

TECHNICAL SPECIFICATION**FOR****CAMPUS WIDE LOCAL AREA NETWORK UPGRADATION AT BHEL RANIPET****Specification Number:** BAP:IC:CAMPUS WIDE LAN UPGRADATION

Date: 10.08.2012

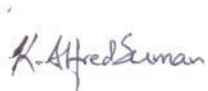
Revision No: 00**Revision Date:** 10.08.2012**Description:** Campus Local Area Network Upgradation

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2	Annexure-II	Scope, Terms & Conditions
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Records of Revisions

Rev No	Revision Date	Prepared by	Checked by	Approved by	Record of Revisions

Qualification Criteria	
Sr. No	Description
1.	The bidder should be either OEM of network Active Components who is willing to undertake total scope of work or an authorized system integrator of the active OEM having direct purchase and support agreement with OEM. Bidder should submit Authorization certificate from OEM for this specific tender.
2.	Bidder should be a highest status of partnership with OEM of network active components (For example Gold Partner in case of M/s CISCO). Bidder should submit the proof for this.
3.	The Bidder should have experience in executing Enterprise Networks. The Bidder should have successfully executed Enterprise networks during the last 5 years in any one of the following: a. Three Enterprise Networks, each order value of not less than the 4 Crores on Lease Rental or 2.5 Crores on outright purchase basis, (Or) b. Two Enterprise Networks, each order value of not less than 5 Crores on Lease Rental or 3.5 Crores on outright purchase basis, (Or) c. One Enterprise Network order value of not less than 8 Crores on Lease Rental or 5 Crores on outright purchase basis. The implementations should be of the same OEM whose product is being quoted. The executed work under consideration should be of total Solution and Infrastructure Setup, which consists Fiber optic cable laying, High end Chassis switches, Distribution switches along with Network monitoring systems Bidder should provide order copies of works executed.
4.	The bidder should possess ISO 9001 and ISO 27001 certification. This certification should be current as on bid opening date. Bidder should submit proof for this.
5.	Bidder should have professionals with certification from the OEM of the quoted products and also having experience of implementing / maintaining Enterprise Network Solution. Bidder should submit the list of certified professionals available with them.
6.	The bidder should provide all the switches, NMS, AAA server, email and web security solution and desktop video conferencing solution from a single OEM. Bidder should give declaration for this.
7.	The bidder shall provide all the passive cabling components from single OEM. Bidder should give declaration for this.
8.	The Bidder should submit a commitment letter from OEM to provide support for quoted network actives for a minimum period of 5 years. However, Bidder shall give commitment letter for additional three years support either through OEM or on their own.
9.	OEM shall have Technical Assistance Center (TAC) operating in India. Bidder should submit proof for this.
10.	Bidder should not be under hold or delist or banned by any of BHEL unit as on bid opening date for enterprise network. Bidder should give declaration to this effect in the format given in Annexure-IV Form-F.

Note:

1. Certificates and evidences should be provided as a proof for all the above mentioned qualification criteria along with the techno commercial bid.
2. If the bidders do not fulfill any of the qualification criteria mentioned above, the offer will be rejected.

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SCOPE, TERMS & CONDITIONS

1 General

- 1.1 The term vendor shall apply to successful tenderer. The vendor is the lessor and BHEL, Ranipet (A Govt. of India Undertaking) is the lessee.
- 1.2 The vendor shall supply, install, commission and maintain on a turn-key basis, the equipment, detailed in the lease orders hereinafter referred as "Lease Orders" placed by BHEL on the vendor from time to time which will fulfill the functional requirements as defined in scope of supply.

2 Lease / Prices

- 2.1 The lease period shall be 5 years and it will start after issue of Commissioning Certificate by BHEL, Ranipet.
- 2.2 Quarterly lease rental charges become payable at the end of each quarter after certification by BHEL, Ranipet. Bidder shall submit the invoice in triplicate after each quarter. 100% quarterly payment will be made available within 45 days from the date of submission of invoice. Deduction of downtime if any shall be made from quarterly lease rental value as per SLA given in this document.
- 2.3 **Loading factor for non-acceptance of BHEL Payment Terms:** Offer with deviations to BHEL Payment Terms will be loaded at the TT selling Rate of SBI + 2% for the period of relaxation sought by bidder for deviated amount for the purpose of evaluating the lowest bidder. Offers with advance payment or any other payment method like payment through an letter of credit, hundi payment or direct payment less than 30 days of submission of verified invoices will be rejected. In no case BHEL shall accept liability towards any interest payments.
- 2.4 Prices shall remain firm without any variation during contract period. No interest whatsoever shall be payable by BHEL on any amount due, to the vendor.
- 2.5 Lease charges are all inclusive of regular hardware, maintenance, support, interest, etc. Taxes and duties by central government and state government shall be quoted extra. Quarterly lease charges indicated in the price bid format (Annexure-V) for all the items shall remain firm and fixed without any variation during the contract/lease period of 5 years.
- 2.6 In case the government (Centre/ State) imposes any new taxes/ duties on the output services/ work after the award of contract, the same shall be reimbursed by BHEL at actuals. All necessary documents as required by BHEL shall have to be provided by the Bidder. However, in the event of delay in work execution attributable to the Bidder, the new taxes/ duties imposed during the delay period shall not be reimbursed to the Bidder. BHEL's decision in this regard shall be final.
- 2.7 In case the government (Centre/ State) changes the taxes/ duties on the output services/ work after the award of contract, the same shall be reimbursed by BHEL at actuals. All necessary documents as required by BHEL shall have to be provided by the Bidder. However, in the event of delay in work execution attributable to the Bidder, the changes in the taxes/ duties imposed during the delay period shall not be reimbursed to the Bidder. BHEL's decision in this regard shall be final.
- 2.8 The vendor shall be responsible for payment of excise duty, custom duty, all other state/central/local govt. taxes, freight and insurance up to equipment-installation-sites in BHEL Ranipet and during the lease period.

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- 2.9 The Bank guarantee shall be paid along with the acceptance of order. The Bank guarantee shall be equivalent to 10% of the value of the lease rental contract and valid for the complete lease period. Refer Form –I of Annexure-IV.
- 2.10 Offers with Non-acceptance of Performance Bank Guarantee valid for the complete lease period or acceptance of Performance Bank Guarantee with lesser percentage or lesser period than specified will be rejected.
- 2.11 The Bank Guarantee (PBG) shall be released only on expiry of the claim period, provided there has been no claim by BHEL on the Supplier.
- 2.12 The insurance coverage should be comprehensive with provisions for theft, fire, floods, riots etc. The responsibility for the insurance will rest with the vendor. Evidence of insurance policy shall be submitted to BHEL. Insurance coverage for bidders employees posted at BHEL, Ranipet is also in bidder scope.
- 2.13 In case of any taxes which are reimbursable to BHEL in form of Cenvat etc. will be considered for payment.
- 2.14 BHEL may go in for additional quantity of equipment/software. The vendor shall extend the same rates for 12 months from the date of PO for the additional equipment / software to be installed at BHEL Ranipet. Any requirement after 12 months from the PO date will be subject to mutual consent.
- 2.15 The benefit of depreciation under IT act and other related statutory provisions for the equipment supplied by the vendor under this contract will be claimed by BHEL after capitalisation of goods in its books. The vendor will furnish all relevant documents to enable BHEL to claim benefit of depreciation.

3 Delivery

- 3.1 The vendor shall deliver the equipment within 10 weeks of the placement of order and install the active components within 18 weeks of the placement of order and commission the whole network within 20 weeks of the placement of the order.
- 3.2 BHEL reserves the right to ask for a delayed delivery of a part of network equipment.
- 3.3 Hardware/software configuration shall be deemed as incomplete or undelivered, if any component of hardware or software within the configuration or main documentation related thereto is not delivered and if delivered is not operational or not acceptable after testing/examination.
- 3.4 **Liquidated Damage (LD):**
In case the delivery, installation and successful commissioning schedule for the Equipment is not adhered to, penalty at the rate of 0.5% of the amount equivalent to four quarterly rentals of the goods in arrears per week (subject to a maximum of 15%) shall be levied by BHEL on the vendor.
- 3.5 This penalty will be deducted from the first quarter rental charges, in case the penalty amount to be deducted is more than the first quarter rental charges, the same will be adjusted from the consecutive quarter.
- 3.6 **Loading Factor for non-acceptance of Penalty Clause:** Will attract maximum 15% loading on the offer and accordingly proportionate percentage will be loaded for accepting lesser percentage of penalty clause. Example: If the Supplier has accepted for maximum 2% penalty clause, then balance 13% will be loaded for evaluating lowest bidder.
- 3.7 **Risk Purchase**
Alternatively, BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the bidder has failed

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to deliver or dispatch within the time stipulated as aforesaid or if the same were not available from the best and the nearest available substitute. The bidder shall be liable for any loss which BHEL may sustain by reason of such risk purchases. .

4 Scope of Work

Migration of existing 1Gbps campus network to high speed 10Gbps backbone network on 5 year lease rental basis consisting of following:

- 4.1 Supply, installation, testing, commissioning and maintenance of networking, security equipment, desktop video conference, software and passives as per specified configuration including Inter VLAN routing, Multitrunk linking, network segregation, firewall configuration, separate security zones etc.
- 4.2 Supply, installation, testing and commissioning of Computer Systems along with system software for infrastructure management, like network & security management.
- 4.3 LAN/WAN IP schemes proposal & configuration.
- 4.4 Integration of existing infrastructure (routers/firewall etc) with the new setup.
- 4.5 Supply, installation, testing, commissioning and maintenance of UPS at various locations. All UPS batteries to be changed after 2.5 years and also as and when they fail. All the UPS batteries shall be replaced in the last quarter of the lease contract. Electrical work along with the required cables and accessories to connect the UPS with the switches is in vendor's scope.
- 4.6 Supply and installation of racks for mounting of network equipment & Computer Systems including dressing of cables in the racks using cable managers with Velcro.
- 4.7 Supply, laying, termination, testing and maintenance of Fiber Optic cable, UTP cable.
- 4.8 Replacing the existing Cat 5E cables to Cat 6 cables.
- 4.9 Repairing/replacing any fiber/UTP during full lease period, cut due to any reason whatsoever, will be done by the vendor. BHEL shall not bear any cost for the same.
- 4.10 Supply and installation of all passive components including I/O, Back boxes, Light Interconnect Units (LIUs), Patch panels, Patch cords, connectors etc required to complete the work on structured cabling concept.
- 4.11 Supply of all cable laying accessories including GI/MS conduits, PVC pipes/channels, supporting structures, clamps, identification tags, ferules, cable route markers etc required for laying of cables. The vendor shall include in his scope, any digging work required for laying of cables.
- 4.12 Minor civil works such as chipping / cutting of floors for making grooves, making holes/opening through walls, ceiling or floors, drilling of holes through steel structures and frames, grouting of frames, hooks on walls/ceiling etc. required for execution of work. After erection, surface shall be made good by plastering / painting to their original shape and finish. Road cutting, if any, shall also be resurfaced and brought to their original shape and finish.
- 4.13 Civil works required for OFC laying across National Highways and Railway track should be included in vendors scope.
- 4.14 Dismantling of existing networking equipment after successful testing & commissioning of the proposed network. The existing networking equipment shall be bought back by vendor.
- 4.15 Training on Network administration at OEM/OEM certified centre premises as well as on site, as per mutually agreed training plan.
- 4.16 Supply of all relevant documents/drawings/test certificates and manuals (two sets of Hardcopy as well as on CD).
- 4.17 Acceptance Testing based on mutually agreed ATP document.

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- 4.18 Comprehensive maintenance of entire network equipment/passive including existing network passives which shall become the part of new network for entire 5 year lease period.
- 4.19 BHEL's involvement during each stage of implementation shall be ensured by the vendor.
- 4.20 Wherever possible, existing passive components such as fiber and copper can be reused.
- 4.21 Vendor should demonstrate the 10 gigabits network functioning as a system.

5 Installation

- 5.1 The vendor shall nominate a Project Manager who on behalf of the vendor shall coordinate and be responsible for all the activities related to execution of the order for establishing the network at BHEL. He shall act as an interface between the vendor and BHEL. The project manager shall:
- Carry out detailed site inspection
 - Prepare Bill of Material for structured cabling system location wise.
 - Suggest additional site preparation requirement to BHEL not a part of the order.
 - Submit a complete layout plan for networking equipment and cabling system.
 - Submit the detailed project schedule in consultation with BHEL.
 - Monitor the progress vis-à-vis the project schedule.
 - Coordinate for all required help and inputs necessary for the execution of the contract.
 - Maintain logbook of the cabling work carried out.
 - Submit a detailed drawing of cable layout, position of nodes, switches etc.
 - Finalise the training requirement with the BHEL.
 - Finalise the acceptance test procedure with the BHEL.
- 5.2 Any equipment, fitting, material, software or supplies which may not be specifically mentioned in the specifications but which are necessary for carrying out the contract works within the scope of the tender are to be provided for and rendered to by the vendor. Such items not quoted by the vendor, if found necessary during execution of the contract, shall have to be supplied at no extra charge by the vendor.
- 5.3 The vendor shall provide the following certificates along with the equipment at the time of supply:
- Certificate of newness of the equipment
 - Test Certificate of the equipment/fiber/UTP
 - Performance warranty certificate (at least 15 years) of the structured cabling from OEM
 - The cabling system installed by the vendor shall meet the specifications as prescribed in ANSI/EIA/TIA, ISO 11081 standards and to that effect shall submit a certificate after the completion of the work that the work has been done as per standards.
- 5.4 The vendor shall ensure that the structured cabling system work is carried out by an experienced, registered and certified contractor of the proposed system. The technical support staff engaged by the contractor shall be experienced and approved by the structured cabling system solution provider.
- 5.5 The vendor shall supply at least one licensed set of manuals for each equipment/software at no extra cost.

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- 5.6 Migration from the current network setup to new network setup should be done such that the entire Network downtime should be less than 24 hours, where segmented downtime also should be minimal and without affecting the operation and business continuity. The migration can be planned in phased manner to achieve the minimal downtime and business continuity. Migration process will include, but not limited to, migrating the network connectivity of users/desktop/links/servers/routers from the existing switches to the new core/distribution/access switches as per the design.
- 5.7 Any temporary make shift arrangement like shifting of switches, rerouting of Fiber and UTP, etc., which are required during migration work is in vendor's scope.

6 Acceptance Test Procedure

- 6.1 The vendor shall submit project completion report to BHEL once the network is established so that acceptance test can be carried out. All manuals, accessories etc. will be handed over by vendor to BHEL.
- 6.2 The vendor shall submit the acceptance test document to BHEL during the design phase itself and this document will include all the tests to be carried out on each hardware / software installed.
- 6.3 The vendor shall submit the detailed documentation of network including cabling layout, equipment location and bill of material etc. prior to start of the acceptance test. The vendor shall give all documents in computer format.
- 6.4 The acceptance test which involves running standard vendor tests and/or BHEL tests and the operations of the complete network will be for 10 days after completion of installation. This will also include the testing of all the software quoted by the vendor.
- 6.5 All the software offered, shall be loaded completely and made functional in all respects before the start of the acceptance test by the vendor. Vendor shall demonstrate all the features of the equipment/software and show that equipment/software is performing as per specified configuration.
- 6.6 If any equipment fails during the acceptance test, it will be replaced by the vendor and the acceptance test on the replaced equipment shall be performed afresh.

7 Training

- 7.1 Training of BHEL personnel shall be part of the contract. During installation at BHEL, the associated BHEL engineers shall be guided on the configuration being made and usage. Advanced level training shall be provided by OEM / authorized training partner at OEM Place /OEM certified training centre. BHEL will nominate engineers. BHEL team shall get training for minimum 10 (ten) working days at Ranipet. Training shall be focused on fundamentals of networking/security in general and supplied equipment in particular. It should be based on standard certification programmes of OEM's equipment.
- 7.2 The training should include the following areas:
- Introduction to Networking Technologies
 - Interconnecting Network Devices
 - Implementing Multilayer Switched Networks

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- Internetwork Troubleshooting
- Wireless LAN Fundamentals
- Security & Monitoring
- Network Management Solution
- Structure Cabling Solution
- OFC Solution

8 Warranty, Maintenance & Support

- 8.1. The vendor should be able to provide the support for quoted network active technology and the equipment for a minimum period of 8 years. Vendor shall give commitment letter in this regard. Vendor shall warrant that spare parts of the equipment shall be available for minimum period of 8 years after completion of the acceptance test.
- 8.2. The vendor shall maintain the network after completion of 5 year lease period, if BHEL desires so, on the same scope, terms & conditions as during the lease period. The Annual Maintenance Charges subsequent to the lease rental period shall be quoted as a percentage of total outright purchase value of each item.
- 8.3. The vendor shall keep the sufficient spares to keep the network downtime at minimum.
- 8.4. The vendor shall provide comprehensive maintenance support on 24x7 hours basis by five OEM certified and trained resident engineers posted at BHEL Ranipet without payment of extra charges for maintenance and upkeep of network. All engineers shall be engineering degree holder with minimum two year experience in network maintenance and should hold OEM (network) certifications also. The resident engineers:
 - 8.4.1. Shall observe BHEL working hours and BHEL holidays. BHEL working hours are 8AM to 4:30PM, 6 days a week. However at least one engineer shall always be available 24x7 hours on call basis in case of exigency. Out of these five engineers, one engineer should come in general shift (8:00 AM to 4:30 PM) and other four engineers should come in three shifts(First shift 6:00 AM to 2:00 PM, second shift 2:00 PM to 10:00 PM, third shift is 10:00 PM to 6:00 AM)
 - 8.4.2. Maintenance during this period shall not be sub-contracted. The maintenance engineers posted at site shall be direct employees of the bidder.
 - 8.4.3. Shall change the resident engineers only after seeking permission from BHEL and arranging for proper substitute.
 - 8.4.4. Shall ensure network connectivity up to the desktop level.
 - 8.4.5. Shall have their own vehicles for movements and shall have mobile phones accessible from BHEL landline/mobile phones.
 - 8.4.6. Accommodation, boarding, transport and other logistics for these engineers are vendor's scope.
- 8.5. Comprehensive maintenance shall include the following :
 - 8.5.1. Replacement of faulty equipment
 - 8.5.2. Installation charges
 - 8.5.3. Site inspection charges
 - 8.5.4. Cost of Maintenance Engineers
 - 8.5.5. Lease tax/right to use tax / any other statutory levies including service tax.
 - 8.5.6. Keeping sufficient spares to maintain the specified uptime.

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- 8.5.7. Shifting and installation of equipment from one location to another within BHEL campus without any extra cost to BHEL.
- 8.6. The vendor should fulfill all statutory and safety requirements for personnel engaged while executing the contract. If BHEL has to incur any expenditure due to non-compliance of the applicable statutory provisions, the same will be compensated by the Bidder
- 8.7 BHEL reserves the right to opt for continuation of maintenance support for the hardware and software at end of 5 year lease period by way of awarding AMC contract to bidder at the quarterly AMC charges quoted by bidder from 6th years onwards. Bidder shall agree to provide the AMC service for at least two years after the expiry of the 5 year lease period. The Technical terms of AMC shall be same that of maintenance support during the lease period. The payment for AMC will be made quarterly at the end of the each quarter.

9. Service Level Agreement (SLA)

1. Bidder shall be responsible for continuous and smooth operation of the LAN for the entire lease period.
2. Maintenance and services shall cover services, repairs and replacements necessary to keep the hardware and software in good working condition.
3. Bidder shall maintain sufficient spares, in BHEL Ranipet to ensure immediate attention in case of breakdown.
4. Uptime of 99.5% per month should be ensured for all the actives individually. Uptime is calculated on 24x7 basis.
$$\text{Uptime} = ((\text{Hours in the month} - \text{downtime hours}) / \text{Hours in the month}) * 100$$
5. In case the uptime is less than 99.5% for a particular month, deduction will be calculated as per the following scheme and the amount will be deducted from the quarterly lease rental:
$$\text{Deduction for the month for an item} = (99.5 - \text{uptime percentage}) / 100 \times \text{rental per month} \times \text{multiplication factor}$$

Where, the multiplication factor is calculated by,

For uptime $\geq 99.5\%$ multiplication factor = 0
For uptime $\geq 99.0\%$ and $< 99.5\%$ multiplication factor = 1
For uptime $\geq 98.5\%$ and $< 99.0\%$ multiplication factor = 2
For uptime $\geq 98.0\%$ and $< 98.5\%$ multiplication factor = 4
For uptime $\geq 95.0\%$ and $< 98.0\%$ multiplication factor = 8
For uptime $< 95.0\%$ multiplication factor = 16
6. If non availability of an item affects availability of other items, then all such items will also be treated as down for downtime calculation
7. If an item has less than 95% availability continuously for 3 months then it shall be replaced with a new item and uptime is to be ensured at more than 95%. If majority items are having availability less than 95% continuously for more than three months and not rectified, BHEL reserves the right to terminate part or entire contract.

10. New / Better System

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During the contract period of this rental agreement, if new / better computer systems are available and if desired by BHEL, the existing system shall be replaced by the vendor on mutually agreed terms and price.

11. Transfer of Ownership

The transfer of ownership of the equipment which is in efficient working condition and is also decided to be taken over by BHEL shall be automatically in favour of BHEL at the termination of the 5 year lease period on payment of token terminal payment of Rs. One only. The government taxes if any, and to the extent chargeable, shall be borne by vendor.

12. Claims

All the claims etc. lodged with the underwriters, if any, shall be dealt with by the vendor or Assignee directly.

13. Arbitration

Disputes, if any arising out of or in connection with this contract shall be resolved mutually, at the very first instant. In the event parties fail to amicably resolve the dispute within a period of 30 days of being communicated in writing by one party to the other, the same shall be referred to arbitration under the Indian Arbitration and conciliation Act, 1996 to be held at Ranipet. The unit head of BHEL/BAP, Ranipet or his nominee shall be sole arbitrator and the decision of the sole Arbitrator shall be final and binding on the both the parties hereto

14. Jurisdiction

All disputes or differences arising out of, under or in connection with this contract shall be subject to the exclusive jurisdiction of Ranipet courts only.

15. Governing Law

15.1 This contract shall be governed in all respects by the Indian laws.

15.2 The Contractor shall comply with all the provisions of Applicable Laws, including any laws relating to the Project, statutory compliances, tax, labour law. The Contractor shall be bound to give all notices required by Applicable Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof. BHEL shall not be responsible for any reason whatsoever for the non-compliance by the Contractor of Applicable Laws.

16. Force Majeure

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, strike, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (herein after referred to as events), then provided notice of happening of

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any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by any reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

17. Confidentiality

Vednor shall, at all times, undertake to maintain complete confidentiality of all data, information, software, drawings & documents, etc. belonging to the BHEL and also of the Systems, procedures, reports, input documents, manuals, results and any other company documents discussed and/or finalized during the course of execution of the order/contract

18. Patents and TradeMarks

Vendor shall at all times indemnify BHEL against all claims which may be made in respect of the Systems/goods/Software supplied, for infringement of any right protected by patent, registration of designs or trademarks and legality of usage of Software. In the event of any such claims being made against BHEL, BHEL will inform the Bidder who shall at his own cost either settle any such dispute or conduct any litigation that may arise there from.

19. Non Disclosure Agreement

Vendor shall sign an non disclosure agreement as per BHEL format (copy enclosed) in compliance to Information Security Management System.

20. Intellectual Property Rights

Vendor shall at all times indemnify the BHEL Ranipet against all claims which may be made in respect of the systems/goods/software supplied by the vendor, for infringement of any right protected by patent, registration of designs or trademarks and legality of use of software. In the event of any such claims being made against BHEL Ranipet, BHEL Ranipet will inform the vendor who shall at his own cost settle any such dispute or conduct any litigation that may arise there from.

21. Termination of Inquiry

- a) BHEL reserves the right to cancel any inquiry before opening of the tender, without assigning any reason.
- b) BHEL reserves the right to cancel any tender and refloat a fresh tender, at any time after opening of the tender, in case it finds the response to its tender as not meeting its requirement. This shall be at the sole discretion of BHEL.

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22. Termination of Lease contract

BHEL reserves the right to terminate the Contract, at any stage during the period of the Contract based on the contractor's performance, by giving 30 days notice in writing.

BHEL shall have the right to terminate this contract if:

- The contractor fails to provide services or contractual obligations in accordance with the SLA.
- The contractor suspends the performance of all or part of the services, or
- The contractor abandons the services, or
- The contractor becomes bankrupt or goes into receivership (or) liquidation or makes an assignment for the benefit of his creditors.
- In the event of termination of contract, the amount due to the Contractor as per contractual provisions after recovery of dues (from Contractor's pending invoices/ Security Deposit, as the case may be), shall be released to them.

23. Acceptance of Order

Bidder shall submit Letter of acceptance for the LOI/ Order/ Contract within 7 working days. This will be submitted along with the Bank guarantee.

24. Withdrawal from the Contract

In case the bidder withdraws the offer submitted by him/her after it is accepted by BHEL and fails to supply the goods as per the terms and conditions of the contract, or at any time repudiated the contract wholly or in part, BHEL shall be at liberty to cancel the purchase order and to recover from the bidder the extra cost and the other loss incidentals to the breach of contract on the part of the Bidder. BHEL may put HOLD or Delist or Ban the bidder as per BHEL Policy.

25. Limitation of Liability

The Vendor/Lessor's liability will be limited to the scope of this contract fully.

26. Integrity Pact

Bidder should submit the Integrity Pact along with the techno commercial bid, duly signed by the authorized signatory who signs the bid. The format of Integrity Pact is given in Form-J.

27. In addition to the terms and Conditions mentioned in this document, General Terms and Conditions in Annexure-IV are to be adhered to.

Compliance: Accepted to comply all the above points

Name:

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Signature of bidder with Date:

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL on contract is confidential and that the nature of the business of the BHEL is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose perpetually, directly or indirectly, any information related to the BHEL. Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL all documents and property of BHEL, including but not necessarily limited to: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, and are reasonable given the nature of the business carried on by the BHEL. I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature

Compliance: Accepted to comply all the above points

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TECHNICAL SPECIFICATIONS OF CAMPUS WIDE LOCAL AREA NETWORK UPGRADATION

1. INTRODUCTION

1. Bharat Heavy Electricals Limited is one of the largest engineering organizations in India. The Boiler Auxiliaries Plant (Ranipet) is one of major manufacturing unit of BHEL. Accordingly many new shops/offices are being established in BHEL Ranipet campus.
2. The existing Local Area Network (LAN) at BHEL Ranipet is a Network based on 1 Gbps Distribution switches. BHEL Ranipet requires upgrading their LAN to 10Gbps to support the following applications:

- 3D drawing application
- Finite Element Analysis
- Computation Fluid Dynamics
- Plant Design Management
- Product Life Cycle Management (Team center Engineering)
- Web server (Web sphere, Apache)
- MS office Share point (Intranet Portal, DMS)
- Citrix Xen application server for Thin clients
- Oracle database and Application server
- Mail and internet (10 Mbps)
- MPLS (8Mbps)
- Remote access Corporate R&D, Hyderabad for CFD and FEM analysis
- Corporate wide SAP
- Others

The existing Hardware of LAN is not capable enough to provide requisite network bandwidth to take care of the above applications.

3. The existing LAN has outdated switches and need to upgrade to the latest technology switches which can provide fault free Data switching network.
4. The proposed data communication network shall be based on two Core Switches. It is proposed to install the central network equipment including one Core Switch at the primary data Centre in the IC block, and the Second core switch in the secondary Data Centre in the Telephone Exchange which is adjacent to Administration Block
5. The proposed Data communication network shall be having connectivity of 10Gbps between the Core switch and the Distribution switch and between Core switch and Server Farm switches.

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6. Since old switches have become obsolete, we have planned for replacement of old switches. Also since number of PCs is increasing across the plant, it has been decided to augment around 1500 more network points in five years, which shall increase the number of network points to about 3000. Network has to be designed in such a manner to provide fail-safe operation of ERP infrastructure. Also multimedia applications can be run on desktop level.

2. CONCEPTUAL VIEW

At BHEL Ranipet, the business server farm/Data center is mainly located at INFORMATICS CENTRE and PCs, thin clients, workstations are spread across the plant. A near disaster recovery site is located in TELEPHONE EXCHANGE department located near Administrative Building. This site will host main business servers so in case of disaster at main site (INFORMATICS CENTRE), business processes can be run from this DR site. The LAN infrastructure shall have capacity to interconnect around 3000 nodes. Backbone speed shall be 10Gbps and 1Gbps shall be available at desktop level. The requirement is to seamlessly interconnect business server farms, workstations, thin clients, PCs and CNC machines etc. The network should provide the following features:

- Fail-Safe Operation through DR site
- Network traffic monitoring & Control
- Seamless desktop to backbone connectivity
- Comprehensive Network integrated services
- Campus wide network security
- VLAN, network segregation, network management, multimedia services
- Near 0% network downtime

The proposed infrastructure shall be on 10 Gbps backbone in the core and Gigabit Ethernet at desktop level.

The networking solution shall be based on three tier architecture as described below:

Core Layer – Two Core switches shall be placed at these locations:

1. Informatics Center (Data Center)
2. Telephone Exchange Building (DR Site)

These switches shall be connected with each other with 10G speed.

Distribution Layer – L3 Distribution switches shall be placed in various departments/blocks. These distribution switches shall be connected to core switches with 10 Gbps connectivity. This type of arrangement has been planned to provide redundant path to all distribution switches. All distribution switches shall be connected to core switches through optical fiber. Optical fiber shall be Single mode or Multimode, Armoured or Unarmoured based on distance and speed requirement. Distribution Switch should be capable to provide 10Gbps

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to some access switches and 1 Gbps connectivity to some Access switches in their respective departments/block through UTP cable or optic fiber cables depending upon the distance between the distribution and access switches.

Access Layer – Access switches shall be placed at various locations across the plant/offices and shall connect to distribution switches with either 1 Gbps or 10Gbps speed. Connectivity shall be through UTP or Optical Fiber based on distance. No media converter shall be used in whole implementation and wherever fiber connectivity is required, it shall terminate directly at switch having fiber transceivers. All UTP ports on access switches shall be 10/100/1000 Mbps. Desktops shall be connected to network through access switches.

If Copper uplinks are used from access to distribution, the links should be such that each switch should have 1Gbps connectivity. All the physical copper links from an access to distribution should form an ether channel between access and distribution for maximum availability of bandwidth.

Vendors are requested to refer to the distribution network diagrams for clarity on type and bandwidth of links between distribution and access locations.

Bandwidth Requirement

1. All the access ports should be 10/100/1000 mbps.
2. The Bandwidth between Core Section and Distribution should be 20Gbps. This bandwidth should be the active functional Bandwidth at any given point of time. The load balancing over multiple links to achieve this bandwidth should be per packet based load balancing.
3. The Bandwidth between Core Segment and any Server Farm Switch should be 20 Gbps. This bandwidth should be the active functional bandwidth at any given point of time. The load balancing over multiple link to achieve this bandwidth should be per packet based load balancing.

Compliance: Accepted to comply all the above points

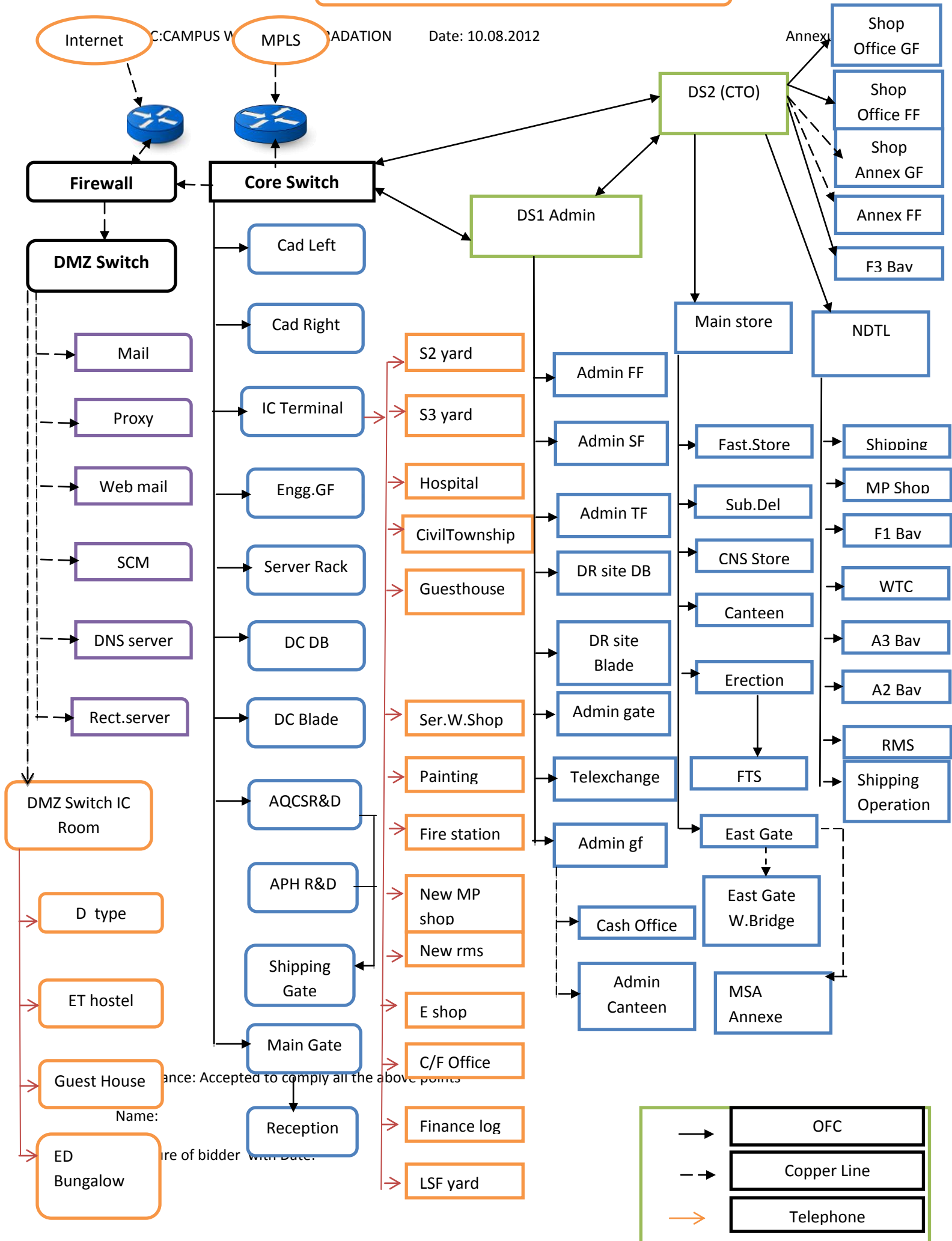
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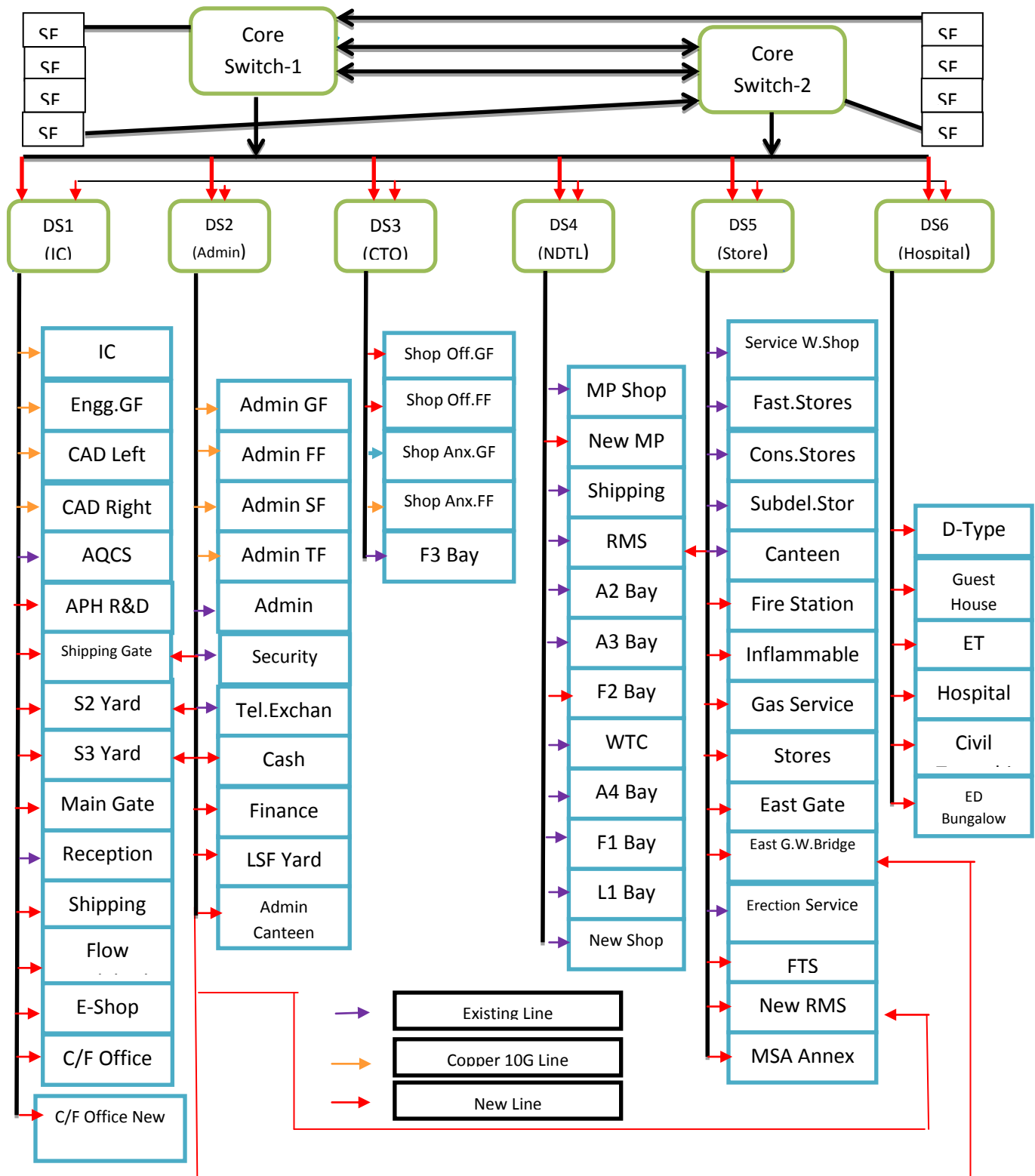
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EXISTING NETWORK DIAGRAM



PROPOSED NETWORK DIAGRAM



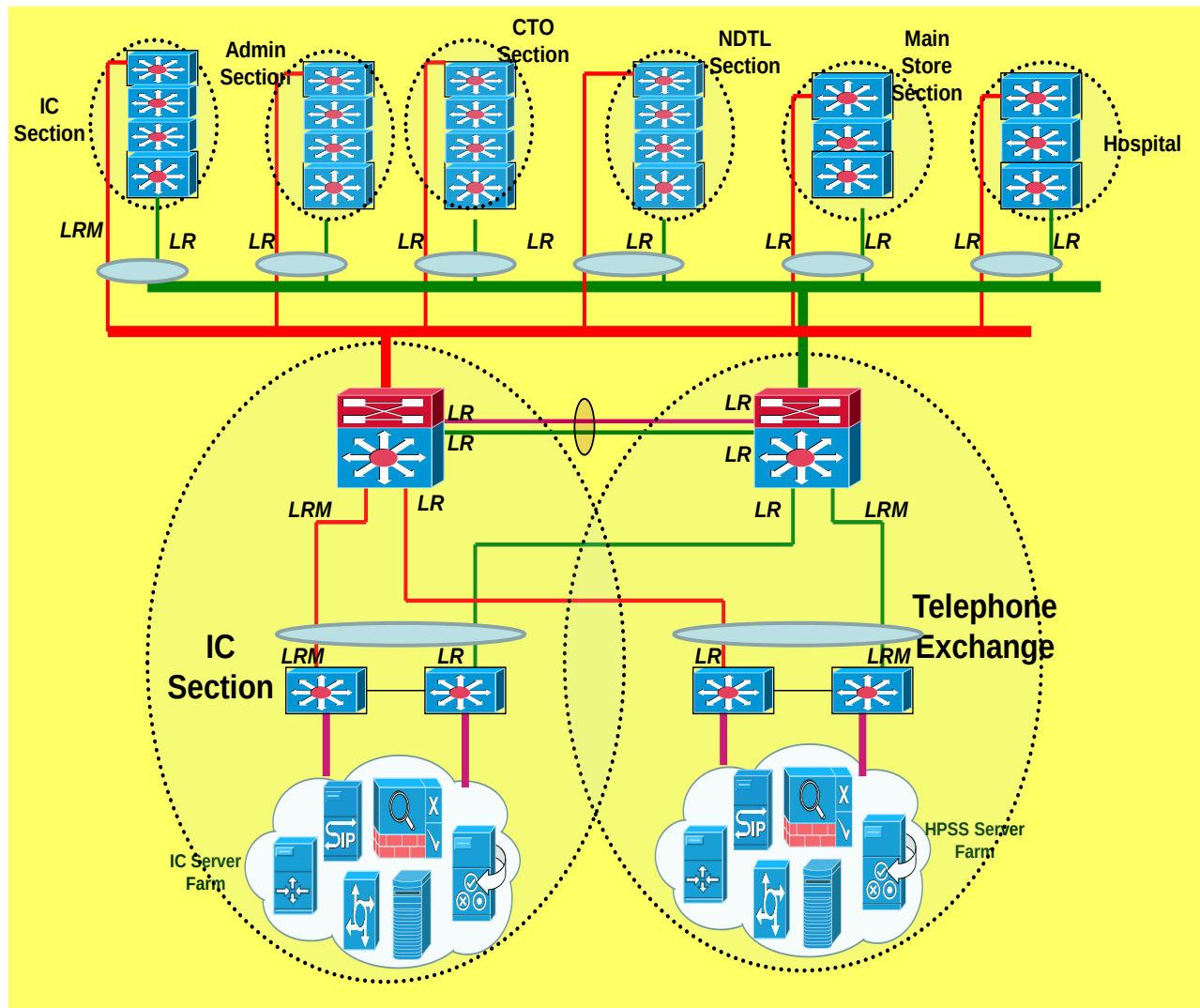
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Detailed Network Diagram:**Core Distribution Server Farm Diagram**

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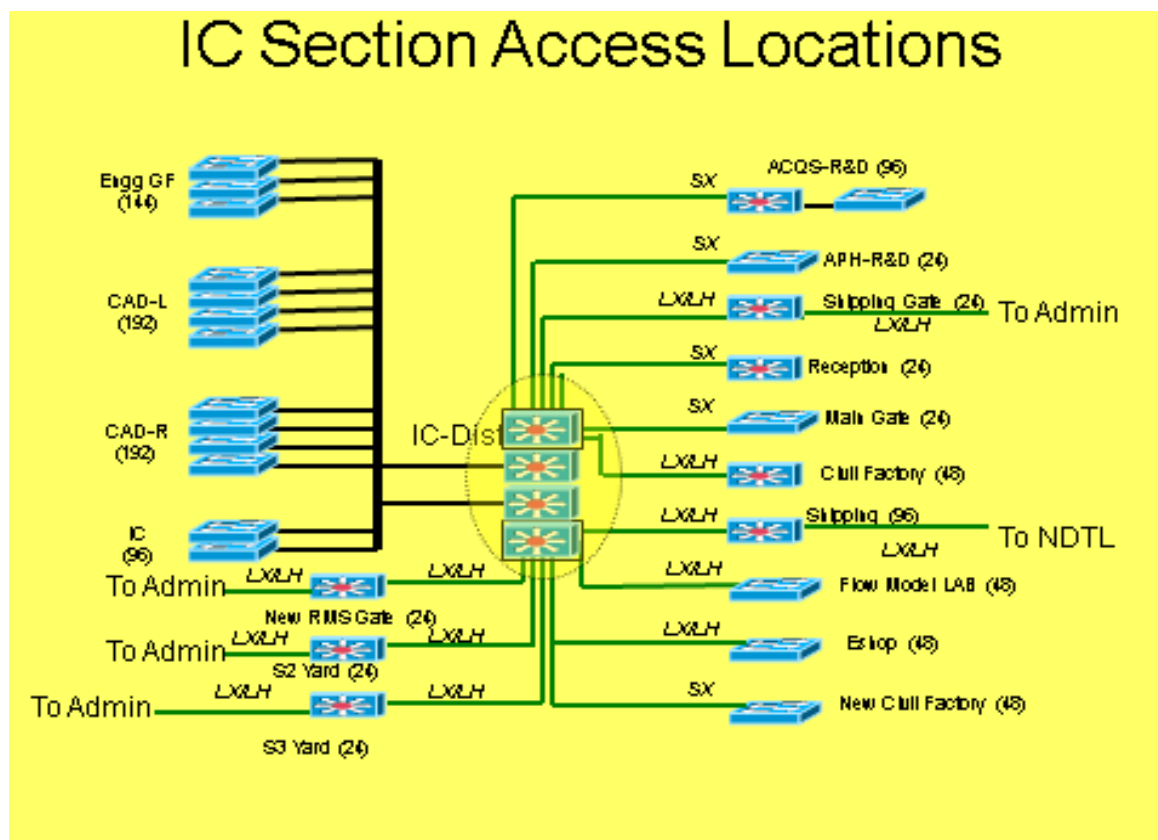
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IC Distribution Section



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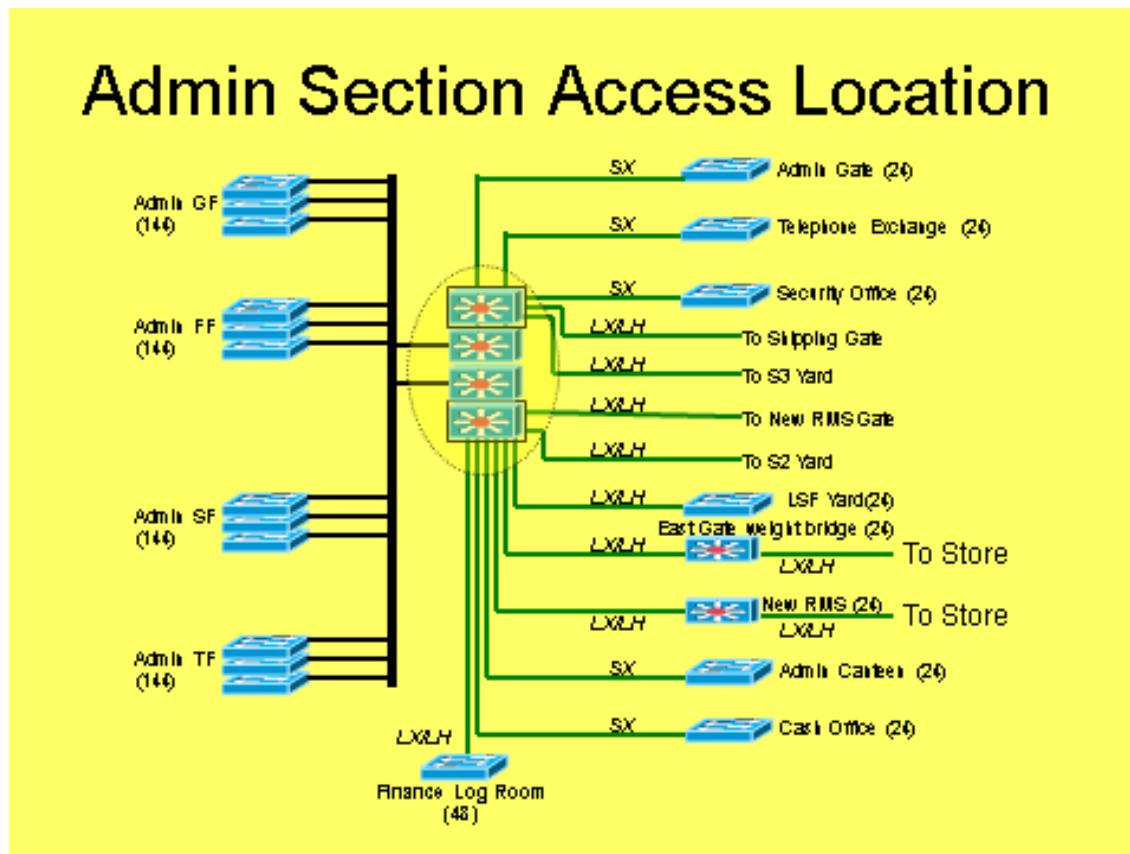
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Admin Distribution Section



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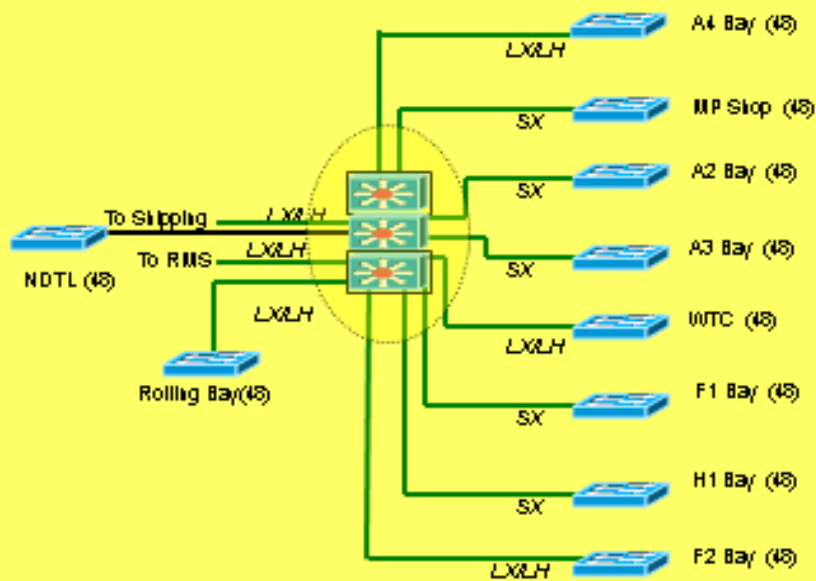
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NDTL Distribution Section

NDTL Section Access Locations



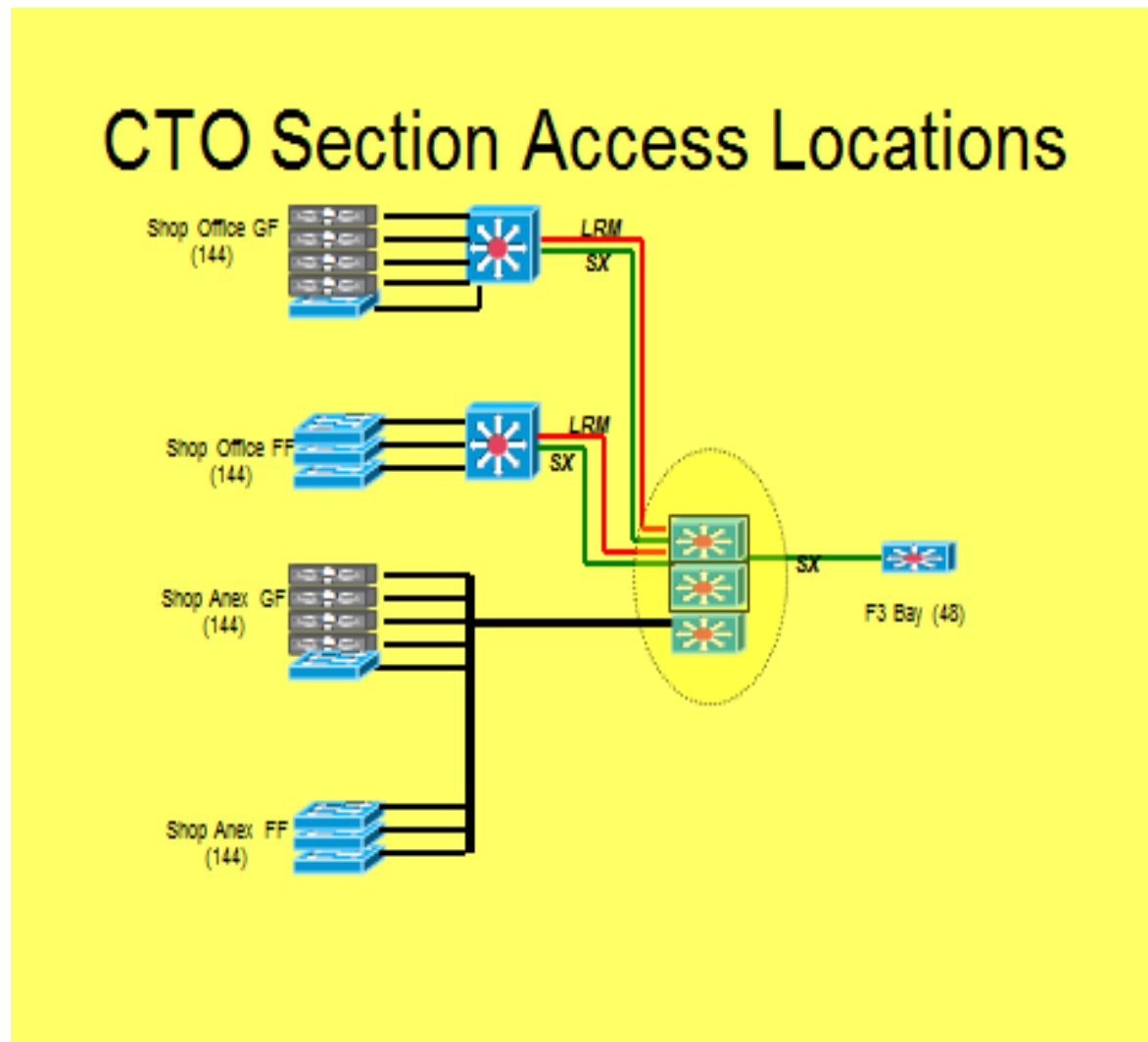
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CTO Distribution

Compliance: Accepted to comply all the above points

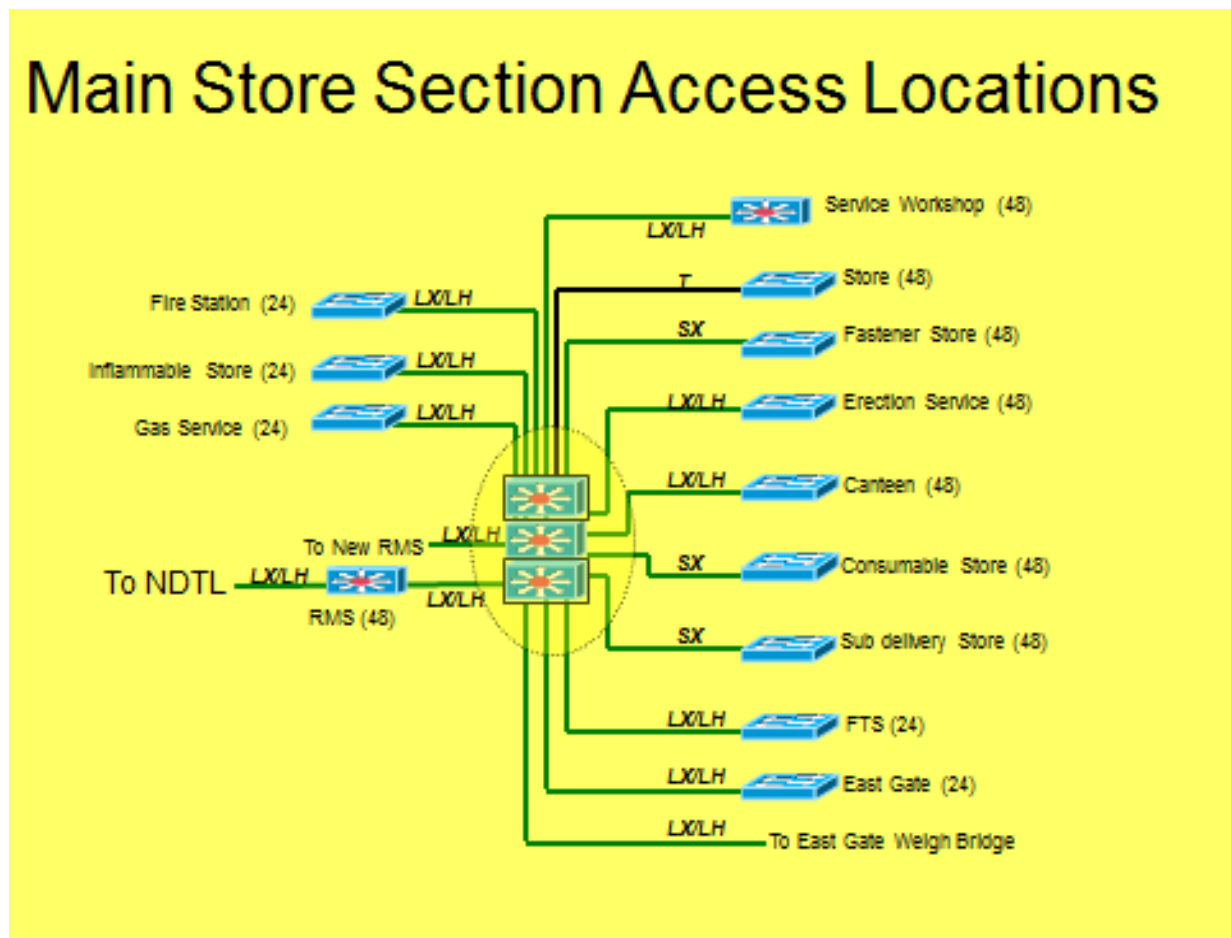
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Main Stores Distribution



Compliance: Accepted to comply all the above points

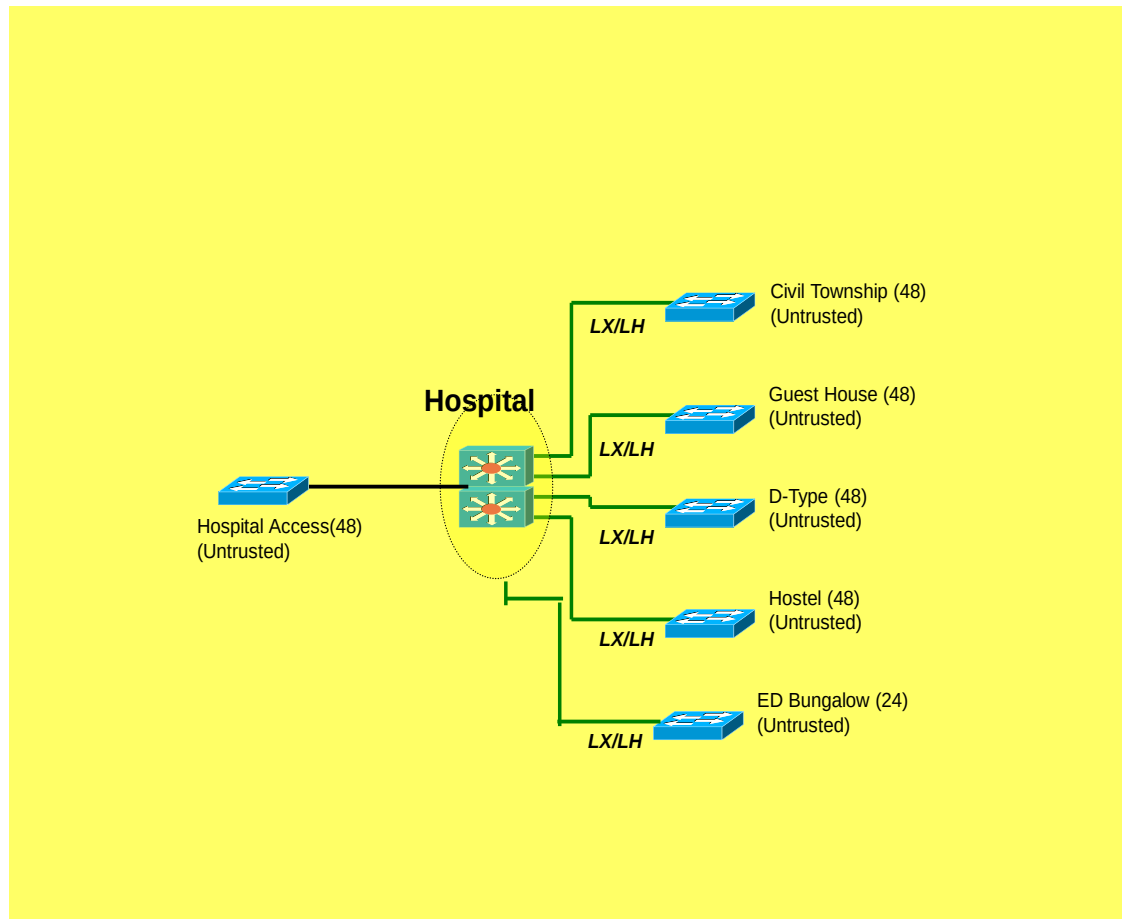
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Hospital Distribution Section



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3.0 DETAILED SPECIFICATIONS

All active components viz. switches, NMS, AAA server, Email and web security and desktop video conferencing solution should be from the same OEM. The switches shall be of reputed International brands. The vendor shall ensure that all switches shall be of same OEM make and all the components work seamlessly and in tandem together without any interface problems. The switches offered should be suitable for continuous operation round the clock 365 days a year.

3.1 Core Switch

Switches shall be Chassis based Multilayer architecture with Single CPU module and capable of redundant CPU modules. One core switch shall be placed at Informatics Centre and other at Telephone Exchange. Switches shall be with following specifications:

Hardware & Performance Requirements		
1	Architecture	Chassis based Multilayer Switch architecture with sufficient modules/cards to fit required transceivers/UTP ports as per the network design. Chassis shall have minimum 9 slots. Minimum 4 slots should be free after fitting all CPUs/Modules.
2	System Throughput	Single fabric throughput should be more than 2 TBPS. When combined together, the total aggregate switching capacity of both the switches should be minimum of 4 TBPS. Both switches should logically act as a single switch to achieve 4 TBPS of performance. In the event of one core switch failure the convergence time should be less than 200ms. In future, the throughput should scale to 8 TBPS. The switch modules should be compatible with no performance degradation.
3	Switch Redundancy	The Switch shall support redundant CPU module and shall be provided with Load-Sharing Redundant Power Supplies. All Switch Components, like modules/power supplies/fan tray should be Hot Swappable.
4	CPU Level Redundancy	If the switch is provided with redundant CPU, then the failure of one CPU Module should not result in loss of Switching and Routing Functionality. There should not be any traffic disruption during this change-over and the change over time should be less than 1 sec when operating alone.

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5.	Chassis Architecture	The Chassis should have vertical slots for Line cards / Service Modules.
6	Service Module Support	The Core Switch should support following Service Modules: a. Fully functional FireWall b. Fully Functional Wireless Service Module c. Fully Functional Server Load Balancer d. Fully Network Analysis Module These Service Modules should go into one of the slot of the Core Switch and should have dedicated resources such as Processor, RAM etc. There should be provision to have multiple service modules of same type on one switch.
7	WAN Capability	The switch should support multiple types of WAN interfaces like DS0, OC-192 etc.
8	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. The switch should hold two software images. One is the previous image and other is the new image. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs etc. at their peak values as claimed in the Data Sheets of the Switch.
9	Switch Forwarding Rates (Layer 2)	The Switch should Support Minimum Switching (Layer 2) Performance of 720 Mpps. Performance should be hardware based.
10	Routing Capability (Layer 3)	The Minimum IPv4 Routing Performance should 720 Mpps. Performance should be hardware based.
11	Backplane Connect Capacity	The Backplane should be 100% Passive.
12	Switching Architecture	The Switch should have a Truly Distributed Architecture. All Interface Modules should have all the resources for switching and Routing and should offer True Local Switching
13	10 Gigabit Ethernet Capability	The Switch platform should Support Minimum 176 nos. of 10 Gigabit Ethernet Ports for connectivity and when two switches combined as a single logical switch it should support 352 10 Gigabit Ethernet Ports.

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14	10G Port Density	There should not be more than 8 numbers of 10G transceivers populated per module/line card
15	1 Gigabit Ethernet Capability	The Switch platform should Support Minimum 528 nos. of 1 Gigabit Ethernet Ports for connectivity and when two switches combined as a single logical switch it should support 1056 1 Gigabit Ethernet Ports.
16	Firewall Services	The switch should support Firewall Service Module. The Firewall Service Module should support the following : 1. Hardware Based Firewall 2. Should be capable of handling 20 Gbps of traffic 3. 10 Million concurrent connections 4. 300,000 connection setups and teardowns per second 5. 10 Million concurrent NAT or PAT translations 6. Jumbo Ethernet packets (8500 bytes) supported
17	No. of 10/ 100/ 1000 BaseTX UTP Ports	48 no of 10/100/1000 RJ-45 ports. The card should connect to the backplane with minimum of 80GBPS Full Duplex Fabric Connection
18	No. of 10G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
19	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports. Also Cross Module Link aggregation should be supported. Ether channel shall span across multiple chassis.
20	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit / 10 G Ports
21	Storm Control	Support for broadcast/multicast/unicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
22	802.1Q	Should support 802.1Q protocol
23	Type of VLANs	Should support port, subnet based VLANs
24	Voice VLAN	Should Support Voice VLAN for separating and prioritising VoIP traffic and Auto QoS feature.

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25	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
26	No. of VLAN	Should support minimum 4000 active VLANs
27	MAC Addresses	No. of MAC Address Supported: 120000
Layer 3 Functionality		
28	OSPF, BGP, RIP/RIP2	Should support OSPF, BGPv4, RIP/RIP2 from day one.
29	NAT	Should Support H/W NAT
30	Ipv6 Support	Should support IPv6 from day one
31	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
32	No. of Route Entries	Should support minimum 1000K IPv4 and 500K IPv6 Route entries.
Security Features		
33	Access Control Lists	Should support Standard and Extended ACLs
34	Various type of ACLs	Should support various types of ACLs like port based/time based.
35	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
36	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
37	802.1X	Should support 802.1X Network Security and Authentication along with auxiliary VLAN's
38	RADIUS	Should have support for RADIUS
Switch Redundancy		
39	Redundancy in Hardware	Should Have Redundancy for Power Supply, FANs and clocks to minimise unavailability of switch

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40	SSO/NSF	Stateful Switchover and Nonstop Forwarding to ensure that in case of failure of active CPU module the redundant CPU should start switching L2/L3 traffic in less than 1 sec (in case switch has redundant CPU) when operating alone.
41	Hitless Software Upgrades	Should Support Hitless software upgrades to reduce downtime during software upgrade when operating alone.
42	Network Recovery	The Switch must support an independent object tracker that helps to speed network recovery during outage situations. Describe the implementation.
Network Protocols		
43	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
44	PVSTP/PVRSTP	Support for Per VLAN STP and Per VLAN RSTP
45	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
46	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
47	MPLS	Should support MPLS in Hardware
48	ERSPAN	Switch should support Encapsulated Remote Switched Port Analyzer (ERSPAN) allowing for transmission of SPAN traffic across an L3 network to a remote analyzer
Quality of Service		
49	Ingress/Egress Queuing	Should support Ingress/Egress Queuing
50	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address, IP Source/ Destinations address, TCP/UDP port nos etc
51	QoS Scheduling	Should support QoS scheduling with queues supported in hardware
52	Queue per port	Should support minimum 4 queues per port
53	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs

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Multicasting		
54	Multicast	Should support H/W based IPv4 and IPv6 Multicasting
55	IGMP	Should Support IGMP v1, v2 , v3
56	Multicast Entries	Should support minimum 120000 entries
57	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM – SSM
Management		
58	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
59	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
60	Sys Log Correlation	The switch must support a programmable framework that allows you to filter, escalate, correlate, route, and customize system logging messages prior to delivery by the system message logger
Service/Security Module		
61	Firewall Module	Should have support for either integrated firewall module or external firewall appliance as per specifications mentioned later. In case any interface module is required in the core switch to connect external firewall, same shall be provisioned without cost.
63	Network monitoring	Should have support for network analysis module.
Software		
64	Software Version	Version of software for supplied switch should be latest release to support all required features
65	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		

Compliance: Accepted to comply all the above points

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66	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

Compliance: Accepted to comply all the above points

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3.2 Distribution Switch Type I

These switches shall be Stack based Multilayer Switch architecture. These switches shall be placed at critical locations. Switches shall be of following specifications

Hardware & Performance Requirements		
1	Architecture	Multilayer Switch architecture with sufficient modules/cards to fit required transceivers/UTP ports (Stacked)
2	Switching Fabric Capacity	The Switch should support a minimum of 150 Gbps of Switching Fabric Capacity. It should be of non blocking architecture.
3	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs, ACLs, etc.at their peak values as claimed in the Data Sheets of the Switch.
4	Switch Forwarding Rate	The Switch should Support Minimum Switching Performance 60 Mpps. Performance should be hardware based.
5	Stacking	The Switch should have two stacking ports and stacking bandwidth of 64 Gbps. The switch should be stackable with Distribution Switch Type – 2.
6	10 Gigabit Ethernet capability	The Switch should Support Minimum 2 nos. of 10 Gigabit Ethernet Ports with Local Forwarding for connectivity.
7	No. of 10/ 100/ 1000 BaseTX UTP Ports	24 Nos. 10/100/1000BaseTx UTP ports
8	No. of 1G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
9	No. of 1G UTP Transceivers	As per 3.9, Required Transceivers shall be separately ordered
10	No. of 10G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
11	802.3ad	Should support Industry Standard Port/Link Aggregation for All

Compliance: Accepted to comply all the above points

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		Ports.
12	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit / 10 G Ports
13	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
14	802.1Q	Should support 802.1Q protocol
15	Type of VLANs	Should support port, subnet based VLANs
16	Voice VLAN	Should Support Voice VLAN for separating and prioritizing VoIP traffic
17	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches.
18	No. of VLAN	Should support minimum 1000 active VLANs
19	MAC Addresses	Minimum No. of MAC Address Supported: 12000
Layer 3 Functionality		
20	OSPF, BGP, RIP/RIP2	Should support OSPF, BGPv4, RIP/RIP2.
21	Ipv6 Support	Should support IPv6 from day one
22	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
23	No. of Route Entries	Should support minimum 10000 Route entries
Security Features		
24	Access Control Lists	Should support Standard and Extended ACLs
25	Various type of ACLs	Should support various type of ACLs like port based/time based
26	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources

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27	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
28	802.1X	Should support 802.1X Network Security and Authentication
29	RADIUS	Should have support for RADIUS
Network Protocols		
30	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
31	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
32	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
33	Ingress/Egress Queuing	Should support Ingress/Egress Queuing on per port basis.
34	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address, IP Source/ Destinations address, TCP/UDP port nos etc
35	QoS Scheduling	Should support QoS scheduling.
36	Queue per port	Should support minimum 4 queues per port
37	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs
38	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
39	Multicast	Should support H/W or S/W based IPv4 and Ipv6 Multicasting
40	IGMP	Should Support IGMP v1, v2 , v3
41	Multicast Entries	Should support minimum 1000 entries
42	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM – SSM

Compliance: Accepted to comply all the above points

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Management		
43	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
44	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
45	Software Version	Version of software for supplied switch should be latest release to support all required features
46	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
47	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

Compliance: Accepted to comply all the above points

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3.3 Distribution Switch Type 2

These switches shall be Stack based Multilayer Switch architecture. These switches shall be placed at critical locations. Switches shall be of following specifications

Hardware & Performance Requirements		
1	Architecture	Multilayer Switch architecture with sufficient modules/cards to fit required transceivers/UTP ports (Stacked)
2	Switching Fabric Capacity	The Switch should support a minimum of 150 Gbps of Switching Fabric Capacity.
3	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs, ACLs, etc.at their peak values as claimed in the Data Sheets of the Switch.
4	Switch Forwarding Rates	The Switch should Support Minimum Switching Performance 35 Mpps. Performance should be hardware based.
5	Stacking	The Switch should have two stacking ports and stacking bandwidth of 64 Gbps. The switch should be stackable with Distribution Switch Type – 1.
6	No. of SFP Ports	The Switch should have 12 number of SFP ports.
7	No. of 1G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
8	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports.
9	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit / 10 G Ports
10	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
11	802.1Q	Should support 802.1Q protocol
12	Type of VLANs	Should support port, subnet based VLANs

Compliance: Accepted to comply all the above points

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13	Voice VLAN	Should Support Voice VLAN for separating and prioritizing VoIP traffic
14	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches.
15	No. of VLAN	Should support minimum 1000 active VLANs
16	MAC Addresses	Minimum No. of MAC Address Supported: 12000
Layer 3 Functionality		
17	OSPF, BGP, RIP/RIP2	Should support OSPF, BGPv4, RIP/RIP2.
18	Ipv6 Support	Should support IPv6 from day one
19	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
20	No. of Route Entries	Should support minimum 10000 Route entries
Security Features		
21	Access Control Lists	Should support Standard and Extended ACLs
22	Various type of ACLs	Should support various type of ACLs like port based/time based
23	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
24	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
25	802.1X	Should support 802.1X Network Security and Authentication
26	RADIUS	Should have support for RADIUS
Network Protocols		
27	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
28	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol

Compliance: Accepted to comply all the above points

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29	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
30	Ingress/Egress Queuing	Should support Ingress/Egress Queuing on per port basis.
31	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address, IP Source/ Destinations address, TCP/UDP port nos etc
32	QoS Scheduling	Should support QoS scheduling.
33	Queue per port	Should support minimum 4 queues per port
34	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs
35	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
36	Multicast	Should support H/W or S/W based IPv4 and Ipv6 Multicasting
37	IGMP	Should Support IGMP v1, v2 , v3
38	Multicast Entries	Should support minimum 1000 entries
39	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM – SSM
Management		
40	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
41	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
42	Software Version	Version of software for supplied switch should be latest release

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		to support all required features
43	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
44	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

3.4 Server Farm Switches

These switches shall be stack based multilayer switches. All servers shall terminate on these switches. Four switches shall be placed in Informatics Centre and four switches shall be placed in Telephone Exchange. Specifications shall be as follows:

Hardware & Performance Requirements		
1	Architecture	Fixed Configuration Layer 3 Rack mountable Switch. Rackmount kit to be provided alongwith the switch
2	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. The Memory should be large enough to support fully populated ports, all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs, ACLs, etc.at their peak values as claimed in the Data Sheets of the Switch.

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3	Switching Fabric Capacity	The Switch should support a minimum of 150 Gbps of Switching Fabric Capacity.
4	Switch Forwarding Rates	The Switch should Support Minimum Switching Performance of 100 Mpps.
5	Stacking	The Switch should have two stacking ports and stacking bandwidth of 64 Gbps.
6	10G/Gigabit Ethernet capability	The Switch should Support Minimum 2 nos. of 10 Gigabit Ethernet Ports with Local Forwarding for connectivity in addition to the 48 10/100/1000BaseTx UTP ports
7	No. of 10/ 100/ 1000 BaseTX UTP Ports	48 Nos. 10/100/1000BaseTx UTP ports
8	No. of 10G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
9	Type of Ports	All Autosensing, Autonegotiating, Auto-MDIX on all UTP ports
Connectivity & Filtering		
10	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports
11	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit / 10 G Ports
12	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
13	802.1Q	Should support 802.1Q protocol
14	Type of VLANs	Should support port, subnet based VLANs
15	Voice VLAN	Should Support separate Voice VLAN for separating and prioritizing VoIP traffic
16	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
17	No. of VLAN	Should support minimum 1000 active VLANs

Compliance: Accepted to comply all the above points

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18	MAC Addresses	No. of MAC Address Supported: 12000
Layer 3 Functionality		
19	OSPF, BGP, RIP/RIP2	Should support OSPF, BGPv4, RIP/RIP2 with an software upgrade
20	Ipv6 Support	Should support IPv6 in hardware from day one
21	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
22	No. of Route Entries	Should support minimum 10000 Route entries
Security Features		
23	Access Control Lists	Should support Standard and Extended ACLs
24	Various type of ACLs	Should support various type of ACLs like port based/time based
25	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/ external sources
26	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
27	802.1X	Should support 802.1x Network Security and Authentication
28	RADIUS	Should have support for RADIUS
Network Protocols		
29	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
30	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
31	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
32	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		

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33	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address
34	QoS Scheduling	Should support QoS scheduling
35	Queue per port	Should support minimum 4 queues per port
36	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs
37	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
38	Multicast	Should support H/W or S/W based IPv4 and Ipv6 Multicasting
39	IGMP	Should Support IGMP v1, v2, v3
40	Multicast Entries	Should support 1000 entries
41	PIM	Should support Protocol Independent Multicast - Sparse and dense mode
Management		
42	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
43	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. Port mirroring should also be possible across the switches
Software		
44	Software Version	Version of software for supplied switch should be latest release to support all required features
45	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		

Compliance: Accepted to comply all the above points

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46	IEEE Standards	Ethernet: IEEE 802.3x, 10BASE-T, 100BASE-TX, 1000BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

Compliance: Accepted to comply all the above points

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3.5 Layer-3 Access Switch Type I

Hardware & Performance Requirements		
1	Architecture	Multilayer Stackable Switch architecture with sufficient modules/cards to fit required transceivers/UTP ports (Stacked)
2	Switching Fabric Capacity	The Switch should support a minimum of 150 Gbps of Switching Fabric Capacity.
3	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs, ACLs, etc.at their peak values as claimed in the Data Sheets of the Switch.
4	Switch Forwarding Rate	The switch should support minimum switching performance of 100 Mpps. Performance shall be hardware based.
5	No of 10/100/1000 Port	The Switch should have 48 Nos of 10/100/1000 ports
6	No. of SFP Ports	The Switch should have 4 number of SFP ports in addition to the above number of ports.
7	No. of 1G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
8	No. of 1G UTP Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
9	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports.
10	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit
11	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		

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12	802.1Q	Should support 802.1Q protocol
13	Type of VLANs	Should support port, subnet based VLANs
14	Voice VLAN	Should Support separate Voice VLAN for separating and prioritizing VoIP traffic
15	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches.
16	No. of VLAN	Should support minimum 1000 active VLANs
17	MAC Addresses	Minimum No. of MAC Address Supported: 12000
Layer 3 Functionality		
18	Layer 3 Routing	Should support static routing from day one and should support OSPF, BGPv4, RIP/RIP2 with a software upgrade.
19	Ipv6 Support	Should support IPv6 in hardware from day one
20	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
21	No. of Route Entries	Should support minimum 10000 Route entries
Security Features		
22	Access Control Lists	Should support Standard and Extended ACLs
23	Various type of ACLs	Should support various type of ACLs like port based/time based
24	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
25	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
26	802.1X	Should support 802.1X Network Security and Authentication
27	RADIUS	Should support for RADIUS
Network Protocols		

Compliance: Accepted to comply all the above points

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28	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
29	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
30	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
31	Ingress/Egress Queuing	Should support Ingress/Egress Queuing on per port basis.
32	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address, IP Source/ Destinations address, TCP/UDP port nos etc
33	QoS Scheduling	Should support QoS scheduling.
34	Queue per port	Should support minimum 4 queues per port
35	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs
36	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
37	Multicast	Should support H/W or S/W based IPv4 and Ipv6 Multicasting
38	IGMP	Should Support IGMP v1, v2 , v3
39	Multicast Entries	Should support minimum 1000 entries
40	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM – SSM
Management		
41	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
42	Port Mirroring	Should support port mirroring feature for monitoring network

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		traffic of a particular port/VLAN/group of ports/entire switch.
Software		
43	Software Version	Version of software for supplied switch should be latest release to support all required features
44	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
45	IEEE Standards	Ethernet: IEEE 802.3x, 10BASE-T, 100BASE-TX, 1000BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 802.1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

3.6 Layer-3 Access Switch Type 2

Hardware & Performance Requirements		
1	Architecture	Multilayer Switch architecture with sufficient modules/cards to fit required transceivers/UTP ports (Stacked)
2	Switching Fabric Capacity	The Switch should support a minimum of 150 Gbps of Switching Fabric Capacity.
3	Flash & Memory	The proposed switch should have enough Memory (Flash and RAM) to hold the latest Software Release. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs, ACLs, etc.at their peak values as claimed

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		in the Data Sheets of the Switch.
4	Switch Forwarding Rate	The switch should support minimum switching performance of 65Mpps. Performance shall be hardware based.
5	No of 10/100/1000 Port	The Switch should have 24 Nos of 10/100/1000 ports
6	No. of SFP Ports	The Switch should have 4 number of SFP ports in addition to the above mentioned ports.
7	No. of 1G Fiber Transceivers	As per 3.9, Required Transceivers shall be separately ordered
8	No. of 1G UTP Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
9	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports.
10	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit
11	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
12	802.1Q	Should support 802.1Q protocol
13	Type of VLANs	Should support port, subnet based VLANs
14	Voice VLAN	Should Support separate Voice VLAN for separating and prioritizing VoIP traffic
15	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches.
16	No. of VLAN	Should support minimum 1000 active VLANs
17	MAC Addresses	Minimum No. of MAC Address Supported: 12000
Layer 3 Functionality		

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18	Layer 3 Routing	Should support static routing from day one and should support OSPF, BGPv4, RIP/RIP2 with a software upgrade.
19	Ipv6 Support	Should support IPv6 from day one
20	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
21	No. of Route Entries	Should support minimum 10000 Route entries
Security Features		
22	Access Control Lists	Should support Standard and Extended ACLs
23	Various type of ACLs	Should support various type of ACLs like port based/time based
24	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
25	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
26	802.1X	Should support 802.1X Network Security and Authentication
27	RADIUS	Should have support for RADIUS
Network Protocols		
28	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
29	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
30	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
31	Ingress/Egress Queuing	Should support Ingress/Egress Queuing on per port basis.
32	Traffic Policing	Should be able to limit traffic flows based on MAC Source/Destination address, IP Source/ Destinations address, TCP/UDP port nos etc
33	QoS Scheduling	Should support QoS scheduling.

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4	Queue per port	Should support minimum 4 queues per port
35	Traffic Classification	Should support policy based traffic classification based on Type of Service (ToS), IP Precedence mapping, Layer 2/3/4 defined traffic flows, MAC address, VLANs
36	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
37	Multicast	Should support H/W or S/W based IPv4 and Ipv6 Multicasting
38	IGMP	Should Support IGMP v1, v2 , v3
39	Multicast Entries	Should support minimum 1000 entries
40	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM – SSM
Management		
41	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
42	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
43	Software Version	Version of software for supplied switch should be latest release to support all required features
44	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
45	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH

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		10G Ethernet: IEEE 802.3ae, 10GBase-SR, 10GBase-LR
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

Compliance: Accepted to comply all the above points

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3.7 Access Switch- I

These 48 port layer-2 fixed configuration switches shall be of stack based used to connect users desktops/workstations etc. These switches shall be placed across the plant. Specifications shall be as given below.

Hardware & Performance Requirements		
1	Architecture	Fixed Configuration Layer 2 Rack mountable Switch. Rackmount kit to be provided alongwith the switch
2	Flash & Memory	The proposed switch should have enough Memory (Flash and/or any other) to hold the latest Software Release. The Memory should be large enough to support fully populated ports, all features of switch and parameters like MAC Address Table, VLANs etc.at their peak values as claimed in the Data Sheets of the Switch.
3	Switching forwarding bandwidth	The Switch should support a minimum of 80 Gbps of Switching forwarding bandwidth.
4	Switch Forwarding Rates	The Switch should Support Minimum Switching Performance of 75 Mpps.
5	Stacking	The Switch should have two stacking ports and stacking bandwidth of 20 Gbps.
6	No. of 10/100/1000 Ports	The Switch should have minimum 48 nos. 10/100/1000BaseTX ports
7	No of SFP Ports	The switch should have 4 numbers of SFP ports in addition to the above mentioned ports
8	Type of Ports	All Autosensing, Autonegotiating, Auto-MDIX on all UTP ports
9	No. of Transceivers	As per 3.9, Required Transceivers shall be separately ordered
Connectivity & Filtering		
10	802.3ad	Should support Industry Standard Port/Link Aggregation for All

Compliance: Accepted to comply all the above points

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		Ports
11	Jumbo Frames	Jumbo Frames support up to 9K Bytes
12	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
13	802.1Q	Should support 802.1Q protocol
14	Type of VLANs	Should support port based VLANs
15	Voice VLAN	Should Support separate Voice VLAN for separating and prioritising VoIP traffic
16	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
17	No. of VLAN	Should support minimum 250 active VLANs
18	MAC Addresses	No. of MAC Address Supported: 8000
Security Features		
19	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
20	DHCP Snooping	Should support DHCP Snooping to filter untrusted DHCP messages
21	802.1X	Should support 802.1x Network Security and Authentication
22	802.1x with VLAN Assignment/ Guest VLAN	Should support 802.1x with VLAN Assignment/Guest VLAN features
23	RADIUS	Should have support for RADIUS
Network Protocols		
24	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
25	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast

Compliance: Accepted to comply all the above points

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Quality of Service		
26	QoS Scheduling	Should support QoS scheduling
27	Queue per port	Should support minimum 4 queues per port
28	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
29	Multicast	Should support H/W or S/W based IPv4 Multicasting
30	IGMP	Should Support IGMP v1, v2
Management		
31	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
32	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
33	Software Version	Version of software for supplied switch should be latest release to support all required features
34	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
35	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		IEEE 802.1D Spanning-Tree Protocol
		IEEE 802.1S & 1W for Rapid Spanning tree convergence

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	IEEE 802.1p CoS Prioritization
	IEEE 802.3x Flow Control
	IEEE 802.3ad Link Aggregation

3.8 Access Switch – II

These 24 port layer-2 fixed configuration switches shall be used to connect users' desktops/workstations etc. These switches shall be placed across the plant. Specifications shall be as given below.

Hardware & Performance Requirements		
1	Architecture	Fixed Configuration Layer 2 Rack mountable Switch. Rackmount kit to be provided along with the switch
2	Flash & Memory	The proposed switch should have enough Memory (Flash and/or any other) to hold the latest Software Release. The Memory should be large enough to support fully populated ports, all features of switch and parameters like MAC Address Table, VLANs etc.at their peak values as claimed in the Data Sheets of the Switch.
3	Switching Forwarding bandwidth	The Switch should support a minimum of 80 Gbps of Switching Fabric Capacity.
4	Switch Forwarding Rates	The Switch should Support Minimum Switching Performance of 40 Mpps.
5	Stacking	The Switch should have two stacking ports and stacking bandwidth of 20 Gbps.
6	No. of 10/100/1000 Ports	The Switch should have minimum 24 nos. 10/100/1000BaseTX ports
7	No of SFP Ports	The switch should have 4 numbers of SFP ports in addition to the above ports
8	Type of Ports	All Autosensing, Autonegotiating, Auto-MDIX on all UTP ports
9	No. of Transceivers	As per 3.9, Required Transceivers shall be separately ordered

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Connectivity & Filtering		
10	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports
11	Jumbo Frames	Jumbo Frames support up to 9K Bytes
12	Storm Control	Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
13	802.1Q	Should support 802.1Q protocol
14	Type of VLANs	Should support port based VLANs
15	Voice VLAN	Should Support Voice VLAN for separating and prioritising VoIP traffic
16	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
17	No. of VLAN	Should support minimum 250 active VLANs
18	MAC Addresses	No. of MAC Address Supported: 8000
Security Features		
19	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
20	DHCP Snooping	Should support DHCP Snooping to filter untrusted DHCP messages
21	802.1X	Should support 802.1x Network Security and Authentication
22	802.1x with VLAN Assignment/ Guest VLAN	Should support 802.1x with VLAN Assignment/Guest VLAN features
23	RADIUS	Should have support for RADIUS
Network Protocols		
24	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol

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25	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
Quality of Service		
26	QoS Scheduling	Should support QoS scheduling
27	Queue per port	Should support minimum 4 queues per port
28	Rate Limiting	Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports.
Multicasting		
29	Multicast	Should support H/W or S/W based IPv4 Multicasting
30	IGMP	Should Support IGMP v1, v2
Management		
31	Network monitoring/ management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support syslog, SNMP, RMON/RMON-II, SSH, telnet, web management
32	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
33	Software Version	Version of software for supplied switch should be latest release to support all required features
34	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
35	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T
		Fast Ethernet: IEEE 802.3u, 100BASE-TX, 100BASE-FX
		Gigabit Ethernet: IEEE 802.3z, IEEE 802.3ab, 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX, 1000BASE-LX/LH
		IEEE 802.1D Spanning-Tree Protocol

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	IEEE 802.1S & 1W for Rapid Spanning tree convergence
	IEEE 802.1p CoS Prioritization
	IEEE 802.3x Flow Control
	IEEE 802.3ad Link Aggregation

3.9 Modules Details

Sl. No.	Source	Destination	Connect Type	Transceivers	
				Type	Qty
		Core Switch 1			
1	CD1-IC	Server Farm 01 (IC)	10 Gig- MMF	10G-LRM	2
		IC Distribution	10 Gig- MMF	10G-LRM	2
		Admin Distribution	10 Gig- SMF	10G-LR	2
		CTO Distribution	10 Gig- SMF	10G-LR	2
		NDTL Distribution	10 Gig- SMF	10G-LR	2
		Main Store Distribution	10 Gig- SMF	10G-LR	2
		Server Farm 01 (HPSS)	10 Gig- SMF	10G-LR	2
		Hospital	10 Gig- SMF	10G-LR	2
		CD2-HPSS	10 Gig- SMF	10G-LR	2
		Core Switch 2			
2	CD2 – Telephone Exchange	Server Farm 02 (HPSS)	10 Gig- MMF	10G-LRM	2
		IC Distribution	10 Gig- SMF	10G-LR	2
		Admin Distribution	10 Gig- SMF	10G-LR	2
		CTO Distribution	10 Gig- SMF	10G-LR	2
		NDTL Distribution	10 Gig- SMF	10G-LR	2
		Main Store Distribution	10 Gig- SMF	10G-LR	2
		Server Farm 02 (HIC)	10 Gig- SMF	10G-LR	2
		Hospital	10 Gig- SMF	10G-LR	2
		CD1-IC	10 Gig- SMF	10G-LR	2
		Distribution Node 1			
3	Distribution Switch 1 IC Ground Floor	Civil Factory	Gig over SMF	GLC-LH-SM	2
		Shipping Gate	Gig over SMF	GLC-LH-SM	2
		Flow Model Lab	Gig over MMF	GLC-LH-SM	2
		Shipping	Gig over SMF	GLC-LH-SM	2
		E-Shop	Gig over SMF	GLC-LH-SM	2
		New RMS Gate	Gig over SMF	GLC-LH-SM	2
		Reception	Gig over MMF	GLC-SX-MM	4
		CAD-L	Copper	UTP	NA
		CAD-R	Copper	UTP	NA
		Engg GF	Copper	UTP	NA
		Info. Center	Copper	UTP	NA
		S3 Yard	Gig over SMF	GLC-LH-SM	2

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		S2 Yard	Gig over SMF	GLC-LH-SM	2
		Main Gate	Gig over MMF	GLC-SX-MM	2
		AHP-R&D	Gig over MMF	GLC-SX-MM	2
		New Civil Factory	Gig over MMF	GLC-SX-MM	2
		AQCS-R&D	Gig over MMF	GLC-SX-MM	4
		Distribution Node 2			
4	Distribution Switch 2 Admin Building	Cash Office	Gig over MMF	GLC-SX-MM	2
		Admin Canteen	Gig over MMF	GLC-SX-MM	2
		Admin Gate	Gig over MMF	GLC-SX-MM	2
		Tele Exchange	Gig over MMF	GLC-SX-MM	2
		Security Office	Gig over MMF	GLC-SX-MM	2
		New RMS	Gig over SMF	GLC-LH-SM	2
		S2 Yard	Gig over SMF	GLC-LH-SM	2
		Admin GF	Copper	UTP	NA
		Admin FF	Copper	UTP	NA
		Admin SF	Copper	UTP	NA
		Admin TF	Copper	UTP	NA
		S3 Yard	Gig over SMF	GLC-LH-SM	2
		LSF Yard	Gig over SMF	GLC-LH-SM	2
		Finance Log Room	Gig over MMF	GLC-LH-SM	2
		Shipping Gate	Gig over SMF	GLC-LH-SM	2
		East Gate Weigh Bridge	Gig over SMF	GLC-LH-SM	2
		New RMS Gate	Gig over SMF	GLC-LH-SM	2
		Distribution Node 3			
5	Distribution Switch 3 CTO	F3 Bay	Gig over MMF	GLC-SX-MM	2
		Shop Annex Office GF	Copper	UTP	NA
		Shop Annex Office FF	Copper	UTP	NA
		Shop Office GF	10 Gig over MMF	10G-LRM	2
			Gig over MMF	GLC-SX-MM	2
		Shop Office FF	10 Gig over MMF	10G-LRM	2
			Gig over MMF	GLC-SX-MM	2
		Distribution Node 4			
6	Distribution Switch 4 NDTL	A4 Bay	Gig over MMF	GLC-LH-SM	2
		MP Shop	Gig over MMF	GLC-SX-MM	2
		A2 Bay	Gig over MMF	GLC-SX-MM	2
		A3 Bay	Gig over MMF	GLC-SX-MM	2
		F2 Bay	Gig over MMF	GLC-LH-SM	2
		Rolling Bay	Gig over SMF	GLC-SX-MM	2
		New MP Shop	Gig over MMF	GLC-SX-MM	2
		Shipping	Gig over MMF	GLC-LH-SM	2
		WTC	Gig over MMF	GLC-LH-SM	2
		F1 Bay	Gig over MMF	GLC-SX-MM	2
		RMS-L3	Gig over MMF	GLC-LH-SM	2

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		NDTL	Coper	UTP	NA
		Distribution Node 5			
7	Distribution Switch 5 Main Stores	East Gate	Gig over MMF	GLC-LH-SM	2
		Service Workshop	Gig over SMF	GLC-LH-SM	2
		Fire Station	Gig over MMF	GLC-LH-SM	2
		Inflammable Stores	Gig over MMF	GLC-LH-SM	2
		RMS	Gig over SMF	GLC-LH-SM	2
		Gas Service	Gig over MMF	GLC-LH-SM	2
		New RMS-L3	Gig over SMF	GLC-LH-SM	2
		East Gate Weigh Bridge	Gig over SMF	GLC-LH-SM	2
		Sub-Delivery Stores	Gig over MMF	GLC-SX-MM	2
		Canteen	Gig over MMF	GLC-LH-SM	2
		Consumable Stores	Gig over MMF	GLC-SX-MM	2
		Fastener Stores	Gig over MMF	GLC-SX-MM	2
		Erection Service	Gig over MMF	GLC-LH-SM	2
		FTS	Gig over MMF	GLC-LH-SM	2
		Main Stores	Copper	UTP	NA
		Distribution Node 6			
8	Distribution Switch 6 Hospital	Civil Township	Gig over SMF	GLC-LH-SM	2
		Guest House	Gig over SMF	GLC-LH-SM	2
		D-Type	Gig over SMF	GLC-LH-SM	2
		Hostel	Gig over SMF	GLC-LH-SM	2
		Hospital	Copper	UTP	NA
		ED Bungalow	Gig over SMF	GLC-LH-SM	2
		Heartbeat Switches		GIC-LH-SM	8
		Total Transceivers → 10G LRM		10G-LRM	10
		Total Transceivers → 10G LR		10G-LR	30
		Total Transceivers → 1G LX		GLC-LH-SM	82
		Total Transceivers → 1G SX		GLC-SX-MM	48

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3.10 Firewall Appliance

Firewall appliances are required for network segregation as per requirements of ISMS. Specifications shall be as follows:

Hardware & Performance Requirements		
1	Architecture	The firewall with IPS should be appliance based with minimum 1 Gbps firewall throughput and 400 Mbps of Firewall and IPS throughput. High Availability should be from day one.
2	Flash & Memory	The proposed firewall should have enough Memory (Flash and RAM) to hold the latest Software Release. The Memory should be large enough to support parameters at the peak values as claimed in datasheet
3	Number of users	Should support unlimited number of users from day one.
4	IPS	The firewall should include IPS functionality (with no additional hardware for IPS)
		IPS subscription licenses should be included for the entire contract period.
5	Stateful Inspection	Should support stateful inspection firewall services, application-aware inspection and controls at layer 4-7 like Web, data center application, VoIP, and multimedia protocols.
6	Access Control List	Should support Standard/Extended ACLs.
7	NAT	Should Support NAT.
8	Management	Should be manageable through CLI, telnet, SSH, web, SNMP, GUI based software. GUI Software along with any licenses should be supplied without extra cost
9	Protection from Attacks	Should support Protection from various DoS attacks
10	DHCP Relay	Should support DHCP relay function
11	Role Based Access	Should support role based administrative access for granular control
12	Logging/ Monitoring	Should support syslog; logging to external servers, correlation engine, SNMP
13	Software Version	Version of firewall software for supplied module should be latest release to support all required features
14	Software Updates	Software updates should be bundled for the entire contract period

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3.11 IPS Appliance

IPS appliance is required for datacenter monitoring and prevention as per requirements of ISMS. Specifications shall be as follows:

Hardware & Performance Requirements		
1	Architecture	The IPS should be appliance based with minimum 1 Gbps with average inspection throughput of 750 Mbps. High Availability should be from day one.
2	Flash & Memory	The proposed firewall should have enough Memory (Flash and RAM) to hold the latest Software Release. The Memory should be large enough to support parameters at the peak values as claimed in datasheet
3	Connections	Should support minimum 700000 concurrent connections and 30000 connections per second.
4	Subscription	IPS subscription license should be included for the entire contract period.
5	Latency	Average latency should be less than 150 Micro Seconds
6	Threat Protection	Should support threat protection for minimum of 25000 threats from day one
7	Zero Day Protection	Should support Zero day protection from new threats when the signature database is not available.
8	Detection Techniques	Should Support Multiple detection techniques like protocol/application anomaly and evasion detection and mitigation .
9	Management	Should be manageable through CLI, telnet, SSH, web, SNMP, GUI based software. GUI Software along with any licenses should be supplied without extra cost
10	Role Based Access	Should support role based administrative access for granular control
11	Logging/ Monitoring	Should support syslog; logging to external servers, correlation engine, SNMP
12	Software Version	Version of firewall software for supplied module should be latest release to support all required features
13	Software Updates	Software updates should be bundled for the entire contract period

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3.12 Network Management System

Suitable network management system shall be provided to manage the whole network. NMS shall be of following specifications:

1	Software Requirement	Multiple administrative access logins should be possible
2		Provide tools for configuring, managing, monitoring and troubleshooting of the Campus Area Network devices.
3		Provide a flexible framework to address the device management needs of network converging voice, video and data.
4		Automatic discovery process for networked devices that create a network topology map using a color-coded, hierarchical view of the network for IP networks.
5		Tools to simplify Device configuration and management for Routers and Switches.
6		Have tools for creating, deleting and editing VLANs.
7		Should supports automated fault detection that recognizes common problems in the network
8		Threshold management features that can be set for many performance variables to generate an alarm or event notification if threshold are exceeded.
9		Path trace tool for layer 2 and layer 3 path analysis
10		Provide functionality to correlate MAC address and IP address to switch port
11		Support for Inventory Management
12		The system must manage and deploy configuration changes to multiple network devices. Changes can be downloaded immediately or run as scheduled operations
13		Provide capabilities for software updates to be performed against multiple network devices in the network.
14		Pro-active & real-time monitoring and tracking of key information and data relating to device performance, traffic, and environment, with metrics such as utilization percentage, frames transmitted and received, errors, and a variety of other device-specific indicators
15		Provide troubleshooting and diagnostics tools including Ping, Trace Route, Connections, Statistics, and Hostname/Address Lookup
16		Should be possible to Integrate with other management tools and third-party applications, like HP OV, IBM Tivoli etc.
17		New device support should be easily added
18		Web Interface for managing the network
19		Should be able to manage devices using inventory- and device-change management, network-configuration and software-image management, network availability, and syslog analysis.

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20	OS Compatibility	NMS software should be Windows OS compatible
21	Hardware Requirement	Suitable hardware for running NMS shall be provided alongwith NMS without additional cost. Minimum Hardware: Dual Core Xeon 3.6 GHz Based CPU, 4 GB RAM, RAID controller, 140 GB Available Disk Capacity in RAID Configuration, DVD Writer, 2 10/100/1000 NIC, Redundant Power Supply, Rack mounting Kit, 19" TFT color monitor, Hardware make: HP/IBM/Dell. Suitable Windows Server 2003/2008 OS license should also be provided without additional cost. If solution requires Database server license, same shall be supplied without additional cost.
22	Performance Requirement	A single Installation should support minimum 200 devices. License if any shall be given for minimum 200 devices.
23	Software Updates	Software updates should be bundled for the entire contract period

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3.13 RADIUS/TACACS Server

RADIUS/TACACS Server should be a appliance based on security hardened Operating system with the following specification. The Access control server should have redundancy with one server in Primary Data Center (Informatics Centre) and one server in Secondary site(Telephone Exchange).

SNo	Specification
1	The AAA Server should offer centralized command and control for all user authentication, authorization, and accounting from a Web-based, graphical interface, and distribute those controls to hundreds or thousands of access gateways in the network.
2	The AAA Server should provide the manageability and administration of user access for routers, VPNs, firewalls, dialup and DSL connections, cable access solutions, storage, content, voice over IP (VoIP), wireless solutions, and switches using IEEE 802.1x access control.
3	The same AAA Server should leverage access framework to control administrator access and configuration for all RADIUS enabled network devices in the network.
4	Automatic service monitoring, database synchronization, and importing of tools for large-scale deployments
5	Flexible 802.1X authentication type support, including Extensible Authentication Protocol Transport Layer Security (EAP-TLS), Protected EAP (PEAP), LEAP, EAP-Flexible Authentication via Secure Tunneling (EAP-FAST), and EAP-Message Digest Algorithm 5 (EAP-MD5)
6	Lightweight Directory Access Protocol (LDAP) and Open Database Connectivity (ODBC) user authentication support
7	Downloadable access control lists for any Layer 3 device, including Routers, Firewalls, and VPNs
8	Restrictions such as time of day and day of week, as well as user and device group profiles.
9	Device command set authorization
10	Network access restrictions
11	User and administrative access reporting

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12	Dynamic quota generation
13	Restrictions such as time of day and day of week
14	User and device group profiles
15	The AAA Server should have a Web-based user interface to simplify and distribute configuration for user profiles, group profiles.
16	The AAA Server should be able to support large networked environments with support for redundant servers, remote databases, and user database backup services.
17	Lightweight Directory Access Protocol (LDAP) authentication forwarding support for authentication of user profiles stored in directories from leading directory vendors, including Sun, Novell, and Microsoft.
18	Windows Active Directory and Windows NT database support to consolidate Windows username and password management and uses the Windows Performance Monitor for real-time statistics viewing.
19	Different access levels for each AAA Server administrator-and the ability to group network devices-enable easier control and maximum flexibility to facilitate enforcement and changes of security policy administration over all the devices in a network.
20	The proposed AAA Server should be used across virtually any network access server from the same vendor.
21	Tight coupling with Routers and VPN solutions to provide features such as Multichassis Multilink Point-to-Point Protocol (PPP) and Router/Switch Software command authorization.
22	The AAA Server should offer token server support for any One-Time Password vendor that provides an RFC-compliant RADIUS interface (such as RSA, PassGo, Secure Computing, ActiveCard, Vasco, and CryptoCard).
23	It should also provide dynamic quotas for time-of-day, network use, number of logged sessions, and day-of-week access restrictions.
24	The AAA Server should act as a policy decision point in Network Admission Control deployments. Using policies that are configured, it should evaluate the credentials sent to it by Host Agent, determine the state of the host, and send the AAA client ACLs that are appropriate to the host state. Evaluation of the host credentials should enforce many specific policies, such as OS patch level and antivirus DAT file

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	version. It should also record the results of policy evaluation for use with your monitoring system. Policies should be evaluated locally by AAA Server or can be the result returned from an external policy server to which the AAA Server forwards credentials. For example, credentials specific to an antivirus vendor should be forwarded to the vendor's antivirus policy server.
25	Support for Wireless Authentication- to support organization who cannot enforce a strong password policy and who wish to deploy an 802.1X EAP type that does not require digital certificates, support a variety of user and password database types, supports password expiration and change, and is flexible, easy to deploy, and easy to manage. For example, organization using Extensible Authentication Protocol who cannot enforce a strong password policy and does not want to use certificates can migrate to EAP-FAST for protection from dictionary attacks. The AAA Server should support for EAP-FAST supplicants available today on client devices and 802.11a/b/g WLAN client adapters.
26	Secure ACS should include simultaneous TACACS+ and RADIUS support for a flexible solution
27	The AAA Server should extend per-user ACL support to any Layer 3 network device that supports this feature. This includes proposed firewalls, VPN solutions, and Routers. The Administrator should be able to define sets of ACLs that can be applied per user or per group. This feature complements NAC support by enabling the enforcement of the correct ACL policy. When used in conjunction with network-access filters, downloadable ACLs can be applied differently per AAA client, allowing you to tailor ACLs uniquely per user, per access device.
28	The AAA Server should have support for certificate revocation using the X.509 CRL profile. A CRL is a time-stamped list identifying revoked certificates, which is signed by a certificate authority or CRL issuer and made freely available in a public repository. The Server should periodically retrieve the CRLs from provisioned CRL Distribution Points, using LDAP or HTTP, and store them for use during EAP-Transport Layer Security (EAP-TLS) authentication. If the certificate presented by the user during an EAP-TLS authentication is present in the retrieved CRL, the AAA server should fail the authentication and deny access to the user. This capability is extremely important in view of the frequent organizational changes and protects valuable company assets in case of fraudulent network use.
29	The AAA Server should have NAF. NAF is required to provide a flexible way of applying network-access restrictions and downloadable ACLs on AAA client names, network device groups, or the IP addresses of AAA clients. NAFs applied by IP addresses could use IP address ranges and wildcards. This feature is also required for granular application of network access restrictions and downloadable ACLs. NAF

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	should allow flexible network device restriction policies to be defined in large environments.
30	The AAA Server should allow for replicating the user and group databases separately. This is to reduce the amount of data sent between the AAA Servers during a replication event. A configurable replication timeout option should be available to provision for slow network connectivity between the AAA Server replication partners.
31	Administrators should have the capability to replicate network access profiles and all related configuration, including posture validation settings, AAA clients and hosts, external database configuration, global authentication configuration, network device groups, dictionaries, shared profile components, and additional logging attributes.
32	Capability to allow administrators to classify access requests according to network location, membership in a network device group, protocol type, or other specific RADIUS attribute values sent by the network device through which the user connects. Authentication, access control, and authorization policies should be mapped to specific profiles.

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3.14 DESKTOP VIDEO CONFERENCING SOLUTION

DESKTOP CLIENT
The solution should have the capability for 100 desktop clients based on SIP protocol from the day one so that video, voice, content features can be availed by the users in the network
The desktop solution should support firewall NAT traversal so as to allow Video desktop participants over Internet. The solution should be equipped to handle 5 simultaneous calls over the internet.
The desktop clients should be capable to transmit and receive HD 720P resolution along with BFCP data sharing video when connected to a hardware based HD endpoint
The desktop client should support bandwidth up to 8Mbps
The desktop client should support video standards H.263, H.263+ and H.264
The desktop client should support audio standards MPEG4 AAC-LD 48 kHz, G.722.1 24 kbps, G.722.1 32 kbps, G.711 A-law, G.711 μ -law
The desktop client must also be able to share content at anytime during a call either with another client or with hardware based endpoint
The users must be able to use any standard based web camera and head set for the use of the desktop client feature.
The system to be provided with a common network management system based on SNMP with user friendly GUI for both the MCU and video end points. Telnet may be provided for element management
Network Management software supporting the following functionality
-Network status updates- MCU elements, call, bandwidth, end point information, error status.
-communication view – MCU controlling the communication, communication ID, communication type, video and bandwidth settings, number of participants- including the current no, the number reserved and the no of local participants
-Centralised log management- for network and element type levels, log files for MCU elements and gateways.
The management software must register Video endpoints and MCU's from 3 rd party /other OEM's.
The management software must capture CDR's, diagnostics, faults , alarms.
Support for all the Video terminals and MCU in the network, as per the quantities stated in the BOM
Support IP address translation, user can make call using ITU standards numbering scheme

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Monitors current number of on-call and online users
Monitors current used bandwidth
Simple fault monitoring
MANAGEMENT
COMMUNICATION CONTROL CENTER
The management application should support device registration for 10 devices
Complete communication overview on one screen
communication and participant connection control
communication-by-communication and system-by-system information
SYSTEM UPGRADES
Pre-scheduled or ad-hoc software updates
Release key import and export
SYSTEM CONTROL
Phonebook access
Monitoring and reporting
Software upgrades
Initiate, extend and terminate communications
Change video layouts
Volume control and audio mute/unmute
Microphone on/off
Edit local phone books
Send messages to systems
Detect illegal system configurations
REMOTE SYSTEM SUPPORT
Phone book access
Software Upgrades
Statistics
INTELLIGENT TICKET HANDLING
Automated ticket handling (open/close)
Ticket priority customization
Proactive system check-up prior to engaging scheduled meetings
Intelligent Trouble Ticketing Handling
Diagnostic messages and solution suggestions
System status, gatekeeper status, SNMP configuration, ISDN/IP configuration and information
TEMPLATES/PROVISIONING
Customized template creation, management and distribution to systems
Selectable audio, video, network and bandwidth settings
Mass Deployment with automatic configuration from management software

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Ability to create persistent setting templates that can be proactively enforced on system
EVENT NOTIFICATION
Event Notification can be integrated into any SNMP Network Management system (e.g., HP Openview and IBM Tivoli)
E-mail notification to individuals or groups
Event logging including boot, link down/up, connect error, call connected/ disconnected, lost response/got response,
Downspeeding, upgrade start/finish scheduling, gatekeeper registration, low battery, wrong password alert
SCHEDULING AND BOOKING
SYSTEM BOOKING
Book system and meeting room simultaneously
Book recurring meetings and video resources
Create, password protect, edit or delete booked communications
Add web or data communication to meetings
Add/remove participants from reservation or connect/disconnect participants during communications
Connect communications ad-hoc or pre-schedule connection
Reserve resources for dial-in participants (telephone or video on ISDN or IP v.4 or IP v.6)
Schedule point-to-point communications or bridged meetings
Lock communication, preventing new participants from joining
Invite participants by e-mail
Customize meeting names
CALL DETAIL RECORDS (CDR) AND STATISTICS
Supports CDR capturing from Endpoints, MCUs, Gatekeepers and Gateways
Call detail records on screen or in native Excel format
Graphical display of call detail data
Support for multiple reporting formats: Onscreen, PDF or HTML
Number of incoming and outgoing calls
Bandwidth usage
Network type
Number/address called
Statistics in data, graph and chart format
Number of scheduled communications per person
Network, gatekeeper and ISDN inter face
Authentication failure
Error statistics
Battery status
SIP REGISTRAR FOR DESKTOP CLIENTS
H.323 gatekeeper (Control Application)

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SIP Proxy/Registrar (Control Application) for desktop software based clients
SIP and H.323 support, including SIP/H.323 gatewaying for locally registered endpoints
IPv4 and IPv6 support, including IPv4/IPv6 gatewaying
SIP and H.323 gatewaying for non-registered endpoints
Bandwidth management on both a per-call and a total usage basis, configurable separately for calls within the local subzones and to neighboring systems and zones
Automatic downspeeding option for calls that exceed the available bandwidth
URI and ENUM dialing via DNS, enabling global connectivity
Up to 2,500 registrations, 50 concurrent calls. Scalable to support 10,000 registrations
Flexible zone configuration with prefix, suffix and regular expression support
Can function as a standalone system or be neighbored with other systems
Gatekeepers and SIP proxies
Supports up to 5 Alternate gatekeeper for redundancy purposes
Optional endpoint authentication
Control over which endpoints that are allowed to register
Administrator Policy including support for CPL
Embedded setup wizard via a serial port for initial configuration
System administration via a web interface or RS-232, Telnet, SSH and HTTPS
ARCHITECTURE
Secure appliance based architecture
Flash memory and hard drive
ITU-T H.323 v5 compliant
ITU-T H.225 v4 compliant
H.323 v5 Annex O (for DNS dialing support)
H.460.18/.19 compliant
H.460.18 client proxy support
Supports H.460.19 multiplexed media
SECURITY
Secure Management with HTTPS, SSH and SCP
– Secure File Transfer
– Inactivity Timeout
Can lock-down IP services
Authentication required on HTTP(S), Telnet, SSH, SCP and serial port
Compatible with H.235 v2 and v3 enabled H.323 devices
H.235 Authentication support
TLS for SIP signaling

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MANAGEMENT
Supports industry standards such as RS-232, Telnet, HTTP(S), XML, SNMP, SCP and SSH
Embedded setup wizard on serial port for initial configuration
Advanced management support and configuration with
Call logging and diagnostics
Support for logging to a syslog server
Local time zone aware
CALL CONTROL AND REGISTRATIONS
Supports manual registration of H.323 and SIP endpoints
and API call control
Supports H.225/Q.931, H.245 call control routed mode
Supports H.323-SIP Inter working Encryption
Supports H.323-SIP Inter working DuoVideo
Registration of H.323 ID, E.164 aliases and services
Disconnect H.323 calls from the API interface
URI Dialing
Call Policy Management (RFC 3880) including
ZONE CONTROL
Supports Remote Zone monitoring
Supports Remote Zone redundancy
Supports sub-zone area definition for bandwidth management
Flexible zone configuration with named zones and default zone
Registration Control (open, specifically allow, specifically deny)
BANDWIDTH MANAGEMENT
Interzone — definable call by call
– Max bandwidth per call
– Max aggregate bandwidth for all neighboring zones
Intrazone — definable call by call
– Max bandwidth per call
– Max aggregate bandwidth
Auto-downspeeding if call exceeds per-call maximum
Gateway load balancing
INTERFACES
4x 10/100/1000 Base-TX Ethernet ports (RJ-45) (front)
1x RS232 console port (RJ-45)2 (front)
2x USB (front)

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Gateway Security Solutions

3.15 Email Gateway Security Solution

SECURE MAIL GATEWAY APPLIANCE		
Sl. No	Specification	Minimum Requirements
1	Manufacturer and Model	The solution should be appliance based MTA for SMTP traffic and should support 3000 users scalable to 5000 users. The solution should also support redundancy in future
2	Operating System	Hardened and Secured Proprietary Operating System. Mention the OS name and the version of the OS.
3	File System	Proprietary File System Built and Optimized for Messaging
4	MTA software	Proprietary MTA (not sendmail, Qmail or postfix)
5	Denial of Service Defense	Should support domain based destination queue for out going mails. Multiple domains, multiple queues.
		Ability to perform SMTP session control and traffic rate limiting (down to per recipient) according to sender's IP address/range, domain
		Could assign maximum SMTP sessions per IP address on appliance
6	Reputation Filter Protection	Need to use one of the biggest web and email traffic monitoring network for sender reputation
		Should be based on different sources for collecting Data.
7	Data Loss Prevention	The solution should be scalable to add support of On-Box DLP with predefined policies including International Regulatory compliance like HIPAA/SOX etc, International standards like PCI etc, non regulatory compliance policies and should also support custom DLP policies. The administrator should be able to track messages based on the DLP policies and should be able to define the remediation actions like BCC, notify, quarantine, encrypt. The solution should also support detailed reporting for DLP violations.
8	Bounce Verification	Should be able to support a mechanism to block the Bounce Attacks.
9	DHAP Support	Should support Directory Harvest Attack Prevention
10	Anti Virus	The Appliance should support On-Box Dual AntiVirus scanning for SMTP (Single Antivirus engine to be provided from day one). Mention the names of the Antivirus engines.
11	Virus Outbreak Filter	Virus outbreak prevention on abnormal increase of emails with specific email attachments
12	Outbreak Quarantine	Dynamic quarantine (release of quarantined messages not falling into new virus/worm characteristics upon outbreak rule update and before virus signature update)
13	Spam Quarantine	Should support End User Spam Quarantine Access, Spam Digest Notification option and Option for Safelist/Black List by End Users via Portal from day one.

Compliance: Accepted to comply all the above points

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		The solution should support Centralized Spam Quarantine Access when redundancy is added in the future
14	Multiple Host Identities	Could assign different IP addresses on single appliance to allow different host identities and also own traffic flow policy and sender groups (each IP address represents one department or one faculty MX host) Each IP address can respond with different SMTP response and banner
15	Multiple IP's Supported	Could customize SMTP banner, hostname and response code per IP address or sender group Could support multiple domains per IP address or multiple domains using different IP address on single appliance. Mention the exact number of IP's supported in the Appliance
16	User Policy Management	Per User or User Group Policy (Based on sender/recipient address/domain or LDAP group, i.e. single email to multiple recipients can be processed with different policies) Single View of all user policies for easier management
17	Sender Group	Blacklists (IP, Domain, Reputation) Whitelists (IP, Domain, Reputation) Third party RBLs/ORBLs Sender and Recipient address whitelist and blacklist
18	Email Throttling	Have the capability to block or throttle bad senders and define individual mail policies of senders (both internal and external) based on:- Sender IP/IP Range, Domain, Email Reputation, DNS List
19	Traffic Rate Control	Rate limit control by IP address, domain and sender's reputation Maximum Recipients per period traffic control
20	Fine-grained Mail Policies	Ability to define traffic flow based on time period down to minutes (say 15 minutes)
21	Sender Verification	Reverse DNS Domain Lookup and Policy Assignment Maximum Messages per connection (Per Policy) Maximum Recipients per message (Per Policy) Maximum message size (Per Policy) Maximum Concurrent sessions per IP address (Per Policy) TLS enforcement and preferred option (Per Policy) SMTP Authentication enforcement and preferred option (Per Policy) Sender Verification on connecting IP address DNS PTR record and also envelope sender address (Per Policy)
22	LDAP support	LDAP routing LDAP masquerading LDAP recipient address verification
23	Multiple DNS Servers	Support both Internet Root DNS servers or local DNS servers Support multiple DNS servers and should provide option for DNS server overrides

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24	Message Tracking	Should support Message tracking based on sender and/or recipient address/domain, subject, time period, message event
		Should support Centralized Message Tracking for multiple appliances in the future when redundancy is added.
25	System monitoring	SNMP v2/v3 support
		MIB-II
26	Report API support	XML
		Syslog
27	Alerts	Email-based
		SNMP Trap
28	Configuration Interfaces	WebUI (HTTP and HTTPS)
		CLI (SSH and Telnet)
29	Configuration files	XML based files archived on the box itself or downloaded to local system or sent out as attachment to email from the appliance itself
30	Centralized Management	The solution should be capable of supporting Centralized management support for managing and configuring multiple appliance without the need for additional dedicated management console in the future
		Allow policies to apply based on cluster, group or per machine
31	Outbound Mail Monitoring	Real-Time Outbound Mail Flow per IP/Domain
		Distinct Message Queue Per Destination Domain
32	Centralized Reporting	The Solution should support centralized reporting of multiple security gateways in the future
33	Destination Domain Rate Control	Domain-based Delivery Rate and Session Control
34	Footer or Disclaimer	Could add different footers or disclaimers based on sender domain or sender email address/group
35	Outbound TLS Support	Support outbound SMTP over TLS based on destination domains or systemwide
36	Outbound SMTP Authentication Support	Support outbound SMTP authentication
37	Domain Key Signing	able to signing outgoing emails based on domain key
38	Bounce Management	Should support different bounce profiles for destination domains (retry frequency, maximum retry period, etc.)
39	Support Options	The solution should provide Customer Support over Phone/Email.
		The solution should provide Portal login access for accessing tools, userguides, forums & knowledge base. For advanced support/troubleshooting, the product should support the ability to open a secure tunnel over port 25 to the support datacenter for remote access and diagnostics/troubleshooting

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40	Updates and Upgrades	Support should cover all updates and upgrades for the time period the licenses and support purchased from principal vendor including hardware replacement warranty for a period of 5 years
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3.16 Web Gateway Security Solution

SECURE WEB GATEWAY APPLIANCE		
Sl. No	Specification	Minimum Requirements
1	Requirement and Functionality	The solution should be appliance based Web Proxy for HTTP/HTTPS and FTP & Caching, Web based Reputation filtering, URL filtering, Dual Anti Malware, HTTPS decryption, Onbox Data Security. All the functionalities should be in a single appliance only.
2	Operating System	The appliance based Solution should be provided with Hardened Operating System
3	Number of users supported	The solution should be able to support 1000 users scalable to 2000 users
4	Operating System Security	The operating system should be secure from vulnerabilities and hardened for web proxy and caching functionality only.
5	Forward proxy mode	The forward proxy mode deployment should Support for Explicit proxy integration (e.g. PAC files or host browser settings) and should also Support for hosting PAC files on-box
6	Transparent mode	The solution should also support transparent mode deployment using WCCP v2 and L4 switches/PBR (Policy-based Routing)
7	Multiple Upstream Proxy support	The solution should be able to support configuration of multiple upstream proxies for failover, load balancing, and conditional routing (specific clients or destinations routed to a specific upstream proxy).
8	DNS Splitting	The solution should support configuration to use Split DNS. It should be able to refer to different DNS for Different Domains e.g. (root DNS for all external domains and internal DNS for organization domain)
9	IP Spoofing support in transparent mode deployments	The solution should have facility to do IP spoofing. When enabled, requests originating from a client should retain the client's source address and appear to originate from the client instead of the appliance. This is useful in scenarios where policies are based on original IP and logging/reporting is required to track activity of individual IP basis.

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10	High Availability	The solution should be able to support High Availability
11	Proxy support	The proposed solution should be a Web Proxy and should support HTTP, Native FTP and HTTPS proxy. The solution should also support HTTPS scanning. Should Support HTTPS de-cryption natively (i.e. no additional hardware required)
12	Protocol Tunneling	The solution should support to tunnel certain ports via HTTP e.g. Tunneling FTP via HTTP
13	Native FTP protection	The solution should act as an FTP proxy and enable organizations to exercise granular control, including: allow/block FTP connections,
		restrict users/groups, control uploads/downloads, and
		restrict sent/received files of certain types or sizes.
14	File download and size restrictions	The solution Should be capable of blocking specific files downloads and based on size per user group basis. It should also block object using MIME types.
15	User Agent Blocking	Should support blocking User Agents e.g. Mozilla Firefox version 1.x, etc
16	Proxy Bypass List	The solution should have flexibility to create a list of source / destination addresses that bypass all Web Proxy security and access policy features, such as authentication, web reputation, URL filtering, and anti-malware scanning.
17	Time Based Policies	The solution should support policies based on time of the day (or day of the week)
18	User Agent Policies	The proposed solution should be able to configure policies specific to applications defined by user agent strings
19	Routing Policies	The solution should support conditional routing policy to determine where to pass the client request to, either to another proxy, or to destination server
20	Outbound Malware detection	Should detect Phone Home attempts occurring in the Entire Network. It should also provide visibility into which systems are infected with Malware. The Appliance should catch malware that attempts to bypass port 80.
21	HTTPS Decryption & Scanning	Should support HTTPS Decryption & Scanning of HTTPS transaction as per the Policy Defined
22	Intelligent Decryption	The solution should be able to Decrypt HTTPS traffic based on custom policy settings such as only certain categories of web sites shall be decrypted or those with poor reputation shall be decrypted or all HTTPS access of certain users shall be decrypted
23	IP based Access Control	The solution should allow administrator to define access to internet based on IP addresses, range of IP addresses, subnet and CIDR basis. It should also support to be forced for Authentication from Specific IP addresses, Subnet or CIDR's

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24	User based Access Control	The solution should support integration with Lotus Domino R8 and Microsoft Active directory and other LDAP directories. This should allow administrator to define user or group based access policies to Internet
25	Access Control	Should seamlessly Integrate with Lotus Domino R8 / Microsoft Active Directory / Other LDAP directories for authentication & access control
26	Multiple Authentication Server Support	The solution should support Multiple Auth Servers / Auth Failover using Multi Scheme Auth (NTLM and LDAP).
		Support for Lotus Domino R8
		Support for Novell eDirectory client auth
		Support for Microsoft Active Directory client auth
27	Authentication Exemption	Support for authentication without requiring a client on the authentication server
28	Caching Capacity	The Solution should support authentication exemption for specific URL's/Categories
29	Object caching	Should Have Inbuilt Caching Mechanism. The appliance should do Caching with more than 50 GB of Caching capacity. Mention the Exact Caching capacity of the appliance.
30	Application Signatures	Should Cache up to 1 GB of a single object. Mention the exact cache of a single object.
31	Bandwidth Controls	Should support Granular controls for social networking tools such as Facebook and LinkedIn (e.g allow Facebook access but block Entertainment application within Facebook)
32	Anti Malware	Control Bandwidth of streaming media at a per policy level
		The Appliance should have an inbuilt multiple AntiMalware Engines. Please mention the Antimalware Engines
		The solution should provide protection from Web 2.0 exploits (e.g. Koobface)
		The solution should provide protection from financial theft botnets (e.g. Zeus)
		The solution should provide protection from phishing websites
		The solution should provide protection from spyware / adware
		The solution should provide per-object security filtering
		The Solution should detect botnet phone-home traffic on any port (not just proxy ports)
		The solution should support parallel scanning with multiple scanning engines (On the same hardware)
		The product should support scanning zip files for embedded exploit payloads

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		The solution should provide Web Reputation Filters that examine every request made by the browser
33	Web Reputation	the initial HTML request to all subsequent data requests) – including live data, which may be fed from different domains. The Reputation system should provide botsite protection, URL outbreak detection and exploit filtering – protecting users from exploits delivered through cross-site scripting (XSS), cross-site request forgery, SQL injections or invisible iFrames
34	Web Reputation Dashboard Controls	The solution should support controllable dashboard for Web Reputation , like Allow, Scan and Block based on the scoring settings by the Administrator.
35	Web Reputation Threat Details	The solution should Provide detailed reports on the threats that Web Reputation is defending against.
36	Internet Traffic/ Phone Home Traffic scanning	The solution should provide protection for the internet traffic and phone home traffic
37	Outbound Traffic monitoring	The Appliance should support Outbound traffic monitoring/ Network Layer Malware Detection for AntiSpyware and block Phone home attempts. The Outbound traffic monitor /Network Layer Malware Detection should detect and block Spyware/ Malware in all the 65535 ports and details reporting should be provided on a per IP basis.
38	URL filtering	The Appliance should have an inbuilt URL filtering functionality with Pre-defined categories.
39	Custom URL filtering	The Appliance should support unlimited custom categories.
40	Dynamic categorization of unknown websites on box	Provision should be available to enable Real Time Dynamic categorization that shall classify in real time in case the URL the user is visiting is not already under the pre-defined or custom categories database
41	Reporting Mis-categorization	The solution should have facility for End User to provide False Positives in URL Category.
42	End User Acceptance Page	The solution should have facility to inform end user with notification page informing them of organization internet usage policies and provide reasons as to why they have been blocked
43	URL check & submission	Support portal should provide facility to check URL category and submit new URL for categorization and also should have the Ability to track URL re-categorization requests
44	Data Security - On-Box	Ability to allow access to Web 2.0 sites, but prevent data leakage
		Support for File/MIME type filtering (e.g. blocking *.xls in webmail sites)

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		Options should be provided to block file uploads to specific categories for specific users, block specific mime types, file sizes, etc. Option for specifying separate file sizes for different commonly used file types should be provided.
45	Data Loss Prevention - Off-Box	The solution should be able to integrate with the DLP Solutions like RSA, Vontu over ICAP Ability to scan POST content through integration with DLP solutions
46	Remote support	The remote support from principal company should be available via India Toll Free and Email. The Support Portal access should be provided for CASE management, knowledgebase, new version information, tools etc.
47	Secure Remote Access	The support engineer should be able to login to appliance using secure tunneling methods such as SSH for troubleshooting purposes
48	Diagnostic Tools	The appliance should have diagnostic network utilities like telnet, traceroute, nslookup and tcpdump
49	Updates and Upgrades	The appliance should provide seamless version upgrades and updates without any user intervention. Operating System Upgrades should be manual
50	Out of Band Management Support	The solution should be able to support out of band management. i.e management port should be separate from the proxy ports
51	Secure Web Based management	The appliance should be manageable via HTTP/HTTPS/SSH
52	CLI based management	The appliance should be manageable via command line using SSH
53	Serial Console access	The appliance should have serial console access
54	Policy Trace Tools	For troubleshooting and debugging, the solution should provide a policy trace tool, which can simulate a transaction to show what policies matched, what policies did not, and ultimately, what policies were applied.
55	Configuration Backup & export	The solution should be able to provide backup of configurations via email or file store which can be easily restored in the event of failure. Also should have facility to export config to multiple appliances.
56	Console Restriction	The proposed solution should be able to restrict administrative access based on IP address restrictions
57	Role Based Administration	Should support multiple roles like administrator, operator, guest user roles
58	Radius Integration for Appliance management	The solution should support integration with Radius servers for appliance administration
59	Centralized Management	The solution should support centralized management console for policy administration for multiple proxy appliances when redundancy is added in the future

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60	SNMP Support	The proposed solution should support SNMP V1, V2, and V3. And should have capabilities of hardware & software monitoring via both enterprise grade MIBS as well as alerts via SNMP traps.
61	Retention Period	Solution to provide the flexibility of keeping the logs for specified no of days
62	Custom EUN (End User Notification Page)	The solution should be able to display custom notifications to the end users as desired by the corporate policies.
63	Hosting EUN (End User Notification Page)	The solution should be able to host basic custom HTML notification pages
64	User Reports	Informative and exhaustive set of reports on User Activity and URL filtering activities (GUI to report past activity, top usage users and top malware threat)
65	Bandwidth Reports	Reports on Bandwidth Consumed / Bandwidth Saved
66	Detailed logging	Product to maintain detailed access logs that can be searched via filters, for easy location of any desired access of the user and to see how the product dealt with it
67	Outbound traffic reports	Detailed report on a per user basis should be provided on the L4 traffic monitoring / Network Layer Malware Detection.
68	Updates and Upgrades	Support should cover all updates and upgrades for the time period the licenses and support purchased from principal vendor including hardware replacement warranty for a period of 5 years
69	Web Tracking	Detailed Visibility into browsing patterns for all users or a specific user for finding out complete info related to specific event/incident
70	Support Options	The solution should provide Customer Support over Phone/Email.
		The solution should provide Portal login access for accessing tools, userguides, forums & knowledge base

3.17 UPS

All switches shall be powered through uninterrupted power supply. Three types of UPSs have been planned as given below:

- For server farm along with core switches, 80 KVA UPS with 30 min. backup at full load
- For distribution switches, 5 KVA UPS with 30 min. backup at full load.
- For access switches, 1 KVA UPS (BHEL will provide these UPS).

All UPS shall be of either APC, Liebert, Emerson make. Specifications are as given below:

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3.17.1 5 KVA UPS

1	Make	APC/ Liebert/ Emerson
2	Rating	5KVA or Higher
3	Technology	True Online, Double Conversion with PWM technology and IGBT based inverter
4	Nominal Input Voltage	230V Single Phase
5	Input Voltage Range	175V AC to 275V AC
6	Input Frequency	50 Hz +/- 3 Hz
7	Nominal Output Voltage	230 Vac +/- 5%
8	Output Frequency	50 Hz +/- 1 Hz
9	Output power Capacity	3.5KW or Higher
10	Input power factor	>0.90
11	Output power factor	0.7 or higher
12	Battery Type	Sealed, maintenance-free. If external, proper casing to be provided
13	Battery Make	OEM/Panasonic / Global Yuasa / Rocket
14	Desired Backup	Min. 30 minutes backup on full load
15	Battery Management	All batteries whether external or internal should be recognised by UPS. UPS should be able to test all batteries periodically. UPS should be able to show actual backup time considering all batteries
16	Power Sockets	Output power sockets should be 5/15A standard Indian type or necessary Interface power cords should be provided to connect to network devices
17	Cold Start	Cold start on 100% load
18	Communication Port	RS232 or USB port & necessary communication cables to be provided
19	SNMP Card	SNMP Card to be provided for connecting UPS to Ethernet LAN to monitor and manage the UPS with a standard Web browser, while simultaneously providing shutdown & restart for multiple windows, Linux & Unix computer systems over LAN
20	Power Management Software	The UPS should come with Power Management Software to view & monitor UPS status, backup time & shutdown scheduling for Windows 9x/NT//200/XP/7 & Red Hat Linux 7.2 & above systems
21	Battery Refresh	The bidder shall replace all the batteries after every 2.5 years and whenever the batteries get faulty. All the UPS batteries shall be

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		replaced in the last quarter of the lease contract
22	Warranty	OEM warranty (labour/parts/on-site) for the entire contract period

3.17.2 80 KVA UPS

Sl. No.	Description
1	Make: APC/Liebert/Emerson
2	Two Nos of 80KVA 3 phase to 3 Phase TRUE ON LINE DOUBLE CONVERSION UPS system consisting of Battery circuit breaker, Isolation transformer at output, static and manual bypass facility. The two units should operate in parallel and LBS (Load Bus Synchronization) to share the load. The UPS should be able to work on both Mains power and Generator power.
3	Two independent Sealed Maintenance Free (SMF) battery banks with a separate Battery Rack. SMF Battery to support 30 Min for each UPS totaling 60 minutes continuous backup for the full UPS load of 80 KVA.
4	MODBUS/SNMP card should be provided to UPS's for communications
5	Battery Refresh: The bidder shall replace all the batteries after every 2.5 years and whenever the batteries get faulty. All the UPS batteries shall be replaced in the last quarter of the lease contract
6	Warranty: OEM warranty (labour/parts/on-site) for the entire contract period

3.18 Network Racks

Network racks of various sizes shall be required for various new locations. Racks of some old locations shall also be replaced due to size constraints. Specifications are as given below:

3.18.1 42 U Network Rack

1	Make	APW/RITTAL
2	Mounting	Floor Standing
3	Dimensions	Dimensions (Width X Depth) - 800 x 1000 mm, 42U Height
4	Doors	Lockable front door of toughened tinted glass & lockable vented rear door of steel
5	Side Panels	Side Panels vented with Slam Latches and Key Locks
6	Top & Bottom Covers	Top & Bottom Covers with cable entry gland plates and cut outs. Removable and vented top cover for allowing heat conduction with provision for mounting fan housing unit and cable entry provision from rear side. The top cover should have provision for mounting a fan Housing unit for hosting the fans

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7	Stationary Shelves	3 No. of Stationary Shelves
8	Equipment Mounting Angles	One pair of Equipment Mounting Angles to provide 19" mounting positions
9	Cooling Fans	Min. 4 Nos. of Cooling Fans (230VAC, 90 CFM) in top mounted Fan Housing Unit
10	Mounting Hardware	Captive Mounting Hardware (10 Pkts)
11	Power Distribution	Min. Two independent & redundant vertical or horizontal power strips each containing 10 Nos. of 5/15A power sockets, a fuse, indicator lamp and 15A Switch
12	Castors	4 castors with foot operated brakes
13	Earthing Kit	Copper earthing kit (bars, straps, continuity kit, etc)
14	Cable Management accessories	Two horizontal, two vertical cable managers. Cable entry - Bottom and Top

3.18.2 24 U Network Rack

1	Make	APW/RITTAL
2	Mounting	Floor Standing
3	Dimensions	Dimensions (Width X Depth) - 600 x 800 mm, 24U Height
4	Doors	Lockable front door of toughened tinted glass & lockable vented rear door of steel
5	Side Panels	Side Panels vented with Slam Latches and Key Locks
6	Top & Bottom Covers	Top & Bottom Covers with cable entry gland plates and cut outs. Removable and vented top cover for allowing heat conduction with provision for mounting fan housing unit and cable entry provision from rear side. The top cover should have provision for mounting a fan Housing unit for hosting the fans
7	Stationary Shelves	2 No. of Stationary Shelves
8	Equipment Mounting Angles	One pair of Equipment Mounting Angles to provide 19" mounting positions
9	Cooling Fans	Min. 4 Nos. of Cooling Fans (230VAC, 90 CFM) in top mounted Fan Housing Unit
10	Mounting Hardware	Captive Mounting Hardware (5 Pkts)
11	Power Distribution	Min. Two independent & redundant vertical or horizontal power strips each containing 5 Nos. of 5/15A power sockets, a fuse, indicator lamp and 15A Switch
12	Castors	4 castors with foot operated brakes
13	Earthing Kit	Copper earthing kit (bars, straps, continuity kit, etc)

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14	Cable Management accessories	Two horizontal, two vertical cable managers & two vertical Cable Channels with cabling loops. Cable entry - Bottom and Top
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3.18.3 12 U Network Rack

1	Make	APW/RITTAL
2	Mounting	Wall Mounting
3	Dimensions	Dimensions (Width X Depth) - 600 x 500 mm, 12U Height
4	Doors	Lockable front door of toughened tinted glass
5	Top & Bottom Covers	Sealed cable entrance with access holes with gland plates top and bottom
6	Equipment Mounting Angles	One pair of Equipment Mounting Angles to provide 19" mounting positions
7	Cooling Fans	Min. 2 Nos. of Cooling Fans in top mounted position
8	Mounting Hardware	Captive Mounting Hardware (2 Pkts)
9	Power Distribution	Min. One horizontal power strip containing 5 Nos. of 5A power sockets, a fuse, indicator lamp and 5A Switch
10	Cable Management accessories	Two horizontal cable managers

3.19 STRUCTURED CABLING SOLUTION

- The vendor should quote the OEM's first level of product.
- The structured cabling solution shall be from AMP/ Systimax/ Panduit / Molex.
- All passive cabling shall be from single OEM.
- For Core to distribution fiber links, 12 core fiber is to be laid and all 12 cores to be terminated.
- For Distribution to access fiber links, 12 core fiber is to be laid and 6 cores to be terminated.
- All UTP Cabling shall be of Category 6 type or higher.
- All Multimode optical fiber shall be of OM3 50 micron.
- All Single Mode optical fiber shall be of OS2 Standard.
- End to end numbering of structured cabling including patch cord in the rack.
- The vendor shall label all cables and cords, LIUs, jack panels, SMBs etc according to industry standards
- Racks to be dressed every 3 months or on demand for the entire contract period.
- The vendor shall install all passive components through a certified system integrator of cabling OEM.

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- Existing Cat5/Cat5e cables are to be changed with Cat 6 cables. All the passive components required for this are to be replaced.
- New passive network shall integrate with existing passive network. Existing fiber segments shall be terminated again. BoM required for the same has been provisioned in new solution. Existing Cat 6 UTP shall be used without any change. Wherever, racks are being changed, some UTP points may need to be terminated again by the vendor as per actual material and labour.
- The vendor shall use the existing trenches, conduit for cabling wherever possible.
- The cabling system installed by the vendor shall meet the specifications as prescribed in ANSI/EIA/TIA, ISO 11081 standards and to that effect shall submit a certificate after the completion of the work that the work has been done as per standards.
- Completeness of the configuration for the working network must be ensured by the vendor.
- The actual quantities of various passive items (UTP /fiber/ Pipes/ digging/ labour) shall depend upon their actual consumption at the time of installation. Payment for these items shall be done on actual.
- Most of the LAN locations are within the BHEL factory campus and BHEL property. OFC paths will be dictated by BHEL. There are few segments where the fiber needs to pass through or nearby the Third part property such as National Highway. The bidder should be ready to work in conjunction with BHEL convenience to take the Digging/OFC laying in such segments.
- Outdoor fiber cabling will be laid by vendor along the finalized route between the buildings. The laying work covers road-cutting wherever needed, digging the trenches (100cm deep X 30cm wide), laying of cable inside the HDPE pipe with nylon rope preloaded which will enable the smooth pulling, covering with bricks and sand, filling the trenches with excavated soil/sand and finishing. Hume pipes shall be used at road crossings only. Wherever the roads are cut, these have to be cemented. Care is to be taken for providing smooth curved pipe with acceptable radius at the bends as per standards. The entire outdoor fiber cabling should be done through HDPE pipes.
- Road crossing from BHEL main plant premises to external shipyard using the horizontal directional drilling methodology. Horizontal directional drilling is based on the concept of mechanical cutting a subsurface bore along a pre determined path using Drill bits, reamers and specially designed drilling fluids. Soil and / or rock cuttings are mixed with drilling fluids to create displaceable fluids slurry. Once the bore is sufficiently enlarged a product pipe is pulled into the bore and installed in the subsurface .The high density polythene pipes will be placed inside these bore to run/blow the fiber cable from one side to another side.
- Inside the building/manufacturing blocks, the fiber cable shall be laid inside the PVC conduit/MS pipe. Bending radius shall be as per standards. Route inside the building shall be mutually decided by BHEL and vendor.

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- Vendor shall observe the bending radius and pulling strength requirements for both UTP and fiber.
- The vendor shall be responsible for removing and replacing all ceiling/floor tiles (in case of suspended ceiling/raised floor) required for installation of the wiring. Any damage to tiles shall be made good by the vendor.
- At all stages, there shall be flexibility for future expandability.
- The information outlet shall be surface mounted with single or dual sockets. All the new connections shall be provided with dual sockets.
- In some of the cases, the data cable must be running along with the power cable. The vendor must ensure that there is only acceptable level of interferences in such cases.
- Any opening made in the existing / new racks as well as in LIUs for cable entry shall be closed to control damages by rodents.
- The scope of work shall also include removal of old LAN infrastructure including horizontal cabling on all floors where new nodes are replacing old network nodes.
- The selected bidder needs to do comprehensive site survey in coordination with BHEL officer to analyse the actual requirement of passive component and to plan the installation strategy.
- The selected bidder shall be responsible to provide within scope of work all facilities like transportation, tool kits, testing equipments etc, which is necessary for successful installation, implementation and testing.

Specifications are as follows:

Cat 6 UTP		
1	Cat 6	Should meet minimum Category 6 requirements
2	Type of Conductors	4 Pair 23 AWG Conductors
3	Frequency	Characterised to 250 MHz
4	Standards	TIA/EIA 568B, ISO Class E 11801-2002
5	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 meters

Cat 6a 4-Pair UTP Patch Cord - 33 Feet		
1	Cat 6a	Should meet minimum Category 6a requirements and extend the frequency to 500 MHz
2	Length	33 Feet
3	Boots	Should include snagless, Strain Relief boots at both ends
4	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6a Performance Requirements
5	Gigabit Requirements	Should meet or exceed 10Gigabit Ethernet Requirements at 100 meters

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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Cat 6 Dual Face Plate with RJ45 I/O and Surface Mount Box		
1	Cat 6	Should meet minimum Category 6 requirements
2	Dust Cover	Should have integrated dust cover
3	Strain Relief	Should provide strain relief for terminated cables
4	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6 Performance Requirements
5	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 meters

24 Port Cat 6 UTP Straight Jack Panel Unloaded		
1	RJ45 I/O Compatibility	Should be compatible with RJ45 I/Os (ordered separately), Should be able to accept 24 I/Os
2	Dimension	19" Width, 1U Height
3	Labels	Should include labels and clear label covers

24 Port Cat 6 UTP Angled Jack Panel Unloaded		
1	RJ45 I/O Compatibility	Should be compatible with RJ45 I/Os (ordered separately), Should be able to accept 24 I/Os
2	Dimension	19" Width, 1U Height
3	Labels	Should include labels and clear label covers

Cat 6 RJ45 Information Outlet		
1	Cat 6	Should meet minimum Category 6 requirements
2	Compatibility	Should be compatible with 24 port jack panel (ordered separately)
3	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6 Performance Requirements
4	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 meters

Cat 6 4-Pair UTP Patch Cord - 3 Feet		
1	Cat 6	Should meet minimum Category 6 requirements
2	Length	3 Feet
3	Boots	Should include snagless, Strain Relief boots at both ends
4	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6 Performance Requirements
5	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 meters

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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Cat 6 4-Pair UTP Patch Cord - 7 Feet		
1	Cat 6	Should meet minimum Category 6 requirements
2	Length	7 Feet
3	Boots	Should include snagless, Strain Relief boots at both ends
4	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6 Performance Requirements
5	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 meters

1U 19" 24 port Rack Mount loaded LIU (Fully Loaded-LC)		
1	Rack Mount	Should be 19" rack mounted with 1U height, Rubber grommets shall be provided at the cable entry points, for tight sealing.
2	Couplers	Should be complete with LC Duplex Couplers, etc for terminating 24 core SM/MMFiber
3	Type	Fiber management rings, Cable Strain Relief, Sliding Drawer
4	Labeling	Adhesive labeling for easy port identification

1U 19" 12 port Rack Mount loaded LIU (Fully Loaded-LC)		
1	Rack Mount	Should be 19" rack mounted 12 port with 1U height, Rubber grommets shall be provided at the cable entry points, for tight sealing.
2	Compatibility with Adapter Plates	Should be complete with LC Duplex Couplers, etc for terminating 12 core SM/MM Fiber
3	Type	Fiber management rings, Cable Strain Relief, Sliding Drawer
4	Labeling	Adhesive labeling for easy port identification

Single mode pigtails		
1	Type	LC/SC pigtail with min 1 mtrs buffered fiber
2	connector	Should be complete with LC connectors for terminating 9/125 Single mode fiber

Multimode Pigtails		
1	Type	LC/SC pigtail with min 1.5 mtrs buffered fiber
2	connector	Should be complete with LC connectors for terminating 50/125 OM3 Multi mode fiber

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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Suitable Fiber Patch cords for Switch connectivity from LIU		
1	Type of connectors	Duplex SC /LC on one side and Duplex LC/SC connector on other side.
2	Length	Minimum 3 meters
3	Polishing	Factory polished and tested
4	Insertion Loss	Less than 0.5dB per patch cord
5	Type of Fiber	OM3 50/125 micron Multimode or 9/125 Micron Single Mode
6	Compatibility	The patch cord fiber and connectors should be compatible to make the connectivity from LIU to the vendor given switch port.

Suitable 10 meter SC to SC Fiber Patch cords for Switch Interconnection from Rack to Rack		
1	Type of connectors	Duplex SC /LC on one side and Duplex LC/SC connector on other side.
2	Length	Minimum 10 meters
3	Polishing	Factory polished and tested
4	Insertion Loss	Less than 0.5dB per patch cord
5	Type of Fiber	OM3 50/125 micron Multimode or 9/125 Micron Single Mode
6	Compatibility	The patch cord fiber and connectors should be compatible to make the connectivity from LIU to the vendor given switch port.

Outdoor Multimode Fiber Optic Cable		
1	Type of Fiber	12 Core Multimode 50/125 micron Loose Tube armored with ROHS Compliant
2	Application	outdoor / Underground
3	Compliance	Should be compliant to new ISO/IEC 11801 Standard

Indoor Single mode Fiber Optic Cable		
1	Type of Fiber	12 Core Single mode 9/125 micron Tight buffered OFNR Riser rated unarmored
2	Application	Indoor
3	Compliance	Should be compliant to new ISO/IEC 11801 Standard

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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Outdoor Single mode Fiber Optic Cable		
1	Type of Fiber	12/24 Core Single mode 9/125 micron Loose Tube armored with ROHS Compliant
2	Application	outdoor / Underground
3	Compliance	Should be compliant to new ISO/IEC 11801 Standard

Pipes & Other Specs

1. 1" PVC Pipe, Medium Strength, ISI Mark
2. 1 1/4" PVC Pipe, Medium Strength, ISI Mark
3. 1 1/2" PVC Pipe, Medium Strength, ISI Mark
4. 1" MS Pipe, Medium Strength, ISI Mark, Minimum Wall Thickness 1.6mm
5. 1 1/4" MS Pipe, Medium Strength, ISI Mark, Minimum Wall Thickness 1.6mm
6. 1 1/2" MS Pipe, Medium Strength, ISI Mark, Minimum Wall Thickness 1.6mm
7. 1" GI Pipe, Grade B, ISI Mark
8. 2" HDPE Pipe with nylon rope pre-loaded for smooth and easy pulling of fiber cable through the pipe.
9. Cable Route Marker (at every 20 meters) with round/rectangle shape, " IC FIBER OPTIC CABLE" imprinted on it. Cast Iron Make. Total Height: 2 Feet (one foot above ground and one foot below ground), with proper grouting

3.20 COMPREHENSIVE MAINTENANCE OF THE EXISTING PASSIVES

Details		
1	6 core SM Dark Fiber segments (without termination, as these fibers are to terminated again in new contract)	3 segments of total 1750 Meters length
2	6 core MM Dark Fiber Segments (without termination, as these fibers are to terminated again in new contract)	47 segments of total 10498 Meters length

3.21 BILL OF MATERIAL

SNo	Item		Quantity
1	Core Switch	No.	2
2	Distribution Switch Type I	No.	14
3	Distribution Switch Type II	No.	10
4	Server Farm Switch	No.	8
5	Layer-3 Access Switch Type I	No.	3
6	Layer-3 Access Switch Type II	No.	10
7	Access Switch Type I	No.	72
8	Access Switch Type II	No.	15

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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9	10G LR Fiber Transceivers	No.	30
10	10G LRM Fiber Transceivers	No.	10
11	1G SX Fiber Transceivers	No.	48
12	1G LX/LH Fiber Transceivers	No.	82
13	Firewall Appliance	No.	2
14	IPS Appliance	No.	2
15	Network Management System	No.	1
16	RADIUS/TACACS Server	No.	2
17	Desktop Video Conferencing	Set	1
18	Email Gateway Security	No.	1
19	Web Gateway Security	No.	1
20	24 Port Rack Mount Fiber LIU (Fully Loaded - LC)	No.	48
21	12 Port Rack Mount Fiber LIU (Fully Loaded - LC)	No.	72
22	Single Mode LC Pigtail	No.	845
23	Multi Mode LC Pigtail	No.	441
24	Suitable Fiber Patch Cord for Switch Connectivity (3 Meter)	No.	120
25	Suitable Fiber Patch Cord for Switch Connectivity (10 Meter)	No.	25
26	Suitable Fiber Patch Cord for Switch Connectivity (15 Meter)	No.	8
27	Mode Conditioning Patch Cord (10 Meter)	No.	20
28	Cat 6 Dual Faceplate with I/O and Surface Mount Box	No.	1500
29	24 Port Unloaded UTP Straight Jack Panel 1U Height	No.	19
30	24 Port Unloaded Angled UTP Jack Panel 1U Height	No.	84
31	Cat 6 RJ45 Information Outlet	No.	1956
32	Cat 6 UTP Patch Cord - 3 feet	No.	1500
33	Cat 6 UTP Patch Cord - 7 feet	No.	1612
34	Cat 6A UTP Patch Cord - 33 Feet	Nos	50
35	Outdoor Multimode Fiber armored 12 Core	Mtrs	2134
36	Outdoor Single mode Fiber armored 12 Core	Mtrs	30975
37	Outdoor Single mode Fiber armored 24 Core	Mtrs	1890
38	Indoor Single mode Fiber unarmored 12 Core	Mtrs	1000
39	Category 6 UTP Cable	Mtrs	63135
40	UPS 80 KVA	No.	2
41	UPS 5 KVA	No.	16
42	42U Rack	No.	5
43	24U Rack	No.	13
44	12U Rack	No.	50
45	1U Horizontal Cable Manager	No.	50
46	1" GI Pipe	Mtrs	2000
47	1" MS Pipe	Mtrs	2000
48	1.5" MS Pipe	Mtrs	2000
49	1" PVC Pipe	Mtrs	2000
50	1.5" PVC Pipe	Mtrs	2000
51	1" Casing and Capping	Mtrs	1200

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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52	2" Casing and Capping	Mtrs	700
53	Power Cable for UPS	Mtrs	390
54	HDPE Pipe 2" with preloaded Nylon rope	Mtrs	20000
55	Cable Route Marker (at every 20 meters)	No.	1000
56	Cement Hume Pipe 6" Dia	Mtrs	50
57	Velcro - Pack of 20 meters	No.	50
58	Fixing of PVC Pipe/Casing and Capping on the wall and laying of UTP/Unarmored fiber cable inside it	Mtrs	5900
59	Fixing of HDPE pipe for outdoor cabling	Mtrs	50
60	Fixing of MS/ GI Pipe on steel columns /beams/ wall and laying of UTP/Fiber unarmored cable inside it	Mtrs	4000
61	Installation of 12U Rack	No.	50
62	Installation of 24U Rack	No.	13
63	Installation of 42U Rack	No.	5
64	Installation of 12/ 24 port Fiber LIU	No.	120
65	Installation of 24 ports Patch panel (Straight / Angled)	No.	103
66	Fiber Cable laying charges	Mtrs	35999
67	UTP Cable laying charges	Mtrs	63135
68	Splicing/Testing/Labelling of MM fiber cable (per fiber core basis)	No.	220.5
69	Splicing/Testing/Labelling of SM fiber cable (per fiber core basis)	No.	422.5
70	Connectorisation/ pentascanner testing /Labelling of UTP Points (1500 points x 2 sides)	No.	1500
71	Cutting of hard surface like road, floor etc, digging of trench 300 X 800 mm, laying of fiber optic cable inside GI pipe/hume pipe, laying of brick, refilling of trench, and finishing with cement	Mtrs	100
72	Cutting of soft surface like soft soil etc., digging of trench 300 X 800 mm, laying of fiber optic cable inside GI pipe/Hume pipe, laying of brick, refilling of trench	Mtrs	20000
73	Directional Horizontal Drilling across National Highway Road, Laying of fiber optic cable inside GI pipe / HDPE pipe	Mtrs	40

Note

Item Sl.No. 20 to 73 quantities are indicative figures only. Payments will be made based on actuals.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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General Terms and Conditions

1. BIDDER TO INFORM HIMSELF FULLY

- 1.1. The bidder shall closely peruse all the clauses, specifications and requirements and drawings etc., specified in the tender documents, and the offer made should be in accordance with these documents. If bidder requires any clarification and additional information on any of the tender documents/conditions, the bidder shall contact the BHEL Official inviting bids with due written request **one week before the tender opening due date and any queries will not be entertained after this.**

All correspondence/clarifications are to be addressed to the following:

Sr. Dy. General Manager, Purchase,
Admin Building,
BHEL, RANIPET,
TAMILNADU – 632406.
Contact Number: 04172284338
Email ID: nt@bhelrpt.co.in

- 1.2. Bidders are advised to study all the tender documents carefully and submit their offer and the Bidder is obliged to honor the offer without any modifications. Any offer not meeting the scope/specifications, terms, conditions, and any other clause specified in the tender documents shall be liable for rejection.

2. PROCEDURE FOR SUBMISSION OF BIDS

- 2.1 Tender documents may also be downloaded from www.bhel.com and www.tenders.gov.in
- 2.2 Tenders shall be received upto 1400 Hours (P.M) on the said due date and be opened on the same day at 14.30 Hours (P.M). Tenders received after 1400 Hours (P.M) would not be opened and returned to bidder unopened. The times indicated are Indian Standard Time (IST).
- 2.3 Offer shall be made in two parts in separate envelopes, as specified below and these covers shall be put in a single cover duly super-scribed with tender reference and due date of opening..

(A)Part-I: Techno-Commercial Bid

This part shall consist of the following documents in a separate envelope:

- Qualification criteria compliance as per the format given in Annexure-I duly signed by Authorized signatory with all the support documents for proof/record.
- The Scope, Terms and Conditions as per the format given in Annexure-II, duly signed by Authorized signatory.
- Technical Specifications as per the format given in Annexure-III duly signed by Authorized signatory.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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- d. The General Terms and Conditions as given in Annexure-IV, duly signed by Authorized signatory.
- e. Price Bid without price/values as per Annexure-V duly signed by Authorized signatory.
- f. All the other documents as mentioned in Checklist of formats referred in Clause-10 of this document.
- g. Detailed Solution document which contains the Project Plan & methodology of execution.
- h. Complete BOM with product part number and quantity.

(B)Part-II: Price Bid

This part shall consist of the following documents in a separate envelope:

- a. Price Bid as per the format defined in Annexure-V. The prices shall be quoted in Indian Rupees only.
- b. Price Bid shall not contain any technical details and / or Techno-Commercial terms and conditions.

(C) Bidder should submit the offer in a sealed envelope which would contain two separate sealed envelopes of Part-I(Techno-commercial bid) and Part-II (Price bid).

2.4 Mode of Signature

Tenders shall be signed by persons duly authorized / empowered to do so. Certified copies of such authority and relevant documents shall be submitted along with the tenders. The Declaration (see FORM-H) shall be signed by the duly authorized person.

One more original of the authorization letter should be kept in the PART-I. Authorizations received by fax/email would not be acceptable.

3. MARKINGS ON THE ENVELOPE

- 3.1 The two part of the offer – Part-I and Part-II – shall be submitted in separate envelopes with bidder's distinctive SEAL and super-scribed with the details given below. These covers shall be put in a single cover duly super-scribed with tender reference and due date of opening.

PART-I: 1. Enquiry Number and Item Description for the Tender (“CAMPUS WIDE LOCAL AREA NETWORK UPGRADATION”)

2. Due Date for Opening of the Tender

3. “PART-I: TECHNO-COMMERCIAL BID”

PART-II: 1. Enquiry Number and Item Description for the Tender (“CAMPUS WIDE LOCAL AREA NETWORK UPGRADATION”)

2. Due Date for Opening of the Tender

3. “PART-II: PRICE BID”

Note: Un-sealed envelopes and envelopes not super-scribed as above will be liable to be rejected.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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4. BID SUBMISSION

- 4.1 Bids shall be addressed to the BHEL official inviting Bids and sent to the following address on or before the tender due date:

Sr. Dy. General Manager, Purchase,
Admin Building,
BHEL, RANIPET,
TAMILNADU – 632406.

Bids can also be dropped in tender box provided in purchase department on or before the tender due date.

5. BID OPENING

- 5.1 PART-I (Techno-commercial bid) shall be opened on the due date and time as specified in the Enquiry, in the presence of bidders who may like to attend. Part-II (Price Bid) shall be opened only for such offers, which have qualified in PART-I.
- 5.2 In case of Price Bid opening, date and time of Price Bid (Part-II) opening shall be intimated to the technically and commercially acceptable bidders only.
- 5.3 One representative will be permitted to be present for the tender opening. Persons attending the bid opening should have authorization letter.
- 5.4 Standard pre-printed conditions of the bidders attached to the offer will not be considered and only those mentioned in the body of the offer will be considered.
- 5.5 Unsolicited bids shall not be entertained.
- 5.6 No Literature, Pamphlets other than what is relevant for the offer shall be enclosed. All such enclosures shall be considered as unread and also will not be considered as part of the quotation.
- 5.7 BHEL reserves the right to negotiate the tender.
- 5.8 Reverse Auction (RA) / On –line bidding on internet**
- (a) At its option BHEL may choose to conduct a Reverse Auction (R/A) or bidding through the Internet for the price, instead of opening the sealed Price-Bids. This will be decided after technical evaluation and
- b) In case BHEL decides not to go for Reverse Auction procedure for the tender enquiry, the Price bids and price impacts, if any, BHEL shall be opened as per BHEL's standard practice.
- c) BHEL decision regarding this mode of bidding will be final.
- 5.9 All taxes and duties payable as extra to the quoted price should be specifically stated in offers. Offer from within India shall be submitted along with CST & TIN No. / Tariff No. etc, failing which the

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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purchaser will not be liable for payment of such taxes and duties. Our TIN No. 33243560005, CST No. 239383/11.06.91, BHEL ECC No. AAACB4146PXM008.

- 5.10 (a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
- (b) If there is an error in a total corresponding to the addition or subtraction of subtotals the subtotals shall prevail and the total shall be corrected, and
- (c) If there is a discrepancy between words and figures, the amount in word shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above
- (d) If there is such discrepancy in an offer, the same would be conveyed to the erring bidder with target date of one week, up to which the bidder would be allowed to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

5.11 If a supplier submits one envelope / cover containing all the bids or combined bids e.g. techno-commercial bid & price bid together, the bid is liable for rejection. The decision to accept such bids shall be the sole discretion of BHEL, which may be done by BHEL after segregating the bids so received.

6. VALIDITY OF OFFER

6.1 The offer shall have a minimum validity period of 180 days from Due Date for Tender Opening.

7. LANGUAGE AND CORRECTIONS

7.1 The offer shall be in English only.

8. ALTERATIONS, REJECTION OF BID AND OTHER CONDITIONS

- 8.1 BHEL reserves the right to accept or reject the technical offer at any stage of the tender with assigning reasons.
- 8.2 Any format not properly filled, partially filled or not filled will make the bid liable for rejection. Bidders are requested to note that all columns, rows and spaces provided to fill up the data must be filled with relevant data without fail. In case any bidder fails to do so or fills up irrelevant data, BHEL is not bound to seek clarifications on such items and will be free to reject the tender summarily.
- 8.3 In case, there is a discrepancy in the term quoted in techno-commercial bid and price bid, the term as per the techno-commercial bid (Part- I) shall hold good and the term quoted in the Bid (Part- II) shall not be considered.
- 8.4 In their own interest, all Tenderers are advised to double check their prices, applicable duties and taxes.
- 8.5 In exceptional cases, at the discretion of BHEL, in the event of the named representative (named in the Tender Document) is unable to come due to unavoidable circumstances, then an alternative

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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representative would be allowed, where the alternative representative should carry a revised original authorization certificate. Suppliers are advised to avoid such situations to avoid embarrassments on both sides

- 8.6 BHEL reserves the right to open the Price Bids, 'in-camera'. Intimation to this effect would be given to the Supplier by BHEL, before the opening of Price Bids.
- 8.7 At its option, BHEL may consider extending the due date/s for the tender openings. Sufficient notice would be given by BHEL for such extensions.
- 8.8 In the event of any change in scope arising out of the discussions, such bidders would have to submit their revised offer. The revised offer shall contain only the price addition/deletion for such change in the scope, over and above the original scope and price quoted. The original price quoted shall not be changed on account of the technical discussions. In order to arrive at the lowest offer BHEL will include cost of essential spares in the total cost unless specified in Technical Specification/Approved Scope otherwise.
- 8.9 BHEL reserves the right to conduct negotiations on the "Price" and "Other Commercial Terms and Conditions" with the lowest ranked bidder.
- 8.10 If so required by BHEL, Supplier may have to share their cost data / costing sheet with BHEL.
- 8.11 Where ever deviations on Standard Commercial Terms and Conditions of BHEL are quoted by the supplier, such deviations would be loaded with "Load-Factors" by BHEL, to arrive at the landed price to BHEL. These load-factors are provided in the "Standard Terms and Conditions". However, BHEL reserves the right to apply, alter, modify, change, delete some or all the load-factors. The decision of BHEL would be final and binding on the tenderer in this regards. This decision would be communicated to the tenderers before the Price Bid opening. The load-factors, as applicable then will be applied on the Prices, to arrive at the landed price to BHEL.
- 8.12 With respect to conformance to BHEL's Terms & Conditions, if any Supplier's offer is found to be not conforming to specific Terms & Conditions, BHEL will have the option of loading such offer with the highest quote submitted by other participating Supplier in the tender.
- 8.13 Equipment offered must have current certifications as detailed in relevant sections. Future expectations of certification, conditional certifications, variation in certification and certification for equipment different from the make and model offered in the bid is not acceptable.
- 8.14 No change in specifications, clauses of contract, Terms and Conditions etc shall be entertained by BHEL under any circumstances.
- 8.15 Late bids are not accepted and will be rejected.
- 8.16 The offer is liable to be rejected, if it is found after the Price Bid Opening that the format of Price Bid (without price values) submitted by the bidder, as a part of Part-I offer, is different from the Price Bid format quoted in Part-II.
- 8.17 If the bidder deliberately gives wrong information in his bid, BHEL reserves the right to reject such a bid at any stage or to cancel the Order/Contract and will take remedial action as given in the tender document.
- 8.18 If the Prices/Rates of one or more of the enquired equipments have not been quoted, the offer is liable to be rejected.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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- 8.19 Non-compliance with any of the requirements and instructions of the Tender Enquiry may result in the rejection of the bid.
- 8.20 Successful Bidder, will be issued a firm Letter of Intent (LOI).

9. TENDER EVALUATION

- 9.1 The offers will be evaluated based on the total cost for the entire scope of the tender.
- 9.2 Though offer of higher warranty/configuration/rating, than what is required as per tender specifications, may be accepted, no extra weightage or preference will be given for the same.
- 9.3 The offers shall be evaluated based on the total lease rentals for 5 year for the entire scope of the tender. AMC charges quoted after lease period will be considered.
- 9.4 Prices of optional items, if any, shall not be considered for Price evaluation and comparison, unless stated otherwise
- 9.5 Order/contract or any part thereof shall not be sub-contracted, assigned or otherwise transferred without prior written consent of BHEL.

Compliance: Accepted to comply all the above points

Name:

Signature of bidder with Date:

Company Seal

10. CHECKLIST OF FORMATS

TO BE ATTACHED WITH TECHNO-COMMERCIAL BID (PART I) DULY FILLED BY THE BIDDER

S No.	Annexure to be attached	Format attached as per FORM /Annexure	Whether Attached (Yes / No)
1	Qualification Criteria Compliance duly signed	Annexure-I	Yes/No
2	Scope, Terms and Conditions duly signed	Annexure-II	Yes/No
3	Technical Specification duly signed	Annexure-III	Yes/No
4	General Terms and Conditions duly signed	Annexure IV	Yes/No
5	Price format without prices, indicating the % of Statutory Levies / Taxes	Annexure V	Yes / No
6	Authorization letter from OEMs for -Network Actives - Network Passives	FORM-A FORM-B	Yes / No Yes / No
7	No Deviation Certificate	FORM-C	Yes / No
8	Details of major Executed projects with Order copies.	FORM-D	Yes / No
9	Details of Old Equipment to be bought back	FORM-E	Yes/No
10	Confirmation on not hold/delist/banned	FORM-F	Yes/No
11	Draft Lease agreement	FORM-G	Yes/No
12	Declaration	FORM-H	Yes/No
13	PBG format, Instructions and Banker Details	FORM-I	Yes/No
14	Integrity Pact duly signed	FORM-J	Yes/No
15	Detailed Solution document which contains the Project Plan & methodology of execution.	-	Yes / No
16	Complete BOM with product part number and quantity.	-	Yes / No

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

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FORM-A
(Network Actives)

“LETTER OF AUTHORITY CUM UNDERTAKING”

Date: _____

To,

Subject: **Letter of Authority cum Undertaking**

Tender Ref. No.: _____ dated _____

Dear Sir,

We hereby authorize _____ who will fulfill the requirements of the tender enquiry ref. no. _____, dated _____ to quote/ negotiate and service the equipment as required in the above tender enquiry.

This authorization is valid for the following equipment for which we are the OEM:

Our Spares Logistic centers in India are at the following locations:

We also undertake that we will not change the authorized agency during the tenure of the contract equipment supply period. This undertaking shall stand valid irrespective of any changed relationship between us and the authorized agency during this tender.

The authorized agency would ensure reliable service during complete lease period. **In case of any default, we will identify another authorized partner with similar certifications/capabilities and extend support to the new partner on the same terms and conditions as negotiated and finalized in this tender enquiry.**

(Authorized Signatory)

For _____

Place:

Date:

Note: This ‘Letter of Authority’ should be issued on the letterhead of OEM and enclosed in Part-I.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM-B
(Network Passives)

“LETTER OF AUTHORITY CUM UNDERTAKING”

Date: _____

To,

Subject: **Letter of Authority cum Undertaking**

Tender Ref. No.: _____ **dated** _____

Dear Sir,

We hereby authorize _____ who will fulfill the requirements of the tender enquiry ref. no. _____, dated _____ to quote/ negotiate and service the equipment as required in the above tender enquiry.

This authorization is valid for the following equipment for which we are the OEM:

1. _____
2. _____
3. _____
4. _____
5. _____

We also undertake that we will not change the authorized agency during the tenure of the contract equipment supply period. This undertaking shall stand valid irrespective of any changed relationship between us and the authorized agency during this tender.

The authorized agency would ensure reliable service during complete lease period. **In case of any default, we will identify another authorized partner with similar certifications/capabilities and extend support to the new partner on the same terms and conditions as negotiated and finalized in this tender enquiry.**

(Authorized Signatory)

For _____

Place:

Date:

Note: This ‘Letter of Authority’ should be issued on the letterhead of OEM and enclosed in Part-I.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM-C**NO DEVIATION CERTIFICATE**

This is to certify that our offer is exactly in line with your tender enquiry no. _____
_____ **dated** _____. This is to
expressly certify that our offer contains **no deviation** either Technical or Commercial in either direct
or indirect form.

Signed By:**Name:** _____**Designation:** _____**Organization:** _____**Date & Place:** _____**Phone/Fax/Mobile/Email:** _____**Stamp & Seal:** _____

Place:

Date:

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM- D**DETAILS OF ORDERS EXECUTED****(As per Qualification Criteria)**

S.No.	Organisation Name & Contact Person details	Type of equipment supplied	Details of Network
1			
2			
3			

Place:

Signature with seal

Date:

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM-E**OLD EQUIPMENT TO BE BOUGHT BACK**

Sl. No.	Equipment	Nos.
1.	Cisco 6006 Switch	1
2.	Cisco 4006 Switch	2
3.	Cisco 3548 Switch	10

Place:

Signature with seal

Date:

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM –F**Confirmation on not hold/delist/banned****(As per Qualification Criteria)**

With reference to the above tender we confirm that we have not been under hold or delist or banned by any of BHEL unit as on bid opening date for enterprise network.

Signed By:**Name:** _____**Designation:** _____**Organization:** _____**Date & Place:** _____**Phone/Fax/Mobile/Email:** _____**Stamp & Seal:** _____

Place:

Date:

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM-G

Contract Ref:

Agreement for LEASE RENTAL AND MAINTENANCE

This agreement made on this----- day of ----- 2012 between M/s -----, incorporated under Companies Act, 1956 and having its Registered office at ----- (hereinafter called the 'Company' which expression shall, unless it be repugnant to the context or meaning thereof, mean and include its successors and assignees) of the one part, and the BHARAT HEAVY ELECTRICALS LTD, Ranipet, TamilNadu – 632406, incorporated under the Companies Act, 1956 and having its Registered Office at BHEL House, Siri Fort, New Delhi (hereinafter called the 'BHEL' which expression shall, unless repugnant to the context or meaning thereof, mean and include its successors and assignees) of the other part.

Whereas 'Company' is in the business of manufacturing and/or selling and renting out equipment(s) and whereas the 'BHEL' has placed an order (No: -----) on Company for hiring Computer Network Equipment i.e. Network Switches and other equipment for a period of Five years as per the Lease Rental Contract (No: -----) and 'Company' has agreed to renting out the said equipment(s) to the 'BHEL' under the following terms and conditions.

Now, therefore, the agreement witnesseth as follows:

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

1. CONTRACT REFERENCE:

This Document shall be read along with the Lease Rental Contract '_____'. The Terms & Conditions of the Lease Rental Contract shall be fulfilled along with the clauses of this agreement.

SCOPE of CONTRACT (in Brief):

'Company' will design, supply, install, configure, test, commission and maintain the '**Campus Local Area Network upgradation**' on Five year lease rental basis in consideration of Lease Rental Payment as per Terms and Conditions of the Lease Rental Contract.

DEFINITIONS:

The following expressions herein used shall, unless repugnant to the subject or context thereof, carry the meaning hereunder respectively assigned to them namely

'CONTRACT' means the Lease Rental Contract referred in the Clause 1.0.

'EQUIPMENT' shall mean all the equipment supplied against the 'CONTRACT'.

'DATE OF INSTALLATION' shall mean the date given in the certificate of acceptance by 'BHEL' after the equipment is installed, commissioned & acceptance testing as per Terms & Conditions of the 'CONTRACT'.

'QUARTERLY LEASE RENTAL' means Lease Rental Payment for Three months and payable after completion of the quarter.

'TERMINAL PAYMENT' means the one time fixed charges as specified in 'CONTRACT', repaid by 'BHEL' at the end of the Lease Rental Contract.

Upon the payment of 'Terminal Payment', the ownership of the entire equipment is transferred to 'BHEL' and 'Company' has no right on the Equipment.

'On site facilities' shall mean suitable dust free accommodation at 'BHEL' premises to house the equipments with power connection, air-conditioning, as required.

2 **Lease / Prices**

- 2.1 The lease period shall be 5 years and it will start after issue of Commissioning Certificate by BHEL, Ranipet.
- 2.2 Quarterly lease rental charges become payable at the end of each quarter after certification by BHEL, Ranipet. Bidder shall submit the invoice in triplicate after each quarter. 100% quarterly payment will be made available within 45 days from the date of submission of invoice. Deduction of downtime if any shall be made from quarterly lease rental value as per SLA given in this document.
- 2.3 **Loading factor for non-acceptance of BHEL Payment Terms:** Offer with deviations to BHEL Payment Terms will be loaded at the TT selling Rate of SBI + 2% for the period of relaxation sought by bidder for deviated amount for the purpose of evaluating the lowest bidder. Offers with advance payment or any other payment method like payment through an letter of credit, hundi payment or direct payment less than 30 days of submission of verified invoices will be rejected. In no case BHEL shall accept liability towards any interest payments.
- 2.4 Prices shall remain firm without any variation during contract period. No interest whatsoever shall be payable by BHEL on any amount due, to the vendor.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- 2.5 Lease charges are all inclusive of regular hardware, maintenance, support, interest, etc. Taxes and duties by central government and state government shall be quoted extra. Quarterly lease charges indicated in the price bid format (Annexure-V) for all the items shall remain firm and fixed without any variation during the contract/lease period of 5 years.
- 2.6 In case the government (Centre/ State) imposes any new taxes/ duties on the output services/ work after the award of contract, the same shall be reimbursed by BHEL at actuals. All necessary documents as required by BHEL shall have to be provided by the Bidder. However, in the event of delay in work execution attributable to the Bidder, the new taxes/ duties imposed during the delay period shall not be reimbursed to the Bidder. BHEL's decision in this regard shall be final.
- 2.7 In case the government (Centre/ State) changes the taxes/ duties on the output services/ work after the award of contract, the same shall be reimbursed by BHEL at actuals. All necessary documents as required by BHEL shall have to be provided by the Bidder. However, in the event of delay in work execution attributable to the Bidder, the changes in the taxes/ duties imposed during the delay period shall not be reimbursed to the Bidder. BHEL's decision in this regard shall be final.
- 2.8 The vendor shall be responsible for payment of excise duty, custom duty, all other state/central/local govt. taxes, freight and insurance up to equipment-installation-sites in BHEL Ranipet and during the lease period.
- 2.9 The Bank guarantee shall be paid along with the acceptance of order. The Bank guarantee shall be equivalent to 10% of the value of the lease rental contract and valid for the complete lease period. Refer Form –I of Annexure-IV.
- 2.10 Offers with Non-acceptance of Performance Bank Guarantee valid for the complete lease period or acceptance of Performance Bank Guarantee with lesser percentage or lesser period than specified will be rejected.
- 2.11 The Bank Guarantee (PBG) shall be released only on expiry of the claim period, provided there has been no claim by BHEL on the Supplier.
- 2.12 The insurance coverage should be comprehensive with provisions for theft, fire, floods, riots etc. The responsibility for the insurance will rest with the vendor. Evidence of insurance policy shall be submitted to BHEL. Insurance coverage for bidders employees posted at BHEL, Ranipet is also in bidder scope.
- 2.13 In case of any taxes which are reimbursable to BHEL in form of Cenvat etc. will be considered for payment.
- 2.14 BHEL may go in for additional quantity of equipment/software. The vendor shall extend the same rates for 12 months from the date of PO for the additional equipment / software to be installed at BHEL Ranipet. Any requirement after 12 months from the PO date will be subject to mutual consent.
- 2.15 The benefit of depreciation under IT act and other related statutory provisions for the equipment supplied by the vendor under this contract will be claimed by BHEL after capitalisation of goods in its books. The vendor will furnish all relevant documents to enable BHEL to claim benefit of depreciation.

3 Delivery

- 3.1 The vendor shall deliver the equipment within 10 weeks of the placement of order and install the active components within 18 weeks of the placement of order and commission the whole network within 20 weeks of the placement of the order.
- 3.2 BHEL reserves the right to ask for a delayed delivery of a part of network equipment.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- 3.3 Hardware/software configuration shall be deemed as incomplete or undelivered, if any component of hardware or software within the configuration or main documentation related thereto is not delivered and if delivered is not operational or not acceptable after testing/examination.
- 3.4 **Liquidated Damage (LD):**
In case the delivery, installation and successful commissioning schedule for the Equipment is not adhered to, penalty at the rate of 0.5% of the amount equivalent to four quarterly rentals of the goods in arrears per week (subject to a maximum of 15%) shall be levied by BHEL on the vendor.
- 3.5 This penalty will be deducted from the first quarter rental charges, in case the penalty amount to be deducted is more than the first quarter rental charges, the same will be adjusted from the consecutive quarter.
- 3.6 **Loading Factor for non-acceptance of Penalty Clause:** Will attract maximum 15% loading on the offer and accordingly proportionate percentage will be loaded for accepting lesser percentage of penalty clause. Example: If the Supplier has accepted for maximum 2% penalty clause, then balance 13% will be loaded for evaluating lowest bidder.
- 3.7 **Risk Purchase**
Alternatively, BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the bidder has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available from the best and the nearest available substitute. The bidder shall be liable for any loss which BHEL may sustain by reason of such risk purchases. .

4 Scope of Work

Migration of existing 1Gbps campus network to high speed 10Gbps backbone network on 5 year lease rental basis consisting of following:

- 4.1 Supply, installation, testing, commissioning and maintenance of networking, security equipment, desktop video conference, software and passives as per specified configuration including Inter VLAN routing, Multitrunk linking, network segregation, firewall configuration, separate security zones etc.
- 4.2 Supply, installation, testing and commissioning of Computer Systems along with system software for infrastructure management, like network & security management.
- 4.3 LAN/WAN IP schemes proposal & configuration.
- 4.4 Integration of existing infrastructure (routers/firewall etc) with the new setup.
- 4.5 Supply, installation, testing, commissioning and maintenance of UPS at various locations. All UPS batteries to be changed after 2.5 years and also as and when they fail. All the UPS batteries shall be replaced in the last quarter of the lease contract. Electrical work along with the required cables and accessories to connect the UPS with the switches is in vendor's scope.
- 4.6 Supply and installation of racks for mounting of network equipment & Computer Systems including dressing of cables in the racks using cable managers with Velcro.
- 4.7 Supply, laying, termination, testing and maintenance of Fiber Optic cable, UTP cable.
- 4.8 Replacing the existing Cat 5E cables to Cat 6 cables.
- 4.9 Repairing/replacing any fiber/UTP during full lease period, cut due to any reason whatsoever, will be done by the vendor. BHEL shall not bear any cost for the same.
- 4.10 Supply and installation of all passive components including I/O, Back boxes, Light Interconnect Units (LIUs), Patch panels, Patch cords, connectors etc required to complete the work on structured cabling concept.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- 4.11 Supply of all cable laying accessories including GI/MS conduits, PVC pipes/channels, supporting structures, clamps, identification tags, ferules, cable route markers etc required for laying of cables. The vendor shall include in his scope, any digging work required for laying of cables.
- 4.12 Minor civil works such as chipping / cutting of floors for making grooves, making holes/opening through walls, ceiling or floors, drilling of holes through steel structures and frames, grouting of frames, hooks on walls/ceiling etc. required for execution of work. After erection, surface shall be made good by plastering / painting to their original shape and finish. Road cutting, if any, shall also be resurfaced and brought to their original shape and finish.
- 4.13 Civil works required for OFC laying across National Highways and Railway track should be included in vendors scope.
- 4.14 Dismantling of existing networking equipment after successful testing & commissioning of the proposed network. The existing networking equipment shall be bought back by vendor.
- 4.15 Training on Network administration at OEM/OEM certified centre premises as well as on site, as per mutually agreed training plan.
- 4.16 Supply of all relevant documents/drawings/test certificates and manuals (two sets of Hardcopy as well as on CD).
- 4.17 Acceptance Testing based on mutually agreed ATP document.
- 4.18 Comprehensive maintenance of entire network equipment/passive including existing network passives which shall become the part of new network for entire 5 year lease period.
- 4.19 BHEL's involvement during each stage of implementation shall be ensured by the vendor.
- 4.20 Wherever possible, existing passive components such as fiber and copper can be reused.
- 4.21 Vendor should demonstrate the 10 gigabits network functioning as a system.

5 Installation

- 5.1 The vendor shall nominate a Project Manager who on behalf of the vendor shall coordinate and be responsible for all the activities related to execution of the order for establishing the network at BHEL. He shall act as an interface between the vendor and BHEL. The project manager shall:
 - Carry out detailed site inspection
 - Prepare Bill of Material for structured cabling system location wise.
 - Suggest additional site preparation requirement to BHEL not a part of the order.
 - Submit a complete layout plan for networking equipment and cabling system.
 - Submit the detailed project schedule in consultation with BHEL.
 - Monitor the progress vis-à-vis the project schedule.
 - Coordinate for all required help and inputs necessary for the execution of the contract.
 - Maintain logbook of the cabling work carried out.
 - Submit a detailed drawing of cable layout, position of nodes, switches etc.
 - Finalise the training requirement with the BHEL.
 - Finalise the acceptance test procedure with the BHEL.
- 5.2 Any equipment, fitting, material, software or supplies which may not be specifically mentioned in the specifications but which are necessary for carrying out the contract works within the scope of the tender are to be provided for and rendered to by the vendor. Such items not quoted by the vendor, if found necessary during execution of the contract, shall have to be supplied at no extra charge by the vendor.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- 5.3 The vendor shall provide the following certificates along with the equipment at the time of supply:
- Certificate of newness of the equipment
 - Test Certificate of the equipment/fiber/UTP
 - Performance warranty certificate (at least 15 years) of the structured cabling from OEM
 - The cabling system installed by the vendor shall meet the specifications as prescribed in ANSI/EIA/TIA, ISO 11081 standards and to that effect shall submit a certificate after the completion of the work that the work has been done as per standards.
- 5.4 The vendor shall ensure that the structured cabling system work is carried out by an experienced, registered and certified contractor of the proposed system. The technical support staff engaged by the contractor shall be experienced and approved by the structured cabling system solution provider.
- 5.5 The vendor shall supply at least one licensed set of manuals for each equipment/software at no extra cost.
- 5.6 Migration from the current network setup to new network setup should be done such that the entire Network downtime should be less than 24 hours, where segmented downtime also should be minimal and without affecting the operation and business continuity. The migration can be planned in phased manner to achieve the minimal downtime and business continuity. Migration process will include, but not limited to, migrating the network connectivity of users/desktop/links/servers/routers from the existing switches to the new core/distribution/access switches as per the design.
- 5.7 Any temporary make shift arrangement like shifting of switches, rerouting of Fiber and UTP, etc., which are required during migration work is in vendor's scope.

6 Acceptance Test Procedure

- 6.1 The vendor shall submit project completion report to BHEL once the network is established so that acceptance test can be carried out. All manuals, accessories etc. will be handed over by vendor to BHEL.
- 6.2 The vendor shall submit the acceptance test document to BHEL during the design phase itself and this document will include all the tests to be carried out on each hardware / software installed.
- 6.3 The vendor shall submit the detailed documentation of network including cabling layout, equipment location and bill of material etc. prior to start of the acceptance test. The vendor shall give all documents in computer format.
- 6.4 The acceptance test which involves running standard vendor tests and/or BHEL tests and the operations of the complete network will be for 10 days after completion of installation. This will also include the testing of all the software quoted by the vendor.
- 6.5 All the software offered, shall be loaded completely and made functional in all respects before the start of the acceptance test by the vendor. Vendor shall demonstrate all the features of the equipment/software and show that equipment/software is performing as per specified configuration.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- 6.6 If any equipment fails during the acceptance test, it will be replaced by the vendor and the acceptance test on the replaced equipment shall be performed afresh.

7 Training

- 7.1 Training of BHEL personnel shall be part of the contract. During installation at BHEL, the associated BHEL engineers shall be guided on the configuration being made and usage. Advanced level training shall be provided by OEM / authorized training partner at OEM Place /OEM certified training centre. BHEL will nominate engineers. BHEL team shall get training for minimum 10 (ten) working days at Ranipet. Training shall be focused on fundamentals of networking/security in general and supplied equipment in particular. It should be based on standard certification programmes of OEM's equipment.

- 7.2 The training should include the following areas:

- Introduction to Networking Technologies
- Interconnecting Network Devices
- Implementing Multilayer Switched Networks
- Internetwork Troubleshooting
- Wireless LAN Fundamentals
- Security & Monitoring
- Network Management Solution
- Structure Cabling Solution
- OFC Solution

8 Warranty, Maintenance & Support

- 8.1. The vendor should be able to provide the support for quoted network active technology and the equipment for a minimum period of 8 years. Vendor shall give commitment letter in this regard. Vendor shall warrant that spare parts of the equipment shall be available for minimum period of 8 years after completion of the acceptance test.
- 8.2. The vendor shall maintain the network after completion of 5 year lease period, if BHEL desires so, on the same scope, terms & conditions as during the lease period. The Annual Maintenance Charges subsequent to the lease rental period shall be quoted as a percentage of total outright purchase value of each item.
- 8.3. The vendor shall keep the sufficient spares to keep the network downtime at minimum.
- 8.4. The vendor shall provide comprehensive maintenance support on 24x7 hours basis by five OEM certified and trained resident engineers posted at BHEL Ranipet without payment of extra charges for maintenance and upkeep of network. All engineers shall be engineering degree holder with minimum two year experience in network maintenance and should hold OEM (network) certifications also. The resident engineers:
- 8.4.1. Shall observe BHEL working hours and BHEL holidays. BHEL working hours are 8AM to 4:30PM, 6 days a week. However at least one engineer shall always be available 24x7 hours on call basis in case of exigency. Out of these five engineers, one engineer should come in general shift (8:00 AM to 4:30 PM) and other four engineers should come in three shifts(First

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

- shift 6:00 AM to 2:00 PM, second shift 2:00 PM to 10:00 PM, third shift is 10:00 PM to 6:00 AM)
- 8.4.2. Maintenance during this period shall not be sub-contracted. The maintenance engineers posted at site shall be direct employees of the bidder.
 - 8.4.3. Shall change the resident engineers only after seeking permission from BHEL and arranging for proper substitute.
 - 8.4.4. Shall ensure network connectivity up to the desktop level.
 - 8.4.5. Shall have their own vehicles for movements and shall have mobile phones accessible from BHEL landline/mobile phones.
 - 8.4.6. Accommodation, boarding, transport and other logistics for these engineers are vendor's scope.
 - 8.5. Comprehensive maintenance shall include the following :
 - 8.5.1. Replacement of faulty equipment
 - 8.5.2. Installation charges
 - 8.5.3. Site inspection charges
 - 8.5.4. Cost of Maintenance Engineers
 - 8.5.5. Lease tax/right to use tax / any other statutory levies including service tax.
 - 8.5.6. Keeping sufficient spares to maintain the specified uptime.
 - 8.5.7. Shifting and installation of equipment from one location to another within BHEL campus without any extra cost to BHEL.
 - 8.6. The vendor should fulfill all statutory and safety requirements for personnel engaged while executing the contract. If BHEL has to incur any expenditure due to non-compliance of the applicable statutory provisions, the same will be compensated by the Bidder
 - 8.7 BHEL reserves the right to opt for continuation of maintenance support for the hardware and software at end of 5 year lease period by way of awarding AMC contract to bidder at the quarterly AMC charges quoted by bidder from 6th years onwards. Bidder shall agree to provide the AMC service for at least two years after the expiry of the 5 year lease period. The Technical terms of AMC shall be same that of maintenance support during the lease period. The payment for AMC will be made quarterly at the end of the each quarter.

9. Service Level Agreement (SLA)

- 1. Bidder shall be responsible for continuous and smooth operation of the LAN for the entire lease period.
- 2. Maintenance and services shall cover services, repairs and replacements necessary to keep the hardware and software in good working condition.
- 3. Bidder shall maintain sufficient spares, in BHEL Ranipet to ensure immediate attention in case of breakdown.
- 4. Uptime of 99.5% per month should be ensured for all the actives individually. Uptime is calculated on 24x7 basis.
$$\text{Uptime} = ((\text{Hours in the month} - \text{downtime hours}) / \text{Hours in the month}) * 100$$
- 5. In case the uptime is less than 99.5% for a particular month, deduction will be calculated as per the following scheme and the amount will be deducted from the quarterly lease rental:
$$\text{Deduction for the month for an item} = (99.5 - \text{uptime percentage}) / 100 \times \text{rental per month} \times \text{multiplication factor}$$

Where, the multiplication factor is calculated by,
For uptime $\geq 99.5\%$ multiplication factor = 0
For uptime $\geq 99.0\%$ and $< 99.5\%$ multiplication factor = 1

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

For uptime $\geq 98.5\%$ and $<99.0\%$ multiplication factor = 2

For uptime $\geq 98.0\%$ and $<98.5\%$ multiplication factor = 4

For uptime $\geq 95.0\%$ and $<98.0\%$ multiplication factor = 8

For uptime $< 95.0\%$ multiplication factor = 16

6. If non availability of an item affects availability of other items, then all such items will also be treated as down for downtime calculation
7. If an item has less than 95% availability continuously for 3 months then it shall be replaced with a new item and uptime is to be ensured at more than 95%. If majority items are having availability less than 95% continuously for more than three months and not rectified, BHEL reserves the right to terminate part or entire contract.

10. New / Better System

During the contract period of this rental agreement, if new / better computer systems are available and if desired by BHEL, the existing system shall be replaced by the vendor on mutually agreed terms and price.

11. Transfer of Ownership

The transfer of ownership of the equipment which is in efficient working condition and is also decided to be taken over by BHEL shall be automatically in favour of BHEL at the termination of the 5 year lease period on payment of token terminal payment of Rs. One only. The government taxes if any, and to the extent chargeable, shall be borne by vendor.

12. Claims

All the claims etc. lodged with the underwriters, if any, shall be dealt with by the vendor or Assignee directly.

13. Arbitration

Disputes, if any arising out of or in connection with this contract shall be resolved mutually, at the very first instant. In the event parties fail to amicably resolve the dispute within a period of 30 days of being communicated in writing by one party to the other, the same shall be referred to arbitration under the Indian Arbitration and conciliation Act, 1996 to be held at Ranipet. The unit head of BHEL/BAP, Ranipet or his nominee shall be sole arbitrator and the decision of the sole Arbitrator shall be final and binding on the both the parties hereto

14. Jurisdiction

All disputes or differences arising out of, under or in connection with this contract shall be subject to the exclusive jurisdiction of Ranipet courts only.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

15. Governing Law

15.1 This contract shall be governed in all respects by the Indian laws.

15.2 The Contractor shall comply with all the provisions of Applicable Laws, including any laws relating to the Project, statutory compliances, tax, labour law. The Contractor shall be bound to give all notices required by Applicable Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof. BHEL shall not be responsible for any reason whatsoever for the non-compliance by the Contractor of Applicable Laws.

16. Force Majeure

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, strike, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (herein after referred to as events), then provided notice of happening of any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by any reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

17. Confidentiality

Vendor shall, at all times, undertake to maintain complete confidentiality of all data, information, software, drawings & documents, etc. belonging to the BHEL and also of the Systems, procedures, reports, input documents, manuals, results and any other company documents discussed and/or finalized during the course of execution of the order/contract

18. Patents and TradeMarks

Vendor shall at all times indemnify BHEL against all claims which may be made in respect of the Systems/goods/Software supplied, for infringement of any right protected by patent, registration of designs or trademarks and legality of usage of Software. In the event of any such claims being made against BHEL, BHEL will inform the Bidder who shall at his own cost either settle any such dispute or conduct any litigation that may arise there from.

19. Non-Disclosure Agreement

Vendor shall sign an non-disclosure agreement as per BHEL format (copy enclosed) in compliance to Information Security Management System.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

20. Intellectual Property Rights

Vendor shall at all times indemnify the BHEL Ranipet against all claims which may be made in respect of the systems/goods/software supplied by the vendor, for infringement of any right protected by patent, registration of designs or trademarks and legality of use of software. In the event of any such claims being made against BHEL Ranipet, BHEL Ranipet will inform the vendor who shall at his own cost settle any such dispute or conduct any litigation that may arise there from.

21. Termination of Inquiry

- a) BHEL reserves the right to cancel any inquiry before opening of the tender, without assigning any reason.
- b) BHEL reserves the right to cancel any tender and refloat a fresh tender, at any time after opening of the tender, in case it finds the response to its tender as not meeting its requirement. This shall be at the sole discretion of BHEL.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

22. Termination of Lease contract

BHEL reserves the right to terminate the Contract, at any stage during the period of the Contract based on the contractor's performance, by giving 30 days' notice in writing.

BHEL shall have the right to terminate this contract if:

- The contractor fails to provide services or contractual obligations in accordance with the SLA.
- The contractor suspends the performance of all or part of the services, or
- The contractor abandons the services, or
- The contractor becomes bankrupt or goes into receivership (or) liquidation or makes an assignment for the benefit of his creditors.
- In the event of termination of contract, the amount due to the Contractor as per contractual provisions after recovery of dues (from Contractor's pending invoices/ Security Deposit, as the case may be), shall be released to them.

23. Acceptance of Order

Bidder shall submit Letter of acceptance for the LOI/ Order/ Contract within 7 working days. This will be submitted along with the Bank guarantee.

24. Withdrawal from the Contract

In case the bidder withdraws the offer submitted by him/her after it is accepted by BHEL and fails to supply the goods as per the terms and conditions of the contract, or at any time repudiated the contract wholly or in part, BHEL shall be at liberty to cancel the purchase order and to recover from the bidder the extra cost and the other loss incidentals to the breach of contract on the part of the Bidder. BHEL may put HOLD or Delist or Ban the bidder as per BHEL Policy.

25. Limitation of Liability

The Vendor/Lessor's liability will be limited to the scope of this contract fully.

26. Integrity Pact

Bidder should submit the Integrity Pact along with the techno commercial bid, duly signed by the authorized signatory who signs the bid. The format of Integrity Pact is given in Form -J.

27. ENTIRE CONTRACT:

The Lease Rental Contract, No. _____ forms part of this Agreement along with the references mentioned therein.

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

This agreement and any amendments thereto shall be valid and binding upon 'Company' only if signed by the Authorised signatories of both 'BHEL' and 'Company'.

IN WITNESS WHEREOF, 'BHEL' has caused this agreement to be signed at Ranipet, the day and year first above written, while 'Company' has caused this agreement to be signed at Ranipet through its Authorised Signatory - under their stamp who are the only constituted attorneys for this purpose, the day and year indicated below against the execution on its behalf.

SIGNED & DELIVERED FOR & on behalf of the above named 'BHEL' by

Shri

its

at Ranipet this the day of , 2012

SIGNED & DELIVERED FOR & on behalf of the above named 'Company' by

its Authorized Representative

at Ranipet this the day of , 2012

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM –H**DECLARATION**

I/We, _____ hereby certify that, all the information and data furnished by me with regard to this Tender Notification dated are true and complete to the best of my knowledge. I have gone through the specification, conditions and stipulations in detail and agree to comply with the same.

I/We, further certify that I am / we are the duly authorized representative(s) of the under mentioned tenderer and a valid power of attorney to this effect is also enclosed.

I/We, hereby declare that I/We shall treat the Tender Documents, drawings, specifications and other records connected with the Project as secret/confidential and shall not communicate information / derived there from to any persons other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the same.

Bidder's Name & Address

Name &Signature of the Bidder (Seal)

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

FORM –I

PERFORMANCE BANK GUARANTEE (PBG) FORMAT

INSTRUCTIONS FOR PBG

AND

LIST OF BHEL BANKERS

Compliance: Accepted to comply all the above points

Name:

Company Seal

Signature of bidder with Date:

Bank Guarantee No. _____ Date _____

Banker Name _____ Bank Guarantee Value _____

Please affix Non-Judicial Stamp here
as per Stamp Act

BANK GUARANTEE

1. This deed of guarantee made this _____ day of _____ by

_____ (Bank's name, branch, place, address) (hereinafter referred to as 'the Bank') in favour of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "EHEL House", SIRI Fort, New Delhi - 110049) through its Boiler Auxiliaries Plant located at Ranipet - 632406, (hereinafter called "the Company").

2. WHEREAS the Company has entered into a contract with M/s. _____ (hereinafter called "the said Contractor", which term includes "suppliers" for the purpose of this guarantee), for supply of equipments and/or services by the said Contractor vide Contract No. _____, dated _____.

3. WHEREAS under the terms and conditions of the said Contract between the Company and the said Contractor, the said Contractor is to furnish a performance Bank Guarantee for due performance of the equipment to be supplied under the said Contract and for the fulfillment of all the terms and conditions of the said Contract.

4. WHEREAS the said Contractor have requested the Bank to offer a Guarantee and at their request, WE the Bank have agreed to furnish such Guarantee to the said Contractor.

.....2

Sign & Seal of the Issuing Bank

Bank Guarantee No. _____ Date _____

Banker Name _____ Bank Guarantee Value _____

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5. NOW, THEREFORE, WE the Bank do hereby undertake to pay the Company an amount not exceeding Rs. _____ (Rupees _____ only) against any loss or damage caused to or suffered or would be caused to or suffered by the Company by reason of any breach by the said Contractor of any of the terms and conditions contained in the said Contract.

6. We, the Bank, do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor of any of the terms and conditions contained in the said Contract or by the reason of the said Contractor's failure to perform the said Contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, the Bank's liability under this Guarantee shall be restricted to an amount not exceeding Rs. _____ (Rupees _____ only).

7. The Bank's liability under this Guarantee is absolute and unequivocal and we, the Bank, undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority and such payment under this guarantee shall not wait till the disputes, if any, have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority.

8. This Guarantee comes into force immediately and shall remain in full force and effect up to and including _____ (date) (including a claim period of 3 months after the date of completion of warranty period).

9. We, the Bank, further agree that, subject to Clause-8, the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged or till the Purchase Department of the Company certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractor and accordingly discharges this Guarantee.

.....3

Sign & Seal of the Issuing Bank

Bank Guarantee No. _____ Date _____

Banker Name _____ Bank Guarantee Value _____

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10. Unless a demand or claim under this Guarantee is made on the Bank in writing on or before the date specified under Clause-8 above, the Bank shall be discharged from the liability under this Guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank on or before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

11. For the purpose of Clause-10, any letter making claim or demand on the Bank by the Company lodged in person or dispatched by Registered Post or by Fax or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank on or before the date specified under Clause-8 above, shall be deemed to be the claim/demand in writing referred to above irrespective of the fact as to whether and when the said communication reaches the Bank.

12. We, the Bank, further agree that the Company shall have the fullest liberty, without our consent and without affecting in any manner our obligations hereunder, to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by virtue of any such variation or extension being granted to the said Contractor or for any forbearance, act or omission on the part of the Company or any indulgence by the Company to the said Contractor or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of so relieving us.

13. This Guarantee shall not become void due to any change in the constitution of the said Bank or the said Contractor.

14. The Guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the said Contractor, but shall in all respects and for all purpose be binding and operative until all payments of all moneys due or that may hereafter become due to the said Company are settled irrespective of any liability or obligation of the said Contractor under the said Contract.

15. It shall not be necessary for the said Company to proceed against the said Contractor before proceeding against the guarantor bank and the Guarantee herein contained shall be enforceable against the said Bank notwithstanding any security, which the said Company may have obtained or obtain from the said Contractor.

.....4

Sign & Seal of the Issuing Bank.

Bank Guarantee No. _____ Date _____

Banker Name _____ Bank Guarantee Value _____

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16. Any claim or dispute arising under the terms of this document shall be subject to the jurisdiction of the Courts at Ranipet, Tamilnadu.

17. The said Bank declares that it has powers to issue this Guarantee under the Bank's Memorandum and Articles of Association and the undersigned has full powers to do so on its behalf under the powers granted to him by the proper authorities of the said Bank.

18. We, the Bank hereby undertake not to revoke this Guarantee during its currency except with the previous consent of the said Company in writing.

In witness whereof we _____ (name of the Bank) have hereunto setout Bank Seal the _____ day of _____ month _____ year.

SIGN & SEAL OF THE ISSUING BANK

Sign & Seal of the Issuing Bank



BHEL BAP RANIPET

INSTRUCTIONS FOR BANK GUARANTEE

- 1.1 Bank Guarantee shall be issued by any one of BHEL's Bankers or any Nationalized Bank. Please refer to List of BHEL's Bankers enclosed.
- 1.2 If it is not possible, then BG can be issued by a Scheduled Commercial Bank with the prior approval of BHEL.
- 1.3 BG from Co-operative Banks is not acceptable.
- 2.1 Pre-printed BG Form of BHEL only shall be used.
- 2.2 Only the relevant information like Supplier Name, BG Value, Contract No., Validity etc. shall be typed in the pre-printed form and executed by Bank.
- 2.3 Special adhesive stamp of the required value shall be affixed on the 1st Page of the Form.
- 2.4 If Special Adhesive stamps are not available, then applicable stamp duty shall be paid at the Bank / Agency nominated by the concerned State Government to collect stamp duty, who will affix their signature, date and seal in the first page of the BG Form clearly marking it as "SPECIAL ADHESIVE" & "STAMP DUTY".
- 2.5 Stamp Duty for the BG shall be at the rate as applicable in the State where the BG is executed.
- 2.6 Bank seal shall be affixed on the special adhesive stamp.
- 3.1 The executing officer of the Bank shall indicate his name, designation and power of attorney number / signing power number etc. on the BG.
- 3.2 Any correction / overwriting on the BG shall be duly authenticated under the Seal and signature of the executing officer of the Bank.
- 3.3 Each page of the BG shall be duly signed/initialed by the executing officer of the Bank and the last page is to be signed with full particulars under the seal of the Bank.
- 3.4 Fax number, e-mail Address, contact person, phone number and complete postal address shall be indicated in the covering letter of the BG from Bank.
- 4.1 The validity of the BG shall cover a period of 18 months (or such other period as per purchase Order, if otherwise specified) from the last date of dispatch as per Purchase Order or actual date of last dispatch under the Purchase Order, whichever is later.
- 4.2 The BG shall have a claim period of 3 months. If no separate claim period is indicated in the BG, then the validity shall be 18 months (or such other period as per Purchase Order, if otherwise specified) plus 3 months.

- 5.1 No clause of the BHEL BG Form shall be altered, deleted or new clauses added by the Issuing Bank under any circumstances. Bank Guarantees with altered/deleted/added clauses will not be accepted by BHEL under any circumstances.
- 5.2 If the Issuing bank wants to add any additional clauses, it shall be intimated to BHEL well in advance with exact text of clause, which shall be subject to approval by BHEL Law Department. Those clauses specifically accepted by BHEL Law Dept. can be added in the last page of the BG Form and executed by Bank.
- 6.1 Bank Guarantee shall be forwarded by Issuing Bank directly to Accounts Officer/ Stores Bills, BHEL/BAP, Ranipet-632406.
- 6.2 If it is not directly forwarded to BHEL due to unavoidable circumstances, then the Issuing Bank shall send a letter directly to BHEL confirming the issue of the BG enclosing a photocopy of the Original BG.
- 6.3 The Bank Guarantee should not be routed through Bank along with other dispatch documents under any circumstances.
- 7.1 In case of any extension of a BG the same shall be executed on non-judicial stamp paper of the required value.
- 7.2 Only the due date and claim period shall be extended.
- 7.3 The extension should not result in alteration of any material facts of the BG.

Bank Guarantees executed as per the above instructions only shall be accepted at our end. Hence kindly ensure compliance with the above instructions for early processing of the bills and to avoid hold up of the bills.



**LIST OF BHEL'S BANKERS
FROM WHOM BANK
GUARANTEE IS TO BE OBTAINED**

Sl. No.	Name of the Bank
1.	State Bank of India
2.	ABN AMRO Bank N.V.
3.	Bank of Baroda
4.	Canara Bank
5.	CITI Bank N.A.
6.	Duestche Bank AG
7.	HDFC Bank Ltd.
8.	ICICI Bank Ltd.
9.	IDBI Bank Ltd.
10.	Punjab National Bank
11.	Standard Chartered Bank
12.	State Bank of Hyderabad
13.	State Bank of Travancore
14.	The Hongkong and Shanghai Banking Corporation Ltd.

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at “BHEL House”, Siri Fort, New Delhi – 110049 (India) hereinafter referred to as “The Principal”, which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as “The Bidder/ Contractor” which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
 - 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in

order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidders(s)/ Contractor(s) from the tender process or take action as per the separate “Guidelines for Suspension of Business Dealings with Suppliers/ Contractors” framed by the Principal.

Section 4 – Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

- 6.1 The Bidder(s)/ Contractor(s) undertake(s) to demand from his sub-contractors a commitment consistent with this Integrity Pact. This commitment shall be taken only from those sub-contractors whose contract value is more than 20% of Bidder's/ Contractor's contract value with the Principal.
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- 8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or

take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

- 9.1 This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.
- 9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.
- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal
(Office Seal)

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place-----

Date-----

Witness: _____

(Name & Address) _____

Witness: _____

(Name & Address)_____

Price Bid	
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1	Price bid has been divided into 5 parts i.e. part A to E. Part A consists of items which are to be procured under lease. Part B consists of maintenance of existing passives. Only maintenance charges & taxes are to be given for part B. Part C is for one time charges of cable laying & testing. Part D is for buyback value of old items offered by bidder. Part E is for AMC value of network after 5 year lease is over.
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2	The lease charges are to be quoted for financial lease for 60 months, payable at the end of quarter.
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3	The comparative statement will be on total lease (col h) of part A & B payable in 5 years on full scope of supply and one time charges (Cable laying & Testing) of Part C. AMC charges of part-E will be considered for Comparative statement purpose
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-	Service tax (payable to BHEL as cenvat) will be subtracted for comparative statement
-	The bookbuck value of old items in col. D will be subtracted in the comparative statement

5	The buyback value of old items in col. D will be subtracted in the comparative statement
6	All values to be quoted in Rupees

All values to be quoted in Rupees.					
Sl. No.	Item	Unit	Qty	Unit Price	Five years lease Rental charges

[illegible]

61	Velcro - Pack of 20 meters	No.	50									
62	Fixing of PVC Pipe / Casing & Capping on the wall and laying of UTP/Unarmored Fiber cable inside it	Mtrs	5900									
63	Fixing of HDPE pipe for outdoor cabling	Mtrs	50									
64	Fixing of MS / GI Pipe on steel columns /beams/ wall and laying of UTP/ Fiber Unarmored cable inside it	Mtrs	4000									
65	Installation of 12U Rack	No.	50									
66	Installation of 24U Rack	No.	13									
67	Installation of 42U Rack	No.	5									
68	Installation of 12/ 24 port Fiber LIU	No.	120									
69	Installation of 24 ports Patch panel (Straight / Angled)	No.	103									
70	Fiber Cable laying charges	Mtrs	35999									
71	UTP Cable laying charges	Mtrs	63135									
72	Cutting of hard surface like road, floor etc, digging of trench 300 X 800 mm, laying of fiber optic cable inside GI pipe / humed pipe, laying of brick, refilling of trench, and finishing with cement	Mtrs	100									
73	Cutting of soft surface like soft soil etc., digging of trench 300 X 800 mm, laying of fiber optic cable inside GI pipe / humed pipe, laying of brick, refilling of trench	Mtrs	20000									
74	Directional Horizontal Drilling across National Highway Road, Laying of fiber optic cable inside GI pipe / HDPE pipe	Mtrs	40									
D Buy back value of old items												
		Unit	Qty.		Amount in Rupees							
75	Buy back value of old items	Lumpsum	1 Set									

E Quarterly AMC Charges from 6th year valid for 2 years												
		Quaterly AMC charges (in Rs.) (A)	Applicable Taxes (in Rs.) (B)	Total Quarterly AMC charges (C=A+B)								
76	Quarterly AMC Charges for Active from 6th year valid for 2 years											
77	Quarterly AMC Charges for Passives from 6th year valid for 2 years											

NOTE:

Taxes and duties by central govt and state govt shall be quoted extra .Any statutory variation in taxes and duties levied by govt payable by the contractor for which rate, basis of charge and break up value of the tax/duty are indicated in price schedule will be considered.. All necessary documentary evidence shall be submitted by the contractor in support of their claim.