

Corrigendum 02

This is with reference to the tender notification for “Facility Management”, Tender Reference No: NITK/CCC-FM/2024-25/DOC4 Dated: 22-11-2024, Please note the following Additions/Modifications/Corrections in the Tender document.

I) Detailed Specifications for Item referred in SI No: 22, refer page No: 30 under table 2T of the Tender document

24 Port 10/100/1000 Mbps POE + 4 1G Ports Managed switch:

S/N	Parameter	Specification / Value
1	Switch	Make: D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 PoE+ Ports - Min 24 or more 1GbE SFP Uplink Ports - Min 2 or more 1GbE RJ45 fixed Uplink Ports – Min 2 or more All Ports & Necessary Licenses to be quoted, supplied / enabled from day one
	Power Supply	Power Input: 110-240 V AC power
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 4.1 Mbits or Higher
	Switching Capacity	Packet Switching Capacity - Min 56 Gbps or higher Layer 2/Layer 3 throughput - Min 41 Mpps or higher
	Power over Ethernet	IEEE 802.3af PoE / 802.3at (PoE+) Minimum 370W or higher PoE Power Budget PD Alive to check the status of PD Devices connected to PoE ports
4	Software Features	

	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 8K or Higher, VLAN Groups: 256 or Higher, VID: 4K or Higher Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics
	Security	MAC, IPv4/v6 ACL, 802.1X - Port based, RADIUS IPv4 & v6, Port Security, Port – IP Address – MAC Address Binding, ARP Inspection, DHCP Snooping, IP Inspection, Storm control, Trusted DHCP Server / DHCP Server Screening, SSH IPv4 & v6, SSL, ARP Spoofing Prevention, Denial-of-Service (DoS) attack prevention
	High Availability	IEEE 802.3ad / 802.1AX LACP, 4 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Full Featured Web-UI (IPv4 & IPv6), SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Power / Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack, Syslog IPv4 & IPv6
5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted
6	OEM / Bidder Criteria	Offered Brand should have direct presence in India Offered Brand should have own Tech support center (TAC) in India Offered Brand should have own service/repair/support center in Karnataka for faster support Offered Brand & Models should be reputed & field proven Bidder should have Registered office in Karnataka Bidder should have qualified technical support team locally
7	Country of Origin	Non-MIC
8	EMC/EMI/Safety	Safety (ICT) – UL / EN 62368-1 or Better EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024 RoHS – EN/IEC 63000 or equivalent

		UL, CE & FCC
9	Compatibility	All Switches, Modules & Transceivers should be from same Brand
10	PoC / Demo	PoC / Demo needs to be arranged during technical evaluation stage (if required). Bidder should have qualified Manpower to demonstrate
11	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted
12	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter
13	Package Contents	24 Ports 1GbE RJ45 PoE + 2 x 1GbE SFP + 2 x 1GbE RJ45 Uplink Ports with required warranty Necessary Port, Feature & OS License (If applicable) 1U Rack Mount Kit AC Power Cord Installation Guide
		Should be compatible to deploy with Eduroam with Dynamic VLAN. Storm control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

II) Detailed Specifications for Item referred in SI No: 24 to 28 refer page No: 30 under table 2T of the Tender document

24 Port 10/100/1000 Mbps + 4 1G Ports Managed switch :

S/N	Parameter	Specification / Value
1	Switch	Make : D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 Ports - Min 24 or more 1GbE SFP Uplink Ports - Min 2 or more 1GbE RJ45 fixed Uplink Ports – Min 2 or more All Ports & Necessary Licenses to be quoted, supplied / enabled from day one
	Power Supply	Power Input: 110-240 V AC power

	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 4.1 Mbits or Higher
	Switching Capacity	Packet Switching Capacity - Min 56 Gbps or higher Layer 2/Layer 3 throughput - Min 41 Mpps or higher
4	Software Features	
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 8K or Higher, VLAN Groups: 256 or Higher, VID: 4K or Higher Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics
	Security	MAC, IPv4/v6 ACL, 802.1X - Port based, RADIUS IPv4 & v6, Port Security, Port – IP Address – MAC Address Binding, ARP Inspection, DHCP Snooping, IP Inspection, Storm control, Trusted DHCP Server / DHCP Server Screening, SSH IPv4 & v6, SSL, ARP Spoofing Prevention, Denial-of-Service (DoS) attack prevention
	High Availability	IEEE 802.3ad / 802.1AX LACP, 4 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Full Featured Web-UI (IPv4 & IPv6), SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Power / Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack, Syslog IPv4 & IPv6
5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted

6	OEM / Bidder Criteria	<p>Offered Brand should have direct presence in India</p> <p>Offered Brand should have own Tech support center (TAC) in India</p> <p>Offered Brand should have own service/repair/support center in Karnataka for faster support</p> <p>Offered Brand & Models should be reputed & field proven</p> <p>Bidder should have Registered office in Karnataka</p> <p>Bidder should have qualified technical support team locally</p>
7	Country of Origin	Non-MIC
8	EMC/EMI/Safety	<p>Safety (ICT) – UL / EN 62368-1 or Better</p> <p>EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024</p> <p>RoHS – EN/IEC 63000 or equivalent</p> <p>UL, CE & FCC</p>
9	Compatibility	All Switches, Modules & Transceivers should be from same Brand
10	PoC / Demo	<p>PoC / Demo needs to be arranged during technical evaluation stage (if required).</p> <p>Bidder should have qualified Manpower to demonstrate</p>
11	Warranty, Services and Support	<p>Min 3 years Warranty</p> <p>On-site Installation, Configuration and troubleshooting support</p> <p>The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted</p>
12	Documentation	<p>Technical Compliance sheet, Datasheet & Cross Reference</p> <p>Manufacturer Authorization Letter</p>
13	Package Contents	<p>24 Ports 1GbE RJ45 + 2 x 1GbE SFP + 2 x 1GbE RJ45 Uplink Ports with required warranty</p> <p>Necessary Port, Feature & OS License (If applicable)</p> <p>1U Rack Mount Kit</p> <p>AC Power Cord</p> <p>Installation Guide</p>
14		Should be compatible to deploy with Eduroam with Dynamic VLAN. Storm control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

48 Port 10/100/1000 Mbps + 4 1G Ports Managed switch :

S/N	Parameter	Specification / Value
1	Switch	Make : D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 Ports - Min 48 or more 1GbE SFP Uplink Ports - Min 2 or more 1GbE RJ45 fixed Uplink Ports – Min 2 or more All Ports & Necessary Licenses to be quoted, supplied / enabled from day one
	Power Supply	Power Input: 110-240 V AC power
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 12 Mbits or Higher
	Switching Capacity	Packet Switching Capacity - Min 104 Gbps or higher Layer 2/Layer 3 throughput - Min 77 Mpps or higher
4	Software Features	
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 8K or Higher, VLAN Groups: 256 or Higher, VID: 4K or Higher Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics
	Security	MAC, IPv4/v6 ACL, 802.1X - Port based, RADIUS IPv4 & v6, Port Security, Port – IP Address – MAC Address Binding, ARP Inspection, DHCP Snooping, IP Inspection, Storm control, Trusted DHCP Server / DHCP Server Screening, SSH IPv4 & v6, SSL, ARP Spoofing Prevention, Denial-of-Service (DoS) attack prevention

	High Availability	IEEE 802.3ad / 802.1AX LACP, 4 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Full Featured Web-UI (IPv4 & IPv6), SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Power / Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack, Syslog IPv4 & IPv6
5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted
6	OEM / Bidder Criteria	Offered Brand should have direct presence in India Offered Brand should have own Tech support center (TAC) in India Offered Brand should have own service/repair/support center in Karnataka for faster support Offered Brand & Models should be reputed & field proven Bidder should have Registered office in Karnataka Bidder should have qualified technical support team locally
7	Country of Origin	Non-MIC
8	EMC/EMI/Safety	Safety (ICT) – UL / EN 62368-1 or Better EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024 RoHS – EN/IEC 63000 or equivalent UL, CE & FCC
9	Compatibility	All Switches, Modules & Transceivers should be from same Brand
10	PoC / Demo	PoC / Demo needs to be arranged during technical evaluation stage (if required). Bidder should have qualified Manpower to demonstrate
11	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted
12	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter
13	Package Contents	48 Ports 1GbE RJ45 + 2 x 1GbE SFP + 2 x 1GbE RJ45 Uplink Ports with required warranty Necessary Port, Feature & OS License (If applicable)

		1U Rack Mount Kit AC Power Cord Installation Guide
		Should be compatible to deploy with Eduroam with Dynamic VLAN. Strom control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

24 Port 10/100/1000 Mbps POE + 4 10G Ports Managed switch :

S/N	Parameter	Specification / Value
1	Switch	Make : D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 PoE+ Ports - Min 24 or more 10GbE SFP+ Uplink Ports - Min 4 or more 1 RS-232 / RJ45 console port All Ports & Necessary Licenses to be quoted, supplied / enabled from day one
	Power Supply	Power Input: 110-240 V AC power
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 1.5 MBytes or Higher
	Switching Capacity	Packet Switching Capacity - Min 128 Gbps or higher Layer 2/Layer 3 throughput - Min 95 Mpps or higher
	Power over Ethernet (PoE)	IEEE 802.3af Power over Ethernet (PoE) / 802.3at Power over Ethernet (PoE+) Minimum 360W or higher PoE Power Budget PD Alive to check the status of PD Devices connected to PoE ports Time based PoE to allow power only during working hours & save power

4	Software Features	
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 16K or Higher, VLAN Groups & VID: 4K or Higher, Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping: v1, v2, and v3, IGMP Filter, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics Digital Diagnostic Monitoring (DDM)
	Security	MAC, IPv4/v6 ACL, 802.1X - Port & Host based, RADIUS IPv4 & v6, TACACS+, Port Security, DAI, DHCP Snooping IPv4 & V6, IPSG IPv4 & v6, IPv6 ND Inspection, Storm control, SSH IPv4 & v6, SSL
	High Availability	IEEE 802.3ad / 802.1AX LACP, 8 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Role-based Full Featured CLI management, Full Featured Web-UI (IPv4 & IPv6), All the features should be configurable via CLI & Web-UI, SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Storm, Power, Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack
	NMS Monitoring	CPU, Memory, Port Utilization, SNMP Traps, Syslog, FDB Table Monitoring, Private MIB
5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted
6	OEM / Bidder Criteria	Offered Brand should have direct presence in India Offered Brand should have own Tech support center (TAC) in India Offered Brand should have own service/repair/support center in Karnataka for faster support Offered Brand & Models should be reputed & field proven Bidder should have Registered office in Karnataka Bidder should have qualified technical support team locally
7	Country of Origin	Non-MIC

8	EMC/EMI/Safety	Safety (ICT) – UL / EN 62368-1 or Better EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024 RoHS – EN/IEC 63000 or equivalent UL, CE & FCC
9	Compatibility	All Switches, Modules & Transceivers should be from same Brand
10	PoC / Demo	PoC / Demo needs to be arranged during technical evaluation stage (if required). Bidder should have qualified Manpower to demonstrate
11	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted
12	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter
13	Package Contents	24 Ports 1GbE RJ45 Switch + 4 x 10GbE SFP+ Uplink Ports with required warranty Necessary Port, Feature & OS License (If applicable) 1U Rack Mount Kit Console Cable AC Power Cord Installation Guide
14		Should be compatible to deploy with Eduroam with Dynamic VLAN. Storm control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

24 Port 10/100/1000 Mbps + 4 10G Ports Managed Switch :

S/N	Parameter	Specification / Value
1	Switch	Make : D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 Ports - Min 24 or more 10GbE SFP+ Uplink Ports - Min 4 or more 1 RS-232 / RJ45 console port All Ports & Necessary Licenses to be quoted, supplied / enabled from day one

	Power Supply	Power Input: 110-240 V AC power
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 1.5 MBytes or Higher
	Switching Capacity	Packet Switching Capacity - Min 128 Gbps or higher Layer 2/Layer 3 throughput - Min 95 Mpps or higher
4	Software Features	
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 16K or Higher, VLAN Groups & VID: 4K or Higher, Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping: v1, v2, and v3, IGMP Filter, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics Digital Diagnostic Monitoring (DDM)
	Security	MAC, IPv4/v6 ACL, 802.1X - Port & Host based, RADIUS IPv4 & v6, TACACS+, Port Security, DAI, DHCP Snooping IPv4 & V6, IPSG IPv4 & v6, IPv6 ND Inspection, Storm control, SSH IPv4 & v6, SSL
	High Availability	IEEE 802.3ad / 802.1AX LACP, 8 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Role-based Full Featured CLI management, Full Featured Web-UI (IPv4 & IPv6), All the features should be configurable via CLI & Web-UI, SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Storm, Power, Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack
	NMS Monitoring	CPU, Memory, Port Utilization, SNMP Traps, Syslog, FDB Table Monitoring, Private MIB

5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted
6	OEM / Bidder Criteria	Offered Brand should have direct presence in India Offered Brand should have own Tech support center (TAC) in India Offered Brand should have own service/repair/support center in Karnataka for faster support Offered Brand & Models should be reputed & field proven Bidder should have Registered office in Karnataka Bidder should have qualified technical support team locally
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14		Should be compatible to deploy with Eduroam with Dynamic VLAN. Storm control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

48 Port 10/100/1000 Mbps + 4 10G Ports Managed Switch :

S/N	Parameter	Specification / Value
1	Switch	Make : D-Link/Cisco/Aruba
2	Hardware	
	Interfaces	1GbE RJ45 Ports - Min 48 or more 10GbE SFP+ Uplink Ports - Min 4 or more 1 RS-232 / RJ45 console port All Ports & Necessary Licenses to be quoted, supplied / enabled from day one
	Power Supply	Power Input: 110-240 V AC power
	Dimensions & Rack Installation	19-inch Rack Mount with Rack Installation Kit
	Environmental	Operating temperature: 0° to 50° C or Higher MTBF - > 2,19,000 Hours or Higher
3	Performance	
	Packet Buffer	Packet Buffer – Minimum 2 MBytes or Higher
	Switching Capacity	Packet Switching Capacity - Min 176 Gbps or higher Layer 2/Layer 3 throughput - Min 130 Mpps or higher
4	Software Features	
	Network Operating System	License should include all Advanced software features Switch should have Commercial Enterprise NOS from same OEM as Switch. Open Source based NOS not acceptable.
	Features	MAC addresses: Min 16K or Higher, VLAN Groups & VID: 4K or Higher, Jumbo frames: 9K or Higher, STP, RSTP, MSTP, Port Mirroring, VLAN - IEEE 802.1Q, Port-based, Voice VLAN, Loopback Detection & Protection (Independent of STP), IEEE 802.3ad: LACP, IGMP snooping: v1, v2, and v3, IGMP Filter, MLD Snooping, ARP, Min 4 or more IPv6 SVI / VLAN Interfaces, IPv4 & IPv6 DHCP Relay, IPv4 & IPv6 Static Routing, Cable Diagnostics Digital Diagnostic Monitoring (DDM)
	Security	MAC, IPv4/v6 ACL, 802.1X - Port & Host based, RADIUS IPv4 & v6, TACACS+, Port Security, DAI, DHCP Snooping IPv4 & V6, IPSG IPv4 & v6, IPv6 ND Inspection, Storm control, SSH IPv4 & v6, SSL

	High Availability	IEEE 802.3ad / 802.1AX LACP, 8 LAGs with Min 8 Ports per LAG Dual Image & Dual Configurations
	Quality of Service (QoS)	L2 and L3 QoS: Classification, rewrite, queuing, Rate limiting SP, WRR / WDRR/SDWRR, 802.1p remarking
	Device Management and Operations	On-Premise Management, Role-based Full Featured CLI management, Full Featured Web-UI (IPv4 & IPv6), All the features should be configurable via CLI & Web-UI, SNMP IPv4 & IPv6, SNMP v1/v2/v3, SNMP Traps – Link, STP, Loop, Storm, Power, Fan, New MAC, Remote monitoring (RMON), NTP / SNTP, SSH v2 (IPv4 & v6), IEEE 802.1AB LLDP, IPv4/v6 Dual Stack
	NMS Monitoring	CPU, Memory, Port Utilization, SNMP Traps, Syslog, FDB Table Monitoring, Private MIB
5	Certifications / Compliance	OEM/OS/Switch should have IEC or ISA or equivalent Indian Cyber Security Certification. Certificate to be submitted
6	OEM / Bidder Criteria	Offered Brand should have direct presence in India Offered Brand should have own Tech support center (TAC) in India Offered Brand should have own service/repair/support center in Karnataka for faster support Offered Brand & Models should be reputed & field proven Bidder should have Registered office in Karnataka Bidder should have qualified technical support team locally
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	EMC/EMI/Safety	Safety (ICT) – UL / EN 62368-1 or Better EMC - EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024 RoHS – EN/IEC 63000 or equivalent UL, CE & FCC
8	Compatibility	All Switches, Modules & Transceivers should be from same Brand
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10	Warranty, Services and Support	Min 3 years Warranty On-site Installation, Configuration and troubleshooting support The offered model should be latest. End of Sales (EoS) announced model or model going to be EoS in next 6 months should not be quoted
11	Documentation	Technical Compliance sheet, Datasheet & Cross Reference Manufacturer Authorization Letter

12	Package Contents	48 Ports 1GbE RJ45 Switch + 4 x 10GbE SFP+ Uplink Ports with required warranty Necessary Port, Feature & OS License (If applicable) 1U Rack Mount Kit Console Cable, AC Power Cord, Installation Guide
		Should be compatible to deploy with Eduroam with Dynamic VLAN. Strom control, Access Control, setup of NITK and should be demonstrated before participating in the tender and MAF from the OEM should be submitted along with bid

III) Detailed Specifications for Items referred in SI No: 29,30,31, refer page No: 30 under table 2T of the Tender document

Access Points	
SL No	Specification / Requirement
1	The APs should support the 802.11a, 802.11b, 802.11g and 802.11n, 802.11ac and 802.11ax standards.
2	Simultaneous client support on dual band radio is essential.
3	Shall provide Min 23 dBm Radio output power for both Radio's.
4	Should support minimum 2x2:2 or higher MIMO on both radio bands for an aggregate capacity of around 1700 Mbps
5	The Access points should be Centrally Managed by a full-fledged controller.
6	It should have adaptive antenna technology for performance optimization and interference mitigation features. Antenna should provide Extended coverage utilizing multi-directional antenna patterns. Access point to have Polarization Diversity with Maximal Ratio Combining (PDMRC).
7	Antenna should dynamically choose antenna patterns in real-time environment to establish the best possible connection with every device. Should support at least 50 antenna patterns combinations.
8	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.
9	Antenna should direct the radio signals per-device on a packet-by-packet in real-time to support high device density environments. Should have 3 dBi gain. Antenna operates without the need for device feedback to support devices using legacy standards.
10	AP should have 1x1Gbps RJ-45 based Ethernet PoE port.
11	It should have less than 15 Watts power consumption for full functionality including USB port on PoE
12	The access point should support IOT based technologies such as Bluetooth, zigbee either inbuilt or using an external usb module.
13	The access point should support WPA2 and WPA3 enterprise authentication and AES/CCMP encryption. AP should support Authentication via 802.1X and Active Directory.
14	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e
15	Should support the following channelization - 20MHz, 40MHz, 80MHz
16	Should support min 250 clients per AP or more

17	AP should be flexible hardware to be deployed as Standalone, Controller-less (Cluster), Controller-based, Cloud-based.
18	AP should be able to act as sensor for WIPS, Location analytics engine and Network analytics engine.
19	The access point should include application recognition and control
20	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards
21	APs should be site survivable. It should be possible to configure as such if controller goes down, still APs should be able to handle client traffic.
22	AP should support AES256 encrypted SSH/GRE-based tunnel for data forwarding.
23	AP should have recovery SSID for easy access to CLI console when AP is unreachable through network.
24	Shall support 16 SSID's per AP.
25	Shall support 1 USB port also.
26	Operating Temperature: 0°C - 40°C
27	Operating Humidity: 10 % - 95% non-condensing.
28	Should be UL 2043 plenum rated and comply to RoHS
29	Should be WiFi certified; WiFi certificate to be enclosed
30	Should be WPC approved; ETA certificate to be enclosed
31	Should support the following standards - WEEE & RoHS, EN 60950, EN 61000
32	AP should be compatible with the existing controller in NITK Surathkal
33	Should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
34	MAF from the OEM should be submitted along with bid

Access Points	
SL No	Specification / Requirement
1	The APs should support the 802.11a, 802.11b, 802.11g and 802.11n, 802.11ac and 802.11ax standards.
2	Simultaneous client support on dual band radio is essential.
3	Shall provide Min 24 dBm Radio output power for both Radio's.
4	Should support minimum 2x2:2 or higher MIMO on both radio bands for an aggregate capacity of around 1700 Mbps
5	The Access points should be Centrally Managed by a full-fledged controller
6	Since most radio interference come from the WLAN network itself the vendor should specify what mechanisms such as beam steering/ adaptive antenna technology/ beamforming are available in combination to focus the energy on the destination STA and minimize radio interference with the surrounding of the AP.
7	Since the WLAN network will be using an unlicensed band the solution should have mechanisms that reduce the impact of interference generated by other radio equipment operating in the same band.
8	The access point should be able to detect clients that have dual band capability and automatically steer those client to use the 5GHz band instead of the 2.4GHz band.

9	The antennas to be dual polarised and should be integrated inside the access point enclosure to minimize damage and create a low profile unit that does not stand out visually.
10	The access point should have minimum 2 x 1 Gigabit Ethernet port
11	The access point should support 802.1q VLAN tagging
12	The access point should have inbuilt support for IOT based technologies such as Bluetooth, zigbee
13	The access point should support WPA2 and WPA3 enterprise authentication and AES/CCMP encryption. AP should support Authentication via 802.1X and Active Directory.
14	Implement Wi-Fi alliance standards WMM, 802.11d, 802.11h and 802.11e
15	Should support the following channelization - 20MHz, 40MHz, 80MHz
16	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration. This feature should be demonstrable.
17	Support RF auto-channel selection by the following three methods: a) measuring energy levels on the channel; b) monitoring for 802.11 signal structures and; (c) detecting radar pulses. Other similar forms of smart selection shall also be accepted.
18	Channel selection based on measuring throughput capacity in real time and switching to another channel should the capacity fall below the statistical average of all channels without using background scanning as a method.
19	The access point should support application recognition and control
20	Should include WIPS to detect and mitigate rogue access points, Spoofing of SSID and Mac spoofing.
21	WLAN solution shall provide unique preshared keys to each and every user in single SSID. All licenses for this solution to be included.
22	Should support Transmit power tuning in 1dB increments in order to reduce interference and RF hazards
23	Should support 1GB RAM and 512 MB flash
24	Should support upto 30 simultaneous Voip clients
25	AP should be flexible hardware to be deployed as Standalone, Controller-less (Cluster), Controller-based, Cloud-based.
26	Should support min 500 clients per AP or more
27	Should support location based services
28	AP should support DHCP and NAT
29	Should support tunneling such as Layer 2 Tunnelling protocol and Generic routing Encapsulation.
30	Should support meshing technologies where cable infrastructure may not be available
31	Shall support 30 SSID's per AP.
32	Shall support 1 USB port also.
33	Operating Temperature: 0°C - 45°C
34	Operating Humidity: 10 % - 95% non-condensing.
35	Should be plenum rated and comply to RoHS
36	Should be WiFi certified; WiFi certificate to be enclosed
37	Should be WPC approved; ETA certificate to be enclosed

38	Should support the following standards - WEEE & RoHS, EN 60950, EN 61000
39	Device should be UL 2043 Plenum Rated.
40	Access point should be compatible with the existing controller in NITK Surathkal
41	Should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
42	MAF from the OEM should be submitted along with bid

Access points	
A. Indoor AP	
Specification / Requirement	
1	The APs should support the IEEE 802/11a/b/g/n/ac/ax with dual radio capabilities conforming to Wi-Fi 6 standard.
2	The AP should support 4x4:4 MIMO on 5GHz and 2x2:2 on 2.4Ghz or higher. It should support minimum 2400 Mbps data rates on 5 GHz and minimum 560 Mbps data rates on 2.4GHz.
3	The AP shall have One 2.5Gbps Ethernet port and one 1Gbps Ethernet port. Additionally, it should have an USB port. The access point should support IOT based technologies such as Bluetooth, zigbee either inbuilt or using an external usb module.
4	The access points should be centrally managed as well as have the capability to work as standalone device.
5	The access point should be able to operate in full MIMO mode and the necessary power POE/POE+/uPOE/POH should be provided.
6	Security mechanisms should be in place to protect the communication between the Access Point controller and the Access Points.
7	The AP should have an option to be powered up through DC power in addition to POE.
8	The AP should have a receive sensitivity of -98dBm.
9	The AP should provide an antenna gain of minimum 3dBi on both the bands.
10	Should support 1GB RAM and 512 MB flash
11	The AP should support 20, 40, 80, 160/80+80MHz channelization.
12	The access point should be able to detect clients that have dual band capability and automatically steer those clients to use the 5GHz band instead of the 2.4GHz band.
13	The AP should provide minimum Tx Power of 24dBm on both the bands
14	The access point should support WPA2 and WPA3 enterprise authentication and AES/CCMP encryption. AP should support Authentication via 802.1X and Active Directory.
15	
16	The access point should support 802.1q VLAN tagging
17	The access point should support WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i security.
18	The Access Point should provide for concurrent support for high definition IP Video, Voice and Data application without needing any configuration change. This feature should be demonstrable.
19	The Access Point should support WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v.
20	
21	The AP should have the capability to support minimum 30 BSSID's
22	Should support 500 or more clients per AP.
23	AP should be flexible hardware to be deployed as Standalone, Controller-less (Cluster), Controller-based, Cloud-based.

24	Should support IPv6 dual stack from day one
25	The Access Point should support mesh configuration where cable infrastructure may not be available either directly or through the controller.
26	AP should support DHCP and NAT
27	The Access Point should support rate limiting, application recognition and control, Access Control lists and device fingerprinting.
28	Device should be UL 2043 Plenum Rated.
29	Operating Temperature: 0°C (32°F) - 40°C (104°F). Operating Humidity: up to 95% non-condensing.
30	Should comply to RoHS
31	Should be WiFi certified and WPC approved.
32	Mechanism for physical device locking using padlock /Kensington lock / equivalent
33	Access point should be compatible with the existing controller in NITK Surathkal
34	Should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
35	MAF from the OEM should be submitted along with bid

IV) Detailed Specifications for Items referred in Sl No: 32, refer page No: 31 under table 2T of the Tender document

Solution	
1	Specify proposed AP make and model
2	Should be Rugged Access Point for Outdoor Environment
Radio Specifications	
3	Access Point should be dual-band, dual-radio Outdoor access point
4	The AP should support 2x2:2 MIMO on 5GHz and 2x2:2 on 2.4Ghz or higher.
5	AP should support IEEE 802.11 a/b/g/n/ac/ax amendments.
6	AP should provide 22dBm peak transmit power on both radios, -94 dBm receive sensitivity.
7	It should have adaptive antenna technology for performance optimization and interference mitigation features. Antenna should provide Extended coverage utilizing multi-directional antenna patterns. Polarization Diversity with Maximal Ratio Combining (PDMRC).
8	Antenna should dynamically choose antenna patterns in real-time environment to establish the best possible connection with every device. Should support at least 50 antenna patterns combinations.
9	Antenna should direct the radio signals per-device on a packet-by-packet in real-time to support high device density environments. Should have 3 dBi gain. Antenna operates without the need for device feedback to support devices using legacy standards.
Interface and Power Requirements	
10	AP should have 1x1Gbps RJ-45 based Ethernet PoE port.
11	It should have less than 15 Watts power consumption for full functionality including USB port on PoE
Functionality and Performance Requirements	
12	AP should have capacity to handle minimum 500 Concurrent devices.
13	AP should be flexible hardware to be deployed as Standalone, Controller-less (Cluster), Controller-based, Cloud-based.
14	Should have IPv6 support, IEEE 802.1Q, Band balancing, airtime fairness, QoS, L2/L3/L4 ACL

15	AP should be able to act as sensor for WIPS, Location analytics engine and Network analytics engine.
16	APs should be site survivable. Configuration should be possible to configure as such if controller goes down, still APs should be able to handle client traffic.
Security features	
17	AP should support SSH/GRE-based tunnel for data forwarding.
18	AP Should support auth/encryption methods for WLAN configuration: Open, WEP, WPA2-AES, DPSK, WPA3-SAE, WPA3-OWE, IEEE 802.1X/EAP, AAA, AES-GCMP-256. It should also support Role-Based Access Control, rate-limiting, device fingerprinting, 802.11w MFP and 802.11r Fast roaming.
Management Features	
19	AP should be having administration access through HTTPS GUI, SSH CLI. It should provide WLAN configuration for standalone operation and provisioning tools for controller/cloud operations. If controller config disallows GUI/CLI access it should follow same.
20	AP should support Zap network speed testing tool. Bidder should provide software for both computers and mobile during installation.
21	AP should have recovery SSID for easy access to CLI console when AP is unreachable through network.
Warranty and Compliance	
22	AP should be included with wall mounting kits.
23	Should have operating temperature of -20 to 60 °C
24	Should be IP-67 protected Access Point
25	AP hardware should have been approved by Wireless Planning Commission (TRAI, Govt of India). ETA certificate should be submitted. Wi-Fi alliance certification also mandatory.
26	Access point should be compatible with the existing controller in NITK Surathkal
27	Should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
28	MAF from the OEM should be submitted along with bid

V) Detailed Specifications for Items referred in SI No: 42,43, 44 , refer page No: 31 under table 2T of the Tender document

GPON OLT - 4 Port

Technical Specification
PON ports: 4 GPON ports With Loaded 4 No's C++++ PON Module
Uplink Ports: 4 RJ45 , 2 SFP and 2 SFP+
Console port
AUX port
Backplane BW :104Gbps
Switching capacity:92 Gbps
Port Forwarding rate :65.472 Mpps
GPON port speed:Upstream : 1.244Gbps and Downstream : 2.488Gbps
Connector :SC/UPC
Fiber type :Single Mode 9/125
Wavelength:TX : 1490nm , RX : 1310nm
Management Function:
SNMP, Telnet ,CLI,WEB,SSH v2;

Fan Group Control
Port Status monitoring and configuration management
Online ONT configuration and management
User management
Alarm management
Layer2 Switch:
32K Mac address
Support 4096 VLANs
Support port VLAN
Support VLAN tag/Un-tag, VLAN transparent transmission
Support VLAN translation and QinQ
Support storm control based on port
Support port isolation
Support port rate limitation
Support 8021D and 8021W
Support static LACP, Dynamic LACP
QoS based on port, VID, TOS and MAC address
Access control list
IEEE802x flow-control
Port stability statistic and monitoring
Multicast:
IGMP snooping
2048 IP Multicast Groups
DHCP:
DHCP server, DHCP relay, DHCP snooping
DHCP option82
Layer 3 Route:
ARP proxy
4096 hardware Host Routes,512 hardware Subnet Routes
Support 8021X,Radius,Tacacs+
Support IP source guard
Support static route ,dynamic route RIP v1/v2,RIPng and OSPF v2/v3
IPv6:
Support NDP;Support IPv6 Ping,IPv6 Telnet,IPv6 routing;
Support ACL based on source IPv6 address,destination IPv6 address, L4 port, protocol type, etc;
Support MLD v1/v2 snooping(Multicast Listener Discovery snooping)
GPON Function:
Tcont DBA
Gemport traffic
In compliant with ITU-T984x standard
Up to 20KM transmission Distance
Support data encryption, multi-cast, port VLAN, separation, RSTP, etc
Support ONT auto-discovery/link detection/remote upgrade of software
Support VLAN division and user separation to avoid broadcast storm
Support power-off alarm function, easy for link problem detection
Support broadcasting storm resistance function
Support port isolation between different ports
Support ACL and SNMP to configure data packet filter flexibly

Specialized design for system breakdown prevention to maintain stable system
Support RSTP,IGMP Proxy
Power Consumption:45W
Working Temperature :0°C ~+50°C
Storage Temperature: -40~+85°C
Relative Humidity : 5~90% (non-condensing)
TEC certified
OLT should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
MAF from the OEM should be submitted along with bid

GPON OLT - 8 Port

Technical Specification
PON ports: 8 GPON ports With Loaded 8 No's C++++ PON Module
Uplink Ports: 4 RJ45 , 2 SFP and 2 SFP+
Console port
AUX port
Backplane BW :104Gbps
Switching capacity:92 Gbps
Port Forwarding rate :65.472 Mpps
GPON port speed:Upstream : 1.244Gbps and Downstream : 2.488Gbps
Connector :SC/UPC
Fiber type :Single Mode 9/125
Wavelength:TX : 1490nm , RX : 1310nm
Management Function:
SNMP, Telnet ,CLI,WEB,SSH v2;
Fan Group Control
Port Status monitoring and configuration management
Online ONT configuration and management
User management
Alarm management
Layer2 Switch:
32K Mac address
Support 4096 VLANs
Support port VLAN
Support VLAN tag/Un-tag, VLAN transparent transmission
Support VLAN translation and QinQ
Support storm control based on port
Support port isolation
Support port rate limitation
Support 8021D and 8021W
Support static LACP, Dynamic LACP
QoS based on port, VID, TOS and MAC address
Access control list
IEEE802x flow-control

Port stability statistic and monitoring
Multicast:
IGMP snooping
2048 IP Multicast Groups
DHCP:
DHCP server, DHCP relay, DHCP snooping
DHCP option82
Layer 3 Route:
ARP proxy
4096 hardware Host Routes,512 hardware Subnet Routes
Support 8021X,Radius,Tacacs+
Support IP source guard
Support static route ,dynamic route RIP v1/v2,RIPng and OSPF v2/v3
IPv6:
Support NDP;Support IPv6 Ping,IPv6 Telnet,IPv6 routing;
Support ACL based on source IPv6 address,destination IPv6 address, L4 port, protocol type, etc;
Support MLD v1/v2 snooping(Multicast Listener Discovery snooping)
GPON Function:
Tcont DBA
Gemport traffic
In compliant with ITU-T984x standard
Up to 20KM transmission Distance
Support data encryption, multi-cast, port VLAN, separation, RSTP, etc
Support ONT auto-discovery/link detection/remote upgrade of software
Support VLAN division and user separation to avoid broadcast storm
Support power-off alarm function, easy for link problem detection
Support broadcasting storm resistance function
Support port isolation between different ports
Support ACL and SNMP to configure data packet filter flexibly
Specialized design for system breakdown prevention to maintain stable system
Support RSTP,IGMP Proxy
Power Consumption:45W
Working Temperature :0°C ~+50°C
Storage Temperature: -40~+85°C
Relative Humidity : 5~90% (non-condensing)
TEC certified
OLT should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
MAF from the OEM should be submitted along with bid

GPON OLT - 16 Port

Technical Specification
PON ports: 16 GPON ports With Loaded 16 No's C++++ PON Module
Uplink Ports: 4 RJ45 , 2 SFP and 2 SFP+

Console port
AUX port
Backplane BW :104Gbps
Switching capacity:92 Gbps
Port Forwarding rate :65.472 Mpps
GPON port speed:Upstream : 1.244Gbps and Downstream : 2.488Gbps
Connector: SC/UPC
Fiber type: Single Mode 9/125
Wavelength:TX : 1490nm , RX : 1310nm
Management Function:
SNMP, Telnet, CLI, WEB, SSH v2;
Fan Group Control
Port Status monitoring and configuration management
Online ONT configuration and management
User management
Alarm management
Layer2 Switch:
32K Mac address
Support 4096 VLANs
Support port VLAN
Support VLAN tag/Un-tag, VLAN transparent transmission
Support VLAN translation and QinQ
Support storm control based on port
Support port isolation
Support port rate limitation
Support 8021D and 8021W
Support static LACP, Dynamic LACP
QoS based on port, VID, TOS and MAC address
Access control list
IEEE802x flow-control
Port stability statistic and monitoring
Multicast:
IGMP snooping
2048 IP Multicast Groups
DHCP:
DHCP server, DHCP relay, DHCP snooping
DHCP option82
Layer 3 Route:
ARP proxy
4096 hardware Host Routes,512 hardware Subnet Routes
Support 8021X,Radius,Tacacs+
Support IP source guard
Support static route ,dynamic route RIP v1/v2,RIPng and OSPF v2/v3
IPv6:
Support NDP;Support IPv6 Ping,IPv6 Telnet,IPv6 routing;
Support ACL based on source IPv6 address,destination IPv6 address, L4 port, protocol type, etc;
Support MLD v1/v2 snooping(Multicast Listener Discovery snooping)
GPON Function:

Tcont DBA
Gemport traffic
In compliant with ITU-T984x standard
Up to 20KM transmission Distance
Support data encryption, multi-cast, port VLAN, separation, RSTP, etc
Support ONT auto-discovery/link detection/remote upgrade of software
Support VLAN division and user separation to avoid broadcast storm
Support power-off alarm function, easy for link problem detection
Support broadcasting storm resistance function
Support port isolation between different ports
Support ACL and SNMP to configure data packet filter flexibly
Specialized design for system breakdown prevention to maintain stable system
Support RSTP,IGMP Proxy
Power Consumption:45W
Working Temperature :0°C ~+50°C
Storage Temperature: -40~+85°C
Relative Humidity : 5~90% (non-condensing)
TEC certified
OLT should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
MAF from the OEM should be submitted along with bid

VI) Detailed Specifications for Items referred in Sl No: 45, refer page No: 31 under table 2T of the Tender document

XPON ONU Router with 1 PON and 1 Giga Port

Technical Specification
Interface type: 1 * 10/100/1000 Mbps auto adaptive ethernet interface Full /Half duplex RJ45 Connector • 1 XPON port (EPON PX20+ and GPON Class B+)
SC single-mode / single-fiber symmetric 1.25 Gbps
SC single-mode / single-fiber Downstream : 2.5 Gbps , Upstream : 1.25 Gbps
GPON support
EPON Support
Wavelength : Tx: 1310 nm, Rx :1490 nm
Sensitivity :< - 27 dBm (PX20+)
Overload: > - 8dBm (PX20+)
Transmitting Optical Power : 0 - 4dBm
OpticalType: SC/PC type
VLAN
Support VLAN tag mode
Support VLAN trunk mode
Support VLAN transparent mode
Support VLAN 1:1 translation mode (max 8 VLANs)
LAN port should support trunking of 8 VLANs

Alarm
Support Dying Gasp
Support Port Loop Detect
Support Eth Port Los
Basic
Support MPCP discover and register
Support Authentication MAC/LOID/MAC+LOID
Support Triple Churning
Support DBA bandwidth
LED indicators
SYS, LINK/ACT, REG
Multicast
Support IGMP v1/v2
Support IGMP Snooping
L3
Support IPv4, IPv6 and IPv4/IPv6 dual stack
Support DHCP / PPPoE/ Static
Support Static route
Support NAT
Management
Support CTC OAM
Support WEB
Support TELNET
Support CLI
QoS
Support 4 Queues
Support SP and WRR
Support 802.1P
DC power supply: 12V external AC-DC adapter
Power Consumption: <=4W
Operating temperature : -30 to +70°C
Operating Humidity: 10 to 90 % (non-condensed)
Storing temperature: -30 to +70°C
Storing Humidity: 10 to 90 % (non-condensed)
Features
Plug and Play
Auto config and Auto FW upgrade
Integrated OAM remote config and maintenance function
TEC certified
ONU should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
MAF from the OEM should be submitted along with bid

VII) Detailed Specifications for Items referred in SI No: 46, refer page No: 31 under table 2T of the Tender document

XPON ONU Router with 1 PON, 1 Gigabit LAN port and 1 FXS port
<p>PON</p> <ul style="list-style-type: none"> • 1 XPON port (EPON PX20+ and GPON Class B+) • SC single mode, SC/UPC connector • TX optical power: 0~+4dBm • RX sensitivity: -27dBm • Overload optical power: -3dBm(EPON) or -8dBm (GPON) • Transmission distance: 20KM • Wavelength: TX 1310nm, Rx1490nm
<p>Interface Type</p> <ul style="list-style-type: none"> • 1*GE, Auto-negotiation, RJ45 ports • 1*POTS Connecto
<p>Indicators</p> <ul style="list-style-type: none"> • PWR, PON, LOS, WAN, LAN, PHONE
<p>Basic</p> <ul style="list-style-type: none"> • Full speed non-blocking switching • 4K VLAN ID • Support auto polarity detection of Ethernet ports (AUTO MDIX)
<p>Security</p> <ul style="list-style-type: none"> • Support Firewall • Support Mac filter Based on MAC or URL • Support ACL
<p>VLAN</p> <ul style="list-style-type: none"> • Support VLAN tag mode • Support VLAN trunk mode • Support VLAN translation
<p>Multicast</p> <ul style="list-style-type: none"> • Support IGMP and MLD snooping
<p>VoIP</p> <ul style="list-style-type: none"> • SIP and IMS SIP • G.711a/G.711u/G.722/G.729 Codec • Echo cancellation, VAD/CNG, <p>DTMF Relay</p> <ul style="list-style-type: none"> • T.30/T.38 FAX • Caller Identification/Call Waiting/Call Forwarding/Call Transfer/Call Hold/3-way Conference • Line testing according to GR-909

<p>QoS</p> <ul style="list-style-type: none"> • Support 4 queues • Support SP and WRR • Support 802.1P and DSCP
<p>L3</p> <ul style="list-style-type: none"> • Support IPv4, IPv6 and IPv4/IPv6 dual stack • Support DHCP/PPPOE/Static • Support Static route • Support DHCP Server • Support DDNS • Support DMZ and Port Forwarding
<p>Management</p> <ul style="list-style-type: none"> • Support WEB • Support OAM/OMCI • Support Telnet • Support TR069
<p>Power consumption</p> <ul style="list-style-type: none"> • ≤10W
<p>Storing humidity</p> <ul style="list-style-type: none"> • 10% ~ 90% (non-condensing)
<p>Operating temperature</p> <ul style="list-style-type: none"> • 0°C ~ +55°C
<p>Operating humidity</p> <ul style="list-style-type: none"> • 10% ~ 90% (non-condensing)
<p>Storing temperature</p> <ul style="list-style-type: none"> • -30°C ~ +60°C
<p>Dimensions</p> <ul style="list-style-type: none"> • 100mm*92mm*29.5mm (L×W×H)
<p>Net Weight</p> <ul style="list-style-type: none"> • 0.11kg
<p>DC Power Supply</p> <ul style="list-style-type: none"> • DC 12V / 1A, external AC-DC power adapter
<p>Made In INDIA</p>
<p>Manufacturing plant / factory in India</p>
<p>Online Support available</p>
<p>Warranty : 3 years</p>
<p>TEC certified</p>

VIII) Detailed Specifications for Items referred in SI No: 47, 48, refer page No: 31 under table 2T of the Tender document

GPON-GEPON ONU 300 Mbps WiFi Router with 1PON -2GE LAN ports and 1FXS Port

Specification
<p>XPON ONU 300Mbps Wireless Router</p> <ul style="list-style-type: none"> • LAN Port: 1 x 10/100/1000 Mbps + 1 x 10/100 Mbps Auto adaptive Ethernet Interface Full /Half duplex RJ45 Connector • 1 FXS (Voice Port) • WAN Port : SC/PC (Optical Type)
<p>PON Interface: SC single-mode / single-fiber</p> <ul style="list-style-type: none"> • Upstream :1.25 Gbps • Downstream 2.488 Gbps
<p>Wavelength:</p> <ul style="list-style-type: none"> • Transmission wavelength: 1310 nm • Receiver wavelength 1490 nm
<p>Sensitivity</p> <ul style="list-style-type: none"> • Receiver Sensitivity: -8dBm to -27dBm
<p>Wireless : Compliant with IEEE 802.11 b/g/n , 300 Mbps, 2T2R with Two external antenna</p>
<p>Indicators: Power , LOS , PON, LAN2, LAN1 , TEL, Wi-Fi, Pair</p>
<p>VLAN</p> <ul style="list-style-type: none"> • Support VLAN tag mode • Support 1:1 VLAN • Support VLAN trunk mode
<p>Multicast</p> <ul style="list-style-type: none"> • Support IGMP Snooping • Support MLD Snooping
<p>QoS</p> <ul style="list-style-type: none"> • Support 4 Queues • Support SP and WRR • Support 802.1P • Support DSCP
<p>Layer 3</p> <ul style="list-style-type: none"> • Support IPv4/IPv6 and IPv4/IPv6 Dual Stack • Support DHCP/ PPPoE/ Static • Support DDNS • Support Static Route • Support NAT • Support Virtual Server • Support DMZ
<p>DHCP</p> <ul style="list-style-type: none"> • Support DHCP Server

<p>VoiP</p> <ul style="list-style-type: none"> • Support SIP Protocol • Support Voice coding : ITU-T G.711/ G.723 / G.726 / G.729 • Support Echo cancellation exceeding ITU-T G.165 / G.168-2002 upto 128ms tail length • Support high/low speed fax/modem • Support bypass fax and T38 fax • Support MD5 authentication • Support Inband / RFC2833 / SIP INFO • Support call forward, call waiting , hot-line call • Support multi party conferencing • Support line testing according to GR-909
<p>Wireless</p> <ul style="list-style-type: none"> • Support 802.11 b/g/n and mixed mode • Support 4 SSID • Support No-auth , WEP, WPA-PSK and WPA2-PSK • Support AES , TKIP encryption
<p>Security</p> <ul style="list-style-type: none"> • Support Firewall • Support MAC filter • Support ACL • Support URL Filter
<p>Management</p> <ul style="list-style-type: none"> • Support CTC OAM 2.0 and 2.1 • Support ITU-T 984.x OMCI • Support WEB • Support TR069 • Support Telnet
<p>Ambient temperature:</p> <ul style="list-style-type: none"> • -5 to +55°C
<p>Ambient Humidity</p> <ul style="list-style-type: none"> • 10~90% (non-condensed)
<p>Store Temperature</p> <ul style="list-style-type: none"> • -30 ~ +60°C
<p>Store Humidity</p> <ul style="list-style-type: none"> • 10~90% (non-condensed)
<p>Made In INDIA</p>
<p>Manufacturing plant / factory in India</p>
<p>Online Support available</p>
<p>Warranty : 3 years</p>
<p>TEC certified</p>
<p>Should be compatible and should be able to manage centrally from existing OLT</p>
<p>ONU should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender</p>
<p>MAF from the OEM should be submitted along with bid</p>

GPON-GEPON ONU AC1200 WiFi Router with 1PON -2GE LAN ports and 1FXS Port

Technical Specification
PON interface <ul style="list-style-type: none"> • 1 XPON port (EPON PX20+ and GPON Class B+) • SC Single mode • TX optical Power : 0 to 4 dBm • Transmission distance : 20 km • RX : 2.488 Gbps , TX : 1.2488 Gbps
LAN interface <ul style="list-style-type: none"> • 2 * 10/100/1000 Mbps auto adaptive Ethernet interface, RJ45 connectors, 1 POTS Rj11 Connector
Wavelength: Transmission wavelength: 1310 nm Receiver wavelength: 1490 nm
TX optical Power : 0 to 4 dBm
Sensitivity
Receiver Sensitivity: -8dBm to -25dBm
Optical Type : SC/PC
Wireless: Compliant with IEEE 802.11 b/g/n/ac
Indicators: Power , LOS , PON, LAN2, LAN1 , TEL, 2.4G, 5G , Phone
VLAN
Support VLAN tag mode
Support VLAN translation mode
Support VLAN trunk mode
Multicast
Support IGMP v1/v2/v3
Support IGMP Proxy and MLD Proxy
Support IGMP Snooping and MLD Proxy Snooping
QoS
Support 4 Queues
Support SP and WRR
Support 802.1P
Support DSCP
Layer 3
Support IPv4/IPv6 and IPv4/IPv6 Dual Stack
Support DHCP/ PPPoE/ Static
Support DDNS
Support Static Route
Support NAT
Support Virtual Server
Support DMZ
Support DHCP Server
VoiP
Support SIP Protocol

Support Voice coding : ITU-T G.711/ G.723 / G.726 / G.729
Support Echo cancellation exceeding ITU-T G.165 / G.168-2002 upto 128ms tail length
Support high/low speed fax/modem
Support bypass fax and T38 fax
Support MD5 authentication
Support Inband / RFC2833 / SIP INFO
Support call forward, call waiting , hot-line call
Support multi party conferencing
Support line testing according to GR-909
Wireless
Support 802.11 b/g/n/ac and mixed mode
Support 4 SSID
Support No-auth , WEP, WPA-PSK and WPA2-PSK
Support AES , TKIP encryption
Security
Support Firewall
Support MAC filter
Support ACL
Support URL Filter
Management
Support CTC OAM 2.0 and 2.1
Support ITU-T 984.x OMCI
Support WEB
Support TR069
Support Telnet
Ambient temperature: 0 ~ +55°C
Ambient Humidity: 10~90% (non-condensed)
Store Temperature: -30 ~ +60°C
Store Humidity: 10~90% (non-condensed)
TEC certified
Should be compatible and should be able to manage centrally from existing OLT
ONU should be compatible to deploy with Eduroam setup of NITK and should be demonstrated before participating in the tender
MAF from the OEM should be submitted along with bid

IX) Detailed Specifications for Items referred in SI No: 49 to 60 refer page No: 31 and 32 under table 2T of the Tender document

Technical Specification	
5MP IR Bullet Camera (2.8mm Lens)	<ul style="list-style-type: none"> • 1/2.8” SONY - CMOS (STARVIS Series) • 5MP, 0Lux with IR LED ON • Horizontal Field of View: 107 degrees and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression, BIS, CE, FCC, IP67 and RoHS

	<ul style="list-style-type: none"> • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • Cyber Security Features: STQC Certified as per OWASP ASVS 4.0 L2 <p>*NDAA Compliant Product on Request</p> <p>Make : Matrix/Vivotek/Bosch</p>
5MP IR Bullet Camera (4mm Lens)	<ul style="list-style-type: none"> • 1/2.8” SONY - CMOS (STARVIS Series) • 5MP, 0Lux with IR LED ON • Horizontal Field of View: 87 degrees and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression, BIS, CE, FCC, IP67 and RoHS • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • Cyber Security Features: STQC Certified as per OWASP ASVS 4.0 L2 <p>*NDAA Compliant Product on Request</p> <p>Make : Matrix/Vivotek/Bosch</p>
8MP IR Bullet Camera (2.8mm Lens)	<p>8MP IR Bullet Camera (2.8mm Lens)</p> <ul style="list-style-type: none"> • 1/2.8” SONY - CMOS (STARVIS Series) • 8MP, 0Lux with IR LED ON • Horizontal Field of View: 107 degree and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression, PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, IP67 and RoHS • Cyber Security Features: STQC Certified as per OWASP ASVS 4.0 L2 <p>*NDAA Compliant Product</p> <p>Make : Matrix/Vivotek/Bosch</p>
8MP IR Bullet Camera (3.6mm Lens)	<ul style="list-style-type: none"> • 1/2.8” SONY - CMOS (STARVIS Series) • 8MP, 0Lux with IR LED ON • Horizontal Field of View: 84 degree and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression, PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, IP67 and RoHS • Cyber Security Features: STQC Certified as per OWASP ASVS 4.0 L2 <p>*NDAA Compliant Product</p> <p>Make : Matrix/Vivotek/Bosch</p>

<p>4 Channel NVR with 4K Support and 1 HDD Slot</p>	<ul style="list-style-type: none"> • 4 IP Channel Inputs; HDMI ;12MP, 8MP, 5MP, 4MP, 3MP, 2MP, 720p, D1 and CIF Recording Resolution • 2x 4K/8x 1080p/16x 720p/ 36x D1 @ 30FPS Local Decoding • 1 SATA HDD Support (Maximum 10TB Capacity, Hard Disk Not Included) • Save Storage Space with Adaptive Recording and Camera-wise Recording Retention • SMS & Email Notification, Video Pop-up, Alarms and Calling from Mobile Application • 360Mbps Throughput - 180 Uplink, 180 Downlink • Cascading: Cre <p>Make : Matrix/Vivotek/Bosch</p>
<p>8 Channel NVR with 4K Support and 1 HDD Slot</p>	<ul style="list-style-type: none"> • 8 IP Channel Inputs; HDMI;12MP, 8MP, 5MP, 4MP, 3MP, 2MP, 720p, D1 and CIF Recording Resolution • 2x 4K/8x 1080p/16x 720p/ 36x D1 @ 30FPS Local Decoding • 1 SATA HDD Support (Maximum 10TB Capacity, Hard Disk Not Included) • Save Storage Space with Adaptive Recording and Camera-wise Recording Retention • SMS & Email Notification, Video Pop-up, Alarms and Calling from Mobile Application • 360Mbps Throughput - 180 Uplink, 180 Downlink • Cascading: Crea <p>Make : Matrix/Vivotek/Bosch</p>
<p>16 Channel NVR with 4K Support and 1 HDD Slot</p>	<ul style="list-style-type: none"> • 16 IP Channel Inputs;HDMI;12MP, 8MP, 5MP, 4MP, 3MP, 2MP, 720p, D1 and CIF Recording Resolution • 2x 4K/8x 1080p/16x 720p/ 36x D1 @ 30FPS Local Decoding • 1 SATA HDD Support (Maximum 10TB Capacity, Hard Disk Not Included) • Save Storage Space with Adaptive Recording and Camera-wise Recording Retention • SMS & Email Notification, Video Pop-up, Alarms and Calling from Mobile Application • 360Mbps Throughput - 180 Uplink, 180 Downlink • Cascading: Cre <p>Make : Matrix/Vivotek/Bosch</p>
<p>32 Channel NVR with 4K Support and 4 HDD Slots</p>	<ul style="list-style-type: none"> • 32 IP Channel Inputs; HDMI, 1/1 Audio I/O and 2/1 Alarm I/O • 12MP, 8MP, 5MP, 4MP, 3MP, 2MP, 720p, D1 and CIF Recording Resolution • 4x 4K/ 10x 3MP/16x 1080p Local Decoding • 4 SATA HDD Support (Maximum 10TB Capacity per Slot, Hard Disk Not Included) • Save Storage Space with Adaptive Recording and Camera-wise Recording Retention • SMS & Email Notification, Video Pop-up, Alarms and Calling from Mobile Application • 512Mbps Throughput - 256 Uplink, <p>Make : Matrix/Vivotek/Bosch</p>

<p>5MP IR Dome Camera (2.8mm Lens)</p>	<ul style="list-style-type: none"> • 1/2.8" SONY - CMOS (STARVIS Series) • 5MP, 0Lux with IR LED ON • Horizontal Field of View: 107 degrees and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, RoHS, IK10, IP67 *NDAA Compliant Product on Request
<p>5MP IR Dome Camera (4mm Lens)</p>	<ul style="list-style-type: none"> • 1/2.8" SONY - CMOS (STARVIS Series) • 5MP, 0Lux with IR LED ON • Horizontal Field of View: 87 degrees and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, RoHS, IK10, IP67 *NDAA Compliant Product on Request Make : Matrix/Vivotek/Bosch
<p>8MP IR Dome Camera (2.8mm Lens)</p>	<ul style="list-style-type: none"> • 1/2.8" SONY - CMOS (STARVIS Series) • 8MP, 0Lux with IR LED ON • Horizontal Field of View: 107 degree and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, RoHS, IK10, IP67 *NDAA Compliant Product Make : Matrix/Vivotek/Bosch
<p>8MP IR Dome Camera (3.6mm Lens)</p>	<ul style="list-style-type: none"> • 1/2.8" SONY - CMOS (STARVIS Series) • 8MP, 0Lux with IR LED ON • Horizontal Field of View: 84 degree and IR Range of up to 30 meters • Video Analytics: Trip Wire, Intrusion Detection and Motion Detection • H.265/H.264/MJPEG Video Compression • PoE Support, NAS Storage, Quad Stream Support • True WDR, 3D Noise Reduction, Adaptive Streaming, Smart Streaming and ROI, SNR > 70 dB • BIS, CE, FCC, RoHS, IK10, IP67 *NDAA Compliant Product Make : Matrix/Vivotek/Bosch

X) Refer SI No: 210 refer page No: 37 under table 2T of the Tender document. Please note:

“Elbow 2 Coach Bolt “may be split into 2 items as Elbow 2” and “Coach bolt” separately and quote the rates separated by a comma in the same order.

XI) Refer SI No: 211 refer page No: 37 under table 2T of the Tender document. Please note:

“Numbering of OFC cables Dressing of OFC cables" may be split into 2 items as Numbering of OFC cables” and “Dressing of OFC cables” separately and quote the rates separated by a comma in the same order.

XII) Refer SI No: 21 page No: 30 under table 2T of the Tender document. Please note

“Item sl. No. 21 is deleted”

XIII) Last Date and Time for submission of tender is extended up to 3.00 p.m. on 10/12/2024

XIV) Date of opening of technical bid: 11/12/2024 @ 3:00 p. m.

**Sd/-
Buyer
(C Vairavanathan)**

**Sd/-
Professor-In-Charge
Central Computer Centre
NITK, Surathkal**