BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE RESEARCH & DEVELOPMENT DIVISION
VIKASNAGAR, HYDERABAD - 500 093, INDIA
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FAX : 91 40 23770698

ENQUIRY

RD:DP:MPX:F-04

To

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Pin

Email :

Attn. .

Enquiry No:	Enq Date:	Due Date:	Delivery By:
070863451	03-FEB-09	03-MAR-09	

PLEASE SUBMIT YOUR QUOTATION IN SEALED COVER SUPERSCRIBED WITH ENQUIRY NO, ENQUIRY DATE AND DUE DATE SUBJECT TO OUR TERMS AND CONDITIONS ENCLOSED, FOR THE FOLLOWING MATERIALS SO AS TO REACH US ON OR BEFORE THE DUE DATE BY 12 NOON. THE TENDERS WILL BE OPENED AT 2 PM ON THE SAME DAY

PLEASE GIVE REFERENCE OF ENQ NUMBER , ENQ .DATE AND DUE DATE IN ALL YOUR CORRESPONDENCE FOR PROMPT ACTION. IN CASE IF YOU ARE NOT MAKING THE OFFER PLEASE POST A REGRET LETTER AND RETURN THE DOCUMENTS.

SL NO	DESCRIPTION / SPECIFICATION	UNIT	QTY
1	SUPPLY, INSTALLATION AND MAINTENANACE OF A 700 NODE GIGABIT LOCAL AREA NETWORK (LAN) IN BHEL CORPORATE R&D ON FIVE YEARS LEASE BASIS. THE SCOPE OF WORK INCLUDES DESIGN AND PLANNING OF LAN, SUPPLY OF ACTIVE AND PASSIVE NETWORK COMPONENTS, INSTALLATION AND MAINTENANCE OF THE LAN DURING THE LEASE PERIOD. SPECIFICATION, TERMS AND CONDITIONS, COMPLIANCE SHEET ARE ENCLOSED. TECHNICAL COMPLIANCE STATEMENT IS AS PER ATTACHED FILE TECH-COMPLIANCE.DOC AND PRICE BID FORMAT AS PER ATTACHED FILE PRICE-BID.XLS. OFFERS PARTIALLY COMPLETE OR WITHOUT COMPLIANCE STATEMENT SHALL NOT BE PROCESSED. EARNEST MONEY DEPOSIT (EMD) : AN AMOUNT OF RS TWO LAKHS SHALL BE PAID BY PAY ORDER OR DEMAND DRAFT ONLY DRAWN IN FAVOUR OF BHEL R&D PAYABLE AT HYDERABAD SHALL BE SUBMITTED ALONG WITH OFFER. OFFERS WITH OUT EMD SHALL NOT BE ENTERTAINED. BHEL RESERVES TO PROCURE THE ITEMS BY REVERSE AUCTION.	NO	1

Please submit your offer in Two parts as per enclosed "General Terms and Conditions of enquiry & Contract for the purchase of Goods/ Services" in separate sealed covers as detailed below:

1) First cover shall contain a) Technical & Commercial bid, b) Compliance Statement, c) Un-priced Price bid, i.e. a copy of the Price bid with the price(s) columns left blank.

2) Second Cover containing Price bid.

If the Price bid is found to be different from the un-Priced Price bid in any way, the offer will be rejected.

3) Ensure your offer meets all specifications and terms of compliance. Incomplete Offers may be rejected.

Note:

1) ALL OFFERS MUST INCLUDE NAME OF CONTACT PERSON, PHONE NO, FAX NO, EMAIL ID. UNSIGNED/INCOMPLETE OFFER(S) ARE LIABLE FOR REJECTION.

2) Taxes & Duties quoted will be taken for cost evaluation & order placement and no change will be entertained later except in the case of changes made by the Government.

3) Changes in Taxes and Duties because of the changes in Turnover etc. will be to the supplier's account.

4) In case any Taxes/duties exempted, a self declaration for the same may be attached to the offer.

AS WE ARE ENGAGED IN R&D ACTIVITY "C" FORM WILL NOT BE ISSUED

PLEASE FILL UP THE ENCLOSED VENDOR REGISTRATION FORM AND SEND IT ALONG WITH YOUR QUOTATION. OTHERWISE YOUR QUOTATION WILL NOT BE CONSIDERED. (IGNORE THIS IF YOU HAVE ALREADY SUBMITTED THIS FORM)

Yours faithfully
for
BHARAT HEAVY ELECTRICALS LTD

RAMESH G
Sr Manager

Email: gramesh@bhelrnd.co.in

Establishment of a new Local area Network in Corporate R&D

BHEL Corporate R&D proposes to completely replace the existing 11 year old LAN infrastructure with a new one on a 5 year financial lease. BHEL, Corporate seeks offers from vendors to design, supply, install and maintain all required active and passive components, material and services as per the terms and conditions and specifications given in Annexure I and II.

The vendor should provide the following along with the technical bid:

1. Vendor should agree to the terms and conditions provided in Annexure I. He should submit a signed copy of these. Any deviations, reservations and remarks related to the terms and conditions should be clearly specified. Remaining silent on any issue will mean that he is accepting the terms and conditions specified by BHEL.

2. Vendor should provide information related to the prequalification criteria and technical specifications in the format provided in Annexure III.

3. All documents / certificates / Brochures / Catalogues in support of their compliance and technical specifications should be provided.

4. Refusal to provide information in the required format and to provide supporting documents may lead to the disqualification of Vendor's offer.

The vendor should provide the commercial bid only in the format provided in Annexure IV. Prices should be quoted item-wise. Consolidated price bids are not acceptable.

Annexure I - Terms & Conditions

1.0 General

1.1 The term vendor shall apply to successful tenderer. The vendor is the lessor and BHEL, Corporate Research & Development (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.

2.0 Lease Prices

2.1 The lease period shall be 5 years after the successful commissioning and acceptance of the complete system.

2.2 Lease payment will be paid on quarterly basis, at the end of each quarter. Deduction of downtime if any shall be made from quarterly lease rental value.

2.3 Prices shall remain firm without any variation during contract period.

2.4 Lease charges are inclusive of regular hardware maintenance support, all taxes and duties.

2.5 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 R&D and during the lease period. Tax structure related to Lease Charges shall be clearly mentioned separately and these taxes will be paid by BHEL on then prevailing rates.

2.6 The insurance coverage should be comprehensive with provisions for theft, fire, floods, riots etc. However, in case of any taxes which are reimbursable to BHEL in form of Cenvat etc. will be considered for payment. The responsibility for the insurance will rest with the vendor. Evidence of insurance policy shall be submitted to BHEL.

2.7 BHEL may go in for additional quantity of equipment/software. The vendor shall extend the same rates for 12 months for the additional equipment / software to be installed at BHEL R&D.

2.8 The benefit of depreciation under IT act and other related statuary 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.

2.9 The Lease Charges are calculated quarterly. BHEL agrees that vendor may assign the Lease Charges in favor of third party ("Assignee") and consents (subject to prior approval from BHEL) to such assignment of the Lease Charges by the vendor to the Assignee. BHEL agrees that the vendor may disclose any information or documents that it may consider necessary to help the vendor exercise these rights subject to NDA (Non Disclosure Agreement) clauses.

2.10 Pursuant to the assignment of the Lease Charges by the Vendor to the Assignee, all amounts payable to the vendor under this agreement by BHEL shall be payable by BHEL to the Assignee. Responsibilities and obligations of BHEL and the vendor under this Agreement shall remain unchanged, notwithstanding the assignment of Lease Charges in favor of the Assignee.

3.0 Delivery

3.1 The vendor shall deliver and install the components and commission the whole network within 22 weeks from the date of 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 is not delivered and if delivered is not operational or not acceptable after testing/examination.

3.4 In case the installation and successful commissioning schedule for the project could not adhered to due to fault of vendor, 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 5%) shall be levied by BHEL on the vendor.

3.5 If equipment is not delivered and commissioned to the satisfaction of BHEL as per schedule, BHEL shall have the discretion to enter into a contract/lease with another vendor at the risk and cost of the vendor without notice.

4.0 Scope of Work

4.1 Supply, installation, testing, commissioning and maintenance of networking / equipment / software / passives as per specified configuration including Inter VLAN routing, Multi-trunk linking, network segregation, separate security zones etc.

4.2 LAN/WAN IP schemes proposal & configuration.

4.3 Supply, installation, testing, commissioning and maintenance of DSLAM at central location and ADSL CPEs at various locations across BHEL R&D / Township. Copper lines for ADSL connectivity from central location to remote locations shall be provided by BHEL. Responsibility of maintaining these lines shall be of BHEL.

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, at the end of the lease and also as and when they fail.

4.6 Supply and installation of racks for mounting of network equipment & Computer Systems including dressing of cables in the racks using cable managers.

4.7 Supply, laying, termination, testing and maintenance of Fiber and UTP cables.

4.8 Repairing/replacing any fiber/UTP during full lease period will be done by the vendor. BHEL shall bear the cost if the failure can not be attributed to the Vendor, manufacturing defects or poor workmanship.

4.9 Supply and installation of all passive components including I/O boxes, LIUs, Patch panels, Patch Cords, connectors etc required to complete the work on structured cabling concept.

4.10 Supply of all cable laying accessories including, 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 the cables.

4.11 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.

4.12 Dismantling of existing networking equipment after successful testing & commissioning of the proposed network.

4.13 Training on Network administration at OEM / OEM certified centre premises and/or on site, as per mutually agreed training plan.

4.14 Supply of all relevant documents / drawings / test certificates and manuals (Hardcopy as well as on CD).

4.15 Acceptance Testing based on agreed ATP document.

4.16 Comprehensive maintenance of entire network equipment / passive which shall become the part of new network for entire 5 year lease period.

5.0 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.
- Project monitoring.
- 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 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 whole 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.

6.0 Acceptance Procedure

6.1 The Vendor shall submit project completion report to BHEL once the network is established so that BHEL can carry out the acceptance test. All manuals, accessories etc. will be handed over by vendor to BHEL.

6.2 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 soft copy also.

6.3 The acceptance test which involves running standard vendor tests and/or BHEL tests if any. The operations of the complete network will be observed for trouble free working for 10 days

after completion of installation. This will also include the testing of all the software quoted by the vendor.

6.4 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 are performing as per specified configuration.

6.5 If any equipment fails / hangs / crashes during the acceptance test for three times, it will be replaced by the vendor and the acceptance test on the replaced equipment shall be performed afresh.

7.0 Training

7.1 Vendor should arrange to impart training on areas covering

- Technical awareness of all equipment and software supplied and their functionalities
- Configuration, Trouble Shooting, Security and Deployment of Layer2 and Layer3 Networks

7.2 Training on NMS software. The training shall cover the installation & configuration of NMS, device configuration, VLAN management, network analysis, report generation and troubleshooting of network. Training shall cover all features of the NMS software.

7.3 Vendor is required to submit details of the proposed training.

8.0 Warranty, Maintenance and Support

8.1 The vendor should be able to provide the support for quoted network actives 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 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 should post one resident engineer in BHEL R&D in the first quarter of lease on all BHEL working days during BHEL working hours.

8.5 The vendor shall provide comprehensive maintenance support on 24x7 hours basis.

8.6 Comprehensive maintenance shall include the following :

- Replacement of faulty equipment
- Installation charges
- Site inspection charges
- Cost of maintenance Engineers if any
- Implementing changes to configuration of LAN components as and when required and backing up of all configuration information as per prevailing BHEL standards.
- Lease tax/right to use tax / any other statutory levies including service tax.
- Keeping sufficient spares to maintain the specified uptime.
- Shifting and installation of equipment from one location to another within BHEL campus without any extra cost to BHEL.

9.0 Downtime Penalty

9.1 The vendor shall maintain the overall uptime of network connectivity to minimum 99% during every quarter of the lease period. Downtime will start from the time the complaint was communicated to the vendor or his support executive.

9.2 There shall be no downtime due to mutually agreed scheduled maintenance of equipment, infrastructure or premises, power outage or application/computer malfunctioning. The period for which Vendor could not gain entry into BHEL premises for attending the complaint due to some reason will not be added to the downtime.

9.3 For each 1% fall of uptime from 99% for a quarter, 1% of maintenance component of the lease rental for the particular quarter multiplied by the penalty factor described below shall be deducted. The downtime calculation shall be based on 24x7 hours.

9.4 Downtime of network shall be the period (in hours) during which connectivity is not available on the network or part of network. If a failure does not affect the availability of the network due to redundant nature of the network, it will not contribute to the downtime calculation. The downtime factors for calculation of the penalty shall be as follows:

Category 1	0.5
Category 2	0.2
Category 3	0.025

Category 1 includes core switch

Category 2 includes distribution switches, aggregation switches, DSLAM

Category 3 includes Access Switches, Router, Firewall & IPS, ADSL CPEs, 5KVA UPS, 1 KVA UPS

Upper limit for the cumulative penalty factor will be 1.

9.5 Downtime calculation will be applicable for non-availability of Network services arising due of malfunctioning of switches, DSLAM, CPEs and malfunctioning due to manufacturing defects and poor workmanship in fiber, backbone UTP, fiber patch cords, converters, connectors etc.

9.6 If the uptime of a particular equipment/system falls below 95% continuously for 3 months, the equipment/system shall have to be replaced with the new equipment by the vendor without any extra cost to BHEL.

9.7 Downtime shall be calculated on the basis of log book.

9.8 In the case of any equipment/service being down, the same may be temporarily replaced by the vendor provided there is no loss of functionality/configuration in the network. The equipment/service shall be considered up in this case and no downtime shall be counted. All efforts shall be made by the vendor to limit such temporary replacements to less than 15 days else it shall be counted as down.

9.9 Example of Downtime Calculation:

If one core switch remains down for 30 hours (cumulative) in a particular quarter and total quarterly rental value for network is Rs. A.

Acceptable downtime in a quarter (in hours) = 0.01 * 24 hours * 91 days = 21.84 hours

Downtime factor of core switch = 0.5

Downtime in Rs. = (0.3 x A x (30-21.84)) / ((24x91)

10.0 Transfer of Ownership

The ownership of all passive components will automatically be transferred to BHEL at the end of the lease period. The ownership of those active components selected by BHEL for retention will be transferred to BHEL, on payment of a token amount Rs. 1.00 only along with taxes if any by BHEL.

11.0 Claims

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

12.0 Arbitration

All disputes or differences arising under, out of or in connection with this contract, shall be referred for arbitration by an arbitrator to be appointed by an officer, who is the administrative head of BHEL R&D. At present, the designation of administrative head is Executive Director. The award of arbitrator shall be final and binding on both parties. The arbitrator shall have power to extend time for arbitration proceedings and making of the award with the consent of the parties.

13.0 Jurisdiction

All disputes or differences arising out of, under or in connection with this contract shall be subject to the exclusive jurisdiction of the courts having jurisdiction over BHEL R&D.

14.0 Governing Law

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

15.0 Force Majeure

Neither BHEL nor the vendor shall be responsible for delays/failures in performance or downtime resulting from acts beyond the control of either. Such acts shall include but not limited to acts of god, strikes, lockouts, riots, acts of war, epidemics and governmental regulations superimposed after the agreement, fire, earthquakes and other such disasters.

ANNEXURE II - SPECIFICATIONS

TECHNICAL PREQUALIFICATION CRITERIA

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 for last 3 years. Authorization certificate from OEM to be submitted along with the bid.
2. Bidder shall be an existing network & security integrator of similar enterprise network setups for last 3 years.
3. The Bidder should have experience in executing Enterprise Networks. The Bidder should have successfully executed Enterprise networks during the last 3 years as on 31-12-2008, in any one of the following:

    a. Three Enterprise Networks, each order value of not less than the 1.5 Crores on Lease Rental or 100 lakhs on outright purchase basis

    Or

    b. Two Enterprise Networks, each order value of not less than 3 Crores on Lease Rental / 2 Crores on outright purchase basis

    Or

    c. One Enterprise Network order value of not less than 4.5 Crores on Lease Rental / 3 Crores on outright purchase basis.

    The implementations should be of the same OEM whose products are being quoted. Evidence in support of the above should be produced.

TECHNICAL SPECIFICATIONS

The proposed infrastructure shall be on 1 Gbps backbone in the core and Gigabit Ethernet at desktop level. The networking solution shall be based on three tier architecture as described below:

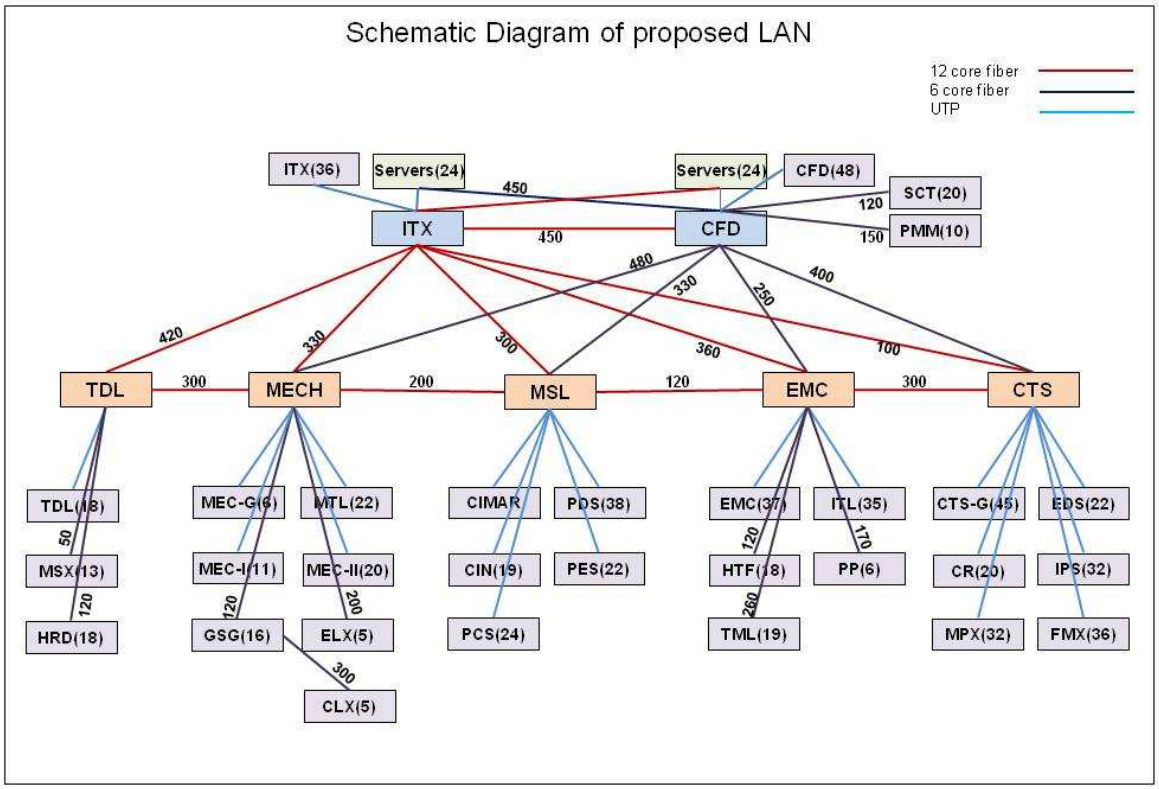
- One Full Layer 3 Core switch will be located in ITX Dept.
- Basic Layer3 Distribution switches will be located at important buildings. One of them located at CFD building will be a full Layer 3 switch and will work as a stand by core switch in addition to catering to distribution requirements.
- Access switches will be located in various departments and will connect directly to Information Outlets.
- xDSL solution is planned to provide connectivity to remote offices.

3.0 General Specifications

All 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.

1	The makes of active and passive components shall be enterprise grade, not SOHO products.
2	The active components must be UL listed / certified, passive components should be certified by UL / ETL / Pyramid / equivalent. Proof of the same should be submitted.
3	The makes and models / brands offered for network switches, passive components, racks shall be of OEMs who possess ISO / NQA (National Quality assurance) certification.
4	Entire switching solution excluding DSLAM, Router, Firewall & IPS appliance should be from one OEM.
5	Entire range of structured cabling components should be of the same make.
6	Shall produce proof of at least two campuses / sites of 700 nodes or above with the same OEMs for switching solution and structured cabling components.
7	Quantities mentioned against passive, work and service components are approximate. They will be billed as per actual quantities and measurements observed on site after completion of the project execution.
8	The active and passive systems, components offered should not be end-of-life products.
9	The bidder should have a 24 X 7 operational Technical Assistance Centre operating in India. Tie ups with third parties not acceptable.

Schematic diagram depicting the overall connectivity is given in figure 1 below:



3.1. Core Switch

Switches shall be Chassis based Multilayer Switching architecture with single CPU module and capable of redundant CPU modules. This core switch shall be placed at ITX.

Switches shall be with following specifications:

Hardware & Performance Requirements		
1	Architecture	Chassis based / Modular Multilayer architecture with sufficient modules/cards to fit required transceivers/UTP ports. Chassis shall have minimum 4 slots for line cards after providing for redundant supervisor modules.
2	System Throughput / Capacity	Backplane capacity should be 400Gbps or more and it is achievable with single Supervisor / Control Module
3	Switch Redundancy	The Switch 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	Switch should be supplied with 1 CPU Module. However Switch should support redundant CPU and 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.
5	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 etc. at their peak values as claimed in the Data Sheets of the Switch.
6	Switch Forwarding Rates (Layer 2)	The Switch should Support Minimum Switching (Layer 2) Performance of 210 Mpps. Performance should be hardware based.
7	Routing Capability (Layer 3)	The Minimum IPv4 Routing Performance with 1 Supervisory installed module should be 210 Mpps. Performance should be hardware based.
8	Backplane Connect Capacity	The Backplane should be 100% Passive.
9	10 Gigabit Ethernet Capability	The Switch should Support 10 Gigabit Ethernet modules from day one.
10	Power or Ethernet	The Switch should Support switching modules with POE
11	No. of 10/ 100/ 1000 BaseTX UTP Ports	48
12	No. of 1G Fiber Transceivers (1000Base-LX)	8
Connectivity & Filtering		
13	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports. Also Cross Module Link aggregation should be supported
14	Jumbo Frames	Jumbo Frames support up to 9K Bytes on Gigabit / 10 G Ports
15	Storm Control	Support for broadcast/unicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
16	802.1Q	Should support 802.1Q protocol
17	Type of VLANs	Should support port, subnet based VLANs
18	Voice VLAN	Should Support Voice VLAN for separating and prioritising VoIP traffic and Auto QoS feature to ensure that once QoS enabled on switch then there is no need to do QoS settings on each port

19	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
20	No. of VLANs	Should support minimum 4000 active VLANs
21	MAC Addresses	No. of MAC Address Supported: 32000
Layer 3 Functionality		
22	OSPF, BGP, RIP/RIP2	Should support OSPF, BGPv4, RIP/RIP2 from day one.
23	Ipv6 Support	Should support IPv6 from Day 1
24	Equal Cost Load Balancing	Should support Equal Cost Load Balancing
25	No. of Route Entries	Should support minimum 16000 Route entries
Security Features		
26	Access Control Lists	Should support Standard and Extended ACLs
27	Various type of ACLs	Should support various types of ACLs like port based/time based.
28	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
29	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
30	802.1X	Should support 802.1X Network Security and Authentication
31	RADIUS	Should have support for RADIUS
32	NAC	Should support integration with NAC solutions. Please provide list of NAC appliances those can be integrated.
Switch Redundancy		
33	Redundancy in Hardware	Should Have Redundancy for Power Supply, FANs and clocks to minimise unavailability of switch
34	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).
35	Hitless Software Upgrades	Should Support Hitless software upgrades to reduce downtime during software upgrade
Network Protocols		
36	HSRP or Equivalent	Should Support Hot Standby Routing Protocol or equivalent
37	PVSTP/PVRSTP	Support for Per VLAN STP and Per VLAN RSTP
38	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
39	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
40	Ingress/Egress Queuing	Should support Ingress/Egress Queuing
41	Traffic Policing	Should be able to limit traffic flows based on MAC Source/ Destination address, IP Source/ Destinations address, TCP/UDP port nos. etc
42	QoS Scheduling	Should support QoS scheduling with queues supported in hardware
43	Queues per port	Should support minimum 4 queues per port
44	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
45	VoIP	Should have support for IPT Solution
Multicasting		
46	Multicast	Should support H/W based IPv4 and IPv6 Multicasting
47	IGMP	Should Support IGMP v1, v2 , v3
48	Multicast Entries	Should support minimum 4000 entries
49	PIM	Should support Protocol Independent Multicast - Sparse Mode and PIM - SSM

Management		
50	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
51	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
52	Service / Security Modules	Should have a Firewall module providing min. 2 Gbps throughput
Software		
53	Software Version	Version of software for supplied switch should be latest release to support all required features
54	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
55	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

3.2 Distribution Switches

These switches shall be of Fixed Configuration Multilayer Rack mountable Switch of Wire speed and non blocking architecture and shall be of following configuration:

Hardware & Performance Requirements common to all Distribution Switches		
1	Architecture	Modular or Fixed Configuration Multilayer Rack mountable Switch of Wire speed and non blocking architecture. Rack mount kit to be provided along with the switch
2	Switch Redundancy	The Switch should support Redundant Power Supplies
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	Switching Fabric Capacity	The Switch should support a minimum of 30 Gbps of Switching Fabric Capacity.
5	Switch Forwarding Rates (Layer 2)	The Switch should Support Minimum Switching (Layer 2) Performance of 17 Mpps.
6	Routing Capability (Layer 3)	The Minimum Routing (Layer 3) Performance should 17 Mpps .
7	1000BASE –TX / LX / SX	Should support 12 nos. of 1000 Base TX / LX / SX Ports either built-in or through SFPs or Modules so that Fiber/Copper connectivity can be configured to suit user requirement by procuring required number Fiber/Copper modules. These modules will be included in the BOM.
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/unicast 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, protocol and subnet based VLANs
13	Voice VLAN	Should Support Voice VLAN for separating and prioritising 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 VLANs	Should support minimum 1000 active VLANs
16	MAC Addresses	No. of MAC Address Supported: 10000
Layer 3 Functionality		
17	RIP/RIP2	Should support RIP/RIP2
18	No. of Route Entries	Should support minimum 1000 Route entries
Security Features		
19	Access Control Lists	Should support Standard and Extended ACLs
20	Various type of ACLs	Should support various types of ACLs like port based/time based.
21	Detection of Attacks	Should support real time detection of DoS attacks, Hacker attacks from Internal/external sources
22	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
23	802.1X	Should support 802.1X Network Security and Authentication, Mac address / IP based port filtering support
24	RADIUS	Should have support for RADIUS
25	NAC	Should support integration with NAC solutions. Please provide list of NAC appliances those can be integrated.
Switch Redundancy		
26	Redundancy in Hardware	Should support Redundant for Power Supply
Network Protocols		
27	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
28	DNS, TFTP, NTP	Should support DNS, TFTP and NTP protocols
Quality of Service		
39	QoS Scheduling	Should support QoS scheduling with queues supported in hardware
30	Queues per port	Should support minimum 4 queues per port
31	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
Multicasting		
32	Multicast	Should support H/W based IPv4 Multicasting
33	IGMP	Should Support IGMP v1, v2 , v3
34	PIM	Should support Protocol Independent Multicast - Sparse Mode
Management		
35	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
36	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
37	Software Version	Version of software for supplied switch should be latest release to support all required features
38	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
39	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
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

3.21 Full Layer 3 Distribution Switch (Backup to Core Switch at CFD) – 1 No.

Additional Hardware & Performance Requirements Full Layer 3 Distribution Switches		
1	Redundant Power Supply	Should be supplied internal / external redundant power supply
2	Full Layer 3 Features	RIPv1, RIPv2, Built in OSPF or OSPF through Software upgrade

3.22 Basic Layer 3 Distribution Switch – 5 No.

Additional Hardware & Performance Requirements basic Layer 3 Distribution Switches		
1	Basic Layer 3 Features	RIPv1, RIPv2

3.3. Aggregation Switches

Modular or Fixed Configuration Multilayer Rack mountable Switch. All important servers shall terminate on these switches. One switch shall be placed in ITX and other switch shall be placed in CFD. Specifications shall be as follows:

Hardware & Performance Requirements		
1	Architecture	Fixed Configuration Layer 2 Rack mountable Switch. Rack mount kit to be provided along with the switch. Switch should support Redundant Power Supply
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 Fabric Capacity	The Switch should support a minimum of 30 Gbps of switching Fabric Capacity.
4	Switch Forwarding Rates (Layer 2)	The Switch should Support Minimum Switching (Basic Layer 3) Performance of 35 Mpps.

5	No. of Ports	The Switch should have minimum 24 nos. 10/100/1000BaseTX ports and 2 nos. of Gigabit Fiber Uplink slots. One of the fiber uplink ports should be loaded with 1000 Base LX module.
6	Type of ports	All Autosensing, Auto-negotiating, Auto-MDIX on all UTP ports
Connectivity & Filtering		
7	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports.
8	Jumbo Frames	Jumbo Frames support up to 9K Bytes
9	Storm Control	Support for broadcast/multicast/unicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
10	802.1Q	Should support 802.1Q protocol
11	Type of VLANs	Should support port, protocol and subnet based VLANs
12	Voice VLAN	Should Support Voice VLAN for separating and prioritising VoIP traffic
13	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
14	No. of VLANs	Should support minimum 250 active VLANs
	MAC Addresses	No. of MAC Address Supported: 8000
Security Features		
15	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address
16	DHCP Snooping	Should support DHCP Snooping to filter untrusted DHCP messages
17	802.1X	Should support 802.1x Network Security and Authentication
18	802.1x with VLAN Assignment/ Guest VLAN	Should support 802.1x with VLAN Assignment/Guest VLAN features
19	RADIUS	Should have support for RADIUS
20	NAC	Should support integration with NAC solutions
Network Protocols		
21	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
22	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
Quality of Service		
23	QoS Scheduling	Should support QoS scheduling
24	Queues per port	Should support minimum 4 queues per port
25	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		
26	Multicast	Should support H/W based IPv4 Multicasting
27	IGMP	Should Support IGMP v1, v2 , v3
28	Multicast Entries	Should support 4000 entries
29	PIM	Should support Protocol Independent Multicast - Sparse and dense mode
Management		
30	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
31	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
32	Software Version	Version of software for supplied switch should be latest release to support all required features
33	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
34	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
		IEEE 802.1p CoS Prioritization
		IEEE 802.3x Flow Control
		IEEE 802.3ad Link Aggregation

3.4 Access/Edge Switches

These layer-2 fixed figuration 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 Common to all Access Switches		
1	Architecture	Fixed Configuration Layer 2 Rack mountable Switch. Rack mount 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	No. of Uplink Ports	2nos. of dual purpose uplink ports (Choice of 10/100/1000 BaseTX and SFP based Gigabit port) to be used for copper or fiber uplink for those switches which require fiber connectivity or 2 nos. of 10/100/1000 Base TX uplink ports for copper only uplinking.
4	Type of ports	All Autosensing, Auto-negotiating, Auto-MDIX on all UTP ports
5	Redundancy	Should support redundant power supply except in 8 port Switch
Connectivity & Filtering		
6	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports.
7	Jumbo Frames	Jumbo Frames support up to 9K Bytes
8	Storm Control	Support for broadcast/multicast/unicast storm control to prevent degradation of switch performance from faulty end stations
Layer 2 Functionality		
9	802.1Q	Should support 802.1Q protocol
10	Type of VLANs	Should support port, protocol and subnet based VLANs

11	Voice VLAN	Should Support Voice VLAN for separating and prioritising VoIP traffic
12	VLAN Trunking Protocol or Equivalent	Should support VTP or equivalent protocol to reduce administrative burden of configuring VLANs on multiple switches
13	No. of VLANs	Should support minimum 250 active VLANs
14	MAC Addresses	No. of MAC Address Supported: 8000
Security Features		
15	MAC Address Filtering	Should Support MAC Address Filtering based on source and Destination address
16	DHCP Snooping	Should support DHCP Snooping to filter untrusted DHCP messages
17	802.1X	Should support 802.1x Network Security and Authentication
18	802.1x with VLAN Assignment/ Guest VLAN	Should support 802.1x with VLAN Assignment/Guest VLAN features
19	RADIUS	Should have support for RADIUS
20	NAC	Should support integration with NAC solutions.
Network Protocols		
21	STP	Should Support Spanning Tree Protocol, Rapid Spanning Tree Protocol, Multiple Spanning Tree Protocol
22	PortFast/ UplinkFast	Support for fast convergence features like PortFast/ UplinkFast
Quality of Service		
23	QoS Scheduling	Should support QoS scheduling
24	Queues per port	Should support minimum 4 queues per port
25	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		
26	Multicast	Should support H/W based IPv4 Multicasting
27	IGMP	Should Support IGMP v1, v2 , v3
28	Multicast Entries	Should support 4000 entries
29	PIM	Should support Protocol Independent Multicast - Sparse and dense mode
Management		
30	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
31	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch.
Software		
32	Software Version	Version of software for supplied switch should be latest release to support all required features
33	Software Updates	Software updates should be bundled for the entire contract period
IEEE Standards Compliance		
34	IEEE Standards	Ethernet: IEEE 802.3, 10BASE-T

3.41 48 port 10/100 Access Switch with 2 nos. of Gigabit copper uplinks

Hardware & Performance Requirements		
1	Switching Fabric / Back Plane capacity	13.6 Gbps
2	Forwarding rate	10 Mpps
3	10/100 Mbps ports	48
4	10/100/1000 Mbps Uplink ports	2 nos. of 10/100/1000Mbps combo / SFP ports loaded with UTP modules Required Fiber modules will be included in BOM suitably

3.42 24 port 10/100 Access Switch with 2nos. of Gigabit fiber uplinks

Hardware & Performance Requirements		
1	Switching Fabric / Back Plane capacity	8.8 Gbps
2	Forwarding rate	6.5 Mpps
3	10/100 Mbps ports	24
4	10/100/1000 Mbps Uplink ports	2 nos. of 10/100/1000Mbps combo / SFP ports loaded with UTP modules Required Fiber modules will be included in BOM suitably

3.43 24 port 10/100 Access Switch with 2 nos. of Gigabit copper uplinks

Hardware & Performance Requirements		
1	Switching Fabric / Back Plane capacity	8.8 Gbps
2	Forwarding rate	6.5 Mpps
3	10/100 Mbps ports	24
4	10/100/1000 Mbps Uplink ports	2 nos. of 10/100/1000 Base TX

3.44 8 port 10/100 Access Switch with 1 no. of Gigabit fiber uplink

Hardware & Performance Requirements		
1	Switching Fabric / Back Plane capacity	3.6 Gbps
2	Forwarding rate	2.5 Mpps
3	10/100 Mbps ports	8
4	10/100/1000 Mbps Uplink ports	1 no. of 10/100/1000Mbps combo / SFP port. Required Fiber module will be included in BOM suitably

3.5 Router

This Router shall be used to connect to 1 Mbps leased Internet circuit used for the purpose of hosting Email services, Name Servers etc. Specifications are as below:

Hardware & Performance Requirements		
1	Architecture	The router shall be modular in design for scalability
2	Flash & Memory	256 MB DRAM upgradeable up to 1GB and 64 MB Flash upgradeable up to 256MB
3	Ports & Interfaces	Router shall have 2 Nos. of 10/100/1000 Base TX Ethernet ports as per 802.3z specification. The ports shall support both half duplex and full duplex.
		The Router shall support WAN ports such as V.35 and G.703 (Clear Channel) interfaces for connecting to long haul carrier network.
		The Router shall support ISDN BRI, E1, E1 G703, E1 - DI (Drop & Insert), ADSL, SHDSL, Analog Modem interface, Ethernet Switch Interface
		Should have minimum of 5 slots and should have three free slots after the current port requirement
		Router should scalable up to twenty V.35 Ports
		Should have at least 2 internal slots and 3 DSP slots apart from the above to save the interface slots
		The router shall have Two V.35 WAN ports
		Should have minimum of 2 USB ports
		Router shall support a console port with RS-232 interface for configuration and diagnostic purposes.
4	Performance	The Router shall support aggregate packet forwarding rate up to 150 kpps for a packet length of 64 bytes.
		Should support hardware assisted encryption up to 35 Mbps
5	Availability	Shall support dual-redundant GE connection to Campus LAN
		Shall support Redundant Power Supply
		Shall support link aggregation using LACP as per IEEE 802.3ad
		It shall support fast reboot for minimum network downtime.
		It shall support boot options like booting from TFTP server, Network node and Flash Memory.
6	QoS Features	Classification and Marking: Policy based routing, IP Precedence, DSCP, MPLS exp bits
		Congestion Management: WRED, Priority queuing, Class based weighted fair queuing
		Traffic Conditioning: Committed Access Rate/Rate limiting
		Signalling: RSVP for Bandwidth reservation
7	Protocols	Shall support Routing protocols like RIP ver1 &2, OSPF ver2 , OSPF on demand, BGP4
		Should have Dual Stack IPv4 & IPv6 protocols.
		Shall support IPv6 features (DHCPv6, IPv6 QoS, IPv6 Multicast support, BiDirectional PIM, Multicast VPN, PIM SSM (Source Specific Multicast), IPv6 PIMv2 Sparse Mode, IPv6 PIMv2 Source-Specific Multicast).
		Shall support RIPng and OSPFv3 for IPv6
		Shall support MPLS Provider /Provider Edge functionality.

		MPLS VPN, MPLS mVPN (Multicast VPN), Support for VRF-Aware Services (NAT, FW, IPsec, Syslog), Carrier Supporting Carrier (CsC), DiffServ Tunnel Modes, MPLS TE (Fast re-route), DiffServ-Aware TE, Inter-AS VPNs).
8	Security Features	Should have GRE Tunneling, NAT, L2TP tunneling, without any major performance impact.
		Should support IPSEC Site-to-Site and Remote Access VPNs. Hardware based encryption. Any Office to Any other office, dynamic establishment of VPNs so that the configuration & management of IPSEC VPNs becomes easier. IPSEC VPNs should be able to carry data, voice, video multicast traffic.
		Should support Firewall, IPS & support for SSL VPN features. Support for customized IPS signatures.
		Support for tunnel less VPNs for very high scalability with support for routing protocols and multicast traffic
		MD-5 route authentication for RIP, OSPF, IS-IS and BGP
		SNMPv3 authentication, SSHv2
		AAA support using Radius and/or TACACS
		DoS prevention through TCP Intercept, DDoS protection
		IEEE 802.1x support for MAC address authentication
9	Multimedia Support	Shall support Voice capabilities
		Shall support Voice pass-through
10	Diagnostics Support	Router shall have built in power-on diagnostics system to detect hardware failures.
		Support for monitoring of Traffic flows for Network planning and Security purposes
		Display of input and output error statistics on all interfaces
		Display of Dynamic Arp table
		Trace-route, Ping and extended Ping
		Should have extensive support for SLA monitoring for metrics like delay, latency, jitter, packet loss, and MOS
		Support for MPLS OAM
11	Management	Shall have support for Web based management, CLI, Telnet, SNMP-V1, V2 and V3.
		Shall support Secure Shell for secure connectivity
		Shall support Out of band management through Console and external modem for remote management
		Should have accounting features
		Shall support RMON, MIB-I & MIB-II
		Shall support all MIBs pertaining to Routing protocols such as OSPF, BGP4 etc.
12	General	Router shall support 19” rack mountings.
		Router shall support software upgrade through Flash Memory
		Router shall support live software reconfiguration on the fly while on working, to implement without rebooting.
		Router shall be capable of working with 170 – 240 volts AC nominal at frequency 50±2 Hz.
		Router shall have LEDs or LCD panel for diagnostics to check the status of ports and modules.

3.6 Firewall & IPS

Hardware & Performance Requirements		
1	Hardware	The Firewall should be Hardware based, Reliable, purpose-built security appliance with hardened operating system that eliminates the security risks associated with general-purpose operating systems with minimum 4 interfaces
		The Firewall should be Hardware based, Reliable, purpose-built security appliance with hardened operating system that eliminates the security risks associated with general-purpose operating systems with minimum 4 interfaces The Appliance should be Full-featured, high-performance firewall and IP Security, Secure Sockets Layer (IPSec, SSL) VPN technologies deliver robust application security, user- and application-based access control, worm and virus mitigation, malware protection, and remote user/site connectivity.
		Should support Active/Active or Active/Standby Firewall for High Availability & Scalability
		Firewall Throughput of Up to 300 Mbps
		Concurrent Threat Mitigation Throughput (Firewall and IPS Services) upto 150Mbps
		VPN Throughput of Up to 170 Mbps
		Concurrent Sessions of at least 50,000
		Virtual Interfaces (VLANs) support for at least 100 VLANs for forming Secure server Farms and DMZs
		Scalability through VPN clustering and load balancing
2	Application Security	The Firewall should have Integrated specialized inspection engines for protocols like HTTP, FTP, ESMTP, DNS, SNMP, ICMP, SQL*Net, NFS, H.323 Versions 1-4, SIP, MGCP, RTSP, TAPI and JTAPI over CTIQBE protocol, GTP, LDAP, ILS, RPC.
		The Firewall should provide advanced inspection services to detect and optionally block instant messaging, peer-to-peer file sharing, and other applications tunneling through Web application ports
		It should be able to block popular instant messaging applications such as AOL Instant Messenger, Microsoft Messenger, and Yahoo Messenger
		Should be able to stop peer-to-peer file sharing applications such as KaZaA and Gnutella. Should be able to thwart tunneling applications such as GoToMyPC
		Support for SNMP version filtering for all SNMP traffic attempting to flow through security appliance, supporting filtering of SNMP versions 1, 2, 2c, and 3
		Support for port-hopping UNIX applications through stateful inspection and NAT services for Sun RPC and NIS+ sessions transactions that use Portmapper v2 or RPCBind v3 or v4
		Advanced H.323 inspection services that support versions 1-4 of the protocol along with Direct Call Signaling (DCS) and Gatekeeper Router Control Signaling (GKRCS) to provide flexible security integration in a variety of H.323-driven voice-over-IP (VoIP) environments
		NAT and PAT support for H.323 services, including advanced

		features such as fax over IP (FoIP) using the T.38 protocol, an ITU standard that defines how to transmit FoIP in real time
		Support for foundational capabilities to assist in detecting protocol and application layer attacks
		To provide TCP stream reassembly and analysis services to help detect attacks that are spread across a series of packets
		Should offer TCP traffic normalization services for additional techniques to detect attacks, including advanced flag and option checking, TCP packet checksum verification, detection of data tampering in retransmitted packets, and more
3	IPS Features	Protects your network from policy violations, vulnerability exploitations, and anomalous activity through detailed inspection of traffic in Layers 2 through 7
		Deliver a wide array of inline packet drop actions, including the ability to drop single malicious packets, all packets within a flow that contains multiple malicious packets, and all packets from the attacker's IP address
		Should support Traffic anomaly detection to provide anomaly identification for attacks that may cover multiple sessions and connections, using techniques based on identifying changes in normal network traffic patterns.
		Should support Protocol anomaly detection to identify attacks based on observed deviations in the normal RFC behavior of a protocol or service.
		Should support stateful pattern recognition to identify vulnerability-based attacks through the use of multipacket inspection across all protocols.
		Should provide traffic normalization, IP defragmentation, TCP stream reassembly.
		Should provide protection against Reconnaissance activity, misuse activity, file-sharing threats, DoS activity, Back Orifice, failed login attempts, and TCP hijacking
4	Network Containment and Control	Robust stateful inspection firewall services that track the state of all network communications
		Inbound and outbound access control lists (ACLs) for interfaces, time-based ACLs, and per-user or per-group policies for improved control over network and application usage
		Convenient troubleshooting tool that allows administrators to test and fine-tune ACLs without the need to remove and replace ACL entries
		Creation of security policies based on interface name instead of IP address, a feature that is especially useful in broadband environments where the external interface is typically assigned a dynamic IP address
		Powerful reporting and troubleshooting capabilities that help enable collection of detailed statistics on which ACL entries are triggered by network traffic attempting to traverse a security appliance
5	Secure Connectivity	IPSec remote-access VPN concentrator services for up to hundreds of simultaneous remote software- or hardware-based VPN clients
		Should be able to Push VPN policy dynamically to Easy VPN

		Remote-enabled solutions upon connection, eliminating the need to manage each client separately and therefore helping ensure enforcement of the latest corporate VPN security policies
		Should provide convenient method for authenticating VPN users through native integration with popular authentication services, including Microsoft Active Directory, Microsoft Windows Domains, Kerberos, LDAP, and RSA SecurID (without requiring a separate RADIUS server to act as an intermediary)
		Support for Internet Key Exchange (IKE) and IPSec VPN standards with hub-and-spoke or meshed VPN configurations
		Support for SSL VPN for mobile users, remote sites
		Scalable to support for SSL VPNs for up to 250 peers
6	High Availability	Support for Active/Active & Active/Standby failover
		Support for bidirectional state sharing between Active/Active failover pair members for support of advanced network environments with asymmetric routing topologies, allowing flows to enter through one Firewall appliance and exit through the other, if required
		Maximizing VPN connection uptime with Active/Standby stateful failover for VPN connections
		Support for Synchronizing all security association state information and session key material between failover pair members, providing a highly resilient VPN solution
		Enable geographic separation of Security appliances in a failover pair by allowing failover information to be shared over a dedicated LAN connection between failover pair members
7	Intelligent Networking	Enable creation of multiple security contexts (virtual firewalls) within a single security appliance, with each context having its own set of security policies, logical interfaces, and administrative domains
		Support for upto 5 number of virtual firewalls on the same hardware firewall. Providing a convenient way of consolidating multiple firewalls into a single physical appliance or failover pair, while retaining the ability to separately manage each of these virtual instances.
		Support for deployment of the Firewall in a secure Layer 2 bridging mode, providing rich Layer 2-7 firewall security services for the protected network while remaining "invisible" to devices on each side of it. Simplified appliance deployments in existing network environments by not requiring businesses to readdress the protected networks
		Support for multiple virtual interfaces on a single physical interface through VLAN trunking and multiple VLAN trunks per appliance
		Facilitate a wide range of multicast applications by including support for Internet Group Management Protocol (IGMPv2) and stub multicast routing, including NAT and PAT and the

		ability to build ACLs for multicast traffic
		Access control and deep inspection firewall services for native IPv6 network environments and mixed IPv4 and IPv6 network environments through dual-stack support
		IPv6-enabled inspection services for applications based on HTTP, FTP, SMTP, ICMP, TCP, and UDP
		Support for SSHv2, Telnet, HTTP and HTTPS, and ICMP-based management over IPv6
8	Management	Should support automatic updates to provide most up to date protection.
		Support for Built-in Management Software for simple, secure remote management of the security appliances through integrated, Web-based GUI
		Should provide a wide range of informative, real-time, and historical reports that give critical insight into usage trends, performance baselines, and security events
		Accessible through console port, Telnet, and SSHv2
		Strong authentication of users through the Firewall appliance through a local user database or through integration with enterprise databases, either directly using RADIUS or indirectly with AAA Server
		Prevention of unauthorized access to sensitive configuration data, certificates, and key material stored on the security appliance by automatically wiping flash memory contents if an asset recovery or password reset procedure occurs

3.7 DSLAM

This DSLAM shall be used to connect various maintenance offices/dispensaries spread across the township. Copper wires shall be arranged by BHEL. This DSLAM shall be placed at Telecom Office and shall connect to Distribution switch of Old Engg. Building as shown in figure-I. Specifications are as follows:

Hardware & Standards		
1	Uplink UTP Interfaces	Minimum 2 Nos. 100/1000BaseTX Ports
2	Uplink Fiber Interfaces	Minimum 2 Nos. SFP based Fiber uplink Gigabit Interface. Required LX/LH/SX Transceivers shall be separately ordered
3	Subscriber Line Interfaces	48 Ports ADSL2+ with integrated POTS Splitter
4	ADSL/ADSL+ Standards	G.994.1, G.997.1, G.992.1, G.992.3, G.992.5
Protocol Support		
5		IP Host and gateway support
6		Bridging 802.1D support, RFC 1483/2684 bridged encapsulation
7		RIP1 and RIP2
8		DHCP Relay
9		VLAN 802.1p/q
10		PPPoA to PPPoE Interworking, PPPoE Intermediate Agent
11		RADIUS Authentication
Management		

12		In-Band IP
13		Out-band IP over 10/100BT Ethernet or V.24 RS-232 serial for async terminal
14		Manageable through CLI, telnet, SNMP, Web Interface
Other Requirements		
15	Bandwidth/Distance	Data Rate Upto 24 Mbps, Distance Minimum 7 Km
16	Rack Mount	Should be Rack Mountable, Rack Mount Kit should be provided
17	Misc	Should come with necessary manuals, cables for ADSL input/POTS output and CDs, 230V internal power supply.
18	Software Updates	Software updates should be bundled for the entire contract period

3.8 ADSL CPEs

These CPEs are required to connect various remote locations of township and shall connect to DSLAM through copper wires. Specifications are given as below:

1	WAN Interface	1 No. RJ11
2	LAN Interface	1 No. RJ45 10/100BaseT
3	POTS Splitter	Built-in or External POTS Splitter to be provided
4	ADSL/ADSL+ Standards	G.994.1, G.997.1, G.992.1, G.992.2, G.992.3, G.992.5
5	Standards Support	Routing/ Bridge Support
		Transparent Bridge Support
		RIP1 and RIP2
		DHCP Relay/Server/Client
		VLAN 802.1p/q
		PPPoA, PPPoE, PAP/CHAP Authentication
6	Security	NAT, Ingress/Egress Packet Filtering, MAC Filtering, Stateful Packet Inspection
7	Management	Manageable through CLI, telnet, SNMP, Web Interface
8	Syslog	Syslog Support
9	Misc	Should come with necessary manuals, cables and CDs, 230V internal/external power supply.
10	Software Updates	Software updates should be bundled for the entire contract period

3.9 Network Management System

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

1	Make	Should be of same make of the offered Switches
2	Software Requirement	Multiple administrative access logins should be possible
		Provide tools for configuring, managing, monitoring and troubleshooting of the Campus Area Network devices.
		Provide a flexible framework to address the device management needs of network converging voice, video and data.
		Automatic discovery process for networked devices that create a network topology map using a color-coded,

		hierarchical view of the network for IP networks.
		Tools to simplify Device configuration and management for Routers and Switches.
		Have tools for creating, deleting and editing VLANs.
		Should supports automated fault detection that recognizes common problems in the network
		Threshold management features that can be set for many performance variables to generate an alarm or event notification if threshold are exceeded.
		Path trace tool for layer 2 and layer 3 path analysis
		Provide functionality to correlate MAC address and IP address to switch port
		Support for Inventory Management
		The system must manage and deploy configuration changes to multiple network devices. Changes can be downloaded immediately or run as scheduled operations
		Provide capabilities for software updates to be performed against multiple network devices in the network.
		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
		Provide troubleshooting and diagnostics tools including Ping, Trace Route, Connections, Statistics, and Hostname/Address Lookup
		Should be possible to Integrate with other management tools and third party applications, like HP OV, IBM Tivoli etc.
		New device support should be easily added
		Web Interface for managing the network
		Should be able to manage devices using inventory- and device-change management, network-configuration and software-image management, network availability, and syslog analysis.
3	OS Compatibility	NMS software should be Windows OS compatible
4	Hardware Requirement	Suitable hardware for running NMS shall be provided along with 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, 17" TFT color monitor, Hardware make: HP/IBM/Dell. Suitable Windows Server 2003/2008 OS license should also be provided without additional cost
5	Performance Requirement	A single Installation should support minimum 200 devices. License if any shall be given for minimum 200 devices.
6	Software Updates	Software updates should be bundled for the entire contract period

3.10. UPS Systems

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

- For distribution switches, 5 KVA UPS with 30 min. backup at full load.

- For access switches, 1 KVA UPS with 5 min. backup at full load.

All UPS shall be of Specifications are as given below:

3.10.1 1 KVA UPS

1	Rating	1 KVA or Higher
2	Technology	Line-Interactive
3	Nominal Input Voltage	230V Single Phase
4	Input Voltage Range	175V AC to 275V AC
5	Input Frequency	50 Hz +/- 3 Hz
6	Nominal Output Voltage	230 VAC +/- 5%
7	Output Frequency	50 Hz +/- 1 Hz
8	Output power capacity	600 Watts or Higher
9	Automatic Voltage Regulation	Automatic Voltage Regulation to be provided
10	Transfer time	< 6ms
11	Protection	Surge, brownout, sag, short circuit etc protection to be provided
12	Battery Type	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
13	Battery make	OEM/ Panasonic / Global Yuasa / Rocket
14	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
15	Battery Refresh	The bidder shall replace all the batteries after every 2.5 years and whenever the batteries get faulty during the entire contract period
16	Communication Port	RS232C or USB port & necessary communication cables to be provided
17	Backup	Min. 5 minutes on full load
18	Power Management Software	The UPS should come with Power Management Software to view & monitor UPS status, backup time & shutdown scheduling for Windows XP/2003/Vista systems
19	Warranty	OEM warranty (labour/parts/on-site) for the entire contract period

3.10.2 5 KVA UPS

1	Rating	5 KVA or Higher
2	Technology	True Online, Double Conversion
3	Nominal Input Voltage	230V Single Phase
4	Input Voltage Range	175V AC to 275V AC
5	Input Frequency	50 Hz +/- 3 Hz
6	Nominal Output Voltage	230 VAC +/- 5%
7	Output Frequency	50 Hz +/- 1 Hz
8	Output power capacity	3.5 KW or Higher
9	Battery Type	Sealed, maintenance-free. If external, proper casing to be

		provided
10	Battery make	OEM/ Panasonic / Global Yuasa / Rocket
11	Desired Backup	Min. 30 minutes backup on full load
12	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
13	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+++++
14	Cold Start	Cold start on 100% load
15	Communication Port	RS232C or USB port & necessary communication cables to be provided
16	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
17	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 & Red Hat Linux 7.2 & above systems
18	Battery Refresh	The bidder shall replace all the batteries after every 2.5 years and whenever the batteries get faulty during the entire contract period
19	Warranty	OEM warranty (labour/parts/on-site) for the entire contract period

3.11 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:

3.11.1 42 U Network Rack

1	Make	Enterprise makes like APW/RITTAL/VALRACK
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
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 & two vertical Cable Channels with cabling loops. Cable entry - Bottom and Top

3.11.2 15 U Network Rack

1	Make	Enterprise makes like APW/RITTAL/VALRACK
2	Mounting	Wall mounting
3	Dimensions	Dimensions (Width X Depth) - 600 x 600 mm, 15U 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

3.11.3 12 U Network Rack

1	Make	Enterprise makes like APW/RITTAL/VALRACK
2	Mounting	Wall mounting
3	Dimensions	Dimensions (Width X Depth) - 600 x 600 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

3.12. Structured Cabling Solution

- The structured cabling solution shall be from Tyco/Systimax/Molex/Panduit/Krone/Dlink/R&M/ Belden.
- All passive cabling components shall be from single OEM.
- All UTP Cabling shall be Category 6 type.

- All Multimode optical fiber shall be of 50 micron.
- The vendor shall install all passive components through a registered system integrator of cabling OEM.
- The vendor shall label all cables and cords, LIUs, jack panels, SMBs etc according to industry standards.
- 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.
- Quantities specified in the bill of material given below FOR passive components and labour are approximate. The quantities used / measured in the site after the completion of net work will be used for payments.
- 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 (80cm deep X 30cm wide), laying of cable inside the HDPE pipes, covering with bricks or granite stones and sand, filling the trenches with excavated soil/sand and finishing. Wherever the roads are cut, these have to be cemented after refilling. Care is to be taken for providing smooth curved pipe with acceptable radius at the bends as per standards.
- 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.
- Any opening made in the racks as well as in LIUs for cable entry shall be closed to control damages by rodents.

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
6		These cables are UL Listed and UL & ETL verified.

CAT 6 Face Plate with 8 Position 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 Jack Panel 1U Height		
1	Cat 6	Should meet minimum Category 6 requirements
2	RJ45 I/O	Should be loaded with 24 nos. Individually removable/Replaceable RJ45 I/Os
3	Dimension	19" Width, 1U Height

4	Labels	Should include labels and clear label covers
5	Standards	Should meet or exceed TIA/EIA 568B, ISO Category 6 Performance Requirements
6	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

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

24 Port Rack Mount Fiber LIU		
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	Coupler/Connectors	Should be complete with 24 port SC Couplers, Connectors, Pigtails etc. for SM/MM Fiber
3	Labeling	Adhesive labeling for easy port identification

12 Port Rack Mount Fiber LIU		
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	Coupler/Connectors	Should be complete with 12 port SC Couplers, Connectors, Pigtails etc. for SM/MM Fiber
3	Labeling	Adhesive labeling for easy port identification

6 Port Rack Mount Fiber LIU		
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	Coupler/Connectors	Should be complete with 6 port SC Couplers, Connectors, Pigtails etc. for SM/MM Fiber
3	Labeling	Adhesive labeling for easy port identification

1G/10G Fiber Patch Cord		
1	Type of connectors	SC on one side and LC connector on other side
2	Length	Minimum 3 meters
3	Polishing	Factory polished and tested
4	Insertion Loss	Less than 0.35dB per connector for single mode, Less than 0.5dB per connector for multimode fiber
5	Type of Fiber	Single Mode

Singlemode Fiber 6 Core		
1	Type of Fiber	6 Core singlemode 9/125 micron Loose Tube armored
2	Application	Outdoor/ Underground
3	Compliance	Should be compliant to new ISO/IEC 11801 Standard

Singlemode Fiber 12 Core		
1	Type of Fiber	12 Core single mode 9/125 micron Loose Tube armored
2	Application	Outdoor/ Underground
3	Compliance	Should be compliant to new ISO/IEC 11801 Standard

AUTHORISATION LETTER FOR E-PAYMENT/ NEFT / RTGS

(PLEASE FILL UP THE FORM COMPLETELY IN CAPITAL LETTERS ONLY)

1	Type of Request (Tick One)	NEW / CHANGE
2	BHEL Vendor Code	
3	Company's Name	
4	Address	
5	City with Pin Code	
6	State	
7	PAN NUMBER	
8	Name of Contact Person	
9	Phone No with STD Code	
10	Fax No with STD Code	
11	Email Id	
12	Web Site (URL)	

BANK DETAILS FOR EFT / RTGS

1	Bank Name	
2	Branch	
3	Branch Code	
4	Address	
5	PHONE No.	
6	Account No.	
7	MICR/ IFSC Code	
8	Bank Swift Code	
8	NEFT/ RTGS enabled	Yes / No
10	Cancelled Cheque	Enclosed / Not Enclosed

1. I, as representative / owner of the above named company, hereby authorise BHEL R&D Hyderabad, to electronically make payments to the designated bank account. I hereby certify that the particulars given above are true, complete and correct.
2. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
3. This authority remains in full force until BHEL receives and acknowledge written notification requesting a change or cancellation.

Date:

Authorised Signatory
Designation :

COMPANY SEAL

BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE R&D DIVISION, VIKAS NAGAR, HYDERABAD – 500 093, AP, India
Ph: 0091-40 – 23778474, FAX: 0091-40 – 23770698

RD:MPX:F-20 **General Terms and Conditions of Enquiry & Contract for the Purchase of Goods/ Services**

1. The quotation and any order resulting from this enquiry shall be governed by these General Terms and Conditions of enquiry and contract for the supply of goods and the supplier quoting against this enquiry shall, unless specifically stipulates any different terms or conditions, be deemed to have read and agreed to the same.
2. Sealed quotations in double cover with tenderer's distinctive seal, superscribing enquiry number, date and due date are to be submitted so as to reach on or before due date & time, addressed to **Additional General Manager(MM) and Head, Bharat Heavy Electricals Limited, Corporate Research & Development Division, Vikasnagar, Hyderabad, Andhra Pradesh, India – PIN–500 093, India.**
   In the case of **Two-part bid**, each inner cover shall clearly be labeled as a) **Technical & Commercial Bid** containing technical data/ drawings/ catalogues/ quality plans along with commercial terms and conditions & copy of the price bid with the price columns left blank (unpriced price bid), b) **Price bid** containing prices quotes. Installation and/or Commissioning charges shall be spelt out in absolutely lucid terms, taking into account total charges, rather than quoting vaguely, such as charges per man-day or charges per engineer per day etc. **If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected summarily.**
3. **Tender/ Technical bid Opening**: Unless specified otherwise, tenders/ technical bids will be opened on appointed date and time as mentioned in the enquiry or as communicated changed date/time, if any, in the presence of such of those tenderers who may be present.
4. **Delayed/ Late Tender**: Tenders, which have been posted by registered post through the postal department in time before opening date but received after tender opening, shall be treated as regular tenders. Other tenders received after tender opening time shall be treated as late tenders and normally they may be rejected.
5. The Quotation should be free from overwriting and erasures. Corrections and additions, if any, must be attested. Supplier should indicate in the quotation dimensions (Size), weight, rate etc., in the metric system unless the enquiry calls for different unit.
6. **Validity of Quotation**: All quotations shall be kept open for acceptance for a period of ninety days from the date of opening of Tenders/ Technical bid and this shall be deemed to be an express condition of all quotations. The rate shall be quoted in both figures and in words.
7. In the case of Two-part bid, the vendor should furnish technical clarifications, if any, within stipulated time mentioned, failing which, it will be construed that the vendor is not interested in the tender and BHEL shall not consider the offer for further evaluation.
8. **Revision of Pricebid**: In the event of any bidder, after finalizing the technical specifications and scope of supply, opting to revise and submit their latest price bid, then BHEL reserves the right to open their original / previous price bid also while evaluating revised bid.
9. **Pricebid Opening**: Unless specified otherwise in the enquiry, the Price bids of technically qualified vendors shall be opened with prior intimation in the presence of such of those tenderers who may be present.
10. **Conformity to Specifications**: The material should be of the best quality and shall be conforming to our specification given in our enquiry. Unless otherwise agreed upon by BHEL, no payment shall be due by BHEL in respect of any sample. Offers without details of specifications/ applicable catalogues will not be considered and are liable to be rejected.
11. **Terms of Delivery**: All suppliers shall quote the lowest prices on ex-works and FOB/FCA basis. Foreign suppliers will also indicate their Indian agent's name and address with percentage of agency commission out of the quoted price, if any. Name and Address of the supplier's Bankers address should also be given. Indian suppliers for the indigenously manufactured/ imported stock shall quote on Ex-works /Free-on-Rail/Road /FOR-destination basis, indicating packing & forwarding charges, if any, separately.
12. **Taxes and Duties**: Unless specified otherwise in the enquiry, BHEL do not provide "C" or "D" Form as it is engaged in R&D. All Indian suppliers shall clearly mention current Sales Tax/ VAT, Excise Duty, and Service Tax etc, if any, payable in addition to the quoted price and indicate applicable rates/ percentage, item-wise clearly. It will be paid only if Registration Number under State(TIN)/ Central Sales Tax or Service Tax is specifically mentioned in the Bill/Invoice. Vendors without a Sales Tax/VAT registration and applicable Service Tax registration will not be considered.
13. **Insurance:** Insurance will be arranged by BHEL in case of Ex-Works as well as FOB basis supplies.
14. **Terms of Payment:** Full payment will be made within 30 days after receipt, inspection and acceptance of the material (and where involved, Erection and commissioning of the material/ equipment at BHEL/Destination) though Electronic Fund transfer (RTGS/NEFT/SEFT) with bank charges to the supplier's account. For foreign suppliers, the preferred payment term will be on Sight Draft basis and bank charges inside India will be to BHEL account and outside India will be to supplier's account.
15. Suppliers shall quote competitive price and best delivery for all the items mentioned in the enquiry. BHEL reserves the right to reject partial quotations and to place order on overall landed cost basis. Correct date of effecting supplies in the event of an order should be indicated in the offer. If the supplier's quoted terms are different from BHEL standard payment terms (Refer #14 above), interest @11% per annum (or as indicated in the enquiry) will be loaded to the quoted prices for difference of payment period.
16. **Packing**: The supplier shall be responsible for the goods being properly and adequately packed so as to prevent any loss, damage or deterioration during transit and indicate packing charges, if any, separately.
17. **Part/ Split Ordering**: BHEL reserves right to Order part of the item/ quantity of the enquiry and split the order among qualified vendors.
18. In case the goods enquired are on Rate Contract basis with any other unit of BHEL, such fact should be clearly indicated in the quotation giving full particulars of Rate Contract number, validity and price and also your willingness to comply with order if placed against such Rate Contract. A true copy of Rate contract signed by the supplier should be sent with the quotation.
19. **Inspection**: On receipt, the goods shall be subjected to inspection and also test, if necessary, and our decision regarding the acceptability of the goods shall be final and binding on the suppliers.
20. **Penalty for late delivery**: The time stipulated for delivery of goods shall be deemed to be the essence of the contract and delivery must be completed within the stipulated date/s. In the event of supplier's failure to supply the goods by the stipulated date/s , a penalty of ½% per week for the delayed no of weeks or part thereof for the undelivered portion of PO subject to a maximum of 10% of total order value shall be levied at the discretion of BHEL.
21. **Withdrawal from the Contract:** In case the supplier withdraws the quotation after its acceptance by BHEL or fails to supply the goods as per the terms and conditions of 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 supplier the extra cost and other loss, incidentals due to the breach of contract on the part of the supplier through risk purchase.
22. **Guarantee/ Warranty certificate and Manufacturer's Test report**: Invariably in all cases where it is so stipulated, the supplier should furnish Guarantee/ Warranty certificate valid for a period of 18 months from date of supply or 1 year from the date of receipt, acceptance and commissioning(or more, if provide by oem) whichever earlier and manufacturer's Test report along with the goods, failing which, BHEL shall have the right to reject the goods.
23. All ferrous/ non-ferrous items shall be colour coded as per bureau of Indian standards/ or IS standards/ BHEL Standards.
24. **Recovery of Dues**: BHEL shall recover any amount due from the supplier or any amount outstanding to the credit of the supplier with BHEL R&D unit or any other BHEL unit(s) and/or by legal action.
25. **Arbitration & Forum for Legal Proceedings**: All disputes arising in connection with indigenous/ foreign supplies shall be settled through arbitration held at Hyderabad, AP, India and arbitration shall be appointed by Arbitration Tribunal of the Federation of Andhra Pradesh Chambers of Commerce and Industry, Hyderabad, AP, India. The Courts at Secunderabad/ Hyderabad, AP, India shall have jurisdiction in respect of any suit or other legal proceeding arising from or relating to this contract

The rights and remedies of BHEL stated in these General terms and conditions shall be in addition and supplemental to its rights and remedies under law and custom or usage of trade or business and shall in no way be deemed to limit, curtail, supercede or derogate from its said rights and remedies.

RD:MPX:F-18

BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE R&D Division
Vikasnagar, Hyderabad, Andhra Pradesh, India – 500093.,

IMPORTED

Suppliers' compliance statement to basic conditions of enquiry (to be submitted along with Technical & Commercial bid)

Enquiry number: **Enquiry dt:**

(In case Order to be placed on the Principal and foreign currency)

Condition	BHEL R& D's terms	Supplier's compliance (indicate Yes/No. if 'No', state terms desired)
1. Validity of offer	90 days from the tender opening date (or as per enquiry)	
2. Delivery requirements	FCA – Nearest International Airport (or as indicated in the enquiry)	
3. Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/ commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
4. Terms of payment	Sight draft. All bank charges inside India will be to BHEL R&D account and outside India will be to the supplier's account. Documents through State Bank of India, Trade Finance Central processing Cell (TFCPC), Opp. Anand Theatre, Secunderabad, Andhra Pradesh, India-500003. SWIFT Code: SBININBB602, Phone: 91-40-27816795, FAX: 91-40-27720459	
5. Agency commission	Pl specify Indian agency commission charges, if any, in percentage of quotation. The same shall be paid to the agency in Indian Currency only.	
6. Erection/ Commission	As per enquiry	
7. Documentation	As per enquiry	
8. Insurance	BHEL will arrange Insurance based on intimation to our Insurance agency. Address of the agency will be mentioned in the Purchase Order.	
9. Penalty for late delivery	0.5% per week beyond the delivery date on undelivered portion subject to a maximum of 10% of the total order value.	

* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition
* Any other elements of cost in addition to the above may please be specified in detail

(Signature and Stamp/ Seal of Vendor)

RD:MPX:F-17

BHARAT HEAVY ELECTRICALS LIMITED
CORPORATE R&D Division
Vikasnagar, Hyderabad – 500093, India.

Suppliers' compliance statement to basic conditions of enquiry (to be submitted along with Technical & Commercial bid)

Enquiry number:: **Enquiry date::**

(In case Order to be placed on Indian supplier in Indian currency)

Condition	BHEL R& D's terms	Supplier's compliance (indicate Yes/No. if 'No', state terms desired)
1) Validity of offer	Unless specifically mentioned in the enquiry, 90 days from the tender opening date	
2) Delivery requirements	Free delivery at our stores or FOR destination (or as indicated in the enquiry)	
3)Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of despatch or 12 months from the date of commissioning, whichever is earlier	
4) Terms of payment	Unless specifically mentioned, full payment will be made within thirty days after receipt, inspection and acceptance of the material at BHEL R&D (and where involved, erection and commissioning of the material/equipment at BHEL/destination), by EFT/RTGS with bank charges, if any, to supplier's account.	
5) Taxes & Duties	Unless specifically mentioned in the enquiry, we do not provide 'C' or 'D' form. Supplier to specify rates of taxes and duties element wise and related percentages. Terms like "inclusive" or "extra" are not acceptable. Please mention "NIL" if taxes/ duties are exempted/ not applicable.	
6) Penalty for late delivery	0.5% per week beyond the delivery date on undelivered portion subject to a maximum of 10% of the total order value	

* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition
* Any other elements of cost in addition to the above may please be specified in detail

(Signature and Stamp/Seal of Vendor)

RD:DP:MPX:F-14

BHARAT HEAVY ELECTRICALS LTD.
Corp. R&D DIVISION
VIKAS NAGAR,
HYDERABAD- 500 093 (INDIA)

SUPPLIER REGISTRATION FORM

(FOREIGN SUPPLIER)

ALL COLUMNS SHOULD BE PROPERLY FILLED IN THE SPACE PROVIDED FOR. WHEREVER IT IS NOT APPLICABLE PLEASE WRITE "NOT APPLICABLE". INCOMPLETE OR INCORRECT FORMS MAY NOT BE CONSIDERED.

1.0 GENERAL INFORMATION:

1.1 ….NAME OF COMPANY

1.2 ….DETAILS OF HEAD OFFICE:

ADDRESS :
TELEPHONE :
FAX :
.EMAIL :
.WEB SITE :

1.3 ….DETAILS OF FACTORY/WORKS:

ADDRESS :
TELEPHONE :
FAX :
.EMAIL :
.WEB SITE :

1.4 ….DETAILS OF MARKETING AGENT

ADDRESS :
TELEPHONE :
.FAX :
.EMAIL :
.WEB SITE :

1.5 CHIEF EXECUTIVE

1.6 CONTACT PERSON(S)
FOR PRODUCT OFFERED
NAME(S)
OFFICIAL CPACITY
ADDRESS:
TELEPHONE
FAX
E-MAIL

1.7 YEAR OF ESTABLISHMENT

1.8 PRODUCTION CAPACITY PER ANNUM

1.9 PARTICULARS OF PRODUCT INCLUDING
SPECIFICATION AND RANGE OFFERED
FOR REGISTRTION
(ATTACH BROUCHERS AND CATALOGUE)

1.10 NAME(S) OF BANKERS

1.11 BANKER'S CERTIFICATE

1.12 PORT OF LOADING

1.13 NEAREST AIRPORT

1.14 NAME OF THE INDIAN AGENT, IF ANY
WITH AUTHORISATION LETTER

2.0 FINANCIAL INFORMATION

2.1 …TOTAL CAPACITY

2.2 …ANNUAL TURN OVER FOR LAST 3 YEARS

2.3 …WHEHER CREDIT LICENSE ACCEPTABLE YES/NO

3.0 QUALITY MANAGEMENT SYSTEMS
ENCLOSED FORMAT PART-B

3.1 EXPERIENCE LIST FOR SAME/SIMILAR ITEMS
TO BE ENCLOSED

4.0 …..**FUTURE EXPANSION PLANS:**
(GIVE DETAILS)

5.0 LIST OF ENCLOSURES:
INCLUDING BROUCHERS, CATALOGUES, TECHNICAL
LITERATURE ETC.

6.0 ANY OTHER INFORMATION

SIGNATURE OF SUPPIER (AUTHORIZED SIGNATORY)

NAME
DESIGNATION
DATE
…….OFFICIAL SEAL

Note: Please attach separate sheets, if space found is inadequate

BHARAT HEAVY ELECTRICALS LTD.
Corp. R&D DIVISION
VIKAS NAGAR,
RD:DP:MPX:F-13 **HYDERABAD- 500 093 (INDIA)**
Ph: 040 – 23778474, Fax: 040 – 23770698, email: mpx@bhelrnd.co.in

VENDOR REGISTRATION FORM

(Indigenous supplier)

[FORM TO BE SUBMITTED* BY THE BIDDER ALONG WITH TECHNICAL-BID]

Before filling, please refer to instructions on page-4

1.0 VENDOR PROFILE:

1.1 Name and address of the vendor:

_____

_____

_____

Phone Nos.:
Fax No.:
Email: 1. 2.

1.2 Local representative name & address in Hyderabad/ Secunderabad:

_____

_____

_____

_____

Phone Nos.:
Fax No.:
Email:
Contact person:
Mobile No.:

2.0. TYPE OF ORGANIZATION:

PROPRIETORSHIP	COMPANY	SISTER CONCERN (mention vendor registration number of main organization)	
PARTNERSHIP	CORPORATION	Small Scale Industry	ANY OTHER (Please specify)

In case of SSI unit, copy of registration to be enclosed.

3.0 ANNUAL TURN OVER:

#	Year	Turn-Over
1	Current Year(budgeted)	
2	Previous year (200 - 0)	
3	Prior Year (200 - 0)	

4.0 NAME AND ADDRESS OF THE BANKER:

1. Bank Name
2. Branch name
3. Account number
4. Account Type
5. MICR Code:
6. IFSC Code(RTGS/NEFT):
7. Bank Phone number(s),

Blank cheque, duly cancelled, to be enclosed.

Please note that all payments shall be made through Electronic clearance services to your above account against the orders executed, if any.

5.0 REGISTRATION PARTICULARS (relevant copies to be enclosed)

5.1 IT Permanent Account No.(PAN):
5.2 State sales tax/VAT Registration No.:
5.3 Central Sales Tax Registration No.
5.4 ED Registration No.
5.5 Service Tax Registration No.:
5.6 PF Account No.:
5.7 Labour Licence No.:
5.8 **ESI Account No.:**

6.0 CONTACT PERSON: S/Sri

Designation::: Phone/ Mobile No. :

7.0 TOTAL NUMBER OF EMPLOYEES:

Graduates (Engr./Scientists/ Mgmt/Fin.)	Consultants	Workers		
		Sup./Skilled	Semiskilled	Unskilled

8.0 WISH TO REGISTER FOR SUPPLIES/SERVICES:

#	**Service/Supplies**	**Capacity**
1		
2		
3		
4		
5		
6		
7		

9.0 REFERENCE LIST :

(Only recognized public and private sector companies, attach if printed copy available)

#	Customer	Volume / Year
1		
2		
3		
4		
5		
6		
7		

10.0 INFRASTRUCTURE / FACILITIES:

#	Facility (with specifications)	Age/ Year procured
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

11.0 REGISTRATION WITH OTHER BHEL UNIT/UNITS:

#	Unit	Registration No.	Year
1			
2			
3			
4			

12.0 ANY OTHER INFORMATION :

DECLARATION:

The information furnished above is true and authentic.

(CEO / PROPRIETOR)

SEAL:

DATE:

The competent authority reserves the right to accept or reject the registration. Registered vendors will be informed by mail / email, as convenient. Contact AGM (MM) for clarification/ additional information on registration.

A separate communication will be sent to you in case of non-registration, citing reasons thereof.

Instructions

1. Answer all items; use NA for items not applicable.
2. BHEL units do not require this registration.
3. Use additional sheets for want of space if required.
4. Attach copies of latest document s in respect of items 5.0 (Registration no.s)
5. Photographs of registered office and the chief executive/proprietor shall be furnished.
6. Use A4 sheets for this document and the enclosures.

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* REGISTERED BIDDERS, HAVING BHEL (R&D) REGISTRATION NO. OR HAVE SUBMITTED THIS FORMAT FOR REGISTRATION, NEED NOT FURNISH THIS INFORMATION AGAIN