Annexure I (F) - MINIMUM HARDWARE SPECIFICATION OF CORE ROUTER

Sl. No.	Technical Specifications / Features	Compliance (Yes/No)
	Architecture:	
1	Should have support for Data, Voice, Video, Security and mobility services.	
2	Should be chassis based & modular architecture with multicore processor for scalability and should be a single box configuration for ease of management.	
3	Should have redundant power supply from day 1.	
4	Should have embedded hardware based Encryption card accelerator. Should have hardware (necessary hardware and licenses need to be proposed) based IPSEC.	
5	Should have Firewall features/support.	
6	Should have 4GB DRAM and should be upgradable to Higher Memory	
7	Should have 8GB flash and should be upgradable to Higher Memory	
8	Should have atleast 4 Module Slots of which 1 or 2 Service Module Slots will be preferable.	
9	Should have atleast 2 free slots for future expansion.	
10	may support PoE	
11	Should have 2 numbers of 2.0v USB ports	
12	Chassis should be 19" rack mountable type.	
13	Should be supplied with necessary power cards, data cables, connectors, CD's, manuals, bracket accessories, wire managers and other appropriate accessories.	
	Performance:	
14	Should support performance of more than 2.5 Mpps for 64 Byte packet.	
15	Should support WAN bandwidth upto 2 Gbps	
16	Backplane architecture should supports module-to-module communication at speeds up to 10 Gbps.	
17	Should Support Variety of interfaces like Ch-El for future Uplink purposes, Ethernet interfaces- 1Gbps,10/100 Mbps. It will be preferable if it supports V.35 Sync Serial (64.Kbps, 2 Mbps), G.703 and 3G interfaces.	
18	It will be preferable if it Supports DSL connectivity Using ADSL/G.SHDSL	
19	Should support other IP Services like GRE tunneling, ACLs, IPSEC VPNs, Firewalling, NAT services.	

20	Should support Voice traffic optimization with features like WRED, RSVP.	
	High Availability	
21	Should support redundant Gigabit Ethernet connection to LAN.	
22	Internal Redundant Power supply from day 1.	
23	Should support fast reboot for minimum network downtime.	
24	Should support Non-Stop forwarding for fast re-convergence of routing protocols	
25	Should support boot options like booting from TFTP/ FTP server, Network node and Flash Memory	
26	Should support multiple storage of multiple images and configurations	
27	Should support link aggregation using LACP as per IEEE 802.3ad	
28	Should support VRRP or equivalent	
	Protocol Support	
29	Should support Routing protocols like IS-IS, RIP v1 & RIP v2, OSPF ver2, OSPF on demand, BGP4, BGP Route-Reflector	
30	Should support Multicast routing protocols IGMPv3, PIM-SM, PIM-SS, DVMRP, IPv4 to IPv6 Multicast, BFD, IEEE802.3ah, IEEE802.1ag	
31	Should have DHCPv6, IPv6 QoS, RIPng, OSPFv3	
32	Should support MPLS, Layer2 and Layer3 VPN, L2TPv3 or equivalent	
33	Support for Load balancing Protocol.	
34	Configuration Roll Back to recover the mis-configured router to last good configuration	
35	Proposed router Should support MPLS L2 and L3 vpn features and security features like encryption and firewall simultaneously.	
36	Should support Network address translation (NAT) with support for source NAT with PAT and Destination NAT with PAT,Persistent NAT and IPv6 Address translation	
	Encapsulation Support	
37	Should support Encapsulation like Ethernet, 802.1q, PPP, MLPPP, FR, MLFR, HDLC, , and PPPoE. It will be preferable if it supports Serial (RS232, RS449, X.21, V.35, EIA530) Encapsulation.	
	Security Features:	
38	Support Standard ACL, Extended ACL, ACL that can match arbitrary bits of packet bits of a packet at an arbitrary depth in the packet header and payload	
39	IPSEC Site-to-Site and Remote Access VPNs. Any Office to Any other office, dynamic establishment of VPNs so that the configuration & management of IPSEC VPNs becomes easier.	

40	Support IPSEC VPNs should be able to carry data, voice, video	
41	Should have Firewall feature set supporting Stateful, Zone based Firewall, zone-based policies, advanced application inspection, transparent firewall.	
42	MD-5 route authentication for RIP, OSPF and BGP	
43	Should support multi-level of access	
44	Should support SNMPv2, SSHv2 and SNMPv3 authentication	
45	AAA support using Radius.	
46	Should support CHAP authentication for P-to-P links	
47	Should support DoS prevention through TCP Intercept & DDoS protection	
48	Should support IP Access list to limit Telnet and SNMP access to router	
49	Should support Multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server.	
50	Time based & Dynamic ACLs for controlled forwarding based on time of day for offices	
51	IEEE 802.1x support for MAC address authentication	
52	Router OS should be at least EAL2/NDPP (Common Criteria) Certified.	
	Debug, alarms & Diagnostics:	
53	Support for monitoring of Traffic flows for Network planning and Security purposes	
54	Trace-route, Ping and extended Ping	
55	Should support extensive support for SLA monitoring for metrics like delay, latency, jitter, packet loss, RTP-Based VoIP traffic and should support the capability for measurement of the call setup time using H.323/SIP signaling protocol over IP network.	
56	Should support embedded event manager that enables automation of many network management tasks and directs the operation of router OS to increase availability, collect information, and notify external systems or personnel about critical events	
	Accounting:	
57	The router should have following accounting features:	
58	Packet & Byte Counts	
59	Start Time Stamp & End Time Stamps.	
60	Network Time Protocol	
61	Input & Output interface ports.	
62	Type of service, TCP Flags & Protocol	

63	Source & Destination IP addresses	
64	Source & Destination TCP/UDP ports	
	Management	
65	Should have support for Web, GUI based management, CLI, Telnet, SNMPv2 and SNMPv3	
66	Should support Secure Shell for secure connectivity.	
67	Embedded RMON support for four groups – history, statistics, alarms and events	
68	Should have to support Out of band management through Console	
69	Event and System logging: Event and system history logging functions shall be available. The Router shall generate system alarms on events. Facility to put selective logging of events onto a separate hardware here the analysis of log shall be available.	
70	Pre-planned scheduled Reboot Facility: The Router shall support the preplanned timed reboot to upgrade their hardware to a new software feature and plan the rebooting as an off-peak time	
	Interface Requirements:	
71	Should have 8 x 10/100/1000 Gigabit Ethernet WAN Interfaces ,expandable upto 12 WAN Interfaces	
72	Should have 8 x 10/100/1000 Gigabit Ethernet LAN Interfaces ,expandable upto 12 LAN Interfaces	
73	At least two Free slots to support additional WAN link and GE interfaces.	
74	Should support 4 RJ-45-based ports	
75	Should support 4 SFP-based ports	
76	Should Support atleast 2 1/O slots for future port expansion	
77	I/O Module should support LAN/WAN ports. It will be preferable if I/O Module support Blade Server, Voice Module, Storage Module.	