

# HIGH COURT OF JAMMU AND KASHMIR

No: TENDER-JKHC/ 4/2017

Dated: 21.06.2017

## **TENDER NOTICE**

1. The High Court of Jammu and Kashmir invites sealed quotations (Technical & Financial) from eligible bidders which are valid for a minimum period of 180 days from the date of opening for "The Supply, Testing, Installation and Maintenance of LAN at both wings of High Court of J&K". Interested bidders should submit the Sealed-quotations on or before 6th of July 2017 up to 04.00 pm which will be opened on 7th of July 2017 at 11 A.M. The Bid /Sealed Quotation should reach physically or by post/courier on or before the last date & time fixed for submission of quotations in the office Central Project Coordinator High Court of Jammu & Kashmir at Srinagar. Bids received after due date and time shall not be considered.

### **2. Bid Submission:**

The bidders fulfilling the Terms and Conditions as prescribed below, may submit their bids to the Central Computer Coordinator, e-Courts High Court of Jammu & Kashmir, Srinagar. The Technical and Commercial bids should be in two separate sealed covers marked 'Technical bid' and Financial bid'. Both the covers shall then be submitted in one single cover superscribed as "Quotation for Supply, Testing, Installation and Maintenance of LAN". Technical Bid' will be opened first and only those firms, which fulfil the 'Technical Terms and Conditions', will be eligible for participating in the 'Financial Bid'.

Sd/-

Central Project Coordinator  
High Court of Jammu & Kashmir

# **HIGH COURT OF JAMMU AND KASHMIR AT SRINAGAR**

## **Object and Scope**

High Court is to have a total revamp of LAN in both wings of the High Court at Srinagar and Jammu. Before submission of bids, the prospective bidders can visit the High Court at Jammu and Srinagar for their own survey and will then submit their BoM with rates quoted for each of the items mentioned in the BoM. The Commercial bids must be accompanied with LAN Survey reports and LAN Diagrams. Chief features of the project will be:

- There should be proper segregation of equipment in each floor of High court.
- Each floor of High Court should have a dedicated core switch (L3) which would then extend to that particular floor using other L2 switch.
- A centralized core Fibre switch should be placed at NIC Centre where from all the administration and distribution would be done through OFC to each core switch of the High Court.
- The Network racks should be of good built and quality and should have proper ceramic brakes to avoid accidental damage and should have also locking facility.
- The Ethernet cabling should be either CAT 6E or CAT 6A.
- The IP allocation schema of the High Court is to be changed from Static to Dynamic.
- In order to change the IP allocation schema, the DHCP server is to be implemented on a L3 switch on each floor.
- If VLANS are to be created then inter-VLAN routing between each floor of the High Court is to be implemented
- It should be noted that the High Court uses NIC IP distribution schema only.
- If necessary, sub-netting should be done in a way that could extend to several hundred IP's.
- Quality of Service is to be implemented in which a part of Bandwidth is to be kept preserved for Video Conferencing sessions.
- VLAN's are to be created for different sections of High Court which would have different set of policies.
- Measurement of UTP and Fibre through automatic measuring tools.

**Note: Specifications of different components required are provided in Annexure-A to this document.**

## **General Terms and Conditions**

1. The Bidders are expected to examine all instructions, forms, terms and conditions in the bidding Documents. Failure to furnish all the information required by the bidding documents or submission of a Bid not substantially responsive to the bidding documents in every respect, shall be at the Bidder's risk

and may result in rejection of the Bid. The Bid is liable to be rejected out rightly without any intimation to the Bidder, if complete information called for in the Tender Document is not given therein or if any particular information asked for in the Forms / Proforma in the Tender are not fully furnished.

2. The vender should have done similar type of work and must have completed at least two such tenders during the last five years.
3. The vendor must have a cumulative turnover of at least Rs 50 lakh during the last three financial years i.e, 2013-14, 2014-15, 2015-16 from the LAN and LAN related activities.
4. The prices quoted by the Vendor shall be in Indian rupees, inclusive of all taxes and not be subject to any price escalation.
5. High Court of Jammu and Kashmir reserves the right to split orders and / or accept or reject any quotation as also to alter any or all of the terms and conditions without assigning any reasons thereof.
6. Printed conditions mentioned in the Tender bids submitted by Vendors will not be binding on the Jammu and Kashmir High Court. All the terms and conditions for the supply, testing and installation, payment terms, penalty etc. will be as those mentioned herein and no change in the terms and conditions by the Vendors will be acceptable. Alterations, if any, in the Tender bids should be attested properly by the Vendor, failing which, the Tender will be rejected.
7. Upon verification, evaluation / assessment, if in case any information furnished by the Vendor is found to be false/incorrect, their total bid shall be summarily rejected and no correspondence on the same, shall be entertained.
8. The bidder must furnish single OEM for LAN, UTP and Fibre.

**Eligibility Criteria:**

1. The Bidder should be registered in India under the Indian Companies Act, 1956/Partnership firm/sole proprietorship firm and existing for the past 3 years. The bidder shall provide the Certificate of Incorporation for Registered Companies, Partnership Deed for Partnership Firms, VAT or Service Tax Registration Certificate for Sole Proprietorship Firms.

2. In case of a dealer/distributor bidding as frontline bidder on behalf of OEM, Certificate of dealership/authorization letter to be submitted by the front end bidder on company letter head.
3. The minimum cumulative Turn-over of the bidding company during last three audited financial years should be minimum of Rs. 50 lakh. As a proof audited Balance sheet of the Bidder for each of the last 3 financial years i.e, 2013-14, 2014-15, 2015-16 must be provided with the technical bid.
4. The Bidder should have a registered number of VAT/Sales Tax where his business is located and Income Tax/Pan/TIN and must submit copies of relevant certificates with the technical bid.
5. A Bidder who is blacklisted from any other Govt. Institution is not eligible to participate in this project while under sanction by High Court of J&K. Similarly at the time of bidding, the firms blacklisted/debarred in participating in any activities for fraudulent or corrupt practices by any State or Central Govt. or UT in India are not allowed to bid. For not being so debarred, the bidder must enclose a self certified letter as proof.

**Opening of Bids and Bid evaluation :-**

1. Technical Covers will be opened as per Schedule mentioned in the Tender Document and the Financial Covers of technically qualified Bids will be opened on a later date.
2. The decision of the Evaluation Committee in the evaluation of the Qualification criteria and Commercial Bids shall be final. No correspondence will be entertained outside the process of negotiation / discussion with the Committee.

**Note:** High Court of Jammu and Kashmir may waive any minor informality or non-conformity or irregularity in a Bid.

3. High Court of Jammu and Kashmir reserves the right to accept or reject any Bid and to annul the Bidding process and reject all Bids at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for Tendering

Authority's action.

**Bid Security (EMD – Earnest Money Deposit)**

1. Non-refundable Tender fee of Rs 1000/= (Rupees One thousand only) may be paid through Demand Draft in favour of Registrar General, High Court of J&K payable at Srinagar.
2. EMD of Rs. 1, 20,000/- (Rupees One Lakh, Twenty thousand only). Payment can be made through FD/DD/CDR/Bank Guarantee valid for three months in each case favouring Registrar General High Court of Jammu and Kashmir payable at Srinagar.
3. Bidder registered with will have to submit copies of Registration certificate to claim exemption from tender fee and EMD.
4. Successful bidder will have to submit Performance Security Deposit of 5% of actual value of contract through bank guarantee in favour of Registrar General, High Court of J&K valid for the period of contract including the period of warranty.
5. The Earnest Money Deposit will be returned to the unsuccessful bidder within seven days of opening of financial bids and to the successful bidder within fifteen days of award of contract.

**Performance Bank Guarantee:-**

- 1 The successful Bidder shall at his own expense submit within fifteen (15) working days from the date of Notice of award of the Contract or Prior to signing of the contract whichever is earlier, an unconditional and irrevocable Performance Bank Guarantee (Annexure-C) of an amount equivalent to 5% of Contract value in Indian Rupees.
- 2 No interest shall be payable on the Performance Bank Guarantee.
- 3 Performance Bank Guarantee shall remain valid for the period of Contract.

**Contract / Agreement:-**

- 1 After letter of acceptance is issued but before award of contract, the successful Bidder shall submit an undertaking within the stipulated time that the terms and

conditions are acceptable to him.

2 Failure of the successful Bidder to agree with the Terms and Conditions of the Bid/Contract shall constitute sufficient grounds for the annulment of the award, in that event, Tender issuing Authority may make the award to the next Best Value Bidder or call for new Bids.

**Time Schedule:**

The vendor has to strictly adhere to time schedule in execution of the work. In any case the time for supply, testing and Installations of LAN in both the wing of the High Court is 30 (Thirty) days from the date of issuance of work/purchase order.

**Warranty**

1 The complete systems should be under 5 (Five) years free onsite comprehensive warranty support service from the date of installation.

2 Vendor will maintain enough spares (not less than 10%) so as to provide satisfactory onsite comprehensive maintenance services during the warranty period.

3 Vendor would provide the helpdesk support services through telephone/e-mail where users can lodge their complaint.

4. During warranty period, any failure in the LAN items/ Components should be rectified within maximum period of 2 working days.

5 On completion of the Warranty period, the Security Deposit without any interest accrued shall be released after satisfying that proper free warranty support has been provided during warranty period of five years for all the systems.

6 If considered necessary, suitable amount of penalty shall be recovered from the Vendor out of either already due payments or from their Security Deposit while releasing the Security Deposit.

7 After expiry of warranty, the Jammu and Kashmir High Court has option to enter into Annual Maintenance Contract with the supplier for post warranty maintenance of the systems.

**Penalty:-**

1. During warranty period, any failure in the LAN Items, Components should be rectified within maximum period of 2 working days.

2. If the complaint is not attended within two days or if the failure is not rectified within two days, a penalty at the rate of Rs 500/- (Rupees five hundred only) per day will be charged against the vendor and the same will be recovered from the performance security deposit.

**Termination: -**

1 High Court of Jammu and Kashmir reserves the right to terminate the Contract by giving due notice in case of breach of any of the material obligations under the Contract, if committed by the Vendor, during the Contract period.

2 The Contract may also be terminated in case of any unsatisfactory service performance during the Contract period with due notice.

**Payment Terms: -**

1 Payment will be made on successful installation and testing of LAN at both wings of the High Court. Certificate of successful installation shall be provided by a team of experts appointed by the High Court for this purpose.

2 The payment would be made after deducting necessary taxes, penalties etc. if applicable.

**Arbitration:-**

In the event of any dispute or difference arising out or touching upon any of the terms and conditions of this contract and / or in relation to the implementation or interpretation thereof, the same shall be resolved initially by mutual discussion and conciliation but in the event of failure thereof, the same shall be referred to the sole arbitrator appointed by Registrar General, High Court of Jammu and Kashmir.

**Legal Jurisdiction:** - All Legal disputes are subject to the jurisdiction of Jammu and Kashmir only, preceded by Arbitration.

**Annexure – A**

**Technical Specification: - Core SFP+ Managed Core Switch**

Sr. No	Desired Specification/Qualitative Requirement
<b>A</b>	<b>Core SFP+Switch</b>
1	Core Switch with 24 SFP+ SM 10G ports (Populated from day 1) and 8 1G Copper Ports.
2	The switch should be modular and flexible enough for deploying 1G Ethernet & 10G Ethernet, 1 G fiber and 10 Gigabit Fiber.
3	Should have RJ-45 console port for out-of-band management and dedicated 10/100/1000 Base-T RJ-45 Ethernet port for out-of-band remote management
4	Maximum supported Flash (inbuilt 1GB) & SDRAM (inbuilt 2GB) installed with support of SD card slot (min 32G SDHC capacity) for easy file store & restoration like firmware, configuration file, boot image, syslog etc.
5	Should support switching capacity of minimum 480Gbps & forwarding rate more than 350 Mpps
6	Should Support Packet Buffer Memory of 9 MB
7	Should have inbuilt 1+1 hot swappable load sharing AC power supplies and hot-swappable fan trays to provide N+1 cooling redundancy
8	Physical Stacking: Upto 4 units
	Virtual Stacking: Upto 32 units supported by Single IP Management
9	MAC Address Table: 128K
10	Port / Link Aggregation upto 80 Gbps, Port Mirroring, Load Balancing, Both Unicast & Multicast Routing, DHCP Support, inter VLAN routing enabled. Two core switches to connect at 40 Gbps through port aggregation
11	Supports 16K hardware routing entries shared by IPv4/IPv6
	Max. 16K IPv4 entries
	Max. 8K IPv6 entries
12	Can enable IMPB, 802.1X, WAC on the same port
	Should Support following authentication criteria:
	- Any: must pass one of MAC, 802.1X or WAC
	- Dot1x_IMPBB: must pass 802.1X & IMPBB
13	Should Support 16 groups per device, 12 ports per groups
	Support following load sharing mechanism
	Source MAC
	Destination MAC
	Source MAC + Destination MAC
	Source IP
	Destination IP
	Source IP + Destination IP
Support across module/stacking trunk	



14	Should have full layer 2, 3 & 4 features like: SNMP, RMON, VLAN, RIPv1, RIPv2, Static Routes, BGPv4 (Border Gateway Protocol), IGMP, ICMP, OSPF, RIPng, OSPFv3, MAC address, QoS, VLAN
15	Support Port-based Q-in-Q
16	Should support IGMP, Static IP Multicast Route, PIM DM, PIM SM, PIM-SSM, PIM-SDM, DVMRP v3, MLD v1/v2
17	Support following mode
	Strict
	Weighted Round Robin (WRR)
	Strict + WRR
	Round Robin (RR)
18	Compatible with all Ethernet IEEE 802 standards like IEEE 802.3x, IEEE802.3ad, IEEE 802.1d, IEEE802.1w, IEEE802.1S (minimum 64 instances), IEEE802.1X, IEEE 802.1Qaz, IEEE 802.1Qbb, IEEE 802.3ah etc.
	Should Support the following;
	4K dynamic VLANs
	GVRP advertisement both on dynamic and static VLAN
	GVRP enabled/disabled per port or per system basis.
19	GVRP can be disabled/enabled per VLAN basis
	Should have hardware & time based ACLs & Hardware Multicast Management: 64 Time Range Profiles
	Should support Web-based GUI, CLI, Telnet, FTP, TFTP, LLDP-MED, SNMP v3, RMON v1/v2, multiple image, password recovery, SNTP, MTU for IPv6,
	VLAN support: minimum 4K VLAN should have inbuilt management & MSTP support for Multiple Spanning tree instances
20	Should have hardware & time based ACLs & Hardware Multicast Management: 64 Time Range Profiles
21	Should support Web-based GUI, CLI, Telnet, FTP, TFTP, LLDP-MED, SNMP v3, RMON v1/v2, multiple image, password recovery, SNTP, MTU for IPv6,
22	VLAN support: minimum 4K VLAN should have inbuilt management & MSTP support for Multiple Spanning tree instances
23	IPv6 ready for all layer 2, 3 & 4.
24	Security
	802.1x Port-Based Authentication
	SSH v2 (support IPv6 access)
	SSL v1/v2/v3 (support IPv6 access)
25	Support 15 level user account
26	Support power saving function on all Gigabit/10G Base-T RJ45 ports
	Should Support 2 power saving modes
	Power Saving Link status
	Power Saving Cable length
27	Certification: CB, CUL, FCC, CE, C-Tick, IC, VCCI, BSMI

### **Technical Specification: - Distribution Managed (L3) Switch**

Sr. No	Desired Specification/Qualitative Requirement
A	<b><u>Distribution Managed (L3) Switch</u></b>
1	Proposed Switch should have 20 10/100/1000BASE-T ports 4 Combo 10/100/1000BASE-T/SFP ports and 4 SFP+ ports
2	Switch should Support Internal/External Redundant Power Supply.

3	Switch shall have SD Card slot/USB/External flash for easy file store & restoration like firmware, configuration file, boot image, syslog etc.
4	RJ-45 & mini-USB console port,RJ-45 Alarm port,RJ-45 Management Port & 1 USB 2.0 Type A port
5	Shall support 1GB DRAM and 1GB flash
6	Switch shall have 6 kV surge protection on all RJ-45 access ports
<b>B</b>	<b><u>Performance</u></b>
1	The Switch shall have Non-blocking wire speed switch fabric with Min. 128 Gbps Back plane or higher
2	The Switch shall have Min.95 million pps or higher
3	The Switch shall support Min. 68K Mac address
4	The Switch shall be able to do Physical Stack min 9 units per stack or more
5	The Switch shall be able to do IP Stacking up to 30 units per IP
6	The Switch Should support Jumbo Frame (up to 12K Bytes)
<b>C</b>	<b><u>Layer 2 switching</u></b>
1	Switch should support ARP,Proxy ARP and Gratuitous ARP.
2	The LAN switch shall have IEEE 802.1Q VLAN encapsulation and should support 4k Vlans.
3	It shall have support for Detection of Unidirectional links and to disable them to avoid problems such as spanning tree loops
4	It shall support 802.1v Protocol-based VLAN
5	Should support MAC based Vlans
6	Should support GVRP or equivalent,Private Vlan or equivalent,Subnet Vlan or equivalent, Voice Vlan and QinQ (port based qinq and selective qinq).
7	Multicast VLAN to allow multiple VLANs to receive the same multicast traffic
8	Switch should have support for below Spanning Tree protocol Standards:
9	• 802.1D STP
10	• 802.1w RSTP
11	• 802.1s MSTP
12	The Switch should have 802.1AX Link Aggregation Up to 30 groups per device.
13	Port Mirroring One to one/Many to One, Flow based mirroring & VLAN Mirroring
14	Switch shall support ITU-T G.8032 Ethernet Ring Protection Switching to provide protection for Ethernet traffic in a ring topology, while ensuring that no loops are within the ring at the Ethernet layer
15	The Switch shall have the intelligence to detect the loop occurring from the unmanaged network segment
<b>D</b>	<b><u>Layer 3 Routing Features</u></b>
1	Switch should support Static routing for IPv4 and IPv6, RIP for IPv4 and RIPng for IPv6, OSPF,OSPF v3, BGP4, BGP4+ IS-IS v4/V6 and MPLS from day 1
2	Multiprotocol extensions for BGP4
3	Switch should support PIM-SM,PIM-DM,PIM-SDM,PIM-SMv6,DVMRP v3 and MSDP
4	Should have policy based routing.
5	Route Redistribution support

6	IPv6 Tunnelling: Tunnel types should be supported are Static, 6to4, ISATAP and GRE.
7	Should support VRRP v2 & V3.
8	Should support Bidirectional Forwarding Detection
9	Should support URPF,ECMP.
<b>E</b>	<b>Quality of service</b>
1	Switch should support 802.1p priority queuing with 8 queues per port.
2	Queue Handling mode: WRR & Strict Mode,Strict + WRR and Weighted Deficit Round Robin (WDRR)
3	Granular Rate Limiting functions on per port & flow based to guarantee bandwidth in increments shall be as low as 8 Kilobits per Second.
4	Class of service shall be based on Switch port, DSCP, Vlan ID,TCP/UDP port, Protocol type,802.1p queues, IPv4/v6 address, IPv6 flow label & User defined packet content
5	Broadcast and Multicast traffic/storm control
6	Weighted Random Early Detection (WRED) for congestion control
<b>F</b>	<b>OAM</b>
1	802.3ah Ethernet Link OAM
2	802.1ag Connectivity Fault Management (CFM)
3	Switch shall support ITU-T Y.1731
4	Optical Transceiver Digital Diagnostic Monitoring (DDM) & Dying gasp
<b>G</b>	<b>Security</b>
1	IEEE 802.1X Port Based Access control and Host based Access control and Guest Vlan
2	It shall support RADIUS/TACACS+ authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.
3	It shall have IP-MAC-Port binding
4	Switch should be able to authenticate and access control based on MAC and web (Http or Https)
5	BPDU Attack Protection, ARP protection, IP Source Guard, Dynamic ARP Inspection and DOS Attack Prevention
6	It shall support for SSHv2, SNMPv3 to provide network security by encrypting administrator traffic
7	Switch shall support 802.1Qbb Priority-based Flow Control (PFC).
<b>H</b>	<b>Management</b>
1	The LAN switch shall have CLI support to provide a common user interface and command set with all routers and switches of the same vendor.
2	It should support RMON v1 and RMON v2
3	It shall support Trivial File Transfer Protocol (TFTP) to reduce the cost of administering software upgrades by downloading from a centralized location.
4	It shall support Network Timing Protocol (NTP/SNTP) to provide an accurate and consistent timestamp to all intranet switches.

5	It shall support SNMPv1, SNMPv2c, and SNMPv3 and Telnet interface to deliver comprehensive in-band management, and a CLI-based management console to provide detailed out-of-band management
6	It shall have support for Netflow/Jflow/Sflow
<b>I</b>	<b>Certifications</b>
1	cUL, CB, CE, CCC, BSMI,EMI/EMC,FCC Class A, C-Tick, VCCI.

## **L2 Switch Technical Specification** **Desired Specification/Qualitative Requirement**

Switch should have minimum 24 x 10/100/1000 Mbps, 2 x Gigabit SFP, and 2 x 10G SFP+.
Switch should have minimum 92 Gbps Switching Capacity.
Switch should have minimum 68.45 Mpps packet forwarding rate
Should support single IP Management to enable management of minimum 30 switches using a single Web interface; simplifies management of multiple devices
Should Support Physical Stacking Up to 6 units per stack with Up to 40G stacking bandwidth full duplex and Supports Duplex Chain/Ring topology.
Should support minimum 16K MAC address entries
Should support IGMP Snooping and 256 IGMP groups
Should support MLD snooping
Switch should support IEEE 802.3ad Link Aggregation control protocol up to 14 Groups for switch, 8 ports for Group. And should support LLDP-MED.
Switch should have support for below Spanning Tree Protocol Standards:
• 802.1D STP • 802.1w RSTP • 802.1s MSTP • Ethernet Ring Protection Switching (ERPS)
Switch should support IEEE 802.3X Flow control, BPDU Attack Protection and DoS Attack Prevention.
Should support loop back detection, Guest VLAN, RADIUS and TACACS+ authentication for switch access, RADIUS and TACACS+ accounting
Switch should have support for Cable diagnostics
Switch should support Port Mirroring to Enable traffic on a port to be simultaneously sent to a network analyzer for monitoring
Jumbo Frame support up to up to 9 kilobyte frame size to improve the performance of large data transfers
Switch should support IEEE 802.1Q with 4,094 simultaneous VLAN IDs
Should have support for Auto-voice VLAN to Recognize IP phones and automatically assigns voice traffic to dedicated VLAN for IP phones
GVRP support for automatically propagating and configuring VLANs
Switch should support Strict Priority Queue (SPQ) & Weighted Round Robin (WRR)
Class of Service should be based on 802.1p Priority Queues, DSCP, ToS, IPv6 Traffic Class, IPv6 Flow Label etc.
Should support Bandwidth control
Switch Should Support Green Technology
Switch should support Static routing for IPv4 and IPv6.
16 IP interfaces, IPv6 Neighbour Discovery (ND), Supports Gratuitous ARP
Should support Broadcast/Multicast/Unicast Storm Control
Should support DHCP Snooping
Should have Support for advanced network security applications such as IEEE 802.1X
Switch should allow only authorized users by checking whether the source MAC and IP addresses of an inbound packet is identical to the configured MAC-to-IP binding on the port

Switch should support IPV6 Host management
Switch should support IPv6 Neighbor Discovery (ND)
Switch should support IPv4 /IPv6 Dual stack
Should support SNMP v1, v2c and v3, IEEE Compliant: IEEE802.3az standard support, Debug command, CLI Port (RJ45), STP, LLDP, LLDP-MED, RMON, DHCP Auto Configuration, Dual images Support, Support IPv4/v6 Dual Stack, IPv6 Neighbour Discovery Support.

### **Technical Specification: - 10G SFP+ Transceiver for Single Mode Fiber**

Sr. No	Desired Specification/Qualitative Requirement
1	Transceiver should be Enhanced Small Form-Pluggable (SFP+) form factor and compatible with quoted switches.
2	Transceiver should be Hot pluggable and support 10G speed on Single Mode.
3	Should be RoHS Compliant.
4	Should be Multi-Source Agreement (MSA) specification compliant.
5	Transceiver should be fcompliant with IEEE802.3ae standards.
6	Transceiver distance capacity should be 10Km.
7	Transceiver interface should be Duplex LC connector.
8	Transceiver should support Single-mode 9/125 um fiber
9	Operating Temperature: 0 to 50 °C

### **SM Fiber Cable**

S/N	Desired Specification/Qualitative Requirement
1	The fiber type is a Matched Cladding Single Mode
2	Fiber dual coated with acrylate coating.
3	The fiber is optimized for operation at 1310 nm and at 1550 nm.
4	Should fulfill the requirements of: IEC 793-2: 1992, EN 188101 and ITU-T Recommendation G.652
5	Testing methods are in accordance with the following standards: ITU-T G.652.D, IEC 793-1 and Telecordia : GR-20 Core,ISO : 11801
6	Maximum induced permanent loss after 1000 h at 1 bar H2 at 70 °C and out gassing for 72 h at 70°C (valid both at 1310 nm and at 1550 nm): 0.2 dB/km

### **FIBER PATCH PANELS – RACK MOUNT**

S/N	Desired Specification/Qualitative Requirement
1	Have sufficient slots accommodate Simplex/duplex SC/LC/FC adapters individually.
2	Aluminum base material for light mounting
3	Should have Splice Tray & Cable Spool provision inside

4	Accessory kit consists of cable ties, mounting ear screw earthling and spiral wrap tube.
5	Can Include 48 LC,24SC,24 ST and 24 FC Terminations
6	Removable Rear & Front cover for better access to interior of LIU
7	Snap-in Locker Design for easy to change adapter panels.
8	Removable Rubber grommet to allow for pre-terminated fiber trunk installation, protect cable and minimize dust build up
9	Should have cable ties, mounting ear screws and spiral wrap tube.

### ADAPTORS

S/N	Desired Specification/Qualitative Requirement
1	All SC/LC/FC adaptors should be Simplex and duplex type. Adapters should have compact design & high precision, which perform well under various circumstances & maintain good plug retention strength.
2	Telcordia, TIA/EIA, IEC compliance
3	0.20db for Zirconia Sleeve
4	SC / FC Adapter 2.0N ~ 5.9N , LC Adapter-1.0N ~ 2.5N

### Optical Fiber Connectors

S/N	Desired Specification/Qualitative Requirement
1	Provide a field installable single mode connector to terminate fiber optic cables from cable-to-cable, cable-to-equipment and equipment-to-equipment.
2	The connector must: Be field installable
3	Utilize a PC polishing on the tip to provide high yield during installation.
4	Meet EIA and IEC standards for repeatability.
5	<0.3 db
6	1000 Times
7	> 50 db
8	-40 deg C. to +85 deg.c
9	IEC 61754-20
10	SC/LC/FC

### **Optical Fiber Equipment Cords (minimum 3 meter)**

S/N	Desired Specification/Qualitative Requirement
1	All optical fiber patch leads shall comprise of Single mode 9/125µm fiber with SC/LC/FC, fiber connectors terminated at each end. The optical fiber patch leads shall comply with the following specifications:

2	Optical Fiber – Corning Single Mode
3	Connector: Zirconia ceramic ferrule
4	Pre-radiuses and pre-polished ferrule
5	Simplex / Duplex
6	Color-coded Yellow for SM
7	Insertion Loss - <0.2 db
8	Cable: 9/125, SM
9	Repeatability - < 0.2 db
10	Durability – 1000 mating cycle
11	Working Temp : -40 deg C.to + 85 deg. C
12	Standard : G652D, G 657A & G 657B
13	Length : 1,2,3,5 & on request

### **Rack Wall Mount 12U x 550 W x 450 D**

S/N	Desired Specification/Qualitative Requirement
1	Front Glass Door (tinted, Toughened) with Lock & Key, 2 pairs of 19" Mounting Rails with Screen Printed U-Marking Welded Side Walls With Metal Engraved Brand Logo
2	1U Cable Manager (1), Hardware Packet (1 Pkt) 6 Elcom Socket 5 Amp. Power Distribution Unit (1 No) Roof Mounted Hicool Fan Unit / 90 CFM /230V AC (1 No)"

### **Rack 42U**

S/N	Desired Specification/Qualitative Requirement
1	42U Enclosure Frame-800X1000-STEEL, Caster Wheels Set of 4 (2 with ceramic Brakes & 2 without Brakes)
2	Adjustable Levellers set of 4
3	Glass Door-800-42U, Metal Door-800-42U-Vented, Side Panels-1000-42U-Vented
4	Mounting Hardware-(Pack of 20), FHU with 4 FAN 360CFM
5	Vertical Power Distribution Unit with 12 x 5/15 sockets Round Pin, 230 Volts AC, 32 Amp with Plug
6	Vertical Cable Manager-42U-Loop, Horz. Cable Manager-1U-Loop
7	Conforms to DIN 41494 OR equivalent ISO Standards
8	Adjustable 19" equipment mounting verticals provide the better mounting flexibility maximizing the usable mounting space
9	Depth adjustable mounting slots
10	Top and bottom Panel with ventilation and cable entry facility
11	Provision to mount the cooling fans on the top panel
12	Powder coated finish with pretreatment process meeting all industry standards
13	Grounding and Bonding Options can be provided

14	100% assured compatibility with all equipment conforming to DIN 41494. General industrial standard for equipment
15	Conforms to DIN 41494 or equivalent standard
16	Welded Frame, Lockable Toughened Glass Door, Metal Vented Door Steel,
17	DIN Standard 10mm Sq. Slots / Direct M6 Tap, 19" Mounting angles made of formed steel Powder Coated
18	Welded to Frame, Vented and Field Cable entry exit cut outs
19	Static Load 500 KG

## **Specifications for Passive Items Cable & others**

### **Category 6A/E UTP, 4 Pair**

S/N	Desired Specification/Qualitative Requirement
1	Category 6 A Unshielded Twisted Pair 4 pair shall be compliant with ANSI/TIA/EIA-568-C.2 Supports Gigabit Ethernet (10GbaseT) standard. Operates at bandwidth of 500MHz. Exceeds all requirements for IEE 802.3an.
2	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, polymer spine / full separator. Half shall not be accepted.
3	The 4 pair Unshielded Twisted Pair cable shall be ETL Certified and UL® Listed.
4	Conductor Solid Bare Copper and Jacket FR PVC and UL approved CM rated cable and Outer jacket sheath of the cable shall be LSZH.
5	Insulation High Density Polyethylene
6	Dielectric Strength of cable should be 1.0KV dc
7	Attenuation (< 17 db), Pair – to – pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR.
8	Bending Radius should be < 25.4mm at -20°C ± 1°C and Pulling Force: 11.5 Kg
9	Construction: 4 twisted pairs separated by internal X shaped, 4 channel, polymer spine / full separator. Half shall not be accepted.
10	Cable should support operating Temperature from -20° to +70°C
11	Cable should come with printed sequential Length Counter on each meter
12	Cable support Conductor Resistance < 9.38 Ω /100m
13	Mutual Capacitance of cable should be < 5.6nF/100m
14	Max Resistance Unbalance of cable should be 5% Max
15	Capacitance Unbalance of cable should max 330pF/100m
16	Cable support Delay Skew: < 25nS, Operating Voltage: 72V and NVP: 68.2%
17	Category 6A UTP cables shall Enhanced performance cable for transmission of high speed data, digital and analogue voice and video signals on LANs. Supports Gigabit Ethernet (10GbaseT) standard. Operates at bandwidth of 500MHz.

### **FACE PLATE**

S/N	Desired Specification/Qualitative Requirement
1	Single & DUAL square plate (86*86mm) , Quad in Rectangular shape (146*86mm) (ABS, UL94-HB)



S/N	Desired Specification/Qualitative Requirement
2	Write on labels in transparent plastic window – supplied with plate PC (UL94V-2)
3	Screw hole covers – to be supplied with plate M3.5 x L25mm
4	It should have clear label for application identification and inbuilt shutters for protection against dust (ABS, UL94-HB)
5	Should be able to support variety of jacks – UTP5e, UTP6, UTP6A and STP

### INFORMATION OUTLET

S/N	Desired Specification/Qualitative Requirement
1	INFORMATION OUTLET should support Category 6A, ANSI/EIA/TIA568 C.2 and 568A/B configuration
2	All information outlets for 100 $\Omega$ , 22-26 AWG copper cable shall: Use insulation displacement connectors (IDC)
3	Allow for a minimum of 200 re-terminations without signal degradation below standards compliance limits.
4	Be constructed of high impact, flame-retardant thermoplastic with color and icon options for better visual identification.
5	IDC Contact Plating: Phosphor bronze with tin plated and Housing PC + glass fiber (UL 94 V-2)
6	Insertion force: 20N max ( IEC 60603-7-4 )
7	Contact Plating: 50 $\mu$ inches gold on plug contact area
8	Information outlet (RJ45 jack) should be covered under ETL Verification program for compliance with TIA568.C.2
9	Operation Temp: -10 C to 60 C
10	Plastic Housing: Polycarbonate, UL94V-0 rated or equivalent
11	Operating Life: Minimum 750 insertion cycles
12	Contact Material: Copper alloy

### 24 PORT JACK PANEL

S/N	Desired Specification/Qualitative Requirement
1	The Cat-6A transmission performance in compliance with ANSI/TIA-568-C.2, ISO/IEC 11801 Ed.2 and EN 50173-1 specification.
2	Allow for a minimum of 200 re-terminations without signal degradation below standards compliance limit.
3	Have port identification numbers on the front of the panel.
4	Should have self-adhesive, clear label holders and white labels with the panel Panel should be of 1U height with 24 port pre-loaded IO.
5	IDC: Suitable for 22-26 AWG stranded and solid wire compatible with both 110 & Krone punch down tools
6	Each port / jack on the panel should be individually removable on field from

S/N	Desired Specification/Qualitative Requirement
	the panel.
7	IDC cap : ABS, UL 94V -2 and Phosphor bronze with tin plated and Made of powder coated steel
8	Plastic Housing: Polycarbonate, UL94V-0 rated or equivalent
9	Jack Bracket set ABS , UL94V-0 rated
10	Operating Life: Minimum 750 insertion cycles
11	Contact Material: Copper Alloy
12	Contact Plating: 50μ” Gold plated on plug contact area
13	Contact Force: 20N max ( IEC 60603-7-4)
14	Plug Retention Force: 15 lb.

### MOUNTING CORDS

S/N	Desired Specification/Qualitative Requirement
1	Equipped with modular 8-position modular plugs on both ends, wired straight through with standards compliant wiring.
2	The Patch cords shall, at a minimum comply with proposed ANSI/TIA/EIA-568-C.2 Commercial Building Cabling Standards Transmission Performance Specifications for 4 pair 100Ω Category 6A Cabling.
3	Should have 50 micro inches of gold plating over nickel contacts.
4	Should be covered by ETL verification program for compliance with TIA 568.C.2
5	Conductor size: 24 AWG stranded bare copper
6	Cable flame property should follow VW-1 and FT-1 Standard
7	Jacket: PVC UL-94V-O
8	Temperature range: -10oC to +80oC
9	Operating life: Minimum 750 insertion cycles
10	Contact blade: Phosphor bronze
11	Contact plating: 50μ” Gold
12	Plug dimensions & tolerances compliant with FCC Part 68.500 and IEC 60603-7
13	Approvals: UL 444 for copper conductor
14	Dielectric with standing voltage:500 V AC
15	Insulation resistance : 35 M Ohm (Max )