

TENDER NOTICE

NATIONAL INSTITUTE OF TECHNOLOGY, UTTARAKHAND

Temporary Campus-Govt. Polytechnic Srinagar Garhwal, Distt. Pauri Garhwal, Uttarakhand-246174

Contact: 01346-257400, 251104 (O), 01346-251095 (Tele Fax)

[E-Mail:nituttarakhand@gmail.com](mailto:nituttarakhand@gmail.com), Website: www.nituk.com



Tender No. NITUK/Stores/2014/11

TENDER FOR

“Supply and Installation of Computer Networking Devices”

Open Tenders are invited from reputed manufacturer/dealer/ suppliers for Supply and Installation of Computer Networking Devices to the National Institute of Technology, Uttarakhand.

The tender document along with terms & conditions is attached. A demand Draft of Rs. 500/- (Five Hundred Only) has to be attached with technical bid as a cost of tender. The tender complete in all respect must be dropped in a tender box placed at the Office of NIT Uttarakhand located at Govt. Polytechnic, Srinagar Garhwal on or before 25th July, 2014 upto 11:00 AM or by speed post only on or before 24th July, 2014 upto 06:00 PM. Incomplete in any respect and conditional tenders shall be summarily rejected. The Director NIT, Uttarakhand reserves the right to reject any or all the tenders without assigning any reason thereof.

Date: 03/07/2014

Director

Schedule

S. No.	Details	Date	Time
1	Notification of Tender	04/07/2014	----
2	Pre-Bid Conference	16/07/2014	02:00 PM
3	Last date of submission of tender	24 th July (Speed Post Only)	Upto 06:00 PM
		25 th July	Upto 11:00 AM
4	Opening of tender document	25 th July	01:00 PM

INVITATION TO TENDER

(Non-Transferable)

Tender for “SUPPLY AND INSTALLATION OF COMPUTER NETWORKING DEVICES” to National Institute of Technology, Uttarakhand

Ref: Tender No. NITUK/Stores/2014/11

1. Sealed Tenders in the prescribed form (attached) are invited from the reputed manufacturer/dealer/suppliers, experienced in supplying computing equipments, in two bid system i.e.
 - (i) Technical bid
 - (ii) Price bid
2. Tenderer should attach cost of tender in the form of Demand Draft of Rs 500/- payable in favour of Director NIT Uttarakhand along with Technical bid of the Tender Document.
3. The completed tender is required to be submitted along with the E.M.D. of Rs. 3,00,000/- (Three Lakh only) in the form of D.D. drawn in favour of “Director, NIT Uttarakhand” payable at “Srinagar Garhwal”. The EMD in the form of DD should be kept with the Technical Bid.
The Technical Bid and Price Bid will be opened on 25th July, 2014 at 01:00 p.m. in the Conference hall of the Institute, in presence of the tenderers or their authorized representatives.
Bids without proper E.M.D. shall be summarily rejected.
The EMD amount without interest will be returned to the unsuccessful tenderer within 30 days from the award of the Contract.
4. The Tender must be submitted in the prescribed formats only for technical bid and price bid together with its enclosures as asked for.
5. The Tenderer, with prior appointment on any working day, may visit the office of Assistant Registrar-Stores of the Institute to get familiarized with the nature, specification and quality of the required equipments. The Tenderer may contact Assistant Registrar (Stores), NIT Uttarakhand for this purpose on Tel. no. 01346-257400.

By submitting the tender, the Tenderer shall be deemed to have fully familiarized with all requisite conditions under which the Tenderer is to perform the obligations under contract. Any Tender received after the above mentioned date and time shall not be considered.

However, in the event of any unforeseen circumstances, the tenders may be opened at a later date and the same would be intimated through Institute website www.nituk.com.

6. Tenders which are not submitted in the prescribed formats and/or without requisite documents and incomplete in any manner shall not be considered. Tenderer should submit the Tender duly signed on each page with the rubber-seal of respective manufacturer/dealer/ supplier indicating the status of the signatory.

Tender with additional or counter clauses/items and any additional conditions if incorporated, will be liable for rejection and Institute will not be bound to give any explanation for such rejections. Tenderer(s) should submit the Tender duly signed on each page with the rubber-seal of the manufacturer/dealer/ supplier indicating the status of the firm/organisation.

7. Sealing and Marking of Bids:

- a. The Technical Bid (Annexure- IV) along with all the documents mentioned in the check list should be placed in one sealed envelope superscribed “Technical Bid”. The Price Bid should be kept in a separate sealed envelope superscribed “Price Bid” (Annexure-VI). Both the envelopes should then be placed in one single, sealed envelope Super scribed **“BID FOR SUPPLY AND INSTALLATION OF COMPUTER NETWORKING DEVICES”** and should be addressed to the Director, National Institute of Technology, Uttarakhand. The tenderer’s name, telephone number and complete mailing address should be indicated on the cover of the outer

- envelope.
- b. Both the inner envelopes superscribed Technical Bid and Price Bid should have the name and address of the tenderer so that if required, they may be returned to the tenderer without opening them.
 - c. If the outer and inner envelopes are not sealed and marked as required, the Institute will assume no responsibility for the bid's misplacement or premature opening.
 - d. If for any reason, it is found that the Technical Bid reveals the Price Bid related details in any manner whatsoever, or the Price Bid is enclosed in the envelope superscribed, "Technical Bid", the Bid document will be summarily rejected in the first instance itself.
8. At any time prior to the deadline for submission of bids, the Institute may, if necessary, modify the tender document by a written amendment. All prospective tenderers will be notified the amendment which will be binding. The amendments will be notified on the NIT Uttarakhand website www.nituk.com.
 9. A pre-bid conference will be held at 02:00 p.m. on 16th July, 2014 in the Conference Hall of the Administrative Building of NIT Uttarakhand for which all the tenderers are advised to attend. Any doubt regarding the tender document, technical specification of the required items and the terms and conditions of the contract may be clarified in the pre-bid conference.
 10. Tenders shall be kept valid for a period of at least 180 (one hundred eighty) days from the date of opening.
 11. The Authorities of NIT, Uttarakhand reserve the right to accept or reject any or all the offers or apportion the work amongst the different tenderers in any manner as they may choose without assigning any reason whatsoever and their decision shall be final and binding on all concerned.
 12. The tenderers have to fill all relevant technical details of the each item, which will be provided to the Institute, as asked in technical specification (Annexure-III). It is mandatory to use the same format as provided in Technical Specification.

DIRECTOR
NIT UTTARAKHAND

Enclosures:

Annexure – I: Check list of the documents to be provided with technical bid

Annexure – II: Terms and Conditions

Annexure – III: Technical Specifications

Annexure – IV: Technical Bid

(Part A) – Company Details

(Part B) - Specification Sheet to be filled by the vendor

Annexure – V: Declaration Regarding Blacklisting/Debarring for Taking Part in Tender

Annexure – VI: Price Bid

Check List of the documents to be provided with Technical Bid:-

Sr. No.	Documents/ Certificate	Yes/No
1	Technical Bid – Annexure- III	
2	Demand Draft of Rs. 500/- (Five Hundred Only) as Tender Fees (non refundable).	
3	Demand Draft of Rs. 3,00,000/- (Three Lac Only) as EMD.	
4	The Certificate for the Status of the Firm/ Company/Agency. (as applicable)	
5	Copy of affidavit duly notarized or certificate issued by Competent Authority as a proof of proprietary (in case of proprietorship firm)	
6	Tender specific authorization letter from Original Equipment Manufacturer (OEM) in favour of tenderer.	
7	Copy of Balance Sheet with Profit & Loss Account for last three financial years. (duly attested by Chartered Accountant)	
	2010-11	
	2011-12	
	2012-13	
8	Copy of appropriate PAN Card	
9	Income Tax return for last three financial years	
	2010-11	
	2011-12	
	2012-13	
10	Copy of purchase order of value of Rs. 10 lac or more.	
11	Copy of Sales Tax Registration Number.	
12	Copy of Service Tax Registration Number.	
13	Declaration regarding blacklisting/ debarring for taking part in tender	
14	Signed copy of the following tender documents as a token of acceptance. a) Copy of Tender Notice. b) Copy of Invitation to tender (all pages). c) Copy of Terms & Conditions (all pages). d) Copy of Technical Specification (all pages).	
15	Signed & stamped guarantee / warranty declaration certificate must be enclosed.	
16	Copy of certificate that the firm has adequate experienced manpower for installation and maintenance of equipment's supplied.	
17	Any other document.	

Note: The technical bid shall be summarily rejected if these documents are not attached.

Terms and Conditions

1. Only manufacturer(s) or their sole authorized distributor / agent are eligible to bid. Tender Specific Authorization letter from Original Equipment Manufacturer (OEM) in favor of authorized Agent to bid / negotiate / conclude the order against this tender, must be enclosed with technical bid.
2. The tenderer should have executed at least one order of not less than Rs. 20 Lakhs in the recent 03 (three) years.
3. If any terminolog(y)/(ies) or specification(s) in the bill of materials is/are specific to any particular manufacturer, provide equivalent International standard, if exists, with proper justification is acceptable.
4. The vendor should supply all required hardware and software to meet the technical specifications. Part bid will not be entertained.
5. It will be the responsibility of the selected vendor to integrate the proposed infrastructure with the existing connectivity of 34 Mbps Leased line point to point Ethernet connectivity and future connectivity to the National Knowledge Network (NKN).
6. Annual turnover of the tenderer for each of the last three financial years should not be less than Rs. 20,00,000/- (Rupees Twenty Lakhs). Financial statement with net profit, duly audited / certified by Chartered Accountant (CA), of the last three financial years along with the copies of Income Tax Return (ITR) must be enclosed with the technical bid.
7. There should not be multiple quotes for an item. Only one and best product that meets the technical specifications for an item should be quoted.
8. The tenderer should not have been debarred or blacklisted by any Central / State Government Departments of India. An affidavit to that effect on Non-Judicial stamp paper of Rs.100/- duly notarized must be enclosed with the technical bid in prescribed format. The proforma of the affidavit is attached with the tender as Annexure – V.
9. Signed & stamped specification sheet of the technical specification of the goods as given in Annexure - III with technical printed literature must be enclosed with the technical bid. The pamphlet and committed specification must match. In case there is any mismatch, then there has to be undertaking by the firm that the requisite modifications will be done in the product before supply. However, if there is any deviation and no such undertaking is submitted, then tenderer will be rejected even after opening the price bid.
10. No additional service charges for installation/integration will be paid by the Institute, if any.
11. Signed & stamped guarantee / warranty declaration certificate must be enclosed with the technical bid.
12. Tenders should state categorically that they have fully trained technical staff for installation / commissioning of the equipment and for “after sales service”.
13. The tenderer shall submit a copy of the tender document and addenda thereto, if any, with each page signed and stamped to confirm the acceptance of the entire terms & conditions of the tender.

14. The tender of any tenderer, who has not complied with one or more of the conditions of pre-qualification criteria and / or fail to submit the required documents in prescribed format as mentioned / or required / or conditional tender are liable to be summarily rejected.

15. The Institute reserves the right to accept or reject any or all the offers or apportion the work amongst the different tenderers in any manner as it may deem fit without assigning any reason whatsoever and its decision shall be final and binding on all concerned.

16. Delivery & Installation:

1. All the items/materials shall be delivered, satisfactorily installed/commissioned with ready to use status within a stipulated period mentioned in purchase order or within such time as extended by the institute. The delivery period expected is 6 weeks from the date of issue of the purchase order.

2. Additional components (hardware, software, accessories etc.), if required, for providing the 'total solution' as mentioned in the tender document should be specified and quoted. Required technical details/brochure of such products offered by the vendor duly supported by schematic diagrams and technical specifications of each component offered should be furnished along with the reasons justifying the requirement of such additional components as part of the technical bid and furnish the cost of each of such components in the price bid.

17. Liquidated Damages(LD):

If the supplier fails to perform the satisfactory installation / commissioning of the equipment with a status of ready to use within stipulated time, penalty at the rate of 1% per week subject to maximum of 10% of the order value will be deducted / the Institute may withdraw the Purchase order.

18. Extension of Delivery & Installation Period:

If the supplier is unable to deliver/install and satisfactorily commission the order within the stipulated time, for which the supplier is responsible, he is required to request in writing for the extension of the delivery period before the stipulated date of delivery, it may be extended at the discretion of competent authority with the imposing of the liquidated damages. In case the supplier has failed to complete the order within the stipulated time, Institute reserves the right to cancel the purchase order and performance security / EMD may be forfeited.

19. Guarantee / Warranty:

Tender must be quoted with the one (01) years comprehensive on-site Warranty / Guarantee and it will commence from the date of the satisfactory installation / commissioning of equipment against the defect of any manufacturing, workmanship and poor quality of components and tenderer also give the guarantee / warranty declaration.

In case supplier has failed to repair / or rectify the equipment during the warranty / guarantee period in reasonable time not exceeding two weeks, Institute may employ or pay other person for the repairing of the equipment and all the such damages, loss and expenses shall be recoverable from the supplier.

20. LEGAL

Any dispute with regard to the meaning, effect or interpretation of any terms and conditions shall be referred to Director, NIT, Uttarakhand who would act as the sole Arbitrator and proceedings of such arbitration shall be conducted in accordance with the provision of the Indian Arbitration Act, 1940 or any statutory modification thereof. The venue of Arbitration shall be Srinagar Garhwal. In case of litigation, if any and the cause of action shall be deemed to have been arisen in Pauri District only and the District Court of Pauri (Uttarakhand) shall have the jurisdiction for any such litigation.

21. PERFORMANCE SECURITY

- (i) To ensure due performance of the contract, performance security is to be obtained from the successful bidder awarded the contract. Performance security is to be obtained from every successful bidder irrespective of its registration status, etc. Performance security should be for an amount of six (06) percent of the value of the contract. Performance security may be furnished in the form of an account payee Demand Draft, Fixed Deposit Receipt from a commercial bank, bank guarantee from a commercial bank in an acceptable form safeguarding the purchasers' interest in all respects.
- (ii) Performance security should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.
- (iii) Bid security should be refunded to the successful bidder on receipt of performance security.

21. Important Note - No Deviation clause

Any deviation in terms and condition in the form of price bid i.e. inclusive/exclusive of Taxes, levies, surcharges and additional head for charges shall be discussed in Pre-Bid conference. The institute authority shall modify the tender documents, if required in the light of the discussion. However any Bid Technical/Price stipulating additional condition or deleting the condition mentioned in the tender shall be summarily rejected.

**DIRECTOR
NIT UTTARAKHAND**

UNDERTAKING

I have read and agree to all the terms and conditions of the tender.

Date:

Signature

Place:

Name _____

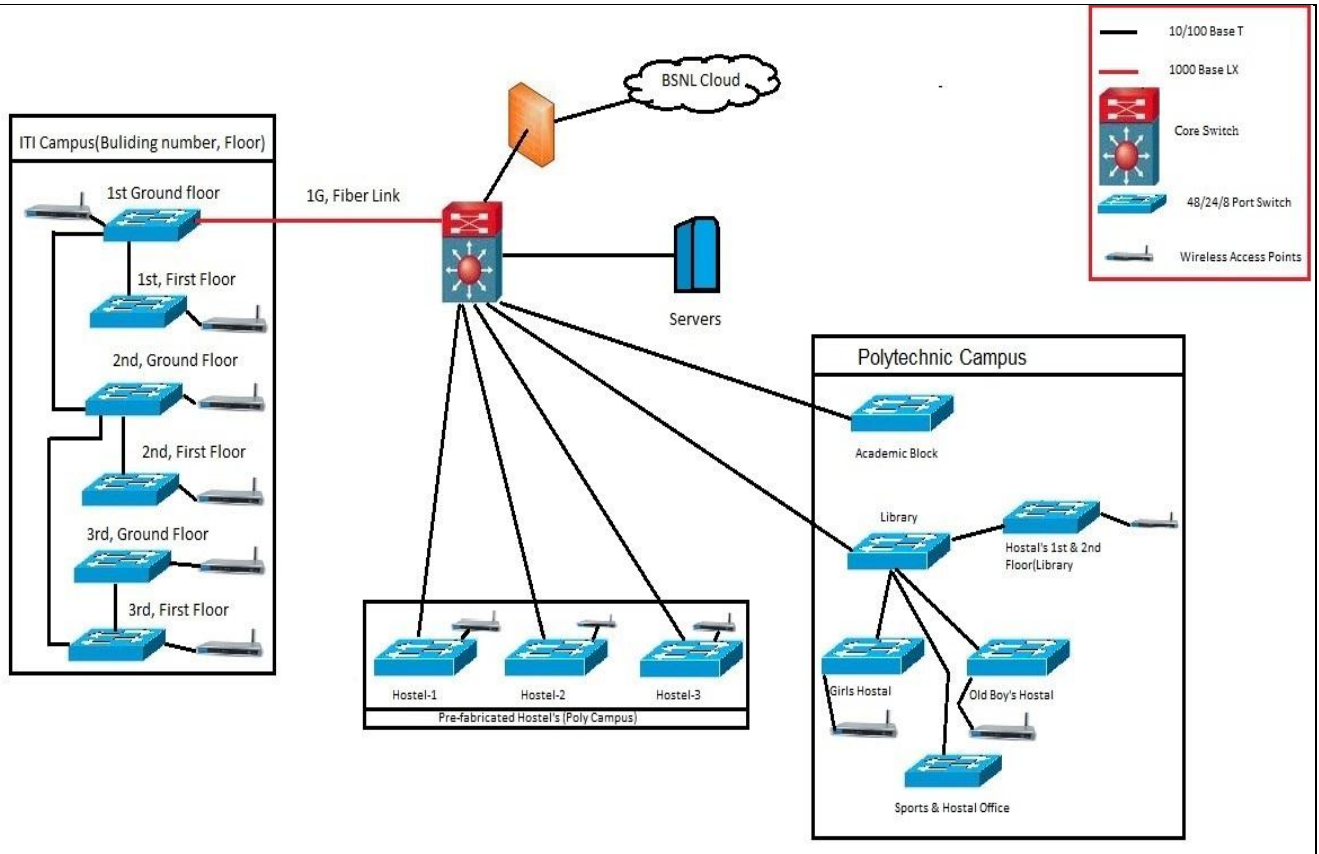
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Requirements

1. Core switch
 - a. To uplink access switches through 1Gbps Single mode fiber link and UTP links.
 - b. To integrate internal interface of Firewall and Servers.
2. 48 Port Layer 2 Switch as an access switch for Computer Laboratory and high user density zone.
 - a. To connect Desktop.
 - b. To uplink Access Points, Layer 2 Switch.
3. 24 Port Layer 2 Switch as a Distribution/Access Switch.
 - a. To Connect IP Camera, Desktop.
 - b. To uplink Layer-2 Switch, Access Points.
4. 8 Port Layer 2 Switch as Distribution/Access Switch.
 - a. To Connect Desktop.
 - b. To uplink Access Points.
5. Wireless Access Points
6. Wireless Controller
7. Power over Ethernet Injector.
8. Single Mode Fiber Optic (LX) to be populated on one of the Access Switch(Switch to be connected with Core Switch)

A brief Schematic of the temporary campus of NIT Uttarakhand is shown below. The requirement of data and Wireless LAN access points in the temporary campus is given below.

Proposed Network Topology for Temporary Campus of NIT Uttarakhand



Quantity Required

S.No.	Item	Qty	Table No.
1.	L3 Core Switch	1 nos.	1
2.	48-Port L2 Switch	18 nos.	2
3.	24-Port L2 Switch	3 nos.	3
4.	8-Port L2 Switch(POE)	7 nos.	4
5.	Wireless Access points	42 nos.	5
6.	Wireless Lan Controller	1 nos.	
7.	POE Injector	20nos.	6
8.	Single Mode Fiber Optic (LX)	2nos.	7
9.	Service Component	In actual	8

Technical Specification

Table 1: L3 Core Switch	
Feature	Specification(Required)
Type	High Density Wire-speed Scalable Layer3 Switch
Form Factor	Chassis/Stackable
Ports	24 x 10/100/1000 Base-T and 4 SFP ports populated with 2 x 1000 Base-LX from Day 1. Should support 10G in future
	All the ports should be non-blocking from day 1
Inter-switch Connect / Payload Slot Bandwidth	60 Gbps or more
Aggregate Switching Capacity	200 Gbps for IPv4 and IPv6 packets
Architecture	Should have Supervisor Engine/ CPU redundancy
	ASIC based packet forwarding
	The Switch should have Line Rate forwarding at all ports.
	Multiple switches should be able to be clustered together with like VSS or equivalent virtualization feature by which they can be configured to act as one single Virtual switch with single configuration file, single image and one management IP address
	OS should support individual process (eg ssh , snmp, telnet, dhcp etc) restart to prevent reboot in case of Software Process Crash by running processes on top of Kernel.
High Availability features	Hot Swappable Power Supplies from Day 1
	Software upgrades with minimal traffic disruption during the upgrade
	Graceful switchover during Supervisor failure
Layer 2 features	Layer 2 features Standard Port/Link Aggregation for All Ports. Also Cross Module Link aggregation should be supported
	Broadcast/multicast/unicast storm control to prevent degradation of switch

	performance from faulty end stations
	Port, subnet based 802.1Q VLANs. The switch should support 4000 VLANs
	30,000 MAC addresses.
	The switch should support IEEE 802.1w RSTP and IEEE 802.1s MSTP
	The switch should support IEEE 802.1AE MACSec for hardware-based encryption
Routing Protocols	Routing Protocols RIP v1/v2, OSPF v1/v2 from Day 1
	BGPv4, IS-IS, VRRP in future
	IPv6 packet switching and routing using OSPFv3, RIPng.
	Minimum 10000 Route entries.
Security features	Layer 2-4 Access Control Lists
	ACLs - port based/VLAN based.
	Integrated security features like DHCP relay, Control Plane DoS protection
	MAC Authentication
	802.1X Network Security and Authentication
	RADIUS and TACACS+
	1000 Security ACL's.
	Port-security.
Traffic policing	Traffic policing Ingress/Egress shaping and policies
	Filter, mark and limit traffic flows
	Minimum 8 queues per port
	Policy based traffic classification based on MAC Address, Port, DSCP, IP Address, VLAN
Multicast	H/W based Ipv4 and Ipv6 Multicasting
	IGMP v1, v2 , v3, IGMP Snooping
	Protocol Independent Multicast – Sparse Mode and PIM – SSM, MSDP
Network Management	Switch should be manageable through NMS on per port/switch basis.
	Should Support SNMP, RMON, SSH, telnet, web management through network management software.
	Port mirroring feature based on port, VLAN and ACL for monitoring network traffic.
	Role based access control to limit access to switch operations.
IEEE standards	IEEE Standards Gigabit Ethernet: 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX,
	1000BASE-LX/LH based SFP support.
	10G Ethernet: 10Gbase-SR, 10Gbase-LR
	IEEE 802.1D Spanning-Tree Protocol
	IEEE 802.3AD LACP
	IEEE 802.3AB LLDP
	IEEE 802.1S & 1W for Rapid Spanning tree and Multiple Spanning-tree convergence
	IEEE 802.1p CoS Prioritization
	IEEE 802.3x Flow Control
Certification	Common

Table 2: 48-Port L2 Switch

Sr No.	Specification(Required)
A	Architecture

1	The switch should have 48 x 10/100/1000 BaseT ports and 4 additional GE SFP uplink ports
2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules
3	Should support 1000 Base- SX, LX, LH and T ports
4	Should have at least 100 Gbps switching bandwidth
5	Should have switching throughput of up to 75 million pps
6	MAC Address table size of 15000 entries
7	The Switch should be 19" Rack-Mountable / 1 rack unit (RU)
8	DRAM:512 MB, Flash:256 MB
B	Resiliency and high availability
1	Should support IEEE 802.3ad Link Aggregation Control Protocol (LACP)
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol
3	Should support Internal/External Redundant Power Supply
4	Should support load sharing algorithm for bridged and routed traffic
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces.
C	Layer 2 and Layer-3 features
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network
3	Should support Jumbo frames of 9000 bytes
4	Should support IPv4 Static IP routing, RIP from Day 1 with support for OSPF in future
5	Should support IPv6 static routing
6	Should support VRRP for redundancy
D	Security
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces
2	Should support port and VLAN Access control lists (Ingress and Egress)
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces
5	Should support Dynamic ARP inspection (DAI), IP source guard
6	Should support broadcast, unicast and multicast (BUM) storm control
7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon
8	Should support SSHv2 and HTTPs allowing secure access to the switch
E	Convergence and QoS
1	Should support IGMP v1, v2, v3 and IGMP snooping
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast
3	Should support Multicast VLAN Registration Protocol (MVR)
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE budget requirements
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration
7	Should support per-port Rate Limiting setting ingress enforced maximums
8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)

F	Advance Features
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems.
2	Should support Policing/Rate-limiting of traffic to CPU
3	Should support port security with Sticky MAC Addresses
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR)
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink.
6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes
7	Should detect Ethernet link failures and correcting the failures in less than 50 ms by forming a Ethernet protection ring.
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites
G	Manageability
1	Web User Interface, CLI
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for analysis
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station
5	Should store multiple configuration and image files
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages.
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3
H	Certifications
1	Common Criteria EAL3 or above

Table 3: 24-Port L2 Switch	
Sr No.	Specification(Required)
A	Architecture
1	The switch should have 24x 10/100/1000 BaseT IEEE 802.3 ports and 4 additional GE SFP uplink ports
2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules
3	Should support 1000 Base- SX, LX, LH and T ports
4	Should have at least 50 Gbps switching bandwidth
5	Should have switching throughput of up to 35 million pps
6	MAC Address table size of 15000 entries

7	The Switch should be 19” Rack-Mountable / 1 rack unit (RU)
8	DRAM:512 MB, Flash:256 MB
B	Resiliency and high availability
1	Should support IEEE 802.3ad Link Aggregation Control Protocol (LACP)
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol
3	Should support Internal/External Redundant Power Supply
4	Should support load sharing algorithm for bridged and routed traffic
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces.
C	Layer 2 and Layer-3 features
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network
3	Should support Jumbo frames of 9000 bytes
4	Should support IPv4 Static IP routing, RIP from Day 1 with support for OSPF in future
5	Should support IPv6 static routing
6	Should support VRRP for redundancy
D	Security
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces
2	Should support port and VLAN Access control lists (Ingress and Egress)
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces
5	Should support Dynamic ARP inspection (DAI), IP source guard
6	Should support broadcast, unicast and multicast (BUM) storm control
7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon
8	Should support SSHv2 and HTTPs allowing secure access to the switch
E	Convergence and QoS
1	Should support IGMP v1, v2, v3 and IGMP snooping
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast
3	Should support Multicast VLAN Registration Protocol (MVR)
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE budget requirements
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration
7	Should support per-port Rate Limiting setting ingress enforced maximums

8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)
F	Advance Features
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems.
2	Should support Policing/Rate-limiting of traffic to CPU
3	Should support port security with Sticky MAC Addresses
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR)
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink.
6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes
7	Should detect Ethernet link failures and correcting the failures in less than 50 ms by forming a Ethernet protection ring.
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites
G	Manageability
1	Web User Interface, CLI
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for analysis
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station
5	Should store multiple configuration and image files
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages.
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3
H	Certifications
	Common Criteria EAL3 or above

Table 4: 8-Port Layer 2 (POE)	
Sr No.	Specification(Required)
A	Architecture
1	The switch should have 8x 10/100/1000 BaseT IEEE 802.3at PoE+ ports and 2 additional GE SFP uplink ports
2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules
3	Should support 1000 Base- SX, LX, LH and T ports
4	Should have at least 20 Gbps switching bandwidth
5	Should have switching throughput of up to 14 million pps
6	MAC Address table size of 15000 entries
7	The Switch should be 19" Rack-Mountable / 1 rack unit (RU)
8	DRAM:512 MB, Flash:256 MB
B	Resiliency and high availability
1	Should support IEEE 802.3ad Link Aggregation Control Protocol (LACP)
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol
3	Should support Internal/External Redundant Power Supply
4	Should support load sharing algorithm for bridged and routed traffic
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces.
C	Layer 2 and Layer-3 features
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network
3	Should support Jumbo frames of 9000 bytes
4	Should support IPv4 Static IP routing, RIP from Day 1 with support for OSPF in future
5	Should support IPv6 static routing
6	Should support VRRP for redundancy
D	Security
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces
2	Should support port and VLAN Access control lists (Ingress and Egress)
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces
5	Should support Dynamic ARP inspection (DAI), IP source guard
6	Should support broadcast, unicast and multicast (BUM) storm control
7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon
8	Should support SSHv2 and HTTPs allowing secure access to the switch
E	Convergence and QoS
1	Should support IGMP v1, v2, v3 and IGMP snooping
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast
3	Should support Multicast VLAN Registration Protocol (MVR)
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE

	budget requirements
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration
7	Should support per-port Rate Limiting setting ingress enforced maximums
8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)
F	Advance Features
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems.
2	Should support Policing/Rate-limiting of traffic to CPU
3	Should support port security with Sticky MAC Addresses
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR)
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink.
6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes
7	Should detect Ethernet link failures and correcting the failures in less than 50 ms by forming a Ethernet protection ring.
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites
G	Manageability
1	Web User Interface, CLI
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for analysis
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station
5	Should store multiple configuration and image files
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages.
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3
H	Certifications
	Common Criteria EAL3 or above

Table 5: Wireless Access points (42 nos.) with 1 Central Console	
Sr No.	Specification(Required)
Architecture	
General	Indoor AP with Dual Radios that supports concurrent operation on 802.11a/n (5 GHz) and 802.11b/g/n (2.4 GHz)

	Internal Antenna with Optimized gain pattern for maximum radio coverage
	True omni-directional antenna that allows position-independent placement
Radio Transmit Power Setting	Granular Transmit Power Settings in single dBm increments
	Configurable power that allows control of RF cell size
LAN Interfaces	1 x 10/100/1000 BASE-TX autosensing (RJ45) PoE port
Encryption	Dedicated hardware-based line-rate encryption for certified operation of WPA (TKIP), WPA2, (AES), 40-bit WEP, 128-bit WEP, and Dynamic WEP with per session rotating keys
Radio features	<ul style="list-style-type: none"> · 2 x 2 MIMO with two spatial streams · 20 MHz and 40 MHz channels · PHY data rates up to 300 Mbps per radio · Max Power - 21dBm (2 antennas) for 802.11a/n · MCS 0 to MCS 15 (6.5 Mbps to 300 Mbps) · Bridge & Mesh support · 802.11n :Adaptive Frame Aggregation on L2 and L3 · Maximal Ratio Combining · Cyclic Delay Diversity (CDD)
Security	<ul style="list-style-type: none"> · No data, security credentials or encryption keys stored locally · No console port; no local access possible
Environmental	<ul style="list-style-type: none"> · Operating temperature: 0°C to 50°C or better · Humidity: 10% - 95% (non-condensing) or better · Power consumption at full operation < 12W
Status Indicators	LED indicators to indicate various states like Power and activity for both Radios
Quality of Service	<ul style="list-style-type: none"> · 802.11e quality of service (QoS) (WMM), · Call admission control (TSPEC), · Unscheduled Automatic Power Save Delivery (U-APSD) · 802.11i Fast Roaming (PMK Cache) · 802.1Q VLAN tagging
Standard Compliance	IETF CAPWAP WG Taxonomy and Architecture compatibility
	Safety standard: UL 60950-1
	Environmental: EN60601-1-2 (2001); EU Medical Directive, ROHS: EU Directive 1999/5/EC
Wireless LAN Controller (1 Nos.)	
Deployment	Wireless Access switch/controllers to be deployed for managing and controlling all Indoor/outdoor Wireless Access Points (802.11a/b/g/n/ac)
Support for WLAN AP	The controller/switch should be configured for 45 AP and scalable to support 120 APs or more
Redundancy	<ul style="list-style-type: none"> · Redundant Power Supplies as standard from day one. · Spanning tree and per-VLAN spanning tree (PVST+)

	<ul style="list-style-type: none"> Resilient network attachment via any controller port
	<ul style="list-style-type: none"> N:1 or N:N redundant controller capabilities. Capability to configure two or more controllers in a cluster in future for additional redundancy and availability.
Interfaces	4 x 10/100/1000Mbps copper RJ45 ports, additional two or more Gigabit SFP ports that support 1000BaseSX or LX transceivers
RF Management	Automated Power/channel auto-tuning, Dynamic Frequency Selection (DFS).
	The controller should be able to control/manage radio/Access points which are deployed as Point-to-Point backhaul / bridge.
Management	Command Line Interface (Console serial port, telnet, SSHv2)
	web access (https), SSL, XML
Standards compliance	802.11 a/b/g/n, 802.3af, 802.11d, 802.11e, 802.11h, 802.11i, 802.1D Spanning Tree, 802.3ad
Management & control	Access Point configured by controller for Direct Data Path Forwarding, AP configured to switch data traffic locally or forward to the wireless switch/controller on a per-VLAN basis
	Optimizes network and controller/switch capacity and performance
Performance optimization	Client Load Balancing, Equalize client sessions across groups of Access Points with like service policies
	Restore equality of session load across groups of APs when new APs are added or return from a temporary outage
	Band Steering, Enable client steering across bands for efficient usage of the available spectrum, and reduce network load on the congested 802.11b/g band
	Voice with Quality of Service (QoS), Prioritized per user, per session, per application and per-flow priority queuing
	Wi-Fi Multimedia (WMM) 802.11e Quality of Service to preserve voice priority across the network
	WMM Power Save (802.11e) and Proxy ARP and broadcast suppression
	Per-user bandwidth control with strict limiting of per-user traffic
	Support for QoS priority retagging of per-user traffic flows into higher or lower queues
	Per-SSID bandwidth control. Radio based Weighted Fair Queuing ensures equal access to “air time” for different client types
Encryption and authentication	<ul style="list-style-type: none"> Scalable Encryption with support for Encryption processing distributed amongst Access Points
	<ul style="list-style-type: none"> IEEE 802.1x with multiple EAP types (TLS, PEAP/MSCHAP, TTLS),
	<ul style="list-style-type: none"> X.509 support
	<ul style="list-style-type: none"> Wi-Fi WPA2 Enterprise certified
Environmental compliance	<ul style="list-style-type: none"> Operating temperature: 0C to 40C
	<ul style="list-style-type: none"> Humidity: 10% - 90% (non-condensing)
Power	Redundant Power supply - 100-240 VAC 50-60 Hz

Table 6: POE Injector(20 Nos)	
S.NO.	Specification(Required)
Power	There should not be any external 12V Power Adopter
	Standard power supply for access points

Table 7: Single Mode Fiber Optic (LX) (2 Nos)	
S.No.	Specification(Required)
Standard LX port to be populated from Day 1	

Table 8: Service Component		
Sr. No.	SERVICE DESCRIPTION	Required
1	Core Switch Configuration and Mounting	01
2	48 Port Branch Switch Configuration and Switch Mounting	18
3	24 Port Branch Switch Configuration and Switch Mounting	03
4	8 Port Branch Switch Configuration and Switch Mounting	07
5	WAP configuration and WAP mounting	42
6	Project Management & Documentation	01

Technical Bid
“Supply and Installation of Computer Networking Devices”
Part A – Company Details

(Signed copy of all relevant documents must be enclosed in the under mentioned serial order)

1. Name of the Tenderer _____
2. Address _____

3. Telephone No. (O) _____ (R) _____ (M) _____
4. Demand Draft no. _____ dated _____ as Tender Fees of `500/-
(non-refundable).
5. Demand Draft no. _____ dated _____ as EMD of
`5,00,000/- (Five lakh only).
6. Status of Tenderer (Firm/ Company/Agency).
7. Original Equipment Manufacturer (OEM) whose authorization is attached

8. Balance Sheet with Profit & Loss Account for last three financial years (Rs. In
lakhs).(Duly Attested by Chartered Accountant.)
(a)2010-11 _____(Turnover)_____(Net Profit/Loss)
(b)2011-12 _____(Turnover)_____(Net Profit/Loss)
(c) 2012-13 _____(Turnover)_____(Net Profit/Loss)
9. PAN Number _____
10. Taxable income as mentioned in Income Tax Return for last three financial years (Rs.
In lakhs).
(a)2010-11 _____(Taxable Income)_____(Total Tax Paid)
(b)2011-12 _____(Taxable Income)_____(Total Tax Paid)
(c) 2012-13 _____(Taxable Income)_____(Total Tax Paid)
11. Detail of Purchase order of Rs. 10 lakh or more
a) Name of Organization _____
12. Sales Tax Registration Number. _____
13. Service Tax Registration Number. _____

Date:

Signature _____

Name _____

Stamp _____

Part B - Specification Sheet to be filled by Vendor

Note: (i) The vendor must fill all the Tables given below by the offered specification or compliance (yes/no).

(ii) The pamphlet and committed specification must match. In case there is any mismatch, then there has to be undertaking by the firm that the requisite modifications will be done in the product before supply. However, if there is any deviation and no such undertaking is submitted, then tender will be rejected even after opening the price bid.

Table:1 - L3 Core Switch (1 no.)		
Feature	Description	Value/Compliance(Y/N)
Type	High Density Wire-speed Scalable Layer3 Switch (Y/N)	
Form Factor	Chassis/Stackable	
Ports	24 x 10/100/1000 Base-T and 4 SFP ports populated with 2 x 1000 Base-LX from Day 1. Should support 10G in future	
	All the ports should be non-blocking from day 1 (Y/N)	
Inter-switch Connect / Payload Slot Bandwidth	60 Gbps or more	
Aggregate Switching Capacity	200 Gbps for IPv4 and IPv6 packets	
Architecture	Should have Supervisor Engine/ CPU redundancy (Y/N)	
	ASIC based packet forwarding (Y/N)	
	The Switch should have Line Rate forwarding at all ports. (Y/N)	
	Multiple switches should be able to be clustered together with like VSS or equivalent virtualization feature by which they can be configured to act as one single Virtual switch with single configuration file, single image and one management IP address (Y/N)	

	OS should support individual process (eg ssh , snmp, telnet, dhcp etc) restart to prevent reboot in case of Software Process Crash by running processes on top of Kernel. (Y/N)	
High Availability features	Hot Swappable Power Supplies from Day 1 (Y/N)	
	Software upgrades with minimal traffic disruption during the upgrade (Y/N)	
	Graceful switchover during Supervisor failure (Y/N)	
Layer 2 features	Layer 2 features Standard Port/Link Aggregation for All Ports. Also Cross Module Link aggregation should be supported (Y/N)	
	Broadcast/multicast/unicast storm control to prevent degradation of switch performance from faulty end stations (Y/N)	
	Port, subnet based 802.1Q VLANs. The switch should support 4000 VLANs (Y/N)	
	30,000 MAC addresses.	
	The switch should support IEEE 802.1w RSTP and IEEE 802.1s MSTP (Y/N)	
	The switch should support IEEE 802.1AE MACSec for hardware-based encryption (Y/N)	
Routing Protocols	Routing Protocols RIP v1/v2, OSPF v1/v2 from Day 1 (Y/N)	
	BGPv4, IS-IS, VRRP in future (Y/N)	
	IPv6 packet switching and routing using OSPFv3, RIPng. (Y/N)	
	Minimum 10000 Route entries.	
Security features	Layer 2-4 Access Control Lists (Y/N)	
	ACLs - port based/VLAN based.	
	Integrated security features like DHCP relay, Control Plane	

	DoS protection (Y/N)	
	MAC Authentication (Y/N)	
	802.1X Network Security and Authentication (Y/N)	
	RADIUS and TACACS+ (Y/N)	
	1000 Security ACL's.	
	Port-security. (Y/N)	
Traffic policing	Traffic policing Ingress/Egress shaping and policies (Y/N)	
	Filter, mark and limit traffic flows (Y/N)	
	Minimum 8 queues per port	
	Policy based traffic classification based on MAC Address, Port, DSCP, IP Address, VLAN (Y/N)	
Multicast	H/W based Ipv4 and Ipv6 Multicasting(Y/N)	
	IGMP v1, v2 , v3, IGMP Snooping (Y/N)	
	Protocol Independent Multicast – Sparse Mode and PIM – SSM, MSDP (Y/N)	
Network Management	Switch should be manageable through NMS on per port/switch basis. (Y/N)	
	Should Support SNMP, RMON, SSH, telnet, web management through network management software. (Y/N)	
	Port mirroring feature based on port, VLAN and ACL for monitoring network traffic. (Y/N)	
	Role based access control to limit access to switch operations. (Y/N)	
IEEE standards	IEEE Standards Gigabit Ethernet: 1000BASE-X (mini-GBIC/SFP), 1000BASE-SX,	
	1000BASE-LX/LH based SFP support.	
	10G Ethernet: 10Gbase-SR, 10Gbase-LR	
	IEEE 802.1D Spanning-Tree Protocol (Y/N)	

	IEEE 802.3AD LACP(Y/N)	
	IEEE 802.3AB LLDP (Y/N)	
	IEEE 802.1S & 1W for Rapid Spanning tree and Multiple Spanning-tree (Y/N)	
	Convergence	
	IEEE 802.1p CoS Prioritization (Y/N)	
	IEEE 802.3x Flow Control(Y/N)	
Certification	Common (Y/N)	

Table 2: 48-Port L2 Switch (18 nos.)		
Sr No.	Requirement	Value/Compliance(Y/N)
A	Architecture	
1	The switch should have 48 x 10/100/1000 BaseT ports and 4 additional GE SFP uplink ports (Y/N)	
2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules (Y/N)	
3	Should support 1000 Base- SX, LX, LH and T ports (Y/N)	
4	Should have at least 100 Gbps switching bandwidth	
5	Should have switching throughput of up to 75 million pps	
6	MAC Address table size of 15000 entries	
7	The Switch should be 19" Rack-Mountable / 1 rack unit (RU) (Y/N)	
8	DRAM:512 MB, Flash:256 MB	
B	Resiliency and high availability	
1	Should support IEEE 802.3ad Link Aggregation Control Protocol (LACP) (Y/N)	
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol (Y/N)	
3	Should support Internal/External Redundant Power Supply (Y/N)	

4	Should support load sharing algorithm for bridged and routed traffic (Y/N)	
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces. (Y/N)	
C	Layer 2 and Layer-3 features	
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs (Y/N)	
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network (Y/N)	
3	Should support Jumbo frames of 9000 bytes	
4	Should support IPv4 Static IP routing,RIP from Day 1 with support for OSPF in future (Y/N)	
5	Should support IPv6 static routing (Y/N)	
6	Should support VRRP for redundancy (Y/N)	
D	Security	
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces (Y/N)	
2	Should support port and VLAN Access control lists (Ingress and Egress) (Y/N)	
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN (Y/N)	
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces (Y/N)	
5	Should support Dynamic ARP inspection (DAI), IP source guard (Y/N)	
6	Should support broadcast, unicast and multicast (BUM) storm control (Y/N)	
7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon (Y/N)	
8	Should support SSHv2 and HTTPs allowing secure access to the	

	switch (Y/N)	
E	Convergence and QoS	
1	Should support IGMP v1, v2, v3 and IGMP snooping (Y/N)	
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast (Y/N)	
3	Should support Multicast VLAN Registration Protocol (MVR) (Y/N)	
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts (Y/N)	
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE budget requirements (Y/N)	
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration (Y/N)	
7	Should support per-port Rate Limiting setting ingress enforced maximums (Y/N)	
8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)	
F	Advance Features	
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems. (Y/N)	
2	Should support Policing/Rate-limiting of traffic to CPU (Y/N)	
3	Should support port security with Sticky MAC Addresses (Y/N)	
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR) (Y/N)	
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink. (Y/N)	
6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes (Y/N)	
7	Should detect Ethernet link failures and correcting the failures in	

	less than 50 ms by forming a Ethernet protection ring. (Y/N)	
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites (Y/N)	
G	Manageability	
1	Web User Interface, CLI (Y/N)	
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for analysis (Y/N)	
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS (Y/N)	
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station (Y/N)	
5	Should store multiple configuration and image files (Y/N)	
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair (Y/N)	
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server (Y/N)	
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages. (Y/N)	
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3 (Y/N)	
H	Certifications	
1	Common Criteria EAL3 or above (Y/N)	

Table 3: 24-Port L2 Switch (3 nos.)		
Sr No.	Requirement	Value/Compliance(Y/N)
A	Architecture	
1	The switch should have 24x 10/100/1000 BaseT IEEE 802.3 ports and 4 additional GE SFP uplink ports (Y/N)	

2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules (Y/N)	
3	Should support 1000 Base- SX, LX, LH and T ports (Y/N)	
4	Should have at least 50 Gbps switching bandwidth	
5	Should have switching throughput of up to 35 million pps	
6	MAC Address table size of 15000 entries	
7	The Switch should be 19" Rack-Mountable / 1 rack unit (RU) (Y/N)	
8	DRAM:512 MB, Flash:256 MB	
B	Resiliency and high availability	
1	Should support IEEE 802.3ad Link Aggregation Control Protocol (LACP) (Y/N)	
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol (Y/N)	
3	Should support Internal/External Redundant Power Supply (Y/N)	
4	Should support load sharing algorithm for bridged and routed traffic (Y/N)	
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces. (Y/N)	
C	Layer 2 and Layer-3 features	
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs (Y/N)	
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network (Y/N)	
3	Should support Jumbo frames of 9000 bytes	
4	Should support IPv4 Static IP routing, RIP from Day 1 with support for OSPF in future (Y/N)	
5	Should support IPv6 static routing (Y/N)	
6	Should support VRRP for redundancy (Y/N)	
D	Security	
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces (Y/N)	
2	Should support port and VLAN Access control lists (Ingress and Egress) (Y/N)	
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN (Y/N)	
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces (Y/N)	
5	Should support Dynamic ARP inspection (DAI), IP source guard (Y/N)	
6	Should support broadcast, unicast and multicast (BUM) storm control (Y/N)	

7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon (Y/N)	
8	Should support SSHv2 and HTTPs allowing secure access to the switch (Y/N)	
E	Convergence and QoS	
1	Should support IGMP v1, v2, v3 and IGMP snooping (Y/N)	
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast (Y/N)	
3	Should support Multicast VLAN Registration Protocol (MVR) (Y/N)	
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts (Y/N)	
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE budget requirements (Y/N)	
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration (Y/N)	
7	Should support per-port Rate Limiting setting ingress enforced maximums (Y/N)	
8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)	
F	Advance Features	
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems. (Y/N)	
2	Should support Policing/Rate-limiting of traffic to CPU (Y/N)	
3	Should support port security with Sticky MAC Addresses (Y/N)	
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR) (Y/N)	
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink. (Y/N)	
6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes (Y/N)	
7	Should detect Ethernet link failures and correcting the failures in less than 50 ms by forming a Ethernet protection ring. (Y/N)	
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites (Y/N)	
G	Manageability	
1	Web User Interface, CLI (Y/N)	
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for	

	analysis (Y/N)	
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS (Y/N)	
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station (Y/N)	
5	Should store multiple configuration and image files (Y/N)	
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair (Y/N)	
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server (Y/N)	
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages. (Y/N)	
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3 (Y/N)	
H	Certifications	
	Common Criteria EAL3 or above (Y/N)	

Table 4 : 8-Port L2 Switch (7 nos.)		
Sr No.	Requirement	Value/Compliance(Y/N)
1	The switch should have 8x 10/100/1000 BaseT IEEE 802.3at PoE+ ports and 2 additional GE SFP uplink ports (Y/N)	
2	The Switch should be configured to support Stacking from Day 1 via standard interfaces for a scalable solution with necessary cables and modules (Y/N)	
3	Should support 1000 Base- SX, LX, LH and T ports (Y/N)	
4	Should have at least 20 Gbps switching bandwidth	
5	Should have switching throughput of up to 14 million pps	
6	MAC Address table size of 15000 entries	
7	The Switch should be 19" Rack-Mountable / 1 rack unit (RU) (Y/N)	
8	DRAM:512 MB, Flash:256 MB	
B	Resiliency and high availability	
1	Should support IEEE 802.3ad Link Aggregation Control Protocol	

	(LACP) (Y/N)	
2	Should support IEEE 802.1s Multiple Spanning Tree Protocol (Y/N)	
3	Should support Internal/External Redundant Power Supply (Y/N)	
4	Should support load sharing algorithm for bridged and routed traffic (Y/N)	
5	Should monitor and detect link failure on uplink interfaces and can propagate the failure to downlink interfaces so that servers connected to those downlink interfaces can switch over to secondary interfaces. (Y/N)	
C	Layer 2 and Layer-3 features	
1	Should support IEEE 802.1Q 1000 active VLANs simultaneously and private VLANs (Y/N)	
2	Should support Multiple VLAN Registration Protocol (MVRP, IEEE 802.1ak) for dynamic registration and deregistration of VLANs on ports in a VLAN bridged network (Y/N)	
3	Should support Jumbo frames of 9000 bytes	
4	Should support IPv4 Static IP routing, RIP from Day 1 with support for OSPF in future (Y/N)	
5	Should support IPv6 static routing (Y/N)	
6	Should support VRRP for redundancy (Y/N)	
D	Security	
1	Should support MAC address limiting (per port and per VLAN) and MAC address move to detect MAC movement and MAC spoofing on access interfaces (Y/N)	
2	Should support port and VLAN Access control lists (Ingress and Egress) (Y/N)	
3	Should support IEEE 802.1X - Port, Multiple supplicant, VoIP VLAN (Y/N)	
4	Should support DHCP snooping, DHCP server and relay with option 82 for Layer 2 VLANs and Layer 3 interfaces (Y/N)	
5	Should support Dynamic ARP inspection (DAI), IP source guard (Y/N)	

6	Should support broadcast, unicast and multicast (BUM) storm control (Y/N)	
7	Should support TACACS+ and RADIUS authentication for secure switch CLI logon (Y/N)	
8	Should support SSHv2 and HTTPs allowing secure access to the switch (Y/N)	
E	Convergence and QoS	
1	Should support IGMP v1, v2, v3 and IGMP snooping (Y/N)	
2	Should support Sparse (SM), Dense (DM) and Source Specific (SSM) Protocol Independent Multicast (Y/N)	
3	Should support Multicast VLAN Registration Protocol (MVR) (Y/N)	
4	Should support Multicast Listener Discovery (MLD) snooping enables the switch to monitor MLD messages between IPv6 multicast routers and hosts (Y/N)	
5	Should support Link Layer Discovery Protocol (LLDP) with the capability to manage the PoE budget requirements (Y/N)	
6	Should support LLDP-MED (Media Endpoint Discovery) with voice over IP (VoIP) integration (Y/N)	
7	Should support per-port Rate Limiting setting ingress enforced maximums (Y/N)	
8	The switch should support at least 8 queues to ensure multiple level of traffic prioritization (data, voice, video)	
F	Advance Features	
1	The switch should have active probes to track and monitor real time traffic across the network and to investigate network problems. (Y/N)	
2	Should support Policing/Rate-limiting of traffic to CPU (Y/N)	
3	Should support port security with Sticky MAC Addresses (Y/N)	
4	Should support 802.1ag Ethernet OAM, IEEE 802.3ah Link Fault Management (LFM) and Time domain reflectometry (TDR) (Y/N)	
5	Should be able to automatically configure ports with security, QoS, and other parameters based on the type of device connected to the port with profiles like Wireless access point, PC, PC plus IP phone, Layer 3 uplink, and Layer 2 uplink. (Y/N)	

6	Should be able to eliminate the complexities involved in configuring class of service (CoS) across the network by offering templates with preconfigured CoS values based on typical application requirements for key traffic classes	
7	Should detect Ethernet link failures and correcting the failures in less than 50 ms by forming a Ethernet protection ring. (Y/N)	
8	Should support Private VLAN to split a broadcast domain into multiple isolated broadcast subdomains and Q-in-Q to extend a Layer 2 Ethernet connection between two customer sites (Y/N)	
G	Manageability	
1	Web User Interface, CLI (Y/N)	
2	Should support Port mirroring and mirror traffic that is traversing interfaces or a VLAN on the switch to a different location for analysis (Y/N)	
3	Should support IPv6 management features like neighbour discovery (RFC 4861), Telnet, SSH, SNMP, NTP, DNS (Y/N)	
4	Should have monitoring technology like netflow/s-flow to randomly sample network packets and send the samples to a monitoring station (Y/N)	
5	Should store multiple configuration and image files (Y/N)	
6	Should have the capability to revert to the last known good state if the switch image, configuration and the backup configuration files become damaged beyond repair (Y/N)	
7	Should support automatic configuration over the network from a pre-existing configuration file that is created and stored on a configuration server (Y/N)	
8	Should support automatic software download feature using the DHCP message exchange process to download and install software packages. (Y/N)	
9	Should support standard IP-MIB (RFC 4293) and SNMP v1, v2 & v3	
H	Certifications	
	Common Criteria EAL3 or above (Y/N)	

Table 5: Wireless Access points (42 nos.) with 1 Central Console		
Sr No.	Requirement	Value/Compliance(Y/N)
Architecture		
General	Indoor AP with Dual Radios that supports concurrent operation on 802.11a/n (5 GHz) and 802.11b/g/n (2.4 GHz) (Y/N)	
	Internal Antenna with Optimized gain pattern for maximum radio coverage (Y/N)	
	True omni-directional antenna that allows position-independent placement (Y/N)	
Radio Transmit Power Setting	Granular Transmit Power Settings in single dBm increments (Y/N)	
	Configurable power that allows control of RF cell size (Y/N)	
LAN Interfaces	1 x 10/100/1000 BASE-TX autosensing (RJ45) PoE port (Y/N)	
Encryption	Dedicated hardware-based line-rate encryption for certified operation of WPA (TKIP), WPA2, (AES), 40-bit WEP, 128-bit WEP, and Dynamic WEP with per session rotating keys (Y/N)	
Radio features	· 2 x 2 MIMO with two spatial streams (Y/N)	
	· 20 MHz and 40 MHz channels (Y/N)	
	· PHY data rates up to 300 Mbps per radio (Y/N)	
	· Max Power - 21dBm (2 antennas) for 802.11a/n (Y/N)	
	· MCS 0 to MCS 15 (6.5 Mbps to 300 Mbps) (Y/N)	
	· Bridge & Mesh support (Y/N)	
	· 802.11n :Adaptive Frame Aggregation on L2 and L3 (Y/N)	

	· Maximal Ratio Combining (Y/N)	
	· Cyclic Delay Diversity (CDD) (Y/N)	
Security	· No data, security credentials or encryption keys stored locally (Y/N)	
	· No console port; no local access possible	
Environmental	· Operating temperature: 0°C to 50°C or better (Y/N)	
	· Humidity: 10% - 95% (non-condensing) or better	
	· Power consumption at full operation < 12W (Y/N)	
Status Indicators	LED indicators to indicate various states like Power and activity for both Radios (Y/N)	
Quality of Service	· 802.11e quality of service (QoS) (WMM), (Y/N)	
	· Call admission control (TSPEC), (Y/N)	
	· Unscheduled Automatic Power Save Delivery (U-APSD) (Y/N)	
	· 802.11i Fast Roaming (PMK Cache) (Y/N)	
	· 802.1Q VLAN tagging (Y/N)	
Standard Compliance	IETF CAPWAP WG Taxonomy and Architecture compatibility (Y/N)	
	Safety standard: UL 60950-1 (Y/N)	
	Environmental: EN60601-1-2 (2001): EU Medical Directive, ROHS: EU Directive 1999/5/EC (Y/N)	
Wireless LAN Controller (1 No)		
Deployment	Wireless Access switch/controllers to be deployed for managing and controlling all Indoor/outdoor Wireless Access Points (802.11a/b/g/n/ac) (Y/N)	
Support for WLAN AP	The controller/switch should be configured for 45 AP and scalable to support 120 APs or more	
Redundancy	· Redundant Power Supplies as standard from day one. (Y/N)	

	· Spanning tree and per-VLAN spanning tree (PVST+) (Y/N)	
	· Resilient network attachment via any controller port (Y/N)	
	· N:1 or N:N redundant controller capabilities. Capability to configure two or more controllers in a cluster in future for additional redundancy and availability. (Y/N)	
Interfaces	4 x 10/100/1000Mbps copper RJ45 ports, additional two or more Gigabit SFP ports that support 1000BaseSX or LX transceivers	
RF Management	Automated Power/channel auto-tuning, Dynamic Frequency Selection (DFS). (Y/N)	
	The controller should be able to control/manage radio/Access points which are deployed as Point-to-Point backhaul / bridge. (Y/N)	
Management	Command Line Interface (Console serial port, telnet, SSHv2) (Y/N)	
	web access (https), SSL, XML (Y/N)	
Standards compliance	802.11 a/b/g/n, 802.3af, 802.11d, 802.11e, 802.11h, 802.11i, 802.1D Spanning Tree, 802.3ad (Y/N)	
Management & control	Access Point configured by controller for Direct Data Path Forwarding, AP configured to switch data traffic locally or forward to the wireless switch/controller on a per-VLAN basis (Y/N)	
	Optimizes network and controller/switch capacity and performance (Y/N)	
Performance optimization	Client Load Balancing, Equalize client sessions across groups of Access Points with like service policies (Y/N)	
	Restore equality of session load across groups of APs when new APs are added or return from a temporary outage (Y/N)	
	Band Steering, Enable client steering across bands for efficient usage of the available spectrum, and reduce network load on the congested 802.11b/g band (Y/N)	
	Voice with Quality of Service (QoS), Prioritized per user, per session, per application and per-flow priority queuing (Y/N)	
	Wi-Fi Multimedia (WMM) 802.11e Quality of Service to preserve voice priority across the network (Y/N)	
	WMM Power Save (802.11e) and Proxy ARP and broadcast suppression (Y/N)	

	Per-user bandwidth control with strict limiting of per-user traffic (Y/N)	
	Support for QoS priority retagging of per-user traffic flows into higher or lower queues (Y/N)	
	Per-SSID bandwidth control. Radio based Weighted Fair Queuing ensures equal access to “air time” for different client types (Y/N)	
Encryption and authentication	· Scalable Encryption with support for Encryption processing distributed amongst Access Points (Y/N)	
	· IEEE 802.1x with multiple EAP types (TLS, PEAP/MSCHAP, TTLS), (Y/N)	
	· X.509 support (Y/N)	
	· Wi-Fi WPA2 Enterprise certified (Y/N)	
Environmental compliance	· Operating temperature: 0C to 40C (Y/N)	
	· Humidity: 10% - 90% (non-condensing) (Y/N)	
Power	Redundant Power supply - 100-240 VAC 50-60 Hz (Y/N)	

Table 6: POE Injector(20 Nos)

S.NO.	Requirement	Value/Compliance(Y/N)
Power	There should not be any external 12V Power Adopter (Y/N)	
	Standard power supply for access points (Y/N)	

Table 7: Single Mode Fiber Optic (LX) (2 Nos)

S.No.	Requirement	Value/Compliance(Y/N)
	Standard LX port to be populated from Day 1 (Y/N)	

Table:8 Service Component

Sr. No.	SERVICE DESCRIPTION	Quantity and Quality Complied as per Requirement (Y/N)
1	Core Switch Configuration and Mounting (Y/N)	
2	48 Port Branch Switch Configuration and Switch Mounting (Y/N)	
3	24 Port Branch Switch Configuration and	

	Switch Mounting (Y/N)	
4	8 Port Branch Switch Configuration and Switch Mounting (Y/N)	
5	WAP configuration and WAP mounting (Y/N)	
6	Project Management & Documentation (Y/N)	

Undertaking

I hereby agree to provide and install all the items mentioned in Annexure-III as per the rate quoted/negotiated in Annexure -VI by me as per the terms and condition in Annexure - II.

Date:

Signature:

Place:

Name:_____

Stamp_____

**DECLARATION REGARDING BLACKLISTING/ DEBARRING FOR TAKING
PART IN TENDER.**

(To be executed & attested by Public Notary/ Executive Magistrate on Rs. 100/- non judicial Stamp paper by the Tenderer)

I/ We _____(Tenderer) hereby declare that the
firm/agency/namely
M/s. _____ has not been blacklisted or debarred in
the past by Union/ State Government or Organization from taking part in Government
tenders in India.

OR

I/ We _____(Tenderer) hereby declare that the
firm/agency/namely M/s. _____ was blacklisted or
debarred by Union/ State Government or any Organization from taking part in
Government tenders for a period of _____ years w.e.f. _____ to
_____. The period is over on _____ and now the firm/company is
entitled to take part in Government tenders.

In case the above information found false I/We are fully aware that the tender/contract
will be rejected/ cancelled by Director, NIT, Uttarakhand, and EMD/SD shall be forfeited.
In addition to the above the Director, NIT, Uttarakhand will not be responsible to pay the
bills for any completed/ partially completed work.

DEPONENT

Attested:
(Public Notary/ Executive Magistrate)

Address_____

Name_____

राष्ट्रीय प्रौद्योगिकी संस्थान, उत्तराखण्ड

NATIONAL INSTITUTE OF TECHNOLOGY, UTTARAKHAND

ANNEXURE- VI

Price Bid

Ref: Tender No. NITUK/Estt./2014/11

Name of the Tenderer: _____

Address: _____

Telephone No. _____ Mobile No. _____

Sr. No.	Item	Quantity	Description	Percentage (%)	Amount (Rs.)	Total Price (Rs.)
1	Core Switch	1	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
2	48 Port Switch	18	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
3	24 Port Switch	3	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
4	8 Port Switch	7	Base Price	-----		
			Excise			
			CST			
			VAT			

			Others			
			Packing, Forwarding and installation			
5	Wireless Access Points	42	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
6	Wireless LAN Controller	1	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
7	POE Injector	20	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
8	Single Mode Fiber Optic(LX)	2	Base Price	-----		
			Excise			
			CST			
			VAT			
			Others			
			Packing, Forwarding and installation			
Grand Total (Rs.)						
Grand Total (Rs.) in Words						

* F. O. R. NIT, Uttarakhand Srinagar

Terms and Conditions

- (i) Comparison will be done on the basis of lowest total price quoted.

- (ii) If price increases due to error/change in Tax rate/freight etc. shall be borne by the tenderer. Any reduction shall be passed on to the Institute.
- (iii) Any calculation error by tenderer shall be at the cost of tenderer i.e. if quoted price is higher, Institute will pay as per correct calculation, if it is lower, difference will be borne by the tenderer.
- (iv) The complete tender will be awarded to only one tenderer with lowest quoted price, no part tender will be awarded.

Undertaking

I hereby agree to provide and install all the items mentioned in Annexure-III as per the rate quoted/negotiated in Annexure -VI by me as per the terms and condition in Annexure - II.

Date:

Signature:_____

Place:

Name:_____

Stamp_____