



# GAUHATI UNIVERSITY

Gopinath Bordoloi Nagar: Guwahati 781014: Assam: India

NIQ No.: GU/G/3680C, Dated 22-11-2016

## Notice Inviting Quotation For Procurement and Integration of Campus Core Switch and IP Telephony Solution

### **Important Dates:**

Issue of NIQ: 31-12-2016

Late date and Time: 18-1-2016 12 noon Quotation Opening: 18-1-2016 3 PM

1. Name of work: **“Procurement and Integration of Campus Core Switch and IP Telephony Solution”**
2. Tender No. : **GU/G/3680C**, Dated **22-11-2016**
3. Validity of the Offer: 100 (One Hundred) Days
4. Completion Period: 90 (Ninety) Days,
5. Processing fee- Rs. 500/ vide DD drawn in favour of Registrar, GU

### **SCOPE OF WORK -**

Gauhati University intends to procure and install

**1) Core Switch for upgrade of campus wide optical fiber infrastructure. The proposed Core Switch has to be integrated with the existing Core Switch in high availability mode.**

### **2) IP Telephony Solution.**

Vendors, joint ventures/consortium, companies, or authorized entities of companies, who are with adequate expertise and experience for similar works may participate in the quotation process for consideration for selection.

The following terms and conditions in brief will be applicable:

1. Two Bid Procedure: The quotation must be in a two-bid system. All technical documents, along with the supporting documents in conformity of the terms and conditions are to be in a sealed envelop to be marked as “Technical Bid”. Price quotations for various components clearly indicating the amount quoted, various tax components etc. must be in the second envelop to be marked as “Price Quotation”. Both the envelopes are to be put in a single envelope and to be sealed and submitted to the Registrar, Gauhati University.

2. Only registered vendor with proper registration of Companies/Trades/Services, and for applicable Taxes of the Government can participate. Necessary documents must be enclosed.
3. At least 1(one) System Integration- NOC/Data Center/Campus Network work contract in Educational Institutes or Government Organization in previous 3 years is required. The order must be atleast 60% of the current quoted values. Certified copies of the work order must be enclosed.
4. At least 1(one) similar work with successful implementation and completion certificate from the customer must be produced.
5. Manufacturer Authorization Form to be submitted for all the Products.
6. All products should preferably be from a single OEM for ease of operation, maintenance and support.
7. Back-lining support from Original Equipment Manufacturer (OEM) for 3 years. The OEM support should cover advance hardware replacement, firmware updates and bug fixes for 3 years without any additional cost.
8. The product or parts should not become end of support for next five years and end of sale as on date of order.
9. OEM warranty and service policy should be included.
10. The OEM should be listed in Gartner Quadrant for the last three years in the similar product portfolio.
11. The OEM should have their distributor and partners in Guwahati for last 3 years.
12. The OEM campus network product portfolio should be in existence and operational in Indian market for last 10 years.
13. The OEM should have a dedicated TAC center in India.
14. The Bill of Materials should entirely fulfill the purpose and should be vetted by the OEM accordingly (OEM should certify the design). The design should not be restricted to the specification mentioned in this bid document. In case there is additional requirement it should be quoted.
15. All works must be covered with three years on-site warranty.
16. The last date of submission of quotation is \_\_\_\_\_, 2016, \_\_\_\_\_ AM. The quotations will be opened on the same day at \_\_\_\_\_ PM. Representatives of the participating vendors may attend the quotation opening meeting to be held in the office of the Registrar, GU.
17. Rates must be quoted module/item wise.
18. Payment will be made 80% on delivery and 20% after successful implementation.
19. All other terms and conditions will be as per the GU rules and regulations.
20. GU reserves the right of modifications, cancellations and decisions in regards to the entire process.
21. All communications must be addressed to the Registrar, Gauhati University, Guwahati 781014, Assam, India.

**Quantity of Items required:-**

SI No	Items	Qty
1	Core Switch	1
2	SFP Module	1
3	IPPBX Solution	1
4	Voice Gateway	1
5	IP Phone (Basic)	200
6	IP Phone (Advanced)	2

**Note:- Quantity may vary at the time of placing the work order.**

**Product Specifications:**

**1. Core Switch**

<b><u>Sl. No</u></b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Web Reference</b>
-	<b>General</b>		
1	The platform shall capable of delivering up to 11 Terabits per second of system bandwidth capacity and up to 800 Gigabits per second or more of per-slot bandwidth		
2	There shall be integrated resiliency by providing 1+1 fabric redundancy, redundant fans, and N+1 power supply redundancy, thereby limiting network downtime		
3	The variable speed fans in the fan tray shall handle individual fan failures (N+1 redundancy) and still provide sufficient cooling to the chassis		
4	The chassis shall have side-to-side airflow with support up to 4 AC power supplies, which can be added incrementally as the system requirements grow		
5	The switching system shall be optimized for high-density 10 Gigabit Ethernet or more, 40 Gigabit Ethernet or more.		
6	Chassis shall carry a form factor of not more than 10 rack units due to space constraints in existing Network Rack.		
8	The switching system shall be optimized for high-density 10 Gigabit Ethernet.		
9	Platform shall support Network Equipment Building Standards Layer 3 compliance for deployment in demanding environments		
10	The platform shall support minimum seven slots in a single chassis		
11	Single switch should have provision to add minimum of five line cards and two switching fabrics (primary-secondary) in a chassis. In case of Primary Fabric failure, secondary fabric should be able to take the complete load or the performance should not be degraded.		
12	Switch should support minimum 240 x 10/100/1000BaseT GE Ports.		
13	Switch should have at least 48 x 10/100/1000BaseT GE ports.		
14	Switch should support minimum 248 x 1 Gbps SFP Ports		
15	Switch should have at least 24 x 1Gbps SFP ports.		
16	Switch should support minimum 176 x 10 Gbps SFP+ Ports for future 10Gig backbone.		

17	Switch should have at least 2 x 10Gbps SFP ports populated with respective transceivers/cables from day 1.		
18	Switch should support minimum 2 x 4 0Gbps QSFP+ Ports		
	<b>Quality of Service</b>		
19	Enterprise wide Quality of Service management: LAN to WAN integration		
20	Traffic Classification: Physical Port, IP DA/SA, IP DA/SA/L4 Port		
21	Admission Control: IP DA/SA, IP DA/SA L4, RSVP		
22	Traffic Marking: IEEE 802.1Q/P COS, IPv4 Time of Service, via ACLs		
23	Congestion Avoidance: WRED, multiple Queue Thresholds		
24	Scheduling IP precedence, 802.1p, three transmit queues on a per port basis, WRR, Strict Priority Queue Time of Service, Class Of Service mapping		
25	Micro-Flow Policing (limits BW of specific user/application)		
26	Strict-Priority Queue ( (protects mission-critical, delay-sensitive traffic)		
	<b>Routing Services</b>		
27	Routing Protocols: OSPF, IGRP, RIP, RIP-2, BGPVer4 & IS-IS, Static IP routing		
28	IP Multicast: PIM (sparse and dense mode) and DVMRP, Bi-Directional PIM		
29	Destination-based load sharing among equal cost paths		
30	Route up to 1000 VLANs		
	<b>Bandwidth Scaling</b>		
31	Should support Fast and Gigabit Ether channel up to 8 ports per channel		
32	Should support multi-module ether channel		
33	Should support bandwidth scaling for 10G Ethernet or more		
34	Should support L2 and L3 jumbo frame for MPLS		
35	Should support protocol filtering and broadcast suppression		
36	Should support 128K MAC address		
37	Should support 256K (IPv4) and 128K (IPv6) routes.		
38	Should support 64K shared for QoS and security		
39	Should support up to 128K (IPv4) and up to 128K (IPv6) Multicast routes		
40	Switch should support Up to 8192 VRFs, with a total of up to 256K forwarding entries per system		
	<b>Layer 2 Services</b>		
41	Should support layer 2 services: VTP, 802.1Q, ISL, L2 Traceroute		

42	Should support 4096 VLANs		
43	Should support Spanning Tree Enhancements: Uplinkfast, Portfast, Backbonefast, BPDU Guard, and Root Guard. 802.1s(RSTP/equivalent), 802.1w (MST/equivalent)		
44	Security Group Tagging and Security Group Access Control List		
45	IEEE 802.1ae (MACsec) Layer 2 encryption in hardware		
46	Native Layer 2-over-multipoint GRE		
	<b>Additional Services</b>		
47	Should support DHCP and BOOTP relay		
48	Should support standard DNS support		
49	Should support IGMP v1/2, IGMP snooping, CGMP server support		
50	Should support MPLS in hardware to support use of Layer 3 VPNs and Ethernet over (EoMPLS) tunneling		
	<b>High Availability – Device</b>		
51	Stateful Fail-over and Hitless Software Upgrades		
52	Synchronized L2 / L3 Protocol States between Supervisors		
53	Synchronizes: Routing, ARP, and CAM tables; STP state, ACLs		
54	Stateful failover (1-3 sec)		
55	Hitless software upgrades w/ redundant supervisor upgrade software while switch remains active		
	<b>High Availability – Network</b>		
56	Physical Link Redundancy (Layer 1)		
57	Multi-Module Ether channel		
58	Multiple ports from different line cards/supervisors form logical trunks between switches. The Ether Channel stays up in the event of any a line card or supervisor failure.		
59	Unidirectional Link Detection		
60	Provides a mechanism to detect connectivity issues with both fiber and copper cabling. Ensures that a partially failed link is shut down on both sides, to avoid L2/L3 protocol convergence issues.		
	<b>Redundancy at Layer 3</b>		
61	VRRP/HSRP default gateway redundancy for end systems		
62	Failover (1-3 seconds)		
63	OSPF/EIGRP advanced dynamic routing protocols		
64	Failover (3-50 seconds, dependent on topology and tuning)		
	<b>Wire rate Access Control Lists</b>		
65	Standard/Extended		
66	Reflexive (stateful)		
67	Dynamic (time of day)		
68	IP permit lists		

69	MAC address filtering based on Source and Destination Address		
70	Unicast Reverse Path Forwarding check		
71	Bi-directional VACL per PVLAN Community		
72	VACL Denied Logging		
73	Traps and Syslog messages sent on security violations		
74	Transceivers from same OEM - Single Mode SFP transceivers, 10km <b>(unit price should be quoted)</b>		
<b>Core Switch - Warranty and Service requirement</b>			
1	3 years Onsite advance hardware replacement warranty from OEM.		
2	3 years Onsite Support & Service by OEM/Authorized Partner.		
3	3 years firmware upgrade and bug fixes from OEM.		
4	The proposed products should not become End-of-Support for next 5 years. OEM Certificate required.		
5	The proposed products should not become End-of-Sale at the time of placing the order.		
6	The OEM Should have registered office in India		
7	The OEM Should have dedicated Technical Support Center in India		
8	MAF, Warranty & Support Certificate from OEM is required.		
8	OEM should be listed in latest Gartner's quadrant for LAN Infrastructure.		

## 2. IPPBX Solution

<u>Sl. No</u>	<u>Specification</u>	<u>Compliance (Yes/No)</u>	<u>References</u>
<b>2.1</b>	<b>Software Specifications – IPPBX</b>		
1	Proposed solution should be software based call server solution which can be installed on Server Hardware of any brand, the hardware it needs to be installed should meet the specifications as recommended by the Manufacturer of Software		
2	Software solution should be able to Intel based hardware with necessary configuration to support the desired expandability. No proprietary hardware is acceptable.		
3	The solution should support for installation in a Virtualized environment in order to efficiently utilize the hardware resources		
4	The software should provide converged communication System with ability to run TDM and IP on the same platform using same software load based on server and Gateway architecture.		
5	The software solution should support integration with Gateways with DSP resources for allowing TDM resources like PSTN connectivity and Analog Phones		

6	The software solution should support integration with Gateways with DSP resources for allowing TDM resources like PSTN connectivity and Analog Phones		
7	Single software instance should be able to support up to 1000 IP Stations.		
8	Software should have single database to manage all the users		
9	Software should support Linux/Unix platforms for Installation		
10	Software should offer call control functionality based on SIP and must support standard SIP RFCs like 3261, 3262, 3264, 3265, 3311, 3515, 3842, 2833, 2976, 3323, 3325, 3515, 3856 and 3891		
11	Software should support active-active configuration over the distributed IP infrastructure (LAN/WAN) in order to have a call control system that is fully redundant and NO single point of failure. Both the software instance on different hardware servers should do call processing all the time and act as backup in case of the failure of one server.		
12	It should be possible for solution to have distributed architecture and the centralized control for all the software instances within the same setup		
13	The communication software should support IPv6 from day 1 so as to be future proof.		
14	The software version offered should be the latest release as on the date of supply of as available globally.		
15	The offered solution must provide a standard based mechanism for QoS implementation.		
16	Software should allow direct registration / profile creation of SIP endpoints onto it and perform all functions of Proxy/ Registrar / Redirect etc		
17	Software should support Quality of Services (QoS) would be configured to administer the call and ensure voice traffic get priority over normal traffic.		
18	The Software should support Call Admission Control to configure number of calls that can be active between locations —intercluster and intracluster.		
19	Software should support LDAP integration for directory synchronization & user authentication.		
<b>2.2</b>	<b>Support for call-processing and call-control.</b>		
1	Should support standard signaling standards/Protocols – SIP, MGCP, H.323, Q.Sig.		
2	Voice CODEC support - G.711, G.729, G.729ab, g.722, ILBC		

3	Video codecs: H.261, H.263, H.264, and Wideband Video Codec		
4	Video telephony support (H.323, and SIP)		
5	Support for configuration database (contains system and device configuration information, including dial plan)		
6	Having inbuilt administration web based administration. No additional thick client for administration on the Admin PC. Should also support HTTPS for management.		
7	IP Phone Address Book Synchronizer—allows users to synchronize Microsoft Outlook or Outlook Express address books with Personal Address Book.		
8	Should provide Single Number Reach (Simultaneous Ring on IP phone and user defined alternate phone) for all the IP phone users.		
<b>2.3</b>	<b>System Management &amp; Monitoring</b>		
1	The System should have GUI support web based management console.		
2	System should provide management tool to monitor system performance, device status, device discovery and CTI applications.		
3	Should provide alert notifications for troubleshooting performance		
4	It should support secure HTTPS & TCP to troubleshoot system problems.		
5	Generate various alerts in the form of e-mails, for objects when values go over/below pre-configured threshold levels.		
6	Should monitor the system in real-time on a set of preconfigured parameters.		
7	It should be possible to configure the sample interval rate for the applicable performance monitoring.		
8	The management platforms must provide different levels for accessing the system based on the role being played by the user who is accessing the system. The administrator should have the highest authority.		
9	Should provide a daily summary report of key monitoring parameters like Call Activity (No of calls attempts and completed), Device status (Number of registered phones / gateways / trunks per server), server status (load on server resources), alert status etc.		
<b>2.4</b>	<b>Security</b>		
1	The protection of signaling connections over IP by means of authentication, Integrity and encryption should be carried out using TLS.		
2	The password and Access Control must Include the following:		



	a. Passwords to prevent the possibility of an aggressor to easily read or deduce system or account access password.		
	b. Password aging with Configurable time periods.		
3	System should support MLPP feature.		
4	Proposed system should support SRTP for media encryption and signaling encryption by TLS.		
5	Secure HTTP support for Call Server Administration, Serviceability, User Pages, and Call Detail Record Analysis and Reporting Tool. Should support Secure Sockets Layer (SSL) for directory.		
6	The administrator logging on to the call control server needs to authenticate by suitable mechanism such as User Login Information and Passwords/ Radius Server.		
<b>2.5</b>	<b>End user / system Features required:</b>		
1	Extension mobility		
2	Message-waiting indicator (MWI)		
3	Hunt groups		
4	Dial-plan partitioning		
5	The system should support at least <b>13</b> digit numbering scheme.		
6	Distributed call processing		
7	Hotline and private line automated ringdown (PLAR)		
8	Interface to H.323 gatekeeper for scalability, CAC, and redundancy		
9	Multi-Level Precedence and Preemption (MLPP)		
10	Q.SIG (International Organization for Standardization [ISO])		
11	Secure HTTP support for Call Server Administration, Serviceability, User Pages, and Call Detail Record Analysis and Reporting Tool.		
12	Secure Sockets Layer (SSL) for directory		
13	Phone Security: TFTP files (configuration and firmware loads) are signed with the self-signed certificate of the TFTP server. The CallServer system admin will be able to disable http and telnet on the IP phones		
14	SIP trunk (RFC 3261) and line side (RFC 3261-based services)		
15	SIP trunk Call Admission Control (SIP CAC)		
16	Time-of-day, day-of-week, and day-of-year routing and restrictions		
17	The proposed system should support automatic route selection (ARS) and least Cost routing (LCR) features to route the calls based on priorities related to user profile, tariff, and network availability, along the most cost-effective path. This service will be transparent for users and irrespective of the physical carrier connection.		
18	<b>Distinctive Ringing.</b> The system should provide audibly different station ringing patterns to distinguish between internal and external calls		
<b>2.6</b>	<b>User Features</b>		
1	Abbreviated Dial		

2	Callback busy, no reply to station		
3	Call park and pickup		
4	Call status per line (state, duration, number)		
5	Calling Line Identification (CLID)		
6	Calling party name identification (CNID)		
7	Direct inward dial (DID)		
8	Direct outward dial (DOD)		
9	Directory dial from phone—corporate, personal		
10	Directories—missed, placed, received calls list stored on selected IP phones		
11	Distinctive ring (on net vs. off net)		
12	Shared Line support		
13	Message waiting indication (Visual and Audio)		
14	Multiple line appearances per phone		
15	Music-on-hold		
16	Station volume controls (audio, ringer)		
17	Transfer		
18	Video (SIP and H.323)		
19	Boss-secretary feature support		
20	On-hook dialing		
21	Call waiting		
22	Call Conference.		
<b>2.7</b>	<b>Presence Services for Software users:</b>		
1	The software should provide a "presence" application for all software users, so that they can see the availability status of his contacts in their buddy list.		
2	The common supported status for this application should be available, busy, idle, away etc.		
3	Should provide network-based presence. This means that the user should be able to see the communication channel on which the other user is available; like chat, phone, video, email etc. If the remote user has not logged on to the presence client, primary user should be able to contact the person through phone, email etc.		
4	Should support the users to see other user's IP phone's on/off hook states		
5	The instant messaging application should support manual setting of user status to: Available, Away, Do Not Disturb (DND), Logged Off etc.		
6	Should support management of contact list, IM history, and personal settings.		
7	Shall provide support for open protocols like XMPP.		
8	Presence based desktop application shall allow escalation of Instant Message to Audio call and further to Video call		

9	Should support management of contact list, IM history, and personal settings from Presence based desktop application		
10	Presence based desktop application shall support logging of Instant Messages for compliance purpose if any.		
11	Should provide SSH and HTTPS access to management platform for enhanced security.		
12	Should support click to call, click to Video and click to conference features.		
<b>2.8</b>	<b>Video Telephony Features and Support:</b>		
1	The software call control system should provide integrated video telephony features to the users so that user with IP Phone / Soft phone and video telephony end point should be able to place video calls with the same user model as audio calls.		
2	The users should be able to transfer video calls as audio calls		
3	It should be possible to have multiparty video call through the conferencing system.		
4	Software based Call-Server should provide a common control agent for signaling, configuration, and serviceability for voice or video end points.		
5	Call control system should handle CODEC and video capabilities of the endpoints, bandwidth negotiation to determine if video/audio call can take place.		
<b>2.9</b>	<b>IP Phone – Basic</b>		
1	Phone should be of the same OEM as the IP-PBX/Call Control.		
2	The phone should be a SIP based		
3	Should have 128 x 30 or better pixel-based display.		
4	Should have full duplex speaker phone and dedicated headset port with RJ-9 interface.		
5	It should support G.711, G.729a/b audio compression codecs.		
6	Should provide the directory services to the user by displaying the missed, received and dialed call details including the caller ID and calling time.		
7	Should support IEEE 802.3af POE, and external AC power adapter option.		
8	The phone should have two 10/100 BASE-T Ethernet ports, one for the LAN connection and the other for connecting to PC/laptop.		
9	The phone should support QoS mechanism through 802.1p/q.		
10	Support for online firmware upgrades using Trivial File Transfer Protocol (TFTP)		
11	Should have 4 MB flash memory and 30 MB or more SDRAM.		
<b>2.10</b>	<b>IP Phone – Advanced</b>		
1	Phone should be of the same OEM as the IP-PBX/Call Control		
2	Have high-resolution 800 x 480 pixel backlit display with 5" or higher LCD Screen with integrated video Camera.		
3	It should have HD Video Support of 720p or higher		
4	Have Intuitive user interface and keypad for quick access to all IP phone and video services		

5	Have an integrated 2-port 10/100/1000 Ethernet switch.		
6	Support for Wireless Connectivity (IEEE 802.11a/b/g/n/ac)		
7	Support Bluetooth 2.0 or above and RJ-9 interface for headsets.		
8	Should have 5 or more line keys.		
9	Should have 4 or more programmable feature keys.		
10	SIP support for signaling.		
11	Audio Codec Support: G.711, G.729.		
12	Video Codec Support: using H.264 upto 30 fps.		
13	It support XML based applications for productivity enhancement.		
14	Full-duplex speakerphone with high-definition voice support for handset, headset and speaker		
15	Any Other		
<b>Warranty and Service requirement</b>			
1	3 years Onsite advance hardware replacement warranty from OEM.		
2	3 years Onsite Support & Service by OEM/Authorized Partner.		
3	3 years firmware upgrade and bug fixes from OEM.		
4	The proposed product should not become End-of-Support for next 3 years. OEM Certificate required.		
5	The OEM Should have registered office in India		
6	The OEM Should have dedicated Technical Support Center in India		
7	MAF, Warranty & Support Certificate from OEM is required.		
8	OEM should be listed in latest Gartner's quadrant for both Unified Communications as well as Corporate Telephony.		
9	Solution should be designed and implemented by OEM.		

### **Important Dates:**

Issue of NIQ: 31-12-2016

Late date and Time: 18-1-2016

12 noon

Quotation Opening: 18-1-2016 3 PM

Registrar  
Gauhati University

Copy to:

1. Rector, GU
2. Secretary to the Vice Chancellor, for information of the Vice Chancellor
3. Treasurer, GU
4. Controller, GU
5. Jt. Registrar, GU, for uploading in the GU website
6. M/s Gulf Advertising Agency, for publishing the BRIEF VERSION of this notice in the Assam Tribune in the immediate next issue, and submit the bill in triplicate for payment.
7. Office Files



Registrar  
Gauhati University 31-12-2016

পৰ্ব্বীক্ষক  
ভৱাহাটী বিশ্ববিদ্যালয়, ভৱাহাটী-১৪  
Registrar  
Gauhati University, Guwahati-14