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ADDENDUM	No. 01
CONTRACT NUMBER:	JW IT 011/24
CONTRACT TITLE:	**JW IT 011/24 TO SUPPLY, INSTALL AND CONFIGURE ICT INFRASTRUCTURE HARDWARE WITH A THIRTY-SIX (36) MONTHS MAINTENANCE AND SUPPORT CONTRACT.**
SUBJECT	Addendum 1
Date	14 April 2025
Sender	Nthabiseng More 011 688 1512 nthabiseng.more@jwater.co.za Ricky Chauke 011 688 1478 ricky.chauke@jwater.co.za

Tenderers are required to incorporate the following amendments into the tender document and return the Addendum:

- The Specifications and Bill of Material items on page 49 of the original tender document is referencing sections 5.2.2 to 5.2.19 which were not labelled on the document. This has now been corrected on the amended specification. Bidders to submit the amended specification together with the addendum.

- Pricing Schedule A item 17.1.3 on page 64 of the original tender document mentioned 6 Quantities. This has now been corrected to Quantity of One (1) to be in line with the other items where we require overall pricing (see Amended pricing page). Bidders are also advised to attach detailed quotation showing quantities stated on scope of work (section 5.3) to substantiate their pricing. Bidders to replace the original page on the document with the amended pricing page .

- Specifications requirements: Inclusion of the evaluation of compliance with specification requirements, along with OEM Gartner Ratings for Primary Storage, Enterprise Wired and Wireless LAN Infrastructure and Data Center Switching, under the mandatory evaluation criteria outlined on page 53 of the tender document. Bidders to submit the amended Mandatory evaluation together with the addendum.

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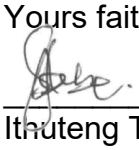
Note to bidders: Bidders are requested not to remove any original pages from the tender document. Instead, the revised pages should be inserted alongside the corresponding original pages. For the amended pricing page, please attach it directly to the affected pricing schedule. The revised specification pages and mandatory evaluation criteria may be attached either at the end of the tender document, together with the addendum cover or included as an annexure alongside the supporting documents and tender response

Yours faithfully



Ithuteng Tabe
Acting General Manager: Supply Chain Management

Addendum Received
Name of Tenderer:……
Signatory:……
Signature:……
Date:……

SCOPE OF WORK AND SPECIFICATIONS

5.1 Scope of Work

a) Supply, install and configure ICT infrastructure hardware as per specification,
b) Provide Support and Maintenance for a period of 36 months, and
c) Provide Professional services as and when required during the contract.

5.2 Technical Requirements

5.2.1 All Flash Storage Requirements

- Controllers must work in active-active mode
- All controllers must be interconnected using protocols such as PCIe, IB, or RDMA, instead of FC or IP federation networking.
- Controllers must support non-disruptive upgrade with modular software design.
- Must supports dynamic RAID reconstruction.
- Supports RAID-TP (to withstand up to three (3) disk failures)
- The system must be capable to create a snapshot every 3 seconds. Visualized management interfaces are provided.
- Supports secure snapshots, that is, snapshots cannot be deleted.
- Supports synchronous and asynchronous replications
- Total cache should be greater or equal to 1 TB

5.2.2 Compute Minimum Requirements

NO.	Node Type	Description for each node
1	Type 1	2* CPU (2.1 GHz, 24 Cores), 16*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE
2	Type 2	2* CPU (3.1 GHz, 16 Cores), 16*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE
3	Type 3	2* CPU (2.4 GHz, 16 Cores), 2*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE
4	Type 4	2* CPU (2.4 GHz, 16 Cores), 2*32G memory. 2 x 960 GB SSDs, 2 x 4 TB SATA, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE,

		2*25GE

5.2.3 Virtualization Platform Requirements

- Supports Windows, Oracle, Ubuntu, Redhat and Suse Linux OS
- After a VM is deleted, it is moved to the recycle bin. VMs in the recycle bin can be restored.
- Allows creating consistency snapshots for Windows and Linux OSs (in the x86 scenario). When a fault occurs, services can be quickly restored to the state at point in time when the snapshot was created.
- During VM startup and running, the system periodically checks the load of each host in a cluster and migrates VMs among different hosts to implement load balancing among hosts in the cluster.
- Dynamic power management (DPM) is supported. The system automatically powers on or off hosts based on the cluster load to reduce power consumption of the data center.
- VMs with snapshots can be migrated online or offline.
- Each VM has an independent storage LUN. The snapshot, clone, and replication capabilities of VMs can be offloaded to the storage device to reduce host resource overhead.
- Allows migrating only VM storage. the configuration mode of destination disks and migration rate control can be specified during migration setting.
- Supports log recording of operations performed by O&M personnel on the O&M system. The system O&M personnel can view the logs but cannot delete them.
- Allows the platform or software to support unified management of storage devices, switches (FC and IP switches), servers, hyper-converged infrastructure, and virtual resources, including the query of the following: basic device information, configurations, historical performance, resource usage, and device alarms.
- Supports full-link I/O path diagnosis from the perspective of VMs: I/O path topology information of virtual disks, VMs, hosts, switches, and storage devices are displayed on one UI.
- Supports multi-dimensional associated object analysis from the application perspective for object instances, including VMs, hosts, LUN, and storage, to quickly

demarcate and locate faults.

- Allows modifying the CPU, memory, and disk hardware parameters of VMs in batches, improving O&M efficiency.
- Supports report statistics. The system periodically and automatically generates reports, with preset reports for more than 30 typical service scenarios, such as capacity, resource performance, and alarms. Users can customize report statistics.
- Supports intra-city active-active data centers, asynchronous replication, as well as ring and non-ring architectures for the geo-redundant 3DC solution.

5.2.4 10GE TOR Switch Requirements

- Supports a minimum of 6*100G interfaces and 48*10GE SFP+ interfaces, and the switching capacity is no less than 2.16Tbps
- Supports AC Power supplies work in 1+1 mode, and fan modules work in 3+1.
- Supports at least 256K MAC address, 256K IPv4 FIB table and 80K IPv6 FIB table.
- Supports inter-chassis link aggregation M-LAG technology which has the independent control planes.
- Supports RIP, OSPF, IS-IS, BGP, OSPFv3, IS-ISv6, BGP4+, VXLAN and BGP EVPN.
- Supports NetStream.
- Supports ZTP technology that allows the configuration to be automatically delivered.
- Supports telemetry technology to collect device data in real time
- Supports intelligent TCP/UDP traffic analysis.

5.2.5 25GE Switch Technical Requirements

- The switch provides a minimum of 8*100G interfaces and 48*25GE interfaces. And compatible with 48*50GE interfaces and 8*200GE interfaces.
- Supports at least 640K MAC address, 1M FIB table. The switch supports inter-chassis link aggregation M-LAG technology which has the independent control planes.
- Supports RIP, OSPF, IS-IS, BGP, OSPFv3, IS-ISv6, BGP4+, VXLAN and BGP EVPN.

- Supports NetStream.
- Supports telemetry technology to collect device data in real time.
- Supports intelligent TCP/UDP traffic analysis.
- Supports adaptive adjustment of ECN parameters, PFC storm/deadlock detection, and deadlock prevention.
- The ECN overlay function is applied to the VXLAN network. The ECN inner and outer layers are copied to detect underlay congestion.
- The switch supports NVME over Fabric in storage Networking

5.2.6 Management Switch Technical Requirements

- The switching capacity must not be less than 672 Gbit/s.
- The packet forwarding rate is no less than 125 Mpps.
- The switch supports local forwarding and has independent control panel.
- AC Power supplies and fan modules work in 1+1 mode.
- The switch supports a minimum of 4*10GE optical interfaces and 48*GE RJ45 interfaces.
- The switch supports inter-chassis link aggregation M-LAG technology which has the independent control planes.
- The switch supports RIP, OSPF, IS-IS, and BGP, RIPng, OSPFv3, IS-ISv6, and BGP4+.
- The switch supports N:1 virtualization technologies such as stacking.

5.2.7 Data Centre SDN Controller Technical Requirements

- Supports multiple fabrics that include the centralized network overlay, distributed network overlay, and distributed hybrid overlay.
- Supports VXLAN Layer 2 and Layer 3 interconnection and interconnection between VXLAN and traditional networks, implementing automatic network orchestration in a VXLAN network.
- Support inter-DC deployment of Layer 2 subnets and provide a graphical configuration interface to guide users to configure Layer 2 network interconnection.
- Support inter-DC deployment and interconnection of different subnets in the same

routing domain and provide a graphical configuration interface to guide users to configure Layer 3 router interconnection.

- Support data consistency verification with a cloud platform and provide restoration tools or methods for the detected inconsistencies.
- Displays the application, physical, and logical topologies. Displays the mappings of elements from the application topology to the logical topology and from the logical topology to the physical topology.
- Supports collaboration with management components of bare metal servers on the cloud platform and automatically delivers network configurations required for bare metal service deployment.
- Supports detection of Layer 2 or Layer 3 network connectivity between VMs, as well as between VMs and external networks, through IP Ping and MAC Ping, helping administrators quickly rectify the fault.
- Supports 3rd-party device management and automatic configuration and automatic rollback based on service, network-wide configuration or tenant, when the configuration does not meet the expectation. And the device does not restart and restores the original network status in minutes.
- Supports pre-event simulation verification before service configuration to avoid configuration errors. The impacts of network change operations on live network resources and services can be simulated to prevent network faults caused by misoperation.

5.2.8 Data Centre Intelligent Analyzer Requirements

- Support the monitoring the number of queue buffer bytes through telemetry with a collection period of 100ms.
- Support to check the health status of the entire network. It can display the network connectivity, average transmission delay, packet loss rate and other key indicators
- Support monitoring and active identification of device resource table exceptions, including ACL resources, MAC table items, ARP table items, FIB4 table items.
- Support the collection of device / board / interface / queue performance indicators through telemetry protocol, and show in dashboard.
- Support viewing the health status of the multiple dimensions such as device, network, protocol and overlay dimensions, and supports real-time export or regular

push of health evaluation reports

- Support to automatically check the configuration difference before and after the network change, and analyze the detailed change points of the configuration before and after the network change.
- Support minute level discovery and root cause analysis of common faults (such as suspected optical module fault, suspected layer-2 loop, port congestion fault, etc.), and provide minute-level fault rectification suggestions.
- Support the risk prediction of network hidden dangers, including a systematic risk evaluation model with five dimensions: network reliability, performance load, resource capacity, configuration consistency and network stability.
- Supports network retracement and one-click troubleshooting for TCP retransmission and TTL anomalies, and quickly find the root cause of issues.
- Support global search of network objects such as network devices, interfaces, boards, logical network elements, OSPF, ARP table entries, IPv4 / IPv6 routing table entries and configuration files in fabric, and displays the corresponding details.

5.2.9 Core Switch for Data Centre Technical Requirements

- The switching capacity is no less than 43 Tbit/s, packet forwarding rate is no less than 22000 Mpps.
- The switch supports redundant fan modules and AC power modules. The number of fan modules is no less than 3.
- The supervisor is separated from the fabric module hardware. The MPU and SFU hardware are separated.
- Supports 10G/25G/40G/100G line cards. 48-port 10GE Ethernet optical line cards, 24 or more port 40GE Ethernet optical line cards and 18 or more port 100GE Ethernet optical line cards.
- Supports cell switching: Traffic is evenly distributed to multiple switching fabrics to ensure that the switching fabric is not blocked.
- The switch supports inter-chassis link aggregation M-LAG technology which has the independent control planes.
- The switch supports 1:N virtualization. One physical switch can be virtualized into a maximum of 9 logical switches.
- The switch supports telemetry technology to collect device data in real time

- The switch supports intelligent TCP/UDP traffic analysis and NetStream feature that can implement near-real-time network monitoring.
- The switch supports the standard NETCONF interface for third-party software to enable programming of functions and integration with third-party software, providing openness and flexibility.
- The switch supports adaptive adjustment of ECN parameters, PFC storm/deadlock detection, and deadlock to prevent ROCE packet loss when the interface bandwidth is 90%.

5.2.10 Firewall Technical Requirements

- Firewall Throughput: no less than 40Gbps
- Concurrent Sessions: no less than 10,000,000, New Sessions/Second: no less than 400,000
- Support service-specific PBR and intelligent uplink selection based on multiple load balancing algorithms
- Supports policy-based routing based on the following matching conditions: source IP address, destination IP address, service type, application type, user/user group/security group, inbound interface, and DSCP priority.
- Support application-layer protocol-based traffic control policies, including setting the maximum bandwidth, guaranteed bandwidth, and protocol traffic priority.
- Provides a URL category database with over 120 million URLs and accelerates access to specific categories of websites, improving access experience of high-priority websites.
- Supports application-layer flood attacks such as HTTP, HTTPS, DNS, and SIP, supports traffic auto-learning, the setting of the auto-learning time, and automatic generation of anti-DDoS policies.
- Allows users to configure security policies based on time, user/user group/security group, application-layer protocol, geographical location, IP address, port, domain name group, URL category, access type, vlanID and content security.
- Support multiple user authentication methods, including local, RADIUS, TACACS, AD, and LDAP. Support built-in Portal and Portal redirection functions.

5.2.11 Core Switch for Branch Technical Requirements

- Supports 48 × 100M/1000M/2.5G/5G/10G Base-T Ethernet ports, 4 x 10/25GE SFP28 + 2 x 40/100GE QSFP28 ports, and switching capacity ≥ 1.72Tbps
- Supports dual pluggable power modules 1+1 power backup.
- Supports ≥ 128K MAC address entries and at least 4094 VLANs.
- Supports IEEE 802.1d, 802.1w, 802.1s and Ethernet Ring Protection Switching (ERPS) .
- Supports RIP V1/2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+
- Supports BFD for BGP/IS-IS/OSPF/static routes, Link Aggregation Control Protocol (LACP), M-LAG, and LLDP.
- Supports the VXLAN function, centralized gateway, distributed gateway, and BGP EVPN.
- Supports SSH, SNMP v1/v2c/v3, FTP, TFTP, SFTP and Streaming Telemetry.
- Supports Defense against DoS attacks, Transmission Control Protocol (TCP) SYN Flood attacks, User Datagram Protocol (UDP) Flood attacks, broadcast storms, and heavy traffic attacks.
- Supports secure boot, Port security and Macsec(IEEE 802.1ae).

5.2.12 48-Port Access Switch Technical Requirements

- Support 48 x 10/100/1000/2.5G Base-T ports, 4 x 10 GE SFP+ ports, 2 x 12GE stack ports, and switching capacity ≥ 368 Gbps
- Supports 3 power supplies, N+1 power supply backup.
- Supports 32K MAC address entries and at least 4094 VLANs.
- Supports ERPS, IEEE 802.1d, IEEE 802.1w, and IEEE 802.1s.
- Supports at least 8K FIBv4 entries and 3K FIBv6 entries.
- Supports static routes, RIP, RIPng, OSPFv2, OSPFv3, IS-IS, IS-ISv6, BGP, and BGP4+.
- Supports MLD snooping, IGMP v1/v2/v3 snooping, IGMP v1/v2/v3, PIM-DM, PIM-SM and PIM-SSM.
- Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.

- Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.

5.2.13 24-Port Access Switch Technical Requirements

- 24 x 10/100/1000/2.5G Base-T ports, 4 x 10 GE SFP+ ports, 2 x 12GE stack ports, and switching capacity ≥ 248 Gbps
- Supports 3 power supplies, N+1 power supply backup.
- Supports 32K MAC address entries and at least 4094 VLANs.
- Supports ERPS, IEEE 802.1d, IEEE 802.1w, and IEEE 802.1s.
- Supports at least 8K FIBv4 entries and 3K FIBv6 entries.
- Supports static routes, RIP, RIPng, OSPFv2, OSPFv3, IS-IS, IS-ISv6, BGP, and BGP4+.
- Supports MLD snooping, IGMP v1/v2/v3 snooping, IGMP v1/v2/v3, PIM-DM, PIM-SM and PIM-SSM.
- Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.
- Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.

5.2.14 12-Port Access Switch Technical Requirements

- Support at least 12 x 10/100/1000Base-T ports (PoE+), 2 x 100M/1/2.5/5/10G Base-T ports (PoE++), 2 x 10GE SFP+ ports, and switching capacity ≥ 112 Gbps
- Support built-in AC power supply
- Supports up to 32K MAC address entries and at least 4094 VLANs.
- Support Up to 4096 FIBv4 entries and 1024 FIBv6 entries.
- Support Static route, RIP, RIPng, OSPFv2, OSPFv3, VRRPv4 and VRRPv6
- Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.
- Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.

5.2.15 Indoor Access Point (AP) Technical Requirements

- The AP should support IEEE 802.11ac Wave 2/ax/be.
- The AP should support 3 radios, one 802.11be 2*2 MIMO on 2.4 GHz band, one 802.11be 4*4 MIMO on 5 GHz band and one 802.11be 2*2 MIMO on 6 GHz band.
- The AP should support system maximum rate up to 7.8Gbit/s.
- The AP should have a USB port for external IoT expansion.
- The AP should support PoE power supply: in compliance with 802.3at.
- The AP should support minimum 16 SSIDs for each radio.
- The AP should support minimum 1800 users.
- The AP should support built-in smart antennas.
- The AP should support smart roaming and load balancing during smart roaming.
- The AP should support security features, ensure eavesdropping terminals cannot capture packets over the air interface

5.2.16 Wireless Controller (AC) Technical Requirements

- The AC should support manage 2K APs.
- The AC should support 32K users.
- The AC should provide 120Gbps forwarding performance.
- The AC should have at least eight 1GE Ethernet interface.
- The AC should have at least two 40GE QSFP+ interface and twelve 10GE SFP+ interface.
- The AC should support dual power modules.
- The AC should support static route, OSPF, BGP, IS-IS, routing policies, and policy-based routes.
- The AC should support device redundancy backup, 1+1 or N+1 backup, and configuration synchronization between the active and standby ACs.
- The AC should support intelligent roaming based on 802.11k and 802.11v, enabling clients with low roaming sensitivity to roam to the optimal AP.
- The AC should support application identification and set control policies based on identified applications.

5.2.17 Network Management System Technical Requirements

- The product must supports a software management solution for both wired and wireless devices in a single campus, multiple campuses, and wide-area networks. It should feature a guided menu for end-to-end configuration across various business scenarios.
- The product must supports multiple plug-and-play technologies (such as DHCP Option, QR code scanning, email-based provisioning, etc.) for simultaneous device registration and online onboarding. It eliminates the need for manual ESN collection, command-line operations, configuration files, and scripts, improving provisioning efficiency. It also supports device provisioning using non-VLAN1 networks. Devices can be configured before installation or installed before configuration.
- The product must support various authentication methods, including 802.1x, MAC, Portal, VPN, PPSK/DPSK, and more. Authentication protocols supported include PAP, CHAP, EAP-MD5, EAP-PEAP-MSCHAPV2, EAP-TLS, EAP-TTLS-PAP, EAP-PEAP-GTC, HACA, and others. It also supports IPv6 devices to access the network through 802.1x, MAC, or Portal authentication.
- The product must support group-based policy management, avoiding the overload of ACL specifications based on IP subnets. It also supports policy deployment in non-VXLAN networks. Authentication points and policy points are separated, ensuring compatibility with multi-vendor devices and RADIUS relay authentication scenarios.
- The product must support user + application-based dual-condition HQOS traffic scheduling, ensuring the quality of experience for key applications like video and voice for VIP users.
- It must also support device configuration and entry comparison functions. The product enables network-wide IP subnet connectivity checks and allows GUI-based verification of network connectivity between any subnets. Additionally, it should support simulating terminal access connectivity, enabling quick verification of terminal access permissions.

5.2.18 Network Analysis System Technical Requirements

- Wireless network health: The system must provide a quality evaluation system to evaluate the wireless network health and create rankings in terms of access success

rate, access time consuming, roaming, signal and interference, capacity, and throughput, and lists deteriorated metrics that affect the rankings. It should allow Administrators to check details about the deteriorated metrics, including the root cause and troubleshooting suggestions for metric deterioration.

- Wired network health: The system must provide a wired network quality evaluation system in terms of device environment, device capacity, network performance, and network status, proactively identifies major problems that affect network quality, and provides service impact, root cause, and troubleshooting suggestions.
- Health report: The system must generate health evaluation reports in real time or periodically. The report to include network-wide resource overview, client overview, quality overview, metric details, and rectification suggestions. The system must be able to send the reports to administrators by email or administrators can download the reports immediately to learn the network status in real time.
- Mainstream application analysis: The system should accurately identify more than 1000 mainstream applications, collect application traffic statistics from multiple dimensions, detect the quality of mainstream applications, identify poor-QoE applications, and demarcate faults for poor-QoE application flows. It should supports edge device detection and identifies east-west and north-south applications.
- Protocol tracing: The system must display the protocol-level process based on the association, authentication (802.1X authentication, Portal authentication, MAC address authentication, and HACA authentication for wired and wireless users, as well as PSK authentication for wireless users), and DHCP phases of user access. The system must also provide refined analysis on user access issues, root causes of user access failures, and troubleshooting suggestions.
- Poor-QoE analysis: The system must support correlation analysis on poor-QoE issues and provides poor-QoE issue description, including the APs on which poor-QoE issues occur and poor-QoE time distribution. In addition, the system must intelligently identifies metrics that affect user quality and the correlation percentages from dimensions of coverage, interference, throughput, and hardware, locates the root cause, and provides troubleshooting suggestions.
- Intelligent radio calibration function. Based on historical big data, the system should be able to use AI algorithms to identify high-load APs and edge APs and perform radio calibration for devices based on big data analytics results.

5.2.19 Service Requirements

- **Professional Services:**
  - **Must include Planning, Designing and Implementation Service based on SDN platform and solution.**

- Support Service Requirement:
  All equipment in this tender must provide 3 years, 9x5xNBD OEM Service.
  Bidder must provide 7*24*7 remote desktop to support all technical issues. Bidder will also be responsible for the monitoring of the whole network and support with the below;
  - providing all updates and patches related to network management software
  - displaying the software platform
  - monitoring bandwidth usage and optimize the capacity of circuits, identify bottlenecks etcetera
  - providing detailed reports and actions based on the reporting received from the tools
  - replace faulty component or equipment and reconfigure with spare
- **Training**
  The skill transfer is a mandatory requirement Bidder must provide the following training to appointed staff:
  1. Onsite operation, maintenance and troubleshooting training that cover all equipment installed.
  2. Certified training for experienced engineer.

5.2.20 DR Service

The bidder should provide DR planning, design, and implementation and acceptance services which are shown as follows:

- Information Collection should include services requiring DR, environment information collection (server, VM, storage, network, and others), objectives of the DR establishment and other DR requirements.
- The planning and design service should include energy consumption calculation,

compatibility confirmation, DR LLD planning and design, and LLD document submission.

- Implementation service should include DR site deployment, DR network deployment.
- Acceptance service should include DR acceptance test and update of device archive

PRICING DATA

Pricing Schedule

The Service Provider shall only claim rates / fees payable in terms of the pricing schedule below:

Tender prices must include all transport, labour, and any other costs
Tenders to take note of itemised quantities on bill of materials.

17.1 SCHEDULE A – ICT INFRASTRUCTURE HARDWARE PRICING

Item	Configuration Specification	Quantity	Year 1 Price	Year 2 Price	Year 3 Price	Total (Excl. Vat)
17.1.1	Rack 1 as per specification **applicable for year 1**	1		-	-	
17.1.2	Rack 2 as per specification **applicable for year 1**	1		-	-	
17.1.3	Rack Mountable Server as per specification. **applicable for year 1**	1		-	-	
17.1.4	Data Centre Network as per specification **applicable for year 3**	1	-	-		

12.1 Stage 1: Mandatory Evaluation

Mandatory requirement

These are defiantly non-negotiable criteria that must be complied with or must be part of the bid process submit before tender closing date and time.

NO.	MANDATORY CRITERIA	YES/NO
1.	Signed and completed Pricing Schedule.	
2.	Tenderer's Accreditation The Service Provider must provide proof that they are certified by the ICT Infrastructure Hardware OEM/s to sell, install and maintain their product/s. (Relevant certificates to be provided)	
3.	OEM Primary Storage Gartner Ratings The service Provider must indicate that the OEM is part of the Gartner Magic Quadrant for Primary Storage in either the Leaders, Visionaries or Challengers quadrants. (Provide latest relevant Gartner Magic Quadrant as evidence)	
4.	OEM Enterprise Wired and Wireless LAN Infrastructure Gartner Ratings The service Provider must indicate that the OEM is part of the Gartner Magic Quadrant for Enterprise Wired and Wireless LAN Infrastructure in either Leaders, Visionaries or Challengers quadrants. (Provide latest relevant Gartner Magic Quadrant as evidence)	
5.	OEM Data Center Switching Gartner Ratings The service Provider must indicate that the OEM is part of the Gartner Magic Quadrant for Data Center Switching in either the Leaders, Visionaries or Challengers quadrants. (Provide latest relevant Gartner Magic Quadrant as evidence)	
6.	Specifications Compliance Requirements The service provider's proposed solution must meet all the technical requirement items in the scope of work and specifications and provide relevant evidence in the form of data sheets or brochures. (Complete Statement of Compliance herein)	

EVALUATION

Statement of Compliance

Please attach relevant datasheets or product documentations as part of the evidence

Item No.	Technical Requirements	Supplier's Statements of compliance [Fully Compliant (FC) or Not Fully Compliant (NFC)]	Evidence Reference or Proof
	All Flash Storage Requirements		
1	Controllers must work in active-active mode.		
2	All controllers must be interconnected using protocols such as PCIe, IB, or RDMA, instead of FC or IP federation networking.		
3	Controllers must support non-disruptive upgrade with modular software design.		
4	Must supports dynamic RAID reconstruction.		
5	Supports RAID-TP (up to three (3) drives failures protection)		
6	The system must be capable to create a snapshot every 3 seconds.		
7	Supports secure snapshots, that is, snapshots cannot be deleted.		
8	Supports synchronous and asynchronous replications.		
9	The total cache capacity in the system is greater than or equal to 1TB		
	Compute Requirements		
10	2* CPU (2.1 GHz, 24 Cores), 16*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE		
11	2* CPU (3.1 GHz, 16 Cores), 16*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE		
12	2* CPU (2.4 GHz, 16 Cores), 2*32G memory. 2 x 960 GB SSDs, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE		

13	2* CPU (2.4 GHz, 16 Cores), 2*32G memory. 2 x 960 GB SSDs, 2 x 4 TB SATA, RAID Card supporting RAID 0,1,5,6,10,50,60. 4*10GE, 2*25GE		
	Virtualization Platform Requirements		
14	Supports Windows, Oracle, Ubuntu, Redhat and Suse Linux OS.		
15	After a VM is deleted, it is moved to the recycle bin. VMs in the recycle bin can be restored.		
16	Allows creating consistency snapshots for Windows and Linux OSs (in the x86 scenario). When a fault occurs, services can be quickly restored to the state at point in time when the snapshot was created.		
17	During VM startup and running, the system periodically checks the load of each host in a cluster and migrates VMs among different hosts to implement load balancing among hosts in the cluster.		
18	Dynamic power management (DPM) is supported. The system automatically powers on or off hosts based on the cluster load to reduce power consumption of the data center.		
19	VMs with snapshots can be migrated online or offline.		
20	Each VM has an independent storage LUN. The snapshot, clone, and replication capabilities of VMs can be offloaded to the storage device to reduce host resource overhead.		
21	Allows migrating only VM storage. the configuration mode of destination disks and migration rate control can be specified during migration setting.		
22	Supports log recording of operations performed by O&M personnel on the O&M system. The system O&M personnel can view the logs but cannot delete them.		
23	Allows the platform or software to support unified management of storage devices, switches (FC and IP switches), servers, hyper-converged infrastructure, and virtual resources, including the query of the following: basic device information, configurations, historical performance, resource usage, and device alarms.		

24	Supports full-link I/O path diagnosis from the perspective of VMs: I/O path topology information of virtual disks, VMs, hosts, switches, and storage devices are displayed on one UI.		
25	Supports multi-dimensional associated object analysis from the application perspective for object instances, including VMs, hosts, LUN, and storage, to quickly demarcate and locate faults.		
26	Allows modifying the CPU, memory, and disk hardware parameters of VMs in batches, improving O&M efficiency.		
27	Supports report statistics. The system periodically and automatically generates reports, with preset reports for more than 30 typical service scenarios, such as capacity, resource performance, and alarms. Users can customize report statistics.		
28	Supports intra-city active-active data centers, asynchronous replication, as well as ring and non-ring architectures for the geo-redundant 3DC solution.		
	10GE TOR Switch Requirements		
29	Supports a minimum of 6*100G interfaces and 48*10GE SFP+ interfaces, and the switching capacity is no less than 2.16Tbps		
30	Supports AC Power supplies work in 1+1 mode, and fan modules work in 3+1.		
31	Supports at least 256K MAC address, 256K IPv4 FIB table and 80K IPv6 FIB table.		
32	Supports inter-chassis link aggregation M-LAG technology which has the independent control planes.		
33	Supports RIP, OSPF, IS-IS, BGP, OSPFv3, IS-ISv6, BGP4+, VXLAN and BGP EVPN.		
34	Supports NetStream.		
35	Supports ZTP technology that allows the configuration to be automatically delivered.		
36	Supports telemetry technology to collect device data in real time.		
37	Supports intelligent TCP/UDP traffic analysis.		
	25GE Switch Technical Requirements		

38	The switch provides a minimum of 8*100G interfaces and 48*25GE interfaces. And compatible with 48*50GE interfaces and 8*200GE interfaces.		
39	Supports at least 640K MAC address, 1M FIB table. The switch supports interchassis link aggregation M-LAG technology which has the independent control planes.		
40	Supports RIP, OSPF, IS-IS, BGP, OSPFv3, IS-ISv6, BGP4+, VXLAN and BGP EVPN.		
41	Supports NetStream.		
42	Supports telemetry technology to collect device data in real time.		
43	Supports intelligent TCP/UDP traffic analysis.		
44	Supports adaptive adjustment of ECN parameters, PFC storm/deadlock detection, and deadlock prevention.		
45	The ECN overlay function is applied to the VXLAN network. The ECN inner and outer layers are copied to detect underlay congestion.		
46	The switch supports iNoF (NVME over Fabric) in storage Networking.		
	Management Switch Technical Requirements		
47	The switching capacity must not be less than 672 Gbit/s.		
48	The packet forwarding rate is no less than 125 Mpps.		
49	The switch supports local forwarding and has independent control panel.		
50	AC Power supplies and fan modules work in 1+1 mode.		
51	The switch supports a minimum of 4*10GE optical interfaces and 48*GE RJ45 interfaces.		
52	The switch supports inter-chassis link aggregation M-LAG technology which has the independent control planes.		
53	The switch supports RIP, OSPF, IS-IS, and BGP, RIPng, OSPFv3, IS-ISv6, and BGP4+.		
54	The switch supports N:1 virtualization technologies such as stacking.		
	Data Centre SDN Controller Technical Requirements		
55	Supports multiple fabrics that include the centralized network overlay, distributed network overlay, and distributed hybrid overlay.		

56	Supports VXLAN Layer 2 and Layer 3 interconnection and interconnection between VXLAN and traditional networks, implementing automatic network orchestration in a VXLAN network.		
57	Support inter-DC deployment of Layer 2 subnets and provide a graphical configuration interface to guide users to configure Layer 2 network interconnection.		
58	Support inter-DC deployment and interconnection of different subnets in the same routing domain and provide a graphical configuration interface to guide users to configure Layer 3 router interconnection.		
59	Support data consistency verification with a cloud platform and provide restoration tools or methods for the detected inconsistencies.		
60	Displays the application, physical, and logical topologies. Displays the mappings of elements from the application topology to the logical topology and from the logical topology to the physical topology.		
61	Supports collaboration with management components of bare metal servers on the cloud platform and automatically delivers network configurations required for bare metal service deployment.		
62	Supports detection of Layer 2 or Layer 3 network connectivity between VMs, as well as between VMs and external networks, through IP Ping and MAC Ping, helping administrators quickly rectify the fault.		
63	Supports 3rd-party device management and automatic configuration and automatic rollback based on service, network-wide configuration or tenant, when the configuration does not meet the expectation. And the device does not restart and restores the original network status in minutes.		
64	Supports pre-event simulation verification before service configuration to avoid configuration errors. The impacts of network change operations on live network resources and services can be simulated to prevent network faults caused by misoperation.		
	Data Centre Intelligent Analyzer Requirements		
65	Support the monitoring the number of queue buffer bytes through telemetry with a collection period of 100ms.		

66	Support to check the health status of the entire network. It can display the network connectivity, average transmission delay, packet loss rate and other key indicators		
67	Support monitoring and active identification of device resource table exceptions, including ACL resources, MAC table items, ARP table items, FIB4 table items.		
68	Support the collection of device / board / interface / queue performance indicators through telemetry protocol, and show in dashboard.		
69	Support viewing the health status of the multiple dimensions such as device, network, protocol and overlay dimensions, and supports real-time export or regular push of health evaluation reports		
70	Support to automatically check the configuration difference before and after the network change, and analyze the detailed change points of the configuration before and after the network change.		
71	Support minute level discovery and root cause analysis of common faults (such as suspected optical module fault, suspected layer-2 loop, port congestion fault, etc.), and provide minute-level fault rectification suggestions.		
72	Support the risk prediction of network hidden dangers, including a systematic risk evaluation model with five dimensions: network reliability, performance load, resource capacity, configuration consistency and network stability.		
73	Supports network retracement and one-click troubleshooting for TCP retransmission and TTL anomalies, and quickly find the root cause of issues.		
74	Support global search of network objects such as network devices, interfaces, boards, logical network elements, OSPF, ARP table entries, IPv4 / IPv6 routing table entries and configuration files in fabric, and displays the corresponding details.		
	Core Switch for Data Centre Technical Requirements		
75	The switching capacity is no less than 43 Tbit/s, packet forwarding rate is no less than 22000 Mpps.		

76	The switch supports redundant fan modules and AC power modules. The number of fan modules is no less than 3.		
77	The supervisor is separated from the fabric module hardware. The MPU and SFU hardware are separated.		
78	Supports 10G/25G/40G/100G line cards. 48-port 10GE Ethernet optical line cards, 24 or more port 40GE Ethernet optical line cards and 18 or more port 100GE Ethernet optical line cards.		
79	Supports cell switching: Traffic is evenly distributed to multiple switching fabrics to ensure that the switching fabric is not blocked.		
80	The switch supports inter-chassis link aggregation M-LAG technology which has the independent control planes.		
81	The switch supports 1:N virtualization. One physical switch can be virtualized into a maximum of 9 logical switches.		
82	The switch supports telemetry technology to collect device data in real time.		
83	The switch supports intelligent TCP/UDP traffic analysis and NetStream feature that can implement near-real-time network monitoring.		
84	The switch supports the standard NETCONF interface for third-party software to enable programming of functions and integration with third-party software, providing openness and flexibility.		
85	The switch supports adaptive adjustment of ECN parameters, PFC storm/deadlock detection, and deadlock to prevent ROCE packet loss when the interface bandwidth is 90%.		
	Firewall Technical Requirements		
86	Firewall Throughput: no less than 40Gbps.		
87	Concurrent Sessions: no less than 10,000,000, New Sessions/Second: no less than 400,000.		
88	Support service-specific PBR and intelligent uplink selection based on multiple load balancing algorithms		
89	Supports policy-based routing based on the following matching conditions: source IP address, destination IP address, service type, application type, user/user group/security group, inbound interface, and DSCP priority.		

90	Support application-layer protocol-based traffic control policies, including setting the maximum bandwidth, guaranteed bandwidth, and protocol traffic priority.		
91	Provides a URL category database with over 120 million URLs and accelerates access to specific categories of websites, improving access experience of highpriority websites.		
92	Supports application-layer flood attacks such as HTTP, HTTPS, DNS, and SIP, supports traffic auto-learning, the setting of the auto-learning time, and automatic generation of anti-DDoS policies.		
93	Allows users to configure security policies based on time, user/user group/security group, application-layer protocol, geographical location, IP address, port, domain name group, URL category, access type, vlanID and content security.		
94	Support multiple user authentication methods, including local, RADIUS, TACACS, AD, and LDAP. Support built-in Portal and Portal redirection functions.		
	Core Switch for Branch Technical Requirements		
95	Supports 48 × 100M/1000M/2.5G/5G/10G Base-T Ethernet ports, 4 x 10/25GE SFP28 + 2 x 40/100GE QSFP28 ports, and switching capacity ≥ 1.72Tbps		
96	Supports dual pluggable power modules 1+1 power backup.		
97	Supports ≥ 128K MAC address entries and at least 4094 VLANs.		
98	Supports IEEE 802.1d, 802.1w, 802.1s and Ethernet Ring Protection Switching (ERPS) .		
99	Supports RIP V1/2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+		
100	Supports BFD for BGP/IS-IS/OSPF/static routes, Link Aggregation Control Protocol (LACP), M-LAG, and LLDP.		
101	Supports the VXLAN function, centralized gateway, distributed gateway, and BGP EVPN.		
102	Supports SSH, SNMP v1/v2c/v3, FTP, TFTP, SFTP and Streaming Telemetry.		

103	Supports Defense against DoS attacks, Transmission Control Protocol (TCP) SYN Flood attacks, User Datagram Protocol (UDP) Flood attacks, broadcast storms, and heavy traffic attacks.		
104	Supports secure boot, Port security and Macsec(IEEE 802.1ae).		
	48-Port Access Switch Technical Requirements		
105	Support 48 x 10/100/1000/2.5G Base-T ports, 4 x 10 GE SFP+ ports, 2 x 12GE stack ports, and switching capacity ≥ 368 Gbps.		
106	Supports 3 power supplies, N+1 power supply backup.		
107	Supports 32K MAC address entries and at least 4094 VLANs.		
108	Supports ERPS, IEEE 802.1d, IEEE 802.1w, and IEEE 802.1s.		
109	Supports at least 8K FIBv4 entries and 3K FIBv6 entries.		
110	Supports static routes, RIP, RIPng, OSPFv2, OSPFv3, IS-IS, IS-ISv6, BGP, and BGP4+.		
111	Supports MLD snooping, IGMP v1/v2/v3 snooping, IGMP v1/v2/v3, PIM-DM, PIM- SM and PIM-SSM.		
112	Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.		
113	Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.		
	24-Port Access Switch Technical Requirements		
114	24 x 10/100/1000/2.5G Base-T ports, 4 x 10 GE SFP+ ports, 2 x 12GE stack ports, and switching capacity ≥ 248 Gbps		
115	Supports 3 power supplies, N+1 power supply backup.		
116	Supports 32K MAC address entries and at least 4094 VLANs.		
117	Supports ERPS, IEEE 802.1d, IEEE 802.1w, and IEEE 802.1s.		
118	Supports at least 8K FIBv4 entries and 3K FIBv6 entries.		
119	Supports static routes, RIP, RIPng, OSPFv2, OSPFv3, IS-IS, IS-ISv6, BGP, and BGP4+.		
120	Supports MLD snooping, IGMP v1/v2/v3 snooping, IGMP v1/v2/v3, PIM-DM, PIM- SM and PIM-SSM.		

121	Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.		
122	Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.		
	12-Port Access Switch Technical Requirements		
123	Support at least 12 x 10/100/1000Base-T ports (PoE+), 2 x 100M/1/2.5/5/10G Base- T ports (PoE++), 2 x 10GE SFP+ ports, and switching capacity ≥ 112 Gbps		
124	Support built-in AC power supply.		
125	Supports up to 32K MAC address entries and at least 4094 VLANs.		
126	Support Up to 4096 FIBv4 entries and 1024 FIBv6 entries.		
127	Support Static route, RIP, RIPng, OSPFv2, OSPFv3, VRRPv4 and VRRPv6.		
128	Supports CPU defense, DoS attack defense, ARP attack defense, and ICMP attack defense.		
129	Supports Cloud management based on Netconf/Yang, SNMPv1/v2/v3, iPCA, sFlow, NQA, Telemetry.		
	Indoor Access Point (AP) Technical Requirements		
130	The AP should support IEEE 802.11ac Wave 2/ax/be.		
131	The AP should support 3 radios, one 802.11be 2*2 MIMO on 2.4 GHz band, one 802.11be 4*4 MIMO on 5 GHz band and one 802.11be 2*2 MIMO on 6 GHz band.		
132	The AP should support system maximum rate up to 7.8Gbit/s.		
133	The AP should have a USB port for external IoT expansion.		
134	The AP should support PoE power supply: in compliance with 802.3at.		
135	The AP should support minimum 16 SSIDs for each radio.		
136	The AP should support minimum 1800 users.		
137	The AP should support built-in smart antennas.		
138	The AP should support smart roaming and load balancing during smart roaming.		

139	The AP should support security features, ensure eavesdropping terminals cannot capture packets over the air interface.		
	Wireless Controller (AC) Technical Requirements		
140	The AC should manage up to 2K APs.		
141	The AC should support 32K users.		
142	The AC should provide 120Gbps forwarding performance.		
143	The AC should have at least eight 1GE Ethernet interface.		
144	The AC should have at least two 40GE QSFP+ interface and twelve 10GE SFP+ interface.		
145	The AC should support dual power modules.		
146	The AC should support static route, OSPF, BGP, IS-IS, routing policies, and policy-based routes.		
147	The AC should support device redundancy backup, 1+1 or N+1 backup, and configuration synchronization between the active and standby ACs.		
148	The AC should support intelligent roaming based on 802.11k and 802.11v, enabling clients with low roaming sensitivity to roam to the optimal AP.		
149	The AC should support application identification and set control policies based on identified applications.		
	Network Management System Technical Requirements		
150	The product must supports a software management solution for both wired and wireless devices in a single campus, multiple campuses, and wide-area networks. It should feature a guided menu for end-to-end configuration across various business scenarios.		
151	The product must supports multiple plug-and-play technologies (such as DHCP Option, QR code scanning, email-based provisioning, etc.) for simultaneous device registration and online onboarding. It eliminates the need for manual ESN collection, command-line operations, configuration files, and scripts, improving provisioning efficiency. It also supports device provisioning using non-VLAN1 networks. Devices can be configured before installation or installed before configuration.		

152	The product must support various authentication methods, including 802.1x, MAC, Portal, VPN, PPSK/DPSK, and more. Authentication protocols supported include PAP, CHAP, EAP-MD5, EAP-PEAP-MSCHAPV2, EAP-TLS, EAP-TTLS-PAP, EAP-PEAP-GTC, HACA, and others. It also supports IPv6 devices to access the network through 802.1x, MAC, or Portal authentication.		
153	The product must support group-based policy management, avoiding the overload of ACL specifications based on IP subnets. It also supports policy deployment in non- VXLAN networks. Authentication points and policy points are separated, ensuring compatibility with multi-vendor devices and RADIUS relay authentication scenarios.		
154	The product must support user + application-based dual-condition HQOS traffic scheduling, ensuring the quality of experience for key applications like video and voice for VIP users.		
155	The product must support device configuration and entry comparison functions. The product enables network-wide IP subnet connectivity checks and allows GUI-based verification of network connectivity between any subnets. Additionally, it should support simulating terminal access connectivity, enabling quick verification of terminal access permissions.		
	Network Analysis System Technical Requirements		
156	Wireless network health: The system must provide a quality evaluation system to evaluate the wireless network health and create rankings in terms of access success rate, access time consuming, roaming, signal and interference, capacity, and throughput, and lists deteriorated metrics that affect the rankings. It should allow Administrators to check details about the deteriorated metrics, including the root cause and troubleshooting suggestions for metric deterioration.		
157	Wired network health: The system must provide a wired network quality evaluation system in terms of device environment, device capacity, network performance, and network status, proactively identifies major problems that affect network quality, and provides service impact, root cause, and troubleshooting suggestions.		

158	Health report: The system must generate health evaluation reports in real time or periodically. The report to include network-wide resource overview, client overview, quality overview, metric details, and rectification suggestions. The system must be able to send the reports to administrators by email or administrators can download the reports immediately to learn the network status in real time.		
159	Mainstream application analysis: The system should accurately identify more than 1000 mainstream applications, collect application traffic statistics from multiple dimensions, detect the quality of mainstream applications, identify poor-QoE applications, and demarcate faults for poor-QoE application flows. It should supports edge device detection and identifies east-west and north-south applications.		
160	Protocol tracing: The system must display the protocol-level process based on the association, authentication (802.1X authentication, Portal authentication, MAC address authentication, and HACA authentication for wired and wireless users, as well as PSK authentication for wireless users), and DHCP phases of user access. The system must also provide refined analysis on user access issues, root causes of user access failures, and troubleshooting suggestions.		
161	Poor-QoE analysis: The system must support correlation analysis on poor-QoE issues and provides poor-QoE issue description, including the APs on which poor-QoE issues occur and poor-QoE time distribution. In addition, the system must intelligently identifies metrics that affect user quality and the correlation percentages from dimensions of coverage, interference, throughput, and hardware, locates the root cause, and provides troubleshooting suggestions.		
162	Intelligent radio calibration function. Based on historical big data, the system should be able to use AI algorithms to identify high-load APs and edge APs and perform radio calibration for devices based on big data analytics results.		
	Service Requirements		
163	Professional Services: Must include Planning, Designing and Implementation Service based on SDN platform and solution.		

164	Support Service Requirement: All equipment in this tender must provide 3 years, 9x5xNBD OEM Service. Bidder must provide 7*24*7 remote desktop to support all technical issues. Bidder will also be responsible for the monitoring of the whole network and support with the below; -providing all updates and patches related to network management software -displaying the software platform -monitoring bandwidth usage and optimize the capacity of circuits, identify bottlenecks etcetera -providing detailed reports and actions based on the reporting received from the tools -replace faulty component or equipment and reconfigure with spare		
165	Training The skill transfer is a mandatory requirement Bidder must provide the following training to appointed staff: 1.Onsite operation, maintenance and troubleshooting training that cover all equipment installed. 2.Certified training for two (2) engineers.		
	DR Service: The bidder should provide DR planning, design, and implementation and acceptance services which are shown as follows:		
166	Information Collection should include services requiring DR, environment information collection (server, VM, storage, network, and others), objectives of the DR establishment and other DR requirements.		
167	The planning and design service should include energy consumption calculation, compatibility confirmation, DR LLD planning and design, and LLD document submission.		
168	Implementation service should include DR site deployment, DR network deployment.		
169	Acceptance service should include DR acceptance test and update of device archive.		