

Annexure I

Blade Enclosure - 1 no		
Item Details	Description of Requirement	Compliance / Remarks
Blade Chassis	Solution to house the required number of blade servers in smallest number of enclosures. Industry standard suitable for housing in Standard Server Racks should have support for full height and half height blades in the same enclosure, occupying a maximum rack height . The enclosure should support all current and minimum previous two generation blades	
	Blade enclosure should support latest Intel Xeon based Server Blades among others.	
	Should support hot pluggable and redundant management modules.	
	Should provide a highly reliable and high performance mid-plane/back-plane design in the blade enclosure. Should provide detailed technical information	
	Should provide reconfigurable chassis to accommodate a variety of current and future blade server form factors and functions	
	Supports up to 2 x 40 Gigabit Ethernet for every blade server slot when used in high-availability mode	
	Should provide 8 blades with 1.2 terabits (Tb) of available Ethernet throughput to meet future I/O requirements	
	Should be able to accommodate the blade servers mentioned in the sections below in the proposed blade enclosures. The proposals must offer the most dense packaging possible for the blade servers in the enclosure and maximum headroom for future expansion in the offered enclosures	
	Enclosure should support hot-pluggable Server Blades to provide uninterrupted service during maintenance or server deployment	
Support simultaneous remote access for different servers in the enclosure		
Interconnect	The chassis should support redundant modules for connectivity - Ethernet and Fiber Channel OR converged fabric modules in lieu thereof	
Blade Server Interconnect to LAN/ Network and Fiber	Should be able to support 10G/1G ethernet, 8GBPS Fiber Channel, 10Gbps FCOE in single module. Should be able to support minimum 4 uplinks with any combinations	
Power Supply	The power subsystem should support N + N power redundancy (where N is at least equal to 2) for a fully populated chassis with all servers configured with the highest CPU configuration with highest speed, maximum memory and IO configuration possible. The power supply should be Hot-Pluggable.	
Cooling	Each blade enclosure should have a cooling subsystem consisting of redundant hot pluggable fans or blowers enabled with technologies for improved power consumption and acoustics	
Warranty	36 months (3 Years) comprehensive (on-site with parts) Warranty from the date of installation	
System Software	Management/controlling software have to be from the OEM	

Blade Server - 4 Nos.

Item Details	Description of Requirement	Compliance / Remarks
Processor	Latest generation x86-64 processor, Two nos of Intel 8-core Intel E5-2667 V2 / 3.3 Ghz processor, based on Intel C600 series chipset. Cache Memory should be 25 MB with Highest DDR3 DIMM Clock support of 1866 MHZ . Server should provide an intelligent socket that would ease the installation of CPU to avoid errors caused by mis-inserting processors during install or upgrade.	
Memory	64 GB scalable to at least upto 768 GB , using DDR3Registered (RDIMM) memory modules. Should be capable of identifying and reporting whether genuine OEM memory is installed.	
Memory Protection	Advanced ECC with multi-bit error protection supporting technologies of memory mirroring and memory lockstep mode	
Hard disk drive with carrier	2 * 300 GB 10K RPM hot plug SFF SAS drives. The server should support a minimum of 2 hot plug SAS, SATA and SSD hard disk drives	
Controller	Integrated SAS Raid Controller with RAID 0, 1	
Networking features	The server should provide a minimum of 36 GB aggregate bandwidth per server (2 x 10Gb for Ethernet and 2 x 8 Gb for FC OR 4X10Gb for Converged Network adapter).	
Ports	Minimum of 1 * internal USB 2.0 port and 1* internal SDHC card slot	
Blade Server Connectivity to SAN	Should be done using Converged Network Adapter	
Bus Slots	Minimum of 2Nos of 3.0 PCIe x16 based mezzanine slots supporting Ethernet, FC, SAS adapters	
Graphics	Integrated Matrox G200e Video Controller	
Industry Standard Compliance	ACPI 2.0 Compliant; PCIe 3.0; WOL Support; Microsoft® Logo certifications; USB 2.0 Support; IPMI2.0; Secure Digital 2.0; TPM1.2 support; Advanced Encryption Standard (AES); Triple Data Encryption Standard (3DES); SNMP; SSL 2.0; DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP); Active Directory v1.0	
OS Support	Microsoft Windows, RHEL, SLES, VMware ESX	
Warranty	36 months (3 Years) comprehensive (on-site with parts) Warranty from the date of installation	

Storage - 1 No

Item Details	Description of Requirement	Compliance / Remarks
Cache	Offered Storage Array shall be given with Minimum of 12 GB cache per controller in a single unit after removing the operating system overhead. Cache shall be backed up in case of power failure for indefinite time either using batteries or capacitors or any other equivalent technology.	
Capacity & Scalability	Storage shall be scalable to minimum of 380 number of drives or greater than 300TB using 900GB SFF SAS drives.	

Front end ports	Offered Storage system shall be supplied with minimum of Dual 16Gbps FC ports and Dual 10Gbps ISCSI ports per controller. Offered storage shall have flexibility to use all above ports either as FC or ISCSI by replacing the requisite SFP. Vendors shall provide the additional SFP accordingly. In case, vendor doesn't support this feature, then every controller shall be populated upfront with 4 x 16Gbps FC ports and 4 x 10Gbps ISCSI ports.	
Disk drive support	For SFF drives, Offered Storage Array shall support minimum 300/450/600/900/1200 GB hot-pluggable Enterprise SFF SAS hard drives, 200/400/800GB SSD along with SAS MDL / NL 1TB drives. For LFF drives, offered Storage Array shall support minimum of 1/2/3/4TB NL - SAS drives. For green datacenter initiative, Storage subsystem disks shall support Spin down feature for drives whenever not in use. Offered storage array shall also have support for self-encrypted SAS and NL-SAS / SAS MDL drives.	

Tape Library - 1 No

Item Details	Description of Requirement	Compliance / Remarks
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Same specifications - no amendment

Ethernet Switch for Server Farm : 2 nos

Item Details	Description of Requirement	Compliance / Remarks
Architecture	Shall be 19" Rack Mountable	
	Shall have dual, hot-swappable power supplies	
	Shall have dual, fan tray slots which shall support front-to-back or back-to-front airflows	
	24 fixed Gigabit/10G SFP+ ports which can be upgraded to support 48 x 10G SFP+ ports . The switch should also have support for at least 6*40G port . The switch will be delivered with 8 nos 10 G modules .	
	1 RJ-45 serial console port	
	1 RJ-45 out-of-band management port	
	2GB SDRAM, 256 MB flash	
	Deep Packet buffer size of minimum 3GB to support server virtualization, bursty multimedia, storage applications, and other critical services	
	Shall have switching capacity of 1.2 Tbps .	
	Shall have up to 357 million pps switching throughput	
Shall provide Latency of < 1.7 μs (64-byte packets)		

Graceful Restart	Shall have the capability to extend the control plane across multiple active switches making it a virtual switching fabric, enabling interconnected switches to perform as single Layer-2 switch and Layer-3 router	
	Shall support virtual switching fabric creation across multiple switches using 10G Ethernet Links	
	The modules/cables to create virtual switching fabric shall be provided	
	IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol and IEEE 802.1s Multiple Spanning Tree Protocol	
	IEEE 802.3ad Link Aggregation Control Protocol (LACP)	
	Virtual Router Redundancy Protocol (VRRP) to allow a group of routers to dynamically back each other up to create highly available routed environments	
	Graceful restart for routing protocol	
	Shall provide hitless software upgrade with single-unit In Services Software Upgrade (ISSU) and hitless patching of modular OS	
Layer 3 Features (any additional licenses required shall be included)	Static Routing for IPv4 and IPv6	
	RIP for IPv4 (RIPv1/v2) and IPv6 (RIPng)	
	OSPF for IPv4 (OSPFv2) and IPv6 (OSPFv3)	
	IS-IS for IPv4 and IPv6 (IS-ISv6)	
	Border Gateway Protocol 4 with support for IPv6 addressing	
	Policy-based routing	
	Multiprotocol Extensions for BGP-4	
	The Switch should support at least 8000 IPv4, 8000 IPv6 routes and 8000 multicast routes on delivery.	
QoS and Security Features	Access Control Lists for filtering traffic to prevent unauthorized users from accessing the network	
	Congestion avoidance using Weighted Random Early Detection (WRED)	
	Powerful QoS feature supporting Strict Priority Queuing (SP), Weighted Fair Queuing (WFQ), Weighted Deficit Round Robin (WDRR), SP+WDRR, Ingress Rate Limiting or equivalent QOS mechanism	
	IEEE 802.1X Port Based Network Access Control	
	DHCP Snooping support including Option 82	
	Port security, Directed Broadcast Control	
Environmental Features	Shall provide ROHS Compliance	
	Shall be capable of supporting both AC and DC Power inputs	
	Operating temperature of 0°C to 45°C	
	Safety and Emission standards including UL 60950-1; IEC 60950-1; VCCI Class A; EN 55022 Class A	
	Configuration through secure command-line interface (CLI) over Telnet and SSH	

Management Features	SNMPv1, v2, and v3	
	sFlow (RFC 3176) or equivalent for traffic analysis	
	FTP and TFTP support	
	Port mirroring to enable traffic on a port to be simultaneously sent to a network analyser for monitoring	
	RADIUS or TACACS+ for switch security access administration	
	Network Time Protocol (NTP) or equivalent support	
	Shall have Ethernet OAM - Connectivity Fault Management (IEEE 802.1AG) and Ethernet in the First Mile (IEEE 802.3AH) capability	
Layer 2 and Convergence Features (any additional licenses required shall be included)	Shall support up to 4,000 port or IEEE 802.1Q-based VLANs	
	MAC address table size of minimum 128000 entries	
	Shall support GARP VLAN Registration Protocol or equivalent feature to allow automatic learning and dynamic assignment of VLANs	
	Shall have the capability to monitor link connectivity and shut down ports at both ends if uni-directional traffic is detected, preventing loops	
	Shall support Jumbo frames on GbE and 10-GbE ports	
	Internet Group Management Protocol (IGMP)	
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)	
	Multicast VLAN to allow multiple VLANs to receive the same IPv4 or IPv6 multicast traffic	
	Data Center Bridging (DCB) protocols support including IEEE 802.1Qbb Priority Flow Control (PFC), Data Center Bridging Exchange (DCBX), and IEEE 802.1Qaz Enhanced Transmission Selection (ETS) for converged applications	
	FCoE support on all 10G SFP+ ports including including support for 8/4/2 Gb FC interfaces to connect storage . Additional SAN Switch should not be required to connect SAN Storage	
	Fabric services support including name server, registered state change notification, and login services; per-VSAN fabric services, FSPF, soft and hard zoning, Fibre Channel trace route, ping, debugging, and FIP snooping	
	Transparent Interconnection of Lots of Links (TRILL) or Fabricpath support to increase the scale of enterprise data centers	
	EVB/VEPA support to provide connectivity into the virtual environment for a data center-ready environment	
Switch should support for at least 4000 VRF to segregate and segment network path and traffic without using multiple devices in the network required for traffic segregation & segmentation.		
Warranty and Support	The below Warranty shall be offered directly from the switch OEM.	
	Three Years warranty with advance replacement and next-business-day delivery	

DMZ Switch for Server Farm - 1 No

Item Details	Description of Requirement	Compliance / Remarks
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Architecture	Shall be 1RU, 19" Rack Mountable; 24 RJ-45 autosensing 10/100/1000 ports with 2 SFP+ slots; 1 RJ-45 (serial RS-232C) or USB micro-B console port; 128 MB flash, 512 MB DRAM	
	Packet buffer size of minimum 1.5 MB to support video/streaming traffic and huge file transfers (like medical scan documents etc.)	
	Shall have switching capacity of 88 Gbps for providing non-blocking performance on all Gigabit ports	
	Shall have up to 41.6 million pps switching throughput to achieve wire-speed forwarding on all Gigabit ports	
	Shall provide Gigabit (1000 Mb) Latency of < 5 us	
Resiliency	IEEE 802.1D Spanning Tree Protocol, IEEE 802.1w Rapid Spanning Tree Protocol and IEEE 802.1s Multiple Spanning Tree Protocol	
	IEEE 802.3ad Link Aggregation Control Protocol (LACP) up to eight links (ports) per group	
Layer 2 Features	MAC address table size of 16000 entries	
	Shall support up to IEEE 802.1Q (4,094 VLAN IDs) and 512 VLANs simultaneously	
	Shall support GARP VLAN Registration Protocol or equivalent feature to allow automatic learning and dynamic assignment of VLANs	
	Shall support Jumbo frames to improve the performance of large data transfers	
	Internet Group Management Protocol (IGMP)	
	Multicast Listener Discovery (MLD) snooping	
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and LLDP-MED (Media Endpoint Discovery)	
	IPv6 host and Dual stack (IPv4/IPv6) support to provide transition mechanism from IPv4 to IPv6	
QoS and Security Features	Access Control Lists for traffic filtering	
	Source-port filtering or equivalent feature to allow only specified ports to communicate with each other	
	Traffic prioritization based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ	
	Shall support traffic classification into eight priority levels mapped to two or four queues using Weighted deficit round robin (WDRR) or Shaped Round Robin (SRR) queuing ; Shall support traffic rate-limiting per port	
	IEEE 802.1x to provide port-based user authentication with multiple 802.1x authentication sessions per port	
	Media access control (MAC) authentication to provide simple authentication based on a user's MAC address	
	Web-based authentication to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant	

QoS and Security Features	Concurrent IEEE 802.1X and Web or MAC authentication schemes per port; Port security to allow access only to specified MAC addresses; MAC address lockout to prevent particular configured MAC addresses from connecting to the network	
	STP BPDU port protection to prevent forged BPDU attacks	
	STP Root Guard to protect the root bridge from malicious attacks or configuration mistakes. IP Source guard, DHCP snooping and Dynamic ARP inspection to be added as the security feature.	
Management Features	Configuration through the CLI, console, Telnet, SSH and browser-based management GUI (SSL)	
	SNMPv1, v2, and v3 and Remote monitoring (RMON) support	
	sFlow (RFC 3176) or equivalent for traffic analysis	
	TFTP and Secure FTP or secure Copy support	
	Dual flash images to provide independent primary and secondary operating system files	
	Multiple configuration files to allow multiple configuration files to be stored to a flash image	
	RADIUS/TACACS+ for switch security access administration	
	Simple Network Time Protocol (SNTP) or equivalent support	
	Shall support 80 Gps stacking through dedicated stacking port for up to 8 switches for single IP address management	
Environmental Features	Shall support IEEE 802.3az Energy-efficient Ethernet (EEE) to reduce power consumption. Support for redundant power supply.	
	Operating temperature of 0°C to 45°C	
	Safety and Emission standards including EN 60950; IEC 60950; VCCI Class A; FCC part 15 Class A	
Warranty and Support	The below Warranty shall be offered directly from the switch OEM.	
	Three Years warranty with advance replacement and next-business-day delivery	