

Detailed Scope of Work

LOT #1 – Procurement of New Servers

The scope of work includes supply, installation, commissioning and maintenance of Servers as per the BOQ with onsite support for a period of 3 years warranty including parts and labour.

1 Supply of Servers

- Supply of new, brand-new, factory-sealed enterprise rack-mount servers.
- Servers shall be suitable for Data Center, virtualization, application, and database workloads, as applicable.
- The proposed configuration shall include enterprise-grade processors, memory, NVMe/SAS storage, a RAID controller, dual power supplies, network interfaces, and all required accessories.
- All components shall be compatible with the offered server model and supported by the OEM.

2 Minimum Hardware Requirements

- Enterprise rack-mount server, suitable for standard Data Center rack installation.
- Minimum four (4) physical CPU cores.
- Minimum 4 × 32 GB ECC RAM, expandable as required.
- 2 × 1.6 TB SAS 24 Gbps enterprise SSDs.
- Hardware RAID controller with the required RAID levels.
- Minimum dual hot-plug, redundant power supplies.
- Dual 1 GbE (or higher) network connectivity, as required.
- Dedicated out-of-band management controller.
- All required rails, power cables, transceivers, and mounting accessories.

3 OEM Support and Warranty

- Minimum three (3) years of 24×7 OEM warranty and support.
- Support shall include hardware replacement, firmware updates, and technical assistance.
- The bidder shall provide an OEM support entitlement/certificate.
- All supplied components shall remain under OEM support for the complete warranty period.
- Documentary evidence shall be provided confirming availability of spare parts in Pakistan, with next-business-day (NBD) delivery in major cities.

4 Installation and Configuration

The supplier shall perform:

- Physical installation and rack mounting.
- Power and network connectivity.

- Firmware/BIOS updates to the latest stable OEM-supported versions.
- RAID/storage configuration.
- Network configuration.
- iDRAC/iLO or equivalent management configuration.
- Hardware health verification.

5 Testing and Commissioning

The supplier shall conduct complete testing, including:

- CPU and memory health testing.
- Storage/RAID health testing.
- Network connectivity testing.
- Redundant power-supply testing.
- Management interface testing.
- Hardware monitoring and alert testing.
- OS/hypervisor compatibility verification.
- Performance and stability testing.

6 Documentation and Handover

The supplier shall provide:

- Complete hardware configuration report.
- Serial numbers and asset details.
- Warranty/support certificates.
- Firmware versions.
- RAID/storage configuration details.
- Installation and commissioning report.

7. Required Delivery Period / Timeline/Delivery Schedule

The delivery timeline for the supply, installation, and commissioning of the servers shall be 10–12 weeks from the date of issuance of the Purchase Order. PRAL, however, reserves the right to extend or revise the delivery timeline as deemed necessary.

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8. Required Warranty Period and Support Requirements

- Comprehensive, OEM-backed post-sales support for hardware and software for a minimum of three (03) years, with extendable 24×7 support.
- Documentary evidence shall be provided confirming the availability of spare parts in Pakistan, with next-business-day (NBD) delivery in major cities.

9. Bill of Quantities (BoQ)

Sr. No.	Equipment Detail	Quantity
1	Rack-mount servers (including all allied accessories and installation)	2

LOT #2 – Procurement of Layer II and Layer III Network Switches

The scope of work includes supply, installation, commissioning and maintenance of Layer II & Layer III Network Switches as per the BOQ with onsite support for a period of 3 years warranty including parts and labour.

Item 1: Layer II Network Switches (24-Port Access Switches)

- Layer 2, PoE-enabled, 24-port switches (minimum power budget of 300 W, sufficient to utilize half of the PoE ports).
- Switching capacity of 160 Gbps or higher per unit.
- Minimum four (4) × 10G optical ports per unit (fully populated fixed ports, or the vendor shall provide 10G multi-mode SFPs for each port); SFPs shall support a minimum range of 300 meters to reach the Core Layer 3 switch.
- 24 × 1G RJ-45 copper ports per switch.
- All ports shall be fully populated, and all required converters, connectors, cables, and other allied accessories shall be supplied and installed by the supplier.
- The vendor shall ensure connectivity of access switches with the core switch and integration with existing network equipment.
- The switch shall run the latest stable firmware version and support upgrades, as and when required, without service disruption or outage.
- Both major and minor firmware upgrades shall be available.
- The solution shall be enterprise-grade and support the latest switching deployment models.
- Multi-vendor interoperability.
- Support for firmware/image upgrade via FTP, TFTP, and/or the web UI.
- Support for exporting configuration from the device.
- The solution shall support multipathing without dependence on Spanning Tree Protocol (STP).
- Line-rate traffic throughput, rather than a blocking architecture.
- Support for all standard protocols, QoS, IP multicast, IPv4/IPv6, and VLANs.
- Support for security features, jumbo frames, and standard switching functions.
- MAC and port security, including port-based, LAG-port, VLAN-based, and filter-based traffic monitoring, along with other relevant features.
- Support for Syslog, SNMP (all versions), traps, telemetry, and other current monitoring protocols.
- Support for network traffic analysis.
- Compatibility with major/standard logging software and network management systems (NMS).
- High availability, stacking, failover, and redundancy support.
- Support for internal and externally integrated administrator authentication platforms.
- Command Line Interface (CLI) management.
- Graphical User Interface (GUI) management (preferred).
- Role-based CLI management, access, and administration.

- Traffic filtering based on IP field and source/destination IP address, subnet, and TCP/UDP port number, on a per-VLAN or per-port basis.
- Effective airflow mechanism with smart, OS-controlled fans.
- Comprehensive post-sales support for hardware, software, and licenses for three (03) years, with extendable 24×7 support.

Item 2: Layer 3 Data Center / Aggregation Switch

- Enterprise-grade Layer 3 switch, suitable for core/aggregation/Data Center network deployment.
- Minimum 24 × 10GE SFP+ optical ports and 6 × 40GE QSFP+ optical ports, or equivalent/higher interface capacity.
- All required optical transceivers, DAC/AOC cables, connectors, patch cords, rack-mounting accessories, power cables, and other allied accessories shall be supplied by the bidder.
- The switch shall provide sufficient switching and forwarding capacity to support line-rate/non-blocking operation across all offered interfaces.
- Support for IPv4 and IPv6 Layer 3 routing.
- Support for static routing and standard dynamic routing protocols, such as OSPF, OSPFv3, BGP, and equivalent enterprise routing protocols.
- Support for VLANs, IEEE 802.1Q, VLAN trunking, and VLAN-based traffic segregation.
- Support for STP, RSTP, and MSTP, along with appropriate loop-prevention mechanisms.
- Support for LACP/link aggregation and multipathing.
- Support for gateway redundancy/high availability, such as VRRP or equivalent.
- Support for IPv4/IPv6 multicast, including IGMP snooping and multicast routing.
- Support for comprehensive QoS features, including classification, marking, policing, shaping, and queuing.
- Support for ACLs based on source/destination IP address/subnet, protocol, TCP/UDP source/destination ports, VLAN, and physical interface.
- Support for MAC security, port security, DHCP snooping, ARP protection, and other standard network security features.
- Support for jumbo frames, suitable for Data Center environments.
- Support for SNMP v1/v2c/v3, Syslog, NTP, and standard network monitoring protocols.
- Support for network traffic monitoring and analysis, including interface utilization, packet statistics, errors, drops, and other performance parameters.
- Compatibility with major NMS, logging, monitoring, and SIEM platforms.
- Support for CLI-based and web/GUI-based management.
- Support for role-based administration and access control.
- Support for integration with external authentication platforms, such as RADIUS and TACACS+.
- Support for configuration backup, export, and restoration.
- Support for firmware/software upgrade via FTP/TFTP/SFTP/web UI or equivalent standard mechanisms.
- Support for major and minor firmware/software upgrades throughout the OEM-supported lifecycle.

- Support for high availability, redundancy, and failover through stacking, virtual switching, MLAG, clustering, or equivalent technology, as applicable to the proposed architecture.
- Multi-vendor interoperability and compliance with relevant IEEE/IETF standards.
- Suitable airflow and thermal management for Data Center deployment, with intelligent/temperature-controlled fans.
- The switch shall be supplied with the latest stable OEM-supported firmware/software at the time of installation.
- The proposed solution shall be enterprise-grade and suitable for integration with the existing network infrastructure.
- Minimum three (03) years of comprehensive OEM/post-sales support, covering hardware, software, and applicable licenses, with extendable 24x7 support.

2. Required Delivery Period / Timeline/Delivery Schedule

The delivery timeline for the supply, installation, and commissioning of the switches shall be 10–12 weeks from the date of issuance of the Purchase Order. PRAL, however, reserves the right to extend or revise the delivery timeline as deemed necessary.

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3. Required Warranty Period and Support Requirements

- Comprehensive, OEM-backed post-sales support for hardware and software for a minimum of three (03) years, with extendable 24x7 support.
- Documentary evidence shall be provided confirming the availability of spare parts in Pakistan, with next-business-day (NBD) delivery in major cities.

4. Bill of Quantities (BoQ) / Financial Price Schedule

Sr. No.	Equipment Detail	Quantity
1	Layer III network switches	2
2	Layer II network switches	25

Bidders submitting substantially responsive bids shall be evaluated under the Least Cost Based Selection (LCBS) methodology. The bidders can participate in any one or both LOTs.