ITEM	Description	Quantity
GPGPU BASED RACKMOUNT SERVERS	HPE ProLiant DL380 Gen11 8SFF Chassis: 2U Rack Mountable CPU: 2 X Intel® Xeon® Platinum 8458P Processor 44 Cores, 82.5M Cache, 2.70 GHz or higher Memory: 512 GB Dual Rank x4 DDR5-4800 Registered Smart Memory or higher Hot Plug SFF NVMe PCIe SSD, 3 x 960GB (with rear Primary and Secondary 2SFF and rear 2SFF drive cages if required) HDD Bays: SFF HDD/SSD, can be expandable upto 24SFF HDD Hard drives: 2x 480GB or above SATA/SAS SFF SSD Controller: PCIe 4.0 based x8 RAID controller with 4GB Flash backed write cache, supporting RAID 0, 1, 5, 6, 10, 50, 60 with 16 SAS/SATA/NVME lanes supporting up to 16 direct-connected storage devices (SAS/SATA/NVMe). Controller must support PCIe Gen4 x8 host / Gen4 NVMe / Gen 3 SAS/SATA. Controller must support Mixed Mode which combines RAID and HBA mode operation simultaneously Networking features 1Gb 4-port network adaptors; 10Gb 2-port Ethernet SFP+ adaptor with SR Transceiver; 2x Single port 16G FC HBA cards with Transceivers GPU: 2x NVIDIA A100 80GB Computational Accelerator or Higher with supported Pwr Cable and High Perf Fan Kit Interfaces: USB 3.0 support With Up to 5 total: 1 front, 2 rear, 2 internal (secure) Bus Slots: Server should have eight PCI-Express 4.0 slots, atleast two x16 PCIe slots Power Supply: Atleast 1600W or above hot plug redundant low halogen power supplies Fans: Redundant hot-plug system fans Industry Standard Compliance: ACPI 6.3 Compliant; PCIe 4.0 Compliant; WOL Support; Microsoft® Logo certifications; PXE Support; USB 3.0 Compliant; Energy Star SMBIOS 3.2; Redfish API; IPMI 2.0; Secure Digital 4.0; TPM 1.20 and 2.0 Support; Advanced Encryption Standard (AES); Triple Data Encrytion Standard (3DES) ; SNMP v3; TLS 1.2; DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP); Active Directory v1.0; ASHRAE A3/A4; UEFI (Unified Extensible Firmware Interface Forum) 2.6; System Security: UEFI Secure Boot and Secure Start support; Tamper-free updates – components digitally signed and verified Immutable Silicon Root of Trust; Ability to rollback firmware; FIPS 140-2 validation; Secure erase of NAND/User data; Common Criteria certification; TPM (Trusted Platform Module) 1.2 option; Configurable for PCI DSS compliance; TPM (Trusted Platform Module) 2.0 option; Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser; Support for Commercial National Security Algorithms (CNSA); Chassis Intrusion detection option; Secure Recovery – recover critical firmware to known good state on detection of compromised firmware; Latest Operating Systems and Virtualization Software Support: Microsoft Windows Server; Red Hat Enterprise Linux (RHEL); SUSE Linux Enterprise Server (SLES); Vmware Provisioning: Should support tool to provision server using RESTful API to discover and deploy servers at scale, Provision one to many servers using own scripts to discover and deploy with Scripting Tool (STK) for Windows and Linux or Scripting Tools for Windows PowerShell Server Remote Management: Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resources user is authorized to view. Accessories Should have Rack mount kits with CMA and Bezel, Power Cords, PDU Interconnect Cords etc. Warranty: 3 Years Onsite and Comprehensive Principal backed Warranty with support / services. Complete and compatible in all respect	**8**

ENTERPRISE ALL NVME SAN STORAGE	Storage array shall be supplied minimum with 92TB raw Capacity using 7.68TB encrypted drives and shall be configured in Raid 6. Vendor shall not use more than 10D+2P while sizing the array. Offered Storage shall be able to protect at-least 2 drives failure simultaneously within a given raid group. Operating System & Clustering Support. The storage array should support industry-leading Operating System platforms & clustering including: Windows Server 2019 / 2022, VMware ESXi 7/8, Linux and HP-UX etc. encrypted drives with appropriate encryption licenses. No controller based or Software based encryption. Encrypted drives shall support both KMIP 1.3 and KMIP 1.4 for key management solutions. At-least support for internal Key manager engine for key management. controller shall be based upon at-least PCI 4.0 technology and offered storage shall be offered with at-least 32 number of CPU cores. Storage array shall have minimum of 8 x 32Gbps Fiber Channel ports and in future shall be upgradable to 64Gbps by replacing the SFP. Each offered controller shall have minimum of 48 PCI 4.0 lanes for NVMe disk connectivity Active / Active replication shall be supported for all well-known OS like VMware, Redhat, Windows etc. Warranty: 3 Years 24x 7 Onsite and Comprehensive Principal backed Warranty with support / services	**01**
SAN SWITCHES	minimum 24 FC ports with minimum of 8 active ports. SFP+ Transceivers: at least 8x 16GB SR SFP+ transceivers. Fibre Patch Cords: 8x LC/LC OM4 15m FC cables. Bandwidth: Aggregate bandwidth of 768 Gbit/sec end to end in full duplex mode. SAN switch should be from same OEM as of SAN Storage. 3 Years 24x 7 Onsite and Comprehensive Principal backed Warranty with support / services	**01**
NETWORK SWITCHES	Advanced Layer 3 Enterprise Data Center Grade switch with dual internal power supplies. 24 x 10G SFP+ ports supporting SR/LR and SX/LX standards; 6 x 40G QSFP+ ports; Forwarding performance - 714 Mpps; Switching Capacity - 960 Gbps; Vlans – 4000; Jumbo Frames - 10,000 bytes; Support stacking over 10G/40G uplinks with atleast 9 switches; support for IEEE 802.1Qbb Priority Flow Control (PFC) and Data Center Bridging Exchange (DCBX) for converged applications; Support for FCoE , NTP/SNTP , advance QoS, SP, WRR, Traffic Policing , Radius/TACACS+ , LLDP , sFlow/Netflow/Jflow UDLD / DLDP or equivalent , DLDP , SNMPv1/2/3 , 802.3x , 802.1ad QinQ, STP/RSTP/MSTP Brand Should be of same brand as of servers and SAN Storage Warranty: 3 Years Onsite and Comprehensive Principal backed Warranty with support / services	**02**

MODULAR DATACENTER RACK	MODULAR DATACENTER RACK • Smart Row in 3 Rack+2 Rack Mount Configuration • General Terms & Conditions • Product should be CE Certified and complying to international standards. • Must Quote Onsite Design, Configuration & Installation • Must Provide OEM Manufacturer Authorization Letter • The Returning Organization (RO) must not be blacklisted in the past by any Federal and/or Provincial Organization. • OEM must have presence in Pakistan and MAF letter should be issued by OEM representative • Bidder should submit atleast 5 Satisfactory Remarks letter from different clients of OEM • All products should be supplied by single OEM Overall Parameters • The overall dimension of micro data center indoor unit is: 3 Rack 600mm x 1400mm Depth + 2 x Rack Mount Split Precision Cooling units • The available space should be as per IT equipment requirement. • The available power or UPS rating should be 15kVA. Qty = 2 Nos. • Suggest Precision cooling rating as per load = 7.6 KW. Qty = 2 Nos Cabinet System • The loading capacity of the cabinet should be at least 1300kg. • The size of each cabinet is 600mm(width) * 1400mm(depth) * 42U(height). Qty = 3 Nos • The cabinet is fully closed to protect equipment from dust and harsh environment. The front door of cabinet is reinforced glass type and adopts insulation material on the back side of it to keep good thermal effect. The rear door the cabinet is double open steel type. • The locking of cabinet is 3in1 Access Control System. • The cabinet comes with wheels and level feet. Power System • The UPS capacity should be 15KVA Rack Mount UPS with Unity Power Factor Qty = 2 Nos • The UPS mounting type should be rack mount, and height should be 3U. • The UPS power input is 380V/1Ph/50Hz-60Hz. • The product shall include a power management module. The power management module works as power distribution, protection, metering, and management. with manual bypass for UPS system. Qty = 2 • The Basic PDU Should be vertical mounting. The power output sockets are C13*12Pcs + C19*4Pcs. Qty = 6 Nos • The battery capacity should be 16x12V 9AH VRLA batteries and they should be Rack Mounted with Battery Bank. Qty = 2 with Each UPS Precision Cooling System • The Precision cooling should be Split DX Inrow type with reheating & humidification, condenser included, and total cooling capacity should be at least as per load 5.5KW or above. Qty = 2 Nos • The cooling power input is 220V/1Ph/50Hz-60Hz. • The cooling system indoor unit is Inrow, and dimension is 300x1100mm • The compressor system is inverter type. Condenser is included. Monitoring Systems / Sensors • The display of monitoring system shall be at least 10" touch type. • The monitoring system should be wall mounted on the front door of MDC no occupying IT space. • The monitoring sensors include smoke, water leaking, door status. • The management of UPS includes display of UPS working mode, UPS alarms, UPS input power parameters, UPS output power parameters.	**01**

	• The management of cooling includes display of cooling working mode, cooling alarms, and setting of target temperature and humidity, control by return or discharge, and ON/OFF unit. • Monitoring function supports calculation of power usage and calculation of system PUE. Fire Extinguishing/ Suppression System • The fire system should be rack mount, and height is 6U. Gas Volume should be at least 4 KG. • The extinguisher gas should be FM200 • The extinguishing trigger method is temperature/smoke sensing and automatic release of firefighting gas. Access Control System 3 in 1 Access control for biometric; ID card and Password. It should be on the front and rear of Rack With Services, Installation, Commissioning	
SOFTWARE	Windows / Linux / System Virtualization / GPU visualization software stack for at least 20 concurrent users	**01**
Misc	Upgradation and addition of raised floor, electrical power points, network cables and points and any other related job	**01**
Training + Certification	Providing related HW and SW training and certification for 02 personals	**01**