As salam alaikum, Dear Vendor

Given below are the Bid items for the project of VDI solution on turnkey basis in UET Lahore. Quote your best prices according to the market survey within 05 working days. Thanks

Note: If you require any further information, let me know. For Visit Campus time 08:00AM to 04:00PM

Technical Specifications For VDI Solution (Supply, Installation, Integration and Commissioning turnkey basis (Firm/Company required to bid for whole tender).

The minimum requirements of VDI Solution are given below. The quoted systems and all other specifications should be equal or higher.

ACTIVE EQUIPMENT	
Desktop Cloud Software:	**Qty.**
Overall Requirements:	
To ensure continuous investment and advancement in the cloud computing field, vendors must be members of international mainstream cloud computing standards organizations (such as OpenStack) and provide proofs.	
Provides virtualization software and desktop cloud software with independent intellectual property rights.	
In order to ensure the diversity and flexibility of hardware selection, the combination of software and hardware is required to be diverse. Vendors can provide integrated software and hardware delivery solutions or only software solutions to be compatible with hardware servers of different brands and performance in the future.	
The running interface of the virtual desktop is transmitted to the client in the form of screen change data. When no other device is connected, only the screen change instruction and the client input instruction are transmitted on the network. In this way, the data is not stored locally.	
There must be three local references of the OEM proposed solution in education sector and one reference should be in exam center.	
User Experience:	
Smooth operation and no frame freezing.	
To ensure the same startup experience as PC, the desktop startup and shutdown processes are visualized. Users can view the VM startup and shutdown processes completely. (Provide screenshots for proof)	
To ensure the same login experience as a PC, users can directly log in to and use virtual desktops after powering on TCs. (Provide configuration screenshots for proof.)	

To minimize the impact of the network on user experience, the desktop cloud must be able to be used smoothly when the bandwidth is low.	
When an existing PC is used as the access terminal, the start menu and local resources of the local PC are shielded. (Provide screenshots for proof)	
Management Capability:	
To quickly deploy the office environment, the solution provides the quick virtual desktop provisioning function. VMs can be created and provisioned in one operation without administrator intervention.	
Supports remote session management. Administrators can remotely disconnect and log out user sessions. The administrator can send messages to users in batches.	
Supports set virtual desktops to the maintenance mode to prevent users from logging in to the system by mistake during system upgrade.	
Supports remote assistance. Administrators can initiate assistance requests. Users can view and operate virtual desktops after obtaining their consent.	
Supports automatic upgrade of the virtual desktop agent. You can configure the administrator forcible update, administrator notification update, and user self-service update.	
Supports status monitoring and alarm reporting, health check, and one-click log collection for all desktop cloud infrastructure components.	
Supports customize the CPU, memory, disk, and network thresholds of clusters, hosts, and VMs. Alarms are classified into warning, minor, major, and critical alarms based on the severity. Email subscription is supported.	
The desktop cloud management system supports local accounts and AD domain accounts. Users can log in to the system only from a specified IP address segment and time segment. Password complexity and conditional lockout policies can be configured.	
The desktop cloud management system allows administrators to view, filter, and export operation logs. Logs cannot be modified or deleted but can be traced.	
CPU/memory specifications can be added online in batches. The settings take effect after VM restart. Virtual NICs can be added or deleted online, and disks can be expanded online. The functions take effect immediately.	
Security:	
To ensure data security, the desktop cloud system and data must be stored in the data center and cannot be stored on terminals.	
Supports security policies, such as forcible password change upon first login, periodic password change, graphic verification code, and two-factor authentication, to ensure user identity security.	
Allows users to log in only from specified terminals or time by IP address (segment), MAC address (group), and time range. Certificate authentication is supported. A BYOD device without a certificate cannot be logged in to.	
Supports binding between users and MAC addresses. Users can log in only from terminals with specified MAC addresses. PCs, TCs, and mobile terminals are supported. Supports manual entry, batch import, and automatic binding upon the first login (users can be maintained and excluded).	
Supports the watermark function. Administrators can configure the color, font size, number of entries, tilt, and customized display content.	
Supports automatic desktop reconnection upon intermittent network disconnection.	

When the network is unstable, the desktop can be automatically reconnected without re-entering the password. The number of reconnection times and interval are configurable.	
Supports common deletion and secure deletion of virtual desktops. Secure deletion erases physical disks by writing zero data to prevent user data from being stolen or maliciously used.	
Supports transfer of files, folders, and clipboards between terminals and virtual desktops. Supports read-only (only access), write-only (only access), and read-write (bidirectional) modes.	
Reliability:	
HA is supported. When a server is faulty, VMs can be automatically migrated.	
Supports cluster load balancing scheduling policies. Scheduling tasks can be triggered based on the CPU and memory usage. VMs are dynamically selected during startup and automatically migrated to low-load hosts during running, implementing automatic load balancing.	
Supports live migration of virtual desktops between different hosts and storage LUNs without interrupting services.	
High-availability health monitoring and automatic failover capabilities are provided between infrastructure components without external components or manual assistance. After a user obtains a VDI desktop connection, the failure of a single component does not affect the user's use.	
The mutual exclusion function of management VMs can be configured to ensure that components that provide the same functions run on different physical hosts, ensuring high availability of the platform.	
Management data (such as databases, logs, and certificate files) can be automatically backed up. Management data can also be backed up to a third-party FTP server. Scheduled backup and immediate backup are supported.	
Scalability:	
To support capacity expansion, the number of online desktops that can be managed by a single desktop cloud management system is greater than or equal to 5000.	
VM Specification Requirements:	
A maximum of 500 VMs can be provisioned. Each VM provides 2 vCPUs, 4 GB memory, and at least 50 GB storage capacity to support smooth running of Windows 10 & 50GB volume disk.	500 VDI Clients
VMs are required for application deployment. The specifications are as follows: 16 vCPU, 32 GB memory, and at least 280 GB storage capacity.	03 VMs
Warranty:	
OEM warranty need to be added for 3 years 9*5*NBD.	
Hyper-converged Appliance:	**Qty.**
Qualification:	
The bidding product has been launched for more than three years and has independent intellectual property rights. The hardware and software of the hyper-converged system are not OEM products. (Provide hardware BMC and storage software certificates and patents.)	
The bidding product vendor must be a Gartner Magic Quadrant brand for hyper-convergence and provide Gartner reports.	

Management Capability:	
Monitors and manages computing, storage, switches, and virtualization platforms on the same management interface.	
Centralized management solutions can be deployed by schools, or local sites can be deployed based on network conditions. The access center can be managed in a unified manner.	
Management nodes work in active/standby mode to ensure platform availability. If a single management node is faulty, services are not affected.	
Supports one-click capacity expansion of storage, computing, and network resources on the GUI. The OS and virtualization platform software installation and initial configuration are automatically completed for added nodes.	
Backup software is provided. Users can easily access the backup system through a browser at no extra charge. Supports agentless VM backup and permanent incremental backup. The backup system ensures that each backup contains a complete VM image, which is a full virtual backup. You do not need to merge backup data when restoring and deleting backup data	
Distributed Storage Capability:	
Distributed storage software is built on standard x86 hardware. Non-open-source software is developed. For example, open-source Lustre, GlusterFS, and Ceph software cannot be used. The decentralized architecture and data redundancy technology at the software layer achieve high scalability and high availability.	
Multi-copy or EC data redundancy mode is supported to meet high reliability requirements.	
A single storage cluster can be expanded to 256 or more nodes.	
A single storage cluster supports a maximum of 64 storage resource pools, and a single storage resource pool supports a maximum of 512 disks.	
A single system supports at least 1000000 storage volumes, and the maximum capacity of a single volume is greater than or equal to 256 TB.	
Warranty:	
OEM warranty need to be added for 3 years 9*5*NBD	
Terminal:	**Qty**
Overall Requirements:	
Provides 500 terminals. To ensure consistency and convenience of maintenance, terminals must be of the same brand as desktop cloud software, virtualization software, servers, storage devices, and switches.	
Pass the CCC, CE, ROHS, and RFID certifications.	
Hardware:	
Vendors provide terminals with multiple architectures, including ARM and x86.	
Software:	
ARM-based terminals support the embedded operating system Android or Linux. Terminals using the x86 architecture support Linux or Windows.	

To manage terminals in batches, a terminal management system must be provided. The management system can remotely perform centralized maintenance, configuration, deployment management, security management, asset management, and performance monitoring on terminals. You can restore, upgrade, and install patches on terminals in batches.	
To prevent terminals from being damaged due to sudden power failure in the office area, the terminal management system provides power management functions such as periodically shutting down terminals. (Provide screenshots to prove it.)	
A self-service connection and maintenance tool is provided to facilitate troubleshooting and automatic rectification of terminal exceptions. The detection objects include but are not limited to the network adapter status, desktop agent, IP address, system clock, desktop protocol service status, and VM registration status. In addition, the one-click repair function is provided. (Provide screenshots for proof)	
The client integrated in the terminal needs to provide a network status indicator so that users can learn the network status in a timely manner when the network is abnormal. When user experience is not smooth, users can determine whether the network is normal based on indicators. (Provide screenshots to prove it.)	
Network Switches:	
24 Port Core Switches	
24 x 10 Gig SFP+, 6 x 40/100 Gig QSFP28	
Dual pluggable power modules, 1+1 power backup	
Forwarding Performance 450Mpps or higher	
Switching capacity: 1.5 Tbps or higher	
The switch should support Jumbo frames up to 8Kbytes.	
Must include redundant power supplies.	
Must support 4GB RAM or higher.	
Layer 2 Features	**02**
The equipment must support up to 200K MAC address tables.	
Must support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment	
Should support Ethernet Ring Protection Switching	
Switch must support the IEEE 802.1ad (Q-in-Q) standard, voice VLAN or equivalent, Port aggregation, STP, RSTP, MSTP.	
Layer 3 Features	
The equipment shall support static route, RIPv1/v2, OSPF, IS-IS, BGP, RIPng, ISISv6, OSPFv3, BGPv4+, GR for OSPF/IS-IS/BGP, IP FRR, IPv4/IPv6 dual stack, VRRP. Should support up to 120K routing entries.	
Multicast	
The equipment shall support IGMP proxy, IGMP snooping, MLD snooping v1/v2,	

PIM DM, PIM SM, PIM SSM, IGMPv1/v2/v3	
QoS	
Ingress and egress traffic shaping and VLAN based traffic limit.	
Queuing algorithms, such as SP, WRR, DRR, SP + WRR, and SP + DRR.	
Flow mirroring.	
Security	
The equipment must support bidirectional ACL, port-based ACL, VLAN-based ACL, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, Denial of Service (DoS) attacks, SYN Flood attacks, Port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management, automatic configuration, and batch remote upgrade.	
48 Port Access Switches:	
48 x 10/100/1000Base-T ports, 4 x 10 GE SFP+ ports, 2 x 12GE stack ports	
1+1 power supply backup	
Forwarding performance: 150 Mpps	
Switching capacity*: 200Gbps or more	
Must support RAM 2GB or more	
Co-Care_36Month(s)	
Layer 2 Features	
The equipment must support up to 32K MAC address tables	
Should support Ethernet Ring Protection Switching	**12**
Support Mac-based, Port-based, protocol-based, and IP subnet-based VLAN assignment, up to 4K active VLAN, Guest VLAN or equivalent, voice VLAN or equivalent	
Layer 3 Features	
The equipment must include Static route, RIP, RIPng, and OSPF features and provide at least 2K FIBv4 entries.	
Multicast	
The equipment must support IGMP snooping v1/v2/v3, MLD snooping v1/v2, multicast VLAN replication	
QoS	
The equipment must support ingress and egress traffic shaping and VLAN based traffic limit, flow mirroring	
Security	

The equipment must support bidirectional ACL, port-based ACL, VLAN-based ACL, automatic isolation of attack sources, CPU defense, DAI (Dynamic ARP Inspection), DHCP Snooping, IP Source Guard, port-based network access control according to IEEE 802.1x standard	
Network O&M	
The equipment must support SNMPv1/v2c/v3, Telnet, RMON, SSHv2, CLI, web management and automatic configuration	

SFP Modules:	**Qty.**
10G Single Mode SFP+ modules (1.4 KM Range)	**15 Pair**
10G Single Mode SFP+ modules (10 KM Range)	**5 Pair**

PASSIVE EQUIPMENT		
ITEM	**SPECIFICATION:**	**Qty.**
UTP Cable	Cat 6 UTP 4 pair cable, Conductor: Solid Bare Copper AWG 23, 305 Meter Box	**68 Roll**
Patch Panel	24 Port Patch Panel with Top Label Holder including 24 Cat-6 Toolless I/O With Shuttered Fully Loaded,	**24 nos**
Cable Manager	Front Cable Manager Horizontal, IU, PVC	**30 nos**
UTP Patch Cable (cord)	Patch Cord, UTP Cat-6 Patch Cord, RJ45 to RJ45, 3- Meter, PVC	**500 nos**
	Patch Cord, UTP Cat-6 Patch Cord, RJ45 to RJ45, 1- Meter, PVC	**500 nos**
Face Plates	Face Plate without Shuttered & with Top Label Holder	**500 nos**
RJ 45 I/O Module	UTP Cat-6 RJ-45 Toolless I/O With Shuttered White	**500 nos**
Back Box	Back Box for Face Plate	**500 nos**
RJ 45	Connector Box	**1 nos**
Data Rack/Cabinets	42U standard Rack for Switches with front & back 70% vented perforated lockable doors - Load capacity 1200 Kg, 16-18SWG, One fixed tray, 4 fans mounted on TOP, Black powder quoted, with 8 ports PDU (Quantity = 4) and PDU should be verified by ROHS & CE.	**02 nos**

	24U Floor Standing Rack for Switches, 4 fans mounted on top, 16-18SWG, Load capacity 850 Kg Black powder quoted and perforated door with 8 ports PDU and PDU should be verified by ROHS & CE.	**01 nos**
	Data Cabinet - 9U Double Section for Switches with Lockable tempered glass door, max 30 KG static loading capacity, 2 Fans, 16-18SWG with 8 Ports PDU and PDU should be verified by ROHS & CE	**12 nos**
Optical Fiber Cable	12-Core Single mode Fiber Optic Cable Outdoor Direct Burial (In Meters)	**2100**
	4-Core Single mode Fiber Optic Cable (In Meters)	**1000**
	Soft and Hard Digging and Refilling (in meters)	**1900**
ODF & Splicing	12 Port Wall Mount/Rack Mount Optical Fiber ODF with Adopters & Splicing Tray	**06 nos**
	4 Port Wall Mount/Rack Mount Optical Fiber ODF with Adopters & Splicing Tray	**12 nos**
	Fiber Splicing with OTDR Testing	**As per requirement**
	Single Mode fiber patch cord SC-LC (3Meter Duplex)	**25 nos**
Joint Box	ODF Joint box for Fiber Cable 12Core.	**10 nos**
Cable Ties	Cable Ties 10 Inch	**200 nos**
	Cable Ties 12 Inch	**200 nos**
Pipes	PVC Flexible Pipe, 1-inch (10 feet Length)	**7000**
	PVC Flexible Pipe, 2 inch (10 feet Length)	**600**
	Pipe HDPE For Fiber 1" (in meters)	**1900**
Duct	PVC Duct 16x38 (in feet)	**400**
Steel Cable	Steel Cable Tray 3"x12" with Cover all Accessories and Complete Fitting Material (in feet)	**250**
Installation	Cable Laying, Ducting, Fixing of Cable Tray, and Complete Installation	**500 points**
	Installation of CCTV Cameras	**15 points**
	Termination/Tagging/ Hanging of Material Face Plate End and Patch Panel End Data, Telephone, CCTV and TV Points	**500 points**
Fluke Testing	Fluke Testing with DTX-1800	**500 points**
CCTV Camera(s)	2MP IP Camera, CMOS image sensor, high image definition ▪ Outputs max. 2MP (1920 × 1080p) @25/30 fps ▪ High compression rate, ultra-low bit rate ▪ Built-in IR LED, max. IR distance: 80 m ▪ ROI, SMART H.264/H.265, flexible coding, applicable to various bandwidth and storage environments ▪ Abnormality detection: Motion detection, video tampering, network disconnection, IP conflict ▪ 12V DC/PoE power support ▪ IP67 protection	**15**
NVR	32 Channel with 2 HDDs x 3 TB HDDs	**01**

PoE Switches	4 Ports PoE Switch 10/100 Mbps	**10**

UPS		
ITEM	**SPECIFICATIONS:**	**Qty.**
UPS 10KVA	Switching Time: 0 ns	**02**
	Topology: Online double conversion VFI/DSP with input PFC and automatic bypass	
	Load Capacity (VA): 10000 VA	
	Load Capacity (Watt): 9000 W	
	Waveform: Sine Wave	
	Input: L-N: 175-280V ± 5 AC, 40Hz~70Hz	
	AC Output Voltage Regulation must be less than ±3%	
	Output frequency must be in 50±0.5%Hz (battery mode).	
	Output frequency tracking speed : 0.5-1zHz/S	
	Output power factor must be more than 0.9	
	Overload Protection: Yes	
	Communication: Modbus built-in (JBUS)/SNMP	
	Output Voltage: L-N 220 V AC, 230 V AC, 240 V AC	
	Battery backup: Separate rack mounted battery pack for 10min backup at full load	
	Warranty: 1 Years	

Kindly fill the prices according to the items given below.

S. No.	Specifications	Qty.	Amount Rs.
1.	VDI Network Services		
2.	VDI Professional Services		
3.	VDI Support and Services		
4.	Firm Services		
Total Services: Rs			
5.	VDI Hardware (500 VDI Clients)		
6.	VDI Network Services (24 ports Qty: 02, 48 Ports Qty: 12)		

7.	Passive work as per RFP		
8.	Keyboard and Mouse (500 VDI Clients)		
Total Hardware: Rs			
Grand Total Bid Value Rs.			