switching and application classification and redirection
11	**Layer 1 Features**
12	Support for 10/100/1000 BASE-T, 1000 BASE-SX, LX, LH ,ZX GBIC/SFP and 10-Gig SR/LR/ZR
13	Chassis should support upto 60 Nos. of 10-Gig non blocking ports.
14	**Layer 2 Features**
15	Should have IEEE 802.3 ad Link aggregation and port Trunking across line cards
16	Should have IEEE 802.1Q VLAN encapsulation
17	Should support Secure VTP with MD5 or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
18	Should support a mechanism to detect connectivity issues with both fiber and copper cabling to ensures that a partially failed link is shut down on both sides, to avoid L2/L3 protocol convergence issues
19	Should support Layer 2 trace route to ease troubleshooting by identifying the physical path that a packet takes from source to destination

20	Should have IEEE compliance for 802.1Q VLAN, 801.2p, 802.1d STP, 802.3ad, 802.1w RSTP, 802.1s MSTP, 802.3ad LACP, IEEE 802.1ab Link Layer Discovery Protocol.
21	Should have 128K MAC addresses
22	Should have minimum 4K active VLAN support
23	**Layer 3 Features**
24	Should have basic Routing-Static IP routing, RIP v1/v2, RIPng and policy based routing
25	Should have hardware enabled advance IP routing protocols OSPF, OSPFv3, BGPv4, PIM-SM, PIM-DM , PIM-SSM etc.
26	Should have VRRP or equivalent for redundancy
27	Should have IGMP v1, v2, v3
28	Should support minimum 128K IPv4 and 64K IPv6 multicast entries.
29	Should support minimum 256K IPv4 and 128K IPv6 routes
30	Support VRF-Lite for L3 virtualization
31	**QoS Features**
32	Shall have Per-port QoS configuration
33	Support for IEEE 802.1p QoS policies and Diff Serv QoS on all ports
34	Should support minimum four queues per port in hardware
35	Should have classification and marking based on full Layer 3, 4 headers
36	Should have input and output policing based on Layer 3, 4 headers.
37	**Availability**
38	Should be provided with Dual Switching Fabric/CPU and any failure of one switch Fabric/CPU should not result in loss of capacity of 2 Tbps and 720 Mpps per switch
39	Should have N+1 / 1+1 Redundant Power Supply from day one
40	Should have Hot Swap ability on all modules and Power Supply
41	Should have Hot Swappable Fan tray
42	**Security:**
43	Should have Filters/Access-List on all ports
44	Should have 802.1x user authentication and accounting
45	Should have Advance security – DOS and NAT
46	Should support Port Mirroring based on port basis / vlan basis. Should support port mirroring across the switches to remotely monitor ports in a Layer 2 switch network from any other switch in the same network
47	Should support DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses
48	Should prevents IP spoofing by forwarding only packets that have a source address consistent with the DHCP Snooping table
49	Should be able to shut down Spanning Tree Protocol PortFast-enabled interfaces when BPDUs are received to avoid accidental topology
50	Should be able to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes
51	Should have TACACS+/RADIUS enabled.
52	Should have SSHv1 , SSHv2, SNMPv1, SNMPv2, SNMPv3 and NTP support
53	Should have Management Access Filter (Access Policies)
54	For smooth, seamless and easy manageability, operation, interoperability and maintenance, the bidder should offer/quote all the switches(Core Switches, Zonal Switches & Access Switches) of the same make (OEM) and must be managed by the same NMS offered/quoted.

2. Zonal Switches

S. no.	Technical Specifications
1	**Hardware Features:**
2	Switch should be modular and flexible enough for deploying atleast 40 ports which can be used for 10G/1G Ethernet as per the requirement.
3	Switch shall provide inbuilt redundant hot swappable fans and power supplies for highest resiliency with no single point of failure.
4	**Performance and capabilities:**
5	Switch should offer minimum 800-Gbps switching capacity.
6	Switch should support Netflow or J-flow or equivalent.
7	Switch should support 245 Mpps of forwarding rate
8	Should support multicast in hardware
9	Should have hardware based unicast, multicast and broadcast suppression.
10	Should support multi-layer switching, Layer 2 (MAC), Layer 3 (IP address) and Layer 4 (TCP UDP port) switching and application classification and redirection
11	Should support minimum 8 hardware queues per port for classification and scheduling of network traffic on a packet-by-packet basis and minimum of 64 CPU queues
12	**Layer 2 Features:**
13	Should have IEEE 802.3 ad Link aggregation and port trunking across line cards
14	Should Support Automatic mechanism to ensure that once QoS enabled on switch then it will prioritize voice traffic independent of QoS on each and every port.
15	Should support Secure VTP with MD5 or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches in turn eliminating the configuration errors & troubleshooting in secure manner
16	Should support a mechanism to detect connectivity issues with both fiber and copper cabling. Ensures that a partially failed link is shut down on both sides, to avoid L2/L3 protocol convergence issues
17	Should support Layer 2 trace route to ease troubleshooting by identifying the physical path that a packet takes from source to destination
18	Should have IEEE compliance for 802.1Q VLAN, 801.2p, 802.1d STP, 802.3ad, 802.1w RSTP, 802.1s MSTP, RPVST+,802.3ad LACP, IEEE 802.1ab, Link Layer Discovery Protocol.
19	Should have min 50K unicast and 32K multicast MAC entries
20	Should have minimum 4000 VLAN including port-based, source MAC based, protocol based and subnet based VLANs.
21	**Layer 3 Features:**
22	Should have basic Routing-Static IP routing, RIP v1/v2, RIPng and Policy Based Routing.
23	Should have hardware enabled advance IP routing protocols OSPF, OSPFv3, BGPv4, PIM-SM, PIM-DM , PIM-SSM etc.
24	Should have VRRP or equivalent for redundancy
25	Should have IGMP v1, v2, v3
26	Should support VRF-Lite and Multicast VRF-Lite
27	Should have IPv4 and IPv6 support in hardware, providing wire-rate forwarding for IPv6 networks. Should support minimum 256K IPv4 and 128K IPv6 entries.

28	**QoS Features:**
29	Should have Per-port QoS configuration
30	Support for IEEE 802.1p QoS policies and Diff Serv QoS on all ports
31	Should support 8 queues per port in hardware
32	Should have IP differentiated service code point (DSCP) and IP precedence
33	Should have classification and marking based on full Layer 3, 4 headers
34	Should have input and output policing based on Layer 3, 4 headers.
35	Should support Congestion Avoidance feature
36	Should provide Local and Remote Port Mirroring

3. Access Switches (PoE and Non PoE)

S.no.	Technical Specifications
1	**Switch Architecture and Performance**
2	Switch should have 24 X 10/100/1000Base-T auto-sensing ports complying to IEEE 802.3, IEEE 802.3u and 802.3ab standard, supporting half duplex mode, full duplex mode and auto negotiation on each port with 4X1G / 2 x 10G uplinks with SFP+ support
3	Switch should support stacking with dedicated stacking ports whenever required in future
4	Switch should support link aggregation across multiple switches in a stack.
5	Switch should have non-blocking wire-speed architecture.
6	Switch should support IPv4 and IPv6 from day One
7	Switch should have non-blocking switching fabric of minimum 88 Gbps or more and should have Forwarding rate of minimum 65 Mpps..
8	Switch should support power supply redundancy.
9	**Layer 2 Features**
10	IEEE 802.1Q VLAN tagging with support for minimum 255 active VLANs and 4k VLAN ids
11	Should support for minimum 16k MAC addresses
12	Should support Spanning Tree Protocol as per IEEE 802.1d, Multiple Spanning-Tree Protocol as per IEEE 802.1s, Rapid Spanning-Tree Protocol as per IEEE 802.1w
13	Switch should support IGMP v1/v2/v3 as well as IGMP v1/v2/v3 snooping.
14	**Quality of Service (QoS) Features**
15	Switch should support classification and scheduling as per IEEE 802.1P on all ports.
16	Switch should support DiffServ as per RFC 2474/RFC 2475.
17	Switch should support QoS configuration on per switch port basis support four hardware queues per port.
18	**Security Features**
19	Switch should support MAC address based filters / access control lists (ACLs) on all switch ports.
20	Switch should support Port as well as VLAN based Filters / ACLs.
21	Switch should support RADIUS and TACACS+ for access restriction and authentication.
22	Secure Shell (SSH) Protocol, HTTP and DoS protection

23	Should support DHCP snooping, DHCP Option 82, Dynamic ARP Inspection (DAI)
24	**Management, Easy-to-Use Deployment and Control Features**
25	Switch should have a console port with RS-232 Interface for configuration and diagnostic purposes.
26	Switch should be SNMP manageable with support for SNMP Version 1, 2 and 3.
27	Switch should support TELNET and SSH Version-2 for Command Line Management.
28	Switch should support 4 groups of embedded RMON (history, statistics, alarm and events).
29	Support for Unidirectional Link Detection Protocol (UDLD) to detect unidirectional links caused by incorrect fiber-optic wiring or port faults and disable on fiber-optic interfaces
30	Layer 2 trace route eases troubleshooting by identifying the physical path that a packet takes from source to destination.
31	**Standards**
32	Should be RoHS Compliant.
33	Should support IEEE 802.1x support.
34	Should support IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports.
35	Should support IEEE 802.3u 10 BaseT / 100 Base Tx /1000 Base Tx.

4. Network Management System (NMS)

S.no.	Technical Specifications
1	The NMS should support management of Network devices like Routers, switches and other SNMP based devices
2	The NMS should support an open database schema
3	The NMS should support monitoring, configuration and administration of Routers & Switches
4	The NMS should support guided workflows based on best practices with built-in configuration templates
5	The NMS should support the capability to view the network topology
6	The NMS should support Layer 2 Services
7	The NMS should support Fault Management
8	The NMS should support integration with third-party management platform such as NetView, HP OPenView etc
9	The NMS should support Flexible web-based portal framework
10	The NMS should support creation of user-defined views
11	The NMS should support multiple protocols such as https, SSL, SCP, SSH, FTP, TFTP, Telnet and SNMP (v1, v2c and v3).
12	**Inventory Management**
13	The NMS should automatically discover IP devices on the network
14	The NMS should detect SNMP compliant network devices on the network and manage them.
15	The NMS should support equipment details - chassis, module, interface
16	The NMS should support a single menu for discovery status, device status, user tracking, and inventory dashboards

17	**Monitoring and troubleshooting**
18	The NMS should support Troubleshooting assistant with guided workflows
19	The NMS should support Embedded troubleshooting workflow for quick problem isolation and remediation
20	The NMS should support centralized fault and event browser (consolidated, syslog, traps, and events and alarms)
21	The NMS should support dashboard to allow for real-time performance and event monitoring
22	The NMS should support features to help validate whether the network is ready for video and rich media applications
23	**Configuration management**
24	The NMS should support Configuration backup of Routers, Switches & other network devices
25	The NMS should support User roles and privileges
26	The NMS should support change management required to maintain and update network devices
27	The NMS should support configuration of MACsec
28	The NMS should support setting up auto configuration of switch ports
29	The NMS should support configuration of location settings of switch ports to aid the provisioning and tracking of Media endpoints
30	The NMS should support device Profiling to create triggers and dynamically configure the switch ports based on the device classification
31	The NMS should support rule-based device classification engine for Device Profiling
32	The NMS should support Extensible configuration library; new updates and configurations can be added
33	The NMS should support creation of a Baseline template for configuration of devices
34	The NMS should support generation of a non-compliance configuration report against the Baseline template
35	**Reporting**
36	The NMS should support flexible reporting for inventory
37	The NMS should support flexible reporting for user tracking
38	The NMS should support flexible reporting for switch port usage
39	The NMS should support Audit Trail reports
40	The NMS should support compilation of a report on all Audit Trail changes that occurred in the network during a specific time period
41	The NMS should support Change Audit report
42	The NMS should support Syslog report
43	**Installation**
44	The NMS should support an Unattended install
45	The NMS should support to be installed as a virtual appliance
46	The NMS should support VMware ESX server
47	The NMS should support installation on Windows Server Standard/Enterprise Edition
48	The NMS should support High Availability

5. Wireless Access System (WLAN)

(i) Wireless LAN Controller/switch(WLANC)

S.no.	Technical Specifications
1	WLANC must be compliant with IEEE CAPWAP or equivalent for controller-based Wireless LANs(WLANs)
2	WLANC should support upto 500 Access points. Should be a standalone appliance/device in High Availability mode.
3	Should not require a separate controller for Wireless Intrusion Prevention Access Points
4	Should support multiple redundancy models like 1+1 and N+1.
5	Should have redundant power supplies.
6	Must support an ability to dynamically adjust channel and power settings based on the RF environment.
7	Radio coverage algorithm must allow adjacent WAPs to operate on different channels, in order to maximize available bandwidth and avoid interference
8	Must support interference detection and avoidance.
9	Must support coverage hole detection and correction that can be adjusted on a per WLAN basis.
10	Must support RF Management with 40 MHz channels with 802.11n.
11	Should support at least 500 APs per Controller and should have a scalability to handle up to 1000 access point
12	WLANC performance must remain the same if encryption is on or off for wireless SSIDs.
13	Should support ability to adjust Delivery Traffic Indicator Message (DTIM) on a per
14	WLAN basis to improve performance for latency sensitive applications
15	Should adhere to the strictest level of security standards, including 802.11i Wi-Fi Protected Access 2 (WPA2), WPA, Wired Equivalent Privacy (WEP), 802.1X with multiple Extensible Authentication Protocol (EAP) types, including Protected EAP (PEAP), EAP with Transport Layer Security (EAP-TLS), EAP with Tunneled TLS (EAP-TTLS).
16	Must support setting Access Control Lists (ACLs).
17	Should support Management frame protection for the authentication of 802.11 management frames by the wireless network infrastructure.
18	WLANC should support a capability to shun / block WLAN client in collaboration with wired IPS on detecting malicious client traffic.
19	Must support built-in web authentication
20	Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.
21	Must support user load balancing across Access Points.
22	WLANC must provide Mesh capability for Mesh supported AP
23	Must be able to dedicate some APs to monitor-only for Intrusion Prevention Services.
24	Must support client roaming across controllers separated by a layer 3 routed boundary.
25	WLANC must support clients roaming across at least 500 APs.
26	Must support AP over-the-air packet capture for export to a tool such as Wireshark.
27	Should support the ability to schedule AP power on/off for energy savings.
28	Should be able to classify over 20 different types of interference within 5 to 30 seconds.
29	Should provide a snapshot of air quality in terms of the performance and impact of interference on the wireless network identifying the problem areas.
30	Should provide an Air Quality rating on a per- radio basis to help gauge the impact of

	interference on the network
31	Should provide real-time charts showing interferers per access point, on a per-radio, per-channel basis.
32	Should support 802.11e WMM
33	Should have Voice Call Admission
34	Should support multicast Video call admission control mechanism and Stream prioritization.
35	Support for configuring media streams with different priority to identify specific video streams for preferential quality-of-service treatment.
36	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.
37	Should support IPv4 & IPv6 from day one.
38	Should support Internet Group Management Protocol (IGMP) snooping and access point should transmits multicast packets only if a client associated to the access point is subscribed to the multicast group.
39	For smooth, seamless and easy manageability, operation, interoperability and maintenance, the bidder should offer/quote WLANC & WAPs of the same make (OEM).

(ii) Wireless Access Points (WAP)

S.no.	Technical Specifications
1	**Hardware:**
2	Access Points proposed must include radios for both 2.4 GHz and 5 GHz.
3	Must have a robust design for durability, without visible vents
4	Must have an industrial design for durability, with steel cases, industrial grade antenna connectors, without visible vents, and with metal locking points.
5	Must include dual band antennas to support both the 2.4GHz and 5GHz operations simultaneously from single antenna.
6	Must support a variety of antenna options
7	**802.11n**
8	Must support 4x4 multiple-input multiple-output (MIMO) with three spatial streams
9	Must support simultaneous 802.11n on both the 2.4 GHz and 5 GHz radios.
10	Must support data rates upto 450Mbps on 5Ghz radio and 216Mbps on 2.4Ghz radio.
11	Must support 40 MHz wide channels in 5 GHz.
12	Must support upto 23dbm of transmit power in both 2.4Ghz and 5Ghz radios. (limited as per Govt. of India regulation for such WAP)
13	**RF**
14	WAP should have the technology to improve downlink performance to all mobile devices including one-, two-, and three spatial stream devices on 802.11n. The technology should use advanced signal processing techniques and multiple transmit paths to optimize the signal received by 802.11 clients in the downlink direction without requiring feedback and should work with all existing 802.11 clients.
15	Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data.
16	Must support WAP enforced load-balance between 2.4Ghz and 5Ghz band.
17	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization

18	**Roaming**
19	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.
20	**Security**
21	Must support Management Frame Protection.
22	Should support locally-significant certificates on the WAPs using a Public Key Infrastructure (PKI).
23	Must operate as a sensor for wireless IPS
24	**Encryption**
25	WAPs must support a distributed encryption/decryption model.
26	WAPs must support Hardware-based DTLS encryption on CAPWAP Standard
27	**Monitoring**
28	Must support the ability to serve clients and monitor the RF environment concurrently.
29	WAP that serves clients must be able to be dedicated to monitoring the RF environment.
30	**Flexibility:**
31	WAP proposed must be able to be both a client-serving WAP and a monitor-only WAP for Intrusion Prevention services.
32	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.
33	Mesh support should support QoS for voice over wireless.
34	Must be plenum-rated (UL2043).
35	Must support minimum 16 WLANs per WAP for SSID deployment flexibility.
36	**Operational:**
37	Must support telnet and/or SSH login to WAPs directly for troubleshooting flexibility.
38	**Power:**
39	Must support Power over Ethernet, local power and power injectors. Should be provided with power adapter.
40	802.11e and WMM
41	WiFi Alliance Certification for WMM and WMM power save
42	Must support Reliable Multicast Video to maintain video quality
43	Must support QoS and Call Admission Control capabilities.
44	Must support IPv4 and IPv6 from day One

iii. Wireless Access Points (WAP)(outdoor)

Same as at 5(ii) above with all necessary environmental protections.

6. Routers

I) Router1

S.no.	Technical Specifications
1	**General Architecture**
2	The router should be based on multi-Core processors & have a multi-gigabit Fabric for efficient module to module communication
3	Router should support on-board hardware encryption acceleration for IPsec & SSL VPNs
4	Router should have atleast three 10/100/1000 Routed ports

5	Router should have atleast 3 slots for additional interface modules & 2 service module slots
6	Router should have support for WAN Interfaces like, High-Speed Serial, Sync/Async Interface, ISDN, 3G interfaces, 8-port Gigabit POE Ethernet Switch Modules, Giga Ethernet Routed ports & G.703 interfaces
7	Should have support for in-built redundant power supply
8	Router performance should atleast 950Kpps on 64-Byte packet
9	Router should support hardware based IPSec performance of atleast 800Mbps
10	**Routing Protocols**
11	Router should support following routing protocols & features: RIP, OSPF, BGP,ISIS, Policy based routing, should support un-equal cost load-balancing & un-equal cost load-sharing mechanism, should support functionality to route packets based on Delay, loss, reachability, throughput, jitter & Mean opinion score, Bi-directional forwarding detection support, MPLS
12	**IPv6 Routing Features**
13	Router should support following IPv6 Features : Ripng, OSPFv3, IPv6 support for ISIS, IPv6 support for BGP, IPv6 policy based routing, IPv6 Dual Stack, IPv6 automatic 6 to 4 tunnels, IPv6 VPNs over MPLS 6vpe
14	**High Availability Features**
15	Router should support high-availability protocols like VRRP/HSRP, Should support the functionality to active/active gateway load balancing for IPv4 & IPv6, IPv6 support for HSRP/VRRP,
16	**Multicast Features**
17	Should support multicast BGP, Multicast NAT, Multicast Source Discovery Protocol, PIM, Source Specific Multicast, IGMPv3, IPv6 Multicast, MLD v2, IPv6 Bi-directional PIM, MSDP, IGMP V3, IPv6 PIM SM & PIM SSM,
18	**VPN & Tunneling Features**
19	Should support following VPN Protocols & Features : L2tp, L2tpV3, IPsec VPN, SSL VPN, should support the functionality of forming dynamic tunneless VPN using GDOI Protocol, should support IKEv2, should support IPv6 for IPsec & Ikev2, Should support 3Des, AES, MD5, SHA-1 algorithms, support GRE protocol
20	**QoS Features**
21	Should support the following QoS features: Should support the functionality of recognizing network based applications passing through router & provide statistics of traffic usage, QoS for VPN, Flow based WRED, Class based policing & shaping, DSCP based marking & classification, IPv6 Packet classification & Marking, IPv6 Policing & Shaping, IPv6 Queuing, RSVP, Should support Hierarchical Queuing Framework , QoS policy propagation via BGP, Should support percentage based policing & shaping,
22	**Security Features**

23	Router should support following security features: Router should support stateful zone based firewall, Should support IPS functionality with support for automatic signature updates, Should support inline IPS functionality, Should support IPv6 Stateful firewall, Should support in-built certificate server for digital certificates, should support firewall rules based on user identity, should support control plane policing to prevent dos attacks on the router, Should support VRF aware firewall & transparent firewall functionality
24	**Network Management Features**
25	Router should support embedded Packet Capture to capture packet data flowing through, to, and from the device to an internal buffer.
26	Router should support the ability to monitor events and take informational, corrective action when the monitored events occur or when a threshold is reached.
27	Should support Netflowv9 to provide data to enable network and security monitoring, network planning, traffic analysis, and IP accounting.
28	Should support SNMPv3, SNMP over IPV6, RMON four groups,
29	Should support the functionality of measuring service level indicators including delay, jitter & availability
30	Should support functionality to monitor network performance for VOIP, Video & VPN Network monitoring
31	**Industry Standards & Certifications**
32	The Router & the operating system should be atleast EAL3 or more certified under the Common Criteria Evaluation Program

ii) Router2

S.no.	Technical Specifications
1	**General Architecture**
2	The router should be based on multi-Core processors & have a multi-gigabit Fabric for efficient module to module communication
3	Router should support on-board hardware encryption acceleration for IPsec & SSL VPNs
4	Router should have atleast two 10/100/1000 Routed ports
5	Router should have atleast 2 slots for additional interface modules
6	Router should have support for WAN Interfaces like, High-Speed Serial, Sync/Async Interface, ISDN, 3G interfaces, Giga Ethernet Routed ports & G.703 interfaces
7	Router performance should atleast 275Kpps on 64-Byte packet
8	Router should support hardware based IPSec performance of atleast 140Mbps
9	**Routing Protocols**
10	Router should support following routing protocols & features: RIP, OSPF, BGP,ISIS, Policy based routing, should support un-equal cost load-balacing & un-equal cost load-sharing mechanism, should support functionality to route packets based on Delay, loss, reachability, throughput, jitter & Mean opinion score, Bi-directional forwarding detection support, MPLS

11	**IPv6 Routing Features**
12	Router should support following IPv6 Features : Ripng, OSPFv3, IPv6 support for ISIS, IPv6 support for BGP, IPv6 policy based routing, IPv6 Dual Stack, IPv6 automatic 6 to 4 tunnels, IPv6 VPNs over MPLS 6vpe
13	**Multicast Features**
14	Should support , PIM, Source Specific Multicast, IGMPv3, IPv6 Multicast, IPv6 Bi-directional PIM, IGMP V3, IPv6 PIM SM & PIM SSM,
15	**VPN & Tunneling Features**
16	Should support following VPN Protocols & Features : L2tp, L2tpV3, IPsec VPN
17	**QoS Features**
18	Should support the following QoS features: Should support the functionality of recognizing network based applications passing through router & provide statistics of traffic usage, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Hierarchical QoS, Policy-Based Routing (PBR), Performance Routing (PfR), and Network-Based Advanced Routing (NBAR)
19	**Security Features**
20	Router should support following security features: Router should support stateful zone based firewall, Should support IPS functionality with support for automatic signature updates,
21	**Network Management Features**
22	Router should support embedded Packet Capture to capture packet data flowing through, to, and from the device to an internal buffer.
23	Router should support the ability to monitor events and take informational, corrective action when the monitored events occur or when a threshold is reached.
24	Should support Netflow v9 to provide data to enable network and security monitoring, network planning, traffic analysis, and IP accounting.
25	Should support SNMPv3, SNMP over IPV6, RMON four groups,
26	Should support the functionality of measuring service level indicators including delay, jitter & availability
27	**Industry Standards & Certifications**
28	The Router & the operating system should be atleast EAL3 or more certified under the Common Criteria Evaluation Program

7. Firewall

S. No	Technical Specifications
1	Firewall should appliance based 19" Rack Mountable
2	Firewall should also support the standard Layer 3 mode of configuration with Interface IP's. It should be possible to protect the firewall policies from being compromised.
3	Firewall must provide state engine support more than 150 protocols including all common protocols of the TCP/IP stack

4	Firewall must provide NAT functionality, including dynamic and static NAT translations
5	Firewall should be able to filter traffic even if the packets are fragmented.
6	It should support the VOIP Applications Security by supporting to filter SIP, H.323 & MGCP flows.
7	It should be able to block Instant Messaging like Yahoo, MSN, ICQ, Skype (SSL and HTTP tunneled)
8	It should enable blocking of Peer-Peer applications, like Kazaa, Gnutella, BitTorrent, IRC (over HTTP)
9	Firewall should support authentication protocols like LDAP, RADIUS and have support for firewall passwords, smart cards, & token-based products like SecurID, LDAP-stored passwords, RADIUS or TACACS+ authentication servers, and X.509 digital certificates.
10	Firewall should support database related filtering and should have support for Oracle, MS-SQL, and Oracle SQL-Net.
11	Firewall should provide Web protections designed specifically for Web-based attacks and compliment the network and application level protections. Each protection can be enabled, disabled, or set in passive/monitor mode.
12	Firewall appliance must be supplied with at least 3 X 10/100/1000Mbps Ethernet ports on Copper and 2 X 10Gigabit Ethernet ports.
13	Firewall appliance should support future extensibility with an option to expand with Copper of Fiber interface
14	Firewall appliance should support fiber interfaces LR/LX for 1Gig/10Gig ports
15	Firewall should support VLAN tagging (IEEE 802.1q) supporting up to 250 VLAN.
16	Firewall appliance should allow 1 Million Concurrent connections and expandable to 5 Million Concurrent Connections without additional cost in future
17	Firewall appliance should support 25,000 new connections/second
18	It should support firewall throughput of minimum 1 Gbps
19	Firewall appliance should support Active-Active configuration

8. Intrusion Prevention System(IPS)

S. No	Technical Specifications
1	Performance
a	IPS should be appliance based with inspected Throughput should be minimum of 1 Gbps
b	IPS should not offer Latency more than 200 microseconds (on packet sizes up to 1518 bytes)
c	IPS should support sessions with security state of upto 1,000,000
d	Minimum Connections Per Second Should be 100,000

2	Scalability
a	Port Quantity/Type should support combination of Copper/ SFP providing gigabit connectivity
b	Number of Ports should be 3 X 1Gigabit & 2 X 10Gigabit Ethernet ports.
3	High Availability
a	Should have Dual-Power Supplies
b	Should support software bypass
c	Should support Active-Active or Active-Passive Stateful Redundancy
d	Should support hardware bypass
4	Attack Filters
a	IPS should have 4000+ Attack Filters
b	IPS Categories should atleast contain: Worm , Phishing , Spyware , Virus , Suspicious , DDoS ,Trojan , Reconnaissance ,Bandwidth Hijacking, P2P,Walk-in Worm , Blended Threat ,VoIP , Backdoor , Zero Day Initiative
5	Management
a	IPS Device should have option to manage by Command Line Interface (CLI), Local Security Manager (LSM) On-Box Web-based Management and Enterprise Security Management System.
b	Enterprise Security Management System should manage multiple IPS systems
c	Enterprise Security Management System should support High Availability
d	IPS Management Interfaces should be 10/100/1000 Ethernet, 1 Serial Port, 1 Front Panel LCD
6	Attack Filter Delivery Service
a	Should be Real-Time Inoculation
b	The IPS hardware architecture should be based on FPGA/ASIC switch architecture with parallel processing
c	The IPS appliance should NOT have any high failure rate components like hard disks.
d	The IPS appliance should have both hardware bypass and software bypass
e	It should support Active/Passive, Active/Active, Symmetric and Asymmetric HA without any 3rd party load balancers
f	While in HA, all the segments/ports should be available for inline protection and all synchronization should be done over the Out of the Band management port, not sacrificing the inline ports.
g	The IPS vendor should have invested in Zero Day vulnerability research and actively contributing towards enhancing the IT security arena.
h	The IPS system should have default/out-of-the-box policies by which at least one-fourth of the total signatures are turned ON to block and no falsepositives.
j	It should be possible to define exceptions per signature.
k	It should be possible to define policies per time schedule, direction, VLAN ID, CIDR and segment/port.

9. IT Infrastructure

i)& ii) Server

S. No.	Feature	Specifications
1	Processor type	2X Quad Core Processor 2.4 Ghz, 10 MB Cahce, 1066 MHz Front Side Bus or better
2	Systems Bus	1066 MHz Front Side Bus or better
3	Standard Memory	16 GB Standard Memory with support of feature like ECC, Sparebank
4	Maximum Memory	320GB (24 DIMM Slots) or better
5	Internal Hard Disk Drive	5 X 500 GB 7K RPM HDD
6	Hard Disk Controller	RAID Controller with 256 MB battery backed write cache (RAID 0/1/5/6)
7	Internal Drive Bays	8 small form factor (SFF) hot plug drive bays to support Serial-attached SCSI (SAS) and Serial ATA (SATA) Drives
8	Optical Drive	IDE DVD ROM/CDRW Combo
9	Chassis Type	Maximum 2U Rack Mount
10	Chipset	Intel chipset with Snoop Filter
11	Fiber Channel HBA	Dual Port Fibre Channel HBA
12	Network Interface Card	Two embedded gigabit Network Adapters with TCP/IP Offload Engine
13	External I/O ports	Serial -1,VGA - 2; (1 front, 1 Back);Network RJ-45 -2; Remote management port - 1; USB Port - Ports - 5: (2 Front; 4 rear; 1 Internal)
14	Expansion Slots	I/O 2 X PCI Express or better
15	Power Supply	Redundant & Hot Swappable
16	Compliance Industry Standard	Should be complaint to industry standards like PLUS, Energy star etc.
17	Support	Physical address Extension (PAE) Support; Microsoft Logo Certifications; USB 2.0 Support
19	Compatible Operating Systems	Microsoft Windows Server; Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Vmware Virtulization Software
20	OS	Should be supplied with latest Windows Server /Enterprise Linux server.

iii) Storage

Sr. No.	Technical specifications
1	**Storage Architecture**
a	Unified Storage System with no single point of failure architecture. Storage subsystem should support Unified (SAN & NAS) as an integrated offering. Management of storage system should be through single management tool.

b	SAN and NAS should have dedicated resources to meet performance SLAs. Must continue running at the same performance and service levels, even in the event of a failure.
c	Proposed system must support 6Gbps SAS architecture. The system must support dual-ported SAS drives. The architecture should allow modular upgrades of hardware and software for investment protection.
2	**Array Architecture**
a	Array should be equipped with minimum dual controllers for better performance and redundancy.
b	Proposed System must have minimum 8 FC Host ports at 8Gbps and 4 iSCSI ports each at 1Gbps for file services and 2*10Gbit ports across controllers.
c	Proposed system should have minimum 8 or more backend lanes each at 6Gbps for backend device connectivity.
d	It should support Data in Place upgrade to higher model in the same family.
3	**Host Connectivity**
a	The storage arrays shall minimum support native 8Gbps FC, 1Gbps iSCSI, 10Gbps iSCSI & FCOE Protocols. Both FC and iSCSI ports shall have the capability of host connectivity and array based remote replication.
4	**Front End Port Expansion**
a	Must be able to provide additional connectivity to meet existing or future needs for front end port counts and future technologies non disruptively.
5	**Protocol Support**
a	Array shall natively support FC, iSCSI, CIFS and NFS protocols
6	**Drive Support & Capacity required**
a	The solution must support 2nd generation SAS 6Gb/s drives, proposed system must be able to support all on-line data storage tiers in order to maximize both system performance and capacity scalability. Proposed system should support 10K RPM SAS, 15K RPM SAS as well as 7.2K RPM higher density NL-SAS drives and SSD 100/200GB drives in the same array.
7	Currently the system should be configured with 100TB raw space.
8	**Flash Drive Support**
a	Proposed system should support Flash Drives to maximize performance with minimum foot print and power consumption.
9	**Cache Expansion**
a	Proposed system should provide flexibility of extending system cache up to 500 GB using either SSDs / DRAM in order to absorb spikes in both read and write workloads.
10	**Storage Based Tiering**
a	Proposed system should deliver optimal performance at a lower cost by dynamically moving "hot" data to higher performing drives and "cold" data to more cost-effective higher density drives.
b	Tiering should happen at the sub-LUN level, providing more granular movement of data within the LUN by automatically moving data.
c	Tiering should happen between all 3 tiers i.e. Flash, SAS and NL-SAS drives.
d	Tiering policy should be managed by the same storage management interface.
11	**Cache Protection & Cache memory**

a	Cache should be mirrored between the Active- Active controllers on separate Inter controller paths. The inter controller paths should be redundant(at least 2 paths) to prevent disruption if one path fails. Must support either Cache battery backup for a mjnimum of 96 hours or fully automatic de-stage of cache to disks to prevent possible data loss during extended power outage.
b	Currently the system must be supplied with 16GB DRAM cache memory across controllers
12	**Global Hot Sparing and preemptive protection.**
a	System should have the capability to designate global hot spares that can automatically be used to replace a failed drive anywhere in the system. Must provide automatic **monitoring of disk drive health** and initiate a proactive copy. The preemptive protection process should speed up rebuilds by enabling bulk copy of the drive contents rather than relying on parity rebuild of the data after a drive has failed.
13	**RAID Level Support**
	Must support hardware RAID levels 1, 1+0, 5 and 6. Must support inter-mixing different RAID groups within one storage system. Different type of RAID levels should co-exist within the same array simultaneously to match the different protection requirements of storage.
14	**On-line RAID Group Expansion**
a	Must support online expansion of RAID Group. Must be able to add additional disks on the fly to expand the RAID group capacity.
15	**In-Array data mobility for flexibility of redeployment.**
a	Must be able to **migrate data** from one RAID type or set of drives to another without impacting applications within the same system enabling users to seamless relocate active data from one RAID group to another and or across storage tiers, resulting in the highest cost efficiency and application performance.
16	**Array-based LUN Masking**
a	Must support array-based hardware LUN masking for highest security. It should not be host-based or switch-based. Storage must support LUN masking or Selective storage visibility for different hosts or clusters. Array vendor should provide for licenses to support the maximum number of LUNS possible on the array
17	**Array Management**
a	Easy to use GUI based and web enabled administration interface for configuration, storage management. Storage Management software must include both GUI and CLI tools.
b	It must be able to centrally manage the vendor's complete range of arrays over the network. It must support web-based management. It must support event auditing for security. The date, time, and nature of the action must also be logged.
c	Provide management control of SNMP, email and phone home notification
d	Must be able to discover and monitor virtual machines so that entire environment can be mapped from virtual machines to physical to supporting storage.
18	**Role based access**
a	Must provide multiple levels of access control including role-based security and auditing capability.
19	**Array based copies**

a	The array should support controller based functionality for pointer based snap copies as well as full physical copies. Pointer based snap copies should require minimal space for creation of snapshot. The snapshot must be a readable/writable that can be mounted by a separate host for back up and /or testing.
20	**File Deduplication and Compression**
a	The deduplication process should run constantly in the background and should throttle itself automatically to avoid impact on production performance.
b	Data compression should work as a background task, there should be minimal system performance overhead.
21	**Thin provisioning**
a	Must support thin provisioning to allow physical allocation of just the storage that is needed within a defined virtual file system or LUN.
22	**Multi-protocol File system locking**
a	Must provide flexible multi-protocol locking. Proposed system should provide flexible, robust, and independent native locking paradigms for handling NFS and CIFS requests. The system should permit security policies to be established on a per file system basis for use of both NFS and CIFS file and security attributes independently.
23	**Advanced Networking support**
a	The IP ports on the NAS to have the capability to support VLAN, Link aggregation, Ethernet Trunking for higher availability and performance
24	**Disaster recovery**
a	Storage array should support hardware based long distance data replication at the array controller level in both Sync and Async mode.
b	Currently it should be configured with ashyncornous remote replications software license.
25	**SAN Switch**
a	The System should be supplied with 2 Nos of 24 port SAN Switch for connectivity.
26	The Storage & SAN switch should support IPv4 and IPv6 from day One

iv) Hardware & Software for Backup

S.No.	Technical Specifications
1	Should be able to backup open files on Windows Environment, and backup of other OS platforms like RHEL, SUSE Linux, Mac
2	Should support windows 2003/2008 servers and Windows XP and Windows 7 OS platforms
3	Central administration console should be provided for 2 media servers in case of LAN free backups
4	Should have active directory features like:
i	Online recovery of individual active directory objects
iii	Should support 2003/2008 active directory domain services
iv	Sharepoint agent should support online recovery of individual documents
5	Should support a single pass information backup of Microsoft Exchange Information store and restore of full Exchange server or individual exchange objects with the

	same.
6	Backup software should ensure that the backup data can be read by basic windows OS without using any backup software
7	Backup Software should provide, an online backup for all the standard and commercially available database and applications like MS-SQL, Oracle (both on Windows and Linux), Exchange, Active Directory, Sharepoint Server etc.
8	Backup Software should have Granular recovery for virtual applications for Exchange, Active Directory, SharePoint, and SQL Servers in a virtual environment with integrated VMware and Hyper-V backup and recovery for virtual applications.
9	The backup Software should have support for 256 Bit AES Encryption.
10	Should support single pass backup for faster backup/recovery
11	Necessary agents should be provided as per the server list and configuration.
12	The backup software should support synthesizing new full backups without the need of taking any full backup from clients, with the help of old full backups and incremental backup images.
13	The backup software must have integrated advanced backup technologies like deduplication and archiving. The same can be added in future by just enabling the license for the same.
14	Backup Software should Backup and Recover granular data from virtualized Microsoft Exchange, SharePoint, Active Directory, and SQL Server applications.
15	Backup Software should create sophisticated disk-to-disk-to-tape backups, or replicate data from remote offices to data centers, or migrate backup data from expensive primary disk storage to cheaper secondary disk storage
16	Backup Software should Includes integrated "no-hardware disaster recovery" with physical to virtual conversions.
	Technical Compliance for Bare-Metal System Recovery
17	Should support for Dissimilar Hardware
18	Should support for 32 bit & 64 bit windows
19	Should be able to take incremental backups after full backup so that the only changes are backed up in incremental backup sets.
20	Should support saving of recovery points at FTP locations, DAS, NAS, USB Drive, DVD drives
21	Should have manager console to manage recovery points of all servers from central location
22	Should be provisioned with requisite hardware, software, components & accessories.

S.No.	Specifications
1	Tape Library should support atleast 48 slots.
2	Tape Library : Drives should have native FC support.
3	Tape Library : Tape Library should be provided with minimum of 24 slots.
4	Data transfer rate (per drive): Up to 140 MBps native with LTO 5. Up to 80 MBps native with LTO 3

5	Connectivity : Vendor to provide the required connectivity for host server (Backup Server).
6	Supported host platforms : Windows and Linux environments.
7	Cartridges : Vendor should provide 10 no's of LTO Gen-5 Tape Cartridges.
8	Cartridges : Vendor should supply 2 Cleaning cartridges along.
9	Bar Code Reader : The Library should have an integrated Bar Code reader.
10	Library management : The library should accommodate browser based management that helps in monitoring the tape library.
11	Back up SW Support : Tape Library to support above & other leading Backup software.
12	All required cables, connectors, accessories and labeling shall be supplied and configured with the tape library.

10. Uninterrupted Power Supply (UPS)

i) & ii) UPS 10KVA & 5 KVA

S. No.	Description
1.	Technology
	Microprocessor controlled True On-line using IGBT as switching devices.
2.	User Interface
	LED display for: UPS on, Line on, Battery operation, Inverter overload
3.	**Power Rating**
	10KVA / 5 KVA
4.	Electrical Input
	Rated Voltage: Single Phase 230 VAC
	Voltage Range: 175~270V
	Frequency Range : 46Hz~54Hz
	Power Factor : >=0.85
	Efficiency Overall : >85%
5.	Electrical Output
	Voltage : 230VAC , 230 selectable
	Frequency : 50Hz +/- 0.2Hz
	Crest Factor : 3:1
	Voltage Distribution:<=3% total harmonic with 100% linear load
	Overload Capacity: 105% for 10 minutes
	125% for 1 minute.
6.	Protections: a) Input Over / Under Voltage, b) Phase Fail, c) Overload at the Output d) Output AC Over/Under Voltage, e) Battery Short Circuit
7.	Alarma: a) Mains Fail, b) Low Battery, c) Overload
8.	**Battery**

	Type: Sealed lead acid battery, maintenance free with steel rack for battery housing.		
	Backup Time: One Hour		
	AMBIENT PARAMETERS		
	Operating Temperature	:	0 to 40C
	Humidity	:	20 to 90%
	Audible Noise	:	Less than 55 db
	Dimension & Weight	:	Light weight Smaller Footprint
	Quality Standard	:	ISO Certification
	UPS at i), ii) & iii) should be from same make and the preferred brand are Emerson/APC/Numeric.		

iii) UPS 1KVA

S. No.	Description
1.	Type: Single-phase UPS systems in double-conversion technology (VFI-SS 111) with internal "hot swap" compatible batteries, USB and serial interface. Power Factor 0,7 Topology Double conversion On-Line Type Rack/Tower
2.	**Power Rating :1000 VA**
3.	Input : Rated Voltage 230 V (160 – 288 V) Frequency : 50/60 Hz ± 5 % Power Factor : > 0.99 with linear load
4.	Output: Voltage : 230 V ±1 % (200/208/220/230/240 V adjustable) Output Frequency : 50Hz ± 0.1% Crest Factor Should be 3:1 Power Factor : 0.7 or better
5.	**Battery: Sealed maintenance free battery for backup duration of 30 minutes. Battery & UPS to be housed in a cubicle with suitable louvers.**
6.	Overload Conditions: Overload Capacity : 105% overload continuous Overload Efficiency : 80% or better
7.	Protection against : Short Circuit, Overloading, Low battery, Input Over/Under voltage, Over Temperature
8.	System Indications: LED Indicators: Status displays with AC Power on, load group, Overload, on battery and general alarm indicators. Audible Alarms: For UPS alarm conditions such as on battery, low Battery, overload, UPS fault.
9.	Certification:
	Safety IEC/EN 62040-1-1,IEC 60950-1

	Performance IEC/EN 62040-3
	EMC IEC/EN62040-2 Class A, FCC Part 15 Subpart B Class A, IEC/EN55011, CISPR11, IEC61000-4-2/-3/-4/-5, IEC61000-2-2, IEC61000-3-2/-3
	Markings CE, WEEE
10.	Environmental parameters: Operation Temperature 0 - 40 °C Noise Level < 50 dBA Relative Humidity 0 to 90% (Without condensation)
11.	Form Factor: 19" Rack mountable/ Tower Type Necessary mounting kit to be provisioned along with the UPS

B. Passive Components

1. Should meet ISO 11801 cabling standards and local construction and telecommunication regulations.
2. Should provide a user friendly environment with less technical support and lower maintenance cost.
3. The entire UTP cabling system and components should be tested, approved and certified by internationally recognized third parties such as ETL, CSA, UL etc.(Provide documentary proof in this regard)
4. Should be ETL/UL certified
5. The OFC cable and components should conform to 10Gigabit Ethernet or higher standards.
6. The Following standards are to be complied with
    a. ISO/IEC 11801:2002
    b. EIA/TIA 568B
    c. EIA/TIA 568B.2-1
    d. EIA/TIA 568B.3
    e. EIA/TIA 568-C.2
7. The Faceplate Should have shutter to prevent dust and dirt getting into the outlet for single & dual outlets. Must have clear label for identification.
8. The RJ45 type telecommunication outlets should be surface or flush mounted and should support Gigabit Ethernet or higher. Should have integral hinged dust cover if not available on the face plate and suitable wire management unit for cable entry to protect against any loose joints, strain, etc.
9. The Work Area Patch cord and Mounting Cord should have factory fitted snagless boots to maintain the bend radius at both ends. The patch cords should be available in different colors for ease of identification.
10. The 4 pair UTP cable shall be of 23/24 AWG bare solid copper conductors. The cable should have uniform characteristic impedance. Should meet or exceed EIA/TIA 568-B2.1 CAT6 specifications. The cable should be tested for 250-500MHz or higher. The cabling system should be with Gigabit Ethernet Zero bit error rate performance warranty.
11. The components of the wire termination module should be UL or ETL Certified to meet EIA/TIA 568B.2-1 Category 6 Standard. The panel shall be available in 24 ports

configurations in one Rack Unit for unshielded installation and shall fit into a 19" size. Rear cable management should only occupy the same area as the panel.

12. The 19" rack mount, high quality enclosure fibre termination unit shall provide cross-connect, interconnect or splicing capabilities. Should accept SC/ST and MTRJ adapters. Should have a fibre management system moulded in to the unit structure to effectively route fibres from an incoming cable through to the connector interface. Should be slide able and should have tamper proof positive locking mechanism by means of clips supplied as standard with each unit.
13. The Singlemode Fibre patch cords shall consist of two single, tight buffered, singlemode graded-index fibres with a 9-micron core and a 125 micron cladding (Singlemode) and factory terminated with SC ceramic connectors at each end.
14. The bidder shall provide a list of their technical support staff, together with their working experience in the relevant field. Should provide the nearest location of their principal's support center. This center shall have permanently stationed support staff that is capable of providing technical support effectively and efficiently.
15. The bidder shall provide a 20 years industry standards compliance warranty, The 20 year product warranty shall cover product manufacturing defects for all passive Structured Cabling System as well as components.
16. All the UTP cables and fibre optic cables must be individually tested by the tenderer after installation of the cables for conformance to the said standards. The UTP nodes should be tested using the pentascanner and the fibre testing should be performed using the OTDR.
17. All equipment and materials supplied shall be new, the best of quality and designed to ensure satisfactory operation under varying atmosphere, climatic, humid tropical conditions without distortion and deterioration in any part affecting efficiency and reliability of the systems. The bidder shall provide manufacturer's literature including manufacturer's data on maintenance and operation of all equipment installed. Relevant catalogues of all materials, instruments, equipment, components, etc. supplied shall be included in this Tender.
18. Each equipment, panel and outgoing cable from the patch panels shall be labeled. Proper labeling and numbering shall also be provided on the outlets. All cable labels are to be of clear wrap around self adhesive type & each cable is to be labeled at each end 100mm from termination point. Labeling to be machine typed.
19. The bidder shall plan the cabling system and routing to ensure system integrity and performance, and that it does not present problems of maintenance, access nor conflict with the operation and maintenance of other systems.
20. All necessary penetrations and access between floors is the responsibility of the bidder, to provide same, and to ensure all penetrations and access holes are fully sealed to local Fire Authority rules.
21. The bidder shall provide adequate support for all cabling that is vertically installed, ensuring that the weight of the cables is sufficiently supported.
22. The bidder shall provide complete and detailed documentation covering the installation and maintenance of the building cabling system. Including "as built" drawings showing all main cable runs, cable trays and catenaries, outlets, consolidation points. Complete with outlet numbering.
23. The bidder should use trenchless digging technique for laying fiber under the roads without affecting the existing utilities.
24. The Bidder may use GI Flexible instead of PVC Flexible and ensure the closure of all points in the network racks subject to proper grounding and safety precautions.
25. Materials such as pipe, bricks, sand, stone-chips, cement, paint etc. required for laying the cables and other fixation work will have to be supplied by the Bidder.

26. All the passive networking components (UTP & Fiber optic cable) should be from same manufacturer and preferably from Tyco/Systimax/AMP/Krone/Molex and should be quoted with part numbers alongwith datasheets.
27. All the passive networking components(UTP & Optical Fiber) quoted by the bidder should be from one OEM make to ensure easy integration, compatibility, ease of installation, OEM's warranty and for maintenance purpose.
28. For passive components, the purchase order will be placed based on estimates only. But the payments will be made based on actual quantities installed/consumed.

C Video Conference System

1. Video Conferencing Multipoint Control Unit (MCU)

S.No.	Technical Specifications
1	MCU should be advanced architecture for real time media conferencing platform with higher processing power capabilities. It should be hardware based purpose-built system for advanced video & voice communications. Software based MCU are not acceptable. The MCU should be a non-Windows based operating system with inbuilt Gatekeeper functionality.
2	The MCU should be slot based chassis type MCU and should have minimum 2 slots for housing hot swappable media cards.
3	The MCU shall be a rack mountable unit, provided with all the necessary accessories to integrate into a rack. The MCU shall have at least three dedicated 10/100/1000 Mbps Ethernet interface for diverse IP communication.
4	The MCU should support a dedicated serial/USB connection for maintenance/upgrade. There should be a built-in management tool for hardware monitoring, which can control and monitor the system fans and regulates the AC power supplies.
5	The MCU should support min 20 ports on HD 720p (send and receive) on 4Mbps on IP. It should be scalable to 60 ports on HD 720p. The port quantity (min and scalable) should met in single chassis. Cascading of MCU for port support is not applicable. MCU should support the above with 25/30fps and H.264 resolution and AES encryption.
6	MCU should be able to support H.320/PSTN Voice conferencing without using any external gateway.
7	The MCU shall be capable of supporting H.323, SIP, and H.235 v3 at the same time. The MCU should also support IPv4 and IPv6.
8	The MCU should support H.239 content sharing in ISDN, H.323 mode and BFCP for SIP
10	MCU should support H.261, H.263, H.263++, H.264 video resolutions from QCIF to HD 1080p including intermittent resolutions (SIF, CIF, SD, WSD, and HD 720p). It should support up to HD 1080p in continuous presence (CP) transcoding (TX) and full transcoding on all ports • Video Switching (Voice-Activated Switching) • 16:9 and 4:3 aspect ratio • H.239 content sharing resolution: VGA, SVGA, XGA, HD • Ability to send content to a legacy endpoint
11	MCU should support audio standard like G.711a/u, G.722, G.722.1C, G.722.1,

	G.723.1, G.729A, equivalent or higher, IVR prompts for auto attendance, User and managed mute control, DTMF support
12	It should support web-based embedded management tool: Web-based access and application-based access.
13	It should support Administrator, operator, auditor, and chairperson views
14	It should support up to 24 different conference layouts or higher
15	MCU should support 16 sites in Continuous Presence Layout or higher
18	The MCU shall support scheduled conferences and ad hoc conferencing mode at the same time
19	The MCU shall support a predefined and unique PIN for each conference
20	The MCU shall allow users to create conferences on the fly from their endpoints without the need of an operator.
21	The MCU shall allow different audio and video settings on individual conference basis ie different conferences with different profiles must exist simultaneously.
22	The MCU shall be capable of transcoding on every port without loss of port count
23	The MCU shall allow participants to change the layout they see using their endpoint's remote control. This shall not affect the layout that anyone else sees.
24	Chairperson / Participants should be able to have following feature controls using Remote Control of video system: Mute My Line / Unmute My Line; Mute All Except Me / Cancel Mute All Except Me; Change Password; Play Help Menu; Terminate Conference; Start Personal Layout; Start Recording / Stop Recording / Pause Recording, etc
25	MCU should support IP H.323, SIP, H.320, PSTN and VoIP voice, 10/100/1000 Mbps interface, and 64 Kbps to 4 Mbps conference data rates
26	MCU should support AES media encryption without any port loss, transport layer security for management and SIP, conference participants PIN code authentication via LDAP interface, tiered permission levels include Administrator, Operator, Chairperson and Auditor, GUI user authentication, secure mode option to prevent uninvited participants from joining the conference and It should be possible to separate management and media networks
27	For smooth, seamless and easy manageability, operation, interoperability and maintenance, the bidder should offer/quote MCU, the Endpoints and management & scheduling software of the same make (OEM).

Management & scheduling software/hardware for above MCU

S. No.	Technical Specifications
1	**System Components:**
2	It should have min 1xHDD of min 50GB capacity. It should also have atleast 2 x USB drives with CD/DVD read drive .The system must be able to be used without the need for an active directory administrator for entering credentials at the time integrated windows.
3	The system should be built on a powerful platform to support large registration of endpoints at least 200 from day one. Should be capable to support upto 500 devices via license upgrade on same chassis.
4	It should be possible to integrate the system with existing corporate directories.
5	**Supported Network Services:**
6	The system must support IP & ISDN endpoints. It should be possible to reserve IP & ISDN endpoints as dial-in devices using an entry queue.
7	The system must have an Auto-discovery feature that allows it to discover the

	closest network domain controller and/or AD server.
8	**Automatic Provisioning:**
9	The system should be capable of provisioning in which an administrator can configure one or more endpoints with the set of information (based on administratively configured user policies) the registering devices need to operate within the network. This eliminates the need to configure each endpoint individually.
10	The Device should support two exclusive provisioning processes: automatic and scheduled. Automatic and scheduled provisioning are exclusive management scenarios.
11	It should be possible for the endpoint to automatically pull the device and site provisioning information from the system while start up.
12	**Automatic Soft update :**
13	It should be possible to upgrade the software on one or more endpoints with a standard software package thereby eliminating the need to upgrade each endpoint individually.
14	The system must support two exclusive soft up date processes: automatic and scheduled.
15	It should be possible for the endpoint to automatically pull the soft update profile and package from the device.
16	The system must support a PC-based application for communicating over video and voice with content sharing.
17	The appliance should support min 100 desktop clients from the day one so that video, voice, content and chatting features can be availed by the users in the network.
18	**Presence service**
19	The system should include a presence service that allows video endpoint users to view details about their contacts, including the availability and system capability of the contacts in their contact list. This feature must be ready to use for the desktop clients.
20	Topology: The system must offer a graphical view of sites and site links and the ability to automatically generate functional multi-site links. The Topology page should supplement the existing Sites and Site Links pages, and the functions and data available on the Sites and Site Links pages should also be available on the Topology page.
21	**The administrator should be able to:**
22	Add, edit, or delete sites and site links on the Topology page.
23	Generate multi-site links automatically on the Topology page.
24	Make and save layout and presentation modifications.
25	View Tooltips on the Topology page that provide the pertinent data about sites and site links.
26	Use the graphical Topology page as a dashboard to view real-time alarms and select an alarm to and see the message behind it.
27	**H.350/LDAP-based Directory Services**
28	The system should store video dialing information in H.350 format.
29	The system should have following features:
30	auto-complete (ON|OFF) search function
31	Searching indexed fields and a smaller set of attributes
32	Eliminated searching of all groups
33	Limited use of wildcard searching

34	**Advanced Gatekeeper support**
35	**Call management solution** – Hides confusing numbers, prefixes, codes, and network options (IP or ISDN) required to place your call; users simply select a name from a directory or enter a phone number-like 'alias' to launch a call.
36	**Policy management** – Administrators can create policy management parameters to control bandwidth through segments of their video networks, apply network policies, and manage access to resources based on individual, group, or corporate-wide settings.
37	**Auto ISDN provisioning** – Allows for auto provisioning of DID (ISDN) and E.164 numbers for automated deployment of video endpoints.
40	Increased availability and security – Flags all call attempts from unregistered endpoints and allows administrators to predetermine whether the calls are automatically denied access; administrators can also keep NAT IP addresses confidential, preventing internal IP addresses from being accessed or sent outside the firewall.
41	**RTP statistics** – Provides packet loss, jitter, and latency-over-time statistics to help analyze video call quality over the network.
42	**Alternate gatekeeper support** – Provides greater network availability if the primary gatekeeper should fail or become inaccessible due to network failure.
43	**Sophisticated dial plan support** – Enables a higher level of network security by controlling the routing and blocking of certain calls.
44	**Conference Management**
45	Pre-configured Conference Templates for simplified setup across users, roles, and conference features sets
46	Quick access to meeting and conference schedules helps easily identify potential conflicts
47	On-the-fly parameter modification of in-progress scheduled conferences, including video layout, participant mute and un-mute, and conference duration
48	**Management**
49	All the video conferencing endpoints including central MCU should be centrally managed using the IP network. The Management System must be able to do the following: System Diagnostics, Status, and resource allocated status etc. .
50	It should be capable of supporting multivendor equipments.
51	It should provide the ability to directly connect IP endpoints to the MCU in separate multiple reserved/scheduled conferences without involving the external gatekeeper
52	The Gatekeeper should run on Microsoft platform and external hardware if required must be supplied.
53	Should have dial-in feature providing one number access for all participants on the call for IP participants using the gatekeeper
54	**Firewall/ NAT Traversal:**
55	The device should support H.460 firewall traversal that will enable video endpoints and software VC clients from the Internet to seemlessly join in a multiparty or point-to point conference.
56	**Management Conference Control Center**
57	Complete conference over view on one screen Conference and participated connection control conference-by-conference and system-by-system information of the MCU.
58	All the data available should in a tabular form for the ease of the administrator.
59	**Call Detail Records (Cdr) and Statistics** :Call details records on screen or

	number of incoming and outgoing calls and bandwidth usage. The necessary usage details like no. of calls, bandwidth used etc. should be available in a graphical form for the ease of the administrator.
60	**Power:** Hardware should have redundant power supply module.

2. Telepresense Solution

S.No	Feature	Description
1	Seating Capacity:	The system should have at least 6 seats & 10 seats for off-the-call use.
2	Seamless video displays:	The system should have 3 nos LCD/Plasma displays.
3	Video Standards:	H.261,H.263++,H.264,H.239,,H.263 & H.264 .
4	Bandwidth:	To cater at least 9 to 18 Mbps to support high definition at 1080p at 30fps and 6 to 12 Mbps for supporting 720p at 60 fps.
5	Call Rates:	Compatible with Video Conferencing call rates from 128 Kbps to 6 Mbps.
6	Cameras:	Must support three high-definition video cameras and codecs out of the view (hidden) for better eye to eye contact.
7	Analog Line support:	The system should support atleast 1 analog line support for audio add on.
8	Resolution Support:	The system should support resolution 1080p at 30fps or 720p at 60fps
9	Components:	The tele-presence system should have the following system components:
		Three video codecs supporting 720p at 60 fps and 1080p at 30fps
		Two Digital Ceiling Microphone Arrays
		Stereo Surround Speaker Kit
		Three High Definition Video Cameras
		Room control system with 6 inch color touch panel.
		Content Monitor : Suitable size & number of high resolution content displays integrated in the system
10	High definition audio :	The system should have High definition audio supported on 22 kHz bandwidth with Stereo surround , G.722.1 Annex C ,7 kHz bandwidth with G.722, G.722.1
11	Encryption:	The system should support AES Media Encryption for secure video/audio and content.
12		The system should have the required number of LAN Ethernet ports.
13	High definition video:	The system should have 3 nos, 65" or higher high definition LCD/Plasma displays.
14	Camera:	The system should have three mini 3-CCD high definition video cameras embedded (out of view) hidden.
15	Multiparty conferences:	Should be easily available by the touch of a button and Multipoint Layout Application should be available with the local site (mandatory)
16	Interoperability:	The system should be completely interoperable with all

		standards-based video conferencing products.
17	Flexibility:	It should be possible to have customized wood finish, carpet finish, chair fabric and back wall branding color.
18		The system must have microphones hanging from the ceiling to have clear conference table.
19		The sound system should be out of view and there should be no remote controls on the table.
20		The color Touch Panel should enable to place video and audio calls, hang up calls, control the audio and perform other tele-presence conferencing tasks. The Touch Panel should be placed within easy reach of the center seats at the main table.
21		The system should have Stereo surround audio with digital ceiling microphones for capturing even the lowest audio signal in the room.
22		The system should have highly sensitive, 360 degrees omni-directional digital microphones so that the participants could speak in their natural pitch without pointing towards the microphones.
23		There should be a provision of connecting the laptop for internet connectivity with power sockets on each seat of the room.
24		It should be possible to use the monitors for content displayed from the far site.
25		It should be possible to use the monitors for displaying the content from the local end via laptop or PC.
26		It should also be possible to use the monitors for displaying the content of the room`s integrated computer.
27		It should be possible to integrate the existing video system with the conference phone for audio add on.
28		It should be possible to dial the audio participants with the integrated conference as well as the touch panel.
29		There should be appropriate (studio quality) lighting on the ceiling so that all the participants gets adequate light.
30	Should support IPv4 and IPv6 from day One	
31	Provide UPS with requisite power capacity for telepresense system with 1 Hr Backup (approved brands for UPS: APC/Numeric/Emerson)	

3. VIDEO CONFERENCING ENDPOINTS/CODECS

i) Type 1: HD Video Conferencing Endpoint/Codec

S.No.	Technical Specifications
1	The system must be a hardware device based on PAL with a PTZ camera, mic, wireless remote control, etc. The codec must be based on industry standards such as the H.323 and SIP umbrella standards for IP-based audio/video and H.320 umbrella standard for ISDN-based audio/video.
2	System should support video protocols H.261, H.263, H.263 ++, H.264,
3	System should support for content sharing using standards based H.239 and

	BFCP over SIP. Must also support audio from PC used for content sharing.
4	System should support following video /audio inputs
i	1xHD input for connecting main HD camera
ii	1x input for connecting PC/Laptop to share HD content
iii	1x input for connecting to Document Camera/VCR/DVD player
iv	1xMic input (quoted system should support upto 2 mic arrays)
v	1xLine-Level stereo in (RCA or equivalent)
vi	1x3.5mm stereo mini (PC Audio) i.e. for content audio
vii	1xVCR/DVD stereo audio-in (RCA or equivalent)
5	System should support following audio/video outputs
i	Should have 4 x HD output interface for display and other devices
ii	2xRCA or equivalent for main monitor audio out or to external speaker system and for VCR/DVD player audio
6	System must be equipped with wireless microphones for hands free operations with option for headset or headphones.
7	The wireless mic system should be dual channel supporting 50-20000Hz audio range. Should also provide encryption. The radio bandwidth should be from 1.88 - 1.9GHz. Should have adequate time (min 6 hours).
8	The wireless mic system should be interference free from GSM/ iPhone/ CDMA mobile phones for interference free operation.
9	System should support following network interface
	2 port 10/100 auto NIC (RJ-45). Must support ISDN PRI
10	H.323 and SIP at 4 Mbps and H.320 at 2Mbps
11	Support for NAT and firewall traversal
12	System should support 1/3"CCD or equivalent 1920X1080p camera with 10x optical zoom, 70 degree or more horizontal FOV, 40 degree or more vertical FOV, pan should be atleast +90 to - 90 degrees and tilt range should be +10 to -15 degrees
13	System should support symmetric HD 1080p30fps, HD720p30fps, 4SIF/CIF 30fps, 4SIF/CIF 60, SIF, CIF, QCIF video resolutions.
14	System should support Content Resolution Input: SXGA,HD720p, 1920x1080p, XGA, SVGA, VGA
15	System should support audio Standard like G722.1 Annex C, G.722, G722.1, G.711, G.728, G.729A
16	System should support other standards H.221, H.224/H.281, H.323 Annex Q, H.225, H.245, H.241, H.331, H.239, H.231, H.243, H.460, BONDING, Mode1, BFCP (RFC 4562)
17	System should support Secure web, Telnet based access , Embedded AES, H.235V3 and H.233, H.234, Support for IPv6, NTLM, Remote monitoring of video through web interface, Directory services, System Management by web interface, SNMP, CDR
18	System should support login access levels for web interface, whitelist feature for secure access i.e. list of IP addresses that can connect to codec over web interface, Password policy, Far end camera control
19	It should have support for IEEE 802.1X , H.235 Annex D
20	It should support for at least 20 camera presets and Dual Monitor Emulation
21	System should support inbuilt 4 port MCU (1+3) which can be optionally activated with separate software license.

ii) **Type- 2: HD Video Conferencing End points/Codec (Desktop Type)**

Sr.no	Technical Specification
1	Desktop unit fully integrated with codec, display, camera , microphone and speakers.
2	System should have dual display modes PC display and Video Conferencing display, can be manually switched.
3	**ITU-T supported** network, video and audio standards: **Network:** H.323 (IP), H.320 (ISDN/PSTN) and SIP **Video:** H.264, H.263 ,H.261. **Audio:** G.711, G.722, G.722.1, MPEG4 AAC-LD stereo / Siren 22 stereo supporting audio bandwidth @ 20kHz or higher. Should support IPv4 and IPv6 from day One
4	**Video Features:**
5	**Bandwidth/Frame Rates**: Minimum 4 Mbps /1080p30fps, 720p60fps, 720p30fps.
6	**Supported Live Video resolutions** : QSIF/QCIF, CIF/SIF, 4SIF/4CIF(30 & 60 fps), 720p(30 & 60fps), 1080p30fps. Picture in Picture (PIP)
7	**Audio Specification-** Stereo surround audio with echo cancellation, noise suppression and automatic gain control
8	Inbuilt microphone and powerful speakers.
9	**Input/Output :** Audio In/Out for privacy options
10	Support for HD 2nd monitor from day one
11	**Content**
12	Support for H.239 / People and content.
13	**Supported PC Input resolution**
14	1920 x 1080, 1680 x1050, 1280 x 1024,1280 x 720, 1024 x 768, 800 x 600
15	**Camera**
16	1920x1080 video capture resolution
17	EPTZ Camera with auto / manual focus.
18	Integrated privacy shutter.
19	**Display**
20	24 inch display unit
21	1920x1080 native resolution
22	**User Interface:** Touch screen/Dial pad/remote control, manual or auto answer mode, incoming caller ID.
23	**Dialing Capabilities**: Local and global address book, support for directory service as LDAP; support for H.323 external gatekeeper, gateway and MCU.
24	**Network Interfaces**
25	1x RJ-45 (for IP connectivity)
26	1x RJ-11 (for POTS)
27	**Others physical interfaces**
28	1x RS-232 port.
29	1x USB port
30	Should support Inbuilt multipoint capabilities to connect upto (1+3) locations.

iii) **Type-3: Video Phone for Conferencing**

S.No.	Technical Specifications
1	Should have minimum of 7 inch TFT LCD display with adjustable screen angle

2	Should have a minimum of 16:9 wide screen aspect ratio
3	Should support full-duplex conversations, acoustic echo cancellation and background noise suppression. Type 1 compliant (IEEE 1329 full duplex)
4	Should have Frequency response – 100 Hz – 14 kHz for handset, optional headset and hands-free speakerphone modes
5	Should support following Codecs: G.711 (A-law and μ-law), G.729AB, G.722, G.722.1, G.722.1C
6	Should have provision of Individual volume settings with visual feedback for each audio path
7	Should support Packet loss concealment
8	Should have Dedicated RJ-9 headset port
9	Distinctive incoming call treatment/call waiting
10	Call transfer, hold, divert (forward), pickup, Abbreviated speed dial, redial, Do not disturb function
11	Called, calling, connected party information, Remote missed call notification
15	H.263, H.263+ (1998), and H.264
16	Minimum of CIF(352x288) or SIF(352x240) resolution transmit and receive video up to 30 fps
17	should have minimum of 2 mega pixel camera
18	Should have option of Privacy Shutter
19	Picture in Picture
20	Corporate Directory Access using LDAP
21	Should support "H.323/SIP" Protocol
22	10/100/1000Base-TX across LAN and PC –ports
23	Should support Manual or dynamic host configuration protocol (DHCP) for network setup. Should support IPv4 and IPv6 from day One
24	Should support Time and date synchronization using SNTP
25	Should support FTP/TFTP/HTTP/HTTPS server-based central provisioning for mass deployments
26	Provisioning and call server redundancy should be supported
27	Should support QoS – IEEE 802.1p/Q tagging (VLAN), Layer 3 TOS, and DSCP
28	RTCP and RTP should be supported
29	Should support Hardware diagnostics
30	Should support Status and statistics reporting
31	Should support DNS-SRV
32	Should be capable to provide CIF video up to 768 kbps plus network overhead
33	Should support Media encryption via SRTP
34	Should support Transport Layer Security (TLS)
35	Should have Encrypted configuration files
36	Should have provision of Password login
37	Should support HTTPS secure provisioning
38	Should support Built-in auto sensing IEEE 802.3af Power over Ethernet (Class 0)
39	Should also have External Universal AC power Adaptor

4. HD Recording & Streaming Solution

S No.	Technical Specifications

1	The device should support windows XP / Linux based Operating System. Should be a rack mountable device
2	The device must support at least 5 concurrent sessions expandable up to 15 sessions
3	The system should support calls upto 4 Mbps bandwidth.
4	The device should have recording capacity of up to 700 hours of H.323 and Windows compatible file format content in a 500GB hard disk or higher capacity.
5	The device should support at least 1 live streaming at 720p, 30fps content and video on a single screen with varying bit rates - 128Kbps to 4Mbps.
6	Should support streaming for at least 100 viewers (Unicast or Multicast) upgradable up to 200 viewers on the same chassis. The streaming should include audio, video and data (H.239) of the conference
7	Support for Live Video Resolutions: QCIF, C(S)IF, 4CIF, SD, HD, XGA, SVGA ,VGA: Video standards at H.261, H.263, H.264 compressions.
8	Support for G.711, G.722, G.728, G.722.1 Annex C audio standards or equivalent
9	The windows media player must be embedded on the GUI for the ease of use of the administrator.
10	Should support up to1080p HD record and playback, record stereo calls in single point and point to point calls
11	The Streaming Server should provide a quick and easy way to record Video meetings and view them live or on-demand from H.323 endpoints and computers/laptops.This should support recording, playback and streaming of multiparty conferences as well as point to point calls
12	The device should support H.264 in H.239 enabled conferences.
13	The system should be able to transcode and translate Video and audio played back via H.323 or streamed using a bandwidth and codec that can be different to the source. All recordings should get stored in native format with no loss in quality
14	It should be possible to offload converted video content for playback on other multimedia devices
15	The system should support different viewing formats viz: using Windows Media Player
16	The functions of pause, play, stop should be possible from the endpoint remote using DTMF command from the endpoint`s remote control.
17	The system should have built in web server providing complete configuration, control and monitoring of the system and recordings
18	Should have atleast two levels of passwords and should also support NAT for additional security. It must also support latest AES encryption.
19	It should be possible to do recording of 2 x point to point endpoint`s session without MCU (External or Embedded) .
20	Should support Password protected streaming and content playback
21	It should be possible to create a new default login password for the ease of use of the administrator.
22	The device should support User management and authentication with Active Directory integration.
23	It must be possible to email the conference recording archievable link with the link name information to any or all the participants through the GUI.
24	It should provide an automatic Backup and Delete through System utilities for automatic content archiving

30	The device should support 2 x Ethernet RJ45 interface supporting 10/100 Mbps full/half duplex manual or auto sensing. Should support IPv4 and IPv6 from day One
31	**Interface:**
32	min. 2 x power supplies and dual hard drives.
33	min. 2 x RJ45 Ethernet, 10/100 Mbps full/half duplex, manual or auto sensing
34	min. 2 x USB ports for upgrade and a RS232 serial port.

5. NAT Traversal Device

S.No.	Technical Specifications
1	Solution should allow video conferences to securely traverse firewalls, while retaining complete network security, thus facilitating to communicate when firewall safety measures are in place. The solution should work like an IP Gateway for IP video conferences which enables Internet based video conferencing.
2	Resolves firewall traversal problems by providing application layer Gateway (ALG) or voice and video aware firewall that supports SIP and H.323
3	Resolves firewall traversal problems by providing NAT-Traversal capability.
4	Protects the enterprise LAN using stateful packet inspection (SPI) firewall for both voice and data traffic.
5	Performs static IP routing.
6	Provides integrated test tools to facilitate problem isolation.
7	Uses a simple web based GUI for configuration and management.
8	The application layer gateway should work as a Video traversal allowing H.323 end points from Internet to communicate with end point on LAN seamlessly without opening any ports or causing any security threat on existing network.
9	**Performance**
10	Supports up to 10 Mbps of H.323 video traffic or 10 video calls at 1Mbps each from the Internet.
11	**Secure Remote Access to IP Video Conferences**
12	Interoperable with all standards-based video endpoints, gatekeepers, and multipoint conferencing platforms
13	**Security & Video device protection**
14	H.323 application-aware Stateful packet inspection firewall
15	Application layer gateway dynamically provisions and closes UDP ports used for video and voice calls
16	NAT/PAT server hides LAN topology to protect video devices
17	Allows Desktop clients to seamlessly join in a conference.
17	**Optimal Video Quality**
18	Seamless prioritization of video over data
19	Video and voice call entry control to prevent congestion of priority traffic
20	Traffic management capabilities such as priority queuing, traffic shaping, and diffserv marking/policing
21	**Interfaces:**
22	WAN , LAN , management interfaces

6. 65" full HD display (LCD/LED)

89

S. No	Technical Specifications
1	The Display should have aspect ratio of 16:9.
2	The Display should support true resolution of 1920X1080 pixels.
3	The Display should have minimum (Native) contrast ratio of 3000:1.
4	The Display should have minimum life span of 50,000 Hrs.
5	The Display should have minimum 450cd/m2 Brightness
6	The display should have following input terminals.
	a) RGB Input –Mini D-Sub 15 PIN x 1
	b) DVI-D In – 24+1 PIN
	c) RS-232C - D-Sub 9 PIN X 1
	c) HDMI In – 1
	d) AV Port
7	The Display should have in-built speakers (minimum 15W rms x 2)
8	The Display should have following functions:
	Screen Saver function – Wobbling (For preventing any ghost image to appear on display).
19	a) Auto Power off (For saving the power consumption when not in use)
	b) Power Saver Mode (For saving power if not in use for short duration during VC)
11	The Display should support various types of mounting accessories & should be provided with suitable mounting kit as per requirement such as
	Wall Mount (Tilt / Flat)/ Ceiling/wall Mounting Kit or floor mounting kit
12	The display should have the following standards certification
	a) RoHS compliant – For environment
	b) UL/IEC – For safety
	c) FCC – For radiations regulation

7. 40" Full HD Display(LCD/LED)

S. No	Technical Specifications
1	The Display should have aspect ratio of 16:9.
2	The Display should support true resolution of 1920X1080 pixels.
3	The Display should have minimum (Native) contrast ratio of 3000:1.
4	The Display should have minimum life span of 50,000 Hrs.
5	The Display should have 450cd/m2 Brightness
6	The display should have following input terminals.
	a) RGB Input –Mini D-Sub 15 PIN x 1 (For connecting PC/LAPTOP)
	b) DVI-D In – 24+1 PIN (For More Laptop)
	c) RS-232C - D-Sub 9 PIN X 1 (For programming) (Input and Output)
	c) HDMI In – 2(For connecting VC and other AV Device in Future)
	d) LAN port - RJ45
7	The Display should have in-built speakers (minimum 10W rms x 2)

8	The Display should have following functions:
	Screen Saver function – Wobbling (For preventing any ghost image to appear on display).
19	a) Auto Power off (For saving the power consumption when not in use)
	b) Power Saver Mode (For saving power if not in use for short duration during VC)
11	The Display should support various types of mounting accessories & should be provided with suitable mounting kit as per requirement such as
	Wall Mount (Tilt / Flat)/ Ceiling/wall Mounting Kit or floor mounting kit
12	The display should have the following standards certification
	a) RoHS compliant – For environment
	b) UL/IEC – For safety
	c) FCC – For radiations regulation
	d) Energy Star 5.0 Certified

D IP Surveillance System

1(i) IP based CCTV Camera

S.No	Technical Specifications
1	CCTV Camera with Dual camera, brilliant image color quality during the day and highest sensitivity at night to two separate image sensors for color and B/W,
2	Should be used for indoor and outdoor (minimum IP65)with 3MEGA-resolution (QXGA, 2048x1536 pixels),
3	Should have B/W sensor (at night or IR lighting): 0.1 lux at 1/60 s, 0.005 lux at 1 s exposure time
4	Should have PIR sensor for motion detection in the dark,
5	Should have Microphone and speaker with full audio functionality (VoIP and SIP telephony with video)
6	Should have Integrated switch functions (3 x In, 1 x Out), RS232
7	Should come with Internal DVR recording without network load
8	Should support IPv4 & IPv6 from day one with atleast one Ethernet LAN port
9	Should have External Universal AC power Adaptor and other accessories
10	For smooth, seamless and easy manageability, operation, interoperability and maintenance, the bidder should offer/quote all cameras at D-1(i, ii & iii) above from the same make (OEM).

1(ii) Outdoor PTZ Camera

S.No	Technical Specifications
1	The integrated housing shall have a polycarbonate dome cover, die cast aluminum body and use tamper resistant hardware. The housing shall have a built in sunshield. The housing shall be weatherproof to minimum IP66.

(87)

2	The HD PTZ Dome Network shall feature a dome cover with Rain Wash Coating which shall soak rain drops into surface of camera dome maintaining better view during raining conditions. In addition, stain on camera dome surface can be relatively washed away by rain or by just spraying water without wiping.
3	Fog and Sandstorm compensation for better image quality in rough weather conditions.
4	The HD PTZ Dome Network Camera shall offer an advanced 1/2.8" Progressive Scan double speed Megapixel MOS Sensor, 2.0 **megapixels effective**, with a microlens on each pixel for superior picture detail and clarity.
5	The Network Camera shall offer automatic gain control (AGC) function and an S/N ratio of 52dB or better.
6	The Network Camera shall be a self-contained unitized dome camera assembly that incorporates an integral day/night camera, pan-and-tilt motor, zoom lens and network interface. The Dome assembly shall come pre-wired from the factory and the units with external pan-and-tilt motor, lens etc. will not be accepted
7	The Network Camera shall produce a high quality picture with a minimum illumination of 0.03 lux in color mode or 0.004 lux in B/W mode at F1.4. It shall offer IR cut filter that switches on/off to enhance low-light sensitivity during B/W mode.
8	The Megapixel image sensor shall feature images with a wide dynamic range of up to128 times over standard CCTV cameras.
9	The Network Camera shall be equipped with an intelligent features like Auto Backlight Compensation, Adaptive Black Stretch (ABS), Digital Noise Reduction (DNR) etc.
10	The Network Camera shall support 3D-DNR to ensure noise reduction in various conditions.
11	The Network Camera shall offer Automatic Tracing White Balance Adjustment feature for Sodium Vapor and other night time illumination
12	The Network Camera shall offer a built-in digital motion detection feature with minimum four configurable areas per scene and fifteen sensitivity levels adjustment capabilities.
13	The Network Camera shall be equipped with image stabilization feature capable of electronically stabilizing the image should the camera become subjected to mechanical vibration.
14	The Network Camera shall offer 8 privacy zones that mask areas dynamically with a grey box or mosaic; the size of masked zones shall change dynamically with operator control of pan/tilt/zoom functions.
15	The Network Camera shall be capable of Advanced Auto Tracking function which track and follow a single moving target. The Advanced Auto Tracking function shall not require an external video processor to control the Network Camera. The Advanced Auto Tracking mode shall be able to be interrupted by manual operator control and automatically resume to its previous tracking mode after operator releases control.
16	The Network Camera shall offer on-device intelligence, Face Detection feature to enhance details of human faces for better identification.
17	The Network Camera shall incorporate a 1/4" motorized zoom lens with a focal length of 4.3 to 129mm (20x) or better. It shall provide Extended Optical Zoom in VGA mode to support up to 90x zoom. The zoom lens shall have automatic iris and automatic focus features but will allow manual override if the need arises.
18	The Network Camera shall provide continuous digital zoom (minimum 12X) for a total maximum magnification of 1080x.

19	The Network Camera shall offer an automatic zoom-to-window feature allowing the user to draw a box area using his mouse and the camera will automatically zoom in on that area.
20	The pan-and-tilt motor shall be a high-speed unit which allows 360° endless panning with a tilt range of -15 to +185°.
21	The pan-and-tilt motor shall allow for preset sort and sequence rotation speed of approximately 400° per second.
22	The Network Camera shall use variable manual pan speed control to allow for super fine pan control of 0.065° to 120°/s.
23	The Network Camera shall be a direct drive motor assembly. **Belt-driven unitized** camera units will not be acceptable.
24	The Network Camera shall offer a minimum of 256 preset positions.
25	The Network Camera shall support an image hold capability for retaining images during preset position acquisition phase.
26	The Network Camera shall be able to automatically sequence through the preset positions in logical programming order (sequence mode).
27	The Network Camera shall use a Triple Streaming Codec capable of simultaneously generating and transmitting MJPEG and two independent MPEG-4 (Part 2) / H.264 (High Profile) video streams which are different in resolutions and frame rates. The camera shall keep 30ips at 1,280 x 960 with less than 2.0 Mbps of bandwidth.
28	Simultaneous MJPEG (15 fps) and MPEG-4 / H.264 (30 fps) video streams.
29	The Network Camera shall be able to support uni-cast and multi-cast transmissions.
30	The Network Camera shall have a built in web server so that access to the IP video stream can be obtained using Internet Explorer Version 6.0 SP3 or better. The web browser shall permit the user to make adjustments and settings to the camera.
31	The IP address of the Network Camera shall be able to be detected by a software tool that is provided free-of-charge.
32	The Network Camera shall have the capability of password protecting all menu settings.
33	The web browser shall include the ability to electronically zoom into the picture between 1x to 12x.
34	The Network Camera shall be able to take snapshots of the video by clicking on an icon in the web browser. The image shall be saved as a JPEG file format.
35	The Network Camera shall be able to connect to a Network Time Protocol (NTP) server automatically and synchronize to the network time. The time zone shall be made selectable.
36	Up to 15 other network cameras shall be viewable simultaneously by the user, when connected to the Internet Explorer of the Network Camera without any additional software required.
37	The Network Camera shall generate a VBS 1V p-p / 75Ohms PAL composite signal through a 3.5mm mini jack.
38	The Network Camera shall have built-in Audio input and output jacks and be capable of transmitting and receiving full duplex audio stream through the same Ethernet connection as the video. The audio shall be encoded using the G.726 or equivalent ADPCM standard.
39	The Network Camera shall have 3 external I/O Terminals which can support alarm inputs/outputs or external Day/Night controls or exposure out which is for external flash synchronizing.

40	The Network Camera shall provide a Secure Digital High Capacity (SDHC) Memory Card slot which can support up to a maximum of 32GB SDHC memory card that can cache images in the event of a network failure. The camera shall also support manual/alarm recording to the optional SDHC Memory Card. The Network Camera shall also provide notification of the remaining capacity of the SDHC Memory Card.
41	The Network Camera shall provide bandwidth controls with various throughput levels or frame priority mode.
42	The Network Camera shall be capable of being configured to automatically transmit alarm images transfer via FTP file transfer and/or e-mail. In addition the Network Camera shall support the scheduled transfer of image data via FTP to an FTP server.
43	Terminal inputs, VMD alarms, and alarm commands shall be able to trigger actions such as SDHC memory recording, FTP file transfer, e-mail notification, alarm indications on web browser, alarm terminal output, and alarm command output.
44	Alarm log, Manual recording log, FTP error log saved in the SDHC memory card shall be able to display on the web browser GUI and can also be downloaded to the PC. Video playback or JPEG image download from the log shall also be made available.
45	The Network Camera shall support IPv4 and IPv6 network addressing and shall support TCP/IP, UDP/IP, HTTP, RTSP, RTP, RTP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, and SNMP protocols
46	Should have external universal AC power adaptor & other accessories. The power source for the Network Camera shall also support IEEE802.3at (Power over Ethernet Plus, PoE+) compliant or 24VAC.
47	The Network Camera shall meet the following operating conditions:
	Temperature : -30 to +55 degree C or better
	Humidity : 90% or less (without condensation)
48	All units must be certified to CE and UL, FCC Safety/EMC standards

1(iii) Fix Dome indoor camera

S.no.	Technical specifications
1	The semi-flush-mounted 3 megapixel high sensitivity MOS sensor cameras shall incorporate a 1/3" progressive scan megapixel high sensitivity MOS sensor, 3 megapixels effective, with a microlens on each pixel for superior picture detail and clarity. The camera shall have a minimum illumination of 0.3 lux color mode and 0.2 lux B/W mode.
2	3 megapixel high sensitivity MOS sensor shall be charged with high sensitivity, lower power consumption and superior color reproduction by primary (RGB) color filter. The 3 megapixel sensitivity MOS sensor shall feature images with wide dynamic range linked with ABS (adaptive black stretch) and face detection.
3	The camera's original system shall be charged with multiple H.264 high profile streams, real time high definition video processing and on-device intelligence support (Face Detection). The camera shall keep 30ips at 1,280 x 960 with less than 2.0 Mbps of bandwidth.
4	The camera shall be capable of generating and transmitting images to meet the following specifications.
	4:3 Mode
	JPEG: 1,280 x 960 / VGA (640 x 480) / QVGA (320 x 240) , up to 30 fps
	H.264: 1,280 x 960 / VGA (640 x 480) / QVGA (320 x 240) , up to 30 fps
	16:9 Mode

	JPEG: 1,280 x 720 / 640 x 360 / 320 x 180 , up to 30 fps
	H.264: 1,280 x 720 / 640 x 360 / 320 x 180 , up to 30 fps
	Simultaneous JPEG and two independent H.264 streams which are different resolution and bit. Or simultaneous JPEG and two independent MPEG-4 streams which are different resolution and bit.
5	The camera shall have 10 steps of Picture quality setting for JPEG compression.
6	The camera feature Adaptive Black Stretch to transform shadows and dark areas into natural and crisp images in real time. The camera shall also feature intelligent digital back light compensation, digital wide dynamic range circuit, digital noise reduction and 16x electronic sensitivity-up for real surveillance purposes under severe conditions. For better picture quality, the camera shall feature digital 2H enhancer, digital aperture correction, knee circuit and digital white detective ATW. The camera shall also offer a user-configurable AWC setting for white balance at a manual setting.
7	A web browser menu of the camera shall allow fine adjustment of chrominance, pedestal and aperture level.
8	The camera's built-in shutter shall feature setting of off (1/30), 3/100, 3/120, 2/100, 2/120, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000 and 1/10000 sec. A web browser menu shall allow fine adjustment of chrominance, pedestal and aperture level.
9	The camera shall incorporate 1/3" lens with a focal length of 1.95mm. The lens shall be suitable for use in areas where there is a varying light source. The lens shall have a maximum aperture ratio of 1:2.2. The unit shall have an angular field-of-view of 104 degrees (horizontal) and 85 degrees (vertical).
10	The camera shall be able to support 2x, 4x digital zoom controlled by browser. The camera shall provide Extended Optical Zoom on VGA mode, it supports up to 2x zoom. Max. 8x zoom combined with extra zoom under VGA mode.
11	The camera's imager and lens assembly shall rotate for optimal camera positioning.
	Ceiling installation : Horizontal: +/- 20 deg, Vertical: -20deg to +90 deg.
	Wall installation: Horizontal: +/- 80 deg, Vertical: -90deg to +20 deg
12	The camera shall feature Face Detection to detect the positions and sizes of faces. The function is implemented in System LSI in camera. The information of the positions and sizes of faces is sent by XML format.
13	The camera shall support simultaneous JPEG and two independent H.264 streams which are different resolution and bit rate. The camera shall have capability to select an i-frame interval to refresh the displayed H.264 images from 0.2sec to 5sec. H.264 images can be transmitted over HTTP protocol.
14	The camera shall be capable of setting different picture quality in multiple areas within one picture to save the bit rate of H.264 streams.
15	The camera shall support Video Motion Detector with 4 programmable detection areas, 15 steps sensitivity level and 10 steps detection size. The camera shall be capable of being configured the settings relating to schedules of VMD permission and access permission.
16	The camera shall have up to 20 alphanumeric characters as on-screen camera title display.
17	The camera shall support Privacy zone setting which can mask up to 2 private areas, such as house windows and entrances/exits.
18	The camera shall have a built-in web server so that access to the IP video stream can be obtained using Internet Explorer Version 6.0 SP3 or better. The web browser shall permit the user to make adjustments and settings to the camera. The camera can show video images on full screen mode by clicking the icon on the browser and take snapshot by clicking the icon on the browser. The image can be saved to PC as JPEG file.
19	Up to 15 other Network Cameras shall be viewable simultaneously by the user, when

	connected to the Model Camera without any additional software required. (It depends on network conditions)
20	The Bandwidth Limit shall be adjustable to 64 / 128 / 256 / 384 / 512 / 768 / 1024 / 1536 / 2048 / 3072 / 4096 / 8192 / Unlimited kbps (8192kbps can be selected on H.264 mode.) or frame priority mode (1 / 3 / 5 / 7.5 / 10 / 12 / 15 / 20 / 30 fps).
21	The camera shall be able to support uni-cast and multi-cast transmitting.
22	The camera shall support IPV4 and IPV6 network addressing.
	Supported protocols:
	IPv4:TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP and UPnP.
	IPv6: TCP/IP, UDP/IP, HTTP, RTP, FTP, SMTP, DNS, NTP, SNMP and DHCPv6.
23	The camera shall be capable of being configured to automatically transmit alarm images transfer via FTP file transfer and/or e-mail. In addition the camera shall support the scheduled transfer of image data via FTP to an FTP server.
24	The camera shall have Multi-language GUI and setup menu
25	The IP address of the camera can be detected by software tool.
26	Should have universal AC power adaptor & other accessories. The power source for the camera shall also support PoE (IEEE 802.3af) ,PoE 48 V: 54 mA (Class 1 device)

2. 32" Full HD Display(LCD/LED)

Same features as for 40" Display at point (C-7) above

3. Network Disk Recorder System(NDRS)

S.no.	Technical specification
1	NDRS shall be capable of connecting to up to 64 network cameras without extra license fees and their images can be recorded simultaneously with in single chassis.
2	The NDRS shall be equipped with minimum 9 hot plug HDD slots.
a	should be provided with 35TB HDD storage.
b	Should have the capability of expansion up to 160 TB
3	Should all have Intelligent VMD search function that allow motions in a specified area in the recorded images of the compatible cameras to be quickly searched.
4	NDRS should be the equipment with an embedded real-time operating system and shall not be based on a Microsoft Windows OS. The OS must reside completely in the hardware and not be installed on the hard disk drives. Installed disk drives must be dedicated to recording videos.
5	Should support H.264, MPEG-4 and JPEG multi format.
6	Should provide Various Recording Mode: Manual, Schedule, Event (Pre/Post), Emergency, and External Timer. Should have the capabilities to control: Pan/Tilt, Zoom, Focus, Brightness and Preset Positions. It shall be able to search using: Time & Date, Event Type and Camera number.
7	Should have up to 8 recording programs including individual recording mode for each camera, and 6 time schedules per day.
8	Should have up to 36 audio capabilities and can be recorded and played back at G.726 (ADPCM) 32 kbps.
9	Should have minimum 2x built-in Gigabit network interfaces (10Base-T / 100Base-TX / 1000Base-T) for camera recording and client access.
10	Should have the capabilities to transfer recorded images to FTP server upon alarm

	and/or live image periodically. Images recorded in the SD memory card in the network cameras can be transferred to the recorder automatically even when the recorder is in recording status.
11	Should have User/Host authentication, minimum 4 programmable user levels, 16 user priorities and User-Camera View/Control partitioning setup for sophisticated user management. It shall be capable of up to 32 user registrations.
12	Should have Alteration detection and recorded data encryption for data security.
13	Should have RAID5/6 redundant recording for data security. The RAID6 feature allows the recorder to recover from a two-disk failure without any loss of data (minimum four HDDs are required). With hot plug support, drives can be replaced without any downtime, allowing 24/7 operations. It shall have Disk partitioning to include Normal, Event, Pre-Event and Copy for flexible record management.
14	Should be viewable from any properly connected PC using Microsoft Internet Explorer version 6.0 or later
15	Should provide user authentication and support different user privileges based on logon ID. From the client the user should (with proper authentication) be able to do the following:
	a. Setup cameras
	b. Define live viewing, recording rates and quality settings
	c. Define recording programs and schedules
	d. View live video in either single or quad views
	e. Search and playback recorded video
	f. Download selected recorded video
	g. Control connected PTZ cameras
16	Should work with the viewer software which is capable of viewing multiple cameras from multiple recorders on a single screen and provide the following features:
	a. Software shall be able to display live video from any camera on any connected recorder.
	b. Software shall be able to display 1, 2x2, 3x3 or 4x4 multiplexed video.
	c. Software shall show registered recorders as icons in a drop down menu. Cameras will be shown as icons on the same menu, indented under the attached recorder.
	d. Software shall enable user to assign any video from any recorder into any window on the multiplexed display
	e. Software shall permit to register up to 32 users and each password and provide up to 5 different levels of user privileges.
	f. Software shall permit the remote operation of properly configured PTZ cameras according to the user privilege level.
	g. Software shall provide search functions for registered recorders and allow search by Event, Mark or Motion. It must apply these search criteria across multiple recorders.
	h. Software shall permit the simultaneous playback of up to 16 videos.
17	NDRS should support IPv4 & IPv6 from day one
18	NDRS should be provided with all hardware, software & other accessories as required for its functionality

Annexure-III

PRICE SCHEDULE FOR THE SUPPLY OF Items as at Annexure-I

To,

The Director & Head Projects & Training
ERNET India
Jeevan Parkash Building, 10th floor,
KG Marg, CP, New Delhi-110 001

Tender No. _____ Date of Opening .....

We _____ hereby certify that we are established firm of manufactures/authorized agents of M/s. _____ With factories at _____ which are fitted with modern equipment and where the production methods, quality control and testing of all materials and parts manufactured or used by us are open to inspection by the representative of ERNET India. We hereby offer to supply the following items at the prices and within the period indicated below:

S. No.	Item Description	Qty	*Unit price in US$/INR (A)	Excise duty (B)	WCT C	Sales Tax (D)	Total unit price in US$/INR (A+B+C+D	Total Price in US$/INR
1								
2								
3								
.								
.								
							Total	

*Prices should be quoted without customs duty

We (bidder) hereby undertake and confirm that:

1. Prices are F.O.R. at End-user site and include Installation, Fixing, Octroi and other such Govt. Levies wherever applicable.
2. Prices are without Customs Duty.
3. All items are quoted alongwith necessary accessories and softwares.
4. All the equipment and components quoted, have three years comprehensive warranty. The comprehensive warranty includes on- site warranty with parts/spares.
5. The quotation has been submitted for all items strictly as per the specifications and been given compliance in this regard.
6. There are No deviations in the specifications as asked in the tender.
7. During warranty and AMC services will be provided directly to ERNET India and/or its customers at sites.
8. The support services for all the items will be available for 24 Hrs a day, 7 days a week.
9. It is hereby confirmed that we have understood the terms and conditions of the tender and have thoroughly examined specifications and are thoroughly aware of the nature of goods required and our offer is to supply goods strictly in accordance with the requirement and terms and conditions of the tender. We agree to abide by the terms and conditions of the tender if the contract is awarded to us.
10. We hereby offer to supply the goods detailed above or such portion thereof as you specify in the purchase order at the price quoted and agree to hold this offer open for acceptance for a period of 180 days from the date of opening of bid.
11. Bid security for an amount equal to Rs. ...../- is enclosed in the form of Bank Draft/Pay Order/ Bank Guarantee.

_____

(Signature and seal of Manufacturer/Bidder)

Dated _____ 2013

ANNEXURE-IV

PROFORMA FOR BANK GUARANTEE FOR CONTRACT PERFORMANCE

(To be stamped in accordance with stamp Act)
(The non-judicial stamp paper should be in the name of issuing Bank)

Bank Guarantee No. .....

Ref.:.....

Date:.....

To,

ERNET India
Jeevan Parkash Building, 10th floor,
KG Marg, CP, New Delhi-110 001

Dear Sirs,

In consideration of the ERNET India, Department of Electronics & Information Technology Ministry of Communications & Information Technology (hereinafter referred as the **'Owner'**, which expression shall unless repugnant to the context or meaning thereof include its successors, administrators and assigns) having awarded to M/s._____(her ein referred to as the '**Contractor**', which expression shall unless repugnant to the context of meaning thereof, include its successors, administrator, executors and assigns)a contract bearing No._____ dated_____ valued at _____ for _____ and the Contractor having (scope of Contract) agreed to provide a Contract Performance of the entire Contract equivalent to (_____ per cent) of the said value of the Contract to the Owner.

We_____ having its (Name & Address) Head Office at _____ (hereinafter referred to as the 'Bank', which expression shall, unless repugnant to the context or meaning thereof, include the successors, administrators, executors and assigns) do hereby guarantee and undertake to pay the Owner, on demand any and all money payable by the Contractor to

the extent of _____ as aforesaid at any time up to _____ (day/month/year) without any demur, reservation, contest, recourse or protest and/or without any reference to the Contractor. Any such demand made by the owner the Bank shall be conclusive and binding notwithstanding any difference between the Owner and Contractor or any dispute pending before any court, tribunal or any authority.

77

The Bank undertakes not to revoke this guarantee during its currency without previous consent of the Owner and further agrees that the guarantee herein contained shall continue to be enforceable till the Owner discharges this guarantee. The owner shall have the fullest liberty, without affecting in any way the liability of the Bank under this guarantee, to postpone from time to time the exercise of any powers vested in them or of any right which they might have against the Contractor, and to exercise the same at any time in any manner, and either to enforce or to forebear to enforce any convenants, contained or implied, in the Contract between the Owner and the Contractor or any other course of or remedy or security available to the Owner. The Bank shall not be relieved of its obligations under these presents by any exercise by the owner or by any other matters or thing whatsoever which under law would, but for this provision, have the affect of relieving the Bank. The Bank also agrees that the Owner at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Owner may have in relation to the Contractors liabilities.

Notwithstanding anything mentioned herein above our liability under this guarantee is restricted to Rs._____ and it shall remain in force up to and including _____ shall be extended from time to time for such period as may be desired by M/s. _____ on whose behalf this guarantee has been given.

WITNESS BANK

Signature_____ Signature_____

Name_____ Name _____
(Bank's Rubber Stamp)

Official address_____

Designation with Bank Stamp

Attorney as per Power of Attorney No._____

Date: _____