المواصفات الفنية الخاصة بالمناقصة العامة

رقم المناقصة : (٢٠١١/٦٠)

الخاصة بشراء وتوريد وتركيب وتشغيل تجهيزات

Metro Ethernet Switches مع التدريب

المؤسسة العامة للاتصالات السلكية واللاسلكية

الإدارة العامة للمشتريات والمخازن

إدارة المشتريات - قسم العقود والمناقصات

المواصفات الفنية الخاصة بشراء و توريد

Metro Ethernet Switches مع التدريب

ID	YT Specifications	YT Comments	Compliance		vendor comments
			Yes	No	
1	***General:***				
1.1	Yemen Telecom already adopted an IP/MPLS network which consists of core and edge routers. The Metro Ethernet Switches will be connected to the nearest edge routers as an aggregation nodes through dark fiber, DWDM or SDH (Ethernet over SDH). The Ethernet Switches will be aggregation nodes for access network (MSANs, IP DSLAMS, WiMax..etc) also will provide various IP services such as voice networking, data networking (unicast and multicast) and IPTV.				
1.2	The bidder has to provide a detailed proposal to all of the proposed equipment in hardcopy and softcopy in addition, it is required to fill out the RFP table and mention weather the system is supported or not.	- If the proposed system has additional features, the bidder should mention them.			
2	***Architecture:***				
2.1	Non-Blocking architecture	- Non congested midplane and backplane. - Backplane, Switching capacity, and System architecture should be clarified. - The bidder should provide more details about the system architecture.			
2.2	Carrier class switch				
2.3	Non-stop active routing				
2.4					
2.5	Carrier class Availability and Reliability	- Protection, 99.999% - Full redundancy - Sub-50 millisecond failure recovery - The supplier must provide MTBF (mean time between failures)			
2.6	Support universal card slots				
2.7	Switching capacity minimum 256 Gbps	- The bidder shall mention system throughput (full duplex).			
2.8	Modular and expandable.				
2.9	Redundant uplink card				

2.10	Hot swappable for main or sub cards (control and line cards)	Hot swappable for all modules.			
2.11	DC Redundant power supply				
2.12	Redundant switch fabric				
2.13	Redundant fans and coolers				
2.14	Support 4 Ethernet ports (minimum) of 10Gbps speed.	Non-over subscription			
2.15	Support 72 Ethernet ports (minimum) of 1Gbps speed.				
2.16	Hitless software upgrade	Support in service upgrade even the upgrade is for all the operation system			
3	***Ethernet Services***				
3.1	Support Ethernet Virtual Connections (EVCs): • E-Line Services for delivery of point to point • Ethernet Private Lines (EPLs) and Ethernet Virtual Private Lines (EVPL) • E-LAN or Transparent LAN Services (TLS) for LAN to LAN connectivity services with ingress and egress bandwidth profiles using VPLS-TE • Point-to-multipoint (P2MP) Video Broadcast Services (E-Tree)				
3.2	IEEE bridging				
3.3	Layer 2 Protocol Tunneling (L2PT)				
3.4	Hierarchical VPLS (H-VPLS), Virtual Private Wire Service (VPWS), Ethernet over MPLS (EoMPLS), pseudowire redundancy				
3.5	MPLS				
3.6	Support VRRP				
3.7	Label Distribution Protocol (LDP), Targeted LDP (T-LDP), Resource Reservation Protocol (RSVP), Differentiated Services (DiffServ)-aware traffic engineering, MPLS L3VPN				
3.8	MPLS traffic engineering (including TE-FRR)				
3.9	Support Link Aggregation Control Protocol (LACP)				
3.10	Support Link Aggregation, IEEE 802.3ad, Split Multi-Link Trunking (SMLT).				
3.11	Support Metro Ethernet Forum UNI Type 1, 2				
3.12	Support MEF 9 and 14				
3.13	Support IEEE 802.1d, IEEE 802.1w				
3.14	Support MAC Bridging STP/RSTP				
3.15	Standard IEEE 802.1Q				
3.16	Support QinQ				

3.17	Support Selective QinQ				
3.18	Support Inner and Outer VLAN classification				
3.19	Support IEEE bridging				
3.20	Support Tunneling				
3.21	Support routing protocols OSPF, OSPF v2, OSPF v3, RIPv1, RIPv2, ISIS, BGP-4, MPBGP-4				
3.22	Support Label Distribution Protocol (LDP)				
3.23	Support MPLS L2VPN				
3.24	Support MPLS L3VPN				
3.25	Support MPLS traffic engineering (including TE-FRR)				
3.26	Support Signaling: LDP, RSVP-TE, and CR-LDP				
3.27	Support Routing: OSPF-TE, ISIS-TE				
3.28	Support Differentiated Services (DiffServ) -aware traffic engineering.				
3.29	Support IPv6 software and hardware	- The system must support IPv6 in terms of H/W, S/W, IPv6 protocols, services..etc. - If the system needs additional HW or SW to support IPv6, the bidder must provide price list for all the requirements.			
4	***Security***				
4.1	Support external RADIUS, TACACS.				
4.2	Secure Shell (SSH) Protocol.				
4.3	MAC limiting per Ethernet flow point (EFP) or bridge domain; unicast, multicast, and broadcast storm control blocking on any interface or port.				
4.4	Layer 2 ACLs.				
4.5	Layer 3 ACLs.				
4.6	Support broadcast suppression per VLAN				
4.7	Support MAC and IP anti spoofing				
4.8	Support anti ICMP/IP attacking				
4.9	Support anti DOS attacking.				
4.10	Support MAC filtering.				
5	***Multicast:***				
5.1	IPv4 Multicast				
5.2	IGMP v1, v2,v3				
5.3	IGMP Proxy				
5.4	IGMPv1 and v2 snooping				
5.5	Anti-spoofing				
5.6	IP address anti-spoofing				

6	***Traffic management and QoS:***				
6.1	Standard 802.1p class of service (CoS)	- The bidder shall describe how the system manages the traffic.			
6.2	Priority Queuing				
6.3	Classification based on inner and outer class of service (CoS) or VLAN ID				
6.4	Copy inner to outer CoS				
7	***Availability:***				
7.1	Resilient Ethernet Protocol				
7.2	IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)				
7.3	IEEE 802.1s Multiple Spanning Tree Protocol (MST)				
7.4	Per-VLAN Rapid Spanning Tree (PVRST+)				
7.5	MPLS TE Fast Reroute				
7.6	BFD				
7.7	802.3ad Link Aggregation Bundles				
7.8	Availability shall be annually 99.99%				
8	***OAM:***				
8.1	CFM (802.1ag).				
8.2	Link OAM (802.3ah).				
8.3	MPLS OAM.				
8.4	Uplink BW utilization.				
8.5	Packet drop statistics.				
8.6	Performance measurement capability.				
9	***Manageability:***				
9.1	In-band and out-band management.				
9.2	Telnet and SSH.				
9.3	Simple Network Management Protocol (SNMP) V1, V2 and V3				
9.4	MIBs				
9.5	Support, but not limited to Command line interface(CLI),				
10	***Transceivers and cabling :***				
10.1	Support SFP, SFP+ and XFP Modules				
10.2	Support autosense 10/100/1000BASE-X SFP				
10.3	Support 10GBASE-X SFP+				
11	***Indicators:***				
11.1	Per-port status LEDs: Link integrity, port disabled, and activity indications				
11.2	Power input /output status LED				
11.3	Alarm status LED				
11.4	Synch status LED				
11.5	System status LED				

12	***Environmental Requirements:***				
12.1	Operating Temperature: 0ؚ to 55ؚC • Operating Humidity: 10 to 90% relative humidity, non-condensing • Storage Temperature: -20ؚ to 85ؚC				
13	***Standards and protocols:***				
13.1	The system must support the following standers and protocols: • IEEE 802.1s • IEEE 802.1w • IEEE 802.3ad • IEEE 802.3ah • IEEE 802.1ag • IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports • IEEE 802.1D Spanning Tree Protocol • IEEE 802.1p CoS classification • IEEE 802.1Q VLAN • IEEE 802.3 10BASE-T • IEEE 802.3u 100BASE-T • IEEE 802.3ab 1000BASE-T • IEEE 802.3z 1000BASE-X • BFD for OSPF, IS-IS, BGP, HSRP, EIGRP • IP routing: Static, RIP versions 1 and 2, EIGRP, OSPF, BGPv4, PIM-SM, and PIM-DM (metro IP • access only) • Management: SNMP versions 1, 2, and 3				
14	***Others:***				
14.1	The proposed equipment (including every single card) shall be new,original and they **are not** in the out-of-sale or out-of-life phase and they shall be available for the coming five years before they become out-of-sale and seven years before they become out of life. **The bidder has to provide a proof from the manufacturer for this point.**				
14.2	The proposed equipment has to support features according to the ITU and IETF recommendations.				
15	***License:***				
15.1	**The bidder should provide a list for all services and functions that need a license (price List is needed).**	For future needs, the bidder shall provide a price list for all the services which need license to be enabled and they aren't mentioned in the proposal otherwise it will be assumed free of charge.			

16	***Management system*:**				
16.1	All the required hardware and software necessary for the management system must be quoted.				
16.2	The Bidder shall provide management system that can manage all proposed Equipment.				
16.3	The proposed solution should support, but not limited to, management interfaces like Command line interface (CLI), and,(SNMP V1, V2, V3)				
16.4	Provision the proposed equipment(Creation and Maintenance all broadband and narrowband services with easy manner)				
16.5	Backup and restore configuration to all nodes.				
16.6	Provide alarms, and alerts for all failures, service degradation, or conditions that may cause failure, or service degradation in real time.				
16.7	Initiate broadband and narrowband line testing procedures				
16.8	Support GUI for easy operation (local & centralized management control)				
16.9	The bidder has to provide all the necessary MIBs that allow the provided equipment to be monitored and provisioned from the Network Operation Center (NOC).				
16.10	All users activities must be monitored and stored, in the Server Management and the size depend on the file predetermined.				
16.11	Has the ability to collect performance metric at link, VLAN, …,etc				
16.12	Support different privileges.				
16.13	Capable to store logs for at least one year.				
16.14	Support redundant server.				
16.15	Real-time data duplication/Sync into two servers.				
16.16	Sufficient mechanism for logging in different logging levels.				
17	***Documentation and clarifications*:**				
17.1	The bidder has to supply all the documentation that give full description of the proposed equipment (Soft and Hard copy).				
17.2	Manuals for all proposed equipment should be provide in Hardcopy and softcopy.				
18	***SUPPORT*:**				
18.1	The bidder has to propose support all of the proposed equipment (including management system) with the following specifications: - Delivering the latest software release upgrade. - 24X 7 help desk support to help solving problems and facilitating the process of installation. - The bidder shall describe				

	procedure to obtain on-site support assistance for operation and maintenance difficulties including number of Bidder's staffs, their location , experience and facilities . - Online documentation and support tools. - Replacement of defective parts in mutually agreed time frame.				
19	***Training*:**				
19.1	The bidder has to provide an outside training at the bidder academy.				
19.2	Training academy must have an integrated lab.				
19.3	The training should cover all the required subjects regarding the proposed equipment that enables the staff to do all the Hardware installation, operation, maintenance, and troubleshooting.				
19.4	Facilities, accommodations, materials and, equipment required shall be provided.				
20	***Profile*:**				
20.1	The bidder has to provide the areas and countries where the proposed products were installed. Providing a third party tester report is highly recommended as a reference to the company and to the equipment proposed, and also IOT certificates.				
21	***Delivery*:**				
21.1	Delivery period for the proposed equipment shall be mentioned.				
22	***Implementation*:**				
22.1	Bidders shall provide all Professional Services required to delivery, installation and commissioning.				
22.2	The Professional Services shall be included as separate items in the Bill of Materials separated as (System design and engineering), (Software development and customization), (System delivery and installation), and (System testing and acceptance) etc.				
23	***Spare parts*:**				
23.1	The company shall insure that spare parts of the whole system to be available **at least for ten years from the date of coming into force of the contract**.				
24	***Required Technical Information:***				
24.1	The Bidder shall provide enough information to illustrate how the proposed system fulfills flexible deployment and easy expansion.				
24.2	The Bidder shall provide detailed technical information including hardware design, software				

	design, backplane/system bus design and architecture, dimensioning, capacity, capabilities etc.				
24.3	Indicate which buses are dedicated and which are shared by different parts of the equipment, and specify the internal bandwidth of each bus.				
24.4	Specify whether his products can support several network-side interfaces of each type, and in which modes are they supported (load-sharing, aggregation, redundant active-standby, etc).				
24.5	State the power consumption for all supported cards and the maximum power consumption for fully configured chassis.				
24.6	Specify the maximum heat dissipation (BTU/hour) for a fully configured chassis in normal operation condition.				
24.7	Specify the type of cooling (Passive or Forced air cooling or Air Conditioned). If fans are used state the number of fans and fans redundancy.				
24.8	provide detailed description of subscriber board protection mechanisms against over voltage, over current, short circuits between A, and B, short circuits between two different ports, and circuit, or leakage current between A or B and Earth.				
25	***Priced Bill of Quantities:***				
25.1	The Bidder shall provide pricing for the complete Solution. The Bidder shall submit itemized pricing for all network elements, including modular capacity upgrades.				
25.2	If any articles and/or services are not identified in the Bill Of Quantities, but are required to provide an overall working solution according to the specifications defined in the RFP, It/They shall be delivered, installed, tested or otherwise provided free of charge.				
25.3	The pricing of all elements shall be fully disaggregated.				
25.4	Regarding the proposed system the bidder must provide a price list for all the supported parts including hardware, software and licenses for future need and expansion.				
26	***Warranty:***				
26.1	The Bidder warrants both hardware and software for a period of **24 months** following the date of issuing the Provisional Acceptance Certificate				
26.2	All proposed equipment should pass the factory test before delivery, and Primary test after installation.				
26.3	The Bidder will replace or repair faulty modules. The Bidder shall **bear** all costs including				

	transportation charges and customs duties and taxes incurred in the replacement and/or repair of the defective items.				
26.4	The Bidder should guarantee to supply to YT required spare parts for 10 years.				
27	***Bill of quantity*** :	***YT comments***	***Qty***		
27.1	***Hardware:***				
27.1.1	Chassis		10		
27.1.2	Control card /Chassis		2		
27.1.3	10/100/1000 Mbps electrical ports /Chassis		24		
27.1.4	SFP based 10/100/1000 Mbps ports /Chassis	Should be in 2 or more line cards	72		
27.1.5	10/100/1000 Mbps 10 km SMF(LX) SFP		100		
27.1.6	10/100/1000 Mbps 550m MMF(SX) SFP		100		
27.1.7	10/100/1000 Mbps electrical SFP		50		
27.1.8	10/100/1000 Mbps 40 km SMF(XD) SFP		20		
27.1.9	***Spare Parts***:				
27.1.9.1	Chassis		1		
27.1.9.2	Control card		3		
27.1.9.3	10/100/1000 Mbps electrical line card		3		
27.1.9.4	SFP based10/100/1000 Mbps line card		3		
27.3	***Management system***:				
27.3.1	All the required hardware and software necessary for the management system must be quoted.	**It should be quoted as an optional**	1		
27.4	***Support:***				
27.4.1	The bidder has to propose support for all of the proposed equipment (including management system) with specifications mentioned in 17.1	**It should be quoted as an optional**	1		
27.5	***Implementation:***				
27.5.1	The bidder has to provide installation and commissioning for 5 sites.	**It should be quoted as an optional**	1		
27.6	***Training:***				
27.6.1	The bidder has to provide outside training in authorized training center for 10 persons.		10		