

MINUTES OF THE PRE-BID MEETING OF TECHNICAL EVALUATION COMMITTEE FOR ELEVATOR (LIFT), THIN CLIENT, BESS SOLUTION (POWER BACKUP), MEDICAL EQUIPMENTS, IT EQUIPEMNTS, ACCESSORIES AND CCTV CAMERAS & ACCESSORIES, MISCELLANEOUS & GENERAL APPLIANCES FOR KHYBER GIRLS MEDICAL COLLEGE HELD ON 04.12.2025 FOR THE YEAR 2025-26-2026--27

A Pre-Bid meeting of Technical Evaluation Committee was held on 04.12.2025 at 10:30am in the conference room of Khyber Girls Medical College under the chairmanship of Associate Prof, Dr. Anwar Ul Haq, KGMC. The following members were participated in the meeting:

1. Mr. Redwan Raza, HR Manager, KGMC	Member
2. Associate Prof, Dr. Shahab ud Din, KGMC	Co-opted Member
3. Dr. Ehsan (representing Asst. Prof. Dr. Afsheen Mehmood	Co-opted Member
4. Mr. Fazal Samad, Biomedical Engineer, HMC/KGMC	Co-opted Member
5. Mr. Amir Ullah, Works & Building, HMC/KGMC,	Co-opted Member
6. Mr. Abdul Nasir, Facility Mangaer, HMC/KGMC	Co-opted Member
7. Mr. Naumam Shah, Network Administrator, KGMC	Co-opted Member

Absent Member

1. Asstt. Prof. Dr. Naveed Afzal Khan, DME, KGMC
2. Asstt. Prof. Dr. Fahad Falah, Pharmacology, KGMC

The meeting starts with the recitation of the verses of Holy Qurrān. The Chairman, Technical Evaluation Committee welcomed all the committee members.

They were asked to present their concerns verbally and were instructed to submit written concerns within 48 hours for record and evaluation.

Mr. Nauman Shah was advised to review and revise OEM-related specifications to ensure that the tender remains an open, competitive process rather than being restricted to a single supplier.

The following decisions were made:

Marking Criteria:

The Biomedical Engineer suggest the following changes in the marking criteria and the rest of the committee recommended and agreed:

Marking Criteria for Elevator (Lift):

The marking criteria for Elevator (Lift) was remained same.

Marking Criteria for Medical Equipment and Accessories:

	Khyber Girls Medical College, Peshawar				Doc. No.	KGMC
	RECORD FORMAT				Version No.	0
	MARKING SHEET (EVALUATION CRITERIA)				Date	04.12.2025

FINANCIAL MARKS PROFORMA						
Name of Item:-						
		Weightage				
Total Technical Marks	100	80%	Passing Marks 70%.			
Total Financial Marks	100	20%				

S. #	DESCRIPTION	MARKS	1
1	Compliance to Purchaser's Specification	40	
2	Demo	10	
3	Special Features	2	
4	Product Certification (03 Certificate 02 marks each)	6	
5	Product's Global	Performance Certificate	2
6	Product's Local	Performance Certificate (3 Certificate 02 Marks each)	6
7	Integrity Pact	4	
8	Technical Staff	Engineers (01 Prs) 4 Technical staff (03 Prs) 02 each	10
9	Work Station, Networking & Training	Peshawar 5 Other Cities 5	10
10	Previous Performance with KGMC	2	
11	Testing & Calibration the	Equipment to be procured	2
12	Warranty Period	as per Tender requirement	2
13	Post_ Warranty	Services & Maintenance	4
14	Technical Evaluation Marks	Total Marks	100
15	Financial Evaluation Marks	Total Marks	100
16	Technical Evaluation Percentage	80%	
16	Financial Evaluation Percentage	20%	
17	Combined Evaluation		

Technical Evaluation and Financial weightage shall be 80%/20% in single stage two envelope procedures (KPPRA Rule 6 2 b).

Marking Criteria for Thin Client, Bess Solution (Power Backup), IT Equipments, Accessories and CCTV Cameras & Accessories:



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RECORD FORMAT			Version No.	0
MARKING SHEET (EVALUATION CRITERIA)			Date	04.12.2025

TECHNICAL / FINANCIAL MARKS PROFORMA						
Name of Item:-						
			Weightage			
Total Technical Marks		100	80%	Passing Marks 70%.		
Total Financial Marks		100	20%			

S. #		DESCRIPTION				MARKS	1
1	Product Evaluation	Compliance to Purchaser's Specification				44	
2		Special Features				6	
		Product Demo – physical visit of a completed project				2	
3		Product Certification (03 Certificate 02 marks each)				6	
4		Product's Global		Performance Certificate		2	
5		Product's Local		Performance Certificate (3 Certificate 02 Marks each)		6	
6	Firm Evaluation	Integrity Pact				4	
7		Technical Staff	Engineers	(01 Prs)	4	10	
			Technical staff	(03 Prs)	02 each		
8		Work Station, Networking & Training	Peshawar	4		8	
			Other Cities	4			
9			Previous Performance with KGMC			2	
10		Warranty Period		as per Tender requirement		2	
11		Post_Warranty Marks will be given as follow: 1. 1-1.99% = 08 Marks 2. 2-3.99% = 06 Marks 3. 4-5.99% = 05 Marks 4. 6-7.99% = 03 Marks 5. 8-10% = 01 Marks		Services & Maintenance		8	
12		Technical Evaluation Marks				Total Marks	100
13		Financial Evaluation Marks				Total Marks	100
14		Technical Evaluation Percentage					80%
15		Financial Evaluation Percentage					20%
		Combined Evaluation					

Technical Evaluation and Financial weightage shall be 80%/20% in single stage two envelope procedures (KPPRA Rule 6 2 b).

Marking Criteria for Miscellaneous & General Appliances:



Khyber Girls Medical College, Peshawar	Doc. No.	KGMC
RECORD FORMAT	Version No.	0
MARKING SHEET (EVALUATION CRITERIA)	Date	04.12.2025

FINANCIAL MARKS PROFORMA							
Name of Item:-							
			Weightage				
Total Technical Marks	100	80%	Passing Marks 70%.				
Total Financial Marks	100	20%					

S. #		DESCRIPTION					MARKS	1
1	Product Evaluation	Compliance to Purchaser's Specification					50	
2		Special Features					2	
3		Product Certification (03 Certificate 02 marks each)					6	
4		Product's Global			Performance Certificate		2	
5		Product's Local			Performance Certificate (3 Certificate 02 Marks each)		6	
6	Firm Evaluation	Integrity Pact					4	
7		Technical Staff	Engineers	(01 Prs)	4	10		
			Technical staff	(03 Prs)	02 each			
8		Work Station, Networking & Training	Peshawar	5		10		
			Other Cities	5				
9			Previous Performance with KGMC			2		
10		Testing & Calibration the	Equipment to be procured			2		
11		Warranty Period	as per Tender requirement			2		
12		Post_ Warranty	Services & Maintenance			4		
13		Technical Evaluation Marks				Total Marks	100	
14		Financial Evaluation Marks				Total Marks	100	
15		Technical Evaluation Percentage					80%	
		Financial Evaluation Percentage					20%	
16		Combined Evaluation						

Technical Evaluation and Financial weightage shall be 80%/20% in single stage two envelope procedures (KPPRA Rule 6 2 b).

1. Elevator (Lift)

Objections & Responses

Objection raised by MS Pioneer Elevators (Pvt.) Ltd

Warranty Period

Objection: Requested changes.

Decision: Warranty will remain 3 years as per Eligibility Form Point No. 37.

Workshop in Peshawar

Objection: Requirement questioned.

Decision: A workshop in Peshawar is mandatory, as per KGMC Technical & Financial Marks Proforma.

Audit & Financial Reports

Objection: Clarification requested.

Decision: Accepted. Financial/Audit reports shall be based on the last 3 years.

Evaluation Criteria

Objection: Requested adjustment.

Decision: Will remain 80:20 as per KGMC Proforma.

Touch Panel in Car

Objection: Clarification on type.

Decision: Both button and touch panels are acceptable.

Control Panel Configuration

Objection: Requested changes.

Decision: Will remain unchanged as per approved specifications.

Terms of Payment

Objection: Request for partial payments.

Decision: All payments will be made after successful installation and inspection & verification by KGMC Committee.

No partial payments will be made.

Country of Origin

2. Purchase of Thin Client Solution (On Turn Key Solution) for Online Examination

All the reservations of firms regarding Thin Client Solution are addressed and changed accordingly as per attached updated Specification List.

3. Purchase of BESS Solution (Power Backup) On Turn Key Solution

All the reservations of firms regarding Bess Solution (Power Backup) are addressed and changed accordingly as per attached updated Specification List.

4. Purchase of IT Equipment & Accessories and CCTV Camera & Accessories

There were no reservation regarding IT Equipment & Accessories and CCTV Camera & Accessories remained same.

5. Medical Equipment

i) 3D Table

Objection: Clarification requested.

Decision: Already clearly mentioned in Specification Point No. 32.

4. Agenda Item-2: 3D Interactive Anatomy Table

Point No. 13 – DICOM Import

Modified to ensure all types of DICOM data can be imported.

Hardware – Screen Size

A clerical error was corrected:

“Multipoint touch screen 75 inches” should be read as

“Multipoint touch screen 65 inches.”

Software Modules – License Duration

Updated from 5-year license to lifetime license.

Storage Capacity Correction

In Point No. 23: “1 TB HDD + 1 TB SSD”

In Hardware Includes: incorrectly mentioned as 512 GB SSD

Corrected to 1 TB HDD + 1 TB SSD.

All other specifications remain unchanged.

Software and hardware should be from the same manufacturer **(Mandatory)**

The following remaining items specification are remained same

- ii) Ophthalmoscopes (UK, Japan, USA, Germany)
- iii) Stethoscope (UK, Japan, USA, Germany)
- iv) Otoscope (UK, Japan, USA, Germany)
- v) Automatic Fire Alarm

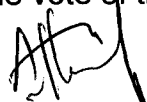
Medinostic Concern

All observations and objections were reviewed and duly rejected. The specifications provided in the original document shall be retained in full, except for a few points where minor amendments have been approved, such as in points No. 5 and 9 of your concerns.

vi) Miscellaneous & General Appliances Items

There were no reservation regarding Miscellaneous & General Items remained same

The meeting was ended with the vote of thanks.



Associate Prof. Dr. Anwar Ul Haq
Chairman
Technical Evaluation Committee
KGMC

**SPECIFICATION FOR SUPPLY, INSTALLATION, TESTING AND
COMMISSIONING OF PASSENGER ELEVATOR/LIFT 630 KG AT
KHYBER GIRLS MEDICAL COLLEGE, PESHAWAR
PURCHASE FOR THE YEAR 2025-26**

S No.	Description	Minimum Requirement
01	Type	Machine Room Type (MR) heavy duty VVVF Passenger Elevator fully complied with EN81, EN 81- 20, EN 81-50 and EN 81-70 standards.
02	Capacity	630 Kg or better
03	Elevator Speed	1.0 m/sec or better
04	Travel Height	As per site
05	No of Stops/Openings	Ground + Four (04) upper floors (05 stops/05 openings)
06	Internal Car Sizes (w x d x h)	(1100mm x 1400mm) x 2300 mm
07	Machine Type	VVVF AC gearless drive
08	Car & Counterweight Guide Shoes	Sliding guide shoes
09	Drive Location	Above in shaft (MR Type)
10	Control System	Collective selective control with Duplex control (EN81-20/50)
11	Architraves	Full width of Stainless Steel satin finish at all floors.
12	Elevator Shaft Size (w x d)	1828mm x 1828mm
13	Pit Depth	1524mm
14	Head Room	4267mm
15	Buffers	Oil buffers of spring return type (Energy Dissipation type) or as recommended by EN 81 Standards
16	Door Size	800mm x 2100mm
17	Door Operation & Type	VVVF control, Power operated, Side opening stainless steel panel construction and fire rating of 2 hr

18	Indicators	- Digital car position indicator on each landing with direction arrows. - Digital position indicator inside car with direction arrows. - Two tone electronic gong announcing arrival of car.
19	Landing Call Station	- Button/ LED touch screen type glass/stainless steel panel with call acceptance illuminated indications.
20	Car Station	- Integral with the car and constructed of glass/stainless steel and recessed/flushed with wall. Separate handicapped car operating panel with push buttons be included. - It shall include alarm buttons, floor call buttons, door open/hold button, key-operated attendant switch, fan switch, intercom, all buttons shall be of LED touch screen/stainless steel type as approved by the engineer
21	Car Design	- Back painted glass/stainless steel as approved by the client/employer. - Car door of stainless steel (hairline finish) construction as approved by the client/employer. - Full width half height mirror on rear wall or as per manufacturer design. - Ceiling removable type full extended poly carbonate diffuser with modular light fittings as approved by engineer - Ventilation Blower (Pre-Installed) - Handrails on two side - Granite Floor - Inter Telecommunication system - Emergency exit - Load measuring device with overload buzzer and inter-lock till overload is removed. - LED Lighting
22	Door Safety Devices	- Full height Light curtain protection (2D) - Door opening timing feature
23	Special Features	- Attendant control - Emergency operation and fireman switch. - Emergency lighting & alarm unit. - Earthquake control system - Voice guidance system - Connected with building control - Suitability for 40°C ambient temperature (but operate able up to 45°C ambient temperature) - Phase reversal failure indication & interlock - Manufacturer Security Cameras for surveillance (Connection with building safety/security is included in Contractor's scope) - ERD Device (Emergency Rescue Device with battery backup) - Manual Brake Release Lever - Halogen free cables

24	Interior Finish	Anti-Bacterial Rubber PVC Floor continues flooring, side walls stainless steel with lights in roof or any other high standard recommended for elevator interiors or as recommended by the committee.
25	Minimum Functions	-Direct Leveling - Optimum travel curve - Re-running automatically when elevator is re-powered - Car location adjusted automatically - Load compensating - Travel Counter - Over/Under voltage protection - Phase trip protection - Over current protection - Over heat protection - Encoder trip protection - Contact adhered protection - Bi-directional over speed protection - Reversal protection - Travel over time protection - Final terminal protection - Over load protection - Anti door lock bridge - Automatic by-pass hall call while full load - Level for self-helping - Travel to next floor when open door trip - Emergency illumination in car - Emergency alarm - Automatic car fan - Automatic car lighting - Fire return feedback - Settable landing number - Automatic parking, parking floor -Car call cancelable -Parking key switch, landing - Fire return (Phase I), Main landing -Hoist way lighting - Car door button
26	Trips/hour	180 minimum
27	Power Supply	3 Phase AC 440V, 50 Hz for Elevator operation Single Phase AC 230V, 50 Hz. (for lighting)



EVALUATION CRITERIA FOR PASSENGER ELEVATOR

S. No.	Description of Variables	Total points
A	Product Evaluation Parameters	
1	Product General Information	
1.1	Ref. No of item in SBD Schedule of Requirement	
1.2	Name of equipment	
2	Conformance to Specification	
2.1	Fully compliance with the required specifications as per Statement of Requirement. Minor deviations may be accommodated up to 4, subject to the condition that main function and performance in any aspect would not be affected. More than 4 minor deviations will be considered as major deviation and the bidder will be considered as non-responsive for the quoted item. (One mark for each deviation will be deducted with due justification by scrutiny committee).	30
2.2	Inspection of already installed elevator of the firm by the technical Committee (Excellent =10, satisfactory =5, unsatisfactory =0)	10 (40)
3	Product Certification / Manufacturer Performance	
3.1	Authorization certificate from the manufacturer if the bidder is not a manufacturer.	Mandatory
3.2	Valid ISO 14001 Environmental Certificate of the manufacturer.	2 (42)
3.3	Valid ISO 9001 Quality management Certificate of the manufacturer.	2 (44)
3.4	CE certificate of the quoted model.	2 (46)
4	After Sale Product Local Performance	
4.1	Two mark for each satisfactory performance certificate (verifiable) of the firm / bidder on letter head, signed and stamped from the public sector organization for quoted item with copies of supply orders/contract agreements etc. Supply Order / Purchase Order. Delivery challan will not be considered as satisfactory performance	10 (56)
4.2	Two mark for each satisfactory performance certificate (verifiable) of the firm / bidder on letter head of private organization for the quoted item with copies of supply orders/contract. Supply Order / Purchase Order. Delivery challan will not be considered as satisfactory	4 (60)
5	Warranty	
5.1	Comprehensive Warranty of 60 months with parts and services from date of commissioning.	Mandatory
A	Total score of the Product Evaluation Parameters	60
B	Firm / bidder Evaluation Parameters	
1	Firm / bidder Certifications	



SEC-II

1.1	Registration with PEC Category (C4) or above Codes ME03	Mandatory
1.2	Valid ISO 9001 Quality Management Certificate of the firm / bidder from PNAC accredited body.	2
2	Personnel/Human Resource	
2.1	Diploma of Associate Engineer (DAE) in electrical / electronic / mechatronics / mechanical / industrial or equivalent. (1 mark for each	2 (4)
2.2	Graduate Engineer with PEC Registration in electrical / electronic / mechatronics / mechanical / industrial. (2 marks for each engineer). Engineers must be registered with firm in PEC	6 (10)
2	Workshop facility / Training	
2.1	Fully Functional workshop at Peshawar.	4 (14)
3	Firm / bidder Financial Strength	
3.1	Annual Sales tax returns for last four years (0.5 mark for each year)	2 (16)
3.2	Annual Income tax returns for last four year (0.5 mark for each year).	2 (18)
3.3	Last four year Audited Balance Sheet Duly attested by Chartered Accountant. (0.5 mark for each year)	2 (20)
B	Total Score of the Firm / bidder Evaluation Parameters	20
A+B	Total Technical Score	(60+20) = 80

Qualifying Marks 70 %

Technical and Financial Bid Weightage: 80:20

	Mandatory Requirements
1.	03 Years Warranty and Support for all components for Annexure – A
2	Bidder must attach Manufacturer authorization letter (MAL) Direct from OE for Annexure A
3	OEM must have local support, and Presence in Pakistan from last 5 Years
4	Bidder must Participate in all items
5	Bidder must be registered with SECP and must attach NTN and GST
6	Bidder must have technical capabilities 2 x CCIE/HCIE/HCSP or equivalent 10 x Technical Team
7	Bidder Must Have a Presence and Offices in major cities of Pakistan one Office in KPK.
8	Please mention the country of origin/manufacturing/assembly of the quoted brand / model
9	International Training with expert level certification for 2 x KGMC Resources with TA/DA on the proposed Solution

CHECK LIST

The provision of this checklist is essential prerequisite along with submission of tenders.

<u>SR. #</u>	<u>DETAIL</u>	<u>YES / NO</u>	<u>PAGE #</u>
<u>KNOCK OUT CLAUSES</u>			
1.	Bid Security 02% of tender value with financial proposal.		
2.	Minimum Five year's business from the date of history authorization.		
3.	Mandatory warranty of the product as per terms and conditions mentioned in the Annexure A (BOQ).		
4.	Acceptance of terms and conditions, tender documents duly signed and stamped every page.		
5.	Company Profile		
6.	An affidavit on stamp paper of Rs.100/- submitting following clauses: i) that the firm is never blacklisted or under-investigation on any grounds whatsoever.		
7.	Price should not be mentioned on technical bid.		
8.	Last two years Bank statement (Minimum annual turnover Rs. 500 million) National tax number and General Sale Tax number with certificate.		
9.	List of products supplied to Govt. and private sector. Supply orders detail over last 5-years. Five Government and private as case may be Mention Supply orders worth Rs 100 million each.		
10.	Literature / brochure of product.		
11.	Manufacturer authorization Form/certificate direct from the Principle/OEM of the Quoted Hardware Annexure -A		
12.	Detail of technical staff to be provided.		

Note: All the Firms are required to attach all documents as per above check list, otherwise the bid shall be rejected.


Sign and Stamp of the bidder

Marking Criteria



Khyber Girls Medical College, Peshawar	Doc. No.	KGMC
RECORD FORMAT	Version No.	0
MARKING SHEET (EVALUATION CRITERIA)	Date	04.12.2025

TECHNICAL / FINANCIAL MARKS PROFORMA							
Name of Item:-							
			Weightage				
Total Technical Marks	100	80%	Passing Marks 70%.				
Total Financial Marks	100	20%					

S.#		DESCRIPTION						MARKS	1	
1	Product Evaluation	Compliance to Purchaser's Specification						44		
2		Special Features						6		
		Product Demo – physical visit of a completed project						2		
3		Product Certification (03 Certificate 02 marks each)						6		
4		Product's Global				Performance Certificate		2		
5		Product's Local				Performance Certificate (3 Certificate 02 Marks each)		6		
6	Firm Evaluation	Integrity Pact						4		
7		Technical Staff	Engineers	(01 Prs)	4		10			
			Technical staff	(03 Prs)	02 each					
8		Work Station, Networking & Training	Peshawar	4			8			
			Other Cities	4						
9			Previous Performance with KGMC					2		
10			Warranty Period		as per Tender requirement				2	
11			Post Warranty Marks will be given as follow: 1. 1-1.99% = 08 Marks 2. 2-3.99% = 06 Marks 3. 4-5.99% = 05 Marks 4. 6-7.99% = 03 Marks 5. 8-10% = 01 Marks		Services & Maintenance			8		
12		Technical Evaluation Marks					Total Marks	100		
13		Financial Evaluation Marks					Total Marks	100		
14		Technical Evaluation Percentage						80%		
15		Financial Evaluation Percentage						20%		
		Combined Evaluation								

Technical Evaluation and Financial weightage shall be 80%/20% in single stage two envelope procedures (KPPRA Rule 6 2 b).

Annexure - A

(Complete Installation and Configuration of VDI SOLUTION based NETWORK EQUIPMENT Infrastructure)

Category	Item	Requirements
Software		
Virtualization	General Requirements	Must Be Compatible with Any Brand of Intel (x86) / AMD Architecture Hardware Servers
		Must Have OEM Local Presence in Pakistan for Minimum 05 Years or more
		Must Have Minimum 05 VDI Deployments in Pakistan with at least one deployment in education sector.
		Must Quote VDI Perpetual Licenses.
		Must Quote 3 Years 24/7 Software Technical Support Services by OEM
		Must Quote Onsite Installation and Configuration by OEM
	Quantity	Must Quote professional level Training and Professional Certification for 05 Participants by OEM
		Non-Compliance to the above general requirements shall lead to the rejection of Bids
		Must Quote all the required components of virtualization covering the mentioned RFP specs (Socket based and perpetual covering all number of sockets mentioned in the server hardware section)
		In the case of a single cluster, a centralized management platform is not needed. Administrator accesses the master server of the cluster in Web mode to manage the servers, VMs, network, and virtual storage in a centralized way.
User License	Virtualization	To ensure business continuity, Hypervisor should support smooth rolling upgrade. Servers should be upgraded one by one without shutdown of the cluster. During the upgrade, VMs will be automatically migrated to other hosts, and business operation is not affected.
		Support to mixed server, desktop and application virtualization in the same cluster and same hypervisor to simplify the management workload.
	Configuration	Unified VM backup and restoration should be supported. Users can choose to back up data on multiple or all VMs to external servers as required. In addition, backup policy setting should be supported to implement automatic backup.
	Type	Licenses are required for concurrent VDI user. Five types of desktop resources, including persistent desktop, Non-persistent desktop, pooling desktop, shared desktop, and remote application, should be supported to meet the requirements in different scenarios.
		The user license must be perpetual license to reduce the total costs.
	Virtual desktop compatibility	Multiple types of endpoints should be allowed to log in to VDI, including PCs, laptops (Windows and macOS), Thin clients (ARM and x86), and iOS and Android mobile terminals.



VDI management platform and software	To ensure the compatibility and stability of peripherals, the product should support USB mapping and be compatible with mainstream peripherals, such as HD document scanner, scanner, camera, password keypad, fingerprint collector, ID card reader, tablet, printer, and USB key. To meet the needs of users in different business scenarios (such as localization requirements and no demand for Microsoft AD domain), the platform should support both deployment compatible with the Microsoft AD domain and deployment independent from the Microsoft AD domain. Supports Windows Server 2008, 2008R2, 2012, 2012R2, 2016, 2019, 2022 to publish applications The application released via application virtualization can associate multiple application virtualization servers. Load balancing can be implemented among multiple servers without special load balancing devices or software. The indicators of load balancing include CPU usage, memory usage, disk usage, disk I/O latency, and number of current sessions. Load balancing is conducted based on these indicators to ensure the reasonable utilization of server resources. Application virtualization servers need to support maintenance mode. A server needs to be maintained when the administrator adds resources to the server or new applications need to be installed. At this time, the server is disabled to prevent access of new users without affecting access of the current user. The load of each group of application virtualization servers and each server in a group can be displayed. This helps administrators to quickly obtain the load health status of server groups and single servers, so as to judge the health status of the platform. Details about application virtualization servers can be viewed, including health status, CPU usage, memory usage, disk usage, disk I/O latency, template name, number of users, number of sessions, connection status, and Agent version. Hypervisor supports automatic monitoring of the health status of server groups and single servers. For disconnected servers, users cannot access these servers, and the administrator should receive related alerts through platform notifications, email. Relevant alert logs should be recorded for troubleshooting. Messages can be sent to some or all users using hypervisor. When the server is maintained, new business goes online, or emergency notifications are required, messages can be sent to specified users in a short time. When users report faults, hypervisor can display status information by server, session, and application, respectively, and facilitate O&M based on relevant information. Hypervisor allows the administrator to manually log out user sessions when: 1) a user session does not respond, and the user cannot close it or log out; 2) a user session does not respond even if the user logs out and then logs in again. Hypervisor can disable certain advanced user permissions on the application virtualization server. This will prevent users from performing dangerous operations on the server. The permissions include: disable the registry; disable Task Manager; disable Resource Manager; disable the control panel; disable Command Prompt; hide the local disk of a server; disable the Run command and do not show the list of sub-directories while typing the file name; disable "Manage"; disable "Map network drive"; perform "Disconnect network drive"; hide the recycle bin; disable access to My Network Places; do not allow to run programs on mapped disk at client side. Hypervisor can configure business system access permissions for users by allowing users' access to a certain network segment or domain name. This feature is built in Hypervisor and does not require other devices (such as firewalls). To ensure the stability of user experience, Hypervisor needs to support session persistence. When an end user's network is abnormal, the user's application state is maintained. The administrator can configure the duration of session persistence.
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Application virtualization

	To save server resources, Hypervisor needs to support session reuse. This feature ensures that the applications of the same application virtualization server are assigned to the same session.
	To ensure the security of the application virtualization server, Hypervisor needs to control calls of third-party applications on the server by released applications. Hypervisor can specify that only specified or all third-party applications can be called.
	The application virtualization server supports the circuit breaker mechanism. When the load exceeds the specified threshold, access from new users is rejected, while the access of existing users is retained. This mechanism ensures that the server is not overloaded, and therefore user experience is not affected. Indicators of the mechanism include CPU usage, memory usage, disk usage, and number of current sessions. If any of these indicators reaches the threshold, access of new users is rejected.
	The anti-screen capture and recording feature is supported on PC. After a PC client accesses the VM, the screen content is protected, and no local screen capture/recording software or remote meeting software can be used to obtain the screen content. This avoids data breaches.
	Automatic failover is supported. If the hard drive fails, the available data replica on another server will be used for storage. The failover completes in several milliseconds, so it is basically unaware to the user. If the host or network fails, virtualized applications can be quickly switched to another server and started, which will take about 3 to 5 minutes.
	To meet the routine maintenance requirements, VM live migration must be supported. The running location of the application virtualization server can be changed to other physical host in the cluster without interruption of the user application operation.
	The template-based linked clone mode should be supported to improve the online maintenance efficiency of the application virtualization server. During cloning, the number of VMs, running location, storage location, CPU, memory, network port, and disk size can be specified. The templated-based deployment of 100 VMs cannot exceed 5 minutes.
	The application virtualization server supports bulk setting of computer names, which prevents domain adding errors of computers as much as possible when administrators add domains.
	Application virtualization servers in a group should support smooth capacity expansion. After capacity expansion, the policies set for the group and associated applications can be automatically matched.
	The application virtualization server supports the restored mode, which prevents the impact of users' operations on the application virtualization server (Windows Server). This mode can reduce the failure of the server and the risk of business interruption.
User experience	The application virtualization server should support scheduled automatic startup and shutdown tasks, so as to implement features such as restoration by restart. Regular restart should also be supported to handle system resource occupation. In this case, the administrator does not need to manually restart the server, and automatic O&M can be achieved.
	In the multi-application office scenario, process acceleration can be performed for frequently used applications. Administrators can also customize the application requiring process acceleration to ensure the application use experience.




	To meet the resource usage requirements, pooling desktop should be supported. VMs are not associated with users all the time. Instead, a random idle VM in the desktop resource pool is assigned to a user. After the user logs out, the system automatically shuts down the VM to release resources.
	To improve the desktop use experience and ensure that the VM startup and shutdown experience is the same as physical PCs, the startup and shutdown processes should be visual in case of access from endpoints. Users can view information about the exceptions (such as SP installation at startup and no response) occurred during startup or shutdown, which helps the user to fix the issues. This feature can improve startup and shutdown experience for users and reduce the maintenance workload of administrators to a certain extent.
	To improve the desktop use stability, the client of the product should be able to connect to the virtual desktop without relying on the VM IP address. If the VM NIC is disabled or the IP address is changed arbitrarily, the desktop session will not be interrupted, and the user can work properly. This will prevent access interruption caused by misoperation.
	To improve the desktop experience, the product should support video redirection. Instead of being decoded on the server, video files are directly redirected to the endpoint for local decoding. This feature can improve the playback experience and support multiple local players such as Media Player.
	To ensure the experience of accessing the virtual desktop in WAN or poor network conditions, the transmission protocols of UDP and TCP should be supported. The transmission protocol is automatically selected based on the network conditions before a session is established. The product should support network optimization by techniques, such as setting the compression quality and frame rate, for high-quality and stable connections.
	The product should support the setting of endpoint traffic and uplink and downlink bandwidths of USB mapping, disk mapping, and the clipboard to prevent bandwidth preemption by a user and ensure user experience.
	The product should support network status display on the navigation bar of VM. The navigation bar can display the network status between the current endpoint (thin client or PC client) and VDI console. Users can view the network status and latency in real time. The network status is displayed using signal bars and rated.
	To improve maintenance efficiency, the product should allow administrators to remotely assist with VM maintenance without installing other software. In other words, administrators can directly initiate remote assistance to users on Virtual Desktop Controller. To implement this feature, virtual desktops and virtual applications should be supported.
	Self-service recovery based on snapshots should be supported. When lagging, blue screen, crash, or virus attacks occur on VM, the user can perform system disk recovery based on snapshots by clicking buttons in the navigation bar. This feature is supported in Android thin clients and PC clients.
	Troubleshooting tools for VDI peripherals should be provided. The tools can carry out policy check, peripheral status check, policy status check, routine analysis, and in-depth diagnosis and provide configuration guidance for users. As a result, the efficiency of solving peripheral problems can be improved.
	Built-in desktop O&M tools should be provided for users to view information such as the desktop running status, VDI version information, real-time client bandwidth/traffic/network latency, network protocol, transmission optimization policy, VM resource usage, operating system version, display resolution, and connection status.




Centralized management	Personal virtual disks (high-speed disks) are supported. On the management interface, the mapping between users' personal accounts and the block storage files stored in the virtualization layer is maintained to allow creation, allocation, deletion, and locking of personal virtual disks for users. When a user logs in to a pooling desktop, the disk will be automatically mounted to the VM, and a fixed drive letter is automatically assigned to the disk. The disk will be automatically dismounted when the user logs out.
	Quick deployment of virtual desktops should be supported. A user can configure startup and shutdown plans, manage idle VMs, and associate policy groups to quickly release desktops based on the VM template, personal disk encryption status, VM name, domain/OU, and permission group/zone. After the release, the user can directly access the desktop without intervention by the administrator.
	Permission and zone control of Virtual Desktop Controller should be supported. Different administrator roles can be created, and operation permissions can be customized for the roles.
	Template-based linked clone and full clone VMs should be supported. Linked clone can improve the efficiency of online maintenance, and full clone can keep VMs independent, without being affected by the single point of failure (SPOF) of templates. During cloning, the number of VMs, running location, storage location, network port, and disk size can be specified. In addition, linked clone VMs can be converted into full clone VMs.
	Template update needs to be able to specify the virtual machine for testing, in the new software or software upgrades, this feature can be used to select a small number of virtual machines for a small number of users to test.
	Templates can be updated using the backup files of other specified templates.
	To implement large-scale deployment and simplify management, unified management, distribution, and update of templates across multiple virtualization resource pools should be supported.
	To implement large-scale deployment, the creation of desktop resource groups based on a single template across multiple virtualization resource pools should be supported. The desktop resource groups can be updated and managed across resource pools in a unified manner.
	To improve the flexibility of desktop O&M and management, the controller should support template version management. Template versions can be added, deleted, edited, and switched, and templates of different versions can be applied to different desktop VMs.
	Smooth capacity expansion by expanding the capacity of the original disk or adding disks of the same format should be supported. (Only disks of the same format can be added for capacity expansion. In addition, simultaneous capacity expansion must be performed for all servers when capacity expansion is required.)
	The product should support template-based upgrade. Software and SPs can be installed at once to facilitate the upgrade of corresponding VMs. This feature meets the upgrade requirements in standard scenarios and does not affect the personal data in directories of non-C disks.
	Health check before and after upgrade should be supported to avoid upgrade-related issues.




	To ensure user experience, the product does not need to rely on the Microsoft Active Directory, and Hypervisor provides the optimized feature of user configuration file management, which allows VDI and virtual applications to "inherit custom settings of user account". The custom settings of the user (such as settings of Chrome, input method, ntuser.dat redirection, user profile of edge, system credentials, and desktop layout) can be retained. In addition, redirection to specified paths is supported, which solves the problem that special software configuration cannot be saved after restoration. Configuration files can be stored on local disks, and both AD domain control environment and non-AD domain control environment should be supported.
	To quickly meet users' demands for desktop resources, the product should allow users to apply for VM configuration changes. The administrators will review the application and choose to approve the application directly, approve application after modification, or reject the application. After the application is approved, the applied resources will be automatically added to the user's VM. In addition, users can specify department asset managers to approve VM configuration change applications, which not only conforms to the regulations but also improves efficiency.
	To meet the requirements of efficient maintenance, the product should support common bulk operations, such as bulk creation, deletion, disabling, import, and export of users, bulk setting of VM IP addresses, bulk associating and disassociating of VMs, and bulk grouping of users.
	In order to ensure the security of the platform, it is necessary to support the setting of the user account idle over a certain period of time automatically disabled, to avoid the risk of idle accounts being maliciously utilized by a third party when the administrator fails to clean up idle accounts in a timely manner.
	To improve resource usage, settings should be supported to automatically log out a user who has been idle, not involved in sessions, or performed any operations on VMs for a certain time period. Once the use is logged out, resources are released.
	The software store should be supported. The administrator can manage software and release software to specific users (groups) or VMs. After the desktop assistant is installed on VMs, users can install the software that has been released in the software store as required.
	Software distribution should be supported. Software can be distributed to specific VMs. After the administrator completes deployment using basic VM templates, the administrator can flexibly, quickly, and efficiently distribute software to employees according to the software requirements of business departments or employees. In addition, the software does not need to be installed.
	File distribution should be supported. Files (including programs and scripts) can be distributed to specific VMs. The files can be directly delivered to the specified location of a VM or be run directly using scripts without operations by users in the VM.
	The management platform can monitor and collect statistics on user traffic and the trend of concurrent users so that administrators can adjust the network bandwidth in time.
	Login information of all users can be recorded, managed, and exported. Login information includes login accounts, endpoint IP addresses, MAC addresses, endpoint models, login time, and logout time.
Monitoring and O&M	External data center reports should be supported. Information such as the number of concurrent user sessions within a period, use duration, server load, storage usage, and storage performance can be queried. In addition, reports can be exported.
	External data center reports should be supported. Information such as the number of concurrent user sessions within a period, use duration, server load, storage usage, and storage performance can be queried. In addition, reports can be exported.

	In order to ensure the smooth operation of the platform and avoid business departments from being affected by insufficient or abnormal platform resources, the platform should be able to quantify the comprehensive scores of the experience and risk of each virtual machine/server/cluster based on the current resource occupation and scheduling of virtual machines/servers/clusters (the lower the scores, the worse the experience of this virtual machine/server/cluster is, and the more likely that risky problems will occur) and Support to view the rating trend change graph to help administrators identify related problems in a timely manner. It also gives suggestions to guide administrators to solve the problems, such as expanding the capacity of a virtual machine with insufficient configuration, or migrating part of the virtual machine if the server load is too high.
	In order to improve the disposal efficiency of virtual desktop platform problems, help administrators quickly locate the root cause of the problem, and reduce the administrator's operation and maintenance burden. The operation and maintenance platform should sustainably detect and discover virtual machines, hosts, cluster-related hardware and software problems (such as virtual machine card slowness), and the detected problems are graded according to the severity, and support combined with the built-in AI intelligent diagnostic library for automated problem diagnosis, which can be directly displayed on the platform in the form of a graphic to illustrate the problem analysis, problem evidence analysis, problem disposal recommendations, and administrators can operate according to the disposal recommendations. It can be directly displayed on the platform in the form of graphics to analyze the problem, problem evidence analysis, problem disposal recommendations, and administrators can operate according to disposal recommendations.
	In order to facilitate administrators to remotely analyze virtual desktop operation problems and reduce the impact of intervening in users' desktops to analyze problems on users' normal business, the operation and maintenance platform should comprehensively monitor and count the various operation data of VMs, including, but not limited to, the total number of processes, process lists, and related resource occupancy inside VMs, the total number of threads, the total number of handles, the details of CPUs (the trend of the usage of the whole and the single-core vCPUs, CPU overhead usage trends required for VM operation), memory details (including commit memory, physical memory, cached memory, free memory, total memory, physical memory + virtual memory), disk details (disk activity time, total wait time, read/write latency, queue lengths, number of reads and writes, number of bytes read/written), scheduling details (CPU run time, scheduling wait time, IO wait time, hibernation wait time); it also supports displaying the software installation list, service list, driver installation list, disk list and peripheral list of the virtual machine.
	In order for administrators to systematically assess the health of servers and locate potential problems, the operation and maintenance platform should monitor and count all operational data of virtualized servers, including but not limited to the total number of server processes, memory details (total memory, used memory, available memory, cached memory, total and used SWAP capacity, total and used large-page memory, physical and NUMA memory, trend graphs of the number of VMs powered on and not powered on), CPU details (total CPU usage, CPU kernel usage, CPU user usage, CPU generated by running VMs), and the trend graphs of the number of virtual machines powered on and not powered on. details trend), VM power-on accessed and power-on not accessed quantity trend graph, CPU details (total CPU utilization, CPU kernel state utilization, CPU user state utilization, CPU overhead incurred by running VMs, CPU IO wait rate, CPU interrupt rate, CPU idle rate, vCPU wait rate, and so on), disk details (disk activity time, requests per second, read/write rate, queue length, response time, and so on), and NIC details (incoming and outgoing packet rates, overload packet loss and error packets, and so on).
	Provides software installation statistics of all virtual machines in the cluster through the operation and maintenance platform, sorted by the number of software installed, and list the virtual machines with specific software installed.
	Custom alarm settings can be made through the operation and maintenance platform, and the settings include alarm name, alarm description, alarm type, severity, detection index, alarm threshold, duration, query statement, optimization suggestion, and alarm object.
	Supports stateful problem locating and one-click repair function for Agent of each virtual machine (persistent desktop), administrators can quickly locate the problem and quickly repair it, and it will not cause desktop connection to be disconnected.

	Supports idle VM identification, identifying idle and zombie VMs within a period of time through algorithmic analysis, and can export statistical reports for administrators to do statistical reports and analysis to avoid unnecessary resource overhead.
	Support for virtual machine expansion and decommissioning identification, due to the complexity of the user's actual business, each user has different performance requirements for virtual machines, in order to better balance the experience and resource utilization efficiency, the monitoring platform needs to be able to intelligently identify whether the virtual machine needs to be expanded to meet the user's experience, but also need to identify which virtual machine performance is excessive, and recommend that administrators do intelligent decommissioning in order to achieve the maximum utilization of host resources
	Provides software resource consumption statistics and business software identification, for software resources (including CPU, memory, users, installation directory and vendors) to carry out statistical analysis of the occupation, if the consumption of high will provide alerts; at the same time to provide business software identification function, administrators can mark the specific software as business software and non-business software, for administrators of the enterprise organization to do analysis of the installation and use of software
	Provide trend the number of virtual machines that can be added to the host cluster, the monitoring platform can be based on the host performance trend, customized performance thresholds and free resources, to determine how many virtual machines the host can still host, without the need for administrators to manually calculate and subjective judgment.
	Administrators can send messages and notifications to specified or all online users as required.
	The platform provides report center function, supports virtual desktop and application usage report, the report contains desktop usage, usage time, software usage, software usage time, number of installers, number of users, number of times of use and other application hotness analysis function, supports customized statistical strategy, such as statistical users, statistical time, etc., to help enterprise administrators accurately understand the use of desktop and application, and provide data support for enterprise software It provides data support for enterprise software asset management, software licensing, and software usage statistics.
	With intelligent operation and maintenance mapping capabilities, it can analyze the correlation between upstream and downstream clusters, hosts, and processes to show the problem propagation chain, helping administrators to fully understand the operation of the platform, quickly locate the root cause of the fault, and quickly resolve the faulty VMs, which significantly improves the efficiency.
	With application knowledge graph analysis and troubleshooting capabilities, it can output application experience scores based on the built-in deep learning model, quickly locate the root causes of poor application experience and give application experience optimization and disposal suggestions, and it can batch push the disposal method to the virtual desktop for accurate processing.
	Login information of all users can be recorded, managed, and exported to support operation by administrators. Login information includes login accounts, endpoint IP addresses, MAC addresses, endpoint models, login time, and logout time.
	Statistics on user access duration can be collected. The data of the day or a specified time period can be queried by using the feature of intelligent monitoring on historical sessions, which helps quickly understand the user access status and access duration and facilitates security audit.
High reliability	To ensure high reliability, Virtual Desktop Controller should support the cluster mode. Sessions can remain connected in case of Virtual Desktop Controller switchover upon crashes without the need of third-party load balancing devices.
	The authentication should be supported if the AD server is offline due to failures. Users can log on to VDI with an authenticated AD account.




	Password security policies should be provided to ensure the security of authenticated passwords and prevent unauthorized access. Such policies include mandatory password change for the first login, scheduled password change, word verification code, and soft keyboard. To meet the secure access requirements of different users, the product should support the virtual portal feature. Users access the virtual desktop using different addresses. This can limit Internet access on the network. Specified accounts can access VDI over WAN, while other accounts can access only over LAN. VM snapshot should be supported to carry out rollback when data is deleted by mistake or the system is faulty. Snapshots stores only incremental data to save the storage space. Recycle bin should be supported for VMs, which can prevent the loss of VM data caused by misoperations. After a VM is deleted, it automatically enters the recycle bin. You can restore the VM to the original position, set automatic cleaning interval for the recycle bin, and view the actual space occupied by the recycle bin. In the case of network disconnection, the virtual desktop window will wait for a period of time before exiting. When the network connection recovers, the user can continue the previous operation in the same window without manual reconnection, which ensures high business continuity. The product should support full-screen watermarks and setting of watermark content, color, transparency, font size, and tilt. The watermark color should be different from the background color. Otherwise, the watermark cannot be seen. To meet the business requirements of users, the product should support temporary permissions. Administrators can grant certain users with temporary USB and PC clipboard permissions, which are available within a certain period of time and are automatically withdrawn after expiration. This feature can ensure data security. To ensure high reliability, Hypervisor should support the cluster mode. Sessions can remain connected in case of Hypervisor switchover upon crashes without the need of third-party load balancing devices. Support virtual machine hot migration from one node to another node in the same cluster. Supports a highly scalable, manageable and flexible virtual infrastructure. Ensure business continuity by adding or reducing pure compute nodes in a cluster without having to shut down the business. Hypervisor can be mapped to the Internet directly. The SSL encryption feature should be built in Hypervisor for both static and dynamic IP addresses. For dynamic IP addresses, third-party plug-ins are not required, thereby reducing the complexity of deployment. Multiple authentication methods can be combined as needed to meet the security requirements of different levels of users. The authentication methods include username/password, USB key, SMS message, bound hardware ID, one-time password, LDAP, RADIUS, AD domain, thin client, and 802.1x. In order to enhance the security of user authentication, the bidding product needs to be built-in OTP dynamic password as a multi-factor assisted authentication method, such as Google Authenticator, Microsoft Authenticator. AD offline authentication is supported. When an AD server is offline due to failures, users can log on to the virtual application with an authenticated account.
Security management	

	Clipboard permission management is supported. Policies can be added to the policy group to specify that only text content can be copied so as to prevent data breaches.
	Audit for clipboard content is supported. When the data is copied between the VM and local path, the information of the user and VM related to copying and copied content will be reported to the data center without informing VDI users. Audit administrators can log on to the data center or the report center to view the copy records online or download the copied content. When a user uses the clipboard during the unpermitted period, the data center records the action and gives an alert.
	Distributed firewall is provided to implement east-west access isolation between virtual desktops and north-south control of access from the virtual desktop to the destination system.
	Administrators can configure specific distributed firewall rules in the conditional policy for different users under different conditions. This feature enables the dynamic control of the access policy in users' business system, which can ensure the security and provide convenience for the end users.
	To better control desktop operations, the product should support authentication correlation with Internet access gateway. the gateway will automatically synchronize the authentication information of a VDI user and record its ID. The user can access the Internet without authentication the next time.
	To meet the security requirements of users, the product should support configuration of ACL policies based on the IP address, VM, and user on Hypervisor without using any third-party product. This feature reduces the complexity of access isolation configuration and ensures security of isolated VMs.
	The Virtual Desktop Controller can be mapped to the Internet directly. The SSL encryption feature should be built in Virtual Desktop Controller for both static and dynamic IP addresses. For dynamic IP addresses, third-party plug-ins are not required, thereby reducing the complexity of deployment.
	Endpoint environment check is supported. Access policies can be configured based on information, such as the endpoint type, operating system version, IP address and access time, and installed software. Access from clients that fails to pass the check is rejected.
	Policies of different security levels can be configured for different access environments based on information such as IP address or endpoint type. This feature ensures that user access from different locations and endpoints is subject to corresponding authentication policies and desktop policies. For example, if a user logs on over LAN, USB flash disks can be used. If a user logs on over WAN, all peripherals are not allowed. For login over WAN, secondary authentication is required.
	Peripheral blacklist/whitelist is supported. The platform can identify all types of peripherals, including HD document scanner, camera, USB optical drive, and USB key. The blacklist and whitelist can enforce access control and improve security.
	File export audit is supported. If Exported file audit is enabled, the VM cannot export files by using the clipboard, PC device, or USB device. Users can use the internal file export tool of the VM to export files. All exported files are encrypted and backed up in the data center for audit. When a suspicious export operation is detected, an alert is reported.

Thin Clients /Endpoint		Application control rules can be built in the control components to perform comprehensive control on virtual desktop. The rules can be configured in the blacklist or whitelist to prohibit or allow the running of specified applications or processes. The application control rules can be configured based on information such as application name, process name, application signature, product name, and provider name. Both custom and existing rule databases can be used. Anti-screen capture and recording for PCs are supported. When a PC client accesses the VM, no local screen capture or recording tools can be used to obtain the window content. This avoids data breaches and protects the desktop data. For example, when a screen capture or recording software is used, the window of virtual desktop becomes invisible. When an online meeting software is used, only the screen sharer instead of attendees can see the virtual desktop window. The distributed firewall, screen watermark, anti-screen capture, anti-screenshot, and USB blacklist/whitelist features are supported for all types of user licenses. Windows operating system is the hardest hit by ransomware, in order to effectively deal with the threat of ransomware attacks, vendors need to provide a complete automated ransomware disposal mechanism, the entire automated disposal process needs to include the ransomware virus identification and protection beforehand, the detection of ransomware behavior in the virtual machine is automatically isolated and linked to the storage of snapshots to retain the current state, the aftermath of the ransomware virus wizard to deal with the restoration of virtual machines, scanning, restoring the network and so on. virus, network recovery, etc. Virtualization platform built-in virtual machine vulnerability patch update, without the need to build additional third-party patch update server, support vulnerability and version information patrol, push patch and upgrade information, and support patch management, update and rollback. Users may worry about the security of their personal information due to the central management of virtual desktop data. Therefore, VM encryption should be supported to encrypt the data disk.
	Brand	The endpoints must be of the same brand as that of VDI software. The embedded operating system is customized.
	O&M management	VMs and thin clients are managed together to facilitate management. To manage thin clients, operations including group management, bulk moving, bulk deletion, and bulk shutdown should be supported. Features, such as startup and shutdown plans, auto startup upon power-on, custom boot screen, simultaneous shutdown, auto login, and password saving, can be configured.
	Access security	For access security, endpoint configurations can be modified, and passwords are required for login. If a thin client has not accessed to virtual desktop before, reject the access or require the password for access.
	Server Virtualization	6 Sockets
Licenses Summary	Storage Virtualization	6 Sockets

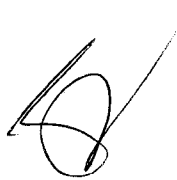



	Virtual Desktop Controller	License for Virtual Desktop Controller software/s
	VDI User Licenses	As per requirement.
Hardware		
Servers	Servers	servers required each with below specifications.
	Form Factor	2U Rack mount Server
	Processor	2x Processors with 64 Cores, 96 Threads per processor having 2.4GHz or higher, the processor must be either AMD Series or Intel XEON Platinum Series, can also propose higher specs.
	Memory	1TB or higher Memory
	Hard Drive	2x 240GB SSDs for OS/Hypervisor with RAID-1. 5x 3.84TB Enterprise Grade Hot Plug SSDs.
	RAID Controller	Raid controller with RAID-1 (for OS) and pass-through/non-RAID mode supported for virtual storage deployment.
	Network Ports	4x 1G Base-T Network Ports 2x Dual Port 10GbE SFP+ Adapters, all ports with SFP+ 10GE Multimode Optical Transceiver Modules
	Power Supply	2xHot-plug Redundant Power Supply as per Server power consumption with PDU style Power Cords
	Rack Mounting Accessories	Server Rack Mounting Kit with sliding rails
	Support	03 year comprehensive OEM warranty / support
	Thin Clients	Thin Client for Virtual Desktops, minimum 4 Cores 1.6GHz, 2GB memory and 8GB disk, must have minimum 6x USB ports, HDMI & VGA port for LED Monitor, required RJ45 port for network connectivity, the proposed Thin client must have Audio port and mic port.
Thin Clients	Mounting Bracket	Provide LED monitor mounting bracket for all thin clients.
	Support	03 year comprehensive OEM warranty / support
	Keyboard+Mouse	USB Keyboard and Mouse for Thin Clients
	LEDs	18.5" or Higher LEDs Displays for Thin Clients
Keyboards+Mouse		
LEDs Display		



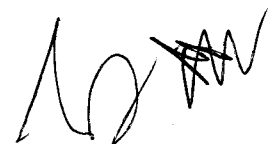

Network Core Switch		
Category	Specification Requirement	Quantity
Interface	48 x 10 Gig SFP+ Ports 6 x 40Gig QSFP28 uplink, upgradeable to 100G Ports need to be Functional/Ready as per the required Proposed Network Infrastructure	
Memory	Memory >= 2GB, Flash >= 1GB	
Switching Capacity	Min 2 Tbps	
Forwarding Capacity	Min 480 Mpps	
Power	Redundant 1+1 AC	
Layer 2	4K VLAN and 4K ACL rules	
	260K MAC Address and above, 130K ARP Entries and above	
	QinQ, LACP, STP, RSTP, MSTP/PVST+, ERPS, LLDP, Jumbo Frames	
Layer 3	Static routes, RIP v1/2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+, MPBGP, ECMP, routing policy	
	FIBv4 >= 130K, FIBv6 >= 65K	
Reliability	Single-hop BFD, BFD for OSPF, BGP, ISIS, VRRP & Static routes	
VXLAN	VXLAN L2 and L3 gateways, BGP EVPN	
Multicast	IGMP v1/v2/v3, PIM-SM, PIM-DM, PIM-SSM	
Stacking	Stacking support for at least 4 devices	
NAC	Support Integration with industry standard NAC Solutions like Cisco ISE	
	Support 802.1x, MAC Authentication, Dynamic VLAN, Dynamic ACL, RADIUS CoA, Local Web Authentication, URL Redirection	
Management	CLI and Web interface (HTTPS), Telnet, SSH v2, SNMP v1, v2, and v3, Telemetry, RMON	
	Support Automation with SDN Controller and NETCONF/YANG	
QoS	Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance/Management	
Security	Support ARP security, DAI, DoS attack defense, ARP attack defense, and ICMP attack defense, CPU protection, Blacklist	
OEM Credibility	OEM must have in-country presence (office and depots) for the past 3 years. OEM own depots in Islamabad, Lahore, and Karachi OEM must have at least Five (5) deployment references in education sector in Pakistan Bidder Must be Partner of the OEM	
Warranty & Support	03 Years Warranty & Support	

Network Access Switches		
Indicator	Technical Specification Requirement	Quantity
Interface	10/100/1000Base-T ports >= 48	
	10 GE SFP+ ports >=4 Ports need to be Functional/Ready as per the required Proposed Network Infrastructure	
Memory	Memory >= 1GB, Flash>= 512M	
Switching Capacity	Minimum 176 Gbps	
Forwarding Capacity	At least 130 Mpps	
Power	Redundant 1+1 AC	
Layer 2	4K VLAN	
	MAC Address Entries >= 30K	
	ARP Entries >= 3K	
	ACL Rules >= 1K	
	QinQ, LACP, STP, RSTP, MSTP/PVST+, ERPS, LLDP, Jumbo Frames	
Layer 3	Static route, RIPv1/v2, RIPng, OSPF, OSPFv3, ECMP, IS-IS, IS-ISv6, BGP, BGP4+, VRRP, and VRRP6, BFD, PBR	
	FIBv4 >=8k, FIBv6>=3k	
Multicast	IGMPv1/v2/v3, PIM-DM /SM /SSM, IGMP Snooping, Load Balancing of Multicast Traffic	
Stacking	Stacking support for atleast 4 devices	
NAC	Support MAC authentication, 802.1x authentication, Dynamic VLAN, Dynamic ACL, RADIUS CoA, Local Web Authentication and URL Redirection	
	Support Integration with industry standard NAC Solutions like Cisco ISE	
Management	CLI and Web interface (HTTPS), Telnet, SSH v2, SNMP v1, v2, and v3, Telemetry, RMON	
	Support Automation with SDN Controller and NETCONF/YANG	
QoS	8 Queues per port, Rate Limiting, Support Traffic classification, Traffic behavior, Traffic shaping, Congestion avoidance/Management	
Security	Support ARP security, DAI CPU Defense, Storm Control and Storm Suppression	
Environment	Operating Temperature -5C to 45°C Humidity 5% to 95%RH	
OEM Credibility	OEM must have in-country presence (office and depots) for the past 3 years. OEM own depots in Islamabad, Lahore and Karachi OEM must have at least Five (5) deployment references in education sector in Pakistan Bidder Must be Partner of the OEM	
Warranty & Support	03 Years Warranty & Support	




Technical Specification Requirement Switch 24-Port Switches	
Should have 24*10/100/1000Base-T Ports	
Must have 2*GE Combo/2*100/1000Base-X SFP Combo Ports and 2*1000Base-X SFP Ports	
Should have 56 Gbps or more port switching capacity	
Forwarding rate should be more than 42 Mpps	
Should have 332 Gbps or more box switching capacity	
Should be a Manageable Switch with Layer-3 features such as RIP, RIPng, OSPF & OSPFv3	
Should support Spanning Tree Protocol, 802.1D STP, 802.1W RSTP & 802.1S MSTP	
Should support Stacking of local and remote devices through standard Ethernet interfaces. Should support stacking of 9 switches or more.	
Should be an Enterprise series Switch. CPU must be Single Core, 790MHz or higher	
Should Support Link Aggregation Protocol	
Should have 4K or more VLANs support and 16K MAC address entries	
Should be able to provide Access Port and Trunk Port	
Broadcast, Multicast and Unicast Storm Control Support.	
Port Mirroring, RSPAN or equivalent must be supported	
Should Support Time & Vlan Based ACLs. In addition, the switch must be capable of configuring the bidirectional ACLs.	
Should support SNMP v1, 2 & 3.	
Switch RAM must be 512MB or higher	
Switch Flash must be 256MB or higher	
Should support security features like IP Source Guard, AAA, RADIUS, 802.1x and Centralized MAC Based Authentication, DHCP Snooping etc.	
Support 1022 IPv4 ARP entries or more	
Support 9800 bytes or larger Jumbo Frame	
QoS Support 8 Queues Per Port, Traffic classification based on IEEE 802.1p DSCP, CAR, TCP/UDP Port Number, Access Control List	
3- Years NBD Equipment warranty from OEM	

Note: The switches or any devices provided by the vendor should have full integrability with our existing installed network equipment in any aspect.



Annexure - B

(Passive Work, Surveillance and Allied Solution)

Brand/Make/Model and Country of manufacturer and origin: _____

1. Passive Work

Serial #	Description	Unit	Make	Quantity
1	Category 6 Unshielded Twisted Pair Ethernet cable. 305m Box.	Roll	3M/Schneider/D-Link or Equivalent	
2	24-port rack mount patch panel loaded.	Each	3M/Schneider/D-Link or Equivalent	
3	19" rack mount cable manager.	Each	3M/Schneider/D-Link or Equivalent	
4	Single port Ethernet faceplate with IO.	Each	3M/Schneider/D-Link or Equivalent	
5	Faceplate mounting box for LAN & Power PVC.	Each		
6	Cat6 Ethernet drop cable 1 mtr length.	Each	3M/Schneider/D-Link or Equivalent	
7	Cat6 Ethernet patch cable 3 mtr length.	Each	3M/Schneider/D-Link or Equivalent	
8	42U Server Rack 600x1000mm Front & Rear Perforated Door's , Side Panels Removeable U's Marking on Mounting rails, 4 x Cooling Fans, 4 x Wheels and Castors, 2 x Fixed Shelves 1 x Sliding Shelf, 2 X 8way PDU.	Each	Dlink/KOTOHIRA SYSTEMS/ Toten/Equivalent	
9	27 U Rack 600 X 800, Front Mesh Door, Front and Rear Mounting Channels, lockable front door. 1 X 8way PDU.	Each		
10	RJ45 Ethernet connectors.	Each		
11	Velcro straps 10 mtr, for UTP & Fiber cables.	Each		
12	PVC Zip Ties. For UTP & Fiber cables.	Pack		
13	Duct/pipe for workstations LAN cables with accessories.	Rft		
14	Cable ladder for data center 12"(for Power, Fiber & UTP cables) along with support brackets, rods.	Rft		
15	Chromed steel pipe for LAN/Power cables drop from ceiling to workstation along with pipe accessories.	Each		
16	Labeling of workstations, patch cables, faceplates, patch panels, power sockets & Fiber cables.	JOB		
17	Fluke testing for LAN nodes.	Each		

18	Laying down UTP cables through walls & ceilings, ensuring the cables are routed efficiently and securely. Installation of connectors, jacks, and racks to ensure proper connectivity. Organizing and labeling cables. Installing of cable ladder & conduits for neat and safe cable routing, Data cabinet installation.	JOB		
19	6 core armored fiber optic cable (single mode)	Mtr	Litech, Blackcopper, Hcom or Equivalent	
20	12 ports ODF (Optical Distribution Frame) loaded.	Each	Litech, Blackcopper, Hcom or Equivalent	
21	OFC Fusion Splicing	Each		
22	Fiber patch cord 3mtr length single mode.	Each	3M/Schneider/D-Link or Equivalent	
23	HDPE fiber optic conduit, impact resistance.	Rft		
24	Laying down OFC cable through ceilings in HDPE conduit.	JOB		
25	Optical Time Domain Reflectometer (OTDR) testing.	Each		
26	25mm ² 5-core power cable. (Fast Cables)	Mtr		
27	10mm ² 3-core power cable. (Fast Cables)	Mtr		
28	6mm ² 3-core power cable. (Fast Cables)	Mtr		
29	UPS Sub DB 1 for Each Hall WIRING & BUSBAR LINKS, CUBICLE: 700(500)125 MM, WALL MOUNTING, INDOOR TYPE MADE OF 1.5 MM SHEET, POWDER COATED. 1 X MCCB TP 100 AMP, 1 X MCCB TP 60 AMP, 2 X MCB DP 32AMP, 20 X MCB SP 16AMP, 1 X VOLTMETER DIGITAL WITH S. SWITCH 500VAC, 3 X PHASE INDICATION 220V, 3 X CONTROL FUS 6AMP.	Each		
30	Server Rack DB WIRING & BUSBAR LINKS, CUBICLE: 600(450)125 MM, WALL MOUNTING, INDOOR TYPE MADE OF 1.5 MM SHEET, POWDER COATED. 1 X MCCB TP 60AMP, 4 X MCB DP 32 AMP, 3 X MCB SP 16 AMP, 1 X VOLTMETER DIGITAL WITH S. SWITCH 500VAC, 3 X PHASE INDICATION 220V, 3 X CONTROL FUSE 6 AMP.	Each		
31	UPS DB WIRING & BUSBAR LINKS, CUBICLE: 700(500)125 MM, WALL MOUNTING, INDOOR TYPE MADE OF 1.5 MM SHEET, POWDER COATED. 1 X MCCB TP 100AMP, 2 X MCCB TP 60 AMP, CB TP 60AMP, 4 X MCB DP 32 AMP, 3 X MCB SP 16 AMP, 1 X VOLTMETER DIGITAL WITH S. SWITCH 500VAC, 3 X PHASE INDICATION 220V, 3 X CONTROL FUSE 6 AMP.	Each		
32	100AMP TP breaker for existing DB.	Each	Schneider or Equivalent	
33	Industrial Sockets 3 pin 32 Amp for 42U/27 racks.	Each		

34	Power points provision for workstations including 2 X Single Multi Power sockets, Power cable 3 X 2.5mm, 1.5mm.	Each	Fast cables/Newage	
35	Duct/pipe for workstations power cables with accessories.	Rft		
36	Laying of main power cables, installation of Duct/Pipe, wiring for workstations, socket installation, power DB installation, industrial sockets installation, terminations.	JOB		
37	Antistatic vinyl flooring for ESD, copper base connectivity with grounding system, Protection against electrostatic discharge, for new & existing DC. Decora/Marflex	Sqft		
38	Access control system for DC door, AMF 70, Fingerprint, RF Card & PIN, Electromagnetic Lock, Push Button, Power supply, and cabling	Each		
39	Brick Wall & aluminum glass partition dismantling with finishing work.	JOB		

2. Surveillance Solution

Sr.No	Item	Description	QTY
2	4MP Bullet Network Camera	4 Mega Pixel camera – POE supported	
	32 Channel Network Video Recorder	Up to 32 channel IP cameras can be connected Supports decoding H.265+/H.265/H.264+/H.264 video formats Up to 4K high-definition live view, storage, and playback Up to 8-ch @ 1080p decoding capacity	
	HDD	Supply of Seagate/WD 8TB Surveillance Hard Disk	
	LED	55-Inch LED with 1-Year Warranty	
	Accessories	Wireless Mouse and HDMI Cable as per proposed Solution	
	Installation	Complete Installation and configuration	

3. 10KVA UPS

Sr.No	Item	Description	QTY
4	UPS 10KVA Online	Rack Mount UPS 10kVA 220V - UPS rack mount, 10kVA Online UPS, output PF 1.0, 220V/220V, 2U height with 32 Nosx12V9Ah or higher batteries. Battery Bank is included. 3 Year Warranty	

**LIST FOR THE PURCHASE OF BESS SOLUTION (POWER BACKUP) ON TURNKEY BASIS FOR
KHYBER GIRLS MEDICAL COLLEGE, HAYATABAD PESHAWAR FOR THE YEAR 2025-26**

	Items		Description	
1	BESS		Minimum Backup Requirement is 5-6 hours; the Vendor must visit premises for complete survey so that load management can be confirmed. 3phase	
2	Battery Cycles		>6000 battery cycles, SOH >=80%	
3	Auxiliary		Integrate AI Algorithms LFP Batteries IP54 for outdoor Protection, C3 Anti Corrosion Level Multi-Level Fire and battery protection and SPD ALL IN ONE DESIGN CLOUD EMS, monitoring through mobile APP liquid Cooling	
4	DC Cables & AC Cables		As per Technical Specification Cables are double insulated, XLPE, PVC, Flexible, or equivalent, with a temperature range -5°C to +60°C. Rated voltage 0.6 /1kV Conductors Stranded annealed copper Grade and quality of the copper ≥ 99.5% of purity	
5	Civil Work		As per required for BESS Placement	
6	Requirements		- As per Technical Specification and explained in BOQ & Certifications: UN38.3, IEC62619, IEC62477, IEC61000, EN50549UV resistant - Inbuilt Fire Suppression, flammable Gas detection, exhaust, water sprinkler system	
7	Earthing	Imported	As per Technical Specification	
8	Installation & Commissioning		Complete System Installation and Commissioning required and if needed the system should be commissioned to the existing on grid PV system. Moreover the existing IT infrastructure installed at KGMC Premises needs to be connected to this BESS solution by the vendor who is awarded the project.	
9	Warranty		Warranty: 6 years replacement for complete system	
10	Trainings		Complete System Training with proper professional certification is required for the project	


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**Khyber Girls Medical College
Hayatabad, Peshawar**

**LIST OF MEDICAL EQUIPMENTS TO BE PURCHASE OF KHYBER GILRS MEDICAL
COLLEGE, HAYATABAD PESHAWAR DURING THE YEAR 2025-26**

3D INTERACTIVE ANATOMY TABLE

TECHNICAL SPECIFICATIONS

- 1) Provide two complete human anatomical persons, one male and one female, and divide the human body into 11 human body organ systems, which are Reproductive system, Respiratory system, Lymphatic system, Cardiac system, Urinary system, Nervous system, Muscular system, Skeletal system, Digestive system, Skin system, Endocrine system.
- 2) 2. Each human body male and female whole-body anatomical model data consists of no less than 2000, all of which can be disassembled to control the anatomical structure and composition.
- 3) Cutting tool to perform the dissection of the virtual human cadaver. Ability to perform dissection with layer by layer.
- 4) Ability to change the color of the specific body part, make annotation being it free hand or text, take the screenshot or make the video of the whole class session by recording the screen itself.
- 5) Atlas features available to search for a specific body part and displayed on the X-Ray of the Virtual Human Cadaver with Annotations.
- 6) Animation of the pumping heart with the blood flow and ability to have the view in Sagittal, Coronal and Transverse Plane.
- 7) Anatomical models, including head, chest, abdomen, back, pelvis, shoulders, arms, elbows, forearms, wrists, palms, thighs, knees, legs, ankles, and soles, a total of 16 groups of high definition 3D human anatomy.
- 8) Three-axis view of human anatomy, which means 3D, sagittal plane (X), transverse plane (Y), coronal plane (Z), which is convenient for viewing the current axis, and the depth of the slice can be adjusted by dragging adjustable from 0% to 100%.
- 9) X-ray system, under any 11 organs, you can observe the relative position of the X-ray to the human body, and adjust the value from 0% to 100% to deepen or dilute the X-ray picture, which is convenient for teaching and explaining the position of the human body.
- 10) Pre-Installed quizzes with more than 8000 questions and chance to design the quizzes according to the user's requirement.
- 11) Virtual Endoscope to navigate through the hollow organs of the virtual human cadaver with 108 real endoscopic videos.
- 12) Radiological viewer with the ability to connect to the PACS of the hospital.
- 13) Import all kinds of DICOM data.
- 14) 400 pre-installed real case examples for the pre-surgical planning for the educational purpose only with the appropriate radiological measurement tools and also pre-surgical planning instrument.
- 15) Ability to re-construct the 2D DICOM data to 3D format in less than 30 seconds with the algorithm for auto-segmentation for better understanding.
- 16) Histopathology Atlas with more than 350 real case examples separated in respective areas 17. The image format is ultra-high definition of 20,000 x 20,000 pixels.
- 17) The image format is ultra-high definition of 20,000 x 20,000 pixels.
- 18) Image reading format: supports svs, jpg, png, *.tif, bmp and other image format files. Video reading format: supports mkv, mp4, avi, *.mov and other video format files.



- 19) The images can be digitally amplified to up to maximum of 20X.
- 20) The image enhancement tool bar like brightness, contrast, sharpness, etc.
- 21) The Touch screen and software should be from same manufacturer.
- 22) 65 inches UHD display with 3840 x 2160 pixels.
- 23) Intel i7, 16GB RAM, 1TB HDD + 1 TB SSD

Hardware Includes:

- o MultiPaint Touch Screen & 65 Inches 4K resolution screen with Tempered glass
- o Movable via motorized system Horizontal & Vertical motion
- o Must support switching to a Smart Board for classroom lectures.
- o Can be easily projected
- o 17 12th Gen
- o NVIDIA Graphics card
- o 16 GB DDR4 RAM
- o Intel i7, 16 GB RAM, 1TB HDD+1TB SSD
- o Trolley base with wheels
- o UPS for power backup

Placement Convenience:

Must be have tilting option in table for positioning motorized elevation for height adjustment - It should be used as Vertical (Landscape) & Horizontal (Table)

Bookmarks:

Must capable of case preparation before class and saving the work to a homework or next class.

Projector / Monitors

Possible to connect with Project/external screens.

Software modules include:

- o Human Anatomy Atlas-Software lifetime license and updatable
- o 3D Virtual Dissection Software - lifetime license and updatable
- o Histology Slides Software-Software lifetime license and updatable
- o Advance Human Anatomy Atlas- Software lifetime license and updatable

Key Features:

Detailed 3D Models (Full anatomical models of major body systems, including bones, muscles, and organs)

In-Depth Information (Descriptions, definitions, and clinical notes for each feature)

Quizzes & Assessments (Test knowledge with interactive quizzes)

Virtual Dissection (Simulate dissection without physical specimens)

Cross-Sectional Views (View internal structures in various planes)

Histology Slides Software:

Digital microscopy platform that must managing, viewing, annotating, and sharing high resolution microscopic and whole slide images in both educational and research settings. Also allows seamless inter-action with 2D, 3D.



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