

UNIVERSITY OF TURBAT



(TENDER DOCUMENT)

For

Procurement of Desktop Computers,

Servers & IT Equipment

at UoT Main Campus

(UOT/ADV/03-2022-A)

1. **INTRODUCTION:**

- 1.11 The University of Turbat (UoT) is a public sector university of Higher Education Commission of Pakistan wants to purchase Desktop Computers, IT & Networking equipment for its main Campus located in Turbat (Kech).

2. **BIDDING DATA.** (Salient features of bid).

2.11	Name & address of employer	UoT
	Currency	Pak Rupees
2.12	Amount of bid security	2 % quoted amount
	Period of validity	Four months
2.13	No. of copies of bid to be submitted	One
2.14	To whom bid is to be submitted	Director Procurement Administration Block Main Campus adjacent to M-8 Road Ginnah Turbat(Kech) Balochistan
2.15	Deadline for submission of the bid	25 th of March 2022 3:00 PM.
2.16	Date time and venue of bid opening	Bids will be opened on 25 th of March 2022, 3:30 PM in the meeting room of UoT Admin block by tender committee.

3. **RESPONSIVENESS OF BID**

A bid to be responsive must fulfill the following conditions	
3.11	The bid is valid till the time mentioned in the bid documents.
3.12	The bid prices are firm during the currency of the contract.
3.13	Completion period is offered within the specified limits.
3.14	The bidder is eligible to bid and possesses the requisite experience, capacity & qualifications.
3.15	The bidder has submitted the requisite bid security.
3.16	The bid does not deviate from basic technical parameters/requirements.
3.17	The bid meets the general specifications of the Tender

4. **PRICE ADJUSTMENT FOR DEVIATION IN TERMS OF PAYMENT**

If a bid deviates from the terms of payment as specified in the conditions of contract and if such deviations are acceptable to the Employer, then markup earned for any earlier payments involved in the terms outlined in the bid as compared to those stipulated in the "Conditions of Contract" shall be calculated

at the prevailing Bank interest rate and shall be added to the corrected total bid price for comparison purposes only.

5. **Basic eligibility conditions**

The bidders in order to be eligible for giving quotation must meet the following basic conditions.

- i. Technically & financially capable to perform such works.
(Documentary evidence to be given)
- ii. Must be registered with GST and Income tax departments (copies of certificates to be attached)
- iii. Must agree with terms and conditions given in the bidding documents.

6. **SPECIFIC WORK DATA (BRIEF DISCRIPTION OF THE WORK)**

6.1	Name of the work/supply	Procurement of Desktop Computers, Servers & IT equipment at UoT Main Campus
6.2	Place of supply	The items are required to be delivered at University of Turbat main Campus.
6.3	Brief Description of work(Scope of Work)	The tender involves Supply, installation, Configuration, Testing and Commissioning of IT equipment as per technical specifications given in the tender documents

7. **Contract Data**

7.1	Employer	University of Turbat
7.2	Contract	Procurement of Desktop Computers, Servers & IT equipment at UoT Main Campus
7.3	Date of Delivery	The supplies are required to be delivered and Installed within three months from date of order.
7.4	Employer 's Representative	Director Procurement
7.5	Performance security	Not Applicable
7.6	Period of removing defects	The defects, if any, must be removed or item replaced within two weeks.
7.7	Insurance	Not Applicable
7.8	Deduction	Income tax & GST will be deducted from bills as per government rules. The suppliers must submit NTN No and clearly state whether they are filer or non –filer.
7.9	GST	The supplier is required to submit copy of invoice with delivery.
7.10	Arbitration	As per relevant rules

8. General Terms and condition

- 8.1 All bids must accompany bid security @ 2 % of the quoted amount without which the bid will be out rightly rejected, being non responsive.
- 8.2 The bids must be kept valid for at least one month.
- 8.3 The bidder must provide details / proof of their registration with GST and Income Tax departments.
- 8.4 The items must be delivered at University of Turbat Main Campus premises in safe and sound condition. The damaged items will have to be replaced as soon as possible but not later than one week without any additional cost.
- 8.5 The Item must be exactly as per the specifications given in the tender documents. In case of any deviation, the items will be returned back with all risk on the supplier.
- 8.6 The quoted rates must be inclusive of all costs including Packing, Transportation, Installation, Taxes etc. No additional payment will be made on any account.
- 8.7 The quantities of the items can be increased or decreased for which no change in price will be allowed.

Seen & accepted
Name of the firm/
Bidder with stamps

Bidding Process

Single stage two envelopes bidding process will be adopted in accordance with the PPRA Rules.

Bidding Procedure for Evaluation of Bids

The bid submitted by the Bidder will be evaluated as per the following procedure:

1. First level of evaluation will be based on mandatory criteria. Only those firms who fulfill mandatory criteria will qualify for next round of evaluation.
2. Second level of evaluation will be on the basis of the Technical Bid, which will include compliance to technical specifications of each item and other factors mentioned in this bid document.
3. Bids that pass technical evaluation will be opened for financial evaluation.

List of Mandatory Documents for Eligibility

S#	Documents	Validity
1	Certificate of Company/Firm Registration/Incorporation under the laws of Pakistan with minimum 5 years of Relevant Experience	Valid certificate from concerned regulator/ authority required.
2	Registration of NTN with Federal Board of Revenue (FBR) and having Active Tax Payer status.	
3	Registration of General Sales Tax (GST) with Federal Board of Revenue (FBR) and having Active Tax Payer status.	
4	Affidavit that firm is not Blacklisted and involved in any active litigation in Pakistan.	

5	Authorized partners of OEM (Distributors, Resellers or Authorized Letter from mentioned Partners) for items where applicable.	Valid Authorization Certificate
6	Proof of similar completed projects for the last five years.	Completion Certificates
7	Bidder has technical capabilities to provide support services / assistance during active period of Contract.	Team List with relevant training /certification
8	Compliance/ Data sheet shall be provided. Unless the submission of the same, bid shall be considered rejected straight away.	Compliance Sheet & Data Sheets
9	Bank Statement of the company for the last two years	Bank Statement

Evaluation Procedure & Criteria

Technical

1) Procedure for opening of Bids

Single stage – two envelope, procedure would be adopted for opening of bids. The procedure and terms are as follows:

- a) The bid shall comprise a single package containing two separate envelopes. Each envelope shall contain separately the Financial Proposal and the Technical Proposal;
- b) The envelopes shall be marked as “FINANCIAL PROPOSAL” and “TECHNICAL PROPOSAL” in bold and legible letters to avoid confusion;
- c) Initially, only the envelope marked “TECHNICAL PROPOSAL” shall be opened;
- d) The Technical Proposals shall be evaluated for compliance to technical requirement of this document, without reference to the price and reject any

proposal which does not conform to the specified requirements as listed in said Sections.

- e) The envelope marked as “FINANCIAL PROPOSAL” shall be opened in front of Procurement Committee members and the representatives of qualified bidders after the technical evaluation who have scored at least 70% marks;
- f) The Financial Proposal of bids found technically nonresponsive or unqualified shall be returned un-opened to the respective bidders;
- g) The opened financial proposals will be evaluated and amount totals will be checked/ verified for correctness. The lowest priced bid compliant in all respects will be considered for the award of procurement order.

2) Technical evaluation

There would be a two-stage evaluation; preliminary mandatory evaluation of technical bids will be done as per information tabulated above in the “list of mandatory documents”. Detailed technical evaluation of those firms would be performed which would qualify the above tabulated mandatory evaluation criteria. Based on the detailed evaluation, a further short listing will be done. These shortlisted firms may be asked to give presentation/ demo of their equipment/ solution as requested by the Purchaser. The technical evaluation would be performed by the Technical Evaluation Committee. Rating for technical evaluation will be as per following criteria:

S#	Criteria	Marks
1	Relevant Experience	40
(i)	Relevant experience in providing of ‘IT Equipment (mid-range Servers, networking devices, PCs, laptops/ notebooks, printers, scanners, etc)’ of similar nature & size for clients in Public Sector. <ul style="list-style-type: none"> • Each Project -> 02 Marks (Maximum limit 10 Marks) 	
(ii)	Relevant experience in providing servers installation and Configuration of similar nature & size for clients in Public/ Private Sector Departments/Organizations <ul style="list-style-type: none"> • No of Projects in Public Sector, Each Project -> 02 Marks (Up to maximum limit of 05 Marks) 	
(iii)	Relevant experience in ‘switches ,Firewalls ,Network Equipment , etc,’ of similar	

	nature & size for clients in Public/ Private Sector Departments/Organizations • Each Project -> 02 Marks (Up to maximum limit of 10 Marks)	
(iv)	Manufacturer Authorization Certificate: 7.5 Marks	
(v)	Previously completed projects of similar nature in Balochistan: 7.5 Marks	
2	Technical Resource (Technical/ Managerial)	10
	Staff strength above 05 employees: 1 marks Including at least 02 Engineers trained / certified on manufacturer's equipment	
(i)	Technical Manager's Experience:	
	Relevant Experience up to (03-05) years of successfully managing and implementing similar nature projects ->01 marks	
	Relevant Experience up to (05-10) years of successfully managing and implementing similar nature projects ->01 mark	
	Relevant Experience (Above 10) years of successfully managing and implementing similar nature projects ->02 marks	
(ii)	Training, Support Strategy, Response time, Warranties, onsite maintenance & technical support -> maximum 05 marks	
3	Project Implementation/ Management Plan	50
(i)	Project Timeline for delivery and installation, Within 4 Weeks -> 30 marks, Within 6 Weeks -> 20 marks, Beyond 6 Weeks -> 0 marks (Maximum limit of 30 Marks)	
(ii)	Overall Proposal Presentation in terms of: Conciseness Clarity, Completeness Demo/ Presentation of equipment/ solution as requested by the Purchaser. (Max 5 Marks)	

	Higher Specification of equipment's(Maximum limit of 15 Marks)	
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Delay in Delivery

- In case of extension in the delivery period, the recovery shall be made on the basis of following percentages of value of goods stores / work completion which the tenderer has failed to supply / complete the work.

Conditions with Percentage

- a. Delay up to one fourth period of the prescribed delivery period. **2.5 %**
 - b. Delay exceeding one fourth but not exceeding half of the prescribed period. **5.0 %**
 - c. Delay exceeding half but not exceeding three fourth of the prescribed period. **7.5 %**
 - d. Delay exceeding three fourth of the prescribed period. **10.0 %**
- Fraction of a day in reckoning period in supplies shall be eliminated if it is less than half a day. The maximum amount of shall be 10%.
 - The security money shall be refunded immediately after expiry of warranty period provided there is no breach of contract by the supplier and provided there is no outstanding against the tenderer.

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Name of the firm/
Bidder with stamps

Particular conductions of contract

1. The quantities given against each item are estimated ones and can be increased or decreased without change in rates depending upon actual requirement or space availability.
2. The items will need to be delivered & installed at the Main campus of UoT situated at Turbat District Kech Balochistan.
3. Any damage or defect during transportation, loading/un loading or installation/fixing will be on supplier's account and no additional cost will be borne by UoT on this account.
4. For the branded items the firm must produce documentary evidence of the genuineness of the product.
5. Part payment may be allowed at the sole discretion of UoT; however in such event, UoT may retain a certain part of the payment.
6. The rates should be quoted for each item separately. The selection of lowest rates will be made on overall lowest basis.
7. The firm will be responsible for installation, configuration, testing and commissioning of the items to the satisfaction of user department.
8. The items supplied will be inspected by a UoT inspection team and any defects pointed out will have to be rectified.
9. The firm will be required to provide guarantee in addition to standard guarantees by the manufacturer for one year. In case of any malfunctioning or defect during this period, the firm will be responsible to rectify the defects free of cost; the firm will also bear the transportation cost of the items which are to be sent for the rectification of defects.
10. The standard procurement rules and regulations of PPRA will be applicable.

Seen & accepted
Name of the firm/
Bidder with stamps

TECHNICAL SPECIFICATIONS

S.No	Items	Specifications	Qty	Rate	Amount
01	Desktop Machine Dell / HP / equivalent	Processor 10th Gen Intel® Core™ i5-10400 (6-Core, 12MB Cache, 2.9GHz to 4.3GHz). Operating System DOS. Video Card Intel® UHD Graphics 630. Memory 8 GB, 1 x 8 GB, DDR4, 2666 MHz for Intel® Core™ i5 processors. Hard Drive M.2 2230, 512 GB, NVMe, Class 35 SSD Warranty 01 Year Local Warranty and Manufacturer warranty. Keyboard Multimedia Keyboard - KB216_BLACK Mouse Optical Mouse - MS116_BLACK Ports 4 USB 3.2 Gen 1 Type-A 4 USB 2.0 Type-A 1 Combo Audio Jack 1 Line out 1 VGA port 1 HDMI out 1 RJ-45 Ethernet Slots 1 full-height Gen 3 PCIe x16 slot 2 full-height PCIe x1 slot 1 M.2 2230 slot for WiFi and Bluetooth card 1 M.2 2230/2280 slot for solid-state drive or Intel Optane 2 SATA slots for 3.5-inch HDD, 2.5-inch HDD/SSD Wireless Intel® Wireless-AC 3165 802.11ac 1x1 + Bluetooth 4.2/5.0 Power 200W Bronze	30		
02	Monitor Dell / Equivalent	24" LED/LCD, FHD IPS widescreen 1920 x 1080, PORTS: HDMI, VGA.	30		
S.No	Items	Specifications	Qty	Rate	Amount

03	Multifunction Printer Photocopier	<ol style="list-style-type: none"> 1. CRU Technology 2. 30 Copies Per Minutes 3. A3 Size 4. Digital Copier 5. Network Printer 6. Network Scanning 7. CRU Technology 8. XSA, 9. Digital Multifunction Device, with DADF 110 Sheets (Duplex Automatic Document Feeder) 10. Tray 1: 520 Sheets, 11. Tray 2: 520 Sheets 12. By pass Tray of 50 sheets. 13. Duty Cycle 800 to 1000 / day 14. 2 GB RAM, 320 GB Hard Drive, 1.05 GHz Dual-Core 15. Duplex Copying / Duplex Printing 16. ID Card Copying, Multi-up – 2, 4 or 8 up, Automatic tray selection, Auto reduction/enlargement to fit selected paper size, Electronic pre-collation, Delay Print (specific time), Print from USB, Fit to new paper size, Draft Mode, 17. Paper selection by attribute 18. Zoom 25 % x 400 % 19. Users Accounts Management 20. Print Resolution 1200 x 1200 21. Copy Resolution 600 x 600 22. Electronic Sorting 23. Toner Saver Mode/Power Saver Mode 24. Scan: 55 images per minute A3 Size, Scan USB, Scan to Email, 25. Network Scanning 	01		
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S.No	Items	Specifications		Qty	Rate	Amount
04	Rack Server with VMware Software	Brand	DELL, HP or Equivalent . Branded (New) Servers verifiable via online tags from OEM's public web site. No refurbish or partially used equipment will be accepted.	02		
		Chasis	2.5" Chassis with up to 16 SAS/SATA Drives, 2 CPU			
		Form factor	2RU rack server			

		Processors	2 x Intel® Xeon® Gold 6342 2.8G, 24C/48T, 11.2GT/s, 36M Cache, Turbo, HT (230W) DDR4- 3200			
		Memory	256 GB (4 x 64GB RDIMM, 3200MT/s, Dual Rank)			
		Maximum Memory Capacity	Must Support Up to 1.5TB (using 24 DIMM slots): with a combination of 4GB/8GB/16GB/32GB/64GB DDR4 up to 2400MT/s			
		Hard Drives	2 X 1.2TB Hard Drive SAS 12Gbps 10k 512n 2.5in Hot-Plug			
		Storage Controller	12G Modular RAID Controller with 2GB Cache			
		PCIe expansion	6 PCIe 3.0 slots plus 1 dedicated 12-Gbps RAID controller slot and 1 dedicated mLOM slot			
		Network Interface Cards	1 x Broadcom 57412 Dual Port 10GbE SFP+ Adapter, PCIe Full Height			
		Trusted Platform Module	Trusted Platform Module 2.0 V3			
		Management	Monitor servers for ongoing management, service alerting, reporting and remote management Fully functional GUI			
		Embedded Systems Management	DRAC9 Datacenter 15G with OpenManage Enterprise Advanced			
		Power supplies	Hot-pluggable, redundant 770W AC (UK/EU)			

		Rack options	ball-bearing rail kit with reversible cable management farm			
		Warranty	3 Year			
		Virtualization Software	VMware vSphere 7 Enterprise Plus for 2 Processor Server License & 3 Year Support & Subscription. VMware vCenter Server Standard for vSphere 7 (Per Instance) License & 3 Year Support & Subscription			

Items	Specification			Qty	Rate	Amount
05	Servo AVR (Automatic Voltage Regulator) Single Phase.	Input	220	02		
		Phase	Single Phase			
		Voltage	AC 130V-250V			
		Frequency	50Hz			
		Output				
		Voltage	AC 220V/110V			
		Precision	+3%			
		Capacity	5KVa			
		Frequency (Inverter Mode)	50Hz/60Hz			
		Power Factor	100% When input voltage 220V			

		Function				
		Control Type	Servo Motor			
		Over/Low	YES			
		Delaying	YES			
		Temperature Protection	Temperature Protection Option			
		Short Circuit & Overload	Fuse Protection, MCB			

S.No	Items	Specifications		Qty	Rate	Amount
06	Dry Batteries 12V 200Ah.	Battery Model	Narada ACME 12NDT200	08		
		Nominal Voltage	12V			
		Rated Capacity	200Ah (10 hour rate)to 1.80V/cell @25C			
		Typical Weight	61Kg			
		Internal Resistance	Approx. 3.50m Ohm			
		Temperature Ranges	Operation (Maximum): -40C to 50C			
			Operation (Recommended): 15C to 25 C			
Storage: -20C to 40C						

		Float Voltage	2.25V/Cell@25C			
		Recommended Maximum Charging Current Limit	50A			
		Equalize and Cycle Service	2.35V–2.40V/cell@25C			
		Self-Discharge	The residual capacity is above 90% after 90 days storage (25C)			
		Terminal	M6 Female			
		Terminal Hardware Torque	9 +/- 1.0Nm			

S.No	Items	Specifications	Qty	Rate	Amount	
07	05Kw Hybrid PV Inverter NITROX HYBRID SP-5G -5 KW	Battery Input Data	02			
		Battery Type				Lead-acid or Li-Ion
		Battery Voltage Range (V)				40V-60V
		Max. Charging Current (A)				120A
		Max. Discharging Current (A)				120A
		Charging Curve				3 Stages/equalization

		External Temperature Sensor	Optional			
		Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
		PV String Input Data				
		Max. DC Input Power (W)	6500W			
		PV Input Voltage (V)	370V(100V~500V)			
		MPPT Range (V)	125~425V			
		Start-up Voltage (V)	125V			
		PV Input Current (A)	11A+11A			
		No. of MPPT Trackers	2			
		No. of Strings per MPPT Tracker	1/1			
		AC Output Data				
		Rated AC Output and UPS Power (W)	5000W			

		Max. AC Output Power (W)	5500W			
		Peak Power(off grid)	2 times of rated power, 10 S			
		AC Output Rated Current(A)	21.7A			
		Max. AC Current(A)	25A			
		Max Continuous AC Pass-through (A)	35A			

S.No	Items	Specification	Qty	Rate	Amount
08	Network Firewalls	<ol style="list-style-type: none"> 1. 2×10GE SFP+ and 6×GE Combo ports 2. Firewall Throughput is 3.5Gbps or more 3. FW + SA + IPS + AV throughput is 2Gbps or more 4. Concurrent Sessions is 3.5M or more 5. New sessions per second is 75K or more 6. Support at least 3,500 IPSec VPN tunnels 7. IPSec VPN throughput is 3.5Gbps or more 8. SSL Inspection throughput is 400Mbps or more 9. Integrated Protection: Integrates firewall, VPN, intrusion prevention, antivirus, data leak prevention, bandwidth management, and URL filtering functions, and provides a global configuration view and integrated policy management 10. Application Identification and Control: Identifies common applications, supports application-specific access control, and combines application identification with intrusion prevention, antivirus, and data filtering to improve detection performance and accuracy 	01		

		<ol style="list-style-type: none"> 11. Intrusion Prevention and Web Protection: Obtains the latest threat information in a timely manner for accurate detection and prevention of vulnerability exploits and web attacks, such as cross-site scripting and SQL injection attacks 12. Data Leak Prevention: Inspects files to identify the file type, such as WORD, EXCEL, POWERPOINT, and PDF, based on file contents, and filters sensitive content 13. Bandwidth Management: Manages per-user and per-IP bandwidth in addition to identifying service applications to prioritize mission-critical services and users through methods such as peak bandwidth and committed bandwidth, policy-based routing (PBR), and application forwarding priority adjustment 14. URL Filtering: Can access a URL category database of over 120 million URLs to manage access by URL category, such as blocking malicious URLs and accelerating access to specified categories. Supports DNS filtering, in which accessed web pages are filtered based on domain names. Supports the SafeSearch function to filter resources of search engines, such as Google, to guarantee access to only healthy network resources. 15. Behavior and Content Audit: Audits and traces the sources of URL access based on the user IP address and requested content. 16. Intelligent Uplink Selection: Supports service-specific PBR and intelligent uplink selection based on multiple load balancing algorithms (for example, based on bandwidth ratio and link health status) in multi-homing scenarios 17. VPN Encryption: Supports multiple highly reliable VPN features, such as IPsec VPN, SSL VPN, L2TP VPN, IPsec over GRE, GRE over IPsec, DSVPN, and GRE. Provides a VPN client for remote user access through SSL VPN, L2TP VPN, and L2TP over IPsec VPN. Supports IPsec intelligent link selection and dynamic IPsec tunnel switchover to improve link availability 18. SSL Encrypted Traffic Detection: Serves as a proxy to detect and defend against threats in SSL-encrypted traffic using application-layer protection methods such as intrusion prevention, 			
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		<p>antivirus, data filtering, and URL filtering. Support the HTTPS, POP3S, SMTPS, IMAPS SSL-encrypted traffic detect</p> <p>19. Device Management Capability: Built-in Web UI: Provides abundant device management and maintenance functions, including log report, configuration, and troubleshooting</p> <p>20. User Authentication: Supports multiple user authentication methods, including local, RADIUS, HWTACACS, AD, CA, LDAP, MAC, SSO and authentication exemption</p> <p>21. Security Virtualization: Allows users to create and manage virtual security services, including firewall, intrusion prevention, and antivirus services, on the same physical device</p> <p>22. Policy Management: Provides predefined common-scenario defense templates to facilitate security policy deployment. Automatically evaluates risks in security policies and provides tuning suggestions. Detects redundant and conflicting policies to remove unnecessary and incorrect policies</p> <p>23. Diversified Reports: Provides visualized and multi-dimensional reports by user, application, content, time, traffic, threat, and URL</p> <p>24. Routing: Supports IPv4 static routes, policy-based routing, routing policies, multicast, RIP, OSPF, BGP, and IS-IS. Support IPv6 static routes, policy-based routing, routing policies, RIPng, OSPFv3, BGP4+, and IPv6 IS-IS</p> <p>25. Working Mode: Transparent, routing, and hybrid working modes</p> <p>26. Must quote 3 Years complete security features license (IPS + URL + AV), the license function can't stop working once the license is expired just can't update the database</p> <p>27. The vender should be In leader or visionaries or challenger position of 2021 Network Firewalls Infrastructure Gartner report</p> <p>28. 3 year NBD Replacement</p>			
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S.No	Items	Specification	Qty	Rate	Amount
09	Outdoor AP	<p>1. Radio Protocols = 802.11a/b/g/n/ac/ac Wave 2/ax(Wifi6)</p> <p>2. Compliance with IEEE 802.11ax and IEEE 802.11</p>	11		

		<p>a/b/g/n/ac/ac Wave 2</p> <ol style="list-style-type: none"> 3. Provides service simultaneously on both the 2.4 GHz and 5 GHz bands, at a rate of at least 1 Gbps at 2.4 GHz, at least 4.6 Gbps at 5 GHz, and at least 5.6 Gbps for the device 4. Support 8 spatial streams, 4 spatial streams at 2.4GHz 802.11ax 4x4 MIMO and 4 spatial streams at 5GHz 802.11ax 4x4 MIMO 5. 1 x GE/2.5GE/5GE electrical, 1 x GE electrical, and 1 x 10GE SFP+ 6. Operating temperature is -40°C to +65°C 7. Storage temperature is -40°C to +85°C 8. Dustproof and waterproof grade is IP68 9. 6 KA/6 KV surge protection for Ethernet ports 10. Support transmit power 2.4GHz is 30dBm and 5GHz is 30dBm 11. Support DL/UL MU-MIMO 12. Support 1024QAM 13. Support UL/DL OFDMA 14. Support external antenna, provide 360deg omnidirectional antenna which is used in square & park scenario 15. Support short guard interval (GI) in 20 MHz, 40 MHz, 80 MHz and 160 MHz modes 16. Support service set identifier (SSID) hiding 17. Support Control and provisioning of Wireless Access Points (CAPWAP) in Fit AP mode 18. Number of SSIDs for each radio is 15 or more 19. Number of access users are more than 1000 20. Support 802.11k and 802.11v smart roaming 21. PoE power supply: In compliance with 802.3at/bt, provide the POE++ injector 22. Compliance with IEEE 802.3ab, 802.1q 23. Support SSID-based VLAN assignment 24. Support DHCP client, obtaining IP addresses through DHCP 25. Support VLAN trunk on uplink Ethernet ports 26. Support Unified authentication on the AC in Fit AP mode 27. Support air interface HQoS scheduling, user-based bandwidth limiting, priority mapping for upstream packets and flow-based mapping for downstream packets, queue mapping and scheduling 28. Open system authentication, support Automation with SDN Controller, WPA2-PSK authentication and encryption, WPA2-802.1X authentication and encryption, support WPA3-802.1X authentication and encryption 29. Support 802.1x authentication, MAC address 			
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		authentication, and Portal authentication 30. Support Telnet, STelnet, SFTP, NTP 31. Support Automation with SDN Controller 32. In leader or visionaries or challenger position of 2021 wired and wireless LAN Access Gartner Report 33. Warranty: 3 years NBD replacement			
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S.No	Items	Specification	Qty	Rate	Amount
10	Indoor High-End AP	<ol style="list-style-type: none"> 1. Radio Protocols = 802.11a/b/g/n/ac/ac Wave 2/ax(Wifi6) 2. Compliance with IEEE 802.11ax and IEEE 802.11 a/b/g/n/ac/ac Wave 2 3. Provides service simultaneously on both the 2.4 GHz and 5 GHz bands, at a rate of at least 1 Gbps at 2.4 GHz, at least 7 Gbps at 5 GHz, and at least 8 Gbps for the device 4. Support 10 spatial streams, 4 spatial streams at 2.4GHz 802.11ax 4x4 MIMO and 6 spatial streams at 5GHz 802.11ax 6x6 MIMO 5. Must have 1 x GE/2.5GE/5GE/10GE, 1 x GE, and 1 x 10GE SFP+ 6. Support transmit power 2.4GHz is 26dBm and 5GHz is 29dBm 7. Support DL/UL MU-MIMO 8. Support 1024QAM 9. Support UL/DL OFDMA 10. Built-in smart antennas 11. Support short guard interval (GI) in 20 MHz, 40 MHz, 80 MHz and 160 MHz modes 12. Support service set identifier (SSID) hiding 13. Support Control and provisioning of Wireless Access Points (CAPWAP) in Fit AP mode 14. Number of SSIDs for each radio is 15 or more 15. Number of access users are more than 1000 16. Support 802.11k and 802.11v smart roaming 17. PoE power supply: In compliance with 802.3at/bt, provide the POE++ injector 18. Compliance with IEEE 802.3ab, 802.1q 19. Support SSID-based VLAN assignment 20. Support DHCP client, obtaining IP addresses through DHCP 21. Support VLAN trunk on uplink Ethernet ports 22. Support Unified authentication on the AC in Fit AP mode 	20		

		<p>23. Support air interface HQoS scheduling, user-based bandwidth limiting, priority mapping for upstream packets and flow-based mapping for downstream packets, queue mapping and scheduling</p> <p>24. Open system authentication, support Automation with SDN Controller, WPA2-PSK authentication and encryption, WPA2-802.1X authentication and encryption, support WPA3-802.1X authentication and encryption</p> <p>25. Support 802.1x authentication, MAC address authentication, and Portal authentication</p> <p>26. Support Telnet, STelnet, SFTP, NTP</p> <p>27. Support Automation with SDN Controller</p> <p>28. In leader or visionaries or challenger position of 2021 wired and wireless LAN Access Gartner Report</p> <p>29. Warranty: 3 years NBD replacement</p>			
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S.No	Items	Specifications	Qty	Rate	Amount
11	48 Ports FULL POE/POE+ Switch	<ol style="list-style-type: none"> 1. 48 x 10/100/1000Base-T ports, 4 x 10GE/GE SFP+/SFP ports (POE/POE+ Power from all downlink ports) 2. Dual AC power supply 3. Switching capacity: 168 Gbps or more 4. Forwarding performance: 120 Mpps or more 5. Available 1330W POE power supply 6. 4K VLAN 7. 64K MAC Address 8. QinQ, LACP, STP, RSTP, MSTP, RRPP, ERPS, LLDP, Jumbo Frames 9. Static Routing, RIP, RIPng, OSPF, OSPFv3, IS-IS, IS-IS for IPv6, BGP, BGP4+, ipv6 routes, PBR, DHCP Server/Client/Relay 10. 16K ARP entries 11. 16K IPv4 routes 12. Support IGMP v1/v2/v3, IGMP v1/v2/v3 snooping, PIM-DM, PIM-SM and MSDP 13. IPv4 multicast routes 1K, IPv6 multicast routes 1K 14. Stacking support up to 8 switches 15. VRRP, DLDP, Smart link, Monitor link, EFM and CFM 16. Support mac authentication and 802.1x authentication 17. Defense against UDP flood, TCP SYN flood, ICMP flood and packet fragment attacks, ARP packet rate limiting 18. CLI and Web interface (HTTPS), Telnet, SSH v2, 	02		

		SNMP v1, v2, and v3, eMDI 19. Support VxLAN, BGP-EVPN 20. Support Automation with SDN Controller, NETCONF and YANG 21. Support ITU-T G.8032, ITU-Y.1731, IEEE 802.1D, 802.1P, 802.1Q, 802.1ad, 802.3ab, 802.3ad, 802.3ah, 802.1ab, RFC792, RFC 959, RFC 1305, RFC 1981 and RFC2131. 22. In leader or visionaries or challenger position of 2021 wired and wireless LAN Access Gartner Report 23. Warranty: 3 years NBD replacement 24. All required SFPs , Stack cables, fiber/copper patch cords and necessary accessories should be part of the solution			
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S.No	Items	Specifications	Qty	Rate	Amount
12	24 Ports FULL POE/POE+ Switch	1. 24 x 10/100/1000Base-T ports, 4 x 10GE/GE SFP+/SFP ports (POE/POE+ Power from all downlink ports) 2. Dual AC power supply 3. Switching capacity: 120 Gbps or more 4. Forwarding performance: 90 Mpps or more 5. Available 720W POE power supply 6. 4K VLAN 7. 64K MAC Address 8. QinQ, LACP, STP, RSTP, MSTP, RRPP, ERPS, LLDP, Jumbo Frames 9. Static Routing, RIP, RIPng, OSPF, OSPFv3, IS-IS, IS-IS for IPv6, BGP, BGP4+, ipv6 routes, PBR, DHCP Server/Client/Relay 10. 16K ARP entries 11. 16K IPv4 routes 12. Support IGMP v1/v2/v3, IGMP v1/v2/v3 snooping, PIM-DM, PIM-SM and MSDP 13. IPv4 multicast routes 1K, IPv6 multicast routes 1K 14. Stacking support up to 8 switches 15. VRRP, DLDP, Smart link, Monitor link, EFM and CFM 16. Support mac authentication and 802.1x authentication 17. Defense against UDP flood, TCP SYN flood, ICMP flood and packet fragment attacks, ARP packet rate limiting	02		

		18. CLI and Web interface (HTTPS), Telnet, SSH v2, SNMP v1, v2, and v3, eMDI 19. Support VxLAN, BGP-EVPN 20. Support Automation with SDN Controller, NETCONF and YANG 21. Support ITU-T G.8032, ITU-Y.1731, IEEE 802.1D, 802.1P, 802.1Q, 802.1ad, 802.3ab, 802.3ad, 802.3ah, 802.1ab, RFC792, RFC 959, RFC 1305, RFC 1981 and RFC2131. 22. In leader or visionaries or challenger position of 2021 wired and wireless LAN Access Gartner Report 23. Warranty: 3 years NBD replacement All required SFPs , Stack cables, fiber/copper patch cords and necessary accessories should be part of the solution			
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S.No	Items	Specifications	Qty	Rate	Amount
13	WLAN AC Controller	1. 2 x 40GE optical, 10 x 10GE optical and 10 x GE electrical interfaces, dual AC power supply 2. Compatible with 802.11n, 802.11ac and 802.11ax(Wifi6) APs 3. Support manage 2K APs 4. Support manage at least 32K users 5. Support 64K MAC address 6. Support 4K vlans 7. Support 16K IPv4 routing entries and 4K IPv6 routing entries 8. Support 64K ARP entries 9. Support 32K ACLs 10. Static routing, RIP, OSPF, BGP, IS-IS, routing policy and PBR 11. Support MAC address authentication, 802.1X authentication (EAP-PAP, EAP-MD5, EAP-PEAP, EAP-TLS, and EAP-TTLS), Portal authentication, MAC + Portal authentication, and WAPI authentication 12. WPA, WEP (WEP64/WEP128), TKIP, and CCMP for encryption 13. Built-in Portal/AAA server for Portal/802.1X authentication 14. PPSK authentication (A WAC can independently allocate different PSKs to different clients connected to the same SSID) 15. Smart roaming based on 802.11k and 802.11v is supported, allowing clients with low roaming sensitivity to roam to the optimal AP 16. VIP users can be identified and preferentially scheduled, not controlled by any rate-limiting	01		

		<p>policy. In addition, packets of VIP users can be preferentially scheduled on air interfaces.</p> <ol style="list-style-type: none"> 17. URL filtering is supported to permit or deny users' access to some web page resources 18. Support antivirus function 19. Intrusion prevention is supported to detect and terminate intrusion behaviors, including buffer overflow attacks, Trojan horses, and worms 20. APs supporting dual 5G radios automatically negotiate with each other to switch 2.4 GHz radios to the 5 GHz radios, reducing 2.4 GHz co-channel interference and increasing system capacity. 21. Support 1+1 or N+1 backup of ACs for future expansion, support configuration synchronization between active and standby WACs 22. WAN authentication escape is supported. If a CAPWAP tunnel fault occurs, users who are originally MAC address or 802.1X authenticated are now authenticated locally 23. The WAC and APs are upgraded separately. In addition, services are not interrupted during the upgrade in dual-WAC redundancy mode. 24. Support CLI, web system, SSH and SNMPv1/v2/v3 25. Network-wide wireless performance monitoring for WACs, APs, radios, and STAs 26. In leader or visionaries or challenger position of 2021 wired and wireless LAN Access Gartner Report 27. 3 year NBD Replacement. <p>All required SFPs , Stack cables, fiber/copper patch cords and necessary accessories should be part of the solution</p>			
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