Computation Facility IISER MOHALI

LAN Networking Active and Passive Components Specifications.

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Note: 01. Above quantity is indicative only and can be changed at buyers discretion.

02. Order for Sr. No. 1 and Sr. No. 2 can be split to two different vendors.

Switch 1 Specification Sheet (Distribution Switch)

1. **Architecture**

i	Non blocking architecture
ii	24 RJ45 autosensing 10/100/1000 Mbps ports and 2 dedicated 1000 Base-X SFP ports
iii	2x10G SFP+ ports(Both SFP+ ports should be populated with 10G Base-LR Single-mode fiber module)
iv	19” Rack Mountable
v	Switching Capacity minimum 176 Gbps
vi	Switching throughput minimum 130 million pps
vii	Redundant Power supply

2. **Scalability and Reliability**

i	Support distributed device management, distributed link aggregation and distributed resilient route
ii	Support virtual chassis creation using standard Ethernet interfaces
iii	Virtual chassis accommodates up-to nine interconnected active switches and manageable as a single common fabric with one IP address
iv	Ring Protection Protocol or equivalent to achieve 50ms ring fail-over
v	Virtual Cable Test or equivalent to detect cable faults
vi	Smart-link or equivalent to achieve 50ms link fail-over over L2
vii	Stacking module and cables
viii	VRRP
ix	One free slot for future scalability. This slot supports the interface card which provides either of following: (a) 2 x 10G SFP+ ports (b)8 x 10/100/1000 base-T ports (c)8 x 1000 base-X SFP ports

3. **Layer 2/3/4 Features**

i	32K MAC addresses
ii	4096 VLANs based on port, protocol, MAC addresses and IP subnet
iii	QinQ
iv	Voice VLAN
v	GVRP
vi	Local and Remote port mirroring
vii	Storm suppression based on port rate percentage and PPS
viii	VLAN mapping

ix	DHCP Client, Relay

4. **IPv4 and IPv6 Routing Features**

i	Routing table size 12000 entries
ii	IPv4: Static routing, RIP, OSPFv2, BGP and ISIS from day-1 Route policy and policy base routing
iii	IPv6: RIPng, OSPFv3, BGP4+ for IPV6 from day-1 Route policy and policy base routing
iv	Manual Ipv6 tunnel, 6 to 4 tunnel, ISATAP tunnel

5. **IPv4 and IPv6 Multicast**

i	IGMP Snooping, IGMP v1/v2/v3
ii	PIM-DM/SM/SSM
iii	MSDP for IPv4 and IPv6
iv	Multicast VLAN and Multicast VLAN+
v	MLD snooping v1/v2
vi	PIM-DM/SM/SSM for IPv6
vii	MBGP for IPv6
viii	IPv6 Multicast VLAN and IPv6 Multicast VLAN+
ix	VRF Lite Support
x	The switching capacity does not degrade in case of IPv6

6. **ACL/QOS**

i	Packet filtering at layer 2(L2) to Layer 4(L4), providing traffic classification based on source MAC address, destination MAC address, source IP (Ipv4/IPv6) address, destination IP (Ipv4/IPv6)address, port, protocol, VLAN
ii	Support scheduling modes like Strict Priority(SP), WRR and SP+WRR
iii	Time based Packet filtering
iv	Port based and VLAN based ACL
v	ACL policies in the ingress direction and the egress direction
vi	Each port supports eight output queues

7. **Security**

i	AAA, Radius authentication
ii	MAC address authentication, 802.1x authentication and portal authentication
iii	SSH 2.0, HTTPS and SSL
iv	Port Isolation and port security
v	IP source check
vi	ARP detection
vii	STP Root Guard and BPDU Guard
viii	DHCP Snooping
ix	Binding of IP+MAC+PORT
x	uRPF

8. **Management**

i	Configuration through CLI, Telnet and Console port
ii	SNMPv1/v2/v3, RMON
iii	OAM, UDLD/DLDP or equivalent
iv	Web based management

Switch 2 Specification Sheet (Distribution Switch)

1. **Architecture**

i	Non blocking architecture
ii	48 RJ45 autosensing 10/100/1000 Mbps ports and 4 dual-personality ports, auto-sensing 10/100/1000Base-T or SFP
iii	2x10G SFP+ ports(Both SFP+ ports should be populated with 10G Base-LR Single-mode fiber module)
iv	19” Rack Mountable
v	Switching Capacity minimum 192 Gbps
vi	Switching throughput minimum 142 million pps
vii	Redundant Power supply

2. **Scalability and Reliability**

i	Support distributed device management, distributed link aggregation and distributed resilient route
ii	Support virtual chassis creation using standard Ethernet interfaces
iii	Virtual chassis accommodates up-to nine interconnected active switches and manageable as a single common fabric with one IP address
iv	Ring Protection Protocol or equivalent to achieve 50ms ring fail-over
v	Virtual Cable Test or equivalent to detect cable faults
vi	Smart-link or equivalent to achieve 50ms link fail-over over L2
vii	Stacking module and cables
viii	VRRP
ix	One free slot for future scalability. This slot supports the interface card which provides either of following: (a) 2 x 10G SFP+ ports (b)8 x 10/100/1000 base-T ports (c)8 x 1000 base-X SFP ports

3. **Layer 2/3/4 Features**

i	32K MAC addresses
ii	4096 VLANs based on port, protocol, MAC addresses and IP subnet
iii	QinQ
iv	Voice VLAN
v	GVRP
vi	Local and Remote port mirroring
vii	Storm suppression based on port rate percentage and PPS
viii	VLAN mapping
ix	DHCP Client, Relay

4. **IPv4 and IPv6 Routing Features**

i	Routing table size 12000 entries
ii	IPv4: Static routing, RIP, OSPFv2, BGP and ISIS from day-1 Route policy and policy base routing
iii	IPv6: RIPng, OSPFv3, BGP4+ for IPV6 from day-1 Route policy and policy base routing
iv	Manual Ipv6 tunnel, 6 to 4 tunnel, ISATAP tunnel

5. **IPv4 and IPv6 Multicast**

i	IGMP Snooping, IGMP v1/v2/v3
ii	PIM-DM/SM/SSM
iii	MSDP for IPv4 and IPv6
iv	Multicast VLAN and Multicast VLAN+
v	MLD snooping v1/v2
vi	PIM-DM/SM/SSM for IPv6
vii	MBGP for IPv6
viii	IPv6 Multicast VLAN and IPv6 Multicast VLAN+
ix	VRF Lite Support
x	The switching capacity does not degrade in case of IPv6

6. **ACL/QOS**

i	Packet filtering at layer 2(L2) to Layer 4(L4), providing traffic classification based on source MAC address, destination MAC address, source IP (Ipv4/IPv6) address, destination IP (Ipv4/IPv6)address, port, protocol, VLAN
ii	Support scheduling modes like Strict Priority(SP), WRR and SP+WRR
iii	Time based Packet filtering
iv	Port based and VLAN based ACL
v	ACL policies in the ingress direction and the egress direction
vi	Each port supports eight output queues

7. **Security**

i	AAA, Radius authentication
ii	MAC address authentication, 802.1x authentication and portal authentication
iii	SSH 2.0, HTTPS and SSL
iv	Port Isolation and port security
v	IP source check
vi	ARP detection
vii	STP Root Guard and BPDU Guard
viii	DHCP Snooping
ix	Binding of IP+MAC+PORT
x	uRPF

8. **Management**

i	Configuration through CLI, Telnet and Console port
ii	SNMPv1/v2/v3, RMON
iii	OAM, UDLD/DLDP or equivalent
iv	Web based management

Switch 3 Specification Sheet (Edge Switch)

1. **Architecture**

i	24 RJ45 autosensing 10/100/1000 Mbps ports and 2 or more 10G uplink ports
ii	19” Rack Mountable
iii	Switching Capacity minimum 56 Gbps
iv	Switching throughput minimum 41 million pps
v	External/Internal redundant power supply

2. **Scalability and Reliability**

i	Support virtual chassis creation using standard Ethernet interfaces
ii	Virtual chassis accommodates up-to nine interconnected active switches and manageable as a single common fabric with one IP address
iii	Ring Protection Protocol or equivalent to achieve 50ms ring fail-over
iv	Virtual Cable Test or equivalent to detect cable faults
v	Smart-link or equivalent to achieve 50ms link fail-over over L2

3. **Layer 2 Features**

i	8K MAC addresses
ii	4094 VLANs based on port, protocol, MAC addresses and IP subnet
iii	IEEE 802.1s (MSTP)
iv	IEEE 802.3x (Full-duplex flow control) and back-pressure flow control(half-duplex)
v	Voice VLAN
vi	Link aggregation support up-to 26 trunks, each with 8 links per trunk support, static or dynamic
vii	Local and Remote port mirroring
viii	Broadcast, multicast and unicast storm control
ix	VLAN mapping
x	DHCP Client, Relay
xi	Jumbo frames

4. **IPv4 and IPv6 Routing and Multicast Features**

i	IPv4 and IPv6 static routing from day 1
ii	IGMP snooping v1/v2/v3
iii	Multicast VLAN and IPV6 multicast VLAN
iv	MLD snooping v1/v2

5. **ACL/QOS**

i	Packet filtering at layer 2(L2) to Layer 4(L4), providing traffic classification based on source MAC address, destination MAC address, source IP (Ipv4/IPv6) address, destination IP (Ipv4/IPv6)address, port, protocol, VLAN
ii	Support the remarking of 802.1p and DSCP priorities packets
iii	Time based Packet filtering
iv	Support flexible queue scheduling algorithm, which can be set based on ports and queues supporting Strict Priority(SP), SDWRR and SP+SDWRR

7. **Security**

i	AAA, Radius, TACACS authentication
ii	MAC address authentication, 802.1x authentication
iii	SSH 2.0, HTTPS and SSL
iv	Multiple 802.1x users per port
v	IP source Guard
	IP MAC port binding
vi	ARP detection
vii	STP Root Guard and BPDU Guard
viii	DHCP Snooping
ix	MAC address learning limit on port
x	Hierarchical user management and password based protection

8. **Management**

i	Configuration through CLI, Telnet and Console port
ii	SNMPv1/v2/v3, RMON, alarms, events and history records
iii	NTP
iv	Web based management
v	802.1ag and 802.1ah support
vi	System logs and hierarchical alarms
vii	Power, fan and temperature alarms

Switch 4 Specification Sheet (Edge Switch)

1. **Architecture**

i	24 RJ45 autosensing 10/100/1000 Mbps POE+ ports and four dedicated SFP ports
ii	19” Rack Mountable
iii	Switching Capacity minimum 56 Gbps
iv	Switching throughput minimum 41 million pps
v	External/Internal redundant power supply

2. **Scalability and Reliability**

i	Support virtual chassis creation using standard Ethernet interfaces
ii	Virtual chassis accomodates up-to nine interconnected active switches and manageable as a single common fabric with one IP address
iii	Ring Protection Protocol or equivalent to achieve 50ms ring fail-over
iv	Virtual Cable Test or equivalent to detect cable faults
v	Smart-link or equivalent to achieve 50ms link fail-over over L2

3. **Layer 2 Features**

i	8K MAC addresses
ii	4094 VLANs based on port, protocol, MAC addresses and IP subnet
iii	IEEE 802.1s (MSTP)
iv	IEEE 802.3x (Full-duplex flow control) and back-pressure flow control(half-duplex)
v	Voice VLAN
vi	Link aggregation support up-to 26 trunks, each with 8 links per trunk support, static or dynamic
vii	Local and Remote port mirroring
viii	Broadcast, multicast and unicast storm control
ix	VLAN mapping
x	DHCP Client, Relay
xi	Jumbo frames

4. **IPv4 and IPv6 Routing and Multicast Features**

i	IPv4 and IPv6 static routing from day 1
ii	IGMP snooping v1/v2/v3
iii	Multicast VLAN and IPV6 multicast VLAN
iv	MLD snooping v1/v2

5. **ACL/QOS**

i	Packet filtering at layer 2(L2) to Layer 4(L4), providing traffic classification based on source MAC address, destination MAC address, source IP (Ipv4/IPv6) address, destination IP (Ipv4/IPv6)address, port, protocol, VLAN
ii	Support the remarking of 802.1p and DSCP priorities packets
iii	Time based Packet filtering
iv	Support flexible queue scheduling algorithm, which can be set based on ports and queues supporting Strict Priority(SP), SDWRR and SP+SDWRR

7. **Security**

i	AAA, Radius, TACACS authentication
ii	MAC address authentication, 802.1x authentication
iii	SSH 2.0, HTTPS and SSL
iv	Multiple 802.1x users per port
v	IP source Guard
	IP MAC port binding
vi	ARP detection
vii	STP Root Guard and BPDU Guard
viii	DHCP Snooping
ix	MAC address learning limit on port
x	Hierarchical user management and password based protection

8. **Management**

i	Configuration through CLI, Telnet and Console port
ii	SNMPv1/v2/v3, RMON, alarms, events and history records
iii	NTP
iv	Web based management
v	802.1ag and 802.1ah support
vi	System logs and hierarchical alarms
vii	Power, fan and temperature alarms

Switch 5 Specification Sheet (Edge Switch)

1. **Architecture**

i	48 RJ45 autosensing 10/100/1000 Mbps ports and 4 dedicated SFP ports
ii	19” Rack Mountable
iii	Switching Capacity minimum 104 Gbps
iv	Switching throughput minimum 77 million pps
v	External/Internal redundant power supply

2. **Scalability and Reliability**

i	Support virtual chassis creation using standard Ethernet interfaces
ii	Virtual chassis accommodates up-to nine interconnected active switches and manageable as a single common fabric with one IP address
iii	Ring Protection Protocol or equivalent to achieve 50ms ring fail-over
iv	Virtual Cable Test or equivalent to detect cable faults
v	Smart-link or equivalent to achieve 50ms link fail-over over L2

3. **Layer 2 Features**

i	8K MAC addresses
ii	4094 VLANs based on port, protocol, MAC addresses and IP subnet
iii	IEEE 802.1s (MSTP)
iv	IEEE 802.3x (Full-duplex flow control) and back-pressure flow control(half-duplex)
v	Voice VLAN
vi	Link aggregation support up-to 26 trunks, each with 8 links per trunk support, static or dynamic
vii	Local and Remote port mirroring
viii	Broadcast, multicast and unicast storm control
ix	VLAN mapping
x	DHCP Client, Relay
xi	Jumbo frames

4. **IPv4 and IPv6 Routing and Multicast Features**

i	IPv4 and IPv6 static routing from day 1
ii	IGMP snooping v1/v2/v3
iii	Multicast VLAN and IPV6 multicast VLAN
iv	MLD snooping v1/v2

5. **ACL/QOS**

i	Packet filtering at layer 2(L2) to Layer 4(L4), providing traffic classification based on source MAC address, destination MAC address, source IP (Ipv4/IPv6) address, destination IP (Ipv4/IPv6)address, port, protocol, VLAN
ii	Support the remarking of 802.1p and DSCP priorities packets
iii	Time based Packet filtering
iv	Support flexible queue scheduling algorithm, which can be set based on ports and queues supporting Strict Priority(SP), SDWRR and SP+SDWRR

7. **Security**

i	AAA, Radius, TACACS authentication
ii	MAC address authentication, 802.1x authentication
iii	SSH 2.0, HTTPS and SSL
iv	Multiple 802.1x users per port
v	IP source Guard
	IP MAC port binding
vi	ARP detection
vii	STP Root Guard and BPDU Guard
viii	DHCP Snooping
ix	MAC address learning limit on port
x	Hierarchical user management and password based protection

8. **Management**

i	Configuration through CLI, Telnet and Console port
ii	SNMPv1/v2/v3, RMON, alarms, events and history records
iii	NTP
iv	Web based management
v	802.1ag and 802.1ah support
vi	System logs and hierarchical alarms
vii	Power, fan and temperature alarms

Passive LAN Components Sheet

Table:

S#	Item Description	Quantity
1	24 Port Patch Panel with Cable Manager (Cat-6a)	30
2	12U Wall Mount Rack Unit with accessories (Power Supply, Fans, Cable Trays etc.)	10
3	9U Wall Mount Rack Unit with accessories (Power Supply, Fans, Cable Trays etc.)	15
4	Information Outlet with SMB (Cat-6)	400
5	Patch Cord – 1 Meter (3 feet) Cat-6a	400
6	Patch Cord – 2 Meter (7 feet) Cat-6a	400
7	UTP Cable (Cat-6), Box of 305 mt length	60 Boxes
8	UTP Cable (Cat -6a), Box of 305 mt length	10 Boxes

Note:

- Buyer may increase or decrease the quantity at any time.
- All the passive components should strictly be from any of the international brands viz. AMP / DIGILINK / AVAYA / MOLEX / PANDUIT etc.

Specifications of Passive components:

a. All network UTP cable should be certified and tested to conform to CAT 6 / 6A Gigabit performance by UL and others equipments & accessories should be in accordance with latest applicable recommendations, regulations & standards of:

- CCITT / ITU - ANSI
- IEC - IEEE
- IETF - EIA/TIA 568-B.2-1Standards
- International Electro-technical Commission (IEC)
- UL/ETL Certified (not listed only certified)

Listed & Verified

- To conform to Gigabit performance (Documents attached with technical bid)
- For parameters not covered under the above codes, internationally acceptable standards shall also be accepted.

b. All fiber cable and components should be certified and tested to conform to 10 Gbps Performance (IEEE 802.3ae standards). (Documents attached with technical bid)

c. All passive components should be from the same manufacture.

d All switches (Core, Distribution & Edge) with NMS should be from the same OEM & support prefect inter-operable

A. UTP CAT 6 Cable

- Should confirm / comply or exceed the EIA/TIA 568A/B, EIA/TIA 5688 or ISO/IEC 11801 (Gigabit) standards for physical & Electrical specifications / standards
- 4 Pair 23 AWG Copper Cable with integral cross member pair separator.
- The Cable should have 100ohm impedance for 100 meters length & data transmission frequencies upto 250 MHz transmission frequencies upto 250 MHz
- ETL certified & UL@ Listed

B. UTP CAT 6a Cable

- Should confirm / comply or exceed the EIA/TIA 568A/B2.10, EIA/TIA 5688 or ISO/IEC 11801 (10 Gigabit) standards for physical & Electrical specifications /standards
- 4 Pair 23 AWG Copper Cable with integral cross member pair separator.
- The Cable should have 100ohm impedance for 100 meters length & data transmission frequencies upto 500 MHz
- ETL certified & UL@ Listed

C. 24 / 48 Port Jack Panel with wire Manager

- Should conform to CAT6a (EIA/TIA 568A/B2.10) specifications
- Should terminate 24 UTP CAT 6 (4 pair) Cables at 110 type wiring block at the rear end and RJ45 jack on the front panel.
- Ports should be with individual dust cover & individually replaceable.
- 19" rack mountable
- Should confirm to EIA/TIA 568A wiring Pattern
- Should have labeling strips for identification.
- Should have cable routing rings and ties both at the front and the rear side for cable support
- ETL certified & UL@ Listed
- 19" rack mountable
- Height 1 U
- Should be able to route wire on both front as well as rear of the jack panel

D. Information Outlet with Surface Mount Box

- Should meet for exceed the EIA/TIA 568 A/B, EIA/TIA 5688 (Gigabit) standard
- Surface mount box with single RJ45 socket to terminate UTP CAT 6 Cable
- Gold plated contact surface
- Provision for dust cover for protection against dust
- Provisions for labeling icons and strips
- Provision for anchors for smooth cable entry.
- ETL certified & UL@ Listed
- the size of front plate should be 3 inch by 3 inch (3” X 3”)

E. Patch Cord 7'/3'

- Should confirm / comply or exceed the EIA/TIA 568A/B2.10, EIA/TIA 5688 and
- ISO/IEC 11801 (10 Gigabit) standards for physical & Electrical specifications /standards
- 4 Pair 26 AWG Copper Cable with integral cross member pair separator.
- Patch Cord with Metallic Screening with cable holders with locking mechanism
- Cord in length on 7 feet/ 3 feet with factory mould RJ-45 plugs at both end
- ETL certified & UL@ Listed

F. Racks:

19" wall mountable/ floor resting standard racks, 9U/12U height with front glass door, closed on all sides, lock and key, 4 fans, trays and 6 socket power supply strip with spike buster etc.