

B. Access Switches – For the distributed LAN electronics

1. The fully redundant access switches unit shall have the following minimum specifications:
  - a. Shall be manufactured by the same vendor providing the core switches in order to optimize performance.
  - b. Shall support a minimum of 6 Million Packets per Second (Mpps) Layer 2/3 forwarding rate.
  - c. Shall have a minimum of 32 Gbps switching fabric.
  - d. Shall have 24 10/100 Base-Tx Power over Ethernet (PoE) ports.
  - e. Shall have two Gigabit Ethernet SFP ports. One of the ports shall be configured with 1000Base-SX SFP.
  - f. Shall be stackable with a 32-Gbps stacking bus. Shall support up to nine switches in a stack.
  - g. Shall be configured with at least 128MB of dynamic random-access memory (DRAM) and at least 16MB of flash memory.
  - h. Shall be 19-inch rack-mountable.
  - i. Shall not be more than one Rack-Unit in height
  - j. Shall support a minimum of 12,000 MAC addresses, VTP protocol for Dynamic VLAN configuration, a Neighbour Discovery Protocol such as CDP, Dynamic Trunking Protocol (DTP), Port Aggregation Protocol (PAgP), Network Time Protocol (NTP), Unidirectional Link Detection (UDLD) protocol.

- k. Shall support the following 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).
- l. Shall support Per VLAN Spanning Tree (PVST+).
- m. Shall support local and remote port mirroring (bi-directional SPAN and RSPAN) for advanced troubleshooting.
- n. Support Redundant Router Protocol with Interface tracking such as HSRP.
- o. Shall support the following security features: private VLANs, IEEE 802.1x with dynamic VLAN assignment, IP source guard, dynamic ARP, inspection, DHCP snooping, Network Admission Control, port security and broadcast storm control.
- p. Shall support time-based access control lists.
- q. Shall support the following Quality of Service (QoS) techniques: Shaped Round-Robin (SRR) scheduling, Weighted Tail Drop (WTD), traffic shaping and traffic policing.
- r. Shall support QoS marking and classification at the 802.1p and IP TOS levels.
- s. Shall support multiple queues per output port with strict priority queuing.
- t. Shall support Jumbo frames.
- u. Shall support IPv6 routing in hardware for maximum performance in the future.
- v. Shall support per port, per VLAN, ingress policing.

- w. Shall support cross-stack link aggregation techniques such as Fast EtherChanel and GigaEtherChanel.
- x. Shall be configured to run the following routing protocols: OSPF, RIPv1, RIPv2, IGRP, EIGRP and BGP-4.
- y. Shall support a minimum of 10,000 unicast routes.
- z. Shall support the following multicast protocols: IGMPv1, IGMPv2, PIM, DVMRP, CGMP, and IGMP Snooping.
- aa. Shall support SNMPv1, SNMPv2, and SNMPv3 management protocols.
- bb. Shall support TACACS+, RADIUS, Kerberos, and SSH.
- cc. Shall support Coarse Wave Division Multiplexing (CWDM) SFP's
- dd. Catalyst 3750 stacks or equivalent
- ee. Shall support the following standards:IEEE 802.1x, IEEE 802.1w, IEEE 802.1s, IEEE 802.3x, IEEE 802.1D, IEEE 802.1p, IEEE 802.1Q, IEEE 802.3ad, IEEE 802.3, IEEE 802.3u, IEEE 802.3ab