Meghalaya
Information Technology Society

NIC Building, Secretariat Hill, Shillong 793 001

No.MITS.2/2017/Pt/310 Dated Shillong the 23rd December, 2022

CORRIGENDUM -1

of
NOTICE INVITING TENDER
for
"Supply, Installation, Commission and Integration/testing of the Network - IT Equipment at Meghalaya State Data Center"

Further to the Tender Document published through the eProcurement System of Government of Meghalaya at the website www.meghalayatenders.gov.in vide Notice Inviting Tender No. MITS.2/2017/Pt/291 dated 19th December-2022, **the technical specifications** of the equipment mentioned therein have been R**evised** as follows. All other clauses and Terms & Conditions mentioned in the NIT remain unchanged.

A. Internet Router

Revised Technical Specification

Sl. No.	Specifications	Compliance (Yes/No)
OEM Eligibility Criteria		
1	OEM shall be in the leader's quadrant as per the latest published Gartner's MQ report on DCNI. OEM must have India presence for last 5 years on both Sales and Support operation.	
WAN interfaces		
2	The Router should support 1G,10G WAN ports	
3	The Router should support internal loopback testing for maintenance purposes and an increase in availability, loopback detection protects against incorrect cabling or network configurations and can be enabled on a per-port or per-VLAN basis for added flexibility.	
4	The Router should support minimum 4 payload/module slots or more	
Resiliency and high availability		
5	The Router should support Separate data and control planes to provide greater flexibility and enable continual services.	
6	The Router should support Hot-swappable modules	
7	The Router should have redundant hot-swappable power supply	
8	The Router should support Virtual Router Redundancy Protocol (VRRP)	

9	The Router should support Graceful restart including graceful restart for OSPF, IS-IS, BGP, LDP, and RSVP.	
10	The Router should support nonstop forwarding (NSF) and nonstop routing.	
11	The Router should support Hitless/ ISSU software upgrades of software packages.	
12	The Router should support IP Fast Reroute Framework (FRR)/ Multicast over FRR.	
Architecture		
13	The Router should support Distributed/Centralized processing	
14	The Router should support powerful processing, encryption, and comprehensive HQoS functionalities with four levels	
15	19" rack mountable design. Must be offered with rack mounting kit.	
Performance Requirement		
16	The Router should provide minimum aggregate throughput bandwidth of 5 Gbps scalable up to 20 Gbps and 14 Mpps of forwarding performance or more.	
17	The Router should have minimum 100000 entries (IPv4), 100000 entries (IPv6) in forwarding information base or Routing table size and at least 2000multicast routes.	
Layer 3 Routing		
18	The Router should support Static IPv4 routing	
19	The Router should support Routing Information Protocol (RIP) V2	
20	The Router should support Open Shortest Path First (OSPF) ,Interior Gateway Protocol (IGP) uses link-state protocol for faster convergence; supports ECMP and MD5 authentication for increased security and graceful restart for faster failure recovery	
21	The Router should support Border Gateway Protocol 4 (BGP-4)	
22	The Router should support Intermediate system to intermediate system (IS-IS) Interior Gateway Protocol (IGP) uses path vector protocol	
23	The Router should support Static IPv6 routing	
24	The Router should maintain separate stacks for IPv4 and IPv6 to ease the transition from an IPv4-only network to an IPv6-only network design The Router should support OSPF for IPv6	
25	The Router should support BGP-4 to support Multiprotocol BGP (MBGP), including support for IPv6 addressing	
26	The Router should support IS-IS for IPv6	
27	The Router should support IPv6 tunneling	
28	The Router should support Multiprotocol Label Switching (MPLS)	
29	The Router should support Multiprotocol Label Switching (MPLS) Layer 3 VPN	
30	The Router should support Multiprotocol Label Switching (MPLS) Layer 2 VPN	
31	The Router should support Policy routing	

32	The Router should support Multicast VPN	
33	The Router should support Virtual Private LAN Service (VPLS)	
34	The Router should support Bidirectional Forwarding Detection (BFD)	
35	The Router should support IGMPv1, v2, and v3	
36	The Router should support PIM-SSM, PIM-DM/ PIM-SM (for IPv4 and IPv6) and support IP Multicast address management and inhibition of DoS attacks	
37	The Router should support Equal-Cost/Unequal-Cost Multipath (ECMP/UCMP)	
38	The Router should support OSPFv3 Multi-VPN-Instance	
39	The Router should support OSPFv3 Multi-VPN-Instance /6PE feature to create and maintain separate OSPFv3 routing tables for each IPv6 VPN 6PE to isolate VPN services in the device	
Layer 3 Services		
40	The Router should support Address Resolution Protocol (ARP)	
41	The Router should support User Datagram Protocol (UDP) helper	
42	The Router should support Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP)	
43	The router should support Data Centre features like DCI, EVPN, VXLAN	
Security		
44	The Router should support Dynamic Virtual Private Network (DVPN), IPSEC VPN or any equivalent mechanism or equivalent	
45	The Router should have Stateful firewall/Zone-based firewall	
46	The Router should support powerful ACLs for both IPv4 and IPv6 to use for filtering traffic to prevent unauthorized users from accessing the network, or for controlling network traffic to save resources; and support rule based on a Layer 2 header or a Layer 3 protocol header and specific dates or times	
47	The Router should support Secure shell (SSHv2)	
48	Remote Authentication Dial-In User Service (RADIUS)	
49	The Router should support Terminal Access Controller Access-Control System (TACACS+)	
Quality of Service (QoS)		
50	The Router should support powerful processing, HQoS/Nested QoS functionalities with four levels	
51	The Router should support Traffic policing and support Committed Access Rate (CAR) and line rate	
52	The Router should support Congestion management technique like FIFO/PQ/ CQ/ WFQ/ CBQ/ RTPQ	
53	The Router should support Congestion avoidance technique Weighted Random Early Detection (WRED)/Random Early Detection (RED)	
54	The Router should support traffic shaping, MPLS QoS, and MP QoS/LFI	
Management		
55	The Router should support Industry-standard CLI with a hierarchical structure	

56	The Router should support SNMPv1, v2, and v3	
57	provide complete support of SNMP; provide full support of industry-standard Management Information Base (MIB) plus private extensions; SNMPv3 supports increased security using encryption; provide alerts (via SNMP, logging, and/or SMTP) for system health and blocking/filtering actions	
58	The Router should support enables or disables console port, Telnet port, or reset button interfaces depending on security preferences:	
59	The Router should support Remote monitoring (RMON)	
Management security		
60	The Router should restricts access to critical configuration commands and offers multiple privilege levels with password protection, ACLs provide Telnet and SNMP access, local and remote syslog capabilities allow logging of all access	
61	The Router should support FTP, TFTP, and SFTP support	
62	The Router should support ping and traceroute for both IPv4 and IPv6	
63	The Router should support Network Time Protocol (NTP)	
64	The Router should support RFC3164 Syslog Support	
Multicast support		
65	The Router should support Internet Group Management Protocol (IGMP)	
66	The Router should support Multicast Source Discovery Protocol (MSDP)	
67	The Router should support Multicast Border Gateway Protocol (MBGP)/BGP.	
Required Interfaces		
68	12 no's 10G SFP+ ports, 12 no's of 1G fibre and 4 no's 1G BaseT ports. All transceiver module to be populated from Day 1. Management port 1G BaseT for monitoring. 1 no Fast Ethernet IG Module with 4 ports	

B. Core Switch

Revised Technical Specification

Sl. No.	Specifications	Compliance (Yes/No)
OEM Eligibility Criteria		
1	OEM shall be in the leader's quadrant as per the latest published Gartner's MQ report on DCNI. OEM must have India presence for last 5 years on both Sales and Support operation.	

Solution Requirement		
2	The core layer switches should have hardware level redundancy (1+1) in terms of control plane. Issues with any of the plane should not impact the functioning of the switch. 19" rack mountable design. Must be offered with rack mounting kit.	
3	The switch should have redundant CPUs from day 1. Switch dual supervisor configuration must allow nonstop forwarding (NSF) with a stateful switchover (SSO) when a supervisor-level failure occurs.	
4	The Switch should support non-blocking architecture, all proposed ports must provide wire speed line rate performance	
5	Switch should support in line hot insertion and removal of different parts like modules/power supplies/fan tray etc. This should not require rebooting of the switch or create disruption in the working/functionality of the switch	
6	Switch should support the complete STACK of IP V4 and IP V6 services.	
7	All relevant licenses for all the features and scale should be quoted along with switch	
8	Switch and optics should be from the same OEM	
Hardware and Interface Requirement		
9	Switch should have the following interfaces: 1. 48-Port 10/100/1000 (RJ-45) – Line Card 2. 48-Port Gigabit Ethernet(SFP) – Line Card 3. 24-Port 10 Gigabit Ethernet(SFP+) – Line Card 4. Management port 1G BaseT for monitoring.	
10	Switch should have adequate power supplies for the complete system usage with all slots populated and used, providing N+1 redundancy	
Performance Requirement		
11	Switch should support Graceful Restart for OSPF, BGP etc. Should support uninterrupted forwarding operation to ensure high-availability during primary controller failure	
12	Switch should support minimum 1000 VRF instances with route leaking functionality	
13	The switch should support minimum 500K IPv4 LPM routes	
14	The line card proposed should have minimum 150MB Packet Buffer per LC	
15	The switch should support 100K multicast routes	
16	Switch should support a minimum of 15 Tbps Bandwidth/ Switching Capacity)	

Network Virtualization Features		
17	Switch should support Network Virtualisation using Virtual Over Lay Network using VXLAN	
18	Switch should support VXLAN and EVPN symmetric IRB for supporting Spine - Leaf architecture to optimise the east - west traffic flow inside the data center	
19	Spanning Tree Protocol (IEEE 802.1D, 802.1W, 802.1S)	
20	Switch should support VLAN Trunking (802.1q)	
21	Switch should support minimum 500K of MAC addresses	
22	Switch should support VLAN tagging (IEEE 802.1q)	
23	Switch should support IEEE Link Aggregation and Ethernet Bonding functionality (IEEE 802.3ad) to group multiple ports for redundancy	
24	Switch should support layer 2 extension over VXLAN across all DataCenter to enable VM mobility & availability	
25	The switch should support BGP EVPN Route Type 2, Type 4 and Route Type 5 for the overlay control plane	
Layer3 Features		
26	Switch should support static and dynamic routing	
27	Switch should support segment routing and VRF route leaking functionality from day 1	
28	Switch should provide multicast traffic reachable using: a. PIM-SM b. PIM-SSM c. Support Multicast Source Discovery Protocol (MSDP)	
29	Switch should support Multicast routing	
Quality of Service		
30	Switch system should support 802.1P classification and marking of packet using: a. CoS (Class of Service) b. DSCP (Differentiated Services Code Point)	
31	Switch should support for different type of QoS features for ream time traffic differential treatment using a. Weighted Random Early Detection b. Strict Priority Queuing	
32	Switch should support to trust the QoS marking/priority settings of the end points as per the defined policy	
Security		
34	Switch should support control plane Protection from unnecessary or DoS traffic by control plane protection policy	
35	Switch should support for external database for AAA using: a. TACACS+ b. RADIUS	
36	Switch should support to restrict end hosts in the network. Secures the access to an access or trunk port based on MAC address. It limits the number of learned MAC addresses to deny MAC address flooding	

37	Switch platform should support MAC Sec (802.1AE) in hardware	
38	Switch should support for Role Based access control (RBAC) for restricting host level network access as per policy defined	
Manageability		
39	Switch should support for sending logs to multiple centralised syslog server for monitoring and audit trail	
40	Switch should provide remote login for administration using: a. Telnet b. SSH c. CLI d. Console	
41	• Flow path trace (ingress to egress switch) • Latency and packet drop	
42	• Utilization of Operational like MAC/Route & Hardware resources like port utilization/ BW • Switch environments like (CPU/memory/FAN/Power Supply) • Interface statistics like CRC error	
43	Switch should support for management and monitoring status using different type of Industry standard NMS using: SNMP V1, SNMP V2 and SNMP v3 with Encryption Remote monitoring (RMON) support	
44	Switch should provide different privilege for login in to the system for monitoring and management	
QoS and Security Features		
45	Access Control Lists for both IPv4 and IPv6 for filtering traffic to prevent unauthorized users from accessing the network	
46	Port-based rate limiting and access control list (ACL) based rate limiting	
47	Shall create traffic classes based on access control lists (ACLs), IEEE 802.1p precedence, IP, and DSCP or Type of Service (ToS) precedence	
48	Shall support Strict Priority Queuing (SP)/Weighted Fair Queuing (WFQ)/Weighted Deficit Round Robin (WDRR)configurable buffers and Explicit Congestion Notification (ECN)	
49	Shall support Weighted Random Early Detection (RED) /Random Early Detection (RED) for congestion avoidance	
50	DHCP protection/snooping to block DHCP packets from unauthorized DHCP servers	
51	ARP attack protection to protect against attacks that use a large number of ARP requests	
52	Port security to allow access only to specified MAC addresses. Switch should also support 802 1x authentication and accounting, MACSec-128 or equivalent, IPv4 and IPv6 ACLs and Dynamic VLAN assignment	
53	Shall support Packet storm protection to protect against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds	

C. Access Switch

Revised Technical Specification

Sl.No.	Technical specification	Compliance (Yes/No)
OEM Eligibility Criteria		
1	OEM shall be in the leader's quadrant as per the latest published Gartner's MQ report on DCNI. OEM must have India presence for last 5 years on both Sales and Support operation.	
Architecture		
2	19" rack mountable configuration. Rack mounting kit must be provided.	
3	Shall have routing/switching capacity minimum of 560 Gbps of forwarding performance	
4	Shall be based on modular operating system to support enhanced serviceability along with independent process monitoring.	
5	Shall deliver a maximum of 6 micro second latency with consistent performance across a broad range of applications with typical mixed loads of real-time, multicast and storage traffic.	
6	32K MAC entries or more	
Resiliency		
7	Shall have the capability to extend the control plane across multiple active switches making it a virtual switching fabric, enabling interconnected switches to aggregate the links	
8	Shall have redundant hot swap power supplies (1+1) from Day 1.	
9	Switch should supplied with compatible IEC C13/C14 3pin power cord suitable for PDU.	
10	IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol and IEEE 802.1s Multiple Spanning Tree Protocol	
11	IEEE 802.3ad Link Aggregation Control Protocol (LACP)	
Layer 2 Features		
12	Shall support up to 3950 port or IEEE 802.1Q-based VLANs	
13	Shall support Jumbo frames of 9K bytes	
14	Internet Group Management Protocol (IGMP)	
15	Multicast Listener Discovery (MLD) or IGMP snooping	
16	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)	
17	IEEE 802.3ad Link Aggregation Control Protocol (LACP)	
Layer 3 Features (any additional licenses required shall be included)		
18	Static Routing for IPv4 and IPv6	
19	Dynamic Host Configuration Protocol (DHCP) Client/ Relay or Server.	

QoS and Security Features		
20	Access Control Lists for both IPv4 and IPv6 for filtering traffic to prevent unauthorized users from accessing the network	
21	Port-based rate limiting and access control list (ACL) based rate limiting	
22	Shall create traffic classes based on access control lists (ACLs), IEEE 802.1p precedence, IP, and DSCP or Type of Service (ToS) precedence	
23	Shall support Strict Priority Queuing (SP)/Weighted Fair Queuing (WFQ)/Weighted Deficit Round Robin (WDRR)configurable buffers and Explicit Congestion Notification (ECN)	
24	Shall support Weighted Random Early Detection (RED) /Random Early Detection (RED) for congestion avoidance	
25	DHCP protection/snooping to block DHCP packets from unauthorized DHCP servers	
26	ARP attack protection to protect against attacks that use a large number of ARP requests	
27	Port security to allow access only to specified MAC addresses	
28	Shall support Packet storm protection to protect against unknown broadcast, unknown multicast, or unicast storms with user-defined thresholds	
Management Features		
29	Configuration through the CLI, console, Telnet, and SSH	
30	SNMPv1, v2, and v3 and Remote monitoring (RMON) support	
31	NetFlow/sFlow or equivalent for traffic analysis	
32	Port mirroring to duplicate port traffic (ingress and egress) to a local or remote monitoring port.	
33	RADIUS/TACACS+ for switch security access administration	
34	Network Time Protocol (NTP) or equivalent support	
Required Interfaces		
35	48 ports of 1G BaseT and 4 ports of 10G SFP+ with 10G SFP+ transceiver modules.	

Important to Note:

1. ***The bidder has to take into account the compatibility with the existing equipment in the Meghalaya Data Center while quoting the different equipment. The list of existing equipment (router, core switch and access switch) at the Data Center will be shared with the interested bidder via email or during the pre-bid meeting. The Bidder shall be responsible for the integration of the proposed equipment with the existing infrastructure.***
2. ***For any clarification for pre-bid meeting, the bidders should send their queries in the following format:***

Sl. No.	RFP Document Reference(s) (Section & Page Number(s))	*Content of RFP requiring Clarification(s)*	Points of Clarification
1.			
2.			

Sd/-
K. L. Nongbri)
Joint Secretary to the Govt. of Meghalaya
Information Technology & Communications Department
&
Member Secretary
Meghalaya IT Society