BACHA KHAN MEDICAL COMPLEX / GAJJU KHAN MEDICAL COLLEGE MEDICAL TEACHING INSTITUTION (MTI)

Contact No: 0938-280214

BID SOLICITATION DOCUMENTS
FOR

SUPPLY & INSTALLATION OF COMPLETE LAN & WI-FI INFRASTRUCTURE (ENTERPRISE NETWORK INFRASTRUCTURE PROJECT)

Note: The prospective bidder is expected to examine the Bidding Documents carefully, including all Instructions, Terms & Conditions, and Specifications etc. Failure to furnish all information required by the Bidding documents or submission of a Bid not substantially responsive to the Bidding Documents in every respect would result in the rejection of the Bid.

Manager Materials Management
BKMC/GKMC-MTI, Swabi

Manager MIS
BKMC/GKMC-MTI, Swabi

Hospital Director
BKMC-MTI, Swabi

Brief Introduction of GKMC & BKMC -MTI

1 **Overview of RFP:**

Gajju Khan Medical College & Bacha Khan Medical Complex – MTI invites RFP response from all bidders for **"The supply & Installation of complete LAN & Wi-Fi Infrastructure (Enterprise Network Infrastructure Project)"** as per guidelines mentioned in this RFP.

1.1 **Proposed Methodology**

Bidders will submit a detailed technical proposal including Fiber/Copper Layouts, BoQ with specification compliance as per RFP requirement, previous similar work performed and methodology to complete work. Financial proposal will also be submitted with technical proposal.

1.2 Terms of References (TORs)

1. The Procurement shall be conducted in accordance with the KPPRA Rules 2014 on **Single Stage Two Envelope Procedure**. All Bids must reach in Office at 11 :00AM on Date:28-02- 2025

2. GKMC & BKMC invites two separate sealed envelopes, one for Technical Proposal and One for Financial which will be clearly marked outside the envelops.

3. The Technical bid should clearly mention Make, Model, origin and Brand, (Specification of bid) without quoting the price and must mention the warranty period. (In Case of Hardware)

4. Compliance against each Technical Specifications must be attached.

5. Company seal / stamp must be fixed on Technical Specification and Financial Proposal.

6. Bid Money will be 2% of complete Project Value.

7. **If any firm fails to qualify the Technical Evaluation Criteria based upon ToRs, then financial bid of the same will not be opened.**

   a. **Call Deposit** of Two percent (2%) of the total bid amount must be attached with financial proposal in separate sealed envelope in favor of Hospital Director, Bacha Khan Medical Complex-MTI, Swabi: **on or before 11:00 AM, 28-02-2025.** The EM will be enclosed with Technical Proposal.

8. **Tender bid opening will be held on<mark>, 28-02-2025 at 11:30 AM at BKMC</mark> Swabi.**

9. **Any bid submitted after due date and time will not be entertained.**

10. The BKMC / GKMC – MTI will not be responsible for any costs or expenses incurred by bidders in connection with the preparation or delivery of bids.

11. The prices quoted shall remain valid for <mark>180 days</mark>, after the date of opening of the tender.

12. Delivery and installation of all items must be made within 90 to 120 days after issuance of award letter / purchase order.

13. All prices quoted must be inclusive of all applicable Government Taxes.

14. Rate should be quoted in words and figures.

15. **In case of failure to supply the item under specified time. The work order should be awarded to second lowest.**

16. Supply and Installation should be completed within 180 days. Failure to that, two percent (2%) Call Deposit (CDR) amount will be forfeited**.**

17. Bidders must submit the bid that matches or is better than the required specifications

18. Proposals shall be submitted in English language.

19. The proposals shall be comprehensive, clear, and elaborate. Different sections/Annexures of the proposals shall be separated using color separators, flags, or tags. The proposals shall be prepared without any interlineations or overwriting.

20. The Hospital reserves the right to accept or reject all the proposals submitted at any time in accordance with applicable KPPRA rules.

21. All pages must be Signed & Stamp by the Authorized Authority.

Payment Terms & Conditions:

- Payment will be made in Twelve (12) equal installments after successful installation and commissioning.

22. Proposal weightage is Given below:

PROPOSAL	WEIGHT
Technical	70%
Financial	30%
TOTAL	**100%**

23. Contract Period/Warranties:

        a. Minimum Warranty and SLA (Service Level Agreement) for the Quoted Equipment's must be of 3 years after successful installation and deployment of the active and passive equipment's.

22. TECHNICAL EVALUATION CRITERIA

PASSING MARKS: A technically eligible bidder, based on conditions listed in this document, not meeting the 49 pass marks limit will be rejected in Technical Evaluation, and its sealed / unopened Financial Proposal shall be returned. All bidders scoring greater than or equal to 49 of the marks will be accepted in technical proposal, and their financial bids will be opened.

The Bidders who have duly complied with the Eligibility/Qualification and Evaluation Criteria will be eligible for further processing.

The Bids which do not confirm to the Technical Specifications or Bid conditions or the Bids from the Bidders without adequate capabilities for supply and maintenance / warranty /support services will be rejected.

The technical proposals shall be evaluated by the technical evaluation committee in the light of following evaluation criteria.

Description	Maximum Points
Legal (Mandatory)	
Certificate of Company/Firm Registration/Incorporation under the laws of Pakistan	
Valid Income Tax Registration	
Valid General Sales Tax Registration (Status = Active with FBR) with ATL Proof.	
KPRA Registration	
Submission of undertaking on legal valid and attested stamp paper that the Firm is not blacklisted by any of Provincial or Federal Government Department, Agency, Organization or autonomous body or Private Sector Organization Anywhere in Pakistan (On100 Rs Stamp Paper)	**Mandatory**

Compliance to the technical specifications of Services to be procured are Mentioned in Annex-A of this document.	
In full compliance of the Execution Schedule and Delivery Period mentioned in Tender document (Undertaking)	
OEM authorization & partnership certificate for the quoted products	
Bidder's Office presence must have in major cities of Pakistan.	
Human Resource: Two Team leader – 4 (2 marks for each) Three IT Engineers – 6 (2 marks for each) Four IT Technicians – 3 (1 mark for each)	4 6 3

Partnership Status for Major Network Equipment **(Serial#1 – 8,)**
   Tier 1 Partnership: 10 marks
   Tier 2 Partnership: 06 marks
	10

The bidder should have at least three deployments of the similar Projects. Value 10 million or above (3 POs each). each PO carry 04 marks Note: Copy of Purchase orders and contract should be attached and performance certificates should be attached	12
Company operating in Pakistan: • 16-20 years : 10 marks • 06 - 15 years : 05 marks • 01- 5 years : 02 marks	10
Location of offices in KPK Office Presence – 05 marks	05
Annual Turnover: Minimum 500 million – 10 Marks (To be verified from Audit Report) Minimum 250 million – 05 Marks (To be verified from Audit Report)	10
Performance's certificate of the major equipment **(Serial#1 – 8,)** (2 marks of each certificate)	10
Total	**70**

Enterprise Network Infrastructure Project, MTI Swabi
BOQ of Active and Passive Items

Scope of Project

The scope of work for the enterprise network infrastructure project involves the comprehensive design, installation, and configuration of a robust network system across multiple locations, including the Main Complex MTI Swabi, THQ Chota Lahore, and THQ Topi. This project will deploy a wide range of active and passive network components, such as next-generation firewalls, core SFP switches, aggregation switches, POE switches, wireless LAN controllers, wireless access points, IP phones, PBX exchange, servers, network storage, and other critical infrastructure elements. The goal is to establish a scalable, secure, and high-availability network that seamlessly integrates with existing systems and supports failover mechanisms.

Additionally, the project includes the installation and configuration of essential software solutions, such as backup and replication software, endpoint protection, network management systems (NMS), and security information and event management (SIEM) solutions. The setup of data center infrastructure, including modular racks, power distribution units, uninterruptible power supplies (UPS), and environmental controls like cooling and fire detection systems, is also part of the scope.

The bidder will ensure all components are properly installed, tested, and commissioned, with comprehensive documentation and training provided to the designated staff. The project will implement site-to-site connectivity using secure VPN protocols, establish failover and high availability solutions for critical systems, and provide ongoing support and maintenance, ensuring compliance with all relevant laws, regulations, and standards. The aim is to deliver a fully managed and integrated network solution that enhances the operational efficiency and security of the enterprise.

Project Timelines Structure

- **Phase 1**: BOQ and Contract Document – signed and approved by the MTI Swabi

- **Phase 2.** Design and Approval – Report must be submitted and approved by the MTI Swabi

- **Phase 3**: Deployment and Installation – Report must be submitted and approved by the MTI Swabi

- **Phase 4**: Testing and Validation – Report must be submitted and approved by the MTI Swabi

- **Phase 5**: Go-Live and Support – Report must be submitted and approved by the MTI Swabi

Project Deliverable

1. **Network and Data Center Infrastructure:**

    - Designing, installation, configuration and testing of complete Enterprise network Infrastructure.

    - Deployment of network components such as firewalls, switches, wireless access points, and IP telephony systems.

    - Installation of data center infrastructure including but not limited to servers, storage, modular racks, PDUs, generator and UPS.

    - Complete VOIP and CCTV solutions for all three locations

2. **Software Solutions and Security:**

    - Configuration of backup and replication software, endpoint protection, network management systems (NMS), and security information and event management (SIEM) solutions.

    - Implementation of surveillance systems with IP cameras and network video recorders (NVR).

3. **Connectivity and Integration:**

    - Establishment of site-to-site secure VPN tunnels and fiber optic connectivity.

    - Integration of all systems to ensure seamless operation and high availability.

    - Integration with existing infrastructure services such as CCTV, Network and Telephone.

4. **Support, Training, and Documentation:**

    - Provision of ongoing support and maintenance, including a resident engineer for 12 months.

    - Conducting training programs for staff and providing comprehensive documentation and compliance reports.

Project Deliverable Reports

Initial survey and Implementation Report: (Pre implementation Report)

- Detailed documentation of the project implementation process, details of survey conducted at all locations along with timelines, milestones, and HR details.

- High-Level Designs (HLDs) and Low-Level Designs (LLDs) for the network infrastructure.

- Nomination of a Project focal person

Data Center / Server Room Deployments Reports:
- Three separate reports on Installation, configuration, testing and commissioning of Data center equipment's at all locations. This must include data center setup, including rack layouts, power distribution, cooling systems, and environmental controls.

- Maintenance and operational guidelines for the data center infrastructure including diagrams and topology maps showing the arrangement of network elements.

Surveillance System Report:
- Installation and configuration details of the surveillance system, including camera placements, recording schedules, and storage capacities.

- Diagrams, Maps, Monitoring and maintenance logs for the surveillance system.

VOIP Report:
- Detailed documentation of the VOIP system configuration, including SIP trunk settings, extension mappings, and call routing protocols.

- Diagrams showing the VOIP network topology and integration with the existing network infrastructure.

- Documentation of security measures implemented to protect the VOIP system, including encryption protocols, firewall settings, and access controls.

Testing and Commissioning Report:
- Results of all testing and commissioning activities, including performance tests, security tests, and failover tests.

- Verification of compliance with project specifications and standards.

Passive Equipment Report
- Detailed documentation of the installation process for all passive equipment, including CAT 6 cables, patch panels, fiber optics, and cabinets.

- Diagrams and photos showing the placement and routing of cables and other passive components. Finalized drawings showing the actual installation of passive components, including cable routes, termination points, and equipment locations.

- Comprehensive list of all passive equipment installed, including quantities, specifications, and locations.

- Serial numbers and warranty information for each component.

- Results of testing and certification for all installed passive components, including cable testing for continuity, signal loss, and performance.

Connectivity Report
- Establishment of site-to-site secure VPN tunnels to connect the Main Complex, Chota Lahore, and Topi.

- Installation of fiber optic cables and related components for high-speed connectivity.

- Maps, chats, layouts, testing and required credentials details.

Final Project Report:
- A comprehensive summary of the entire project, including an overview of all deliverables, achievements, and any deviations from the original plan. This must contain details of all active and passive equipment's details and installation map/plans.

- Comprehensive list of all active/passive equipment installed, including quantities, specifications, and locations.

- Serial numbers and warranty information for each component.

- All the relevant Maps, structures, licenses, protocols, credentials and after sales service structure must be part of this report.

- Recommendations for future improvements and scalability options.

Note: All reports must be address to Hospital Director and Concerned IT departments and will be considered accepted after proper sign and stamp of the officials.

Locations:
1. Gajju Khan Medical College (GKMC) / Bacha Khan Medical Complex (BKMC) – MTI Swabi

2. THQ Topi – MTI Swabi

3. THQ Lahor – MTI Swabi

List of Equipment and details of the project
Enterprise Network Infrastructure

S No	Description	Details	GKMC/BKMC	Chota Lahore	Topi
			Qty	Qty	Qty
1	Firewall	Next Generation Firewall	2		
2	Core SFP Switch	24 Port SFP	4		
3	Aggregation Switch	Detailed specs attached	8		
4	Switches (24 Port)	POE	53	5	5
5	Switches (08 Port)	POE	39	3	3
6	Wireless LAN Controller (1+1)	WLAN Controller	2	-	-
7	Wireless Access Points	Wireless APs	130	7	7
8	Wireless outdoor APs	Outdoor APs	2		
9	IP Phone	VOIP Phone	164	12	12
10	Operator Console	VOIP Operator Console	1		
11	PBX Exchange	VOIP support	1		
12	Servers (Virtualization Host)	HIS, CMS, ERP etc.	4		
13	Network Storage	80 TB usable storage	1		
14	Active Directory Server	Basic level server	1	1	1
15	SFP 40G	Single Mode, Dual Strand, 10 KM support	16		
16	SFP 10G	Single Model, Dual Strand, 1 KM support	200	14	14

17	Windows Server Standard License 2025	MS Server 2025 for 16 core pack	2		
18	Backup and Replication Software (10 Instance 5 YR License)	For Physical and VM backups etc.	1		
19	Data Center Modular Rack for Network and IT Devices	Complete modules for Power with intelligent breakers and regulators, Cooling, Fire, etc.	1		
20	30 KVA Generator - AutoStart feature	Concrete bed of Generator, DPs, allied electrical and power distribution equipment's.	1		
21	650 VA UPS	For Cabinets with standards	26	3	3
22	1KVA UPS	For Cabinets with standards	40	4	4
23	55-inch LED - Surveillance Grade thin Screen	TCL/Sony/Dahua, 4 CCTV, 2 NMS, 1 Manager MIS and 2 for THQs	7	1	1
24	Laptop core i5, 14 gen, 512 SSD, 16GB RAM, 14"	Dell/HP/Lenovo	4		
25	End point protection - 3 Year, Server based solution	Kaspersky Endpoint Security for Business	200		
26	IP Camera 4 MP	IP 66 grading, IR, CMOS & Full HD	55	18	18
27	IP Camera 4 MP PTZ	IP PTZ 4MP, night vision and outdoor	12	4	4
28	64 channel NVR with 30 days storage	30 DAYS storage with continuous recording, Onvif support	2		
29	32 channel NVR with 30 days storage	30 DAYS storage with continuous recording, Onvif support		1	1
30	NMS - Open Source - OpenNMS	Open-source solution OpenNMS (Standard protocol monitoring for Servers, Network, voice and nodes.)	1		
31	SIEM Solution - Open Source - Wazuh	Open-source solution (Wazuh SIEM), complete configuration and management	1		
32	Resident Engineer – certified with more than three years of experience. TORs will be mutually signed and agreed.	12 months support at location. This will start after successful handing over of the project.	1		
33	Installation and Configuration of Active Component and complete managed solution for Computer Network, Topology, VoIP, CCTV &	Compete Project activities for Enterprise Network Infrastructure. Additionally, Integration of old CCTV, Telephone and Computer network with new deployed	1	1	1

	Connectivity.	network.			
	PASSIVE ITEMS				
1	CAT 6 I/O with faceplate and back box	3M/ Schneider/ Panduit	1	1	1
2	1 meter Fiber Patch Cord.	3M/ Schneider/ Panduit	1	1	1
3	1meter Cat-6 Patchcords	3M/ Schneider/ Panduit	1	1	1
4	3 meter Cat-6 Patchcords	3M/ Schneider/ Panduit	1	1	1
5	5 meter Cat-6 Patchcords	3M/ Schneider/ Panduit	1	1	1
6	CAT 6 Cable Roll. (305 meter), Pure coper, 23 AWG	3M/ Schneider/ Panduit	1 box	1 box	1 box
7	24 Port patch Panel with I/O	3M/ Schneider/ Panduit	1	1	1
8	Cabinet 9U with PDU	Local with FAN	1	1	1
9	Cabinet 42U with 2 PDU each	Local with FAN	1	1	1
10	Power Socket	3M/ Schneider/ Panduit	1	1	1
11	Power Cable 3.29 dual core. (90 meter), fire resistant	FAST/Pakistan Cable or equivalent	1 bundle	1 bundle	1 bundle
12	Cable Manager	3M/ Schneider/Panduit	1	1	1
13	Duct 16x25	Adamjee/ or Equivalent	10 feet	10 feet	10 feet
14	Duct 16x38	Adamjee or Equivalent	10 feet	10 feet	10 feet
15	Duct 40x40	Adamjee or Equivalent	10 feet	10 feet	10 feet
16	Installation of Passive Work and miscellaneous items		1	1	1
	FIBER ITEMS				
1	12 core optical fiber	Premier/LiTech/ Corning	1 meter	1 meter	1 meter
2	48 Core optical fiber	Premier/LiTech/ Corning	1 meter	1 meter	1 meter
3	12 port ODF rack Mounted	Imported	1	1	1
4	48 port ODF	Imported	1	1	1
5	12 core joint enclosure (joint box)	imported	1	1	1
6	48 Core joint enclosure	Imported	1	1	1
7	Digging of Fiber including HDPE Pipe, warning tape, Hand Hole, fiber Joints, splicing,	1	1	1	

#					
	marker post include Hard Area.				
	DATA CENTER - SERVER ROOM FLOORING				
1	Anti-static flooring		1		
2	Fire detection systems		1	1	1
3	Dampa Ceiling & Venial Tiles		1		
4	AC for datacenter	1.5 ton	1	1	1
5	ATS Pannel		1		
6	Main DBB		1	1	1
7	Cable Trays/Fiber Trays		1	1	1
8	Professional services for center, tempered glass, emergency exit door, Access Control etc. etc.		1		

Note: Approximate quantity of both Passive and Fiber items is mentioned below. Sample of all passive and fiber equipment must be approved from IT Department MTI Swabi. Detailed and mandatory Specs of Active Items mentioned below.

Licenses, Warranties, Trainings, Terms and Conditions and other details

- **Warranty and Licenses**: All active and passive equipment will have a warranty period of Three (03) years, including any licenses for the equipment and/or software's.

- The warranty and license period will commence after the deployment of all equipment and upon receipt of a satisfactory letter from the concerned IT department.

- **Passive items** will be considered as item / length/unit cost on actual deployment/use.

- **Installation and Support**: A resident engineer shall be deployed for the period of one year after successful handing over of project. The engineer will be hired by the bidder as per TORs given by the MTI Swabi. Additionally, the bidder will be responsible for Network designing, subnetting, VLANs, EtherChannel, Roaming, network segregation, any other service as mentioned in the BOQ and integration with existing computer network, CCTV, and other services.

- **Training**: The bidder will conduct a 30-working day training program for the designated staff of MTI Swabi on the installed and configured equipment. The bidder will provide all installation details, plans, user manuals, credentials, protocols, and configuration files

to the IT department. The bidder will find any suitable option for national and international training and related certification opportunities for MTI Swabi Staff.

- **Data Center or Server Room Location**: The MTI Swabi will designate the area for data center and handover to selected bidder at all locations including GKMC/BKMC, THQ Topi and THQ Lahor.

- **Failover and High Availability Solutions:** Design and implement failover mechanisms to ensure uninterrupted service for critical systems (e.g., ERP, HIS, LMS). Leverage the HCI solution to enhance availability and disaster recovery for hosted systems and applications.

- **Corporate social responsibility (CSR):** The bidder will find any suitable support both from bidder side and from principal side for the establishment of additional ICT support in term of Hardware, Software and trainings.

- **Support and Replacement:** The bidder will be responsible for providing support within 3 hours of reporting of the problem and arranging the replacement of any faulty equipment within 24 hours/1 working Day of receiving a complaint from MTI Swabi. This will be applicable till the completion of warranty period of all equipment's.

- **Implementation Plan:** The bidder will conduct a comprehensive survey prior to deployment and verify the findings with the IT department before the actual implementation of both active and passive equipment. The bidder will submit a complete project implementation plan, which will include the following:

  - **Project life cycle:** detailed overview and project cycle.

  - **Timelines:** Detailed schedules outlining the start and end dates for each phase of the project.

  - **Diagrams:** Visual representations of the project layout and design.

  - **High-Level Designs (HLDs):** Overarching design documents that provide a broad view of the system architecture and its components.

  - **Low-Level Designs (LLDs):** Detailed design documents that specify the configuration and setup of each component within the system.

  - **Topology:** Network topology diagrams showing the arrangement of various network elements and their interconnections.

  - **Resource Allocation:** A detailed plan of the resources required for the project, including personnel, equipment, and materials.

- **Modularity and Scalability:** The Data Center solution should be based on a modular design, allowing for flexible scaling of capacity in increments as needed to accommodate future growth and changing IT demands.

- **VOIP Configuration and deployments:** Complete solution of VOIP with SIP, extensions, trunks (Local and external), IVR, CDR and Conferences etc.

- **Open Source:** The bidder will be responsible for installation, deployment, testing and commissioning of proposed open-source solutions with proper training of MTI Staff.

- **Site to Site connectivity:** The bidder will be responsible to establish a site-to-site secure tunnel via IPSec VPN protocol to connect GKMC/BKMC with TQH Chota Lahor and THQ Topi.

- **Confidentiality**: The bidder must adhere to the confidentiality terms outlined in the existing BOQ. If selected, the bidder must sign a new agreement.

- **Compliance**: The bidder must comply with all relevant laws, regulations, and standards applicable to the project.

- **Documentation**: The bidder must provide comprehensive documentation, including user manuals, maintenance guides, and any other relevant materials for all the delivered and installed equipment's.

Service Level Agreement

After successful deployment and project handover, the bidder must meet the following criteria till the completion of warranty period

#	Service	Description	SLA Target	Performance Metric
1	**Incident Acknowledgment**	Acknowledgment of reported issues, problems, or incidents by the vendor.	**30 minutes** response time	MTTA (Mean Time to Acknowledge)
2	**System Recovery**	Restoration of software applications (e.g., SIEM, NMS, NAS, Virtualization), VoIP etc. after a failure.	**Critical: 3 hours**	MTTR (Mean Time to Recovery)
3	**System Availability**	Continuous availability of critical systems (network, Wi-Fi, NAS, Virtualization, etc.).	**99.999% uptime**	MTTR (Mean Time to Repair), MTTF (Mean Time to Failure)
4	**Customization and Updates**	Customization of components and modules or necessary software updates.	**Customization: 72 hours**	MTTR (Mean Time to Resolve)
			Updates: 48 hours	Resource Availability
5	**Backup Success Rate (NAS)**	Backup of data, applications, and surveillance recordings stored on the NAS.	**99% success rate per month**	Backup and storage logs
6	**Surveillance Recording Availability**	Ensuring availability and accessibility of camera surveillance recordings.	**99.9% availability**	MTTR, Storage Health Logs
7	**Phone Support**	Technical assistance via phone for critical or	**30 minutes** response	MTTR (Mean Time to

		high-priority issues.	time	Resolve)
8	**Email Support**	Technical assistance via email for non-critical issues or general queries.	**30 minutes** acknowledgment time	MTTA
9	**Level I Support**	Basic help desk and troubleshooting services for all deployed solutions.	**1 hour** response time	MTTR, Resource Availability
10	**Level II Support**	Advanced technical support for complex issues or escalations. Replacement of faulty hardware.	**24 hours** response time	MTTR
11	**Preventive Maintenance**	Scheduled maintenance for all infrastructure components (network, NAS, virtualization, etc.).	**Quarterly**	Maintenance Logs and Reports
12	**Log and Event Processing**	Real-time log ingestion and alert generation in SIEM.	**Logs processed within 5 seconds**	SIEM Monitoring Reports
13	**System Monitoring and Alerts**	Real-time network and system monitoring (NMS, NAS, Wi-Fi).	**Critical Alerts: 30 seconds update time**	Network and system health dashboards
14	**Uptime of Wi-Fi Network**	Smooth operation and availability of the managed Wi-Fi solution.	**99.95% uptime per month**	MTTR, MTTF
15	**Training Completion**	Training for staff on deployed systems with proper documentation.	**Within 10 working days post-handover**	Training Completion Report

Detailed Specification of Active Equipment's

Item No. 1

Technical Specification Requirement for Next Generation Firewall
6*GE COMBO + 4*GE RJ45 + 4*GE SFP + 4*10GE SFP+
Firewall Throughput >=24 Gbit/s
NGFW throughput >= 4.6 Gbit/s
Concurrent Sessions >=9 million
IPsec VPN Tunnels (GW to GW) >=14k
IPsec VPN Throughput >=24 Gbit/s
Minimum Concurrent SSL VPN Users >=7.8k
SSL VPN throughput >=1 Gbit/s
HDD>= 900 GB
Security Policies >= 45k
SupportVirtual Firewalls >=800
Support firewall, VPN, intrusion prevention, antivirus, data leak prevention, bandwidth management, anti-DDoS, URL filtering, and anti-spam functions
Support Switching & routing protocols and features, such as RIP, OSPF, BGP, IS-IS, RIPng, OSPFv3, BGP4+, and IPv6 IS-IS,VLAN
Support transparent, routing, and hybrid working modes and high availability (HA), including the Active/Active and Active/Standby modes
Support multiple highly available VPN features, such as IPSec VPN, SSL VPN, L2TP VPN, and GRE
Support multiple user authentication methods, including local, RADIUS, HWTACACS, AD, and LDAP.
Support integration with Radius, LDAP, AD, Sandbox and SDN controller
Support report display by user, application, content, time, traffic, threat, and URL

Support SNMP, SSH, Syslog and NetConf
3 Year of Threat Protection Service(include IPS,URL,AV) License
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant at least once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No.2

Technical Specification Requirement for Core 24 Port SFP Switch
10G SFP+ ports >= 24
40/100G QSFP28 ports >= 6
Memory >=4GB, Flash>=2GB
Min 2 Tbps switching capacity
Atleast 480 Mpps forwarding capacity
1+1 AC Power
4K VLAN
MAC Address entries >= 380K
ARP Entries >= 135K
ACLs >= 6k
QinQ, LACP, STP, RSTP, ERPS, MSTP/PVST+, LLDP, Jumbo Frames
Static routes, RIP v1/2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+, ECMP, routing policy
IPv4 FIB >= 250K, IPv6 FIB >= 75K
LDP,IPSec VPN, IGMPv1/v2/v3, PIM-DM, PIM-SM, MSDP, MBGP, IGMP snooping and Load balancing of Multicast Traffic
BFD, BFD for OSPF, BGP, ISIS, VRRP & Static routes
VXLAN L2 and L3 gateways, BGP EVPN
Stacking support for upto 8 devices
Support mac authentication and 802.1x authentication
Support Integration with industry standard NAC Solutions
Support 802.1x, Dynamic VLAN, Dynamin ACL, RADIUS CoA

Support Automation with SDN Controller and NETCONF/YANG
CLI and Web interface (HTTPS), Telnet, SSH v2, SNMP v1, v2, and v3
Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance/Management
Support ARP security, DAI, SAI
DoS attack defense, ARP attack defense, and ICMP attack defense, CPU protection, Blaclist
Operating Temperature -5°C to 45°C
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant at least once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No. 3

Technical Specification Aggregation Switch
10/100/1000Base-T ports, ports >= 48
10 GE SFP+ ports >= 4
Dedicated Stack Port>=2
Memory >=2GB, Flash>=1GB
Switching Capacity>= 224 Gbps
Forwarding Performance >=168 Mpps
Redundant Power Supply
30K MAC address tables
FIBv4 >=8k , FIBv6>=3k
ARP Entries >= 2K
ACL Rules >= 2K
Must support MAC addresses, IP Address based, protocol-based, and interfaces based VLAN assignment
Support Service interface-based stacking , Should support Ethernet Ring Protection Switching
Jumbo frames

Should support stacking upto at least 8 devices
Support MAC, local, 802.1x authentication and other industry leading NAC solutions
Support Static Routing, RIP v1/v2, IPv4 and IPv6, OSPF, OSPF v3, IS-IS, IS-ISv6, BGP, BGP4+,ECMP,VRRP,VRRP6, DHCP Server, PBR, SNMP v1/v2/v3, RMON
Support PIM DM, PIM SM, PIM SSM, IGMP v1/v2/v3, IGMP v1/v2/v3 snooping, MLD Snooping and IGMP fast leave
Switch must support the IEEE 802.1ad (Q-in-Q) standard, Dynamic VLAN, Dynamic ACL, STP, RSTP, MSTP or equivalent
Support ARP security, Dynamic ARP Inspection, CPU protection, Defense against ARP, ICMP ,DOS attacks
The equipment must support SNMP-based NMS for unified configuration, Telnet,Telemetry, NETCONF/YANG, SSH, CLI,802.1X authentication, Web page-based configuration and management and batch remote upgrade.
Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance, Congestion management
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant atleast once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No.4

Technical Specification Requirement POE Switch 24 port
10/100/1000Base-T ports, ports >= 24
10 GE SFP+ ports >= 4
Dedicated Stack Port>=2
Memory >=2GB, Flash>=1GB
Switching Capacity>= 176 Gbps
Forwarding Performance >=132 Mpps
PoE >=400W
4K VLANs
MAC Address entries >=30K

ARP Entries >= 2K
ACL Rules >= 2K
QinQ, LACP, STP, RSTP, ERPS, MSTP/PVST+, LLDP, Jumbo Frames
IPv4 Static Routing, RIP,RIPing, OSPF, OSPFv3
FIBv4 >=4k , FIBv6>=1k
IGMPv1/v2/v3, PIM-DM, PIM-SM, MSDP, IGMP snooping and Load balancing of Multicast Traffic
Stacking support for upto 4 devices
Support MAC authentication and 802.1x authentication, Dynamic VLAN, Dynamic ACL, RADIUS CoA
Support Integration with industry standard NAC Solutions
CLI and Web interface (HTTPS)
Telnet, SSH v2, RMON,SNMP v1, v2, and v3 , Telemetry
Support Automation with SDN Controller and NETCONF/YANG
Support NETCONF, Netstream, Netflow
8 Queues per port, Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance/Management
Support ARP security, DAI, SAI, CPU Defense, Storm Control and Strom Suppression
Operating Temperature -5C to +50C Humidity 5% to 95%RH
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant at least once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No.5

Technical Specification Requirement POE Switch 8 Port
10/100/1000Base-T ports, ports >= 8
10 GE SFP+ ports >= 4
Memory >=2GB, Flash>=1GB

Switching Capacity>= 95 Gbps
Forwarding Performance >=70 Mpps
PoE >=120W
4K VLANs
MAC Address entries >=30K
ARP Entries >= 2K
ACL Rules >= 2K
QinQ, LACP, STP, RSTP, ERPS, MSTP/PVST+, LLDP, Jumbo Frames
IPv4 Static Routing, RIP,RIPing, OSPF, OSPFv3
FIBv4 >=4k , FIBv6>=1k
IGMPv1/v2/v3, PIM-DM, PIM-SM, MSDP, IGMP snooping and Load balancing of Multicast Traffic
Stacking support for upto 4 devices
Support MAC authentication and 802.1x authentication, Dynamic VLAN, Dynamic ACL, RADIUS CoA
Support Integration with industry standard NAC Solutions
CLI and Web interface (HTTPS)
Telnet, SSH v2, RMON,SNMP v1, v2, and v3 , Telemetry
Support Automation with SDN Controller and NETCONF/YANG
Support NETCONF, Netstream, Netflow
8 Queues per port, Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance/Management
Support ARP security, DAI, SAI, CPU Defense, Storm Control and Strom Suppression
Operating Temperature -5C to +50C Humidity 5% to 95%RH
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant at least once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No.6

Technical Specifications Wireless LAN Controller
WLC must support 802.11 a/b/g/n/ac/ac wave 2/ax
The AC should have at least 8GE interface and 2x 10GE SFP+ interface.
Support and manage >= 500 APs.
Supported Users >= 4K, portal based authentication
MAC address entries >=8K
Forwarding performance >= 9Gbit/s
ARP entries >= 6K
ACLs >= 4K
IPv4 routing entries >= 8K & IPv6 routing entries >= 2K
Support static routes, OSPF, BGP, IS-IS, routing policies, and policy-based routes.
IPv6 dynamic routing protocols, including OSPFv3 and BGP4+.
Intelligent roaming based on 802.11k and 802.11v
Application identification and set control policies based on identified applications.
preferential scheduling and frequency band guidance function
Device redundancy backup, 1+1 or N+1 backup, and configuration synchronization between the active and standby ACs.
CLI, web management, SSH management, and SNMPv1/v2/v3.
OEM must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant atleast once in last 3years OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No.7

Technical Specification Requirement Wireless Access Point - Indoor
The AP should support IEEE 802.11ac Wave 2/ax/be.

The AP should support 2 radios, one 802.11be 2*2 MIMO on 2.4 GHz band, and one 802.11be 2*2 MIMO on 5 GHz band.
The AP should support system minimum rate up to 3 Gbit/s.
The AP should support 2.5GE port
The AP should support Bluetooth low energy 5.4
The AP should support USB port, the port can be used for external IoT expansion
The AP should support Bluetooth serial remote wireless operation and maintenance
The AP should support DC power supply.
The AP should support PoE power supply: in compliance with 802.3at/af.
The AP should support cloud management mode allows users to switch to the cloud mode.
The AP should support Operating temperature: -10°C ~ +50°C.
The AP should support minimum 15 SSIDs for each radio.
The AP should support minimum 250 users.
The AP should support built-in smart antennas.
The AP should support application Traffic statistics: globally, by SSID, or by user.
The AP should support load balancing during smart roaming.
The AP should support smart roaming.
The Manufacturer of the Access Point must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant in 2024 OEM must have in-country presence (office and depots) for the past 5 years.
03 Years Warranty & Support

Item No. 8

Technical Specification Requirement Wireless Access Point - Outdoor
The AP should support IEEE 802.11ac Wave 2/ax
The AP should support 2 radios, one 802.11ax 4*4 MIMO on 2.4 GHz band, and one 802.11ax 4*4 MIMO on 5 GHz band.
The AP should support system minimum rate up to 5.9 Gbit/s.

The AP should support GE port, 5GE port and 10G optical port	
The AP should support Bluetooth low energy 5.0	
The AP should support Bluetooth serial remote wireless operation and maintenance	
The AP should support PoE power supply: in compliance with 802.3at/bt.	
The AP should support cloud management mode allows users to switch to the cloud mode.	
The AP should support Operating temperature: -40°C ~ +65°C.	
The AP should support minimum 15 SSIDs for each radio.	
The AP should support minimum 510 users.	
The AP should support built-in smart antennas.	
The AP should support application Traffic statistics: globally, by SSID, or by user.	
The AP should support load balancing during smart roaming.	
The AP should support smart roaming.	
The Manufacturer of the Access Point must be a Leader by Gartner LAN Wired and Wireless Magic Quadrant in 2024 OEM must have in-country presence (office and depots) for the past 5 years.	
03 Years Warranty & Support	

Item No. 9

Technical Specification Requirement IP Telephone set	
Protocols/Standards	Standard Protocols for SIP and VOIP
Network Interfaces	Dual switched auto-sensing 10/100 Mbps Ethernet ports, integrated PoE (GXP1610P/GXP1615 only)
Graphic Display	132 x 48 (2.95'') LCD display
Feature Keys	2 line keys with dual-color LED and 1 SIP account, 3 XML programmable context sensitive soft keys, 5 (navigation, menu) keys. 13 dedicated function keys for PAGE/INTERCOM, PHONEBOOK, MESSAGE, HOME, HOLD, RECORD, MUTE, HEADSET,

	TRANSFER, CONFERENCE, SEND and REDIAL, SPEAKERPHONE, VOLUME
Telephony Features	Hold, transfer, forward (unconditional/no-answer/busy), 3-way conferencing, call park/pickup, downloadable phone book (XML, LDAP, up to 1000 items), call waiting, call history (up to 200 records), off-hook auto dial, auto answer, click-to-dial, flexible dial plan, hot desking, personalized music ringtones, server redundancy & fail-over
Headset Jack	RJ9 headset jack (allowing EHS with Plantronics headsets)
Base Stand	Yes, 2 angled positions available, wall mountable
Wall Mountable	Yes
QoS	Layer 2 QoS (802.1Q, 802.1P) and Layer 3 (ToS, DiffServ, MPLS) QoS
Package Content	handset with cord, base stand, universal power supply, network cable, Quick Installation Guide, brochure, GPL License
Warranty	On Site 3-YearComprehensive Warranty

Item No.10

Technical Specification Requirement Operator Console Set	
Protocols/Standards	Standard Protocols for SIP and VOIP
Network Interfaces	Dual switched auto-sensing 10/100/1000 Mbps Gigabit Ethernet ports with integrated PoE
Graphic Display	4.3 inch (480x272) TFT color LCD
Bluetooth	Yes, integrated

Feature Keys	12 line keys with up to 6 SIP accounts, 5 XML programmable context sensitive soft- keys, 5 navigation/menu keys, 11 dedicated function keys for : MESSAGE (with LED indicator), PHONEBOOK, TRANSFER, CONFERENCE, HOLD, HEADSET, MUTE, SEND/ REDIAL,
Voice Codecs	Support for G7.29A/B, G.711μ/a-law, G.726, G.722(wide-band), G723.1, iLBC, Opus, in-band and out-of-band DTMF(in audio, RFC2833, SIP INFO), VAD, CNG, AEC, PLC, AJB, AGC
Auxiliary Ports	RJ9 headset jack (allowing EHS with Plantronics headsets), USB, extension module port
Telephony Features	Hold, transfer, forward, 5-way conference, call park, call pickup, shared-call-appea- rance (SCA)/bridged-line-appearance(BLA), downloadable phonebook (XML, LDAP, up to 2000 items), call waiting, call log(up to 500 records), XML customization of screen, off-hook auto dial, auto answer, click-to-dial, flexible dial plan, hot desking, persona- lized music ringtones and music on hold, server redundancy and fail-over
HD Audio	Yes, HD handset and speakerphone with support for wideband audio
Base Stand	Yes, 2 angle positions available, Wall Mountable
QoS	Layer 2 QoS (802.1Q, 802.1P) and Layer 3 (ToS, DiffServ, MPLS) QoS
Warranty	On Site 3-YearComprehensive Warranty

Item No.11

Technical Specification Requirement PABX Exchange for VOIP	
Analog Telephone FXS Ports	2 RJ11 Ports All ports have lifeline capability in case of power outage; number of ports can be expanded by peering with an FXS gateway
PSTN Line FXO Ports	2 RJ11 Ports All ports have lifeline capability in case of power outage; number of ports can be expanded by peering with an FXO gateway
Network Interfaces	Three self-adaptive Gigabit ports (switched, routed or dual mode) with PoE+
NAT Router	Yes (supports router mode and switch mode)

Peripheral Ports	1*USB 2.0, 1*USB 3.0, 1*SD card interface
LED Indicators	None
LCD Display	320x240 color LCD with touch screen for Shortcut Keys and Scroll Bar
Reset Switch	Yes, long press for factory reset and short press for reboot
Voice-over-Packet Capabilities	LEC with NLP Packetized Voice Protocol Unit, 128ms-tail-length carrier grade Line Echo Cancellation, Dynamic Jitter Buffer, Modem detection & auto-switch to G.711, NetEQ, FEC 2.0, jitter resilience up to 50% audio packet loss
Video Codecs	H.264, H.263, H263+, VP8
Telephony Operating System	Based on Asterisk version 16
DTMF Methods	In-band audio, RFC2833, and SIP INFO
Provisioning Protocol & Plug-and-Play	Mass provisioning using AES encrypted XML configuration file, auto-discovery & auto-provisioning IP endpoints via ZeroConfig (DHCP Option 66 multicast SIP SUBSCRIBE mDNS), eventlist between local and remote trunk
Network Protocols	Standard Protocols for SIP and VOIP
Disconnect Methods	Busy/Congestion/Howl Tone, Polarity Reversal, Hook Flash Timing, Loop Current Disconnect
Media Encryption	SRTP, TLS, HTTPS, SSH, 802.1X, ZRTP
Universal Power Supply	Input: 100 ~ 240VAC, 50/60Hz; Output: DC 12V, 1.5A
Temperature & Humidity	Operating: 32 - 113ºF / 0 ~ 45ºC, Humidity 10 - 90% (non-condensing) Storage: 14 - 140ºF / -10 ~ 60ºC, Humidity 10 - 90% (non-condensing)
Mounting	Wall mount & Desktop
Caller ID	Bellcore/Telcordia, ETSI-FSK, ETSI-DTMF, SIN 227 – BT, NTT
Polarity Reversal/Wink	Yes, with enable/disable option upon call establishment and termination
Call Center	Multiple configurable call queues, automatic call distribution (ACD) based on agent skills/availability/ work-load, in-queue announcement
Customizable Auto Attendant	Up to 5 layers of IVR (Interactive Voice Response) in multiple languages
Maximum Call Capacity	Users: => 500 Concurrent calls (G.711): 75 Max concurrent SRTP calls (G.711): 50

Call Features	Call park, call forward, call transfer, call waiting, caller ID, call record, call history, ringtone, IVR, music on hold, call routes, DID, DOD, DND, DISA, ring group, ring simultaneously, time schedule, PIN groups, call queue, pickup group, paging/intercom, voicemail, call wakeup, SCA, BLF, voicemail to email, fax to email, speed dial, call back, dial by name, emergency call, call follow me, blacklist/whitelist, voice conference, video conference, eventlist, feature codes, busy camp-on/ call completion, voice control, post-meeting reports, virtual fax sending/receiving, email to fax
Compliance	Compliance with standard regulations
Warranty	On Site 3-YearComprehensive Warranty

Item No.12

Technical Specifications of Server (Virtualization Host)	
Form Factor	2U, 2 Sockets Rack Mount Server (GPU Capable) OR Higher
Chassis	Chassis supporting up to 16 x 2.5" SAS/SATA Drives OR Higher
Processor	2 x Intel® Xeon® Gold 6538N 2.0G, 32C/64T OR Higher
Memory	04 x 64 GB RDIMM, 3200MT/s, Dual Rank OR Higher
Solution	HCI Based
Network Card	1 x Dual Port 10/25GbE SFP28 Adapter with Transceivers OR Higher
	1 x Quad Port 1G Base-T NIC OR Higher
Host Bus Adapter (HBA)	1 x Dual Port 32GB Fiber Channel HBA OR Higher
Storage/Raid Controller	RAID Controller with 8GB Cache Supporting RAID level 0, 1, 5, 6 & RAID Span 10, 50, 60 OR Higher
Hard Drives	At least 2TB SSD Use 6Gbps 2.5" Hot Plug Drive or Higher.
Systems Management	Enterprise License with Dedicated OOB Network Port. Supports remote management,

	Configuration & Troubleshooting
Power Supply	Dual Redundant Power Supply Hot Swapable OR Equivalent
Rack Rails	Rack mounting kit along with cable management arm
Warranty	On Site 3-YearComprehensive Warranty
OS License	2 x Windows Server® 2025 Standard, 16 CORE OEM License with multi language media kit.

Item No.13

Technical Specification Requirement Storage Area Network	
Form Factor	Unified SAN Storage supporting Multi-Protocol (Block & File Level)
OEM Standing	Quoted OEM must be in Leader Quadrant of Gartner Magic Quadrant for Primary Storage 2024
Base Enclosure	Proposed base enclosure should support twenty-five 2.5" or higher
Cache	Minimum 128GB per array or higher
Storage Controller	Dual Storage Controllers with Active-Active Configuration
RAID	Supporting RAID 0, 1, 5 and 6 or higher
Redundancy	End to End Redundant Connections with No Single Point of Failure
Storage Capacity	Array shall be offered with 80 TB usable capacity over RAID 6 with following configuration minimum 60% HDD, remaining 40% top tier using SSD/Flash.
Spare Drive	Single spare drive should be configured for each drive type
Scalability	Scalability up to 2PB or above
Modular Design	Should have a Modular Design which may be upgradable
Power and Cooling	Redundant Power and Cooling
Rack Rails	Rack Mount Kit with all Accessories
Management	Web based Management software
Expandability	Should support a minimum of 500 Drives or more
Front End Ports	4 Ports 16 Gbps FC I/O Ports per Array or higher
Feature Support	Required vol, VASA, VSS Integration Support
Drive Form Factor	Should support 2.5" Disk Drives
Native Replication	Should support SAN to SAN Replication (if required in future)
Warranty	Three Years Standard Warranty with (24x7) support

Item No. 14

Technical Specification Requirement Active Directory Server	
Form Factor	1U, 1 Socket Rack Mount Server
Chassis	Chassis supporting up to 08 x 2.5" SAS/SATA Drives OR Higher
Processor	1 x Intel® Xeon® E-2468 2.6G, 8C/16T, 24M Cache, Turbo, HT (65W) OR Higher
Memory	4 x 32GB UDIMM, 5600MT/s ECC OR Equivalent
Network Card	1 x Dual Port 10/25GbE SFP28 Adapter with Transceivers OR Higher
	1 x Dual Port 1G Base-T NIC OR Higher
Storage/Raid Controller	RAID Controller Supporting RAID level 0, 1, 5, 6 OR Equivalent
Hard Drives	02 x 1.92TB SSD 2.5"Hot Plug Drive OR Higher
Systems Management	Enterprise License with Dedicated OOB Network Port. Supports remote management, Configuration & Troubleshooting
Power Supply	Dual Redundant Power Supply Hot Swappable OR Higher
Rack Rails	Rack mounting kit along with cable management arm
Warranty	On Site 3-YearComprehensive Warranty OR Higher
OS License	1 x Windows Server® 2025 Standard, 16CORE OEM License with multi language media kit.

Item No.15
SFP 40 G: Single Mode, Dual Strand, 10 KM support

Item No.16
SFP 10 G: Single Model, Dual Strand, 1 KM support

Item No.17
Windows Software: Microsoft Windows Server 2025 Standard License

Item No.18

Specification for Backup and Replication Software
Minimum 10VMs or Physical Host Backup Required

Quoted OEM must be in Leader Quadrant of Backup of Enterprise Backup and Recovery Software Solutions for the last 3 consecutive year
Solution should create application-consistent, image-level backups of Virtual Machines and Physical Servers, ensuring successful recovery of business-critical applications and services and allowing for application-specific restore scenarios.
Solution should provide Host based replication of VMware vSphere and Microsoft Hyper-V Virtual Machines for High Availability and Disaster Recovery purposes managed from a single console.
Solution should support VMware vSphere, Microsoft Hyper-V, Nutanix Acropolis Hypervisor (AHV) and Red Hat Virtualization (RHV) platforms
Solution should support Microsoft Hyper-V infrastructure with System Center Virtual Machine Manager (SCVMM), Hyper-V Clusters and Hyper-V standalone hosts.
Solution should support the backup of NAS file shares effectively to Disk Targets and at scale, including SMB/CIFS and NFS formats.
Solution should feature the scalability, real time data traffic flow analysis with backup bottleneck reporting and central management console for multiple backup domains management
Solution should provide end-to-end encryption for Server backup and replication data in flight and at rest.
Solution should also provide ransomware protection in a truly software-defined way, by using a hardened Linux Repository, built out of a general-purpose server.
Solution should be able to create a backup repository with unlimited capacity by using native, cost-effective object storage integrations with Amazon S3, Azure Blob Storage, IBM Cloud Object Storage, Google Cloud Object Storage as well as S3-compatible service providers and on-premises storage solutions.
Solution should have the ability to instantly recover any type of VM Guest OS files from backup with no need to deploy agents in production VMs or Hypervisor before backup.
Solution should provide monitoring, reporting, alerting and capacity planning for Vmware vSphere and Microsoft Hyper-V Virtualization Platforms and Data Protection (Backup & Replication) Activities for Virtual, Physical and Cloud-based Workloads.

Solution should collect data on an interval that allows users to monitor all major performance metrics in real-time.
Solution should support pre-defined reports and monitor location tags for VMs, hosts, computers configured in backup solution to observe data sovereignty. Three Years License of Software.

Item No.19

Specification for Modular Rack for Network and IT Devices

1. **Modularity, Scalability and capacity:** The Data Center solution should be based on a modular design, allowing for flexible scaling of capacity in increments as needed to accommodate future growth and changing IT demands. The data center adopts modular architecture. The hot and cold aisles containment. A single module must be integrated with the cabinet system, power supply and distribution system, cooling system, management system, and integrated cabling system of same OEM.
2. **Capacity and integration:** The proposed modular data center solution must provide 4 managed rack spaces for IT & networking equipment, excluding spaces dedicated to power and cooling infrastructure. The solution should be pre-engineered and factory-integrated to minimize on-site installation and maximize space efficiency.
3. **Energy Efficiency:** The solution should incorporate energy-efficient components and design principles to minimize power consumption and operating costs. Specify a minimum PUE (Power Usage Effectiveness) value.
4. **Cooling System - Precision air conditioners**: The Data Center must include a robust and efficient cooling system designed to maintain optimal operating temperatures for IT equipment, with options for different cooling technologies (e.g., air cooling, liquid cooling, free cooling). This project must have rack-mounted precision air conditioners. The cooling capacity of a single air conditioner would at least 12.5 kW. The technical specifications of a precision air conditioner must meet the following requirements: 1. Precision air conditioners should be able to automatically adjust the indoor temperature and humidity as required, provide cooling and dehumidification functions, and at least one air conditioner has the heating and humidification functions. 2. Temperature adjustment range: $+18°C$ to $+45°C$ 3. Humidity adjustment range: 20%–80% RH. 4. The precision air conditioner uses R410a refrigerant which is environment-friendly and efficient.

5. **Management and Monitoring:** The solution should provide comprehensive management and monitoring capabilities, including remote monitoring, environmental sensors, and alarms for critical events.
6. **Security:** The Data Center must incorporate physical security measures (e.g., access control, surveillance) and cybersecurity features to protect critical IT infrastructure and data.
7. **Compliance and Standards:** The solution should comply with relevant industry standards and regulations (e.g., ASHRAE, ISO, TIA-942) for Data Center design and operation.
8. **Integration and Compatibility:** The Data Center solution should be easily integrated with existing IT infrastructure and support various IT equipment and technologies.
9. **Rapid Deployment:** The modular design should enable rapid deployment and commissioning of the data center to minimize time-to-market.
9. **Factory Integration:** The data center modules should be prefabricated and factory-integrated with IT and infrastructure components, including power, cooling, and cabling, for faster deployment and reduced on-site installation time.
10. **High Density Cooling:** The solution should support high-density computing environments with advanced cooling technologies capable of handling the heat loads generated by modern IT equipment.
11. **Pre-engineered Fire Suppression Module:** The data center solution should offer a pre-engineered and integrated fire suppression module that is factory-tested and pre-installed within the modular unit. This ensures rapid deployment, simplifies installation, and minimizes on-site disruption.
12. **Clean Agent Suppression:** The fire suppression system should utilize a clean agent extinguishing agent that is non-toxic, non-conductive, and leaves no residue, ensuring the safety of personnel and minimizing damage to sensitive electronic equipment.
13. **Integrated UPS:** The data center solution should include a UPS system that is fully integrated within the modular unit, eliminating the need for separate UPS installation and minimizing space requirements.
14. **UPS Redundancy:** The UPS system should support N+1 redundancy to ensure continuous operation even in case of a UPS module failure.

15. **UPS Monitoring and Management:** The UPS system should integrate with the data centre's management and monitoring system, providing real-time visibility into UPS status, performance, and alarms.

16. **Uninterruptible Power Supply (UPS):** The data centre solution must include a UPS system to provide continuous power to critical IT equipment in the event of a power outage.

17. **UPS Capacity and Runtime:** 30 KVA with 90 minutes backup to support the IT load and bridge the gap until backup power sources are available.

16. **Fire Detection and Alarm System:** The data center solution must include a fire detection and alarm system with smoke detectors, heat detectors, and audible/visual alarms to provide early warning of a fire event.

17. **Fire Suppression System:** The solution should incorporate an automatic fire suppression system designed to extinguish fires quickly and effectively while minimizing damage to IT equipment. Specify the type of suppression agent preferred (e.g., gaseous, clean agent) and any specific requirements for environmental impact or safety.

18. **Integration with Building Systems:** The fire suppression system should integrate with the building's fire alarm system and other safety systems for coordinated response in case of a fire emergency.

19. Dimensions   Module (W x D x H) Single module: W x 1350 mm x 2000 mm, W ≤9m;

20. IT cabinet (W x D x H)   600 mm x 1350 mm x 2000 mm (including aisles)

21. Network cabinet (W x D x H)   800 mm x 1350 mm x 2000 mm (including aisles)

22. Battery cabinet (W x D x H) "Inside the aisle containment: 600 mm x 1350 mm x 2000 mm (including aisles)

23. Outside the aisle containment: 600 mm x 1200 (1100) mm x 2000 mm"

24. Aisle width   250 mm

25. Cabinet height   2000 mm

26. IT cabinet bearing capacity   Static load   1500 kg   or more

27. Dynamic load	1000 kg (diagnostic test, based on the platform report) or more	
28. Cabinet door Cold and hot aisle containment	Front door: double-layer hollow glass door	
29. Rear door: single-swing sheet metal door		
30. IP rating IP rating	IP20 or more	
31. Installation mode Installation mode	Installed on an ESD floor or a concrete floor	

Item No. 20
Technical Specifications for 30 KVA Generator
30 kVA Generator Specifications with Auto Start
General Requirements:
1. **Power Output:** 30 kVA continuous power output at 220/440V 50Hz
2. **Deployment:** Concrete bed of Generator, DPs, allied electrical and power distribution equipment's
3. **Engine:** Reliable diesel engine from a reputable manufacturer with 3 years warranty. Engine compliance with relevant emission standards (e.g., Euro Stage IIIA, EPA Tier standards).
4. **Alternator:** High-quality alternator with suitable voltage regulation and protection features.
5. **Fuel Tank:** Integral fuel tank with sufficient capacity for 8 hours at full load.
6. **Grounding Kit**: - Provided with a grounding kit for safe operation.
7. **Cooling System:** Efficient cooling system suitable for the intended ambient temperature range (25 Celsius).
8. **Control Panel:** Digital control panel with comprehensive monitoring and control functions, including:
    o Engine parameters (speed, oil pressure, temperature)
    o Alternator parameters (voltage, current, frequency)
    o Fuel level
    o Running hours
    o Alarms and shutdown protections
9. **Sound Attenuation:** Sound-attenuated enclosure to minimize noise levels as per Environmental standards. The Bidder will deploy with Anti-Vibration Mounts (AVM) to reduce the noise and make it appropriate for a hospital environment.
10. **Additional devices to install:** Equip the generator with high-quality exhaust silencers or mufflers for noise reduction.
11. **Auto Start:** Automatic start functionality with integrated ATS (Automatic Transfer Switch) for seamless transition to generator power upon mains failure.

12. **Protection Features:** Overload protection, overcurrent protection, low oil pressure shutdown, high engine temperature shutdown.
13. **Testing and Commissioning:** Comprehensive testing and commissioning procedures to ensure proper operation.

Specific Requirements for Auto Start:

- **ATS (Automatic Transfer Switch):** Specify the required ATS rating and configuration (e.g., 3-pole, 4-pole) to match the electrical load.
- **Start Delay:** Configurable start delays to allow for brief mains fluctuations.
- **Cool-down Time:** Configurable cool-down time before automatic shutdown after mains restoration.
- **Battery Charger:** Automatic battery charger to maintain the starting battery in optimal condition.
- **Exercise Mode:** Automatic exercise mode for periodic testing of the generator and ATS.
- **Onsite Warranty:** 3 Years

Item No. 21
Technical Specifications for 650VA UPS for Cabinets

1. Capacity: 650VA with 70% power factor
2. Topology: Line-interactive UPS with Automatic Voltage Regulation (AVR) to correct voltage fluctuations without switching to battery power. Pure sign wave output
3. Outlets: Multiple outlets with surge protection, including universal sockets for compatibility with various devices.
4. Form Factor: Compact and space-saving design suitable for desktop or floor placement.
5. Communication: USB connectivity for monitoring UPS status and managing shutdown procedures on connected computers.
6. Backup Time: Minimum 1-hour backup time at typical load at 80% load.
7. Battery: Sealed lead-acid or Lithium-Ion batteries with user-replaceable design.
8. Software: UPS management software for advanced monitoring and control.
9. Warranty: 3 Years

Item No. 22
Technical Specifications for 1000 VA UPS

1. Capacity: 1000VA with 80% power factor
2. Topology: Line-interactive UPS with Automatic Voltage Regulation (AVR) to correct voltage fluctuations without switching to battery power. Pure sign wave output
3. Outlets: Multiple outlets with surge protection, including universal sockets for compatibility with various devices.
4. Form Factor: Compact and space-saving design suitable for floor placement.

5. Communication: USB connectivity for monitoring UPS status and managing shutdown procedures on connected computers.
6. Backup Time: Minimum 1-hour backup time at typical load at 80% Load.
7. Battery: Sealed lead-acid or Lithium-Ion batteries with user-replaceable design.
8. Software: UPS management software for advanced monitoring and control.
9. Warranty: 3 Years

Item No. 23

Technical Specifications for LED Scree 55 Inches CCTV/Network Operations

> Industrial level LCD panel, suitable for continuous 24/7 operation
> 4K Ultra-HD resolution or above
> Using tamper-proof metal housing
> Built-in 3D COMB filter and 3D noise reduction
> 6ms response time for no motion blur, judder or ghosting
> High fidelity digital processing for a brilliant and vivid video
> 178°/178° wide uniterupted viewing angle or above
> Professional thermal design to extend equipment lifespan
> Built-in power, low energy consumption, ultra-quiet
> Support multiple signals, such as HDMI, DP, USB multimedia, Audio etc.
> Warranty: 3 years

Item No. 24

Technical Specification Requirement for LAPTOP System	
Processor	Intel Cori7, 14 Generation, suffix T series or above
Memory / RAM	16 GB DDR5 or above
Network Card	Gigabit supportive NIC
Hard Drives	512 GB SSD M2
Screen	Antiglare 14 inch with camera

Battery	Minimum 8 hours backup
Graphics	Intel Integrated Graphics
Warranty	On Site 3-Year Comprehensive Warranty OR Higher
Accessories	Leather, padded carrying bag
OS License	1 x Windows 11 Professional

Item No. 25

- Kaspersky End point solution - 3 Year license with Server based solution.

- No. of User License: 200 computer systems.

- Configuration and Deployment of client software on client and server machines.

Item No. 26

Technical Specification Requirement 4MP IP Camera	
Type	Bullet - with high dynamic range (WDR) for clear images in challenging lighting conditions.
Specs	Outdoor, dustproof, waterproof etc.
Conditions	Additionally, Night-vision facility
Resolutions	4 MP

Item No. 27

Technical Specification Requirement PTZ IP 4MP Camera	
Type	PTZ – best for boundary wall security
Specs	Outdoor, dustproof, waterproof etc.
Conditions	Additionally, Night-vision facility
Resolutions	4 MP

Item No. 28 & Item No.29
Technical Specification Requirement NVR 64 Channel and 32 Channel

1. **Capacity/Resolution:** Support 32/64 IP camera channels, recording at least 4K (8MP) resolution with H.265/H.264 compression.

2. **Storage/RAID:** Sufficient storage with RAID support (e.g., RAID 0, 1, 5, 6) for data redundancy. Minimum 30 days storage is desirable with full coverage of channels.

3. **Networking/Access:** Gigabit Ethernet, remote access via web browser/client software.

4. **Video Analytics:** Built-in motion detection, intrusion detection, object recognition.

5. **AI/ePoE:** Advanced AI (facial recognition, people counting) and ePoE support for extended camera range.

6. **ONVIF/ANPR:** ONVIF compliance for third-party camera integration and ANPR compatibility.

7. **Cybersecurity:** Robust security features like user authentication, access control, and data encryption.

Item No.30
Details of OpenNMS solution
Installation, deployment, testing, commissioning and training of openNMS

1. **Device Monitoring:** Monitor a wide range of network devices (routers, switches, servers, firewalls) using SNMP and other protocols.

2. **Performance Data Collection:** Collect and store performance data (bandwidth usage, CPU utilization, memory, etc.) for historical analysis and reporting.

3. **Graphing and Visualization:** Generate customizable graphs and dashboards to visualize network performance trends and identify potential issues.

4. **Alerting and Notifications:** Configure alerts based on thresholds and events to notify administrators of network problems.

5. **Open Source and Extensible:** Based on open-source technology with a large community and plugin support for customization and extensibility

Item No. 31
Details of Wazuh SIEM solution
Security information and event management – SIEM
Installation, deployment, testing, commissioning and training of Wazuh

1. **Data loss prevention** module (DLP)

2. **Log Management:** Collect, index, and store security logs from a wide variety of sources (servers, firewalls, applications, databases) in various formats.

3. **Real-time Correlation and Analysis:** Correlate events from different sources in real-time to identify security incidents and patterns.

4. **Threat Detection:** Detect known and unknown threats using rule-based and anomaly-based detection methods.

5. **Incident Response:** Provide tools and workflows for investigating and responding to security incidents, including alert management, case management, and automated response actions.

6. **Reporting and Dashboards:** Generate comprehensive reports and dashboards to visualize security posture, track key metrics, and demonstrate compliance.

6. **Scalability and Performance:** Handle high volumes of data and provide fast search and analysis capabilities, even with large datasets.

7. **Advanced Analytics and Machine Learning:** Utilize machine learning algorithms for advanced threat detection, anomaly detection, and predictive analytics.

8. **User-Friendly Interface:** Offer an intuitive and user-friendly interface for searching, analysing, and visualizing data.

9. **Extensive App Ecosystem:** Provide a wide range of apps and integrations to extend functionality and connect with other security tools.

10. **Flexible Deployment Options:** Support on-premises, cloud, and hybrid deployment models to meet various needs and environments.

Details and Approx. Quantity of Passive Items

S No	Description	Details	Main Complex Qty	Chota Lahore Qty	Topi Qty
1	CAT 6 I/O with faceplate and back box	3M/ Schneider/ Panduit	700	60	60
2	1 meter Fiber Patch Cord.	3M/ Schneider/ Panduit	500	20	20
3	1meter Cat-6 Patchcords	3M/ Schneider/ Panduit	1000	120	120
4	3 meter Cat-6 Patchcords	3M/ Schneider/ Panduit	200	50	50
5	5 meter Cat-6 Patchcords	3M/ Schneider/ Panduit	500	10	10
6	CAT 6 Cable Roll. (305 meter), Pure coper, 23 AWG	3M/ Schneider/ Panduit	80	13	13
7	24 Port patch Panel with I/O	3M/ Schneider/ Panduit	90	8	8
8	Cabinet 9U with PDU	Local with Cooling Fans	69	8	8
9	Cabinet 42U with 2 PDU each	Local with Cooling Fans	2	1	1
10	Power Socket	3M/ Schneider/ Panduit	90	10	10

11	Power Cable 3.29 dual core. (90 meter), fire resistant	FAST or equivalent	5	1	1
12	Cable Manager	3M/ Schneider/Panduit	90	7	7
13	Duct 16x25	Adamjee or Equivalent	10,000	2,000	2,000
14	Duct 16x38	Adamjee or Equivalent	5,000	2,000	2,000
15	Duct 40x40	Adamjee or Equivalent	2,000	350	350
16	Installation of Passive Work and miscellaneous items		1	1	1
FIBER ITEMS					
1	12 core optical fiber	Premier/LiTech/ Corning	3000	2000	2000
2	48 Core optical fiber	Premier/LiTech/ Corning	5000		
3	12 port ODF rack Mounted	Imported	70	7	7
4	48 port ODF	Imported	8		
5	12 core joint enclosure (joint box)	imported	5	7	7
6	48 Core joint enclosure	Imported	10		
7	Digging of Fiber including HDPE Pipe, warning tape, Hand Hole, fiber Joints, splicing, marker post include Hard Area.		1	1	1
DATA CENTER - SERVER ROOM FLOORING					
1	Anti-static flooring		1		
2	Fire detection systems		1	1	1
3	Dampa Ceiling		1		
4	AC for datacenter	1.5-ton invertor	5	1	1
5	ATS Pannel		1		
6	Main DBB		1	1	1
7	Cable Trays/Fiber Trays		1	1	1
8	Professional services for center, tempered glass, emergency exit door, Access Control etc. etc.		1		

…………………………****The End*****…………………………