PTA

Government of Pakistan
PAKISTAN TELECOMMUNICATION AUTHORITY
Headquarters, F-5/1, Islamabad
http://www.pta.gov.pk

"SAY NO TO CORRUPTION"

INVITATION TO BID

Pakistan Telecom Authority, (a telecommunication regulator in Pakistan) invites sealed bids from the underlined original manufacturers / authorized distributors / suppliers/Contractors etc., registered with Income Tax and Sales Tax Departments for supply of following IT Equipment.

S. No.	Description of the Specification	Quantity
	HARDWARE	
1.	**Unified Storage Area Network with Rack , with FC SAN Switches, FC Cables, HBA etc**	1
2.	**48 X 10 Gig access ports layer 3 Switch, with 6 X 40 GE uplink ports**	2
3.	**48 X 1 Gig access ports Layer 2/3 (PoE+) Switch, with minimum 2 X10 G and 2 X 40 GE uplink ports**	2

4. Bidding documents, containing detailed terms and conditions, method of procurement, procedure for submission of bids, bid security, bid validity, opening of bid, evaluation criteria, clarification / rejection of bids, performance guarantee etc. are available for the interested bidders at (www.pta.gov.pk). Price of the bidding documents is Rs. 500/-(non-refundable in form of pay order/DD in favour of Pakistan Telecommunication Authority). Bidding documents can also be downloaded from (www.pta.gov.pk) free of cost.

5. The bids, prepared in accordance with the instructions in the bidding documents, must reach at PTA Headquarters F-5/1, Islamabad on or before **07-02-2017 10:30 AM**. Technical Bids will be opened the same day at **(11:00 AM)**. This advertisement is also available on PPRA website at www.ppra.org.pk.

Deputy Director (ICT-II)
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Government of Pakistan
PAKISTAN TELECOMMUNICATION AUTHORITY
HEADQUARTERS F-5/1, ISLAMABAD.
http// www.pta.gov.pk

BIDDING DOCUMENTS

Sealed bids are invited from well reputed and authorized dealers having Tier-1 / Tier -2 level dealership, registered with Sales Tax and Income Tax Department, having at least 5 years of relevant business experience for the procurement of following items ,

S.No.	Description	Quantity
A	Storage Area Network (With Rack)	1
	FC SAN Switches	2
	FC Cables (10 Meter length)	20
	FC Cables (3Meter length)	4
	HBA (Dual port) compatible with Dell R720,R730	8
	SEPARATE HARDWARE REQUIRED	
B	48 X 10 Gig access ports layer 3 Switch, with 6 X 40 GE uplink ports and with redundant power supply.	2
	QSFP + Cable Assy, 3m, 30AWG, Passive	6
	48 X 1 Gig access ports Layer 2/3 (PoE+) Switch, with minimum 2 X10 G and 2 X 40 GE uplink ports, with redundant power supply and all required power cords.	2
	Power cables and 920W AC Power Supply, front-to-back airflow	2

Detailed specifications of above-mentioned items are provided at Annex-C of this document. Notice of the bids issued on PTA's/PPRA's websites is part of the bidding document.

Key Terms and Conditions

1. GENERAL INFORMATION:

a. Bidding documents duly completed in all respect will be received on or before **07-02-2017** up to 1030 AM. The submission and evaluation of bids will be carried out under the **"*Single Stage Two Envelop Procedure"*.** Technical bids will be opened by Technical Evaluation Committee, at PTA HQs on the same day at 11:00 AM, in presence of bidder's representative, who may choose to attend.

b. Bid will comprise of single package containing two separate sealed envelopes. One envelop will contain the **"**Technical Proposal" and the second envelop will contain the **"Financial** Proposal". Technically qualified bidders will be informed the date, time and venue for the opening of financial bids. Financial bids of technically disqualified bidders will be returned un-opened.

c. Bids should be sent at the address of Deputy Director (ICT-II) Pakistan Telecommunication Authority (PTA), Headquarters F-5/1, Islamabad.

d. Bidder can quote for any one, or both of the IT equipment mentioned above, depending on relevant dealership in each IT equipment. i.e. a vendor can participate for SAN or for Switches or a Vendor can participate for both SAN and Switch.

e. Annex-A, Annex-B, Annex-C and Annex-D are integral part of technical and financial proposals, which may be read/filled carefully, signed and stamped by the bidders. Further, details of the annexures are mentioned below:

   i. Annex-A consists of mandatory requirements for bidder(s)

   ii. Annex-B consists of technical capabilities of bidder(s), which has total 100 marks, whereas minimum qualifying marks are 70%

   iii. Annex-C consists of technical evaluation of the product and bidder(s) may quote higher specs, however, quoting lower specs shall disqualify the bidder

   iv. Annex-D, comprises of financial bid format, to be followed by all bidders, The bidder should quote its rates clearly for each item, in the financial proposal in both figures and words without any ambiguity.

2. BIDDER's INFORMATION

   a. Name of Firm   _____

   b. Date of establishment of business
       (documentary proof of registration etc.) _____

   c. Address   _____

   d. Telephone No _____Fax No. _____

   e. GST Reg. No   _____

   f. National Tax No   _____

3. EVALUATION CRITERIA

   a. Technical bids shall be opened and evaluated by technical evaluation committee in view of Annex-A, Annex- B and Annex-C. Bidder, obtaining at least 70% out of 100 marks, shall be eligible for the participation in financial bid opening.

b. Financial bids shall be opened and evaluated by procurement committee of PTA i.e. PC-I as the case may be, on the basis of criteria given in Annex-D.

c. Work will be awarded to **financially lowest bidder**.

d. If two or more bidders quote equal lowest price in financial proposals, then the work will be awarded to the one having higher technical marks, in technical evaluation.

e. The bidder should quote its rates clearly against __each item__, in the financial proposal in both figures and words. However, total amount of bid will be considered for evaluation/competition.

4. __EARNEST MONEY__

f. Earnest money will be 2% of the bid amount and will be in the shape of pay order / demand draft in favor of Pakistan Telecommunication Authority, Headquarters, Sector F-5/1, Islamabad Earnest money **shall be attached with the financial proposal otherwise proposal** will not be accepted.

g. **Bids without earnest money will be rejected without any right of appeal.**

h. **Earnest money of successful bidder will be retained till warranty period**. However, earnest money of unsuccessful bidders will be returned after award of supply order to successful bidder.

i. In case of cancelation of Supply Order due to default of the supplier, the earnest money shall be forfeited in favor of PTA.

5. __PRICES:__

a. **The bidder should quote its rates clearly in Pak Rupees** inclusive of all applicable taxes i.e. GST etc. **in the financial proposal and amount in both figures and words as per format attached at Annex-D**

b. The rates quoted shall remain valid for 90 days from the date of opening of Technical Proposal.

c. PTA will not bear transportation/carriage charges.

6. __PAYMENT PROCEDURE__

a. No advance payment shall be made against the supply of equipment / software mentioned in the bidding document.

b. Payment shall be made on provision of invoice/bill, after delivery of the equipment /software at PTA Headquarters and issuance of satisfactory completion/stock verification/physical inspection certificate by PC-I.

c. Payment shall be subject to withholding of applicable taxes as per government rules.

7. **EQUIPMENT / SOFTWARE**

    a.   IT equipment should be new, not used or refurbished. The components of the equipment should be assembled by the manufacturer and shall be verifiable at principal manufacturer website.

    b.   IT equipment / software should be arranged through the legal channels by clearing all customs/duties/taxes (if any) levied by Govt..

8. **DELIVERY PERIOD**

    a.   Delivery of items shall be made within eight (8) weeks time after issuance of supply order.

    b.   Vendor will be responsible for the safe supply of equipment / software at PTA H/Qs Islamabad with the provision of warranty / support as mentioned in the bidding agreement.

9. **AUTHORIZED DEALERPARTNER**

    Bidder shall be an authorized dealer//partner, having Tier 1 or Tier 2 partnership / dealership of the quoted brand. Certificate of dealership / partnership from principle manufacturer is required in the name of the authorized dealer / partner of the manufacturer.

10. **WARRANTY/TRAINING**

    a.   Vendor will be responsible for the provision of free at least onsite warranty / support with labor and parts as per detail below;

      i.   Storage Area Network All Parts: Three years or manufacturer warranty period Whichever is higher.

      ii.   FC SAN Switches: Three years or manufacturer warranty period whichever is higher.

      iii.   FC Cables: Three years or manufacturer warranty period whichever is higher.

      iv.   Ethernet switches: One year or manufacturer warranty period whichever is higher.

    b.   The warranty period will be considered from the date of actual date of delivery of IT equipment.

    c.   Vendor will be responsible for Training of Two ICT officers from Authorized Training center, in case of SAN only (Case Specific).

    d.   Configuration, installation and implementation will be the responsibility of the vendor, however ICT directorate will be available to make the process rational.

11. PENALTY

a) If the supplier fails to supply the items as per supply order or within due time. Then a penalty of 1% per week will be charged upto maximum period of four week. (Days less than six will be considered as one week). Thereafter, his supply order will be cancelled and his earnest money will be forfeited. However, the next lowest bidder will be asked to supply the items on matching the lowest winning price and subject to submission of earnest money (if released earlier) and willingness for the shipment within eight (08) weeks, as per initial time frame for supply.

b) In case 2nd lowest bidder also failed to ship the equipment, work order shall be canceled and deposited earnest money shall be forfeited_.

c) A penalty of 1% of the earnest money per day will be charged if the faulty hardware replacement time exceeds the time mentioned, in the certificate provided as per Annex-B- part B-(3),**during the warranty period**.

12. DISQUALIFICATIONS

Proposals will be liable to be rejected if any deviation is found from the instructions as laid down in the bid document i.e.

a. Financial bid is submitted without the required earnest money.

b. Offers are received after specified date and time.

c. Specification and other requirements are not properly adhered to or different from those given in the bidding documents.

d. GST and NTN certificates are not attached.

e. Service centre is not in Islamabad/Rawalpindi.

f. Supplier is not an authorized dealer/partner and warranty provider of the principal manufacturer for Pakistan as per section 9 of this document.

g. Any inferior product / spec / requirement that mentioned at Annex-C.

13. AFFIDAVIT

Affidavit on **Judicial Paper** to the effect that the firm has not been black listed by any government/semi government/autonomous body or company.

14. **RIGHTS RESERVED**

Pakistan Telecommunication Authority Islamabad reserves the rights to cancel the bid, accept or reject any bid as per PPRA Rules.

CHECKLIST

a.	Earnest money in shape of bank draft/pay order. (cheques are not acceptable)	(Yes/No)
b.	Relevant documents for Annex A-C(Yes/No)	
c.	List of such projects handled with copies of supply order.	(Yes/No)
d.	List of clients with telephone numbers and addresses.	(Yes/No)
e.	List of employees including technical staff for this project.	(Yes/No)
f.	Affidavit on legal paper for not being black listed.	(Yes/No)
g.	Copies of authorized dealership/partnership etc. of the principal manufacturer for Pakistan.	(Yes/No)
h.	Specification and other requirements are met	(Yes/No)
i.	Service center is at Islamabad/Rawalpindi	(Yes/No)

Deputy Director (ICT-II)

General Evaluation Part-A Annex-A

	Part A) Mandatory Requirement *
1	Firm has to produce Sales Tax and Income Tax Registration.
2	Firm has to produce Authorization dealer, partner, etc Certificate of the principal/manufacturer for Pakistan as per section 9 of this bidding document. Tier 1 and Tier 2 partners only.
3	Firm shall be authorized warranty provider on behalf of manufacturer. Documentary proof required.
4	Minimum Five years of relevant experience of the vendor
5	Sales and Service Centers at Islamabad / Rawalpindi

Technical Capabilities of Bidder Part-B

Annex-B

Part B) General Evaluation*				
Sr. #	Attributes	Max. Score	Points Earned	Criteria
1	Detail of Offices	10		Firm has sales and services offices at four (4) provincial headquarters with proof of authorized service provider from principal manufacturer. Two and half (2.5) points for each provincial capital head quarter.
2	Spare Parts Availability	10		Firm has Spare Parts of the quoted model Depot/facility at Islamabad / Rawalpindi.
3	Replacement time for faulty under warranty equipment/parts **(Certificate has to be produced)** (Clause 11(c) referred)	25	25	1-3 working days
			15	4-7 working days
			05	7-14 working days
4	Total strength of relevant Technical Staff at **Rawalpindi / Islamabad**(List shall be attached with name, designation, qualification and related experience).	10	10	Firm has ten (10) or more relevant technical staff in Islamabad / Rawalpindi.
			7	Firm has more than seven (7) or more up to nine (9) relevant technical staff in Islamabad / Rawalpindi
			5	Firm has five (5) or more up to six(6) relevant technical staff in Islamabad / Rawalpindi
5	Firm Experience (minimum Five years' experience required)	20		(4) points will be given for each year of experience, beyond 5 years of mandatory requirement.
6	Projects completed of similar nature (documentary proof be provided i.e. Supply Orders etc.)	25		Five points will be awarded for each project of same nature on provision of supply order/certificate i. Supply of 01 SAN with 2 FC SAN Switches or more in single supply order. (Max Five Supply Orders) ii. Supply of 04 Layer/2/3 Switched in single supply order. (Max Five Supply order)
Sub Total		100		

Minimum qualifying marks are 70% in above table whereas Annex "C" shall be compulsory. All supporting Documents to be attached for all relevant pages of Annex-B.

TECHNICAL EVALUATION P-

ART-C

Annex-C

(To be included in Technical Proposal)

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Detailed Specifications of Unified Storage Area Network with Rack			
S. No.	Feature	Requirements	Qty
A. UNIFIED SAN STORAGE			
1	**SOLUTION REQUIRMENT**	Rack Mounted, 3 - Tier storage solution is required with SSDs, SAS and NL SAS, with at least one hot spare disk in all categories to cater at least 30000 IOPS. Offered storage should support at least 150 drives.	1
2	**USABLE STORAGE**	25 TB of Usable (Approx) Space	

3	DRAM CACHE	48 GB per Array or above and must support extended cache	
4	EXTENDED CACHE	200GB using RAID 1/0	
5	TIER-0 (SSD)	Usable Capacity Approx 5%, with automatic storage tiering	
6	TIER-1 (SAS)	Usable Capacity Approx 30%, with 10K rpm Disks, with automatic storage tiering	
7	TIER-2 (NLSAS)	Usable Capacity Approx 65%, 7.2K RPM, , with automatic storage tiering and using RAID-6 with two parity disks for every six disks	
8	POINT IN TIME RECOVERY	Clone with Snap Shoot Functionality with, Continuous data protection must be ensured by taking copies of changed data and this should be done using a minimal amount of storage capacity for each point-in-time image.	
9	HARDWARE MANAGEMENT SOFTWARE	Storage Management Software with GUI (Auto tiering software needs to be part of storage management without extra cost)	
10		Server hardware with HA must be provided for all software that runs external to the storage (management software, etc). Management should have Web based GUI.	
11	PROTOCOLS	Fibre Channel, NFS, SMB 3.0 (CIFS), iSCSI etc	
12	PORTS & REDUNDANCY	Must support at least 2 x 16 Gbps FC ports (to maintain redundancy)	
13		Must support at least 2 x 10 Gbps BaseT RJ45/Optical iSCSI ports (to maintain redundancy)	
14	FC TO IP ROUTES	FC to IP Routers are required if Native IP based replication is not supported	
15	FC CABLES	20 x 10M 16Gbps LC/LC Optical Cables	
16		4 x 3M 16Gbps LC/LC Optical Cables	
B. SAN SWITCHES			
17	FC PORTS	12 x 16Gbps FC port SAN switch	
18	SW SPs	12 x 16Gbps SW SPs on each switch	2
19	SCALIBILITY	Should be scalable to 24 ports per switch	
21	Standard pory attrib	10Gb/1Gb/100Mb	

D. STORAGE & SAN COMPLIANCE		
22	AVAILABILITY	Must be designed to deliver Proven Five 9s availability (99.999%)
23		Must deliver consistent predictable steady state performance
24		Must keep write cache persistent during controller failure to prevent performance degradation
25	FUNCTIONALITY	Must be truly Unified providing native Block and File storage capabilities with support for FC, iSCSI, FTP, SFTP, CIFS (SMB 1/2/3), NFS (ver 3/4/4.1), pNFS
26		Must have thin provisioning to allow physical allocation of just the storage that is needed within a defined virtual file system or LUN.

27		Must provide Enterprise-Class transactional File Storage capability out-of-the-box not only for user File Sharing and without any additional license
28		NAS File storage capacity must be able to scale well over 500TB usable in a single system
29		System must be able to dynamically optimize data placement across not less than 3 tiers of data storage (e.g. Flash, SAS, and NL-SAS) based on user policy and on a Sub-LUN level (Auto-Tiering)
30		Must support VMware VVOLs
31		System must allow for a single Storage Pool to serve Block LUNs/File Systems/Replication Groups and VVOLs all together
32		System must be able to provision Flash SSD capacity as a storage tier inside storage pools
33		Auto-tiering functionality must allow for customizable monitoring cycles
34		Must have continuous auto-tiering functionality with no specific scheduled time to operate. 24 hours interval of Data movement is not acceptable
35		Auto-Tiering capability must be able to dynamically prioritize workloads for QoS
36		Must provide QoS Management on an application-level
37		Must provide end-to-end virtualization support that provides VMware/MS Hyper-V administrators a view into storage resources and allows storage administrators to see the virtual server infrastructure
38		Must provide all-inclusive Software Licenses for Local/Remote File/Block replication, Auto-Tiering and extended SSD caching for open capacity
39	**SCALIBILITY**	Total array workload must be b/w 80% Read - 20% Write
40		Number of disks slots occupied should not be (Approx) 24% of the total available slots in the proposed solution

41		Must be able to scale up to 5 Petabyte RAW in a single dual-controller system with up to 1000 disk drives after Data-in-Place upgrade
42		Must support upgrade of hardware resources as capacity of the system grows. Which means port count, CPU speed, and cache size must be able to be upgraded as storage capacity increases
43		The solution must support 3rd generation SAS 12Gb/s drive connectivity and must be able to support all on-line data storage tiers in order to maximize both system performance and capacity scalability.
44		Must be able to provide additional connectivity to meet existing or future needs for front end port counts and future technologies through hot-pluggable IO modules
45		Should be upgradeable Data-in-Place to more powerful models with no forklift upgrades
46		Must allow capacity upgrade without any additional Software Licenses
47		Must be based on Dual Active/Active Storage Controllers architecture
48		Must implement a full 64-bit Operating System using advanced multi-core Intel and multi-lane SAS-3 12Gb/s Backend Bus Technology
49		Must have the ability to absorb spikes in both read and write workloads by providing an extended global cache solution over SSDs that must also avoid re-warming the cache on failover.
50	PERFORMANCE	Must support extended SSD caching that allows Online Expand/Shrink of SSD cache capacity
51		Must be built on Multi-Core Optimization Technology that effectively stripes array-tasks across ALL available CPU cores in the system and vastly improves performance scaling and platform efficiency
52		Must provide native replication capability that should be performed by both storage controllers for better replication performance
53		The system must ensure data integrity is maintained at all times end-to-end
54		The platform should implement a no single point of failure (SPOF) architecture model
55	DATA INTEGRITY	Must include cache de-stage, dedicated cache mirroring channels, proactive sparing and automatic high-speed failover to ensure zero data loss
56		Array must have the optimal quantity of global hot spare disks as recommended by the manufacturer (in addition to the usable capacity)
57	FLEXIBILITY	Must have a modular unified architecture that supports all types of protocols (Block, File) for SAN, NAS and Cloud. NAS Gateway architectures are not acceptable.
58		Must be future connectivity ready

59		The system should support the following drives:
60		• 200GB, 400GB, 800GB, 1.6TB and 3.2TB Flash SSD
61		• 600GB SAS 15K rpm HDD
62		• 600GB, 1.2TB and 1.8TB SAS 10K rpm HDD
63		• 2TB, 4TB and 6TB NL-SAS 7.2K rpm HDD
64		The solution should provide flexible RAID configuration options like RAID 0/1, 5, 6
65		Must support an All-Flash pool as well as a Hybrid Flash/HDD option
66		Must support an All-Flash pool that scales up to 1000 SSDs and 3PB RAW All-Flash with Data-in-Place upgrade
67		Must support a virtual appliance model with limited capabilities that is able to replicate File/Block Data to full physical storage model
68	**SECURITY**	Must provide multiple levels of access control including role-based security and auditing capability.
69		Must provide a file based Anti-Virus interface that integrates with best of breed AV solutions
70		Must support Data at Rest Encryption at Storage Controller Level for File and Block storage
71	**MANAGEMENT**	Must provide active system management and user-directed control of system resources.
72		Provide management control of SNMP, email, and phone home notification.
73		Must be able to discover and monitor virtual machines.
74		Management tool must merge SAN/NAS and replication management into a next generation user interface. It should provide a simple, customizable, and rich end-user experience. It must be fast and lightweight and integrates directly with VMware vCenter APIs
75	**REPLICATION AND SNAPSHOT SUPPORT (FROM SAME STORAGE VENDOR)**	Must support Replication Technology that provides dynamic adaptive Sync-Asynch replication based on latency and throughput policies leading to enhanced DR functionality and flexibility
76		The replication solution should be configured via business rules for Recovery Point Objectives and Quality of Service.
77		Must support simultaneous local and remote replication for the same volume managed from the same interface
78		The solution must support DVR-like recovery in order to restore Data to any point-in-time
79		Must support replication providing granular recovery to the I/O level for Block storage
80		The solution must support replication technology that offers replication bandwidth reduction through data de-duplication
81		Must support bi-directional replication as well as many-to-one and one-to-many replication
82		Must support Synchronous Replication over IP link
83		Must support Replication that allows Non-Disruptive Testing at DR site without the need to stop replication

<u>Any inferior Specifications of SAN will be rejected</u>

FINANCIAL BID not accompanied with earnest money will be rejected without any right of appeal.

<u>Authorized Signature of bidder with seal stamp</u>

Detailed Specifications of Layer 2/3 Switches

S.No.	Feature	Requirements
1.	Port Density	48T100/1000 POE Ethernet Ports + (2 or above) 10G SFP+ Gigabit port, 2X40GE uplinks ports, dual AC power
2.	PoE, PoE+	Should support IEEE 802.3Power over Ethernet (PoE+) that allows support of the latest PoE+-capable devices such as IP phones, wireless access points, and security cameras, as well as any IEEE 802.3af-compliant end device.
3.	Throughput	From 350Gbps or above
4.	Forwarding Rate/Through Put	From 200Mpps or above
5.	MTU	Up to 6000 bytes
6.	Jumbo Frames	9000 bytes or above
7.	MAC Addresses	32K or above and support MACSec
08.	Flow Controls	SFlow, NetFlow lite or equivalent
09	ARP Entries	8K
10.	Protocols	IPv4,IPv6,IGMP, IP, TCP,DHCP, ACL, MACSec, RIP v2, OSPF, VRRP, VRF-Lite, Multicast MSDP, MLD v1/v2, 802.1X (EAP:MD5, TTLS, PEAP, multiple supplicants, port-based), Dynamic ARP inspection, MAC limiting, LACP 802.3ad, layer2 and layer3 QoS, hardware queues 12 per port, 802.1p, DSCP
12.	Remote Management	HTTP, Telnet, RMON 2, SNMP v2, SNMP v3, RMON 3, TFTP, SSH, config rollback
13.	Operating System	Modular support layer 2 and layer 3 features-Advance OS
14.	Physical layer Features	Cable diagnostics for detecting cable breaks and shorts ,Auto medium-dependent interface/medium-dependent ,interface crossover (MDI/MDIX) support ,Port speed downshift/setting maximum advertised speed on 10/100/1000BASE-T ports,Digital optical monitoring for optical ports
15.	Layer 2 features	IEEE 802.3: 10BASE-T,IEEE 802.3ab: 1000BASE-T IEEE 802.3ad: Link Aggregation Control Protocol (LACP), IEEE 802.1ad Q-in-Q tunneling,IEEE 802.3ae: 10-Gigabit Ethernet,IEEE 802.3af: PoE, IEEE 802.3at: PoE+.IEEE 802.3u: 100BASE-T,IEEE 802.3z: 1000BASE-X, Layer 3 VLAN-tagged subinterface, PVLAN support, Multicast VLAN routing, Adding/removing single tag,Filter-based SVLAN tagging, Flexible CoS (outer .1P marking). Detection and mitigation of layer 2 loops and broadcasts.
16.	Layer 3 features	Maximum number of ARP entries: 8,000,Maximum number of IPv4 unicast routes in hardware,14,000 prefixes; 36,000 host routes, Maximum number of IPv4 multicast routes in hardware, 18,000 groups; 4,000 multicast routes, Routing Protocols: RIP v1/v2, OSPF v2,Static routing, Layer 3 redundancy: VRRP, IP directed broadcast—traffic forwarding, Virtual router (VRF-Lite) supporting RIP, OSPF Routing policy ,Filter-based forwarding (FBF),Unicast reverse-path forwarding . Detection and mitigation of Layer3 loops and Broadcasts.
17.	Warranty and onsite Support	One year or manufacturer warranty whichever is greater. Should be ROHS compliant

Any inferior specifications of Switches will be rejected

TECHNICAL EVALUATION-PART-C   Annex-C
(To be included in Technical Proposal)   **Page 1/2**

Detailed Specifications of Data Center Switches

S. No.	Feature	Requirements
1.	Port Density	48T100/1000/10GRJ45 Ethernet Ports + 6 x 40GE uplinks ports, should fit in single rack unit, dual AC power
2.	Throughput	1Tbps or above, full line rate
3.	Jumbo Frames	9000 bytes or above
4.	VLAN IDs	4K + FCOE VLANs:4K
5.	MAC Addresses	250K or above and support MACSec
6.	Flow Controls	SFlow, NetFlow lite or equivalent
7.	ARP Entries	48K
8.	Protocols	VXLAN, OVSDB, can integrate with VMware NSX SDN, Q-in-Q, VLAN translation, MC-LAG, Data Center Bridging, IPv4, IPv6,IGMP, IP, TCP,DHCP, ACL, MACSec, RIP, OSPF, ISIS, MPLS, VRF-Lite, Multicast, LACP 802.3ad, layer2 and layer3 QoS, 802.1p, DSCP, NSR, NSB, GRES
9.	Remote Management	HTTP, Telnet, RMON 2, SNMP v2, SNMP v3, RMON 3, TFTP, SSH, config rollback, in-service OS upgrade
10.	Operating System	Modular support layer 2 and layer 3 features, in-service OS upgrade, Advance OS.
11.	Layer 2 features	STP—IEEE 802.1D (802.1D-2004),Rapid Spanning Tree Protocol (RSTP) (IEEE 802.1w); MSTP ,(IEEE 802.1s),Bridge protocol data unit (BPDU) protect, Loop protect, Root protect ,RSTP and VSTP running concurrently, VLAN—IEEE 802.1Q VLAN trunking ,Routed VLAN Interface (RVI), Port-based VLAN,MAC address filtering, Private VLAN (PVLAN), Broadcast and loop detection/mitigation., Static MAC address assignment for interface,Per VLAN MAC learning (limit) MAC learning disable, Link Aggregation and Link Aggregation Control Protocol,(LACP) (IEEE 802.3ad),IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
12.	Link Aggregation	Multi-chassis link aggregation (MC-LAG),Redundant Trunk Group (RTG),LAG load sharing algorithm—bridged or routed (unicast or multicast) traffic, IP: SIP, Dynamic Internet Protocol (DIP), TCP/UDP source, port, TCP/UDP destination port, Layer 2 and non-IP: MAC SA, MAC DA, Ethertype, VLAN ID, source port , FCoE packet: Source ID (SID), Destination ID (DID), Originator exchange ID (OXID), source port
13.	Layer 3 features (IP v4)	Static routing, Routing policy, Routing protocols (RIP, OSPF, IS-IS, BGP), Virtual Router Redundancy Protocol (VRRP), Bidirectional Forwarding Detection (BFD) protocol, Virtual router ,Dynamic Host Configuration Protocol (DHCP) relay, Proxy Address Resolution Protocol (ARP), with loop detection and avoidance
14.	Security and Filters	Secure interface login and password, RADIUS,TACACS+, Ingress and egress filters: Allow and deny, port filters, VLAN filters, and routed filters, including management port filters, Filter actions: Logging, system logging, reject, mirror to an interface, counters, assign forwarding class, permit, drop, police, mark , SSH v1, v2, Static ARP support, Storm control, port error disable, and autorecovery, Control plane denial-of-service (DoS) protection, IP Source Guard ,Dynamic ARP Inspection (DAI), Sticky MAC address,DHCP snooping

15.	Traffic Mirroring	Port-based, LAG port, VLAN-based ,Filter-based, Mirror to local, Mirror to remote destinations (L2 over VLAN).
16.	Warranty and onsite Support	One year or manufacturer warranty whichever is greater. Should be ROHS compliant

Element Management System Qty:1		
S. No.	**Feature**	**Requirements**
1.	EMS	A virtual machine based EMS system to manage the switches
2.	Remote Management	GUI based HTTP, HTTPS.
8.	Features	Configuration management of devices offered Fault management of devices offered

Any inferior specifications of Switches will be rejected

Authorized Signature of bidder with seal stamp

Financial Proposal (Bid Format)   **Annex-D**

Date _____

Company Name _____

Required Specification	Quoted Specification (With Brand Name)	Unit Price *Inclusive of GST*	Qty	Total Price Inclusive of GST
25TB(Usable) UNIFIED SAN STORAGE WITH RACK			1	
16G FC SWITCHES			2	
10M 16G FC (LC/LC) CABLES			20	
3M 16G FC (LC/LC) CABLES			4	
HBA (Dual port) compatible with Dell R720,R730 Servers			8	
48 Port 10 Giga layer 3 Ethernet Switch with 6 X 40 GE uplink ports and with redundant power supply. With all required Network and Power cables			2	
48 X 1 Gig access ports Layer 2/3 (PoE+) Switch, with minimum 2 X10 G and 2 X 40 GE uplink ports, with redundant power supply and With all required Network and Power cables			2	
Total				

    Amount in words: (Rupess---)

FINANCIAL BID not accompanied with earnest money will be rejected without any right of appeal.

Authorized Signature of bidder with seal stamp