TENDER NOTICE

Tender Notice No.JNTUK /Campus wide networking /2016/1,   **Dt:19-12-2016**

Sealed Tenders are invited from reputed Dealers/ Suppliers for the supply of the listed items. The detailed specifications, terms & conditions for the items can be obtained in respect of items from the undersigned from **19/12/2016** between **11.00 am to 5.00 pm** on payment of ₹.**2000/- (Non-Refundable)** in the form of Demand Draft payable at Kakinada in favor of the **Registrar, JNTUK, Kakinada** drawn from any nationalized bank not earlier than date of this notification. The sealed tenders should reach the undersigned on or before **2.00 pm on 18/01/2017.**

The College Authorities reserve the right to accept or reject any or all bids without assigning any reason whatsoever.

REGISTRAR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA-533003, Andhra Pradesh (India)

Phone: 0884-2300900, Fax: 0884- 2300901

E-mail: registratr@jntuk.edu.in, chs_eee@yahoo.co.in

Tender Notice No.JNTUK /Campus wide networking /2016/1,   Dt:19-12-2016

TENDER SCHEDULE

GENERAL CONDITIONS:

1. Please quote your lowest rates for eachitem described. The quotation should reach this office **on or before 18/01/2017 by 14:00 hrs.**Sealed covers should be submitted for theitems super scribing as **"Tender No.", "Date of opening:", "Item Number(s)".** The sealed covers should be sent by the Registered Post or to be dropped in the sealed box provided in the office of the Principal. The tender will be **opened on 18/01/2017 at 14:30 hrs**by the undersigned/his nominee in the presence of the committee members and available tenderers or their representatives.

2. **E.M.D:** The tender documents should be submitted along with earnest money deposit ₹ **.1,00,000/-** in the form of Demand Draft in favor of **"Registrar, JNTUK, Kakinada"** to be payable at State Bank of India, Kakinada. The Demand Draft pertaining to E.M.D. of unsuccessful party will be returned.

3. **PRICES (in Indian Rupees**): The price should be F.O.R. destination inclusive of taxes, packing & forwarding charges, freight and delivery charges. Items on rate contract, if any together with the terms and conditions may please be furnished.

4. **PAYMENT:**Payment will be made as below against submission of Invoice with all supporting vouchers such as copy of A.P.Sales Tax or VAT Registration certificate, Proof of Delivery etc., No advance will be paid in any case either in part or in full.
    a. Material: 80% of the cost of delivered material will be made within 30 days from the date of delivery of material at site and balance 20% of the cost of material will be made against installation.
    b. Installation, Integration and Commissioning: Installation, integration and commissioning charges will be made within reasonable time period from the date of completion of installation, testing and commissioning.

5. **ACCEPTANCE:** It is not binding on the university/ institution to accept the lowest of the tenders.The university/ institution reserves the right to place orders for individual items withdifferenttenderers.

6. **SPECIFICATIONS:** Full specifications along with the description and make should be mentioned in the tender.

7. The Proposed Products and Solutions should be seamlessly integrated with the existing Campus Network Infrastructure of the University and should ensure 100% interoperability without any deviations.

8. Onsite Service Engineer for a Period of 3 years of the Warranty Period.

9. **Warranty/Guaranty:** Warranty/Guarantyand service for 3 years.

10. **DELIVERY:** The period of delivery at destination from date of placing orders is FOUR WEEKS.

11. **COMMISSIONING:** Within 8 – 12 weeks after placing P.O.

12. **VALIDITY**: The quotations should be valid for at least 90 days.

13. The University reserves the right to cancel the tender without assigning any reason.

14. Those who purchased tender schedule officially by paying ₹. 2000/- in the form of Demand Draft drawn in favor of **Registrar, JNTUK, Kakinada**, payable at Kakinada are only eligible to Participate in the tender. Those who have downloaded the tender schedule from the JNTUK website (www.jntuk.edu.in) should submit a separate **DD for ₹2000/-** along with the quotation.

15. This Institution being Government educational institution is exempted from payment of Central/State Excise Duty.

16. Since JNTUK is the Government institution whatever conditions are applicable to any Government institute shall be applicable even if not specified.

17. Any tender that is received after due date will not be accepted. The college is not responsible for any postal delay.

18. List of Major Customers should be provided.

                                                                              REGISTRAR

Encl: Items with Description

Intentionally left blank

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh (India)
Phone: 0884-2300900, Fax: 0884- 2300901
E-mail: registratr@jntuk.edu.in, chs_eee@yahoo.co.in

Open Competitive Bid (OCB)

For

Providing Campus Wide Networking & Local Area Network to make WIFI Campus

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh (India)
Phone: 0884-2300900, Fax: 0884- 2300901
E-mail: registratr@jntuk.edu.in, chs_eee@yahoo.co.in

Proprietary & Confidential

Section A

Tender call notice

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA-533003, Andhra Pradesh (India)
Phone: 0884-2300900, Fax: 0884- 2300901

Tender call For
Providing Campus Wide Networking & Local Area Network to make WIFI Campus

Time schedule of various tender related events:

Bid calling date	**19/12/2016**
Pre-bid meeting	**07/01/2017, 15:00**
Bid closing date/time	**18/01/2017, 14:00**
Bid opening date/time	**18/01/2017, 14:30**
Bid Document Fee	**Rs. 2000.00 (Rupees Two Thousand Only)**
JNTUK Contact person	**Registrar, JNUTK**
JNTUK Reference No.	**JNTUK/Tenders/2016**

Pre-Qualification criteria:

S.No	Pre-Qualification Criteria	Document Required	Criteria Met Yes/No
1	The Bidder must have been in the business of providing Networking Infrastructure facilities for a minimum period of 5 years.	Certificate of Incorporation / Firm Registration Certificate to be enclosed	
2	The Bidder bidding for part of the tender will be rejected.	An Undertaking from the bidder on their letter head along with the Blank Un-priced Format of the Quoted components without pricing ALONG WITH PART NOS as a proof.	
3	The Bidder should be an ISO 9001:2008 Certified Company for Networking.	Copy of the ISO 9001:2008 Certificate	
4	The bidder should have a minimum Annual turnover of Rs. 6Croreseach year for the past 3 years (2013-14, 2014-15, 2015-16).	A Proof to this effect should be enclosed in the form of Balance sheets and IT Clearance Certificates/Statutory Auditor's Certificate Stating that the Annual Sales Turnover for the Last 3 years of (2013-14, 2014-15, 2015-16).along with certified Balance Sheets.	
5	The Bidder should have an minimum turnover of Rs. 3 Crores per annum for the past 3 years (2013-14, 2014-15, 2015-16). pertaining to networking domain.	Statutory Auditor's Certificate indicating the turnover pertaining to Networking Business.	
6	The bidder should be an Authorized Integrator / Business Partner / Reseller of the Brand that is proposed for the supplies for a minimum period of 5 yearsin Andhra Pradesh as on bid calling date.	A Letter from the OEM indicating Status of the Bidder who is an Authorized Integrator / Business Partner / Reseller for the past 5 years.	
7	All the Active Network Components proposed should be from a single Manufacturer only and the past experience of the bidders should be for the same make of network actives which the bidder is quoting against this tender.	An Undertaking from the bidder on their letter head with the blank Unpriced format of the Products ALONG WITH PART NOS Quoted.	

8	The Original Equipment Manufacturer of Active Components should be an ISO 9001 & ISO 14001 Certified.	A copy of the ISO Certificates of the OEMs of the Products Quoted.	
9	In addition to Bidders support, Service Support should be available directly from the Principals. Bidder should provide The Service Contract Number from the OEM to the Purchaser.	A letter from OEM indicating the clear Addresses of their Spares depots along with an undertaking from the Bidder that he will provide the Service Contract Number along with the Products at the time of product delivery.	
9a	The Active Components Proposed should be supported by the Principal Manufacturer for Technical Assistance on 24 x 7 bases thru a Technical Assistance Center (TAC).	An undertaking from the OEM about their TAC should be provided.	
10	The Bidder should submit the Manufacturers authorization for the proposed Product on OEM's letter head to participate for this tender mentioning the bid reference.	Direct Authorization Letters from the OEMs indicating the Bid Reference to participate in this tender should be provided.	
11	The Active components proposed should have at least 30% market share in Switching & Routing in India.	A Letter from the OEM / industry specialists like IDC.	
12	The products quoted should not be declared End of Life at the time of delivery and OEM should support the products quoted for at least 5 years.	A Letter from the OEM indicating their uninterrupted support for the product for the next 5 years.	
13	The Passive Components proposed Should be from the Single Manufacturer for both Fiber and Copper Components.	A letter of undertaking from the Bidder with Blank Un-priced List of components ALONG WITH PART NOS indicating the Manufacturer of the Product.	
14	The Passive installation should be certified for 'Extended Product and Application warranty' for a minimum period of 20 years from the date of Installation by the OEM.	An undertaking from the OEM on their willingness to certify the product supplied and Installed by the Bidder.	

15	The bidder must have a full-fledged support centre in Andhra Pradesh to support the installation & should have qualified engineers to attend to the support as & when required by JNTUK Kakinada within 24 hours.	Details of the Bidder's support centers to be provided in the prescribed format.	
16	The Bidder should have at least 5 OEM certified engineers for Active Components proposed. (Certificates to be attached along with the Technical Bid).	Copy of the Certificates of bidder's Employees along with an undertaking that the certified engineers are permanent employees of the bidder's organization.	
16a	Should have minimum 5 OEM Certified cabling installation Personnel. (Certificates to be submitted).	Copy of the Certificates of bidder's Employees along with an undertaking that the certified engineers are permanent employees of the bidder's organization.	
17	The Bidder should have installed at least 3 campus networks in educational institutions with at least 500 copper Nodes and about 5 Kilo Meters of Fiber Optic Cabling for backbone as a single order & should have been in the business of providing Turnkey Solutions for Campus Networking for the last 10 years.	Documentary Evidence should be provided in the form of Installation Reports/Performance Certificates / Purchase Orders.	
18	Technical compliance statement should be submitted in original along with the bid.		

Note: Relevant documents in support of above should be furnished

Statement of important limits/values related to bid

Item	Description
Earnest Money Deposit (EMD)	**Rs. 1,00,000/- Lakhs**
Bid Validity Period	60 days from the date of opening of bid
EMD validity Period	45 days beyond bid validity period
Maintenance Period	3 years for Active network components and one year for Structured Cabling Components.
Warranty Period	**Active Network Components - 3 Years** **Passive Network Components - 1 year for Cabling labour& 20 years for manufacturing Defects.**
Variation in quantities	+/- 10%
Period for signing the Order Acceptance	Within 7 days from date of receipt of notification of award
Up time %	97% calculated over 3 months period
Payment terms	
On delivery	80% of the Product Value
On Installation & Acceptance	20% of Product Value & 100% of Installation Value
LD for late deliveries	0.5% of the late delivered goods per week or part there of.
Maximum LD for late deliveries	10% of value of late delivered goods.
Penalty for failure to maintain during warranty or AMC	For every 1% reduction in uptime from 97%, penalty will be 10% of AMC amount. For this purpose AMC will be assumed as 1.50% of PO value during warranty period. After warranty period AMC will be 1/4th of AMC indicated by bidder.
Conditional bids	Not acceptable and liable for rejection
Options for the required equipment	If the bidder wants to give option, he may submit it as separate bids along with separate EMD. This will be treated as separate bid for evaluation.

Active and passive components for providing backbone LAN – Campus Wide Network

The solution, service or material required:

Supply, installation and commissioning of following equipment:

Active Components

Sl. No.	Make and Part Number	Product Description	UoM	Qty
1		Stackable 24 10/100/1000 Ethernet ports, optional 4 SFP ports, with 350WAC power supply, 1 RU, Layer3 - as per the detailed specifications indicated under Section T	Nos.	1
1.1		8X5XNBD Three Year Hardware Warranty	Nos.	1
2		Stackable 12 10/100/1000 SFP Ethernet ports, with 350WAC power supply 1 RU, Layer3 -as per the detailed specifications indicated under Section T	Nos.	4
2.1		8X5XNBD Three Year Hardware Warranty	Nos.	4
3		24 10/100/1000 Ethernet ports, 4 10/100/1000 SFP, 1U, Layer2 - as per the detailed specifications indicated under Section T	Nos.	20
3.1		8X5XNBD Three Year Hardware Warranty	Nos.	20
4		26 10/100/1000 Ethernet Port, 2 combo Ethernet SFP, Layer3as per the detailed specifications indicated under Section T	Nos.	10
5		1000BASE-T SFP Moduleas per the detailed specifications indicated under Section T	Nos.	2
6		1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM - as per the detailed specifications indicated under Section T	Nos.	56

Passive Components

S. No.	Make	Product Description	UoM	Qty
1		6 Core, Single Mode, TeraSPEED, Outside Plant, Dry core, Stranded Loose Tube, Metallic Armored	Mtrs.	4670
2		12 Port LIU	Nos.	18
3		12Panel, Accepts 12 Duplex SC Adapters	Nos.	18
4		SC Duplex Adapter, SM	Nos.	108
5		Pigtail SC, Single mode 3 feet	Nos.	216
6		RoloSplice Kit E/W 2x Fusion Splice Tray for 1U Shelf	Nos.	18
7		SC-LC Fiber Optic Patchcord 3 Mtr	Nos.	36
8		1" HDPE Pipe	Mtrs.	4430

Installation & Integration Services

Sl. No.	Make	Product Description	UoM	Qty
Quote for OFC Services				
1	Labor	Laying of Fiber Optic Cable	Mtrs.	4670
2	Labor	Splicing of Fiber Optic Cable	Nos.	216
3	Labor	Digging and refilling os soft soil / hard soil	Mtrs.	4430
4	Labor	Manhole for fiber cable	Nos.	82
5	Labor	Route markers	Nos.	169
6	Labor	Road cutting Cement works	Mtrs.	192
7	Labor	Laying of 1" HDPE Pipe	Mtrs.	4430
Quote for Active Services				
1	Labor	Active Installation, Configuration, Testing and Project Management with one year on call support	Lumsum	

A.2. Scope of incidental services:

1. Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods.

2. Warranty period services for Three years for Active components and for others One year.

A.3. Maintenance :

Bidder should indicate Annual maintenance cost for the (1/2/3)yearsafter expiry of warranty period.

A.4. Delivery and Installation period

Bidder shall deliver the goods/services within **Four** weeks and install and commission the same with inEight - **Twelve** weeks from the date of contract signing.

Section T
Technical Compliance

T- Technical specification:
(The Technical compliance Statements need to be duly filled against each line item and should be attached along with the Technical Bid duly signed and stamped failing which the tender is liable to be rejected)

- *Active Components*

1. Network Switch- Layer 3 Level
Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	**General Features**		
	Switch should have 24x1G UTP Ports and at least one slot for Multiple 10G's or 1G uplink connectivity		
	Shall support Internal Redundant Power supply		
	Switch should be based on a Modular OS Architecture capable of hosting applications.		
	Switch should have Multicore CPU Architecture.		
	Switch shall support modular power supply and atleast 3 number of field replaceable FAN's. In case of one FAN failure then other Fans should automatically speed-up		
	Switch should have power savings mechanism wherein it should reduce the power consumption on ports not being used.		
	Switch should be Rack Mountable and should not take space more than 1RU		
	Switch should have 2GB Flash and 4GB DRAM memory		
2	**Performance**		
	Should support at least 90 Gbps switch capacity		
	Forwarding rate – 65 Mpps at least		
	Configurable at least 32000 MAC addresses		
	Should support atleast 20K Ipv4 Routes		
	Should support 4000 VLAN ID's		
3	**Stacking**		
	Switch should have dedicate stacking port and should support atleast 8 switches in a single stack		
	The Switch stack should be based on Distributed forwarding Architecture, where in each stack member forwards its own information on network.		
	The Switch stack architecture should have centralized control and Management plane with Active Switch and all the information should be Synchronized with Standby Switch.		

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	The Switch should support Stateful Switchover (SSO) when switching over from Active to Standby switch in a Stack.			
	The Switch stack architecture should be Plug & Play for attaching or removing any switch from the stack without any downtime.			
	The Switch stacking module should be hot-swappable.			
	The Switch stacking should support 480Gbps of stack throughput.			
	The Switch stacking should support single IP address management for the group of switches.			
	The Switch stacking should support automatic upgrade when master switch receives a new software version.			
	The Switch stacking should support single configuration.			
4	**Layer 3 Features**			
	The Switch should support routing protocols like Static, RIP, RIPng, Eigrp-Stub from day one			
	The Switch should have basic IP Unicast routing protocols (static, RIPv1 & RIPv2).			
	The Switch should support IPv6 & IPv4 Policy Based Routing (PBR)			
	The Switch should have Inter-VLAN routing.			
	The Switch should support HSRP for IPv4 & IPv6.			
	The Switch should support Advance routing protocols like OSPF, EIGRP, BGP in Future.			
5	**Layer 2 Features**			
	The Switch should be able to discover (on both IPv4 & IPv6 Network) the neighboring device giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems.			
	The Switch should support Detection of Unidirectional Links (in case of fiber cut) and to disable them to avoid problems such as spanning-tree loops.			
	The Switch should support centralized VLAN Management, VLANs created on the core switch should be propagated automatically.			
	The Switch should support 802.1d, 802.1s, 802.1w Spanning-Tree & its enhancement for fast convergence.			
	The Switch should support 802.1q VLAN encapsulation.			
	The Switch should support 802.3ad (LACP) to combine multiple network links for increasing throughput and providing redundancy.			
6	**Network Security Features**			
	The Switch should have Port security to secure the access to an access or trunk port based on MAC address to limit the number of learned MAC addresses to deny MAC address flooding.			
	The Switch should support DHCP snooping to prevent malicious users from spoofing a DHCP server and sending out roughe addresses.			

	The Switch should support Dynamic ARP inspection (DAI) to ensure user integrity by preventing malicious users from exploiting the insecure nature of ARP.		
	The Switch should support IP source guard to prevent a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.		
	The Switch should support Unicast Reverse Path Forwarding (RPF) feature to mitigate problems caused by the introduction of malformed or forged (spoofed) IP source addresses into a network by discarding IP packets that lack a verifiable IP source address.		
	The Switch should support Bidirectional data support on the SPAN port to allow the intrusion detection system (IDS) to take action when an intruder is detected.		
	The Switch should support flexible & multiple authentication mechanism, including 802.1X, MAC authentication bypass, and web authentication using a single, consistent configuration.		
	The Switch shoud support RADIUS change of authorization and downloadable Access List for comprehensive policy management capabilities.		
	The Switch should support Private VLANs to restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcastmultiaccess like segment to provide security & isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.		
	The Switch should support Multidomain authentication to allow an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.		
	The Switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		
	The Switch should support IGMP filtering to provide multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.		
	The Switch should support VLAN ACLs on all VLANs prevent unauthorized data flows from being bridged within VLANs.		
	The Switch should support IPv6 ACLs that can be applied to filter IPv6 traffic.		
	The Switch should support Port-based ACLs for Layer 2 interfaces to allow security policies to be applied on individual switch ports.		
	The Switch should support Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3) to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.		

	The Switch should support TACACS and RADIUS authentication to facilitate centralized control of the switch and restricts unauthorized users from altering the configuration.		
	The Switch should support Multilevel security on console access to prevent unauthorized users from altering the switch configuration.		
	The Switch should support Bridge protocol data unit (BPDU) Guard to shut down Spanning Tree PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops.		
	The Switch should support Spanning Tree Root Guard (STRG) to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.		
	The Switch should support IPv6 RA Guard, DHCPv6 guard, IPv6 Snooping to prevent any Man-in-middle attack.		
	The Switch should support IPv6 RA Throttler for Wireless Implementation		
	The Switch should support Dynamic VLAN, Downloadable ACLs, Multi-Auth VLAN Assignment, MAC Based Filtering & Web Authentication security mechanism.		
	The Switch should support enforcement of identity and context-based access policies for users and devices.		
	The Switch should support ACLs based on HTTP Domain Names.		
7	**Smart Operations**		
	The Switch should support software image update and switch configuration without user intervention.		
	The Switch should support automatic interface configuration as devices connect to the switch port.		
	The Switch should support system health checks within the switch.		
	The Switch should support real-time network event detection and onboard automation.		
	The Switch should be capable of being deployed by any installer at the site, without having any prior knowledge of the IOS CLIs.		
	The Switch should support dynamic port and session configuration management.		
	The Switch should support real-time network event detection and onboard automation in order to take informational, corrective actions when the monitored events occur (Embedded Event Manager).		
8	**Quality of Service (QoS) & Control**		
	The Switch should support hierarchical QoS (HQoS) including hierarchical classification, policing and shaping.		
	The Switch should be capable of Downloading Downloadable Access List from network security engine based on user identity.		
	The Switch should support IP SLA feature set to verify services guarantee based on business critical IP Applications.		
	The Switch should support Auto QoS for certain device types and enable egress queue configurations.		

	The Switch should support 802.1p CoS and DSCP Field classification using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 Transmission Control Protocol/User Datagram Protocol (TCP/UDP) port number.		
	The Switch should support Shaped round robin (SRR) scheduling to ensure differential prioritization of packet flows by intelligently servicing the ingress queues and egress queues. Weighted tail drop (WTD) to provide congestion avoidance at the ingress and egress queues before a disruption occurs. Strict priority queuing to ensure that the highest priority packets are serviced ahead of all other traffic.		
	The Switch should support Rate limiting based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps.		
	The Switch should support Eight egress queues per port for wired traffic and four egress queues for wireless to enable differentiated management of different traffic types across the stack for wired traffic.		
9	**Application Visibility**		
	The Switch should support Full Flexible Neflow or equivalent which provides ability to characterize IP traffic and identify its source, traffic destination, timing, and application information and is critical for network availability, performance, and troubleshooting.		
	The Switch should be capable of enabling FnF on all ports of the switch for Ingress and Egress Traffic.		
	The Switch should support atleast 24000 Flows per switch		
	The Switches when stacked together should be capable to exporting the flow independently / directly to the FnF Collector.		
	The Switch should be capable of showing customized reports on OS CLI, based on Top Talkers, Top Destination, Top Protocols etc.		
	The Switch should support Wireshark packet analyzer that supports multiple protocols and analyzes the LAN traffic		
	The Switch should support hop-by-hop analysis of application level statistics for troubleshooting video applications.		
10	**Standards & Compliance (Switch Should support all the mentioned Standards)**		
	IEEE 802.1s		
	IEEE 802.1w		
	IEEE 802.1x		
	IEEE 802.11		
	IEEE 802.1x-Rev		
	IEEE 802.3ad		
	IEEE 802.3af		
	IEEE 802.3at		

IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports		
IEEE 802.1D Spanning Tree Protocol		
IEEE 802.1p CoS Prioritization		
IEEE 802.1Q VLAN		
IEEE 802.3z 1000BASE-X specification		
RMON I and II standards		
SNMPv1, SNMPv2c, and SNMPv3		

2. **Network Fiber Switch- Layer 3 Level**
   Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	**General Features**		
	Switch should have 12*10/100/1000 GbE SFP port and alteast one slot for 10G or 1G uplink connectivity		
	Shall support Internal Redundant Power supply		
	Shall support 1000 Base-t, SX, LH/LX Transceivers for SFP connectivity		
	Switch should be based on a Modular OS Architecture capable of hosting applications.		
	Switch should have USB 2.0 for OS Management (uploading, downloading & booting of OS and Configuration).		
	Switch should have Multicore CPU Architecture.		
	Switch should support modular power supply and atleast 3 number of field replaceable FAN's. In case of one FAN failure then other Fans should automatically speed-up		
	Switch should be Rack Mountable and should not take space more than 1RU		
	Switch should have 2GB Flash and 4GB DRAM memory		
2	**Performance**		
	Should support at least 68 Gbps switch fabric		
	Forwarding rate – 50.5 Mpps at least		
	Configurable at least 32000 MAC addresses		
	Should support atleast 20K Ipv4 Routes		
	Should support 4000 VLAN ID's		
3	**Stacking**		
	The Switch should support Stateful Switchover (SSO) when switching over from Active to Standby switch in a Stack.		
	The Switch stacking module should be hot-swappable.		
	The Switch stacking should support 480Gbps of stack throughput.		
4	**Layer 3 Features**		
	The Switch shall support routing protocols such OSPF, BGPv4, IS-ISv4, EIGRP in Future		
	The Switch shall support IP Multicast and PIM, PIM Sparse Mode, PIM Dense Mode, PIM Sparse-dense Mode & Source-Specific Multicast for		

	wired clients in Future		
	The Switch shall support IPv6 Multicast Routing.		
	The Switch should have basic IP Unicast routing protocols (static, RIPv1 & RIPv2) from day one		
	The Switch shall support IPv6 & IPv4 Policy Based Routing (PBR) day one		
	The Switch should support HSRP for IPv4 & IPv6.		
	The Switch should be able to discover (on both IPv4 & IPv6 Network) the neighboring device giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems.		
5	**Network Security Features**		
	The Switch should support IP source guard to prevent a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.		
	The Switch should support flexible & multiple authentication mechanism, including 802.1X, MAC authentication bypass, and web authentication using a single, consistent configuration.		
	The Switch should support RADIUS change of authorization and downloadable Access List for comprehensive policy management capabilities.		
	The Switch should support Private VLANs to restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcastmultiaccess like segment to provide security & isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.		
	The Switch should support TACACS and RADIUS authentication to facilitate centralized control of the switch and restricts unauthorized users from altering the configuration.		
	The Switch should support IPv6 RA Guard, DHCPv6 guard, IPv6 Snooping to prevent any Man-in-middle attack.		
	The Switch should support Dynamic VLAN, Downloadable ACLs, Multi-Auth VLAN Assignment, MAC Based Filtering & Web Authentication security mechanism.		
	The Switch should support enforcement of identity and context-based access policies for users and devices.		
6	**Smart Operations**		
	The Switch should support software image update and switch configuration without user intervention.		
	The Switch should support automatic interface configuration as devices connect to the switch port.		
	The Switch should support system health checks within the switch.		
	The Switch should support real-time network event detection and onboard automation.		
	The Switch should support real-time network event detection and onboard automation in order to take informational, corrective actions when the monitored events occur (Embedded Event Manager).		
7	**Quality of Service (QoS) & Control**		
	The Switch should support hierarchical QoS (HQoS) including hierarchical classification, policing and shaping.		
	The Switch should support IP SLA feature set to verify services guarantee based on business critical IP Applications.		

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
	The Switch should support 802.1p CoS and DSCP Field classification using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 Transmission Control Protocol/User Datagram Protocol (TCP/UDP) port number.		
8	**Application Visibility**		
	The Switch should support Full Flexible Neflow or equivalent which provides ability to characterize IP traffic and identify its source, traffic destination, timing, and application information and is critical for network availability, performance, and troubleshooting.		
	The Switch should support atleast 24000 Flows per switch		
	The Switch should support Wireshark packet analyzer that supports multiple protocols and analyzes the LAN traffic		
	The Switch should support hop-by-hop analysis of application level statistics for troubleshooting video applications.		

3. **Network Switch- Layer 2 Level**
   Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	The switch should support a minimum of 24 nos. 10/100/1000 Ethernet Ports		
2	The switch should support a minimum of 4*1G SFP uplinks		
3	The switch should support a total of 28 Ports		
4	The switch should support flexibility to configure hardware resource (TCAM) allocation for different features.		
5	The switch should support Forwarding bandwidth of 108 Gbps		
6	The switch should support Full-duplex Switching bandwidth of 216 Gbps		
7	The switch should support 64-Byte Packet Forwarding Rate of 71.4 Mpps		
8	The switch should support a Dual Core CPU		
9	The switch should support 128 MB of Flash memory		
10	The switch should support 512 MB of DRAM		
11	The switch should support 1023 Active VLANs		
12	The switch should support 4096 VLAN IDs		
13	The switch should support Jumbo frames of 9216 bytes		
14	The switch should support Maximum transmission unit (MTU) of 9198 bytes		
15	The switch should support up to 16000 Unicast MAC addresses		
16	The switch should be 1 RU.		
17	The switch shall support Stacking		
18	Stacking should enable all switches to function as a single virtual switch		
19	The switch shall have dedicated Stacking Port		
20	Stacking module should be Hot-swappable		

21	Stacking should support a minimum of 8 Switches		
22	Stacking should support 80 Gbps of bi-directional throughput		
23	Stack should support automatic upgrade when the master switch receives a new software version		
24	The switch should support configurable egress buffer allocation for different queues on the stack ports		
25	The switch should be stackable with older switch models that use similar stacking technology		
26	The switch should support an auto-ranging power supply with input voltages between 100 and 240V AC		
27	The switch should support an External Redundant Power Supply in future		
28	The switch should support variable speed fan		
29	The switch should support IEEE 802.1D, 802.1p,802.1Q,802.1S and 802.1w		
30	The switch should support IEEE 802.1x		
31	The switch should support IEEE 802.1ab (LLDP)		
32	The switch should support IEEE 802.3ad Link Aggregation Control Protocol (LACP)		
33	The switch should support RMON I and II standards		
34	The switch should support SNMP v1, v2c, and v3		
35	The switch should be IPv6 Certified		
36	The switch should support RFC 951 - Bootstrap Protocol (BOOTP)		
37	The switch should support RFC 1112 - IP Multicast and IGMP		
38	The switch should support RFC 1305 - NTP for accurate and consistent timestamp		
39	The switch should support RFC 1757 - RMON (history, statistics, alarms, and events)		
40	The switch should support RFC 1981 - Maximum Transmission Unit (MTU) Path Discovery IPv6		
41	The switch should support RFC 2461 - IPv6 Neighbor Discovery		
42	The switch should support RFC 2462 - IPv6 Auto configuration		
43	The switch should support RFC 2474 - Differentiated Services (DiffServ) Precedence		
44	The switch should support RFC 3376 - IGMP v3		
45	The switch should support RFC 3580 - 802.1X RADIUS		
46	The switch should support Automatic Negotiation of Trunking Protocol, to help minimize the configuration & errors		
47	The switch should support Centralized VLAN Management. VLANs created on the Core Switches should be propagated automatically		

48	The switch should support UplinkFast&BackboneFast technologies to help ensure quick failover recovery, enhancing overall network stability and reliability		
49	The switch should support Spanning-tree root guard to prevent other edge switches becoming the root bridge.		
50	The switch should support IGMP filtering		
51	The switch should support Per-port multicast storm control to prevent faulty end stations from degrading overall systems performance		
52	The switch should support Voice VLAN to simplify IP telephony installations by keeping voice traffic on a separate VLAN		
53	The switch should support Local Proxy Address Resolution Protocol (ARP) working in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.		
54	The switch should support IGMP v1, v2 and v3 Snooping		
55	The switch should support IGMP v1, v2 Filtering		
56	The switch should support MVR (Multicast VLAN Registration)		
57	The switch should support IGMP v1, v2 and v3 Snooping		
58	The switch should support IGMP v1, v2 Filtering		
59	The switch should support MVR (Multicast VLAN Registration)		
60	The switch should support Software image update and switch configuration without user intervention		
61	The switch should support automatic configuration of switch port as devices connects		
62	The switch should support real-time alerts and remediation advice when an issue is detected.		
63	The switch should prevent booting any counterfeit images		
64	The Switch should support signed images		
65	The switch should support 4 or 8 configurable egress queues per port to enable differentiated management		
66	The switch should support class map based traffic differentiation with in the same queue		
67	The switch should support shared egress buffers for all the ports		
68	The switch should support dedicated egress buffers reserved for each ports		
69	The switch should support scheduling techniques for QoS		
70	The switch should support Weighted tail drop (WTD) to provide congestion avoidance		
71	The switch should support CoS/dscp remarking		

72	The switch should support Standard 802.1p CoS field classification		
73	The switch should support Differentiated services code point (DSCP) field classification		
74	The switch should support Control- and Data-plane QoS ACLs		
75	The switch should support Strict priority queuing mechanisms		
76	The switch should support Rate Limiting function to guarantee bandwidth		
77	The switch should support rate limiting based on source and destination IP address		
78	The switch should support rate limiting based on source and destination MAC address		
79	The switch should support rate limiting based on Layer 4 TCP and UDP information		
80	The switch should support availability of up to 256 aggregate or individual polices per port.		
81	The switch should support QoS on the stack ports		
82	The switch should support QoS configuration across the entire stack		
83	The switch should support queue level statistics of dropped and enqueued frames for each port		
84	The switch should support Command Line Interface (CLI) support for configuration & troubleshooting purposes.		
85	The switch should support four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis		
86	The switch should support Telnet interface support for comprehensive in-band management of-band management.		
87	The switch should support SSH for secure access		
88	The switch should support SCP for secure file transfer		
89	The switch should support 2 USB ports for external storage		
90	The switch should support solutions that monitors and conserves energy with customized policies		
91	The switch should support reduction of greenhouse gas (GhG) emissions		
92	The switch should support an increase in energy Cost savings		
93	The switch should support Intelligent power management		
94	The switch should support measuring of energy between itself and endpoints		
95	The switch should support control of energy between itself and endpoints		
96	The switch should support discovery of manageable devices for Energy measurement		

97	The switch should support support monitoring of power consumption of endpoints		
98	The switch should support hibernation mode to save power when switch is idle		
99	The switch should support IEEE 802.1x authentication for dynamic port-based security.		
100	The switch should support MAB based authentication (MAB)		
101	The switch should support Web based authentication (Web-auth)		
102	The switch should support Port-based ACLs for Layer 2 interfaces to allow application of security policies on individual switch ports.		
103	The switch should support downloading user level ACL polices (dACL) defined on the RADIUS server during authentication		
104	The switch should support precise access controls based on role, device, location or a combination of all		
105	The switch should support SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.		
106	The switch should support TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration.		
107	The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		
108	The switch should support Port security to secure the access to an access or trunk port based on MAC address.		
109	The switch should support Multilevel security on console access to prevent unauthorized users from altering the switch configuration.		
110	The switch should support Private VLAN		
111	The switch should support faster authentication by triggering all the supported authentication methods simultaneously		
112	The switch should support implementation of 802.1x without affecting user traffic to confirm network readiness for 802.1x transition		
113	The switch should support 8021.X monitor mode, facilitate smoother transition to 802.1X deployment.		
114	The switch should support MAC based VLAN assignment which allows per user VLAN assignment on Multi-auth port.		
115	The switch should support DHCP Interface Tracker (Option 82) feature to augment a host IP address request with the switch port ID.		
116	The switch should support DHCP Option 82 - Configurable Remote ID and Circuit ID		

117	The switch should support DHCP Snooping Statistics and SYSLOG		
118	The switch should support IPv4 Static routes		
119	The switch should be on the approved list of IPv6 Ready Logo phase II - Host		
120	The switch should support IPv6 unicast Static Routing		
121	The switch should support IPv6 Static routes		
122	The switch should support IPv6 MLDv1 & v2 Snooping		
123	The switch should support IPv6 QoS		
124	The switch should support SCP/SSH over IPv6		
125	The switch should support Radius over IPv6		
126	The switch should support TACACS+ over IPv6		
127	The switch should support NTPv4 over IPv6		

4. **Network Switch- Layer 3 Level**
   Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	**General Features**		
	Shall be 1RU, 19" Rack Mountable		
	26 RJ-45 autosensing 10/100/1000 ports with 2 SFP ports		
	Shall have console port		
	16 MB flash, 128 MB CPU memory		
	Packet buffer size of minimum 8 MB to support video/streaming		
	Traffic and huge file transfers (like medical scan documents etc)		
	Shall have switching capacity of 56 Gbps for providing nonblocking performance on all Gigabit ports		
	Shall have up to 41.6 million pps switching throughput to achieve wire-speed forwarding on all Gigabit ports		
	Shall support Static routing/Layer 3 switching between VLANs		
2	**Resiliency**		
	IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning		
	Tree Protocol and IEEE 802.1s Multiple Spanning Tree Protocol		
	IEEE 802.3ad Link Aggregation Control Protocol (LACP) up to eight links (ports) per group		
3	**Features**		
	MAC address table size of 16000 entries		
	Shall support up to IEEE 802.1Q (4,096VLAN IDs) and 512		
	VLANs simultaneously		
	Shall support GARP VLAN Registration Protocol or equivalent feature to allow automatic learning and dynamic assignment of VLANs		

	Shall support Jumbo frames (9000 bytes) to improve the performance of large data transfers			
	Internet Group Management Protocol (IGMP)			
	Multicast Listener Discovery (MLD) snooping			
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and LLDPMED (Media Endpoint Discovery)			
	IPv6 host and Dual stack (IPv4/IPv6) support to provide transition mechanism from IPv4 to IPv6			
4	**QoS and Security Features**			
	Access Control Lists for traffic filtering			
	Source-port filtering or equivalent feature to allow only specified ports to communicate with each other			
	Traffic prioritization based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ			
	Shall support traffic classification into eight priority levels mapped to two or four queues using weighted round robin (WDRR) queuing			
	Shall support traffic rate-limiting per port IEEE 802.1x to provide port-based user authentication with multiple 802.1x authentication sessions per port			
	Media access control (MAC) authentication to provide simple authentication based on a user's MAC address			
	Shall detect and block deliberate network attacks and support IPMB (IP-MAC-port binding)			
	Web-based authentications to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant			
	Concurrent IEEE 802.1X and Web or MAC authentication schemes per port			
	Port security to allow access only to specified MAC addresses			
	MAC address lockout to prevent particular configured MAC addresses from connecting to the network			
	STP BPDU port protection to prevent forged BPDU attacks			
	STP Root Guard to protect the root bridge from malicious attacks or configuration mistakes			
5	**Management Features**			
	Configuration through the CLI, console, Telnet, SSH and browser based management GUI (SSL)			
	SNMPv1, v2, and v3 and Remote monitoring (RMON) support			
	sFlow (RFC 3176) or equivalent for traffic analysis			
	Shall support TFTP and Secure FTP			
	Dual flash images to provide independent primary and secondary operating system files			
	Multiple configuration files to allow multiple configuration files to be stored to a flash image			

	RADIUS/TACACS+ for switch security access administration		
	Simple Network Time Protocol (SNTP) or equivalent support		
	Model no. & part nos. offered to be indicated clearly		
	Rack mounting accessories and Indian type 5A power cords		
6	**Environmental Features**		
	Shall support IEEE 802.3az Energy-efficient Ethernet (EEE) to reduce power consumption		
	Operating temperature of 0°C to 40°C		
	Safety and Emission standards including UL 60950; CSA 22.2; FCC part 15 Class A		

5. **SFP Transceiver Module**
   Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	1000BASE-LX/LH SFP, compatible with the IEEE 802.3z 1000BASE-LX standard, operates on standard single-mode fiber-optic link spans of up to 10 km and up to 550 m on any multimode fibers and 1300-nm wavelength, dual LC/PC connector, Storage temperature range: -40 to 85°C		

6. **SFP Transceiver Module**
   Make and Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	1000BASE-T SFP transceiver module for Category 6A copper wire, RJ-45 connector		

Specifications for Passive Components

- Fiber Optic Cable Outdoor for Backbone
Make :

Specification	Compliance Yes / No	Remarks
Physical Specifications		
Fiber Count 6 Core		
Core Diameter – 8.3 microns		
Cladding Diameter -125.0 m (0.7) microns		

Core/Cladd Offset – 5 microns		
Cladding Non Circularity – 1%		
Coated Fiber Diameter- 245 (10) microns		
Cladding/Coating Offset - 12 microns		
Colored Fiber Diameter 254 (7) microns		
Proof Test - 0.7 Gpa		
Fiber Curl - > 4 microns		
Dynamic Fatigue Parameter ⊡18		
Macrobend (100 turns, 50 mm mandrel) 0.10dB @ 1310nm, 0.10dB @ 1550nm		
Macrobend (1 turn on a 32mm mandrel) 0.50 db @ 1310 nm and @ 1550 nm		
Outer Diameter Inches. (mm) – 0.51(13.1)		
Weight lbs/ft (Kg/km) - 103 (177)		
Minimum Bend Radius Inch(cm)		
Loaded 10.3(26.2)		
Unloaded 5.1 (13.1)		
Max. Tensile Load lbs(Newtons)		
Short Term 607(2700)		
Long Term 180(800)		
Maximum Vertical Raise Feet(Meters) 1754(535)		
Optical Specifications		
Mode Field Diameter 9.2 Micron (0.3) @ 1310 nm 10.4 (nominal) @ 1550 nm		
Group Index of Refraction 0.92 @ 1310nm		

1383(3)nm,1467 @1550nm		
Attenuation 0.35 db/km @ 1310nm 0.24 db/km @ 1550nm		
Maximum Dispersion 2.8 ps/nm-km 1285 tp 1330 nm		
Zero Dispersion Wavelength 1300-1322 nm		
Zero Dispersion Slope $\quad$ 0.092 ps/$((nm)^2$km)		
Polarization Mode Dispersion LDV $\quad$ 0.08 ps/$(km)^{1/2}$		

Specification	Compliance Yes / No	Remarks
Environmental & Mechanical Specifications		
Operating Temperature $\quad$ 40^0 to $+70^0$C		
Installation Temperature $\quad$ -30^0 to $+60^0$C		
Storage Temperature $\quad$ -40^0 to $+75^0$C		
Crush Resistance $\quad$ 44 N / Min		
Standards & Other Specifications		
The cables shall be designed for point to point applications as well as mid-span access, and provide a high-level of protection for fiber installed in the outside plant Environment		
The cable shall armored with a corrugated polymer coated steel tape		
The singlemode fiber shall be dispersion-unshifted, fiber which meets the ITU-T G.652c requirements		
Shall be fully capable of handling existing and legacy singlemode applications which traditionally operate in the 1310nm and 1550nm regions.		

The fiber cable shall be designed to handle the new and emerging applications that utilize the "Extended" E-band, 1360-nm to 1460nm.		
The cable shall satisfy the requirements of ICEA S-640-1999, "Optical Fiber Outside Plant Communications Cable" and Telcordia Generic requirements for Fiber-Optic Cable (GH-20-CORE), Section 6.		
The fiber cable shall also be designed to provide optimum performance from 1265nm to 1625nm making it suitable for 16-channel Course Wavelength Division Multiplexing (CDDM) applications.		
The Fiber cable shall be constructed with industry standard 3mm buffer tubes, stranded around a central strength member.		
The buffer tubes shall be compatible with standard hardware, cable routing and fan-out kits.		
The cable core shall be water blocked with dry water-blocking materials, making access and handling of individual tubes easier and craft-friendly.		

- *Light Interface Unit 24/12 Port*

Make :

Specification & Requirement	Compliance Yes / No	Remarks
The combination shall have a sliding tray with two 3-inch (7.7 cm) storage drums and two openings with liquid-tight cable fasteners. The sliding tray allows front access and installation of fibers.		
The rack mount combination shelf shall be applicable for use in LANs, premises distribution systems, and small-count splice and termination applications		
The rack mount shelf shall be one-unit-high and be capable of housing 24 ST, 24 SC or 48 LC terminations.		
The shelf shall be capable of 24 fibers (48 with LCs) or to accommodate 48 mechanical splices, 64 fusion splices or 12 ribbon (mass fusion splices using optional splice trays.		
The sliding tray shall ride on two self-locking nylon slides used for pulling the shelf away from the frame for front access to fibers		
An Optional door and cable manager shall be available for use when two shelves are stacked for an aesthetic appearance. This optional accessory shall be a 1U high		

(1.75″) with a 3U door (5.25″). A top cover shall be available to protect from dust and falling debris.		
Shelf dimensions : 1.72″ (4.37cm) H x 17.19″ (43.7 cm) W x 11.20″ (28.5 cm) D.		
The LIU Should be made of Aluminum		
The combination shall have a sliding tray with two 3-inch (7.7 cm) storage drums and two openings with liquid-tight cable fasteners. The sliding tray allows front access and installation of fibers.		
The rack mount combination shelf shall be applicable for use in LANs, premises distribution systems, and small-count splice and termination applications		
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The sliding tray shall ride on two self-locking nylon slides used for pulling the shelf away from the frame for front access to fibers		
An Optional door and cable manager shall be available for use when two shelves are stacked for an aesthetic appearance. This optional accessory shall be a 1U high (1.75″) with a 3U door (5.25″). A top cover shall be available to protect from dust and falling debris.		
Shelf dimensions : 1.72″ (4.37cm) H x 17.19″ (43.7 cm) W x 11.20″ (28.5 cm) D.		
The LIU Should be made of Aluminum		

:-*Fiber –Connectors / Pigtails*

Make :

Specification & Requirement	Compliance Yes / No	Remarks
Connector Type – SC Single Mode		
The connector shall Utilize a Zirconia Ferrule for fiber alignment		
The connector shall have push pull hardware for easier connections, as well as high optical stability		

The connector shall be crimped to the outer hardware, to prevent momentary disconnect when axial load is placed on the cable		
The connectors shall meet the following specification		
Length - 2 in (5.08 cm)		
Operating Temperature - 40 to 85° C		
Average Loss 0.2 db (tuned), 0.3 db (untuned)		

:- Fiber Patch Cord (SC-LC)

Make :

Specification & Requirement	Compliance Yes / No	Remarks
Cable→ Duplex Cordage Single Mode		
Length → 3.0 Mtr		
Insertion Loss → Less than 0.2 db		
Return Loss → -50db for Single Mode		
Cable outside Dia→ 3.0 mm		
Tip Metal → Ceramic		

- Network Schematic – Cable Plant

JNTU – K Existing Network Diagram

Firewall

Router

ISP

Server Farm

ECE

CSE

X

X

EEE

CCL

Library

Guest House

MechEng

Staff Qrtrs

Nagarjuna Hostel

X

X

X

X

X

Nalanda Hostel

Narendra Hostel

Nagavalli Hostel

Auditorium

Narmada Hostel
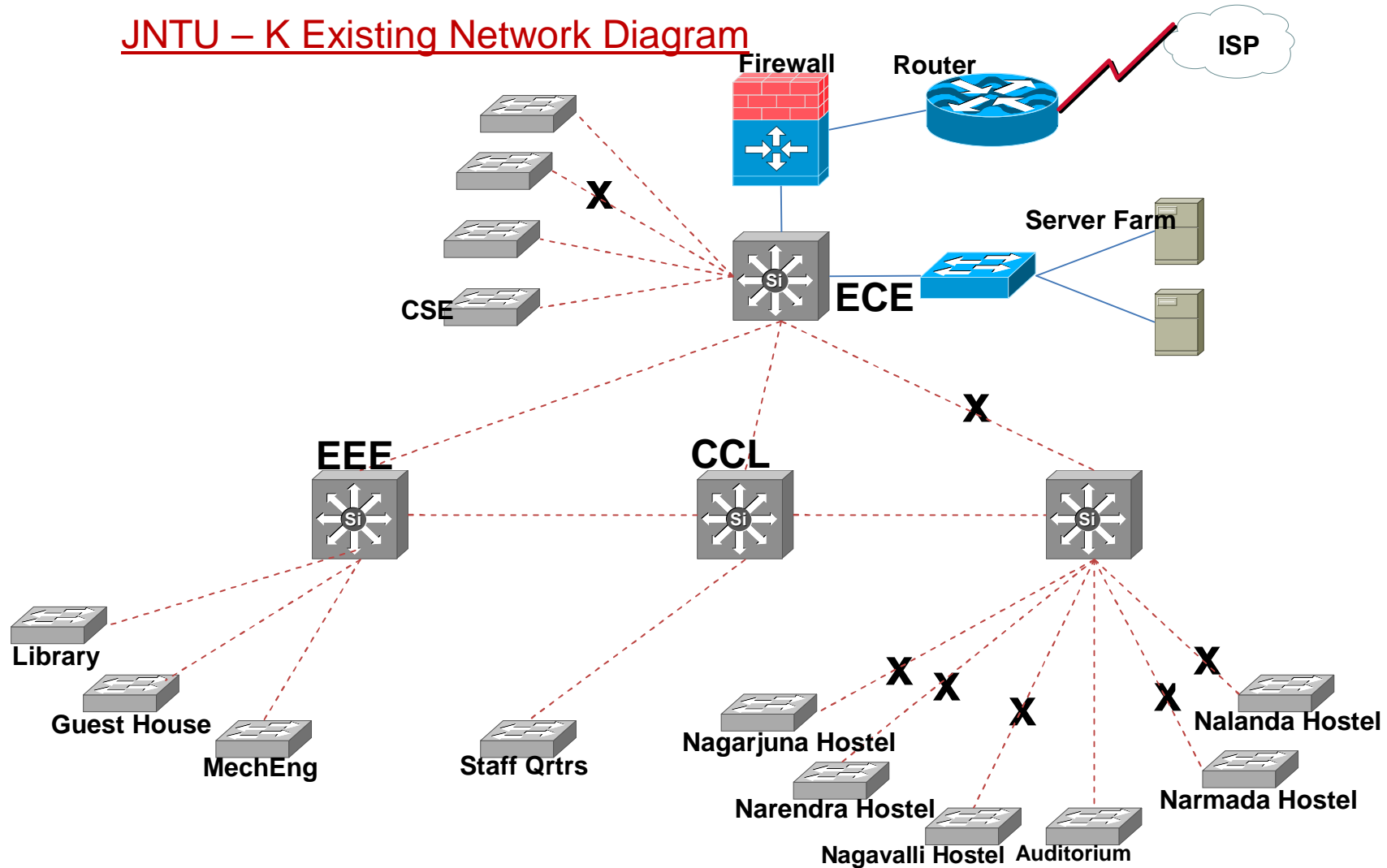
Core Switch Cisco

Cisco Distribution Switch

X - Fiber is cut and No connectivity

Single Mode OFC

RJ 45 Cable

35/76

JNTU – K Proposed Network
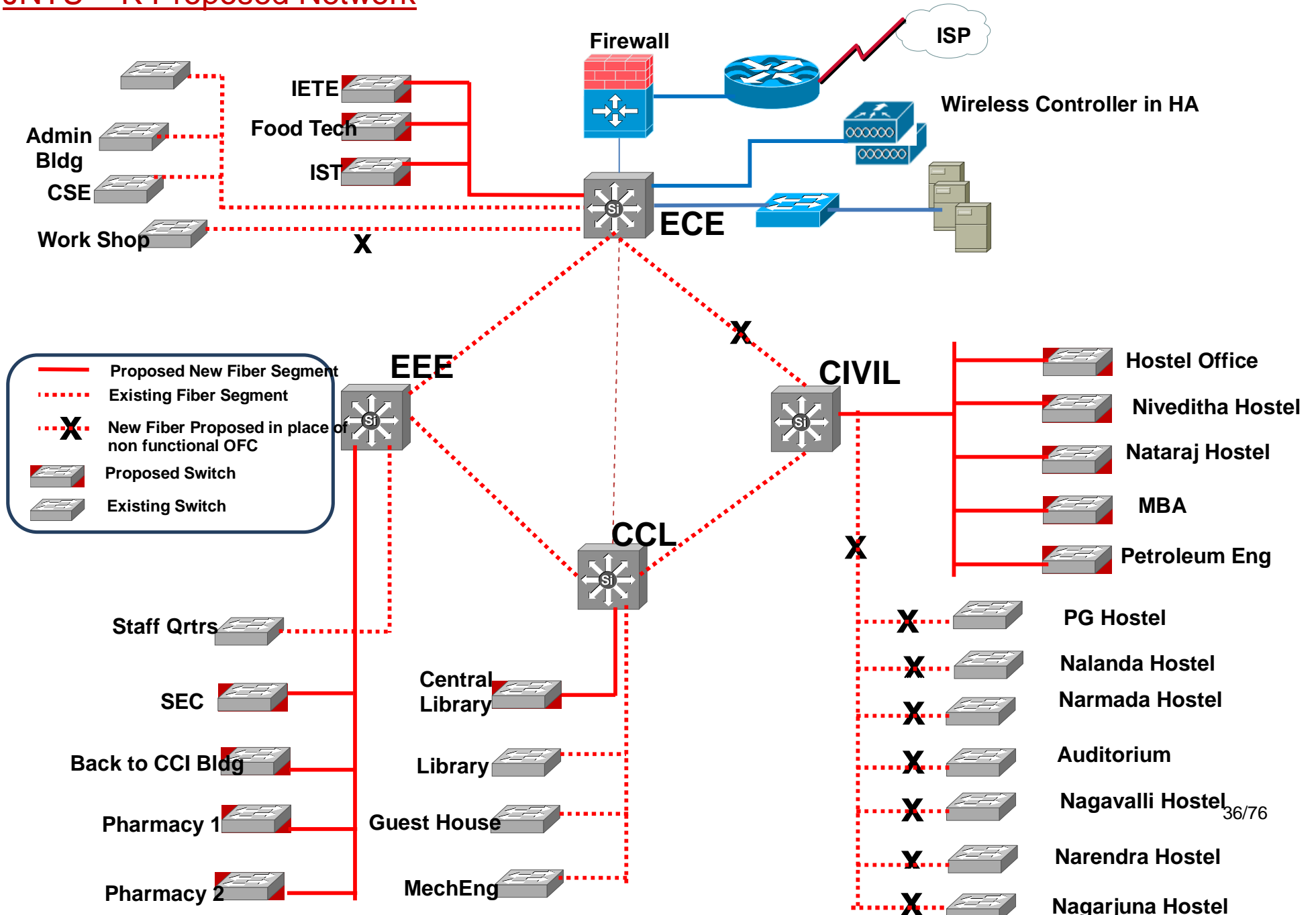
Active and passive components for providing WLAN

Supply, installation and commissioning of following equipment:
Active Components

Sl. No.	Make & Model Number	Product Descriptions	UoM	Qty
1		26 10/100/1000 PoE+ Ethernet Ports, 2 Combo Ethernet SFP, Dedicated power 375W , Layer3 Managed Switchas per the detailed specifications indicated under Section T	Nos.	28
1		Wireless LAN Controller for up to 250 APs, 8 10/100/1000 Ethernet Ports/ 10/100/1000 SFP Portsas per the detailed specifications indicated under Section T	Nos.	1
1.1		8X5XNBD Three Year Hardware Warranty	Nos.	1
2		802.11ac, 3x3:2SS, Internal Antenna, Access Pointas per the detailed specifications indicated under Section T	Nos.	210
3		802.3at PoE+ Power Injectoras per the detailed specifications indicated under Section T	Nos.	10
4		802.11ac Wave2 Outdoor Access Point, External Antennaas per the detailed specifications indicated under Section T	Nos.	10
4.1		2.4 GHz 6dBi/5 GHz 8dBi Dual Band Omni Antennaas per the detailed specifications indicated under Section T	Nos.	20
4.2		Pole-Mount Kit (Type-2) for Outdoor Access Pointas per the detailed specifications indicated under Section T	Nos.	10
4.3		30W Power Injector for Outdoor Access Pointas per the detailed specifications indicated under Section T	Nos.	10
5		1000BASE-T SFP Moduleas per the detailed specifications indicated under Section T	Nos.	2

Passive Components

S. No.	Make	Product Description	UoM	Qty
BOM for LAN connectivity				
1		Cat 6 UTP Cable (roll contains 305mtrs) as per the detailed specifications indicated under Section T	Nos.	45
2		Category 6 U/UTP Information Outlet, user side as per the detailed specifications indicated under Section T	Nos.	210
3		Category 6 U/UTP Patch Panel, 24 port unload as per the detailed specifications indicated under Section T	Nos.	41
4		Category 6 U/UTP Information Outlet, rack side as per the detailed specifications indicated under Section T	Nos.	210
5		Faceplate Single/duplex port with back box	Nos.	210
6		Cat 6 Patch Cords 3 Ft,as per the detailed specifications indicated under Section T	Nos.	220
7		Cat 6 Patch Cords 7 ft,as per the detailed specifications indicated under Section T	Nos.	220
8		15 U Rack 600 mm depthwith with accessories as per the detailed specifications indicated under Section T	Nos.	14

		Passive & Indigenous Components BOM		
1		1"Pvc pipe	Mtrs.	1000
2		1"Casing &caping	Mtrs.	900
3		1 1/2"Casing &caping	Mtrs.	500
4		2"Casing &caping	Mtrs.	600
5		1" flexible pipe	Mtrs.	300
6		2" flexible pipe	Mtrs.	200

Installation & Integration Services

Sl. No.	Make	Product Description	UoM	Qty
Quote for LAN Services				
1	Labor	Laying of Cat 6 UTP Cable	Mtrs.	13725
2	Labor	Termination Category 6 U/UTP Information Outlet,	Nos.	210
3	Labor	Termination Category 6 U/UTP Patch Panel, 24 port	Nos.	41
4	Labor	Termination faceplate Single/duplex port with back box	Nos.	210
5	Labor	Installation Cat 6 Patch Cords 3 Ft,Gray	Nos.	220
6	Labor	Installation Cat 6 Patch Cords 7 ft,Gray	Nos.	220
7	Labor	Fixing 15 U Rack 600 mm depthwith with accessories	Nos.	14
8	Labor	Laying of 1"Pvc pipe	Mtrs.	1000
9	Labor	Laying of 1"Casing &caping	Mtrs.	900
10	Labor	Laying of 1 1/2"Casing &caping	Mtrs.	500
11	Labor	Laying of 2"Casing &caping	Mtrs.	600
12	Labor	Laying of 1" flexible pipe	Mtrs.	300
13	Labor	Laying of 2" flexible pipe	Mtrs.	200
Quote for Active Services				
1	Labor	Active Installation, Configuration, Testing and Documentation Charges with One Year On Call Support	Lumsum	

Section

Technical Compliance

Network PoE+ Switch- Layer3 Level

Make & Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	**General Features**		
	Shall be 1RU, 19" Rack Mountable		
	26 RJ-45 autosensing 10/100/1000 PoE+ ports with 2 SFP ports		
	24 PoE ports with minimum of 375W power budget		
	Shall have console port		
	16 MB flash, 128 MB CPU memory		
	Packet buffer size of minimum 8 MB to support video/streaming		
	Traffic and huge file transfers (like medical scan documents etc)		
	Shall have switching capacity of 56 Gbps for providing nonblocking performance on all Gigabit ports		
	Shall have up to 41.6 million pps switching throughput to achieve wire-speed forwarding on all Gigabit ports		
	Shall support Static routing/Layer 3 switching between VLANs		
2	**Resiliency**		
	IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning		
	Tree Protocol and IEEE 802.1s Multiple Spanning Tree Protocol		
	IEEE 802.3ad Link Aggregation Control Protocol (LACP) up to eight links (ports) per group		
3	**Features**		
	MAC address table size of 16000 entries		
	Shall support up to IEEE 802.1Q (4,096VLAN IDs) and 512		
	VLANs simultaneously		
	Shall support GARP VLAN Registration Protocol or equivalent feature to allow automatic learning and dynamic assignment of VLANs		
	Shall support Jumbo frames (9000 bytes) to improve the performance of large data transfers		
	Internet Group Management Protocol (IGMP)		

	Multicast Listener Discovery (MLD) snooping		
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and LLDPMED (Media Endpoint Discovery)		
	IPv6 host and Dual stack (IPv4/IPv6) support to provide transition mechanism from IPv4 to IPv6		
4	**QoS and Security Features**		
	Access Control Lists for traffic filtering		
	Source-port filtering or equivalent feature to allow only specified ports to communicate with each other		
	Traffic prioritization based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ		
	Shall support traffic classification into eight priority levels mapped to two or four queues using weighted round robin (WDRR) queuing		
	Shall support traffic rate-limiting per port IEEE 802.1x to provide port-based user authentication with multiple 802.1x authentication sessions per port		
	Media access control (MAC) authentication to provide simple authentication based on a user's MAC address		
	Shall detect and block deliberate network attacks and support IPMB (IP-MAC-port binding)		
	Web-based authentications to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant		
	Concurrent IEEE 802.1X and Web or MAC authentication schemes per port		
	Port security to allow access only to specified MAC addresses		
	MAC address lockout to prevent particular configured MAC addresses from connecting to the network		
	STP BPDU port protection to prevent forged BPDU attacks		
	STP Root Guard to protect the root bridge from malicious attacks or configuration mistakes		
5	**Management Features**		
	Configuration through the CLI, console, Telnet, SSH and browser based management GUI (SSL)		
	SNMPv1, v2, and v3 and Remote monitoring (RMON) support		
	sFlow (RFC 3176) or equivalent for traffic analysis		
	Shall support TFTP and Secure FTP		
	Dual flash images to provide independent primary and secondary operating system files		
	Multiple configuration files to allow multiple configuration files to be stored to a flash image		

			Compliance (Y/N)	Deviations (If Any)
	RADIUS/TACACS+ for switch security access administration			
	Simple Network Time Protocol (SNTP) or equivalent support			
	Model no. & part nos. offered to be indicated clearly			
	Rack mounting accessories and Indian type 5A power cords			
6	**Environmental Features**			
	Shall support IEEE 802.3az Energy-efficient Ethernet (EEE) to reduce power consumption			
	Operating temperature of 0°C to 40°C			
	Safety and Emission standards including UL 60950; CSA 22.2; FCC part 15 Class A			

Wireless LAN Controller

Make & Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	Must be compliant with IEEE CAPWAP for controller-based WLANs.		
2	WLAN Controller should support upto 500 Access points in a single 1 RU chassis.		
3	WLAN controller must have at least 6 x 1Gbps of uplink interfaces.		
4	Proposed Controller should be ready for supporting 250 AP's from day one with scalability for 500 AP support in future without adding any new hardware. Each controller (primary and Redundant) should be able to support minimum 500 campus connected AP's or more with support of seamless roaming access over L2/L3 network.		
5	Must not require a separate controller for Wireless Intrusion Prevention Access Points.		
6	Must support both 1+1 and N+1 redundancy models.		
7	Must support stateful switchover between active and standby controller in a sub second time frame.		
8	Must have feature for stateful recovery without re-authentication of the client in the event of LAN and WLAN infrastructure disruption to deliver a non-stop client session		
9	Must support redundant power supplies.		
10	Must support an ability to dynamically adjust channel and power settings based on the RF environment.		
11	Radio coverage algorithm must allow adjacent APs to operate on different channels, in order to maximize available bandwidth and avoid interference		

12	Must have Automatic 802.11 interference detection, identification, classification, and mitigation. Classification should support a dynamically updatable signature library		
13	Must support coverage hole detection and correction that can be adjusted on a per WLAN basis.		
14	Must support RF Management with 40 MHz and 80 Mhz channels with 802.11n & 802.11ac		
15	WLC should support L2 and L3 roaming of IPv6 clients		
16	WLC should support First hop security features in IPv6 network like Router Advertisement guard, DHCPv6 guard and IPv6 source guard		
17	WLC should support IPv6 access control lists		
18	WLC should support Guest-access functionality for IPv6 clients		
19	Controller performance must remain the same if encryption is on or off for wireless SSIDs.		
20	Should support ability to adjust Delivery Traffic Indicator Message (DTIM) on a per WLAN basis to improve performance for latency sensitive applications.		
21	Should adhere to the strictest level of security standards, including 802.11i Wi-Fi Protected Access 2 (WPA2), WPA, Wired Equivalent Privacy (WEP), 802.1X with multiple Extensible Authentication Protocol (EAP) types, including Protected EAP (PEAP), EAP with Transport Layer Security (EAP-TLS), EAP with Tunneled TLS (EAP-TTLS), RFC 4347		
22	Should support Management frame protection for the authentication of 802.11 management frames by the wireless network infrastructure.		
23	The Controller should support a capability to shun / block WLAN client in collaboration with wired IPS on detecting malicious client traffic.		
24	Controller should have rogue AP detection, classification and automatic containment feature		
25	Controller should be able to detect attacks like Broadcast deauthentication, NULL probe, Wellenreiter from day one for all access points		
26	Controller should have profiling of devices based on protocols like HTTP, DHCP and more to identify the end devices on the network		
27	Must support internal and external web authentication.		

28	Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.		
29	Must support user load balancing across Access Points.		
30	Must Support Bonjour Services Directory in both centralized and distributed switching architecture.		
31	Controller must provide Mesh capability for Mesh supported AP.		
32	Must be able to restrict the no. of logins per user		
33	Must be able to dedicate some APs to monitor-only for Intrusion Prevention Services.		
34	Must support client roaming across controllers separated by a layer 3 routed boundary.		
35	Solution proposed must support clients roaming across at least 500 APs.		
36	Must support AP over-the-air packet capture for export to a tool such as Wireshark.		
37	Should support the ability to schedule AP power on/off for energy savings.		
38	Should be able to classify over 20 different types of interference within 5 to 30 seconds.		
39	Should provide a snapshot of air quality in terms of the performance and impact of interference on the wireless network identifying the problem areas.		
40	Should provide an Air Quality rating on a per- radio basis to help gauge the impact of interference on the network		
41	Should provide real-time charts showing interferers per access point, on a per-radio, per-channel basis.		
42	Should support encrypted mechanism to securely upload/download software images to and from wireless controllers		
43	Must support 802.11e WMM		
44	Should have Voice and Video Call Admission and Stream prioritization for preferential QOS		
45	Controller should have Deep Packet Inspection for Layer 4-7 traffic for user for all traffic across the network to analyses information about applications usage and prioritization		
46	Should have rate limiting per user and per SSID basis for encrypted tunnel mode		
47	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.		

Wireless Access Point (Indoor)

Make & Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	Access Points proposed must include radios for both 2.4 GHz and 5 GHz.		
2	Must have a robust design for durability, without visible vents		
3	Each radio has a dedicated memory and CPU apart from the shared Memory and CPU		
4	Access point must have two 10/100/1000BASE-T Ethernet, autosensing (RJ-45) interface		
5	Mounting kit should be standard from OEM directly.		
6	Must have atleast 4 dBi Antenna gain for 2.4 & 4 dBi for 5 Ghz		
7	Must support 3X3 multiple-input multiple-output (MIMO) with TWO spatial streams		
8	Must support simultaneous 802.11ac on 5 GHz radios and 802.11n on 2.4Ghz Radio.		
9	Must support dataratesupto 860 Mbps throughput.		
10	Must support 40 and 80 MHz wide channels in 5 GHz.		
11	Must support upto 22dbm of transmit power in both 2.4Ghz and 5Ghz radios.		
12	The Wireless AP should have the technology to improve downlink performance to all mobile devices including one and two spatial stream devices on 802.11n. The technology should use advanced signal processing techniques and multiple transmit paths to optimize the signal received by 802.11 clients in the downlink direction without requiring feedback and should work with all existing 802.11 clients.		
13	Should have capability to detect and classify non-Wi-Fi wireless transmissions while simultaneously serving network traffic		
14	Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data.		
15	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.		
16	Must have -100 dB or better Receiver Sensitivity.		
17	Must Standards based Beamforming		
18	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization		
19	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.		
20	Must support Management Frame Protection.		
21	Must operate as a sensor for wireless IPS		
22	Access Points must support a distributed encryption/decryption model.		

SI. No.	Detailed Technical Specification	Compliance (Y/N)	Deviations (If Any)
23	Access Points must support Hardware-based DTLS encryption on CAPWAP Standard or eqivalent		
24	Must support the ability to serve clients and monitor the RF environment concurrently.		
25	Must support Spectrum analysis including @ 80 MHz		
26	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.		
27	AP model proposed must be able to be both a client-serving AP and a monitor-only AP for Intrusion Prevention services.		
28	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.		
29	Must continue serving clients when WAN link to controller is down		
30	Mesh should support QoS for voice over wireless.		
31	Must be plenum-rated (UL2043).		
32	Must support Controller-based and standalone(autonomous) deployments		
33	Must support 16 WLANs per AP for SSID deployment flexibility.		
34	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.		
35	Must support Power over Ethernet, power adaptor, and power injectors.		
36	802.3af (15.4W) - The access point can can be powered by any 802.3af-compliant device		
37	802.11e and WMM		
38	WiFi Alliance Certification for WMM and WMM power save		
39	Must support Reliable Multicast to Unicast conversion to maintain video quality at AP level		
40	Must support QoS and Video Call Admission Control capabilities.		

Wireless Access Point (outdoor)

Make & Model Number :

SI. No.	Detailed Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	Access Points proposed must include radios for both 2.4 GHz and 5 GHz.		
2	AP should support dual band antenna ports.		
3	Must support a variety of antenna options. (Omni and directional)		
4	Must have -88 dB or better Receiver Sensitivity.		
5	Must support 2X2 multiple-input multiple-output (MIMO) with two spatial streams		

6	Must support 802.11ac, Wave 2 and back word compatible with 802.11n standards		
7	Must support data rates up to 1.3 Gbps on 5Ghz radio.		
8	Must support 80 MHz wide channels in 5 GHz.		
9	Must support WAP enforced load-balance between 2.4Ghz and 5Ghz band.		
10	Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data		
11	Must support up to 28dbm or higher of transmit power		
12	Access point should 802.11ac, 802.11n and 802.11a/b/g Beam forming		
13	The Wireless Backhaul/Mesh shall operate in 5Ghz		
14	Support Encrypted and authenticated connectivity between all backhaul components		
15	Access point should have multiple wired uplink interfaces including 10/100/1000BASE-T Ethernet autosensing (RJ-45) and a build-in SFP port		
16	Wireless AP should support beam forming technology to improve downlink performance of all mobile devices, including one-, two-, and three-spatial-stream devices on 802.11ac without taking the inputs from client.		
17	Wireless AP Should able to detect and classify non-Wi-Fi wireless transmissions.		
18	Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data.		
19	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization		
20	Access point shall support powering from AC /DC/ UPOE.		
21	Access point shall support pole, wall and Cable strand mounting options.		
22	The equipment shall support up to 100 MPH sustained winds & 140 MPH wind gusts.		
23	The Access point shall be IP67 and NEMA rated		
24	The Access point shall support operating temperature of -40 to 65°C		
25	The Access point shall support Storage temperature of -50 to 70°C		
26	802.11e and WMM		
27	WiFi Alliance Certification for WMM and WMM power save		
28	Must support Reliable Multicast to Unicast conversion to maintain video quality at AP level		
29	Must support QoS and Video Call Admission Control capabilities.		

30	Must support the ability to serve clients and monitor the RF environment concurrently.			
31	Must support Spectrum analysis including @ 80 MHz			
32	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.			
33	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.			
34	Should have and option of configuring all the antennae port via software to run all on dual band or any single band configuration.			
35	Must support 16 WLANs per AP for BSSID deployment flexibility.			
36	Must support telnet and SSH login to APs directly for troubleshooting flexibility.			
37	Antenna Gain: Type 3 Access point –Antenna Gain 6/8 dBi, Dual band external Omni directional, horizontal beam width 360°.			

SFP Transceiver Module

Make & Model Number :

Sl.No	Technical Specification	Compliance (Y/N)	Deviations (If Any)
1	1000BASE-T SFP transceiver module for Category 6A copper wire, RJ-45 connector		

Passive Components

CAT 6 UTP Cables
Make :

Specification & Requirement	Compliance Yes / No	Remarks
Category 6 UTP Cable, 4 Pair		
The high performance Category 6 UTP cable shall be of the traditional round design with mylar bisector tape.		
The cable shall support Voice, Analog Baseband Video/Audio, Fax, Modem,Switched-56, T-1, ISDN,RS-232, RS422, RS-485, 10BASE – T Ethernet, Token Ring, 100Mbps TP-PMD, 100BASE-T Ethernet, 155 Mbps ATM, AES/EBU Digital Audio, 270 Mbps Digital Video, 622 Mbps 64-CAP ATM and emerging high-bandwidth applications, including 1 Gbps Ethernet, gigabit ATM, IEEE 1394B S100 and S400, as well as all 77 channels (550 Mhz) of analog broadband video.		

The cable jacket shall comply with Article 800 NEC for use as a plenum or non-plenum cable. The 4 pair UTP cable shall be UL® and c (UL®) Listed Type CMP (plenum) or CM (non-plenum).		
Performance shall be characterized to 550 MHz to support high-bandwidth video applications		
All Category 6 high performance cables shall the following specification:		
Gauge 23 AWG		
Weight 25.3 lb (1000 ft)		
Jacket Thickness 0.022 in		
Outside Diameter 0.232 in		
Conductor Diameter 0.022 in		
Insulation Type High density Polyethylene		
Jacket Material PVC		
Maximum Pulling Tension 25 lbs		
Nom. Velocity of Propagation 0.69		
Max DC Resistance 9.83 Ohms/100m		
Max DC Resistance Unbalanced Less than or Equal to 3%		
Mutual Capacitance @ 1kHz 4.95 nF/100m		
Operating Temperature -20 to 60° C		
UL Type CMR & CMG		

*Typical worst pair swept margin.

**Guaranteed margin is valid at any frequency from 1-250 MHz for the single manufacturer's certified channel

The high performance Category 6 cable shall be specified to 550 MHz and shall meet the guaranteed swept margin as follows:			
	High Performance Cable	High Performance Channel	Premium Performance Channel
		(4 Connections)	
	Typical Worst Pair Margin*	Guaranteed Margin **	Guaranteed Margin **
Insertion Loss	3.0 %	5.0%	7.5%
NEXT	6.0 Db	6.0 dB	7.0 dB
PSNEXT	6.0 Db	7.5 dB	8.5 dB
ELFEXT	5.0 dB	6.0 dB	8.0 dB
PSELFEXT	5.0 Db	8.0 dB	10.0 dB
Return Loss	4.0 dB	4.0 dB	4.0 dB
Frequency Range	1-550 MHz	1-250 MHz	1-250 MHz

comprising the single manufacturer's Category 6 apparatus and the single manufacturer's High Performance series cable or Premium Performance series. Values represent margin over the TIA/EIA Category 6/Class E channel specifications

CAT 6 Information Outlets

Make :

Specification & Requirement	Compliance Yes / No	Remarks
All Category 6 outlets shall meet or exceed Category 6 transmission requirements for connecting hardware, as specified in TIA/EIA 568-B.2-1 Commercial Building Telecommunications Cabling Standard and ISO/IEC 11801:2002 Second Edition.		
The Category 6 outlets shall be backward compatible with Category 5E, 5 and 3 cords and cables.		
The Category 6 outlets shall be of a universal design supporting T568 A & B wiring.		
The Category 6 outlets shall be capable of being in a modular patching situation or as a modular telecommunication outlet (TO) supporting current 10BASE-T, Token Ring, 100 Mbps TP-PMD, 155 Mbps ATM, 622 Mbps ATM using parallel transmission schemes and evolving high-speed, high-bandwidth applications, including Ethernet, 1000BASE-T and 1.2 Gbps ATM.		
The Category 6 outlets shall be capable of being installed at either a 45° or a 90° angle in any M-series modular faceplate, frame, or surface-mounted box avoiding the need for special faceplates.		
The Category 6 outlets shall have improved pair splitters and wider channel for enhanced conductor placement. The outlet shall also have a low-profile wire cap, which protects against contamination and secures the connection. Multicolored identification labels shall be available to assure accurate installation.		
Meets or exceeds the mechanical, electrical, and clearance specifications in FCC Rules and Regulations, Part 68, Subpart F		
Meet or exceed the Category 6 requirements in ISO/IEC 11801, CENELEC EN 50173, and TIA/EIA568B		
Certifications: UL Listed, CSA Certified and AUSTEL approved.		

The Category 6 outlets shall meet the following Guaranteed Margin Performance and Physical Specifications:	

	Category 6 Outlet	High Performance Channel	Premium Performance Channel
		(4 Connections)	
	Typical Worst Pair Margin*	Guaranteed Margin **	Guaranteed Margin**
Insertion Loss	26.9 %	5.0%	7.5%
NEXT	5.4 dB	6.0 dB	7.0 dB
PSNEXT	4.7 dB	7.5 dB	8.5 dB
ELFEXT	10.5 dB	6.0 dB	8.0 dB
PSELFEXT	10.8 dB	8.0 dB	10.0 dB
Return Loss	8.0 dB	4.0 dB	4.0 dB
Frequency Range	1-250 MHz	1-250 MHz	1-250 MHz

* Typical worst pair swept margin when measured with same manufacture's Category 6 modular patch cord.

**Guaranteed margin is valid at any frequency from 1-250 MHz for the single manufacturer's certified channel comprising the single manufacturer's Category 6 apparatus and the single manufacturer's High Performance series cable or Premium Performance series. Values represent margin over the draft Category 6/Class E channel specifications.

Specification & Requirement	Compliance Yes/No	Remarks
Physical Specifications		
Dimensions - 0.8 in (20 mm) W x 0.8 in (20 mm) H x 1.2 in (31 mm) D		
Plastic - High-impact, flame-retardant, UL rated 94V-0 thermoplastic		
Connector - Copper alloy, 100 micro-inch bright solder over 100 micro-inch nickel underplate		
Outlet Wires Copper alloy, 50 micro-inch lubricated gold plating over 100 micro-inch nickel underplate		
Operating Temperature 14°F to 140°F (-10°C to 60°)		
Storage Temperature Range -40°F to 158°F (-40°C to 70°C)		
Humidity - 95% (noncondensing)		
Nominal Solid Conductor Diameter: 0.025 to 0.020 in (22 to 24 AWG)		

Specification & Requirement		
Nominal Stranded Conductor Diameter 0.64 to 0.51mm (22 to 24 AWG)		
Plug Retention Force 30lb (133 N) minimum		
Plug / Jack Contact Force 100 grams minimum per contact using FCC-8 position telecommunication plug		
Insertion Life 750 cycles minimum using FCC-8 position telecommunication plug		

CAT 6 Patchmax/Jack Panel

Make :

Specification & Requirement	Compliance Yes / No	Remarks
24 port patch panels with 110 IDC connector terminations on rear – 1 U Size		
The patch shall have electrical performance guaranteed to meet or exceed TIA/EIA 568-B.2-1 Category 6 and ISO/IEC Category 6/Class E specifications.		
The panel shall have vertical and horizontal cord organizers available as to improve patch cord management.		
The panel shall be available in 24-port configurations with universal A/B labeling and 110 connector terminations on rear of panel allowing for quick and easy installation of 22 to 24 AWG cable.		
The Panel shall have a black powder finish over high-strength steel.		
The panel shall be UL listed, UL-C certified and ACA approved.		
The panel shall support network line speeds in excess of 1 gigabit per second and be backward compatible with Category 5e, 5 and 3 cords and cables.		

The Category 6 modular jack panels shall meet or exceed the Category 6/Class E standards requirements in ISO/IEC 11801, CENLEC EN 50173 and TIA/EIA and shall be UL Listed.		
The panels shall be either wall or 19-inch rack mountable		

The panels shall meet the following specifications			
	Category 6 Patch panel	HighPerformance Channel	Premium Performance Channel
		(Category 6 Channel)	(4 Connections)
	Typical Worst Pair Margin*	Guaranteed Margin **	Guaranteed Margin**
Insertion Loss	64.3 %	5.0%	7.5%
NEXT	6.6 dB	6.0 dB	7.0 dB
PSNEXT	7.3 dB	7.5 dB	8.5 dB
ELFEXT	6.4 dB	6.0 dB	8.0 dB
PSELFEXT	6.1 dB	8.0 dB	10.0 dB
Return Loss	6.6 dB	4.0 dB	4.0 dB
Frequency Range	1-250 MHz	1-250 MHz	1-250 MHz

* Typical worst pair swept margin when measured with same manufacture's Category 6 modular patch cord.

**Guaranteed margin is valid at any frequency from 1-250 MHz for the single manufacturer's certified channel comprising the single manufacturer's Category 6 apparatus and the single manufacturer's High Performance series cable or Premium Performance series. Values represent margin over the draft Category 6/Class E channel specifications.

Specification & Requirement	Compliance Yes / No	Remarks
Physical Specifications		
Dimensions 19.0 x 1.75 x 1.60 in (48.26 x 4.38 x 4.06 cm) – Universal A/B labeling		
Intra-bay organizer 20.0 x 3.50 x 4.50 in (50.8 x 8.89 x 11.43 cm) – (Front Horizontal / Vertical Routing		
Inter-bay organizer 19.0 x 3.50 x 3.75 in (48.26 x 8.89 x 9.53 cm) – Front Horizontal routing		

Intra-bay organizer 19.0 x 1.72 x 4.60 in (48.30 x 4.38 x 11.70 cm)- Front & back routing		
1U Wall Mount Bracket 19.0 x 3.50 x 3.59 in (48.30 x 8.89 x 12.70 cm)		
Operational Specifications:		
Operating Temperature Range: 14°F to 140°F (-10°C to 60°C)		
Storage Temperature Range: -40°F to 158°F (-40°C to 70°C)		
Humidity: 95% (noncondensing)		
Nominal Solid Conductor Diameter: 0.025 to 0.020 in (0.64 to 0.51 mm) (22 to 24 AWG)		
Nominal Stranded Conductor Diameter: 0.025 to 0.020 in (0.64 to 0.51 mm) (22 to 24 AWG)		
Insulation Size: 0.042 in (1.08 mm) (22 to 24 AWG) Maximum DOD		
Insulation Types: All plastic insulates (including PVC, irradiated PVC, Polyethylene, Polypropylene, PTF Polyurethane, Nylon, and FEP)		
Insertion Life : 750 minimum insertions of an FCC 8-Position Telecommunications Plug		
Front Panel: Black powder painted steel.		
Plastic: High-impact, flameretardant, UL-rated 94V-0 thermoplastic		

Copper Patch Cord 3 Feet & 7 Feet

Make :

Specification & Requirement	Compliance Yes / No	Remarks
All patch cords shall exceed TIA/EIAand ISO/IEC Category 6/Classs E specifications.		
All patch cords shall be backward compatible with Category 5 and Category 5E systems.		
The patch cords shall incorporate an anti-snag feature that provides maximum protection from snagging during moves and re-arrangements.		
Patch cords shall support network line speeds in excess of 1 gigabit per second. 4. Patch cords shall be UL listed, UL-C certified and AUSTEL approved.		
Patch cords shall be available in stranded and solid conductor in lengths to 3 Feet & 7 Feet and Beyond		

The Category 6 modular patch cord shall have guaranteed margin as follows:			
	Category 6 Patch Cord	High Performance Channel	Premium Performance Channel
		(4 Connections)	
	Typical Worst Pair Margin*	Guaranteed Margin **	Guaranteed Margin**
Insertion Loss	N.A	5.0%	7.5%
NEXT	4.4 dB	6.0 dB	7.0 dB
PSNEXT	N.A	7.5 dB	8.5 dB
ELFEXT	N.A	6.0 dB	8.0 dB
PSELFEXT	N.A	8.0 dB	10.0 dB
Return Loss	5.9 dB	4.0 dB	4.0 dB
Frequency Range	1-250 MHz	1-250 MHz	1-250 MHz

* Typical worst pair swept margin when measured with same manufacture's Category 6 modular patch cord.
**Guaranteed margin is valid at any frequency from 1-250 MHz for the single manufacturer's certified channel comprising the single manufacturer's Category 6 apparatus and the single manufacturer's High Performance series cable or Premium Performance series. Values represent margin over the draft Category 6/Class E channel specifications.

Integration Components

Telecom / Network Racks

	Rack 19" 15U Wall Mount Rack		
	Front Glass Door with lock		55/76
	Fan Housing unit with 2 Fans – 1 No Fans 230 VAC 90 CFM – 2 Nos		
	1U Horizontal Cable Manager – 2 Nos		
	AC Distribution box (6x5 Amps) 1 Nos		
	Earthing Continuity Kit, Split		
	Hardware front panel, Square ,packet of 20 – 1 Nos		

Section F

F.1 Bidding procedure - Separate bid for each schedule :

F.1. Offers should be made in Two parts namely, "Technical bid", and "Financial bid" and in the format given in bid document.

1.) EMD details should be given in the "Technical bid".

2.) Tenders will be accepted only from those who have paid the tender document fee.

4.) All correspondence should be with **Registrar, JNTUK** contact person.

5.) A complete set of bidding documents may be purchased by interested bidders from the JNTUK contact person upon payment of the bid document price which is non-refundable or the same can be downloaded from our website. The Downloaded document should be submitted along with tender document Fee which should be enclosed in a separate cover super scribing as tender document fee along with the technical bid. Payment of bid document Cost should be by demand draft/cashier's cheque or certified cheque drawn in favour of "The Registrar, JNTUK, Kakinada. In case the Document is downloaded from JNTUK Website and the same is not accompanied by tender document fee at the time of submission the tender will be summarily rejected.

F.2. Technical Bid:

It shall include the following information about the firm and/or its proposal.

1. General information on the bidder's company in Form P-1
2. Compliance for Prequalification Criterion along with the required supporting documents indicated in the Pre-Qualification Requirements– Form P2
3. List of major customers in support of turnover in Form P-3
4. Details of service centers in AP in Form P-4
5. Certificates like ISO, etc. in Form P-5 (Bidder's format)
6. Manufacturer's authorization to participate in bidding process apart from such other documents like authorization certificate for dealing in the products for which bid is submitted. (However this will not apply to Manufacturers) in Form P-6 (Bidder's format)
7. Deviation(s) to technical specification, if any in Form T-1&T
8. Check list in Form T-2
9. Detailed technical documentation, reference to various industry standards to which the products/ services included in vendor's offer conform, and literature concerning the proposed solution in Form T-3 (Bidder's format)
10. Other information , if any required in the bid document in Form T-4(Bidder's format)

F.3. Financial bid:
The financial bid should provide cost calculations corresponding to unit price of each item of the schedule in Form F-1.

Section G

G.1. Bid evaluation procedure:
Bids would be evaluated for entire Schedule. Bidders should offer prices for all the items of Schedule and for the full quantity of an item of Schedule failing which such bid will not be considered. Technical bid documentation should be in the prescribed format. If a vendor has any comment to offer about the procedural aspects of this tender, it should be intimated to the Registrar, JNTUK, Kakinada at least in advance of two working days from the bid closure date. In case the schedule or procedure of tender processing is revised, the same shall be communicated in the JNTUK website or by e-mail/Fax as the case may be to all vendors who have paid the tender document fee.

G.2. Opening of bids:
Immediately after the closing time, The Registrar,JNTUK / contact person shall open the Technical Bid, and list them for further evaluation. The Financial bids of only those bidders who qualify in the Technical Bid will be opened at the date that will be informed by JNTUK. After evaluation of technical bids, the financial bids of only those bidders who qualify in technical evaluation will be opened.

G.3. TechnicalBid documentation:
The Technical Bid Documentation Consists of two parts Pre-qualification bid documentation & Technical Bid documentation which shall be evaluated in two sub-steps. Firstly, the documentation furnished by the vendor shall be examined prima facie to see if the product/Service offered, technical skill base and financial capacity and other vendor attributes claimed therein are consistent with the needs of this project. In the second step, JNTUK may ask vendor(s) for additional information, visit to vendors site and/or arrange discussions with their professional, technical faculties to verify claims made in Pre-qualification bid documentation and In the second step, JNTUK may ask vendor(s) for additional information, visit to vendors site and/or arrange discussions with their professional, technical faculties to verify   claims made in technical bid documentation.

G.4. Award Criterion:
Final choice of firm to execute the project shall be made on the basis of conformity to technical specifications, appropriateness of the product offered, capability of bidder to execute and service the project and appropriateness of financial offer from the point of view of cost-effectiveness over the entire maintenance period for the product/services.

G.5. Award of Contract:
Evaluation of financial bids will be schedule wise. JNTUK reserves the right to award the contract schedule wise.

G.6. Period of validity of bids
1. Bids shall remain valid for the **90 days** or duration specified in the bid document, after the date of bid opening prescribed by JNTUK. A bid valid for a shorter period shall be rejected as non-responsive.
2. In exceptional circumstances, the JNTUK may solicit the bidders' consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The bid security shall also be suitably extended. A bidder granting the request will not be   permitted to modify its bid.

G.7. Submission of bids

1. The bidders shall seal the Technical and Financial bids in Two separate envelopes which in turn are to be kept in a super cover, duly marking the envelopes as "Technical bid" and "Financial bid", and "Composite bid" respectively.
2. The envelopes shall then be sealed in an outer envelope. The inner and outer envelopes shall:
    a. be addressed to **Registrar, JNTUK, Kakinada**.
    b. Bear the project Name/Title indicated in the tender call, and **bear a statement for** -
        i. Technical bid OR Composite Bid **"Do not open before bid opening day and time"**,
        ii. Financial bid " Don't open until evaluation of technical bid"

3. The outer envelopes shall clearly indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared "late".
4. If the outer envelope is not sealed and marked as required above, REGISTRAR, JNTUK, Kakinada,will assume no responsibility for the bid's misplacement or premature opening.

G.8. Deadline for submission of bids

1. Bids must be submitted at REGISTRAR, JNTUK, Kakinada no later than the bid submission date and time specified in the tender call notice.
2. The REGISTRAR, JNTUK, Kakinada may, at its discretion, extend this deadline for the submission of bids by amending the tender call, in which case all rights and obligations of the REGISTRAR, JNTUK and bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

G.9. Late bids

Any bid not received by the REGISTRAR, JNTUK, Kakinada,contact person by the deadline for submission of bids will be rejected and returned unopened to the bidder.

G.10. Modification and withdrawal of bids

1. The bidder may modify or withdraw its bid after the bid's submission, provided that written notice of the modification including substitution or withdrawal of the bids, is received by the REGISTRAR, JNTUK, Kakinadaprior to the deadline prescribed for submission of bids.
2. The bidder's modification or withdrawal notice shall be prepared, sealed, marked and dispatched in a manner similar to the original bid.
3. No bid can be modified subsequent to the deadline for submission of bids.
4. No bid can be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity. Withdrawal of a bid during this interval will result in the forfeiture of its bid security (EMD).

G.11 General business information:

The bidder shall furnish general business information to facilitate assessment of its professional, technical and commercial capacity and reputation.

G.12 Bid security i.e. earnest money deposit (EMD)

1. The bidder shall furnish, as part of its bid, a bid security for the amount specified in the tender call notice.
2. The bid security is required by REGISTRAR, JNTUK to:
    a. assure bidder's continued interest till award of contract and

b. conduct in accordance with bid conditions during the bid evaluation process.

3. The bid security shall be in Indian rupees and shall be a bank guarantee, or an irrevocable letter of credit or cashier's certified check, issued by a reputable bank scheduled in India and having at least one branch office in Hyderabad.

4. Unsuccessful bidder's bid security will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity prescribed by JNTUK.

5. The successful bidder's bid security will be discharged upon the bidder signing the contract, and furnishing the performance security of 5% for a period of 3 years.

6. The bid security may be forfeited:
    a. If a bidder withdraws its bid during the period of bid validity or
    b. In the case of a successful bidder, if the bidder fails:
        i. To sign the contract in time;

            or

        ii. To furnish performance security.

G.13 Genuineness of the quoted product

1. Bidder should provide an undertaking on the genuineness of the quoted product. The undertaking should be provided in the following format.

2. *"All products supplied against this enquiry will be genuine, new and procured directly or through their Authorized channels. Refurbished products, counterfeit products, products procured from unauthorized sources or grey market will not be supplied. Documents Should be provided to verify the source and date of purchase if required "*

3. Bidder should provide proof of placing the order on Principal Manufacturer or on their Authorized Channels/Distributors for all the Active equipment including cables and interface cards within one week of receiving the order. Failing which the order will be cancelled and EMD will be forfeited.

4. Bidder should provide the Service Contract Number along with the Products at the time of product delivery.

Registrar

JNTU Kakinada

Bid letter form

From:
(Registered name and address of the bidder.)

To:
The Registrar,
JNTUK,Kakinada– 533 003 (AP)

Sir,

Having examined the bidding documents and amendments there on, we the undersigned, offer to provide services/execute the works including supply, delivery installation of hardware, firm wares and soft ware's as the case may be, in conformity with the terms and conditions of the bidding document and amendments there on, for the following project in response to your tender call dated ....

Project title:

We undertake to provide services/execute the above project or its part assigned to us in conformity with the said bidding documents for an estimated sum of Rs .... (total bid amount in words and figures) which may vary in accordance with the schedule of prices attached herewith and coverage options made by JNTUK, or its user organisation.If our bid is accepted, we undertake to;

1. provide services/execute the work according to the time schedule specified in the bid document,

2. obtain the performance guarantee of a bank in accordance with bid requirements for the due performance of the contract, and

3. agree to abide by the bid conditions, including pre-bid meeting minutes if any, which remain binding upon us during the entire bid validity period and bid may be accepted any time before the expiration of that period.

4. We understand that you are not bound to accept the lowest or any bid you may receive, nor to give any reason for the rejection of any bid and that you will not defray any expenses incurred by us in bidding.

Place: Bidder's signature

Date: and seal.

Form P-1

Bidder Information

1	Name of the organization	
2	Year of establishment	
3	Registered Office Address	
4	Phone No.	
5	Fax No.	
6	Email	
7	Total No. of branch offices in AP	
8	Total Support engineers at -	
A	At Head office (No.)	
B	At branch offices (No.)	
9	Whether Manufacturer?	If Yes, Provide relevant documents
10	Whether authorized dealer/ Service Provider?	If Yes, Provide relevant documents
11	Details of EMD furnished	
12	Details of certificates enclosed.	

Form P-2

Compliance Statement for Prequalification Criteria

S.No	Pre-Qualification Criteria	Document Required	Criteria Met Yes/No
1	The Bidder must have been in the business of providing Networking Infrastructure facilities for a minimum period of 5 years.	Certificate of Incorporation / Firm Registration Certificate to be enclosed	
2	The Bidder bidding for part of the tender will be rejected.	An Undertaking from the bidder on their letter head along with the Blank Un-priced Format of the Quoted components without pricing ALONG WITH PART NOS as a proof.	
3	The Bidder should be an ISO 9001:2008 Certified Company for Networking.	Copy of the ISO 9001:2008 Certificate	
4	The bidder should have a minimum Annual turnover of Rs. 6Croreseach year for the past 3 years (2013-14, 2014-15, 2015-16).	A Proof to this effect should be enclosed in the form of Balance sheets and IT Clearance Certificates/Statutory Auditor's Certificate Stating that the Annual Sales Turnover for the Last 3 years of (2013-14, 2014-15, 2015-16).along with certified Balance Sheets.	
5	The Bidder should have an minimum turnover of Rs. 3 Crores per annum for the past 3 years (2013-14, 2014-15, 2015-16). pertaining to networking domain.	Statutory Auditor's Certificate indicating the turnover pertaining to Networking Business.	
6	The bidder should be an Authorized Integrator / Business Partner / Reseller of the Brand that is proposed for the supplies for a minimum period of 5 yearsin Andhra Pradesh as on bid calling date.	A Letter from the OEM indicating Status of the Bidder who is an Authorized Integrator / Business Partner / Reseller for the past 5 years.	
7	All the Active Network Components proposed should be from a single Manufacturer only and the past experience of the bidders should be for the same make of network actives which	An Undertaking from the bidder on their letter head with the blank Unpriced format of the Products ALONG WITH PART NOS Quoted.	

	the bidder is quoting against this tender.		
8	The Original Equipment Manufacturer of Active Components should be an ISO 9001 & ISO 14001 Certified.	A copy of the ISO Certificates of the OEMs of the Products Quoted.	
9	In addition to Bidders support, Service Support should be available directly from the Principals. Bidder should provide The Service Contract Number from the OEM to the Purchaser.	A letter from OEM indicating the clear Addresses of their Spares depots along with an undertaking from the Bidder that he will provide the Service Contract Number along with the Products at the time of product delivery.	
9a	The Active Components Proposed should be supported by the Principal Manufacturer for Technical Assistance on 24 x 7 bases thru a Technical Assistance Center (TAC).	An undertaking from the OEM about their TAC should be provided.	
10	The Bidder should submit the Manufacturers authorization for the proposed Product on OEM's letter head to participate for this tender mentioning the bid reference.	Direct Authorization Letters from the OEMs indicating the Bid Reference to participate in this tender should be provided.	
11	The Active components proposed should have at least 30% market share in Switching & Routing in India.	A Letter from the OEM / industry specialists like IDC.	
12	The products quoted should not be declared End of Life at the time of delivery and OEM should support the products quoted for at least 5 years.	A Letter from the OEM indicating their uninterrupted support for the product for the next 5 years.	
13	The Passive Components proposed Should be from the Single Manufacturer for both Fiber and Copper Components.	A letter of undertaking from the Bidder with Blank Un-priced List of components ALONG WITH PART NOS indicating the Manufacturer of the Product.	
14	The Passive installation should be certified for 'Extended Product and Application warranty' for a minimum period of 20	An undertaking from the OEM on their willingness to certify the product	

	years from the date of Installation by the OEM.	supplied and Installed by the Bidder.	
15	The bidder must have a full-fledged support centre in Andhra Pradesh to support the installation & should have qualified engineers to attend to the support as & when required by JNTUK Kakinada within 24 hours.	Details of the Bidder's support centers to be provided in the prescribed format.	
16	The Bidder should have at least 5 OEM certified engineers for Active Components proposed. (Certificates to be attached along with the Technical Bid).	Copy of the Certificates of bidder's Employees along with an undertaking that the certified engineers are permanent employees of the bidder's organization.	
16a	Should have minimum 5 OEM Certified cabling installation Personnel. (Certificates to be submitted).	Copy of the Certificates of bidder's Employees along with an undertaking that the certified engineers are permanent employees of the bidder's organization.	
17	The Bidder should have installed at least 2 campus networks in educational institutions with at least 500 copper Nodes and about 5 Kilo Meters of Fiber Optic Cabling for backbone as a single order & should have been in the business of providing Turnkey Solutions for Campus Networking for the last 5 years.	Documentary Evidence should be provided in the form of Installation Reports/Performance Certificates / Purchase Orders.	
18	Technical compliance statement should be submitted in original along with the bid.		

Form P -3

List of Major Customers

S.No	Customer Full address	Year of supply	Item Name	Turn over
1				
2				
3				

Form P-4

Details of service centers in AP

S.No	Full Address of service center	Contact person with phone No.	No. of support engineers

Form T-1

Sl. No.	Item	Specification Required	Specification of proposed item	Specification Higher/Lower

Note : Cross reference to the Technical product brochure is to be provided.

Form T - 2

Check List

Compliance/agreed/enclosed/ deviation statement.

The following are the particulars of compliance/deviations from the requirements of the tender specifications.

Bid document reference	Remarks
1. Delivery period	
2. Form P-1	
3. Form P-2	
4. Form P-3	
5. Form P-4	
6. Form T-1	
7. Form T-2	
8. Form F-1	
9. Pre-qualification criterion	
10. Technical specifications	
11. Financial bid format	
12. General instruction to bidders	
18. General condition of proposed contract (GCC)	

The specifications and conditions furnished in the bidding document shall prevail over those of any other document forming a part of our bid, except only to the extent of deviations furnished in this statement.

Place: Bidder's signature

Date :   and seal.

NOTE: For every item appropriate remarks should be indicated like 'no deviation', 'agreed', 'enclosed' etc. as the case may be.

Form F
Providing backbone LAN – Campus Wide Network
Price Bid

Consolidated Price Schedule for the Tender Requirements

Form No.	Item details with make and model	Warranty	Total price with taxes and duties etc with warranty as per Col. 3 (INR)
1	2	3	4
F.1	Active Components	3 Years	
F.2	Passive Components	1 Year	
F.3	OFC Integration Charges	1 Years	
F.4	Actives Installation Charges	1 Years	
	Total Project cost (INR)		

Bid amount in words   (Col. No. 4) _____

(Signature of Bidder with stamp)

Active and passive components for providing backbone LAN – Campus Wide Network

F.1 :Financial Bid for Active Components

Sl. No.	Make	Product Description	UoM	Qty	Unit Price	Total Price	VAT@	Total with VAT
Quote for : Data Network Switches								
1		Stackable 24 10/100/1000 Ethernet ports, optional 4 SFP ports, with 350WAC power supply, 1 RU, Layer3 - as per the detailed specifications indicated under Section T	Nos.	1				
1.1		8X5XNBD Three Year Hardware Warranty	Nos.	1				
2		Stackable 12 10/100/1000 SFP Ethernet ports, with 350WAC power supply 1 RU, Layer3 - as per the detailed specifications indicated under Section T	Nos.	4				
2.1		8X5XNBD Three Year Hardware Warranty	Nos.	4				
3		24 10/100/1000 Ethernet ports, 4 10/100/1000 SFP, 1U, Layer2 - as per the detailed specifications indicated under Section T	Nos.	20				
3.1		8X5XNBD Three Year Hardware Warranty	Nos.	20				
4		26 10/100/1000 Ethernet Port, 2 combo Ethernet SFP, Layer3 as per the detailed specifications indicated under Section T	Nos.	10				
5		1000BASE-T SFP Module as per the detailed specifications indicated under Section T	Nos.	2				
6		1000BASE-LX/LH SFP transceiver module MMF/SMF 1310nm DOM - as per the detailed specifications indicated under Section T	Nos.	56				
		Sub Total						

Total value of the Active Components					

F 2 :Financial Bid for Passive Components

S. No.	Make	Product Description	UoM	Qty	Unit Price	Total Price	VAT@	Total with VAT
1		6 Core, Single Mode, TeraSPEED, Outside Plant, Dry core, Stranded Loose Tube, Metallic Armored	Mtrs.	4670				
2		12 Port LIU	Nos.	18				
3		12Panel, Accepts 12 Duplex SC Adapters	Nos.	18				
4		SC Duplex Adapter, SM	Nos.	108				
5		Pigtail SC, Single mode 3 feet	Nos.	216				
6		RoloSplice Kit E/W 2x Fusion Splice Tray for 1U Shelf	Nos.	18				
7		SC-LC Fiber Optic Patchcord 3 Mtr	Nos.	36				
8		1" HDPE Pipe	Mtrs.	4430				
		Sub Total						

Total value of the Passive Components								

Sl. No.	Make	Product Description	UoM	Qty	Unit Price	Total Price	VAT@	Total with VAT
F 3 : Quote for OFC Services								
1	Labor	Laying of Fiber Optic Cable	Mtrs.	4670				
2	Labor	Splicing of Fiber Optic Cable	Nos.	216				
3	Labor	Digging and refilling os soft soil / hard soil	Mtrs.	4430				

4	Labor	Manhole for fiber cable	Nos.	82				
5	Labor	Route markers	Nos.	169				
6	Labor	Road cutting Cement works	Mtrs.	192				
7	Labor	Laying of1" HDPE Pipe	Mtrs.	4430				
Sub Total								
F 4 : Quote for Active Services								
1	Labor	Active Installation, Configuration, Testing and Project Management with one year on call support	Lum-sum					

Total value of the Passive Services			
Total value of the Active Services			

Price Bid

Active and passive components for providing WLAN

Consolidated Price Schedule for the Tender Requirements

Form No.	Item details with make and model	Warranty	Total price with taxes and duties etc with warranty as per Col. 3 (INR)
1	2	3	4

1	Active Components	3 Years	
2	Passive Components	1 Year	
3	Passive Service Charges	1 Years	
4	Actives Installation Charges	1 Years	
	Total Project cost (INR)		

Bid amount in words   (Col. No. 4) _____

(Signature of Bidder with stamp)

Active and passive components for providing WLAN

1.Financial Bid for Active Components

Sl. No.	Make & Model Number	Product Descriptions	UoM	Qty	Unit Price	Total Price
1		26 10/100/1000 PoE+ Ethernet Ports, 2 Combo Ethernet SFP, Dedicated power 375W , Layer3 Managed Switch	Nos.	28		
1		Wireless LAN Controller for up to 250 APs, 8 10/100/1000 Ethernet Ports/ 10/100/1000 SFP Ports	Nos.	1		
1.1		8X5XNBD Three Year Hardware Warranty	Nos.	1		
2		802.11ac, 3x3:2SS, Internal Antenna, Access Point	Nos.	210		
3		802.3at PoE+ Power Injector	Nos.	10		
4		802.11ac Wave2 Outdoor Access Point, External Antenna	Nos.	10		
4.1		2.4 GHz 6dBi/5 GHz 8dBi Dual Band Omni Antenna	Nos.	20		
4.2		Pole-Mount Kit (Type-2) for Outdoor Access Point	Nos.	10		
4.3		30W Power Injector for Outdoor Access Point	Nos.	10		
5		1000BASE-T SFP Module	Nos.	2		
		Sub Total				

		Total value of the Components				

2.Financial Bid for Passive Components

S. No.	Make	Product Description	UoM	Qty	Unit Price	Total Price	VAT@	Total with VAT
BOM for LAN connectivity								
1		Cat 6 UTP Cable (roll contains 305mtrs)	Nos.	45				
2		Category 6 U/UTP Information Outlet, user side	Nos.	210				
3		Category 6 U/UTP Patch Panel, 24 port unload	Nos.	41				
4		Category 6 U/UTP Information Outlet, rack side	Nos.	210				
5		Faceplate Single/duplex port with back box	Nos.	210				
6		Cat 6 Patch Cords 3 Ft,	Nos.	220				
7		Cat 6 Patch Cords 7 ft,	Nos.	220				
8		15 U Rack 600 mm depthwith with accessories	Nos.	14				
		Sub Total						
Passive & Indigenous Components BOM								
1		1"Pvc pipe	Mtrs.	1000				
2		1"Casing &caping	Mtrs.	900				
3		1 1/2"Casing &caping	Mtrs.	500				
4		2"Casing &caping	Mtrs.	600				
5		1" flexible pipe	Mtrs.	300				
6		2" flexible pipe	Mtrs.	200				
		Sub Total						

Total value of the Passive Components						

Sl. No.	Make	Product Description	UoM	Qty	Unit Price	Total Price	VAT@	Total with VAT
3 . Quote for LAN Services								
1	Labor	Laying of Cat 6 UTP Cable	Mtrs.	13725				

2	Labor	Termination Category 6 U/UTP Information Outlet,	Nos.	210				
3	Labor	Termination Category 6 U/UTP Patch Panel, 24 port	Nos.	41				
4	Labor	Termination faceplate Single/duplex port with back box	Nos.	210				
5	Labor	Installation Cat 6 Patch Cords 3 Ft,Gray	Nos.	220				
6	Labor	Installation Cat 6 Patch Cords 7 ft,Gray	Nos.	220				
7	Labor	Fixing 15 U Rack 600 mm depthwith with accessories	Nos.	14				
8	Labor	Laying of 1"Pvc pipe	Mtrs.	1000				
9	Labor	Laying of 1"Casing &caping	Mtrs.	900				
10	Labor	Laying of 1 1/2"Casing &caping	Mtrs.	500				
11	Labor	Laying of 2"Casing &caping	Mtrs.	600				
12	Labor	Laying of 1" flexible pipe	Mtrs.	300				
13	Labor	Laying of 2" flexible pipe	Mtrs.	200				
	Sub Total							
4. Quote for Active Services								
1	Labor	Active Installation, Configuration, Testing and Documentation Charges with One Year On Call Support	Lumsum					

Total value of the Passive Services			
Total value of the Actives Installation			