

FINANCIAL PROPOSAL (PRICE BID FORMAT)

| | | | Recommended Brands | SMB Grade | Specify SMB Grade | Enterprise Grade | Specify Enterprise Grade |
|--------|---|------|--|-----------|-------------------|------------------|--------------------------|
| S.N os | Description | UOM | | Rate | Brand | Rate | Brand |
| A | LAN COPPER CABLING | | | | | | |
| | Supply, Installation, Termination, Testing and Commissioning of following Copper Components (Supply of Cat 6 cables ,23awg, LSZH as per IEC -60322-3 with ETL third party channel certificate for all accessories like IO, Patch cord ,Face plate, jack panel etc from same OEM. 25 year OEM warranty preferred) | | | | | | |
| 1 | 4 Pair UTP - Category 6 cable | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon | | | | |
| 2 | Category 6 Information Outlet with faceplate and SMB | Nos | Panduit, Commscope, Nexus, Actassi, Siemon | | | | |
| 3 | Category 6 Information Outlet with dual faceplate and SMB | Nos | Panduit, Commscope, Nexus, Actassi, Siemon | | | | |
| 4 | Category 6 Patch Cord 4 ft. For Data Rack Side | Nos | Panduit, Commscope, | | | | |

| | | | Recommended Brands |
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| S.N os | Description | UOM | |
| | | | Nexus, Actassi, Siemon |
| 5 | Category 6 Patch Cord 7 ft. For Data Field Side | Nos | Panduit, Commscope, Nexus, Actassi, Siemon |
| 6 | Category 6 Loaded Patch Panel | Nos | Panduit, Commscope, Nexus, Actassi, Siemon |
| 7 | Category 6 I/O for patch panel | Nos | Panduit, Commscope, Nexus, Actassi, Siemon |
| 8 | 27U/24U ,Standard DIN 41494, 575 mm Depth 1000mm Doors Rear door, perforated Front Glass Door, The rack doors to have locking system, General Angle support for equipment's, Castors with brakes, Cable management accessories, Vertical managers:2 Nos , Horizontal managers Rack trays : 2 nos min, Power distribution box with 10 nos of 5/15A power sockets, Fan and fan trays, Keyboard Tray, | Nos | Startronics, Schneider, DLink |

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| S.N os | Description | UOM | |
| 9 | 19" 9 U wall mount closed rack with Horizontal power strips of 5 sockets (1 Nos) , Fans , vertical cable managers 2Nos ,bolts nuts and all accessories. Additional rack, DIN 41494 | Nos | Startronics, Schneider, DLink |
| 10 | 19" 6 U wall mount closed rack with Horizontal power strips of 5 sockets (1 Nos) , Fans , vertical cable managers 2Nos ,bolts nuts and all accessories. Additional rack, DIN 41494 | Nos | Startronics, Schneider, DLink |
| 11 | 25mm PVC Cap on Casing/ Flexible / Conduit | Mtrs | ISI Mark |
| 12 | 38mm PVC Cap on Casing/ Flexible / Conduit | Mtrs | ISI Mark |
| B | FIBER CABLING | | |
| | Supply, Installation, Termination, Testing and Commissioning of following Copper Components (Supply of Cat 6 cables ,23awg, LSZH as per IEC -60322-3 with ETL third party channel certificate for all accessories like IO, Patch cord ,Face plate, jack panel etc from same OEM. 25 year OEM warranty preffered) | | |
| 1 | 6 F Core SM Low Water leak OSP Fiber Cable (Indoor) | Mtrs | Panduit, Commscope, |

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| S.N os | Description | UOM | Recommended Brands |
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| | | | Nexus, Actassi, Siemon |
| 2 | 12F Core SM Low Water leak OSP Fiber Cable (Indoor) | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon |
| 3 | 24F Core SM Low Water leak OSP Fiber Cable(Indoor) | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon |
| 4 | 48F Core SM Low Water leak OSP Fiber Cable (Indoor) | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon |
| 1 | 6 F Core SM Low Water leak OSP Fiber Cable (Outdoor) | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon |
| 2 | 12F Core SM Low Water leak OSP Fiber Cable (Outdoor) | Mtrs | Panduit, Commscope, Nexus, Actassi, Siemon |
| 3 | 24F Core SM Low Water leak OSP Fiber Cable (Outdoor) | Mtrs | Panduit, Commscope, |

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| S.N os | Description | UO M | |
| 1 | 24 Port 10/100/1000Mbps Gigabit Ethernet Switch Web Managed Switch | Nos | Cisco/ HPE/ Juniper/ Dlink/ Tejas |
| 2 | 24 Port 10/100/1000Mbps Web Managed Switch with 2 Gig SFP ports | Nos | Cisco/ HPE/ Juniper/ Dlink/ Tejas |
| 3 | 48 Port 10/100/1000Mbps Web Managed Switch with 2 Gig SFP ports | Nos | Cisco/ HPE/ Juniper/ Dlink/ Tejas |
| 4 | 16 Port 10/100/1000Mbps Web Managed Switch | Nos | Cisco/ HPE/ Juniper/ Dlink/ Tejas |
| 6 | 8 port 100/1000 Mbps Fast Ethernet Unmanaged PoE Switch with 8 PoE Ports | Nos | Cisco/ HPE/ Juniper/ Dlink/ Tejas |
| 7 | Media Convertors for Fiber | Nos | |
| 8 | Wifi Access Point (POE enabled) (2X2) | Nos | Cisco/ HPE/ Juniper/ Reckus/ Dlink |
| 9 | Wifi Access Point (POE enabled) (4X4) | Nos | Cisco/ HPE/ Juniper/ Reckus/ Dlink |
| 9 | Wireless Router (2X2) | Nos | Tejas or Aliphion with |

| SMB Grade | Specify SMB Grade |
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| S.N os | Description | UOM | |
| 6 | Earthing for main rack | Lot | |
| 7 | 2x 4 sq mm Aluminium armoured cable wiring As reqd | Mtrs | Havells, L&T,RR, polycab |
| 8 | 2x 4 sq mm copper cable wiring As reqd | Mtrs | Havells, L&T,RR, polycab |
| 9 | 1 kVA Online UPS with 1 hour battery Backup | Nos | APC Luminous, Vertiv, Microtek |
| 10 | 600 VA Online UPS with 30 minutes battery Backup for Rack | Nos | APC Luminous, Vertiv, Microtek |
| E | Labour Charge | | |
| 1 | Rate per Node | Rs | |

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Annexures 1- Wireless Access Point

| Wireless Access Point | | |
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| Sl.No | Specification (Access point should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 1 | Industry Standard Security - The product should be compliant with IEEE 802.11ac (MIMO2x2) with backward compatibility to 802.11a/n/ac. and should support multiple security methods, WEP, WPA/WPA2-PSK, 802.1x | |
| 2 | WLAN Hardware/Cloud Compatibility | |
| 3 | Networking Specifications - Layer2/Layer 3- 802.1Q, 802.1D, Layer3 routing, WDS, port forwarding, VLAN tag mapping to SSID | |
| 4 | Security - NAT,802.1x, 802.11i, WPA2-TKIP, WPA2-AES, MAC filtering, Captive portal support, IP filtering etc. | |
| 5 | Management - HTTPS, SNMP, web-based local management | |
| 6 | QoS - WLAN and per user | |
| 7 | WLAN (AP) - AP management, WLAN QoS, WLAN security, WLAN Radio Management, WLAN user management | |
| 8 | Network Services - DNS proxy, DHCP Server | |
| 9 | Interfaces - 802.11 Wireless interface- Dual Radio, 802.11a/b/g/n/ac. 2.4GHz and 5 GHz | |
| 10 | Ethernet - 10/100/1000 Base-T interface MDI/MDIX auto-sense | |
| 11 | Radio Specifications - 802.11ac capabilities - 1.16 Gbps data rates on dual concurrent radio operations Upto 100 Concurrent users includes both radio bands Data rates supported - upto 867 Mbps | |

Annexure 2- 8 port Switch

| Switch Hardware | | | |
|-----------------|---------------------|---|------------------------------------|
| S.No | Items | Specifications (8 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 1 | Switch Hardware | a) 8 Port 10/100/1000BaseT RJ45 | |
| | | b) PoE switch (240W) with Layer2+ software, AC supply Loaded with 2*1G SFP) | |
| | | c) Switching Capacity- 24 Gbps minimum | |
| | | d) Forwarding Rate- 17 Mpps minimum | |
| | | e)MAC table 16K | |
| 2 | Higher Availability | Shall support ITU-T G.8032 for 50m sub-second ring protection | |
| | | Persistence POE | |
| 3 | L2 | 4K VLAN ID's and 4K active VLAN,VLAN double tagging (Q-in-Q) | |
| | | STP/RSTP/MSTP | |
| | | IGMP snooping (IGMPv1, v2 and v3) | |
| 4 | Layer 3 Features | Should support Static routing for IPV4 and IPV6. | |
| 5 | Security | Should support ACLs, DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI), | |
| | | IEEE 802.1x, IP Source Guard, SSH, SSL, Storm Control, DHCP Snooping, DOS, Port Mirroring. | |
| 6 | Management | CLI, GUI LLDP, SNMP v1,v2c and v3, | |
| 7 | Environmental | Operating Temperature range 0 degC to +55 degC or better, Operating Humidity: 0% to 95% or better. | |

| Switch Hardware | | | |
|-----------------|--|---|------------------------------------|
| S.No | Items | Specifications (8 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| | | Switch Should have Low power consumption when NO POE Load 15 W . | |
| 8 | IPR | <ul style="list-style-type: none"> The intellectual Property Right (IPR) resides in India for Hardware Design. IPR applicable only for Indian OEM's | |
| 9 | Other Mandatory Certifications /Compliance | Switch OEM should have QUALITY MANAGEMENT SYSTEM - ISO 9001 | |
| | | Switch OEM should have QUALITY MANAGEMENT SYSTEM - TL 9000 | |
| | | Switch OEM should have implemented ISO14001 | |
| | | Comply to Preference to Make In India products PMA Policy applicable only for Indian OEM's | |

Annexure -3 – 24 port Switch

| Switch Hardware | | | |
|-----------------|---------------------|--|------------------------------------|
| S.No | Items | Specifications (24 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 1 | Switch Hardware | a) 24x1G Base-T | |
| | | b) Additional 4x1G/10G SFP port | |
| | | c) Switching Capacity- 128Gbps minimum | |
| | | d) Forwarding Rate- 154 Mpps minimum | |
| | | e)MAC table 16K | |
| 2 | Higher Availability | Switch Should be Accessible Via GUI Web-managed Switch | |
| | | Shall support ITU-T G.8032 for 50m sub-second ring protection | |
| 3 | L3 | 4K VLAN ID's and 4K active VLAN,VLAN double tagging (Q-in-Q) | |
| | | STP/RSTP/MSTP | |
| | | IGMP snooping (IGMPv1, v2 and v3) | |
| 4 | Layer 3 Features | Should support Static routing for IPV4 and IPV6. | |

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| 5 | Security | Should support ACLs, DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI), | |
| | | IEEE 802.1x, IP Source Guard, SSH, SSL, Storm Control, DHCP Snooping, DOS, Port Mirroring. | |
| 6 | Management | CLI, GUI LLDP, SNMP v1,v2c and v3, | |
| 7 | Environmental | Operating Temperature range 0 degC to +55 degC or better, Operating Humidity: 0% to 95% or better. | |
| 8 | IPR | • The intellectual Property Right (IPR) resides in India for Hardware Design. | |
| | | • IPR clause is applicable only for India OEM's . | |
| 9 | Other Mandatory Certifications /Compliance | Switch OEM should have QUALITY MANAGEMENT SYSTEM - ISO 9001 | |
| | | Switch OEM should have QUALITY MANAGEMENT SYSTEM - TL 9000 | |
| | | Switch OEM should have implemented ISO14001 | |
| | | Comply to Preference to Make In India products PMA Policy applicable only for Indian OEM's | |

Annexure 4 – 48 Switch

| Switch Hardware | | | |
|-----------------|-----------------|--|------------------------------------|
| S. No | Items | Specifications (48 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 1 | Switch Hardware | Switch with following port density: | |
| | | a) 48 Port 10/100/1000Mbps Web Managed Switch with Loaded 2 *1Gig SFP ports for uplink | |
| | | b) Switching Capacity-96 Gbps minimum | |

| Switch Hardware | | | |
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| S. No | Items | Specifications (48 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| | | c) Forwarding Rate-190 Mpps minimum | |
| | | d)MAC Table 16K | |
| 2 | Higher Availability | Switch Should be Accessible Via GUI Web-managed Switch | |
| | | Shall support ITU-T G.8032 for 50m sub-second ring protection | |
| 3 | L3 | 4K VLAN ID's and 4K active VLAN,VLAN double tagging (Q-in-Q) | |
| | | STP/RSTP/MSTP | |
| | | IGMP snooping (IGMPv1, v2 and v3) | |
| 4 | Layer 3 Features | Should support Static routing for IPV4 and IPV6. | |
| 5 | Security | Should support ACLs, DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI), | |
| | | IEEE 802.1x, IP Source Guard, SSH, SSL, Storm Control, DHCP Snooping, DOS, Port Mirroring. | |
| 6 | Management | CLI, GUI LLDP, SNMP v1,v2c and v3, | |
| 7 | Environmental | Operating Temperature range 0 degC to +65 degC or better, Operating Humidity: 0% to 95% or better. | |
| 8 | IPR | <ul style="list-style-type: none"> The intellectual Property Right (IPR) resides in India for Hardware Design. | |
| | | <ul style="list-style-type: none"> IPR clause is applicable only for India OEM's | |

| Switch Hardware | | | |
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| S. No | Items | Specifications (48 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 9 | Other Mandatory Certifications /Compliance | Switch OEM should have QUALITY MANAGEMENT SYSTEM - ISO 9001 | |
| | | Switch OEM should have QUALITY MANAGEMENT SYSTEM - TL 9000 | |
| | | Switch OEM should have implemented ISO14001 | |
| | | Comply to Preference to Make In India products PMA Policy applicable only for Indian OEM's | |

Annexure – 5 – Wired Routers

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| A1 | Attach router document containing detailed bill of material (make, model, OS details: version, date of release, date of release of next version, end of sale & support date, product development path, etc.) | |
| A2 | Router should integrate seamlessly with existing network infrastructure comprising of Cisco/juniper and other make router, switches, firewalls, IPS,VPN-IPSEC devices and various types of WAN links | |
| A3 | Router should provide Data, Voice, Security and mobility services(5G/4G LTE,3G) | |
| A4 | Router should be having OEM support (Hardware, Software, Firmware etc.) for next minimum 3 years from the date of PO | |
| A5 | Branch Router less than 20 Users- Router should support minimum 200 Mbps real world WAN bandwidth with all the services enabled on the router | |
| A5 | Branch Router less than 50 Users Router should support minimum 1 Gbps real world WAN bandwidth with all the services enabled on the router | |
| A5 | Branch Router More than 50 users Router should support minimum 2 Gbps real world WAN bandwidth with all the services enabled on the router | |

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| A6 | The router should have adequate DRAM, Flash Memory, CPU and other hardware to support all the services configured | |
| A7 | The router should have adequate flash memory and other hardware to ensure storage of multiple router operating system images (minimum 2), configuration file backups, event logs etc. | |
| A8 | Further, the router should have adequate memory, storage, processing power, other components so that router should be able to upgrade and patch the operating system till the end of life date without any additional hardware requirement such as flash memory, storage etc | |
| A9 | Should have Mean Time Between Failure of 10000 hours or higher to ensure long life of router hardware. Should have MTTR as 4 hours for the provided router. | |
| A10 | The router Shall support various boot options like booting from TFTP server, Network node and Flash Memory | |
| A11 | Extensive debugging capabilities to assist in hardware and software problem resolution. | |
| A12 | The router should be capable of IP routing protocols like RIPV1 & V2, OSPF, BGP-IBGP & EBGP, Policy Routing, NAT etc | |
| A13 | The router should be capable of WAN protocols like PPP, Multilink PPP, etc. | |
| A14 | Router should support Firewall Services with Standard Access Lists, Extended Access Lists to provide supervision and control. | |
| A15 | Control SNMP access through the use of SNMP V2, V3 with SHA-1, SHA-2 authentication | |
| A16 | Implement Access Lists on the router to ensure SNMP access only to the SNMP manager or the NMS workstation. | |
| A17 | The router should support multiple privilege levels to support role based access control with and without use of external RADIUS or TACACS+ and other AAA servers | |
| A18 | Support for Remote Authentication Dial-In User Service (RADIUS), TACACS+ and AAA. | |
| A18.1 | a) SHA-1, SHA-2 Route Authentication. | |
| A18.2 | b) PPP: PAP & CHAP support. | |
| A19 | Should be able to manage & administer point-to-point VPNs by actively pushing new security policies from a single headend to remote sites | |
| A20 | Should support ability to Layer 2 P2P (Point to point) or MPLS networks to provide full-mesh connectivity by providing tunnel-less VPN's, without any impact on the router performance | |

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| A21 | Should support dynamic and static routing | |
| A22 | The router should be able to make use of dynamic routing adjustments based on criteria such as reachability, response time, packet loss, jitter, path availability, traffic load distribution, and cost minimization policies when doing path selection. | |
| A23 | The router should support dead peer detection or equivalent which enable the router to take down IPSec tunnel when the remote peer goes down due to physical or logical issues. | |
| A24 | Router should be rack mountable and support side rails if required | |
| A25 | Router should support for embedded RMON for central NMS management and monitoring | |
| A26 | Router should support for sending logs to multiple centralized syslog server for monitoring and audit trail | |
| A27 | Router should provide remote logging for administration using: | |
| A27.1 | a. Telnet | |
| A27.2 | b. SSH V.2 etc. | |
| A28 | Support for multilevel security to access the switch with different administrative privilege | |
| A29 | Router should support for basic administrative tools like: | |
| A29.1 | a. Ping | |
| A29.2 | b. Trace route etc. | |
| A30 | Router should have capability to upgrade, patch the operating system automatically, manually and remotely | |
| A31 | Please submit a list of all features provided by proposed router in addition to the specifications mentioned in this document that will be available to the customer without any additional charges and will be under support. These features will be treated at par with other features | |
| A32 | Router resources utilization like CPU, Memory should not exceed 60% for continuous one month during the contract period for required throughput. | |
| A33 | It must be possible to fast boot the router to ensure that software upgrades can be done with minimum network downtime. | |
| A34 | Router should be certified by EAL 2 and above | |
| A35 | Should be Energy Efficient Ethernet or equivalent compliant. Details of Green Initiative and compliance RFC has to be given | |
| A36 | Should have 1U form factor/rack unit Size | |
| B | Interface requirements: | |

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| B1 | Branch Router less than 20 Users The Router should have minimum 2 numbers of Gigabit Ethernet WAN (10/100/1000 Mbps) and 4 number of Ethernet LAN (10/100/1000 Mbps) ports. It should be support either Wan / LAN | |
| B1 | Branch Router less than 50 Users The Router should have minimum 2 numbers of Gigabit Ethernet WAN (10/100/1000 Mbps) and 4 number of Ethernet LAN (10/100/1000 Mbps) ports. It should be support either Wan / LAN | |
| B1 | Branch Router more than 50 Users The Router should have minimum 2 numbers of Gigabit Ethernet WAN (10/100/1000 Mbps) and 4 number of Ethernet LAN (10/100/1000 Mbps) ports. It should be support either Wan / LAN | |
| B2 | Apart from above, the router should have at least one slot wherein customer can place any of the following cards provided by Bidder: | |
| B2.1 | GSM, 3G, 4G LTE, 5G sim based Inbuilt card with antenna and 10 meter cable | |
| B2.2 | 1G Single mode/Multi Mode fiber interface card | |
| B3 | Router should be able to support Cellular WAN (5G,4G LTE, 3G, GSM) interface for cellular multihoming without changing the base router along with the above supplied configuration. The router should be able to display the Received Signal Strength, Current Channel | |
| B4 | Router should support diversity antenna & low loss cable for antenna extension and should support all TSP in India. | |
| B5 | Router shall support use USB dongle for 5G/4G/GSM/3G/connectivity | |
| B6 | Router should have a dedicated console port for Router configuration. | |
| B7 | All fixed Ethernet WAN ports should be routable | |
| C | SOFTWARE FEATURES: | |
| C1 | Routing Information Protocol (RIPv1 and RIPv2), Layer 2 Tunneling Protocol (L2TP, L2TPv3), Port Address Translation (PAT) | |

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| C2 | Branch Router less than 20 Users The router should support at least 25,000 routes in the routing information base using any of the routing protocol including RIPV1 & V2, EIGRP,OSPF,BGP-IBGP & EBGP , policy routing, NAT etc. | |
| C2 | Branch Router less than 50 Users The router should support at least 1,00,000 routes in the routing information base using any of the routing protocol including RIPV1 & V2, EIGRP,OSPF,BGP-IBGP & EBGP , policy routing, NAT etc. | |
| C2 | Branch Router More than 50 users The router should support at least 3,00,000 routes in the routing information base using any of the routing protocol including RIPV1 & V2, EIGRP,OSPF,BGP-IBGP & EBGP , policy routing, NAT etc. | |
| C3 | Dynamic Host Configuration Protocol (DHCP) server/relay/client | |
| C4 | Support for 802.1q VLANs | |
| C5 | Support for Multicast Routing Protocol - PIM Sparse Mode, PIM Sparse Dense Mode, MLD, Auto route processing (Auto-RP) or equivalent | |
| C6 | The router shall have support for discovering network traffic with application-level insight with deep packet visibility into traffic. The router should be able to support classification at application level for QoS and control classifications to improve business-critical application performance, facilitate capacity management | |
| C7 | Router should have the capability of holding multiple OS images to support resilience & easy rollbacks during the version upgrades etc. and should support in service software upgrade including: | |
| C7.1 | a. Multiple System image | |
| C7.2 | b. Multiple system configuration | |
| C7.3 | c. Option of Configuration roll-back | |
| C8 | Router should support for different logical interface types like loopback, GRE and IPIP tunnel, VLAN etc. | |
| C9 | Router should have capability to automatically failover from primary link to secondary link and vice-versa when primary interface is not reachable or there is a latency observed in any of the links/ports using following real-time parameters: | |
| C9.1 | a. Jitter | |
| C9.2 | b. Network path availability | |
| C9.3 | c. Network Response Time | |
| C9.4 | d. Packet loss | |

| Router Hardware | | |
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| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| C9.5 | IP SLA / Latency | |
| D | IPv6 Features: | |
| D1 | The Device should be on the IPv6 Ready Logo or higher certification | |
| D2 | IPv6 addressing architecture, IPv6 name resolution, IPv6 statistics | |
| D3 | IPv6 transport packets between IPv6-only and IPv4 transport packets between IPv4-only endpoints | |
| D4 | ICMPv6, IPv6 DHCP | |
| D5 | Support for the following IP v6 features: RIP NG, OSPF v3, BGP Support for V6, IP V6 Dual Stack, NAT 64, and IP v6 Policy based Routing, and IP v6 QoS. | |
| D6 | Router should support VRF lite | |
| D7 | Router should support VRF-aware IPsec | |
| D8 | Should support following IP v6 Tunneling mechanisms: IP v6 to 4 tunnels, IP v4 compatible tunnels, IP v6 over IP v4 GRE Tunnels, ISATAP Tunneling Support. | |
| E | Security Features: | |
| E1 | Stateful Inspection Firewall | |
| E2 | NAT transparency, Firewall support for clients | |
| E3 | The router should support IPSec Framework for Secured Data transfer with Next Generation Encryption (NGE) based on standard Suite-B algorithms | |
| E3.1 | a. IPSec Data Encapsulation AH and ESP | |
| E3.2 | b. Key Exchange : Internet Key Exchange (IKE), IKEv2, Pre-Shared Keys (PSK), Public Key Infrastructure PKI (X.509), RSA encrypted nonce etc. | |
| E3.3 | c. Encryption Algorithm: AES-128/192/256 , AES-GCM-256 | |
| E3.4 | d. Authentication Algorithm: SHA1 and SHA2 | |
| E3.5 | e. Group: Diffie-Hellman (DH) Group 1, 2, 5 | |
| E3.6 | f. Different mode of communication: Tunnel mode and Transport mode | |
| E3.7 | g. Router should support minimum 20 IPSec tunnels | |
| E4 | Router should support embedded hardware based IP SEC encryption and acceleration | |
| E5 | IPSec AES-128/192/256 termination/initiation, IPSecpassthrough, AES-GCM-256 | |
| E6 | Should be able to build IPSec tunnel dynamically, point to point or point to Multipoint. | |

| Router Hardware | | |
|-----------------|---|------------------------------------|
| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| E7 | The router shall support full mesh tunnel based and also tunnel-less IPSec (3DES or AES) VPN with the capacity to encrypt the packets that are transferred over the Network. Router should support dynamic establishment of Tunnel-less VPNs using the GDOI Protocol as per RFC 6407. | |
| E8 | Support for 802.1X | |
| E9 | SFTP, SSH and Telnet. Access should be through centralized and/or distributed TACACS+, RADIUS auth | |
| F | QoS Features : | |
| F1 | Support for Weighted Fair Queuing (WFQ), Support for IPSecQoS Pre classification & Pre fragmentation, Class-Based Marking (CBM), Priority and custom queuing, Weighted Random Early Detection. | |
| F2 | Management Features : | |
| F2.1 | Management should support : Telnet, Simple Network Management Protocol (SNMP), CLI management/Web based HTTPs management, RADIUS,SSH,TACACS+ | |
| F2.2 | Router should have hardware health monitoring capabilities and should provide different parameters through SNMP | |
| F2.3 | Support for SNMP v1,v2 & v3 over IPV6 and subsequent versions of IPv4 | |
| F2.4 | The router should have the capability to respond to real-time events, automate tasks, create customer commands and take local automated action based on conditions detected by the Router's Operating System. | |
| F3 | Router system should support 802.1P classification and marking of packet using : | |
| | a. CoS (Class of Service) | |
| | b. DSCP (Differential Service Code Point) | |
| | c. Source physical interfaces. | |
| | d. Source/destination IP subnet | |
| | e. Protocol types (IP/TCP/UDP) | |
| | f. Source/Destination TCP/UDP ports | |
| F4 | Router Should support controlling incoming and outgoing traffic using : | |
| | a. Traffic Shaping | |
| | b. Traffic Policing | |
| F5 | Router should support managing congested network connectivity using : | |

| Router Hardware | | |
|-----------------|--|------------------------------------|
| A | General Features (Router should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| | a. TCP congestion protocol | |
| | b. IP Precedence | |
| | c. Ingress and Egress Rate limiting etc | |
| F6 | Router should support for packet classification and fragmentation before applying IPSec security encryption for providing end to end QoS treatment | |
| F7 | Router should support hierarchical QoS for providing granular policy per application basis for providing bandwidth provisioning and management | |
| G | High-Availability Features | |
| G1 | Router should support industry standard redundancy protocol such as VRRP etc | |
| G2 | Router should provide control plane policy control to protect the router from unnecessary or DoS traffic by supporting control plane policy to protect the router from excessive and malicious traffic and giving priority to important control plane and management traffic | |
| H | Licensing Requirement | |
| H1 | Router should have enterprise license without any restrictions. If during the contract, router is not performing as per specifications in this RFP, bidder has to upgrade/enhance the devices or place additional devices and reconfigure the system without any cost to customer | |
| H2 | Router and its various components like 5G,4G/3G card and other inbuilt features etc should not have any licensing restriction on number of users, concurrent connections, total connections, new connections, number of vlan, zones, number of policies, number of appliances, other network parameters, number of equipment's / servers etc | |
| H3 | The offered product part codes have to be General Availability Part codes and not custom built Part Code for SBI. There should be cross reference to the public website of the OEM | |
| H4 | Any third-party product required to achieve the functionality should be provided with the necessary enterprise version license of software/appliance and necessary hardware, database and other relevant software or hardware etc should be provided with the solution | |

Annexure – 6 – Wireless Router

| Wifi Router Hardware | | |
|----------------------|---|------------------------------------|
| A | General Features | Compliance (Please mention Yes/No) |
| 1 | Device Interfaces – 802.11 a/b/g/n/ac wireless LAN, 1 port 10/100/1000 Fibre/Ethernet Gigabit WAN port , Four 10/100/1000 Gigabit LAN ports, USB port | |
| 2 | Antenna Type – 2x2 (2.4GHz) and 2x2 (5GHz) internal antennas | |
| 3 | Standards: IEEE 802.11ac (draft), IEEE 802.11a, IEEE 802.11n, IEEE 802.3, IEEE 802.11g, IEEE 802.3u, IEEE 802.11b | |
| 4 | Wireless Security – WPA & WPA2 (Wi-Fi protected access), WPS | |
| 5 | Others – IPv6 ready, DLNA media Server Support, Dual Active Firewall, NAT, SPI, VPN pass through, Accessibility through web browser | |

Annexure – 7 – 16 Port Switch

| Switch Hardware | | | |
|-----------------|---------------------|--|------------------------------------|
| S. No | Items | Specifications (16 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| 1 | Switch Hardware | Switch with following port density: | |
| | | a) 16 Port 10/100/1000Mbps Web Managed Switch with Loaded 2 *1Gig SFP ports for uplink | |
| | | b)Switching Capacity-36 Gbps minimum | |
| | | c) Forwarding Rate-26 Mpps minimum | |
| | | d)MAC Table 16K | |
| 2 | Higher Availability | Switch Should be Accessible Via GUI Web-managed Switch | |
| | | Shall support ITU-T G.8032 for 50m sub-second ring protection | |
| 3 | L3 | 4K VLAN ID's and 4K active VLAN,VLAN double tagging (Q-in-Q) | |
| | | STP/RSTP/MSTP | |
| | | IGMP snooping (IGMPv1, v2 and v3) | |
| 4 | Layer 3 Features | Should support Static routing for IPV4 and IPV6. | |
| 5 | Security | Should support ACLs, DHCP snooping, IP source guard and Dynamic ARP Inspection (DAI), | |
| | | IEEE 802.1x, IP Source Guard, SSH, SSL, Storm Control, | |

| Switch Hardware | | | |
|-----------------|---|---|------------------------------------|
| S. No | Items | Specifications (16 port switch should meet the minimum specification as below) | Compliance (Please mention Yes/No) |
| | | DHCP Snooping, DOS, Port Mirroring. | |
| 6 | Management | CLI, GUI LLDP, SNMP v1,v2c and v3, | |
| 7 | Environmental | Operating Temperature range 0 degC to +65 degC or better, Operating Humidity: 0% to 95% or better. | |
| 8 | IPR | • The intellectual Property Right (IPR) resides in India for Hardware Design. | |
| | | • IPR clause is applicable only for India OEM's | |
| 9 | Other Mandatory Certifications / Compliance | Switch OEM should have QUALITY MANAGEMENT SYSTEM - ISO 9001 | |
| | | Switch OEM should have QUALITY MANAGEMENT SYSTEM - TL 9000 | |
| | | Switch OEM should have implemented ISO14001 | |
| | | Comply to Preference to Make In India products PMA Policy applicable only for Indian OEM's | |