



**CYBER SECURITY FOR DIGITAL PAKISTAN / NCERT**

**(NATIONAL CYBER EMERGENCY RESPONSE TEAM)**

**TENDER DOCUMENT**

**Establishment of Cyber Operations & Defense Emulation Lab**

**GOVERNMENT OF PAKISTAN**  
**CYBER SECURITY FOR DIGITAL PAKISTAN/nCERT**  
**(NATIONAL CYBER EMERGENCY RESPONSE TEAM)**

**INVITATION TO BIDS**

1. Cyber Security for Digital Pakistan /nCERT invites bids for “**Establishment of Cyber Operations & Defense Emulation Lab at National CERT**” for which electronic bids are invited under Single Stage-Two Envelope bidding procedure through **e-PADS Version 2.0** from the firms/ companies registered with Income Tax, Sales Tax Departments, which are on FBR’s Active Taxpayer’s List (ATL).
2. The prospective service providers are required to submit their electronic bids including technical and financial proposals along with the Bid Security instrument amounting to Rupees 0.8 million/- (Rupees Eight Hundred Thousand Only) submitted in favor of Project Director, CSDP/NCERT (FTN/NTN: 9012000-7) through PPRA e-PADS Version 2.0.
3. **E-Bidding documents**, containing detailed terms & conditions, specifications and requirements etc. are available on e-Pak Acquisition and Disposal System (EPADS) at <https://vendors.epads.gov.pk/>.
4. Bidder(s) are required to get themselves registered on **EPADS v2.0** on or before **March 30, 2026 11:00 AM**. E-bids will be opened using **EPADS v2.0** on the same day at **March 30, 2026 11:30 AM**. Manual submission of Bids shall not be entertained. Those vendors who have not yet registered on the new version of **EPADS v2.0**, may register themselves on <https://vendors.epads.gov.pk/>. A tutorial to explain the registration process is available at <https://www.youtube.com/watch?v=MNW6T38v7tc>
5. Original Bid security instrument **MUST** be submitted to the undersigned before closing hours of the bid submission time otherwise respective bid will not be opened.
6. Bidding documents can be accessed from the website of National Computer Emergency Response Team (<https://pkcert.gov.pk/>) as well as on PPRA website.
7. Bids will be opened on the same day i.e., **30<sup>th</sup> March, 2026** at **1130 hours** in the presence of representatives of the bidders.
8. As per PPRA Rules 33(1), 2004, National Computer Emergency Response Team (nCERT) has the right to reject any or all bids/ proposals at any time prior to the acceptance of a bid/proposal.

Project Director  
National Computer Emergency Response Team (nCERT)  
L- Block, Pakistan Secretariat, Islamabad  
Ph No. 051-9203421-22  
Email: [bid@pkcert.gov.pk](mailto:bid@pkcert.gov.pk)  
Website: (<https://pkcert.gov.pk>)

**TERMS OF REFERENCE (TOR) REQUEST FOR PROPOSAL FOR  
SUPPLY OF HARDWARE AND LICENSED SOFTWARE**

1.	Background
2.	General Terms & Conditions
3.	Implementation & Payment Schedule
4.	Evaluation Criteria
5.	Award Of Contract
6.	Mailing address/ Contact information
7.	Annexure-Bill of Quantities
8.	Annex-I

**1. BACKGROUND:**

“Cyber Security for Digital Pakistan”, is a PSDP project sponsored by Ministry of Information and Technology (MoITT) and executed by National Telecommunication & Information Technology Security Board (NTISB). The project “Cyber security for Digital Pakistan” is a prerequisite for the Digital Pakistan initiative addressing current National cyber security gaps and concerns. This project will provide cyber security and digital initiative support to all public/private/defense sector organizations/institutes at national level. “National CERT” is a PSDP Project sponsored by Ministry of Information and Technology (MoIT&T) and executed by National Telecommunication & Information Technology Security Board (NTISB). The Project “Cyber Security for Digital Pakistan” is a prerequisite for the Digital Pakistan initiative addressing current National Cyber Security requirements. This project will provide Cyber Security support to all Public / Private / Defense Sector Organizations/ Institutions on National Scale.

**2. GENERAL TERMS & CONDITIONS:**

- i. Proposal Submission:** The electronic bid including technical and financial proposals must be submitted online on or before 30<sup>th</sup> March, 2026 at 1100 hours through e-PADS at <http://eprocare.gov.pk>.
- ii.** A bid security, in the shape of a Bank Draft / Pay Order in the name of **Project Director, PKCERT**, amounting to Rs. 0.8 million PKR should be submitted along with the Technical and Financial Proposals at the address given below latest by 30<sup>th</sup> March, 2026 at 1100 hours. Technical bids will be opened on the same date at 1130 hrs:

**Project Director  
Cyber Security for Digital Pakistan (CSDP/nCERT)  
L- Block Pak Secretariat, Islamabad  
Ph No. 051-9203421-22  
Email: [bid@pkcert.gov.pk](mailto:bid@pkcert.gov.pk)**

- iii. Scope of Work:** The scope of work includes Supply, Installation and successful testing of the Hardware & License Software mentioned at Annexure-I.
- iv. Bidders** may participate in the tender under the Single Stage Two Envelope procedure and may quote for one, multiple, or all Lots on a turnkey basis. Evaluation shall be carried out on an item-wise/Lot-wise basis to ensure transparency, fairness, and competitive procurement. Each Lot listed in Annex-I shall be evaluated separately based on a predefined technical scoring criterion, including compliance with specifications, technology offered, OEM credentials, warranty/support, and value-added features. Only technically responsive bids achieving the minimum qualifying technical score shall proceed to financial evaluation. Financial evaluation shall be conducted item-wise among technically qualified bidders, and award of contract shall be made to the bidder obtaining the highest combined score (technical + financial) as per the approved evaluation methodology.

- v. The bidder(s) winning each respective Lot, in accordance with PPRA Rules under the Single Stage Two Envelope procedure, shall be responsible for the complete supply, installation, configuration, integration, testing, commissioning, and handover of the respective item(s) on a turnkey basis.
- vi. The client reserves the right to award contract for one, multiple, or all Lots to one or more bidders. The procuring agency may also increase or decrease the quantity of items in each lot at the time of issuance of supply order as per PPRA Rules. Bidders must quote each module/lot (including hardware and licensed software) separately. Baseline configurations provided in Annex-I represent minimum requirements; equivalent latest or higher configurations may be offered and will be evaluated on scoring criteria considering technical merit versus quoted price.
- vii. Soon after technical evaluation, the technical qualified firms as per evaluation criteria mentioned at para 4(b), shall be called for opening of financial bid on given date and time which will be communicated to the firms in writing. Un-opened bid security instrument shall be returned to the technically disqualified firms.
- viii. Proposal and prices shall remain valid for a period of 90 days from the date of closing for submission of the proposal. However, the responding organizations are encouraged to state a longer period of validity for the proposal.
- ix. Prices should be quoted in the Pakistani rupees (PKR) and inclusive of all taxes, prices mentioned without any remarks will be treated as inclusive of all applicable taxes.
- x. Any proposal received after the due date and time will not be accepted.
- xi. Bidders should be registered with Sales Tax registration Department and should be in possession of valid NTN number. Copies of the certificates must be attached with the technical bid
- xii. The successful bidders shall be responsible for payment of any duties / taxes etc. that are imposed by the Government of Pakistan during the period of delivery and till commissioning.
- xiii. The bidders are hereby informed that the Government shall deduct tax at the rate prescribed under the tax laws of Pakistan, from all payments for Hardware/Software by any bidder who signs a contract with the Government.
- xiv. The successful Firm shall be required to deposit in the form of a Bank Guarantee, a Performance Bond from the date of successful testing and acceptance, a sum equivalent to ten percent (10%) of the contract value. This Bank Guarantee shall be issued by a scheduled bank operating in Pakistan and shall be kept valid from the date of issue, until one (1) year after all contractual obligations have been fulfilled
- xv. Bidders should have been in the IT business, Sales and After Sales Support/Maintenance provisioning for at least (03) three years.
- xvi. Hardware equipment should have minimum one (01) year warranty (unless stated otherwise in Annex-I), including parts and maintenance after the delivery of hardware

with next Business Day Part Replacement and on-site support. Supplier to share list of OEM warehouses for spare-parts and accessories within the country where applicable (nCERT reserves the right to keep faulty Hardware/Equipment under parts replacement warranty claim). Software licenses should be quoted for at least 01 year with perpetual subscription option (if applicable).

- xvii.** The bidders should be authorized Partner / Reseller / Distributor / Manufacturer, of THE ORIGINAL MANUFACTURER, in Pakistan.
- xviii.** All equipment should be supplied through verifiable and legitimate distribution/Sales 6 channels.
- xix.** The Bidders to provide Company information as per para 4 for Technical Evaluation.
- xx.** Bidders should not submit any kind of refurbished/ Used / End of Life Hardware equipment's / components in their technical proposals.
- xxi.** Bidders should clearly indicate the timeline for delivery of equipment after receiving the award of contract.
- xxii.** The end user licenses, end user warranties and end user contracting support services registrations and subscriptions will be in the name of Client, for all the equipment and Software loaded on the equipment delivered during the course of this procurement. All items/solutions must be pre-configured with all applicable licenses, subscriptions and dependencies with no compatibility conflicts / missing dependencies.
- xxiii.** Envelope for financial proposals should be clearly marked: "Financial Proposal".
- xxiv.** Main Envelope should contain "Technical Proposal" & "Financial Proposal" (each being physically separated, bound, sealed and labeled), all the supporting documents as per evaluation criteria mentioned at para 4 & 2 (vi) and a separate clearly marked sealed envelope of bid security instrument.

**3. IMPLEMENTATION & PAYMENT SCHEDULE:**

<b>Sr. No.</b>	<b>Milestones</b>	<b>Time Period</b>	<b>Payment</b>
<b>1.</b>	Supply of equipment / Software. Installation and Configuration	Four-to-Eight weeks from date of signing of contract	40%
<b>2.</b>	Successful testing and acceptance	Four (04) weeks from installation and configuration of Hardware and Software	60% Subject to provision of 10% Performance Guarantee
<b>3.</b>	End of performance Guarantee	Performance Guarantee will have to be provided to cover the warranty period of the hardware which will be One year from the date of successful testing and acceptance.	Release of Performance Guarantee

**4. EVALUATION CRITERIA**

**a. TECHNICAL BID EVALUATION:**

There will be a two-stage technical evaluation. Preliminary evaluation (Initial Screening) of technical bids will be done on the basis of the following criteria:

**Detailed technical evaluation** will be done for firms who qualify the preliminary evaluation mentioned above.

**In detailed technical** evaluation the Evaluation & Award Committee will verify the compliance with specifications mentioned in Annexure-I. Any bid containing less specifications will be rejected.

<b>GENERAL &amp; TECHNICAL EVALUATION</b>				
<b>Sr#</b>	<b>Compliance</b>	<b>Criteria</b>	<b>Max Score</b>	<b>Obtained Score</b>
1	Company Presence in Pakistan	Head Office in Pakistan (5) Branch Office in Pakistan (3) Partner in Pakistan (2)	5	
2	Company presence in Islamabad/ Rawalpindi	Head Office in Isl/Rwp (5) Branch Office in Isl/Rwp (3) Partner in Isl/Rwp (2)	5	
3	Working in IT business (at least 3 x years)	3 or more than 3 years exp (5) Less than 3 years exp (0)	5	
4	Experience of at least 3 x similar size projects	3 or more than 3 projects completed (20) Less than 3 projects completed (0)	20	
5	Solution Presentation, Demonstration and understanding of the required software/ hardware solution.	Deployment plan and functional requirements as per Annex-I	30	
6	Ranking of Technology in Gartner or other relevant body.	Leader (10) Visionary (5) Challenger (4) Niche Player (3) Others (2)	10	
7	Baseline Configuration (Anex-I)	Configuration and Specs higher than Baseline (10), Equivalent (8)	10	
8	Duration of licenses	Perpetual (10) More than 1 year (6) 1 year (4)	10	
9	Warranty duration	More than 1 year (5) 1 year (3)	5	
<b>Total</b>			<b>100</b>	

$$\text{Technical Evaluation Score (70\%)} = \frac{\text{Marks Obtained}}{100} \times 70$$

**b. FINANCIAL BID EVALUATION (30%):**

Financial bids of the technically qualified firms will be opened before the representatives who wish to attend the tender opening. Financial bids will be opened only for those vendors only who qualify (meet the specifications) in technical and detailed technical evaluation.

**Financial Evaluation Score (30%) =  $\frac{\text{Amount quoted by the lowest bidder}}{\text{Amount quoted by the bidder whose financial score is to be calculated}} \times 30$**

**c. Final Evaluation**

Final Score (100%) = Technical Evaluation Marks (70%) + Financial Evaluation Marks (30%)

**The bidders need to score at least 70% marks** in technical evaluation to technically qualify for financial bid opening. The bidder scoring maximum marks in final evaluation will be awarded the contract.

**5. AWARD OF CONTRACT:**

Bidder having scored highest marks in Final evaluation as per para 4(c), will be awarded the contract. After acceptance of Technical and Financial bid, an Award Letter shall be issued, in duplicate, to the successful bidder, and the selected Firm, within 15 days of receipt of Award Letter, sign and return the duplicate copy of the Award Letter in acknowledgement thereof. In the event the duplicate copy of the Award Letter duly signed by the Firm is not received by the stipulated date, the Authority may, unless it consents to extension of time for submission thereof, cancel the Award Letter issued to it.

**6. MAILING ADDRESS/ CONTACT INFORMATION:**

The following address details can be used for any correspondence, queries clarification and communication purposes via email and/or telephone calls:

<b>Address</b>	National Cyber Emergency Response Team (nCERT) HQ's, L- Block, Pakistan Secretariat, Islamabad
<b>Telephone</b>	051-9203421-22
<b>Email</b>	bid@pkcert.gov.pk
<b>Website</b>	www.pkcert.gov.pk

Details of Items Lot-Wise

Lot	Item Description	Qty	Unit Price with GST	Total Price With GST
<b>1 (MicroData Center Solution)</b>	Compute Node	04		
	Firewall	01		
	Core Switch	01		
	Access Switch	02		
	Access Point	06		
	Smart Rack	01		
	NAS Storage	01		
<b>2 (Red Team Suite)</b>	Adversary Simulation Took Kit	01		
	Penetration Testing Tool Kit	01		
	Offensive Security Toolkit	01		
	ClaudeMax Subscription license	03		
<b>3 (End- User Compute)</b>	Laptop	02		
	Wireless Mouse + Keyboard Combo	24		
	Workstation + Monitor (Display)	20		
	Portable SSD	02		
	Portable USB	10		
	Heavy Duty Color Printer	02		
<b>4 (Video Wall Solution)</b>	100-Inch LED / QLED Smart Television	02		

## Technical Specifications

<b>Lot 1. (MicroData Center Solution)</b>		
<b>ITEM NO.</b> <b>01</b>	<b>Compute Node</b>	<b>04</b>
<b>S#</b>	<b>Technical Description, Specifications and Standards Required</b>	
1.1	2U Chassis with 12 (3.5”) 2x (2.5”) Disk Slots or better	
1.2	2x Processor, 32 Cores/64 Threads or higher, Minimum 2.8 GHz base frequency, supporting DDR5 memory.	
1.3	8x 32GB DDR5 5600MHz or better	
1.4	2x 480GB/960GB 2.5" SATA SSD (configured with RAID1) or better	
1.5	5x Minimum 7.68TB Enterprise Grade SSD, 3D NAND TLC SSD 2.5", SATA 3.0 6Gbps or better (or higher capacity equivalent)	
1.6	4x 10GE Optical Ports with SFP Modules (Multimode Optical Transceiver) with 3M Cable or better	
1.7	4x 1G Ethernet Copper Ports with 3M cable or better	
1.8	Raid Card 8GB cache with Raid(0,1,10,5,6) and Pass-through (JBOD) mode supported or better	
1.10	Dual Power Supply or better	
1.11	Embedded Server Management Software for Remote Management	
1.12	Complete Rail Kit for Rack Mounting	
1.13	Front Bezel (front cover or faceplate)	
1.14	OEM Backed Warranty (36 Months)	

- i. The bidder (who qualified) must assign a qualified onsite (Technical/Resident) engineer on-site for 1-Years to perform the installation, integration, configuration, and commissioning of the **Lot1 Micro Data Center solution**. The bidder shall also be responsible for supplying, installing, and properly terminating all required interconnection and power cabling associated with the infrastructure. This includes complete internal rack cabling as well as all necessary cabling between the rack and the laboratory area. All cabling shall be installed following industry best practices, ensuring proper routing, secure mounting, clear labeling, and compliant termination to guarantee reliable operation, ease of maintenance, and a well-organized installation environment

<b>ITEM NO.</b> <b>02</b>	<b>Firewall</b>	<b>01</b>
<b>Technical Description, Specifications and Standards Required</b>		
Must be a globally recognized enterprise-grade Next-Generation Firewall with proven threat intelligence and a strong presence in the Pakistan market for at least 5 years.		
Must Have OEM Presence in Pakistan For Minimum 5 Year		
Must Have Full Features Working Even License Is Expired		
Must Have Minimum 7 NGFW Throughput (FW + SA + IP		

Must Have Minimum 3.5 Threat Protection Throughput (FW + SA + IPS + Antivirus)
Must Have Unrestricted Concurrent User
Must Have Minimum 128GB Storage Capacity
Must Have Minimum 4 x 1G Ethernet Interfaces, & 2 >= 10G SFP+ Interfaces
Must Include Intrusion Prevention System (IPS), Anti-Virus & Anti-Malware, Email Security Protection, Cloud-Based Security Sandbox, Web Filtering, Application Control, Bandwidth Management
Must Quote Minimum 100 Concurrent Users for SSL VPN
Must Quote 3 Years Complete Security Features License
Must Quote 3 Years Software Upgrade & 24x7
Must Quote 3 Years Hardware Warranty Service
Must Quote Onsite Configuration & Installation
Must Quote Onsite Training
Product Certification For 2 Participant (Optional) Extra Marks

ITEM NO. 03	Core Switch	01																								
S#	Technical Description, Specifications and Standards Required																									
3.1	<b>1 Interface Requirements</b>  48 × 10G SFP+ ports ≥ 2 × 40G or 100G QSFP uplinks																									
3.2	<b>1 Performance Requirements</b> The switch must meet or higher specs: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Parameter</th> <th style="text-align: left;">Minimum Requirement</th> </tr> </thead> <tbody> <tr><td>Switching capacity</td><td>≥ 640 Gbps (up to 960 Gbps preferred)</td></tr> <tr><td>RAM</td><td>≥ 4 GB</td></tr> <tr><td>Flash</td><td>≥ 2 GB</td></tr> <tr><td>MAC address table</td><td>≥ 384K</td></tr> <tr><td>ARP entries</td><td>≥ 62K</td></tr> <tr><td>Ipv4 routing entries</td><td>≥ 250K</td></tr> <tr><td>Ipv6 routing entries</td><td>≥ 80K</td></tr> <tr><td>Jumbo frame</td><td>≥ 9K</td></tr> <tr><td>VLANs</td><td>≥ 4K</td></tr> <tr><td>VRF instances</td><td>≥ 1,000</td></tr> <tr><td>VRRP groups</td><td>≥ 255</td></tr> </tbody> </table>		Parameter	Minimum Requirement	Switching capacity	≥ 640 Gbps (up to 960 Gbps preferred)	RAM	≥ 4 GB	Flash	≥ 2 GB	MAC address table	≥ 384K	ARP entries	≥ 62K	Ipv4 routing entries	≥ 250K	Ipv6 routing entries	≥ 80K	Jumbo frame	≥ 9K	VLANs	≥ 4K	VRF instances	≥ 1,000	VRRP groups	≥ 255
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3.3	<ul style="list-style-type: none"> <li>• <b>Layer-2 Features</b></li> </ul> The switch must support: <ul style="list-style-type: none"> <li>• 802.1Q VLANs, QinQ and Flexible QinQ</li> <li>• Private VLANs and Guest VLAN</li> <li>• GVRP and VLAN isolation</li> <li>• LACP with ≥ 64 groups</li> <li>• MSTP, RSTP, STP</li> <li>• Ethernet Ring Protection Switching (G.8032)</li> <li>• Loop detection and fault detection features</li> </ul>																									

3.4	<ul style="list-style-type: none"> <li>• <b>Layer-3 Routing Requirements</b></li> </ul> <p>The switch must support:</p> <ul style="list-style-type: none"> <li>• <b>4.1 Ipv4/Ipv6 Dual Stack</b></li> <li>• Wire-speed forwarding for Ipv4 and Ipv6</li> <li>• Static routing (Ipv4 &amp; Ipv6)</li> <li>• RIP/RIPng</li> <li>• OSPFv2 / OSPFv3</li> <li>• BGP / BGP+</li> <li>• IS-IS / IS-Isv6</li> <li>• Policy-Based Routing</li> <li>• VRRP / VRRPv3</li> <li>• ECMP routing</li> </ul>
3.5	<ul style="list-style-type: none"> <li>• <b>Network Virtualization &amp; SDN</b></li> </ul> <p>The proposed solution must support:</p> <ul style="list-style-type: none"> <li>• <b>6.1 VxLAN / EVPN</b></li> <li>• L2/L3 VxLAN Gateway</li> <li>• Ipv4 &amp; Ipv6 VxLAN tunnels</li> <li>• BGP-EVPN</li> <li>• Distributed and centralized VxLAN gateway</li> <li>• End-to-End VxLAN DCI support</li> </ul>
3.6	<ul style="list-style-type: none"> <li>• <b>QoS Requirements</b></li> </ul> <p>The switch must support advanced QoS including:</p> <ul style="list-style-type: none"> <li>• 8 hardware queues per port</li> <li>• Scheduling algorithms: SP, RR, WRR, WDRR, SP+WRR, SP+WDRR</li> <li>• Traffic shaping and rate limiting</li> <li>• DSCP / CoS / 802.1p classification</li> <li>• RED/WRED congestion management</li> </ul>
3.7	<ul style="list-style-type: none"> <li>• <b>Security Requirements</b></li> </ul> <p>The switch must provide enterprise security including:</p> <ul style="list-style-type: none"> <li>• <b>Access Security</b></li> <li>• 802.1X authentication</li> <li>• Port security</li> <li>• MAC + IP + VLAN binding</li> <li>• DHCP Snooping / ND Snooping</li> <li>• IP Source Guard</li> <li>• <b>Threat Protection</b></li> <li>• Dynamic ARP Inspection</li> <li>• DoS/DdoS protection</li> <li>• Storm control</li> <li>• ARP guard &amp; ARP suppression</li> <li>• <b>AAA</b></li> <li>• RADIUS</li> <li>• TACACS+</li> <li>• Portal authentication</li> </ul>
3.8	<ul style="list-style-type: none"> <li>• <b>Monitoring &amp; Management</b></li> </ul> <p>The switch must support:</p> <ul style="list-style-type: none"> <li>• SNMP v1/v2/v3</li> </ul>

	<ul style="list-style-type: none"> <li>• RMON</li> <li>• SYSLOG</li> <li>• Telemetry &amp; sFlow</li> <li>• SPAN / RSPAN / ERSPAN</li> <li>• LLDP and IP-SLA</li> <li>• Web GUI, CLI, Telnet, SSH</li> <li>• TR-069 management</li> <li>• Zero Touch Provisioning via DHCP or USB</li> </ul>
3.9	<p>The solution must include:</p> <ul style="list-style-type: none"> <li>• All features enabled without additional license tiers</li> <li>• Free firmware upgrades and updates</li> <li>• No recurring feature licensing costs</li> </ul>
4.0	<ul style="list-style-type: none"> <li>• <b>Warranty &amp; Support</b></li> <li>• <b>Minimum 1-year OEM warranty</b></li> <li>• <b>Onsite installation and commissioning required</b></li> </ul>

Access Switches		
ITEM NO.	Access Switch 1G	02
<b>04</b>		
S#	Technical Description, Specifications and Standards Required	
4.1	<p>The switch must provide:</p> <ul style="list-style-type: none"> <li>• <b>Minimum 24 × 10/100/1000 Mbps RJ-45 Ethernet ports</b></li> <li>• <b>Minimum 4 × 10Gb SFP+ uplink ports</b></li> <li>• <b>Dedicated RJ-45 Console Port</b></li> <li>• <b>USB 2.0 management port</b></li> <li>• <b>Non-blocking switching architecture</b></li> </ul>	
4.2	<p>Switching performance must meet or exceed:</p> <ul style="list-style-type: none"> <li>• <b>Switching Capacity: ≥128 Gbps</b></li> <li>• <b>MAC Address Table: ≥16K entries</b></li> <li>• <b>Jumbo Frame Support: ≥12 KB</b></li> </ul>	
4.3	<ul style="list-style-type: none"> <li>• <b>PoE Requirements</b></li> </ul> <p>Switch must support enterprise PoE features:</p> <ul style="list-style-type: none"> <li>• <b>PoE Standard: IEEE 802.3af / 802.3at</b></li> <li>• <b>Minimum PoE Budget: ≥380 Watts</b></li> <li>• <b>Per-port power management and monitoring</b></li> <li>• <b>Power scheduling and consumption control</b></li> </ul>	
4.4	<p><b>Layer-2 Features</b></p> <p>Switch must support enterprise L2 switching including:</p> <p><b>VLAN Capabilities</b></p> <ul style="list-style-type: none"> <li>• <b>IEEE 802.1Q VLAN tagging</b></li> <li>• <b>VLAN capacity: ≥4K VLANs</b></li> <li>• <b>Private VLAN</b></li> <li>• <b>Guest VLAN</b></li> <li>• <b>Voice VLAN</b></li> </ul>	

	<ul style="list-style-type: none"> <li>• Protocol VLAN / Subnet VLAN</li> <li>• QinQ &amp; Flexible QinQ</li> <li>• GVRP support</li> </ul> <ul style="list-style-type: none"> <li>• <b>Spanning Tree &amp; Loop Prevention</b></li> <li>• STP / RSTP / MSTP</li> <li>• BPDU Guard, Root Guard, Loop Guard</li> <li>• Loopback detection</li> <li>• Storm control and flood control</li> </ul> <p><b>Link Aggregation</b></p> <ul style="list-style-type: none"> <li>• IEEE 802.3ad LACP</li> <li>• ≥64 LACP groups</li> <li>• ≥8 ports per aggregation group</li> </ul>
4.5	<p><b>Layer-3 Features</b></p> <p>The switch must support Layer-3 Lite routing:</p> <ul style="list-style-type: none"> <li>• Static Ipv4 and Ipv6 routing</li> <li>• ARP / ICMP / DNS / NTP</li> <li>• DHCP Client support (Ipv4 &amp; Ipv6)</li> </ul>
4.6	<p><b>Multicast Support</b></p> <p>Must support:</p> <ul style="list-style-type: none"> <li>• IGMP v1/v2/v3 Snooping</li> <li>• IGMP Proxy</li> <li>• MLD Snooping</li> <li>• Multicast VLAN Registration (MVR)</li> </ul>
4.7	<p><b>Security Features</b></p> <p><b>Access Control &amp; Authentication</b></p> <p>Switch must support:</p> <ul style="list-style-type: none"> <li>• 802.1X authentication</li> <li>• MAC + IP + VLAN binding</li> <li>• AAA, RADIUS, TACACS+</li> <li>• Portal authentication</li> </ul> <p><b>Network Protection</b></p> <ul style="list-style-type: none"> <li>• DHCP Snooping</li> <li>• Dynamic ARP Inspection</li> <li>• IP Source Guard</li> <li>• ND Snooping</li> <li>• Host Guard</li> <li>• DoS/DdoS attack protection</li> <li>• ARP attack mitigation</li> <li>• Port Security &amp; ACLs</li> </ul> <ul style="list-style-type: none"> <li>• <b>7.3 Access Control Lists</b></li> <li>• Ipv4 / Ipv6 ACL</li> <li>• MAC ACL</li> <li>• Time-based ACLs</li> </ul>
4.8	<p><b>High Availability &amp; Resilience</b></p>

	Switch must support: <ul style="list-style-type: none"> <li>• Ethernet Ring Protection (G.8032) with ≤50ms failover</li> <li>• ULFD / UDLD</li> <li>• BFD with static routing</li> <li>• CPU protection mechanisms</li> </ul>
4.9	<b>Management &amp; Monitoring</b> Must support multiple management methods: <ul style="list-style-type: none"> <li>• CLI, Web GUI (HTTP/HTTPS)</li> <li>• SNMP v1/v2/v3</li> <li>• SYSLOG &amp; RMON</li> <li>• sFlow / Telemetry</li> <li>• LLDP</li> <li>• Firmware upgrades without additional license cost</li> </ul>
5.0	<b>Standards Compliance</b> Switch must comply with IEEE standards including: <ul style="list-style-type: none"> <li>• 802.3, 802.3ab, 802.3ae (10G)</li> <li>• 802.1Q VLAN</li> <li>• 802.1X NAC</li> <li>• 802.1p QoS</li> <li>• 802.1d/w/s STP family</li> <li>• 802.3ad LACP</li> </ul>
5.1	<ul style="list-style-type: none"> <li>• <b>Warranty &amp; Support</b></li> <li>• Minimum <b>1-year OEM warranty</b></li> <li>• Onsite installation and commissioning required</li> </ul>

Wireless Access Points		
ITEM NO.	Access Point	06
05		
S#	Technical Description, Specifications and Standards Required	
1.1	Access Point must support 802.11 abgn/ac/ax standards	
1.2	Support MU-MIMO and OFDMA	
1.3	The access point should work on 2.4GHz and 5 GHz band simultaneously.	
1.4	Access Point should support 574 Mbps (2.4 GHz) and 1200 Mbps (5 GHz).	
1.5	Access point must work on 2 x 2 MU-MIMO with 2 Spatial Streams on both 2.4 and 5 GHz band.	
1.6	Access Point should support Channelization of 20 MHz, 40 MHz and 80 MHz.	
1.7	Support multiple Integrated dual polarized smart antennas with PD-MRC.	
1.8	BeamFlex+ Antennas: Extended coverage and optimized throughput with patented multidirectional antennas and radio patterns	
1.9	Hardware must have a physical gain of 3dBi on both 2.4GHz and 5GHz antennas, with an additional chip-based gain of 4dB.	
2.0	Device must transmit Power upto 23dBm on both bands	
2.1	Access Point must be able to use all RF channel (not only non-overlapping channels) and maintain channel history with respect to Channel interference and throughput.	
2.2	AP must have one Gigabit PoE Ethernet port with 1 USB port support	
2.3	AP should support 802.3af POE standards.	

2.4	Wireless Security: WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i, Dynamic PSK.
2.5	Implement Wi-Fi alliance standards WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v
2.6	The access point should support 802.1q VLAN tagging
2.7	Should support rate limit and MAC base access control.
2.8	Up to 200 or above Concurrent clients support.* /
2.9	1 Year support must be included, support includes Advanced Hardware Replacement (Next Business Day) and Software upgrades.
3.0	Proposed product must in the Wired and Wireless LAN infrastructure of Gartner Magic Quadrant for last 3 years.
3.1	Proposed brand must be Wi-Fi Alliance Certified
3.2	Proposed Access Point must be from a Tier-1, globally recognized enterprise networking vendor with a proven track record.

Smart Rack		
ITEM NO.	Smart Mini Data Center Solution	01
06		
<b>Technical Description, Specifications and Standards Required</b>		
<p>The proposed solution must:</p> <ul style="list-style-type: none"> <li>• Be a <b>fully integrated all-in-one micro data center cabinet</b></li> <li>• Include power, cooling, monitoring, enclosure and security subsystems in one rack</li> <li>• Support <b>rapid deployment and day-one operation</b></li> <li>• Support <b>remote monitoring and centralized management</b></li> <li>• Be suitable for enterprise branch offices, telecom sites, retail, and government locations</li> </ul>		
<p><b>Rack Enclosure</b></p> <p>The rack enclosure must meet or exceed:</p> <ul style="list-style-type: none"> <li>• Rack size: <b>42U, 16pprox. 2000mm (H) × 600mm (W) × 1280mm (D)</b></li> <li>• Minimum usable rack space: <b>29U</b></li> <li>• Maximum equipment depth: <b>≥1023 mm</b></li> <li>• IP protection rating: <b>IP5X</b></li> <li>• Fully enclosed cabinet with <b>dust protection and noise insulation</b></li> <li>• Integrated cable management system</li> <li>• Vertical cable management panels included</li> <li>• Rack color: Black (RAL equivalent)</li> </ul>		
<ul style="list-style-type: none"> <li>• <b>Lighting &amp; Display</b></li> <li>• Minimum <b>10-inch touch LCD control panel</b></li> <li>• LED lighting inside cabinet (minimum 2 units)</li> <li>• System luminance <b>≥ 88 lux</b> at 1 meter</li> </ul>		
<ul style="list-style-type: none"> <li>• <b>Integrated Power System</b></li> <li>• <b>4.1 UPS Requirements</b></li> </ul> <p>The system shall include an integrated online UPS with:</p> <ul style="list-style-type: none"> <li>• Capacity options: <b>3.5 kVA or higher</b></li> <li>• Backup time: Variable based on load</li> <li>• Maintenance bypass: <b>Included</b></li> <li>• Surge protection: <b>Level 3, ≥20kA</b></li> <li>• Single-phase input: <b>230 VAC, 50 Hz</b></li> <li>• Input current range: <b>63–80A</b></li> </ul> <ul style="list-style-type: none"> <li>• <b>4.2 Power Distribution</b></li> </ul>		

- Integrated PDU with:
  - Minimum **32A capacity**
  - At least **15 outlets**
  - Combination of **IEC C13 and IEC C19 sockets**
- Dedicated **power distribution module with breakers** for UPS, cooling and surge protection

- **Precision Cooling System**

The micro data center must include an integrated precision cooling solution:

- Cooling capacity: **3.5 kW or higher**
- Variable speed **EC fans**
- Refrigerant: **R410A**
- Internal air circulation (cold/hot aisle containment within rack)
- Emergency ventilation system
- Indoor condenser option supported

The cooling system must provide:

- Energy-efficient inverter control
- Low noise operation suitable for office environments
- Continuous cooling during power backup

- **Environmental Monitoring & Sensors**

The solution must include integrated sensors with real-time monitoring:

Mandatory sensors:

- Temperature & humidity sensor
- Smoke detection sensor
- Water leak detection (minimum 5m sensing cable)
- Door access sensors (minimum 2)
- Alarm beacon
- Cabinet lighting sensor

Optional supported sensors:

- Infrared motion detector
- Webcam/video monitoring

The system must provide **multi-stage automatic alarms**.

- **Fire Protection**

The solution should support:

- Automatic **gas-based fire suppression system (optional)**
- Smoke detection integrated with alarm system

- **Security & Access Control**

The micro data center must include:

- Mechanical door lock
- Door contact sensors
- Electronic access control supporting:
  - Fingerprint
  - RFID card
  - PIN authentication (optional)

- **Monitoring & Management System**

- **9.1 Local & Remote Monitoring**

The solution must provide a **central monitoring host** with:

- Web portal access
- Local and remote web management

<ul style="list-style-type: none"> <li>• SMS alarm capability</li> <li>• Modbus-TCP interface</li> <li>• Integration capability with third-party monitoring tools</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Compliance &amp; Standards</b></li> </ul> <p>The solution must comply with:</p> <p>Safety standards:</p> <ul style="list-style-type: none"> <li>• EN 60950-1</li> <li>• EN 61000-3-11</li> <li>• EN 55022 / EN 55024</li> </ul> <p>Noise level:</p> <ul style="list-style-type: none"> <li>• ≤ 50 dB (excluding outdoor condenser)</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Warranty &amp; Support</b></li> <li>• Minimum <b>1-year OEM warranty</b></li> <li>• Onsite installation and commissioning required</li> </ul>

NAS Storage		
ITEM NO.	NAS Storage Requirements (Minimum 20 TB)	01
07		
S#	Technical Description, Specifications and Standards Required	
	<p>1. Storage Capacity The solution must provide minimum usable storage capacity of 20 TB without deduplication and compression after RAID 6. Storage should be scalable to at least 100 TB by adding additional disks or disk enclosures.</p> <p>2. Controllers Active-Active dual controllers, extensible to multiple controllers</p> <p>3. Controller Cache With at least 64GB of onboard Cache per controller, not including Flash Cache, SSD cache or any other performance acceleration module</p> <p>4. Processor Intel or equivalent, and each processor should at least 20 cores</p> <p>5. RAID Level The storage system should support RAID 5 / RAID 6 / RAID 10 or better for redundancy.</p> <p>6. Disk Configuration The storage should support Enterprise-grade NL-SAS and SAS SSD drives. Support for hot-swappable drives.</p> <p>7. Max Drives Maximum number of disks supported by the Dual controller is greater than or equal to 1000</p> <p>8. Network Connectivity Minimum 8*1Gb ETH, 4*10Gb ETH (including multi-Mode SFP+) All ports should be activated with SFPs Should support RDMA protocol</p> <p>9. Remote Replication Support both synchronous and asynchronous replication.</p> <p>10. Data Snapshot</p>	

<p>Support data snapshots. Snapshots at a certain time can be recovered without snapshot loss at other time.</p> <p>11. Thin Provisioning The storage should provide thin provisioning of volumes</p> <p>12. OEM Credibility OEM must have in-country presence (office and depots) for the past 5 years.</p> <p>13. Warranty 3 Years 9x5 Next Business Day (NBD) Onsite Support</p>
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Lot 2. Red Team Suite		
ITEM NO.	Adversary Simulation Toolkit	01
S#	Technical Description, Specifications and Standards Required	
1.1	<p>The solution must include a customizable payload (e.g., equivalent to Beacon) that models advanced adversary behavior for post-exploitation tasks. It must support:</p> <ul style="list-style-type: none"> <li>• Asynchronous communication for stealthy, low-and-slow transmission.</li> <li>• Interactive communication for rapid task execution.</li> <li>• Malleable C2 profiles to modify and save network indicators, allowing blending with normal traffic or emulation of malware types.</li> </ul>	
1.2	<p>The tool must offer a highly flexible framework for tailored red team engagements, including:</p> <ul style="list-style-type: none"> <li>• Arsenal Kit or equivalent: <ul style="list-style-type: none"> <li>○ Sleep Mask Kit: Obfuscate the payload in memory during inactivity using a customizable encryption algorithm for data and strings.</li> <li>○ Mutator Kit: Generate alternate versions of obfuscation mechanisms (e.g., using Low Level Virtual Machine – LLVM) to evade in-memory detection like YARA scanning.</li> <li>○ User-Defined Reflective Loaders (UDRLs): Allow modification of default behaviors for personalized tradecraft to enhance evasiveness.</li> </ul> </li> <li>• Community Kit or equivalent: A curated repository of user-submitted tools, with at least 100 extensions available</li> </ul>	
1.3	<p>Extend payload capabilities via compiled C programs that execute within the payload process and use internal APIs. Possible extensions must include:</p> <ul style="list-style-type: none"> <li>• Target information gathering methods.</li> <li>• Data management.</li> <li>• Post-exploitation techniques.</li> <li>• Process optimizations.</li> </ul>	
1.4	<p>The solution must allow tailoring of C2 communication by creating profiles that specify data transformation and storage to suit specific environments and objectives.</p>	
1.5	<p>The tool must support interoperability with other offensive security tools to expand engagement reach, including:</p> <ul style="list-style-type: none"> <li>• Integration with evasive red teaming toolkits (e.g., equivalent to Outflank Security Tooling) via BOFs and reflective DLL loading for bypassing defensive measures.</li> <li>• Compatibility with automated penetration solutions (e.g., equivalent to Core Impact), including session passing, tunneling, and resource sharing (e.g., .NET assembly tools or execute-assembly commands).</li> </ul>	

1.6	Reporting and logging, with support for: <ul style="list-style-type: none"> <li>• Timeline of activities.</li> <li>• Per-host data summaries.</li> <li>• Indicators of compromise.</li> <li>• Full activity accounts for sessions.</li> <li>• Social engineering details.</li> <li>• Tactics, techniques, and procedures (TTPs).</li> </ul>
1.7	The bidder shall quote relevant certifications, such as Red Team Ops (RTO), Red Team Ops II (RTO II), or equivalent
1.8	The bidder shall quote accordingly for 02 Users

ITEM NO. 02	Penetration Testing Toolkit	01
S#	Technical Description, Specifications and Standards Required	
2.1	The solution must offer intuitive automation for deploying advanced tests, including Rapid Penetration Tests (RPTs) as guided wizards for efficient execution of common tasks. It should support quick re-testing of exploited systems to verify remediation effectiveness.	
2.2	The solution must provide a robust, up-to-date library of commercial-grade, certified exploits developed and tested by cybersecurity experts. This must include internally developed exploits and partnerships for add-on packs (e.g., for SCADA, medical, and IoT devices). The library should reveal chains of exploitable vulnerabilities leading to mission-critical systems.	
2.3	The solution must allow gathering information, exploiting systems, and generating reports from a single console with an intuitive dashboard. Include an interactive attack map (network graph view) for real-time visualization of attack chains, pivoting, and testing activities.	
2.4	The solution must allow tailoring of C2 communication by creating profiles that specify data transformation and storage to suit specific environments and objectives.	
2.5	The solution must support testing across multiple vectors, including operating systems (Windows, Linux, Mac), cloud environments (public, private, hybrid), databases, web services, network appliances, software applications, and critical data.	
2.6	The solution must allow powerful integrations with other penetration testing tools (e.g., equivalent to Cobalt Strike, OST, Metasploit, PowerShell Empire, Plextrac) and more than 20 vulnerability scanners.	
2.7	The solution must be able to Identify and target internal systems for network penetration testing, exploiting vulnerabilities in networks, hosts, and devices. Imitate attacker methods for access and data manipulation. Conduct web application tests via detailed web crawling, pivoting to servers, databases, and backend networks to confirm exploitability	
2.8	The solution must offer one-step validation of results from a wide range of leading third-party vulnerability scanners and web application scanners commonly used in the industry. Prioritize and validate infrastructure weaknesses post-scan.	
2.9	The bidder shall quote relevant certifications, such as OSCP, OSEP or equivalent	
	The bidder shall quote accordingly for 02 Users	

ITEM NO. 03	Offensive Security Tooling	01
S#	Technical Description, Specifications and Standards Required	
4.1	The solution must be a cloud-delivered offensive security platform that is securely accessible through a web browser interface. It must support the secure download of locally generated payloads and provide comprehensive in-portal documentation along with operational guidance to assist users in effectively deploying and managing the platform.	
4.2	The solution must provide a comprehensive suite of red teaming tools that cover the entire cyber kill chain. It must support full-scale adversary simulation, from initial compromise through to data exfiltration, and enable both targeted testing as well as complete end-to-end red team exercises.	
4.3	The solution must include anti-forensic payload capabilities designed to evade EDR and antivirus solutions, provide advanced payload obfuscation techniques, and incorporate proprietary evasion methods that are continuously updated through ongoing research and development. It must also support process injection and other advanced weaponization techniques.	
4.4	The solution must support macro-based Office exploitation and steganographic payload delivery using image-based payloads. It must also enable the simulation of real-world phishing campaigns and intrusion scenarios.	
4.5	The solution must provide low-profile command-and-control implants and support system reconnaissance and network discovery capabilities. It must also enable user activity monitoring while maintaining stealthy persistence within the environment.	
4.6	The solution must provide real-time monitoring of defensive actions and alert red teams to blue team detection and response activities during engagements.	
	The solution must integrate with Cobalt Strike using Beacon Object Files (BOFs) and reflective DLL loading, and it must also integrate with the Core Impact automated penetration testing solution. Additionally, the solution must support integration with third-party red team tools and enable vendor consolidation to support coordinated, multi-stage engagements.	
	The bidder shall quote accordingly for 02 Users	

ITEM NO. 4	Claude Max Subscription Licenses (\$100 Tier) for Yearly Basis	03
S#	Technical Description, Specifications and Standards Required	
4.1	<b>Core Capabilities:</b> <ul style="list-style-type: none"> <li>• Access to advanced models (e.g., Claude Opus 4.6, Sonnet 4.5, Haiku 4.5) for superior reasoning, coding, and multimodal tasks.</li> <li>• Conversational AI for writing, editing, content creation, and complex problem-solving.</li> <li>• Code generation, visualization of data, and execution in supported environments (including Claude Code on web and terminal).</li> </ul> Analysis of text, images, and documents with extended context windows.	
4.2	<b>Productivity Enhancements:</b> <ul style="list-style-type: none"> <li>• Unlimited projects for organizing chats, documents, and workflows.</li> <li>• Integration with tools such as Google Workspace (email, calendar, docs) and connectors for remote management.</li> <li>• Extended thinking modes for handling complex, multi-step tasks.</li> <li>• Web search integration and desktop extensions for enhanced functionality.</li> </ul> Memory across conversations and priority access during high-traffic periods.	
4.3	<b>Usage and Performance:</b>	

	<ul style="list-style-type: none"> <li>• 5x higher usage limits compared to Pro (e.g., average users can send approximately 900 messages or 200-800 Claude Code prompts every five hours).</li> <li>• Higher output limits across all tasks.</li> <li>• Early access to new features and models.</li> <li>• Support for advanced integrations (e.g., Claude in Excel).</li> </ul> <p>Enhanced capacity for intensive workloads, such as extended use of Opus models (e.g., 24-40 hours weekly).</p>
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**Lot 3. End User Compute**

<b>ITEM NO. 1</b>	<b>Laptops</b>	<b>02</b>
<b>S#</b>	<b>Technical Description, Specifications and Standards Required</b>	
1.1	Core™ 7 240H; 16GB DDR5; 512GB; RTX™ 5050 8GB; Win 11 16”; WUXGA OR Equivalent	
1.2	<b>Wireless keyboard combo &amp; Mouse</b> The bidder shall supply a wireless keyboard (with integrated touchpad) and mouse combo operating on 2.4 GHz RF and/or Bluetooth with a minimum 10-meter range and USB nano receiver. The keyboard shall be full-size (minimum 104 keys), spill-resistant, and include a responsive multi-touch touchpad, while the mouse shall feature an optical sensor with at least 1000 DPI resolution. The product must be brand new, energy-efficient, and covered by a minimum one-year warranty.	02

<b>ITEM NO. 1</b>	<b>Workstation + Monitor (Display)</b>	<b>20</b>
	Standard professional workstation with mid-tower chassis, high-performance processor, minimum 32 GB RAM, NVMe SSD storage, dedicated GPU and LED monitor with keyboard and mouse.	
<b>S#</b>	<b>Technical Description, Specifications and Standards Required OR Equivalent</b>	
1.1	<b>Processor (CPU)</b> <ul style="list-style-type: none"> <li>• Architecture: 64-bit x86 processor</li> <li>• Minimum Cores: 8 cores</li> <li>• Minimum Threads: 16 threads</li> <li>• Base Clock: ≥ 3.5 GHz</li> <li>• Turbo Boost: ≥ 4.8 GHz</li> <li>• Cache: ≥ 16 MB Smart Cache</li> </ul>	
1.2	<b>Motherboard</b> <ul style="list-style-type: none"> <li>• Chipset compatible with selected CPU</li> <li>• Minimum 4 DIMM slots</li> <li>• Minimum 2 × M.2 NVMe slots</li> <li>• PCIe slots:               <ul style="list-style-type: none"> <li>o 1 × PCIe x16 (Gen4 or higher)</li> <li>o 1 × PCIe x4 or x1</li> </ul> </li> <li>• Onboard Gigabit Ethernet</li> <li>• Support for 128 GB RAM</li> </ul>	
1.3	<b>Memory (RAM)</b> <ul style="list-style-type: none"> <li>• Installed Memory: 32 GB</li> </ul>	

	<ul style="list-style-type: none"> <li>Type: DDR4 / DDR5</li> <li>Configuration: Dual Channel</li> <li>Speed: <math>\geq 3200</math> MHz</li> <li>Expandable up to 128 GB</li> </ul>	
1.4	<b>Storage</b> Primary Drive <ul style="list-style-type: none"> <li>Capacity: 1 TB</li> <li>Type: NVMe SSD</li> <li>Interface: PCIe Gen 3 / Gen 4</li> <li>Read speed: <math>\geq 3000</math> MB/s</li> </ul>	
1.5	<b>Graphics Card (GPU)</b> <ul style="list-style-type: none"> <li>GPU Memory: <math>\geq 12</math> GB GDDR6</li> <li>CUDA / parallel cores support</li> <li>Interface: PCIe 4.0</li> <li>Support for DirectX 12</li> <li>Multi-display support</li> </ul>	
1.6	<b>Operating System</b> <ul style="list-style-type: none"> <li>Windows 11 Pro</li> <li>Support for Linux (Ubuntu / Kali)</li> </ul>	
1.7	<b>Monitor (Display)</b> <ul style="list-style-type: none"> <li>Screen Size: 24 – 27 inches</li> <li>Panel Type: IPS / LED</li> <li>Resolution: 1920 <math>\times</math> 1080 (Full HD) or higher</li> <li>Refresh Rate: <math>\geq 60</math> Hz</li> <li>Brightness: <math>\geq 250</math> nits</li> <li>Connectivity:             <ul style="list-style-type: none"> <li>HDMI</li> <li>DisplayPort</li> </ul> </li> <li>Anti-glare display</li> <li>Tilt-adjustable stand</li> </ul>	
1.2	<b>Wireless keyboard combo &amp; Mouse</b> The bidder shall supply a wireless keyboard (with integrated touchpad) and mouse combo operating on 2.4 GHz RF and/or Bluetooth with a minimum 10-meter range and USB nano receiver. The keyboard shall be full-size (minimum 104 keys), spill-resistant, and include a responsive multi-touch touchpad, while the mouse shall feature an optical sensor with at least 1000 DPI resolution. The product must be brand new, energy-efficient, and covered by a minimum one-year warranty.	24

<b>ITEM NO. 2</b>	<b>Portable SSD</b>	<b>02</b>
<b>S#</b>	<b>Technical Description, Specifications and Standards Required</b>	
6.1	Up to 800 MB/s Transfer Speed, 1TB Storage Capacity, Bus Powered, USB-C 3.2 Gen 2 Interface, 2-years warranty	

<b>ITEM NO. 3</b>	<b>USB</b>	<b>10</b>
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S#	Technical Description, Specifications and Standards Required
7.1	64GB, Speed2 USB 3.2 Gen 1 compliant, Min. 2-years warranty

ITEM NO. 4	Heavy Duty Color Printer	02
S#	Technical Description, Specifications and Standards Required	
5.1	Print Speed (A4): 33ppm, Fax	

Lot 4. Video Wall Solution		
ITEM NO. 1	100-Inch LED / QLED Smart Television	02
Technical Description, Specifications and Standards Required		
<p><b>General Requirement:</b> The bidder shall supply brand-new 100-inch LED/QLED Smart Television units suitable for training rooms, control rooms, classrooms, and presentation environments. The equipment must be from a reputable international manufacturer and must include all required accessories for installation and operation.</p> <p>The offered product must support 4K Ultra HD resolution, smart operating system functionality, high refresh-rate motion processing, and modern connectivity interfaces.</p>		
Specification	Requirement Value / Details	
Screen Size	Minimum 100 inches Diagonal	
Display Technology	LED / QLED panel	
Resolution	4K Ultra HD (3840 × 2160)	
Aspect Ratio	16:9	
Viewing Angle	Minimum 178° horizontal / vertical	
Brightness	Minimum 400 nits	
Color Depth	10-bit or equivalent	
Color Gamut	Wide color gamut / Quantum Dot technology	
Response Time	≤ 8 ms	
Video & Motion Processing	The television must support: HDR10 / HDR10+ HLG HDR Dolby Vision (preferred) MEMC (Motion Estimation Motion Compensation) Minimum refresh rate 120 Hz 144 Hz MEMC motion smoothing (preferred) AI picture enhancement / upscaling technology	
Video & Motion Processing		
HDR10 / HDR10+ HLG HDR Dolby Vision (preferred) MEMC (Motion Estimation Motion Compensation) Minimum refresh rate 120 Hz 144 Hz MEMC motion smoothing (preferred) AI picture enhancement / upscaling technology		
Smart TV Platform		
Operating System	Android TV / Google TV or equivalent	
RAM	≥ 2GB	
Internal Storage	≥ 16 GB	

Voice Control	Built-in voice assistant / smart voice search
Applications	YouTube, Netflix, Prime Video, browser support
Screen Casting	Chromecast / Miracast / AirPlay equivalent
<b>Audio System</b>	
Speaker Output	Minimum 20W – 50W
Audio Technology	Dolby Atmos / Dolby Audio / DTS
Speaker Type	Integrated stereo or 2.1 audio system
<b>Connectivity &amp; Interfaces</b>	
HDMI ports:	Min 3
USB ports	Min 2
<b>Ethernet:</b>	1 × RJ45 LAN
Wireless	Dual-Band Wifi
Bluetooth:	Version 5.0 or higher
<b>Audio Output:</b>	Optical / HDMI eARC
Screen Mirroring	Supported
<b>Physical &amp; Installation Requirements</b>	
<ul style="list-style-type: none"> <li>• Slim or bezel-less industrial design</li> <li>• VESA mounting support</li> <li>• Wall mount bracket or floor stand included</li> <li>• Power supply AC 100–240V, 50/60Hz</li> <li>• Suitable for continuous operation environments</li> </ul>	
<b>Accessories</b>	
<p>The vendor must provide:</p> <ul style="list-style-type: none"> <li>• Original remote control with voice function</li> <li>• Wall mount bracket or stand</li> <li>• Power cable</li> <li>• HDMI cable</li> <li>• User manual</li> </ul> <p>Warranty &amp; Support: • Minimum 1-year manufacturer warranty  Local service support within Pakistan  Vendor must provide installation and commissioning  Replacement or repair within warranty period</p>	
<b>Compliance</b>	
<p>The equipment shall comply with internationally recognized standards such as:</p> <ul style="list-style-type: none"> <li>• CE / FCC or equivalent</li> <li>• Energy efficiency standards</li> <li>• Electromagnetic compatibility (EMC)</li> </ul>	