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Specification for Core Switches (Layer 3)

Supply, Installation, testing and commissioning for Core Switches (Layer 3) with 3year warranty – 2no's

Technical Description for Layer 3 (General Features, Performance & Scalability, Dimension, Stacking, Standards, Power Supply, Smart Operations, Quality of Service (QoS) & Control, DHCP Features and IPv6 Features)

The Switch should be a Fixed Configuration switch
The Switch support at least 800Gbps of switching capacity
The Switch Should support throughput of at least 250 Mpbs for IPv4
The Switch Should support throughput of at least 125 Mpbs for IPv6
The Switch Should support IPv4 support in hardware
The Switch Should support IPv6 support in hardware (Unicast and Multicast)
The Switch Should support Dynamic hardware forwarding-table allocations
The Switch Should support range 2,00,000 IPv4 Routing Entries or higher
The Switch Should support atleast 1,00,000 IPv6 Routing Entries or higher
The Switch Should support atleast 1,000 Multicast Routes or higher
The Switch Should support atleast 55,000 MAC addresses
The Switch Should support atleast 4,000 Active VLANs
The Switch Should support atleast 16,000 ARP Entries or higher
The Switch Should support atleast 2,000 Spanning Tree Protocol Instances or higher
The Switch Should support atleast 2,000 L3 interfaces or higher
The Switch Should support atleast 8 bi-dir (ingress and egress) Mirroring sessions
The Switch Should support atleast 100,000 Security and QoS Hardware Entries or higher
The Switch Should support atleast 10,000 DHCP Snooping Entries or higher
The Switch should support 4 GB Dynamic RAM (SDRAM)
The Switch should support 2G flash
The Switch should support External USB for flexible storage options
The Switch should support SD card for flexible storage options
The Switch should support atleast 16 non blocking 10 Gigabit Ethernet uplinks
The Switch should support SFP+ optics for 10G connectivity with SM Mode
The Switch should support SFP optics for 1G connectivity
The Switch should support 1 dedicated 10/100/1000 management port
The Switch should support RJ-45 console port
The Switch Should support additional module slot
The switch should support Optimized application performance through deep visibility for Layer 2/3/4 information (MAC, VLAN, TCP flags)
The Switch Should support more than 120K Flow entries in hardware
The Switch Should support comprehensive flow visibility for Layer 2 (MAC, VLAN) traffic or

The Switch Should support comprehensive flow visibility for Layer 2 (MAC, VLAN) traffic or
The Switch Should support comprehensive flow visibility for Layer 4 (TCP, UDP flags, and so on)
The Switch Should support Nonstop Forwarding
The Switch Should support configuration rollback
The Switch Should support operating system that can take advantage of the multicore CPU
The Switch Should support MLD Snooping for IPv6 in hardware
The Switch Should support Unicast Reverse Path Forwarding for IPv6 in hardware
The Switch Should support Ethernet: IEEE 802.3
The Switch Should support 10 Gigabit Ethernet: IEEE 802.3ae
The Switch Should support IEEE 802.1D Spanning Tree Protocol
The Switch Should support IEEE 802.1w Rapid Reconfiguration of Spanning Tree
The Switch Should support IEEE 802.1s Multiple VLAN Instances of Spanning Tree
The Switch Should support IEEE 802.3ad LACP
The Switch Should support IEEE 802.1p CoS Prioritization
The Switch Should support IEEE 802.1Q VLAN
The Switch Should support IEEE 802.1X User Authentication
The Switch Should support RMON I and II standards
The Switch Should support redundant power supplies
The Switch Should support redundant fans
The Switch Should support Operating temperature: 32 to 104ºF (0 to 40ºC)
The Switch Should support Storage temperature: -40 to 167ºF (-40 to 70ºC)
The Switch Should support Relative humidity: 10 to 90 percent, noncondensing
The Switch Should support Operating altitude: -30 to 2000m or higher
The Switch Should support discovery of neighbors transparently
The Switch Should support Internet Group Management Protocol (IGMP) Snooping
The Switch Should support IPv6 Multicast Listen Discovery (MLD)
The Switch Should support Multicast Listen Discovery snooping
The Switch Should support Link Aggregation Control Protocol
The Switch Should support IEEE 802.1AB LLDP. Link Layer Discovery Protocol (LLDP)
The Switch Should support IEEE 802.1s Multiple Spanning Tree (MST)
The Switch Should support Classification and marking for QoS
The Switch Should support Ingress and egress policing, including per-port per-VLAN policing
The Switch Should support Class-based shaping
The Switch Should support Unidirectional Link Detection (UDLD) protocol for fiber-optic or
The Switch Should support automatic router backup for IP hosts configured with a single default
The Switch Should support Virtual Router Redundancy Protocol (VRRP) or equivallent
The Switch Should support OSPF
The Switch Should support RIP
The Switch Should support Policy-Based Routing
The Switch Should support Unicast Reverse Path Forwarding (Unicast RPF)
The Switch Should support multiple routing instances
The Switch Should support e-mail-based and web-based notification of critical system events or
The Switch Should support measure, report, and reduce energy consumption across your entire
The Switch Should support analyze IP service levels for IP applications and services by using active traffic monitoring or equivalent
The Switch Should support distributed and customized approach to event detection and recovery

The Switch Should support monitor events and take informational, corrective, or an action when the monitored events occur or when a threshold is reached or equivalent
The Switch Should support Dynamic Host Control Protocol server
The Switch Should support Dynamic Host Control Protocol auto configuration
The Switch Should support MAC address notification to monitor the MAC addresses that are learned by, aged out or removed from the switch
The Switch Should support Secure Shell (SSH)
The Switch Should support SNMP v2C
The Switch Should support SNMP v3
The Switch Should support Multiple Privilege Levels to allow different sets of users to have
The Switch Should support NTP for IPv4 & IPv6
Should have scripting capabilities to trigger actions in response to network events
The Switch Should support 802.1X protocol
The Switch Should support 802.1X with VLAN assignment
The Switch Should support 802.1X RADIUS accounting
The Switch Should support 802.1X authentication for Guest VLANs to use VLAN assignment to limit network access for certain users.
The Switch Should support 802.1X with MAC Authentication Bypass for agent less devices without 802.1X supplicant capabilities or equivalent
The Switch Should support 802.1X with Inaccessible Authentication Bypass when AAA server is unreachable or nonresponsive or equivalent
The Switch Should support 802.1X Authentication Failed Open Assignment or equivalent
The Switch Should support 802.1X with Port Security to manage the number of MAC addresses allowed on that port or equivalent
The Switch Should support 802.1X Authentication with ACL Assignment to download per-host policies such as ACLs and redirect URLs or equivalent
The Switch Should support 802.1X Authentication with Per-User ACL
The Switch Should support 802.1X with Voice VLAN for devices like phones with 802.1X
The Switch Should support interception all ARP requests, replies on untrusted ports, and verifies each intercepted packet for valid IP to MAC binding
The Switch Should support Snooping of Dynamic Host Configuration Protocol (DHCP) packets
The Switch Should support disabling of the flooding of unicast and multicast packets on a per-
The Switch Should support limiting the rate of CPU bound control plane traffic in hardware
The Switch Should support restriction of client IP traffic only to clients with assigned DHCP IP
The Switch Should support Local Authentication
The Switch Should support Remote Authentication Dial-In User Service (RADIUS)
The Switch Should support Terminal Access Controller Access Control System Plus (TACACS+)
The Switch Should support User Based Rate Limiting
The switch should provide HW based per-flow rate-limiting to protect the CPU against DOS
The switch should support Dedicated Hardware for Flows with no impact to packet forwarding performance, should track all flows, detect security anomalies, support multiple collectors and
The Switch Should support display of power and power supply fan sensor information
Ensure network readiness for HD video using built in traffic simulator or equivalent system
Monitor & troubleshoot video calls using Media Tracing Capabilities
The switch should support packet analyzer program based on a free and open-source packet
The packet analyzer program should support dumping packets to a file using a well-known
The packet analyzer program should support Filters to identify and limit the subset of traffic to be

The Switch Should support IPv6 RA Guard
The Switch Should support IPV6 Router Advertisement (RA) Guard
The Switch Should support IPv6 Routing: OSPF for IPv6 (OSPFv3)
The Switch Should support IPv6 Routing: RIP for IPv6 (RIP)
The Switch Should support IPv6 Routing: Route Redistribution
The Switch Should support IPv6 Routing: Static Routing
The Switch Should support IPv6 Security: Secure Shell SSH support over IPv6
The Switch Should support IPv6 Services: AAAA DNS Lookups over an IPv4 Transport
The Switch Should support IPv6 Services: DNS Lookups over an IPv6 Transport
The Switch Should support IPv6 Services: Extended Access Control Lists
The Switch Should support IPv6 Services: Standard Access Control Lists
The Switch Should support IPv6 Stateless Auto-configuration
The Switch Should support IPv6 Switching: Automatic IPv4-compatible Tunnels or equivalent
The Switch Should support IPv6 Switching: Configured IPv6 over IPv4 Tunnels
The Switch Should support IPv6 Switching: Switched ISATAP Tunnels
The Switch Should support IPv6 Tunneling: Automatic 6to4 Tunnels
The Switch Should support IPv6 Tunneling: Automatic IPv4-compatible Tunnels
The Switch Should support IPv6 Tunneling: IPv6 over IPv4 GRE Tunnels
The Switch Should support IPv6 Tunneling: ISATAP Tunnel Support
The Switch Should support IPv6 Tunneling: Manually Configured IPv6 over IPv4 Tunnels
The Switch Should support IPv6 Any cast Address
The Switch Should support IPv6 ICMPv6
The Switch Should support IPv6 ICMPv6 Redirect
The Switch Should support IPv6 OSPFv3 NSF/SSO or equivalent system
The Switch Should support IPv6 OSPFv3 Fast Convergence
The Switch Should support IPv6 Neighbor Discovery Duplicate Address Detection

Specification for Core Switches (Layer 2)

Supply, Installation, testing and commissioning for Core Switches (Layer 2) with 3year warranty – 6no's

S.No	Related Services	Technical Description for Layer 2
1	General Requirements:	The switch should support a minimum of 24 nos. 10/100/1000 Ethernet Ports The switch should support a minimum of 2 SFP+ Uplinks The switch should support 2x10G SFP+ modules The switch should support 2x1G SFP modules The switch should support a total of 26 Ports The switch should support atleast MTBF of 150000 hours or higher
2	Performance and Scalability	The switch should support Forwarding bandwidth of 100 Gbps or higher The switch should support Full-duplex Switching bandwidth of 100 Gbps or higher The switch should support 64-Byte Packet Forwarding Rate of 95 Mpbs or higher The switch should support 128 MB of Flash memory The switch should support 512 MB of DRAM The switch should support 1023 VLANs or higher The switch should support 1023 VLAN IDs or higher The switch should support Jumbo frames of 9216 bytes The switch should support Maximum transmission unit (MTU) of 9198 bytes The switch should support 16000 Unicast MAC addresses The switch should support Forwarding bandwidth of 100 Gbps or higher
3	Dimension	The Switch should be 1RU The switch should support Operating temperature up to 5000 ft (1500 m) -5º to 45ºC The switch should support Operating relative humidity 10% to 95% noncondensing
4	Stacking	The switch should support Stacking Stacking should enable all switches to function as a single unit The switch should support an optional Stacking Port Stacking module should be Hot-swappable Stacking should support a minimum of 2 or more Switches Stacking should support a maximum of 4 Switches or higher Stacking should support 80 Gbps of throughput Stacking should support single IP address management for the group of switches Stacking should support single configuration Stacking should support simplified switch upgrade Stacking should support automatic upgrade when the master switch receives a new software version Stacking should support stacking cable length of 3m Stacking should support QoS to be configured across the entire stack

5	Standards	The switch should support IEEE 802.1D Spanning Tree Protocol The switch should support IEEE 802.1p The switch should support IEEE 802.1Q Trunking The switch should support IEEE 802.1s Multiple Spanning Tree (MSTP) The switch should support IEEE 802.1w Rapid Spanning Tree (RSTP) The switch should support IEEE 802.1x The switch should support IEEE 802.1ab (LLDP) The switch should support IEEE 802.3ad Link Aggregation Control Protocol (LACP) The switch should support IEEE 802.3ah (100BASE-X single/multimode fiber only) The switch should support IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports The switch should support IEEE 802.3 10BASE-T specification The switch should support IEEE 802.3u 100BASE-TX specification The switch should support IEEE 802.3ab 1000BASE-T specification The switch should support IEEE 802.3z 1000BASE-X specification The switch should support RMON I and II standards The switch should support SNMP v1, v2c, and v3
6	Power Supply	The switch should support an auto-ranging power supply with input voltages between 100 and 240V AC The switch should support an External Redundant Power Supply. External Power supply is not a Day One Requirement
7	RFC compliance	The switch should support RFC 2373 – IPv4, IPv6 Aggregatable Address The switch should support RFC 2460 - IPv4,IPv6 The switch should support RFC 2461 - IPv4,IPv6 Neighbor Discovery The switch should support RFC 2462 - IPv4,IPv6 Auto configuration The switch should support RFC 2463 - ICMP IPv6
8	Layer-2 Features	The switch should support Automatic Negotiation of Trunking Protocol, to help minimize the configuration & errors The switch should support IEEE 802.1Q VLAN encapsulation The switch should support Centralized VLAN Management. VLANs created on the Core Switches should be propagated automatically The switch should support Spanning-tree Port Fast and Port Fast guard for fast convergence The switch should support Uplink Fast & Backbone Fast technologies to help ensure quick failover recovery, enhancing overall network stability and reliability or equivalent The switch should support Spanning-tree root guard to prevent other edge switches becoming the root bridge. The switch should support IGMP filtering
		The switch should support discovery of the neighboring device of the same vendor giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems.

9	L3 Features	The switch should support Per-port broadcast storm control to prevent faulty end stations from degrading overall systems performance The switch should support Per-port multicast storm control to prevent faulty end stations from degrading overall systems performance The switch should support Per-port unicast storm control to prevent faulty end stations from degrading overall systems performance The switch should support Voice VLAN to simplify IP telephony installations by keeping voice traffic on a separate VLAN The switch should support Auto-negotiation on all ports to automatically selects half- or full-duplex transmission mode to optimize bandwidth The switch should support Automatic media-dependent interface crossover (MDIX) to automatically adjusts transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed. The switch should support Unidirectional Link Detection Protocol (UDLD) and Aggressive UDLD to allow for unidirectional links caused by incorrect fiber-optic wiring or port faults to be detected and disabled on fiber-optic interfaces. The switch should support Local Proxy Address Resolution Protocol (ARP) working in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth. The switch should support IGMP v1, v2 Snooping The switch should support IGMP v3 Snooping The switch should support IGMP v1, v2 Filtering The switch should support IGMP Snooping Timer The switch should support IGMP Throttling The switch should support IGMP Querier The switch should support Configurable IGMP Leave Timer The switch should support MVR (Multicast VLAN Registration)
		The switch should support Inter-VLAN routing The switch should support IPv4 unicast Static Routing The switch should support 10 IPv4 Static routes
10	Smart Operations	The switch should support configuration of the Software image and switch configuration without user intervention The switch should support automatic configuration as devices connect to the switch port The switch should support diagnostic commands to debug issues The switch should support system health checks within the switch The switch should support Online Diagnostics
		The switch should support 4 egress queues per port to enable differentiated management The switch should support scheduling techniques for Qos The switch should support Weighted tail drop (WTD) to provide congestion avoidance or equivalent system The switch should support Standard 802.1p CoS field classification The switch should support Differentiated services code point (DSCP) field classification

11	Quality of Service (QoS) & Control	The switch should support Control- and Data-plane QoS ACLs The switch should support Strict priority queuing mechanisms The switch should support Rate Limitting function to guarantee bandwidth The switch should support rate limiting based on source and destination IP address The switch should support rate limiting based on source and destination MAC address The switch should support rate limiting based on Layer 4 TCP and UDP information The switch should support availability of up to 256 aggregate or individual polices per port.
12	Management	The switch should support Command Line Interface (CLI) support for configuration & troubleshooting purposes. The switch should support four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis The switch should support Layer 2 trace route to ease troubleshooting by identifying the physical path that a packet takes from source to destination. The switch should support Trivial File Transfer Protocol (TFTP) to reduce the cost of administering software upgrades by downloading from a centralized location. The switch should support SNMP v1, v2c, and v3 of-band management. The switch should support Telnet interface support for comprehensive in-band management of-band management. The switch should support CLI-based management console to provide detailed out-of-band management. The switch should support Serial / USB Console Port The switch should support SNMPv1, SNMPv2c, and SNMPv3
13	Miscellaneous	The switch should support greener practices The switch should support solutions that monitors and conserves energy with customized policies The switch should support an increase in energy cost savings The switch should support sustainable business behavior The switch should support Efficient switch operation The switch should support Intelligent power management The switch should support measuring of energy between itself and endpoints The switch should support control of energy between itself and endpoints The switch should support discovery of manageable devices for Energy measurement The switch should support support monitoring of power consumption of endpoints The switch should support taking of action based on business rules to reduce power consumption
		The switch should support IEEE 802.1x to allow dynamic, port-based security, providing user authentication. The switch should support Port-based ACLs for Layer 2 interfaces to allow application of security policies on individual switch ports. The switch should support SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.

14	Network security features	The switch should support TACACS+ and RADIUS authentication enable centralized control of the switch and restrict unauthorized users from altering the configuration. The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network. The switch should support Port security to secure the access to an access or trunk port based on MAC address. The switch should support Multilevel security on console access to prevent unauthorized users from altering the switch configuration. The switch should support Private VLAN
15	DHCP Features	The switch should support DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addressesDHCP binding database and to rate-limit the amount of DHCP traffic that enters a switch port. The switch should support DHCP Interface Tracker (Option 82) feature to augment a host IP address request with the switch port ID. The switch should support DHCP data Insertion The switch should support DHCP Pass Through The switch should support DHCP Snooping Statistics and SYSLOG
16	IPv6 Features	The switch should be on the approved list of IPv6 Ready Logo phase II - Host The switch should support IPv6 unicast Static Routing The switch should support IPv6 unicast Static Routing The switch should support IPv6 MLDv1 & v2 Snooping The switch should support IPv6 Host support for IPv6 Addressing The switch should support IPv6 Host support for IPv6 Option processing The switch should support IPv6 Host support for IPv6 Fragmentation The switch should support IPv6 Host support for IPv6 ICMPv6 The switch should support IPv6 Host support for IPv6 TCP/UDP over IPv6 The switch should support IPv6 Host support for IPv6 Ping The switch should support IPv6 Host support for IPv6 Traceroute The switch should support IPv6 Host support for IPv6 VTY The switch should support IPv6 Host support for IPv6 SSH The switch should support IPv6 Host support for IPv6 TFTP, The switch should support IPv6 Host support for IPv6 SNMP for IPv6 objects The switch should support IPv6 Port Access Control Lists The switch should support IPv6 Router Access Control Lists The switch should support HTTP, HTTP(s) over IPv6 The switch should support SNMP over IPv6 The switch should support SysLog over IPv6 The switch should support IPv6 Stateless Auto Config The switch should support DHCP based Auto Config (Auto Install) and Image download The switch should support IPv6 QoS

		The switch should support RFC4292/RFC4293 MIBs for IPv6 traffic The switch should support SCP/SSH over IPv6 The switch should support Radius over IPv6 The switch should support TACACS+ over IPv6 The switch should support NTPv4 over IPv6 The switch should support IPv6 First-Hop Security The switch should support IPv6 First Hop Security: RA Guard The switch should support IPv6 First Hop Security: DHCPv6 Guard The switch should support IPv6 First Hop Security: IPv6 Binding Integrity Guard