A. The central security LAN Electronics – Core Switching: Fully redundant modular switches shall be deployed at the core of the network.

    1.     Each switch shall have the following minimum specifications:

        a.     Modular chassis with a minimum of 12 slots.
        b.     Shall have passive backplane architecture.
        c.     Shall be configured with redundant supervisory modules.
        d.     Shall be configured with redundant power supplies.
        e.     Shall be configured with redundant load-sharing cooling fans.

f.  Shall be configured with redundant switch fabrics. Each fabric shall have a minimum switching capacity of 720Gbps.

g.  Shall support up to 400 Million packets per second (Mpps) of layer 2/3/4 forwarding rate.

h.  The supervisory module shall have at least two Gigabit Ethernet ports.

i.  The supervisory module shall be configured with a minimum of 512MB DRAM.

j.  The supervisory module shall have a slot for external compact flash cards (up to 512MB) to store software images for backup and easy software upgrades.

k.  Shall be configured with two 24-Port Gigabit Ethernet Fibre modules, fully populated with 1000Base-SX SFP's. Each module shall be configured to support a local forwarding performance of up to 24 Mpps.

l.  Shall be configured with one 48-port 10/100/1000 Base-TX module. The module shall be configured to support a local forwarding performance of up to 48 Mpps.

m.  Shall be configured with a hardware-based stateful firewall services module. The firewall module must have a minimum throughput of 5 Gbps and shall support at least 1 Million concurrent connections with an HTTP connections setup rate of 80,000 connections per second or more.

n. Shall be configured with a hardware-based Intrusion Detection System (IDS) module with a minimum throughput of 600 Mbps. The IDS module shall support a minimum of 500,000 concurrent connections with a new TCP arrival rate of 4,000 connections per second or more.

2. The system shall support the following:

a. Hardware-based VPN accelerator module for high-speed VPN connections. The hardware accelerator module shall have a 3DES IPSec encryption throughput of 1.5 Gbps or more. It shall also support a minimum of 5000 IPSec tunnels with a tunnel setup rate of 50 tunnels per second or more.

b. Hardware-based SSL accelerator module with a minimum throughput of 300 Mbps. The SSL module shall support the following algorithms and protocols: SSL 2.0, SSL 3.0, SSL 3.1/TLS 1.0, ARC4, DES, 3DES, and RSA.

c. Hardware-based Content Switching/Load Balancing module with a minimum throughput of 4 Gbps. The module shall support a minimum of 1 million concurrent TCP connections with a connection setup rate of 150,000 connections per second or more. The module shall support up to 15,000 real servers and 4,000 virtual servers.

d.  Hardware-based Network Analysis module that can give application level visibility to network traffic going through the switch. The module shall come with a Web-based traffic analyzer capable of capturing and decoding packets in real-time. The module shall also have real-time and historical application monitoring capabilities.

e.  10 Gigabit Ethernet XENPAK-based interface modules with four 10 Gigabit Ethernet ports or more.

f.  WAN interfaces such as E1, E3, HSSI and OC3.

g.  Packet over Sonet (PoS) interface modules.

h.  Power over Ethernet (PoE) 10/100-BaseTx and 10/100/1000-BaseTx modules to connect IP Phones and Wireless Access Points.

i.  Analogue and Digital voice interface modules.

j.     Minimum of 64,000 MAC addresses.

k.     VTP protocol for Dynamic VLAN configuration.

l.     A Neighbour Discovery Protocol such as CDP, Dynamic Trunking Protocol (DTP). Port Aggregation Protocol (PAgP), Network Time Protocol (NTP), Unidirectional Link Detection (UDLD) protocol, Spanning Tree Protocol enhancements: Uplink Fast, Port Fast, Backbone Fast, BPDU Guard, Root Guard, IEEE 802.1w (Rapid Spanning Tree), and IEEE 802.1s (Multiple Spanning Tree), Per VLAN Spanning Tree (PVST+).

m.     Shall support local and remote port mirroring (SPAN, RSPAN and ERSPAN) for advanced troubleshooting. SPAN ports shall support bidirectional data flows.

n.     Redundant Router Protocol with Interface tracking such as HSRP.

o.     Private VLANs, IEEE 802.1x with dynamic VLAN assignment, DHCP snooping, Network Admission Control, port security and broadcast storm control.

p.     Quality of Service (QoS) techniques: Weighted Round-Robin (WRR) scheduling, Weighted Random Early Detect (WRED) congestion avoidance algorithm, Network Based Application Recognition (NBAR), User-based rate limiting, traffic policing, and traffic shaping.

q.     QoS marking and classification at the 802.1p and IP TOS levels.

r.     Cross-module link aggregation techniques such as Fast EtherChanel and GigaEtherChanel.

s.     Routing protocols: OSPF, RIPv1, RIPv2, EIGRP, IS-IS, and BGP-4.

t. Multicast protocols: IGMPv1, IGMPv2, IGMPv3, PIM, DVMRP, CGMP, and MBGP.

u. Web Cache Control Protocol (WCCP) Version 2 in hardware for enhanced caching performance.

v. SNMPv1, SNMPv2, and SNMPv3 management protocols, TACACS+ and SSH.

w. Coarse Wave Division Multiplexing (CWDM) GBICs.

x. Catalyst 6500 or equivalent

y. Shall support the following standards: IEEE 802.3, IEEE 802.3u, IEEE 802.3, IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab, IEEE 802.1Q, IEEE 802.1D, IEEE 802.1w, IEEE 802.1s, IEEE 802.1x, IEEE 802.3ad, IEEE 802.3ab, IEEE 802.3ae.