UNIVERSITY OF ENGINEERING & TECHNOLOGY, LAHORE (PAKISTAN)

TENDER NOTICE

Sealed Proposals, on "single stage, two-envelope" bidding procedure (Technical & Financial Proposals separately), are hereby invited for the Expansion and Up-gradation of I.T. Network of UET Lahore Main Campus (**FOR Basis**) from the authorized dealers, manufacturers or suppliers of well reputed firms. Detailed specifications of the items and other terms and conditions are given in the tender document.

Item No.	Description	Approved amount in PC-1 Rs.
i.	Expansion and Up-gradation of I.T. Network of UET Lahore Main Campus.	118.326 Million

The Tender document can be obtained on the same day of publishing of the advertisement in National News Papers, on PPRA Punjab and UET Lahore websites from the office of the **Director Computer Cell, Research Center UET Lahore (Ph. No. 042-99029101)** during office hours (9:00 AM to 4:00 PM) on the production of Challan amounting Rs. 1,000 (non-refundable) be deposited in the University Main Account No. 553-33 maintained in HBL, UET Branch Lahore. Deposit at call as earnest money from the scheduled bank @ 2% of the estimated cost in the name of **Treasurer, UET Lahore** should be accompanied along with the bid. **The last date of submission of tender is July 02, 2018 at 09:30 AM**. **The Technical proposals/tenders will be opened on same day at 10:00 AM** by the Central Procurement Cell UET Lahore in the Conference Room adjacent to Vice Chancellor's Office in presence of the bidders or their representatives (if any).

- No telephonic/telegraphic/faxed tender will be accepted.
- Only ISO Certified and Registered (Income tax, general sales tax and professional tax) firms are eligible to participate.

(Prof. Dr. Waqar Mahmood)
Director Computer Cell
University of Engineering and Technology,
GT Road, Lahore. Ph: 042-99029101

UNIVERSITY OF ENGINEERING & TECHNOLOGY, LAHORE

REQUEST FOR PROPOSALS

For

NETWORK UP-GRADATION OF UET, LAHORE MAIN CAMPUS

Last Date for Submission:	**02 July 2018 at 09:30 AM**
Bid Opening Date:	**02 July 2018 at 10:00 AM**

COMPUTER CELL, UNIVERSITY OF ENGINEERING & TECHNOLOGY, LAHORE

TENDER DOCUMENT

NETWORK UP-GRADATION OF UET, LAHORE MAIN CAMPUS

(A Turnkey Project)

Contents:

REQUEST FOR PROPOSAL-2018 4
1. INTEGRITY PACT: 5
1. INTRODUCTION: 6
2. SCOPE OF WORK: 6
3. BIDS SUBMISSION REQUIREMENTS: 6
4. SELECTION PROCEDURE: 7
5. LIQUIDATED DAMAGES: 8
6. GENERAL TERMS AND CONDITIONS: 8
7. MANDATORY TERMS AND CONDITIONS: 9
8. MEET OR EXCEED SPECIFICATIONS: 10
9. GENERAL TECHNICAL REQUIREMENTS: 11
10. SOLUTION REQUIREMENT: 11
11. PRODUCTS AND SERVICES SOUGHT: 12
12. CLARIFICATIONS: 12
13. ACTIVE EQUIPMENT: 13
14. PASSIVE EQUIPMENT: 23

TENDER PRICE: **Rs. 1,000/-**

Issue date: **13 / 06 / 2018**

Last date of submission: **02 / 07 / 2018 till 09: 30 AM**

FOR OFFICE USE ONLY

Serial No._____

Sold to: - M/S_____

Date of Sale_____Bank Challan No. _____Date_____

_____

COMPUTER CELL, RESEARCH CENTER
UNIVERSITY OF ENGINEERING AND TECHNOLOGY LAHORE.
PHONE: **(042) - 99029101**

INTEGRITY PACT

(To be submitted on Legal Stamp Paper)

AFFIDAVIT

We _(Name of the Firm/ Supplier)_being the first duly sworn on oath submit, that Mr. /Ms. _____(if participating through agent / representative) is the agent / representative duly authorized by _(Name of the Firm/Supplier)_ hereinafter called the Supplier to submit the attached proposal to the _(Name of the Purchaser)_. Affiant further states that the said M/s (Firm/ Supplier Name) has not paid, given or donate or agreed to pay, given or donate to any line officer or employee of the _(Name of the Purchaser)_ any money or thing of value, either directly or indirectly, for special consideration in the letting of the contract, or for giving undue advantage to any of the Firm/ Supplier in the Pre-Qualification Process and in the evaluation and selection of the Firm/ Supplier for contract or Participating in further Procurement Procedures or for refraining from properly and thoroughly maintaining projects implementations, reporting violation of the contract specification or other forms of non-compliance. [The Firm/ Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with the Purchaser and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty / support. [The Firm/ Supplier] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty / support. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to the Purchaser under any law, contract or other instrument, be voidable at the option of the Purchaser. Notwithstanding any rights and remedies exercised by the Purchaser in this regard, [the Firm/ Supplier] agrees to indemnify the Purchaser for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to the Purchaser in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by [the Firm/ Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from the Purchaser.

_____

Authorized Signature & Stamp

Subscribed and sworn to me this _____ day of _____ 20__

_____ Notary Public.

1. INTRODUCTION:

University of Engineering and Technology (UET) Lahore was established in 1961. The University has twenty-four engineering degree programmes and an equal number of Postgraduate and PhD programmes. The University's IT department (Computer Cell) plays a key role in enabling the research and learning environment, which serves about 10,000 users in UET Main Campus. The IT infrastructure of UET has been laid down in an incremental way augmenting the available resources with new demands in an ad hoc fashion since last 13 years. Growth in network traffic and demand from users for more bandwidth are constant challenges. This situation is compounded by the proliferation of mobile devices among students and faculties. To address these issues, the university is looking forward to upgrade its Wired Network infrastructure.

2. SCOPE OF WORK:

2.1 The Selected Bidder will be responsible for the supply, installation, configuration, integration, testing and commissioning of supplied equipment and components at UET Lahore Main Campus.

2.2 Selected Bidder must ensure that the supplied equipment is operational, new, perform properly, and meet RFP's Technical Specification and it is not going to be EOL & End of support for next five years. And equipment parts remain available with the vendor for said period.

2.3 At the time of installation and commissioning, Selected Bidder must provide comprehensive documentation of Configuration and Manuals etc.

2.4 The selected bidder shall be responsible for the provisioning of extended warranties and services.

3. BIDS SUBMISSION REQUIREMENTS:

The objective of bid submission requirement is to provide bidders the information to submit their bid in response of this RFP according to the specifications defined in this RFP and in order/sequence as set forth in this document. Bidders must follow following requirements for their proposals/bids.

3.1 Single stage/two envelope bidding procedure shall be applied in response to the RFP (Request for proposal). The envelops shall be marked as "TECHNICAL PROPOSAL" and "FINANCIAL PROPSAL" separately. The financial proposal of bids found technically non responsive shall be returned unopened to the respective bidders.

3.2 Technically responsive bidders shall be informed and their financial bids shall be opened in the next Central Procurement Cell (CPC) meeting after informing the technically responsive bidders.

3.3 Responding organizations shall deliver sealed proposal of the "FINANCIAL & TECHNICAL PROPOSALS" before or on **02 July, 2018** at **09:30 AM.**

3.4 The Proposals will not be accepted after the due date &, time. The proposal shall be delivered at the address given below before time. The TECHNICAL PROPOSALS shall be opened on the same day **02 July, 2018** at **10:00 AM** in the presence of bidders or the representatives of the responding organizations.

3.5 A call at deposit equal to 2% of estimated cost should accompany the Tender as Earnest Money drawn in favor of **The Treasurer, UET Lahore**. The Tender shall not be considered without Earnest Money. Bank guarantee will not be accepted.

3.6 Bidders are advised not to quote different options for each item (only one option is to be quoted).

3.7 All Price should be mentioned on **FOR basis**. BOQs submitted by the bidder must use the numbers and labels used in this Request for proposal.

3.8 The original Request for Proposal documents duly signed and officially sealed by the bidder must be submitted in whole with the proposals. Any conditional, ambiguous, incomplete, supplementary or revised offer after the opening of tender shall not be entertained.

3.9 Any overwriting/crossing, etc. appearing in the offer may be properly signed by the person signing the tender. All pages of the tender must be properly signed & stamped. Offer with any overwriting/use of Blanco shall not be accepted in any circumstances.

3.10 The Successful Bidder will deposit blank stamp papers of value of 0.25% of the total offer / contract amount, purchased in the name of **Treasurer University of Engineering & Technology (UET), Lahore.**

3.11 The quantity of an order may vary depending on the quoted price and the allocated funds.

3.12 The **TECHNICAL COMMITTEE**, reserves the rights to modify the conditions / specifications of the Tender Document with written intimation to all the participants those who have purchased the Tender Documents.

3.13 The amount submitted as earnest money shall be returned to the unsuccessful bidders after signing of the contract with successful bidder.

3.14 All the proposals submitted will become the property of the University.

4. SELECTION PROCEDURE:

Technical and financial evaluation will be used for the selection of a bidder for the award of this tender.

4.1 UET's intent in issuing this Tender Document is to award a contract to the lowest evaluated and best responsive bidder who meets specifications as laid out in Technical Information and who fulfill all Mandatory Requirements mentioned in General Terms and Conditions. If any of the requirements or equipment specifications are not met by the bidder, the bid will be considered as non-responsive.

4.2 After the approval of contract award, a contract agreement on the stamp papers shall be executed with selected bidder.

5. LIQUIDATED DAMAGES:

5.1 In case of delay, the **CENTRAL PROCUREMENT CELL** reserves the right to impose a penalty not exceeding 10% of the total amount of the contract at the rate of 1% of the bill for each delay per week.

5.2 In case of services delay or unsatisfactory service deliver non-complying the terms of the comprehensive warranty services, Contractor performance Guarantee / Retention Money will be forfeited.

6. GENERAL TERMS AND CONDITIONS:

6.1 The decision of the committee will be binding on all concerned and will in no case be challenged on any forum or court of Law.

6.2 In case the tenderer fails to execute the contract strictly in accordance with the terms and conditions laid down in the contract, the Earnest Money shall be forfeited

6.3 **The TECHNICAL COMMITTEE**, will get the equipment inspected at UET Lahore and will have the right to reject the equipment if not found according to the stated specifications.

6.4 10% of the contract amount shall be deducted as security at the time of bill process. The deducted amount as security will be returned after successful completion of Defect Liability / Warranty Period, after repairing the defects in the equipment / replacement found during the warranty period.

6.5 It is the sole responsibility of the vendor to comply with local, national and international laws.

6.6 The Contractor will be responsible for the Complete Delivery, Installation, Execution, Configuration & Commissioning within 120 days of issuance of Procurement Order.

6.7 In case of any unexpected event delivery period can be extended by the Procurement Committee on the written request of the contractor, giving compelling reasons for delay in delivery.

6.8 Delivery & Installation (wherever mentioned) be completed according to the agreed upon schedule of works and time.

6.9 In case any supply / material is found not in conformity with the specifications provided in the tender, either on account of inferior quality, defective workmanship, faulty design, faulty packing or is short supplied, or wrongly supplied, the supplier shall replace the same free of charges.

6.10 There will be a Pre Bid Meeting, around one week before the tender opening date, with vendors. The vendors are required to send their queries in writing to the Director IT / Manager IT, before the Pre Bid Meeting.

7. MANDATORY TERMS AND CONDITIONS:

Following are mandatory and general terms & conditions apply to this RFP:

Category	Description	Requirement/Points	Evaluation
Legal	Certificate of Company/Firm Registration/Incorporation under the laws of Pakistan	Mandatory	
	Valid Income Tax Registration	Mandatory	
	Valid Professional Tax Certificate	Mandatory	
	Valid General Sales Tax Registration (Status = Active with FBR)	Mandatory	
	Submission of undertaking on legal, valid and attested stamp paper that the firm is not Blacklisted and not involved in litigation with any of Provincial or Federal Government Department, Agency, Organization or autonomous body anywhere in Pakistan. In case involved in any litigation process, proof of dispute resolution is required.	Mandatory	
Others	Bidder must have successfully completed minimum 05 similar projects. (Details required)	Mandatory	
	Letter from Manufacturer confirming that the equipment provided is brand new and not refurbished or obtained from any unauthorized channels. Moreover, SFP transceivers are provided by the equipment manufacturer, not through OEM or local sources.	Mandatory	

Evaluation Criteria:

Sr. No.	Documents Required	Marks	Firm Name	
			obtained	Total
1	**Details of offices** Head Office in Pakistan Branch offices in Pakistan Branch office in Lahore	**Max Marks 15** 05 01 Mark per office 05		
2	**Company has been in Existence Since (years)** 15 years or more 10 to 14 years 06 to 09 years 03 to 05 years	**Max Marks 10** 10 08 06 04		
3	**Principal Qualification** • Presence of offices and warehouse in	**Max Marks 10** **05**		

	Pakistan Major Cities (Lahore, Karachi, Islamabad) • Selling Network products in Pakistan for last 5 years.	**05**		
4	ISO Certificate 9000 or above of the company and manufacturer	**Max Marks 5**		
5	**Copies of Authorization Certificate of Parts** • Tier 1/ VAP / Business Partner / Gold partner • Tier 2 / Authorized Partner	**Max Marks 15** 15 10		
6	**List of Technical Staff with CV** The bidder must have 2 expert levels and 3 Professional level Certified Engineer in Network domain. 1 PMP Certified Professionals	**Max Marks 15** 12 3		
7	Detail of Relevant Projects in Last Five Years with Govt. / Private. Which shows total turnover business of list of items applied without Tax (Attach Purchase orders or other documentary evidence) • 501.00 Million or above • 401.00 Million to 500.00 Million • 301.00 Million to 400.00 Million	**Max Marks 15** 15 12 10		
8	Copies of Three Years Audited Accounts (2015, 2016, 2017) (for 03 years 15 Marks, for 02 years 10 Marks and for 01 year 05 marks) • Tax Returns • Bank letters / supplier credit position	**Max Marks 15**		
Minimum Score Required to Qualify : 70				

8. MEET OR EXCEED SPECIFICATIONS:

The specifications provided in this RFP are the minimum requirements of UET. The vendors must meet or may exceed these specifications to meet the actual requirements of this Project and its successful practical implementation. However, in such a case additionally proposed or altered specifications should clearly be highlighted to enable Technical Committee of this Project to clearly identify modified specifications.

9. GENERAL TECHNICAL REQUIREMENTS:

The bidder must provide documentary evidence in compliance with each of the below mentioned requirements. Failure to meet with any of these requirements on non-submission of any supportive documents on the day of bid submission would disqualify the contractor and UET reserves the right to disregard contractor's provision, after the closing of the bid.

9.1 The proposed solution must be based on Open-Standards in the fields of information technology, Computer Networks, security and management, fulfilling ISO standards for Open System Interconnection. Refurbished/used equipment will lead to direct disqualification.
9.2 The contractor will be responsible, if the life and support of active equipment ends in less than five years.
9.3 All equipment should be rack mounted with mounting rack kit (where required).
9.4 All equipment should have life time license, UET will not pay any license fees after installation for all equipment, components and software, where mentioned otherwise.
9.5 The bidder is fully responsible for design, assembly, installation, networking and testing of the hardware.
9.6 All switches should preferably be from same brand to avoid interoperability issues.
9.7 All Fiber Cable and related Items should be of same brand.
9.8 Installation of XX Core Single Mode Buried fiber optic cable includes all accessories and material Scope includes; Excavation having depth of 3 Feet, supply and laying of HD-UPVC pipe, marking tape, backfilling of soil. This includes splicing, and route markers, 3'x3' Man Hole where applicable and reinstatement of roads/streets etc.
9.9 All UTP Cable and related Items should be of same brand.
9.10 All Data Cabinets and Racks should be local branded.
9.11 All Active equipment should pass the FAT (factory acceptance test).
9.12 Inspection committee constitute for the purpose will inspect all the equipment in presence of bidder or their representative.
9.13 Passive Equipment duly verified by Principal.
9.14 Core, Distribution and Access layer should provide redundancy.

10. SOLUTION REQUIREMENT:

The proposed solution must be built on the architecture of next generation of networking that is an intelligent network platform and enable operational efficiencies. It is the business foundation to support state of the art networking solution. The core layer should be SDN ready and support following features:

- Centrally managed
- Open standards-based and vendor-neutral

11. PRODUCTS AND SERVICES SOUGHT:

11.1 Vendors are required to propose all items, and be wholly responsible for all products and services offered. Vendors will also be responsible for the connectivity to other system, but not limited to the following:

- Existing Data Center infrastructures
- Existing campus LAN

11.2 The successful Vendor (Contractor) shall be the prime contractor for all products and services offered and are fully responsible for the overall project management, successful project delivery and if needed, the SLA.

11.3 Below support for the quoted equipment must be directly provided by the manufactures (End User Support):

- 8x5xNBD hardware replacement support
- Software updates, upgrades including bug fixes and maintenance releases as available for proposed hardware
- 1 Year Extended warranty on hardware.
- Warranty for Branded Servers as approved by the manufacturers/suppliers, but not less than three-year (3/3/3) replacement of Parts, Labour & Service on site must be covered for after sales and services (labour and parts) for a period of three years from the date of delivery.
- The warranties should start from the time of start of operational status of equipment.
- Topology Layouts and Network Diagrams (Logical and high level Diagrams).

12. CLARIFICATIONS:

Queries regarding this RFP shall be submitted in writing to:

Prof. Dr. Waqar Mahmood
Director Computer Cell
University of Engineering & Technology, Lahore
Phone: +92 (042)99029101
Fax: +92(042) 99029246
E-mail: director@kics.edu.pk

Muhammad Mudasser Khan
Manager I.T.
Computer Cell, University of Engineering & Technology, Lahore
Phone: +92 (042)99029101
Fax: +92(042) 99029246
Mudasser.khan@uet.edu.pk

ACTIVE EQUIPMENT	
Data Center Firewall :	**Qty.**
General Specification	**01**
The proposed firewall shall be built as a firewall appliance and must be compatible with existing firewall (Huawei 6620).	
Firewall Throughput should be minimum of Large packet (1518 bytes or more) throughput ≥ 12Gbps	
Must have minimum 8 x GE (RJ45), 4 x 1GE SFP and 4x10G SFP+ Interface	
Minimum of 5,500,000 Concurrent Connections.	
Supports multiple highly reliable VPN features, such as IPsec VPN, SSL VPN, L2TP VPN, and GRE	
Must have minimum IPsec VPN throughput of 8Gbit/s	
Must support minimum Number of concurrent IPsec VPN tunnels of 4,000	
Number of new sessions per second should be no less than 200,000	
Minimum IPS throughput required is 4Gbps	
Must equip with 1 + 1 dual power supply	
Should support UTM features including firewall, DPI, IPS, antivirus, anti-spam and content filtering services with three year subscription license	
Security Features	
Must integrate the traditional firewall, VPN, intrusion prevention, antivirus, data leak prevention, bandwidth management, and online behavior management functions all in one device, simplifying device deployment and improving management efficiency.	
State full packet inspection based on Source IP, Source Port, Destination IP , Destination Port, Protocol , Application, Content, Time, User and Location	
Should defend against minimum over four million viruses and Trojan horse. Updated on daily basis.	
Must serve as a proxy and implements application-layer protection for SSL-encrypted traffic, such as IPS, AV, data leak prevention, and URL filtering.	
Must control upper and lower traffic thresholds and implements policy-based routing and QoS marking by application.	
Must support application Visibility and Control to control specific behaviors.	
Must support Attack identification and support user-defined signatures	
Must support Static routing, Policy-Based routing, RIP, OSFP, BGP and ISIS	
Should defend against SYN Flood, SYN ACK Flood, TCP Flood, UDP Flood	
Should defend against application-layer attacks, such as HTTP, HTTPS, DNS, and SIP flood attacks	
Active/Active, Active/Standby mode, Supports configuration backup and restore	
Supports BFD and IP-Link for link failure detection	
Should include at least Traffic log, Threat log, URL log, Operation log, System log, Policy matching log, Audit log	
Should include at least Traffic report Threat report, URL report, Policy matching report, File blocking report and Data filtering report	

Interface card for existing USG6620 Firewall (Optional):	**Qty.**
2x10G (SFP+) interface card	**02**

Core Switch:	**Qty.**
Hardware Architecture	**02**
The equipment shall have at least 4 dedicated line card slots.	
The core switch should have switching capacity of 4 Tbps or higher with packet forward throughput at-least 3,000 Mpps.	
The equipment shall support distributed switching architecture and switching fabrics are separated with the main control board.	
Switch should support clustering at fabric hardware level to reduce inter-chassis forwarding delay.	
The core switch should provide following interfaces using line cards: i) 48 x 10G SFP+ ports ii) 48 x 1G Electrical ports	
Switch should have support for 40GE and 100GE ports for future expansion.	
The equipment should support up to 600Gbit/s per-slot unidirectional bandwidth.	
The equipment supports modular fan tray, modular power modules, M+N redundancy (both AC and DC supported) and hot swappable.	
The switch must be capable to provide VAS services module such as Next Generation Firewall, IDS/IPS, AV and URL filtering, and WLAN Controller modules.	
The equipment must support multiple physical devices virtualized into one logical device through switching fabric without occupy service port and the cluster should work normally as long as there is one main control board in the cluster system.	
Should be Open Flow v1.3 standard complied.	
Layer 2 Features	
The equipment must support up to 1M MAC address tables.	
The equipment must support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment.	
The equipment must support the IEEE 802.1ad (Q-in-Q) standard, voice VLAN or equivalent, Jumbo Frames at least 9216 bytes, standard ring protocol STP, RSTP, MSTP, BPDU, root protection, Vlan-based STP, RSTP, MSTP.	
Layer 3 Features	
The equipment shall support up to 2M IPv4 FIB, up to 256k ARP entries, static route, RIPv1/v2, OSPF, IS-IS, BGP, RIPng, ISISv6, OSPFv3, BGPv4+, GR for OSPF/IS-IS/BGP, IP FRR, PBR, IPv4/IPv6 dual stack, BFD for OSPF/IS-IS/BGP, VRRP.	
Multicast	
The equipment must support IGMP proxy, IGMP snooping, MLD snooping v1/v2, up to 128K multicast routing entries, PIM DM, PIM SM, PIM SSM, IGMPv1/v2/v3, MSDP, MBGP.	
QoS	

The equipment must support ingress and egress traffic shaping, queuing algorithms, such as SP, WRR, DRR, SP + WRR, and SP + DRR, 1:1, N:1, and 1:N port mirroring , SPAN, RSPAN, ERSPAN, flow mirroring.	
Security	
The equipment must support bidirectional ACL, port-based ACL, VLAN-based ACL, and Unified User Management for wired and wireless users providing different types of authentication such as 802.1x/MAC/portal.	
The equipment must support CPU defense, DHCP Client, Relay, Server, DAI (Dynamic ARP Inspection), DHCP Snooping.	
Network O&M	
The equipment must support real-time network detection with actual service traffic, SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management, automatic configuration	

Distribution Switch:	**Qty.**
Hardware Architecture	**10**
The switch shall include 24 x 10 Gig SFP+, with one additional interface slot to support 40G interface card.	
The switch must have switching capacity of 2Tbps or higher and packet forward throughput at-least 700Mpps.	
Switch should support stacking with stack modules/cables included and stack bandwidth up to 480Gbps.	
The switch should support Jumbo frames up to 9Kbytes.	
Must include redundant power supplies.	
Layer 2 Features	
The equipment must support up to 200K MAC address tables.	
Must support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment	
Should support Ethernet Ring Protection Switching	
Switch must support the IEEE 802.1ad (Q-in-Q) standard, voice VLAN or equivalent, Port aggregation, STP, RSTP, MSTP.	
Layer 3 Features	
The equipment shall support static route, RIPv1/v2, OSPF, IS-IS, BGP, RIPng, ISISv6, OSPFv3, BGPv4+, GR for OSPF/IS-IS/BGP, IP FRR, IPv4/IPv6 dual stack, VRRP. Should support up to 120K routing entries.	
Multicast	
The equipment shall support IGMP proxy, IGMP snooping, MLD snooping v1/v2, PIM DM, PIM SM, PIM SSM, IGMPv1/v2/v3	
QoS	
Ingress and egress traffic shaping and VLAN based traffic limit.	
Queuing algorithms, such as SP, WRR, DRR, SP + WRR, and SP + DRR.	
Flow mirroring.	
Security	
The equipment must support bidirectional ACL, port-based ACL,VLAN-based ACL, CPU	

defense, DAI (Dynamic ARP Inspection), DHCP Snooping, Denial of Service (DoS) attacks, SYN Flood attacks, Port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management, automatic configuration, and batch remote upgrade.	

24 Port POE+ Access Switches:	**Qty.**
General Specification	**32**
24 x Ethernet 10/100/1000 Base-T ports, 4 x 10 Gig SFP+ ports	
Switching capacity at-least 200Gbps or higher and forwarding throughput of 90Mpps or higher	
Switch should support stacking with stack modules/cables included.	
Must support line rate forwarding on all ports	
Jumbo frames: 9Kbytes	
Must provide at least 370W PoE power budget	
Layer 2 Features	
The equipment must support more than 16K MAC address tables	
Should support Ethernet Ring Protection Switching	
Support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment, up to 1K active VLAN, Guest VLAN or equivalent, voice VLAN or equivalent	
Layer 3 Features	
The equipment must provide Static route, RIP, RIPng, and OSPF features and provide at least 2K FIBv4 entries.	
Multicast	
The equipment must support IGMP snooping v1/v2/v3, MLD snooping v1/v2, multicast VLAN replication	
QoS	
The equipment must support ingress and egress traffic shaping and VLAN based traffic limit, flow mirroring	
Security	
The equipment must support bidirectional ACL, port-based ACL,VLAN-based ACL, automatic isolation of attack sources, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, IP Source Guard, port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management and automatic configuration	

24 Port Access Switches:	**Qty.**
24 x Ethernet 10/100/1000 Base-T ports, 4 x 10 Gig SFP+ ports	**28**
Switching capacity at-least 200Gbps or higher and forwarding throughput of 90Mpps or higher	
Switch should support stacking with stack modules/cables included.	
Must support line rate forwarding on all ports	
Jumbo frames: 9Kbytes	
Layer 2 Features	
The equipment must support more than 16K MAC address tables	
Should support Ethernet Ring Protection Switching	
Support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment, up to 1K active VLAN, Guest VLAN or equivalent, voice VLAN or equivalent	
Layer 3 Features	
The equipment must provide Static route, RIP, and OSPF features and provide at least 4K FIBv4 entries.	
Multicast	
The equipment must support IGMP snooping v1/v2/v3, MLD snooping v1/v2, multicast VLAN replication	
QoS	
The equipment must support ingress and egress traffic shaping and VLAN based traffic limit, flow mirroring	
Security	
The equipment must support bidirectional ACL, port-based ACL,VLAN-based ACL, automatic isolation of attack sources, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, IP Source Guard, port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management and automatic configuration	

48 Port POE+ Access Switches(Optional):	**Qty.**
General Specification	
48 x Ethernet 10/100/1000 Base-T ports, 4 x 10 Gig SFP+ ports	
Switching capacity must be at-least 210Gbps and forwarding throughput of 120Mpps or higher	
Switch should support stacking with stack modules/cables included.	
Must support line rate forwarding on all ports	
Jumbo frames: 9Kbytes	
Must provide at least 370W PoE power budget	
Layer 2 Features	
The equipment must support up to 16K MAC address tables	
Should support Ethernet Ring Protection Switching	

Support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment, up to 1K active VLAN, Guest VLAN or equivalent, voice VLAN or equivalent	**11**
Layer 3 Features	
The equipment must include Static route, RIP, RIPng, and OSPF features and provide at least 4K FIBv4 entries.	
Multicast	
The equipment must support IGMP snooping v1/v2/v3, MLD snooping v1/v2, multicast VLAN replication	
QoS	
The equipment must support ingress and egress traffic shaping and VLAN based traffic limit, flow mirroring	
Security	
The equipment must support bidirectional ACL, port-based ACL, VLAN-based ACL, automatic isolation of attack sources, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, IP Source Guard, port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management and automatic configuration	

48 Port Access Switches:	**Qty.**
General Specification	**98**
48 x Ethernet 10/100/1000 Base-T ports, 4 x 10 Gig SFP+ ports	
Switching capacity must be at-least 210Gbps and forwarding throughput of 120Mpps or higher	
Switch should support stacking with stack modules/cables included.	
Must support line rate forwarding on all ports	
Jumbo frames: 9Kbytes	
Layer 2 Features	
The equipment must support up to 16K MAC address tables	
Should support Ethernet Ring Protection Switching	
Support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment, up to 1K active VLAN, Guest VLAN or equivalent, voice VLAN or equivalent	
Layer 3 Features	
The equipment must include Static route, RIP, RIPng, and OSPF features and provide at least 2K FIBv4 entries.	
Multicast	
The equipment must support IGMP snooping v1/v2/v3, MLD snooping v1/v2, multicast VLAN replication	
QoS	
The equipment must support ingress and egress traffic shaping and VLAN based traffic limit, flow mirroring	
Security	
The equipment must support bidirectional ACL, port-based ACL, VLAN-based ACL,	

automatic isolation of attack sources, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, IP Source Guard, port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management and automatic configuration	

Training / Certification (Optional):	**Qty.**
Training and certification of expert level for 3 persons and also 3 persons of Professional level through Principal Authorized Network Academy	**01**

SFP Modules:	**Qty.**
10G Single Mode SFP+ modules (1.4 KM Range)	**312**
10G Single Mode SFP+ modules (10 KM Range)	**40**
10G Multimode SFP+ modules (0.1 KM Range)(Optional)	**10**

2U Rack Server:	**Qty.**
Chassis: with up to 8, 2.5" Hard Drives	**01**
Processor: 2 x Intel Xeon E5-2640 v4 2.4GHz,25M Cache,8.0 GT/s QPI,Turbo,HT,10C/20T (90W)	
4 x 16GB RDIMM, 2400MT/s, Dual Rank, x8 Data Width	
integrated Remote Access Controller, Express	
8 x 1.2TB 10K RPM SAS 2.5in Hot-plug Hard Drive	
Integrated RAID card, support Raid 0,1,5,6,10,50.60, 12Gb/s, with 2GB Cache	
DVD+/-RW, SATA, Internal	
Dual, Hot-plug, Redundant Power Supply (1+1), 750W	
4 x 1GbE LOM (LAN on Motherboard)	
Ready Rails Sliding Rails With Cable Management Arm	
Provide enterprise version system management software with full features, support independent remote management through graphical user interfaces	
3 Years Comprehensive warranty	

Unified Network Management System:	**Qty.**
System Requirements	**01**
Supports the Windows and SUSE Linux operating systems.	
Vendor Should provide suitable hardware to run the NMS.	

Provides unified management and display pages and allows users to customize management views. In the views, users can clearly view the status, performance, and alarm information about managed resources.	
Provides user-friendly, visual, fast, and easy-to-operate graphical user interfaces (GUIs) that supports the Hypertext Transfer Protocol Secure (HTTPS) protocol. Users can access the GUI using multiple web browsers and use all management functions without installing any plug-ins.	
Allows users to customize the content and style of the home page for the portal. After logging in to the portal, the administrator can adjust the modules on the home page according to monitoring focuses. Some key modules are displayed on the home page by default.	
Management Features	
Automatically discovers network devices based on communication parameters, such as IP address segment and SNMP, and adds the network devices to the network management system.	
Uses the dashboard to show network-wide resource information, such as total number of resources of each type, resource usage, and key indicators. The key indicators include CPU usage, memory usage, and device response time, access rate, interface bandwidth, and voice resource usage.	
Categorizes multiple devices into a group to perform bulk operations on them.	
Supports real-time monitoring and unified browsing of network-wide alarms, provides various alarm severities (for example, critical, major, minor, and warning) that can be distinguished by color or text, and takes specific measures for alarms of different severities.	
Notifies users of alarms in several ways, such as real-time alarm notification (alarm panel), alarm sound and email.	
Monitors performance indicators and centrally displays the monitored statistics on the dashboard. The indicators include CPU usage, memory usage, device connectivity, device response time, interface traffic, and network connection/disconnection rate, and network resource usage.	
Automatically discovers the layer-2 and layer-3 links and virtual local area network (VLAN) topology and supports the topology linkage functions, including real-time performance, resource management, and alarm linkage to device information.	
Displays the wireless network status by collecting statistics on the device status, network resources, interference, area, and service type, such as AP channel usage, numbers of APs and users counted by area, number of client radio frequency (RF) types, number of access users counted by SSID, and user access records.	
Displays links between Controllers/APs and uplink POE switches and device status in topologies.	
Provides WLAN lifecycle management, including planning, deployment, acceptance, maintenance, and optimization.	
Supports voice PBX, IP Telephony Management, full range of voice functions, such as signaling tracing, trunk tracing, traffic statistics, resource statistics, and automatic NE connection.	
Provides a unified management system for whole network including Routers, Switches, Firewall, WLAN, Server, Storage etc.	
Should include licenses for all Network and IP Telephony equipment included in this RFP.	

VOICE SOLUTION		
ITEM	**SPECIFICATION:**	**Qty.**
VOIP Solution	General Specifications: • IP PABX should support 250 telephone extensions at initial stage; whereas expandable up to 20,000 extensions at later stage. • Capable to work with Analog, IP & video phones. • Should provide analog gateway to move existing analog lines from existing PBX's to newly added IPPBX to handle the unified call routing. Required 1120 ports to handle existing analog lines. Need to add all licenses and gateways to handle these 1120 lines. • Main IP PABX should include requisite interfaces to communicate with PSTN network by using E1 interface. Require a unified gateway for IPPABX and trunk. • Support Voice calling, Video calling, CLIP, CNIP, CLIR, CLIRO, Local Number Query, Ring-back Tone, Call Hold, Call Park, Multi-line Call, Call Waiting, CDR, Call Transfer, CFU, CFNR, CFB, CFO, CFC, Hotline, Pickup, automatic callback, DND, Forced Release, Barge, ONLY, Alarm Clock, MoH • AC power support for IP PABX • Minimum 02 PRI/E1 ports • Licenses to connect 250 IP extensions.	**02**
IP Phone	Normal IP phone sets, 2.5 inch color display, 2 Line, Gig Interfaces, POE supported	**200**
Video Phone	Video based executive IP phone sets, Minimum 5 inch touch screen, color display, Gig interfaces, Bluetooth, Wi-Fi & HDMI supported, POE supported	**32**
Executive Video Phone	• Touch-based phone with fixed button for speaker, mute and lock. • Display 7 inch or higher, color LCD to support 1280*800 pixels, video call resolution support 1080p. Phone can support up to 24 sip accounts. • The integrated HD-capable front camera supports up to 1080p 30-fps video encoding and decoding • Support Network Protocols TCP/IP, SIP, SDP, UDP, RTP, RTCP, DHCP, DNS, HTTP, HTTPS, SNTP & VLAN. • Gig interfaces, POE Supported. • Minimum Android OS 4.1.1 • 2 x High-speed USB 2.0 Type-A ports for Keyboard, Mouse, External Camera, Thumb Drive, Headset	**08**

	• High-Definition Multimedia Interface (HDMI) type A port	
VC Terminal	VC Terminal must use an embedded operating system (not Windows or Android operating system) and a non-PC but industrial architecture. VC terminal must support H.323, SIP and IPv4, IPv6. The bidding product must support the following access rates: 64 Kbit/s to 8 Mbit/s. VC Terminal must support H.263, H.263+, H.264, H.264 HP, and H.264 SVC. The VC Terminal must support 1080p50/60, 1080p25/30, 1080i50/60, 720p50/60, 720p25/30, 4CIF, and CIF video and support 1080p 30/60 symmetric encoding and decoding. VC Terminal must support: • G.711, G.722, G.722.1, G.722.1C, G.728, G.719, G.729A, and AAC-LD • At least three types of codec protocols for 20 kHz or higher broadband audio • Stereo VC Terminals must support H.323-based H.239, SIP-based BFCP and deliver the presentation in 1080p60 when the video is also in 1080p60fps. VC Terminal must provide: • At least 3 HD video input ports • At least 3 HD video output ports The bidding product must provide • 5 audio input ports and 6 audio output ports; • At least 1 standard XLR ports for microphones; • SPDIF digital audio output port. VC Terminal must support at least two 10/100/1000 Mbit/s auto-negotiation network ports. Camera must support 12x optical zoom, 12x digital zoom Camera must support the following video output resolutions: • 1080p50/60 • 1080i50/60 • 1080p25/30 • 720p50/60 Camera must support a horizontal angle of 72° and a maximum vertical angle of 44.5°. It must not use any external wide-angle lenses. The bidding product must support: Pan: +/-100º Tilt: +/-30º Microphone must support 360-degree sound pickup and an optimal pick-up range of 6 meters.	**01**

PASSIVE EQUIPMENT		
ITEM	**SPECIFICATION:**	**Qty.**
UTP Cable	Cat 6 UTP 4 pair cable, Conductor: Solid Bare Copper AWG 23, Conductor Dia Norm: 0.57, Jacket: PVC, Electrical Characteristics NVP (%): 65	**998 Rolls**
Patch Panel	24 port UTP patch panel with fully loaded RJ-45 IO, Rear Cable management tray, Coating: Powder coat, Tool Less CAT6 I/O keystone Jack, ANSI, TIA, EIA, ISO Compliance - Support 568B and 568A wiring, Flexible Cable Entry	**70**
	48 port UTP patch panel with fully loaded RJ-45 IO, Rear Cable management tray, Coating: Powder coat, Tool Less CAT6 I/O keystone Jack, ANSI, TIA, EIA, ISO Compliance - Support 568B and 568A wiring, Flexible Cable Entry (Optional)	**129**
Cable Manager (Optional)	Front Cable Manager Metal Body powder coated with Tempered Plastic Top (Slide-able)	**278**
UTP Patch Cable	UTP Cat VI patch cord (3 meter), Conductor size: 24 AWG stranded copper wire Nom, Machine punched, 100 Ohm, ISO 11801 Compliance, Stranded, ANSI, TIA, EIA, and ISO Compliance.	**5948**
Face Plates	Single shutter face plate	**5948**
RJ 45 I/O Module	CAT 6 tool-less (I/O), Plastic Housing: Support 568B and 568A wiring, Flexible Cable Entry	**5948**
Back Box	Back Box for Data Termination.	**5948**
Data Rack/Cabinets	Data Cabinet - 12U Double Section with 2 Fan with power distribution unit: 8 Socket (optional)	**55**
	Data Cabinet - 18U Double Section with 2 Fan with power distribution unit: 8 Socket	**60**
	42U standard Rack Cabinet - Load capacity 200 Kg, One fixed tray, 4 fans mounted on TOP, Black powder quoted and Front perforated door.	**2**
Optical Fiber Cable	Single Mode optical fiber cable G652D, Outdoor type steel tape armored Optical Fiber Cable. Dual PE sheath. Jelly filled for protection from water and moisture. High tensile strength.	
	72 core Single Mode optical fiber multi-tube cable (Optional)	**3500 m**
	48 core Single Mode optical fiber multi-tube cable (Optional)	**5000 m**
	24 core Single Mode optical fiber multi-tube cable	**2200 m**
	12 core Single Mode optical fiber multi-tube cable	**12000 m**
OFDF (Optional)	19" Rack Mountable Slide-out Type Fiber Patch panel with all accessories (Single Mode SC or LC Pigtail, SC or LC adapters etc.).	
	OFDF 24 Port duplex Rack Mount with SC Coupler and PIGTAILS (Single Mode fiber Optics Pigtails with SC Connector).	**108**
	OFDF 48 Port duplex Rack Mount with SC Coupler and PIGTAILS (Single Mode fiber Optics Pigtails with SC Connector)	**6**

	OFDF 12 Port duplex Rack Mount with SC Coupler and PIGTAILS (Single Mode fiber Optics Pigtails with SC Connector).	**40**
Fiber patch cords	Single Mode fiber patch cord SC-LC (1Meter Duplex)	**200**
	Single Mode fiber patch cord SC-LC (3Meter Duplex)	**400**
	Multi-Mode fiber patch cord LC-LC (3Meter Duplex)	**10**
Joint Box (Optional)	OFDF Joint box for Fiber Cable 48Core. It should be IP-65 Compliant.	**75**
Cable Ties (Optional)	Cable Ties 8 Inch	**100**
	Cable Ties 10 Inch	**100**
	Cable Ties 12 Inch	**50**
Pipes (Optional)	HDPE pipe (2 inch)	**10000 m**
	Conduit pipe (2 inch) with bends and fitting material	**2000 m**
	2" Steel Flexible pipe with Clip R/ft	**100 m**
	PVC Flexible Pipe, 1-inch	**2000 m**
	PVC Flexible Pipe, 3 inch	**100 m**
Duct	PVC Duct 16x38 10. Ft Length (as per sample)	**8500**
	PVC Duct 40x40 10. Ft Length (as per sample)	**12000**
	PVC Duct 60x60 per 8 ft. length(Optional)	**7000**
Tags (Optional)	Numerical Tags	**300**

UPS		
ITEM	**SPECIFICATIONS:**	**Qty.**
UPS 1KVA	Power capacity : 1000VA with 0.9 Power factor Standard Backup	**90**
	Should be supply clean ,Uninterrupted Power to the critical Load	
	Input voltage : 110vac to 300vac @ 60% Load	
	Output voltage : 200/208/220/230/240 VAC Pure sine wave	
	Output voltage distortion ≤ 3 % (Linear Load)	
	True Online double conversion	
	Must Provide at least 5 Mint backup time at full load	
	Recharge time 4 hours to recover 90% capacity	
	Battery Type : Maintenance free sealed Lead Acid Battery	
	Automatic Battery test	
	Provide Cold start functionality to ensure power up without main power supply Present	
	Protection against battery deep discharge	
	Network management through TCP/IP protocol	
	Serial or USB Port for communication & ups Monitoring software	

	Built-in surge protection	
UPS 2KVA	Power capacity : 2000VA with 0.9 Power factor Standard Backup	**06**
	Should be supply clean ,Uninterrupted Power to the critical Load	
	Input voltage : 110VAC to 300VAC @ 60% Load	
	Output voltage : 200/208/220/230/240 VAC Pure sine wave	
	Output voltage distortion ≤ 3 % (Linear Load)	
	True Online double conversion	
	Must Provide at least 5 Mint backup time at full load	
	Recharge time 4 hours to recover 90% capacity	
	Battery Type : Maintenance free sealed Lead Acid Battery	
	Automatic Battery test	
	Provide Cold start functionality to ensure power up without main power supply Present	
	Protection against battery deep discharge	
	Network management through TCP/IP protocol	
	Serial or USB Port for communication & ups Monitoring software	
	Built-in surge protection	
UPS 10KVA (Optional)	Online double conversion	**02**
	Switching Time: 0 ns	
	Load Capacity (VA): 10000 VA	
	Load Capacity (Watt): 9000 W	
	Input: L-N: 80-280V AC, 40Hz~70Hz	
	AC Output Voltage Regulation must be less than ±1%	
	Output frequency must be in 50±0.5%Hz (battery mode).	
	Output frequency tracking speed : 0.5-1zHz/S	
	Output power factor must be more than 0.9	
	Output Voltage: L-N 220 V AC, 230 V AC, 240 V AC	
	Battery backup: Separate rack mounted battery pack for 10min backup	