Enterprise Storage Solution – Technical Specifications

1. General Requirements

- The equipment must be **new, unused, and not refurbished.**
- All components must be **enterprise-grade**, suitable for mission-critical applications.
- The solution must be manufactured by a **recognized international vendor** with proven experience in enterprise storage systems.
- All hardware and software components must be **fully compatible** and ensure optimal system operation.
- All required software features must be **included and activated**; solutions with subscription-based licensing must provide **perpetual licenses** for all features.
- **All requirements are minimum and mandatory.**

2. Hardware Specifications

2.1. Storage System Type

- Tier-0 Enterprise All-Flash NVMe Storage.

2.2. Form Factor & Physical Design

- Rack-mountable enclosure, compatible with EIA 19-inch racks.
- Maximum 2U height per enclosure.
- Minimum 24 NVMe SSD bays per enclosure.
- Rack mounting kit must be included.

2.3. Drives

- Dual-ported NVMe SSDs with TLC NAND technology.
- Other NAND technologies (e.g., QLC, hybrid) are not accepted.
- Minimum installed: 12 SSDs, each with at least 7.68TB capacity.
- All drives must support self-encryption.

2.4. Capacity & Redundancy

- Minimum total usable capacity: 64TB (after system overhead, RAID protection, sparing, and other reservations) in RAID 6 or equivalent protection scheme (e.g., 10+2 parity).
- Usable capacity calculation must be provided, detailing raw, spares, and usable figures. Confirmative report from manufacturer sizing tool for exact proposed configuration.
- N+2 redundancy for storage nodes, host bus adapters (HBAs), power supplies, and disks.

- The system must tolerate failure of any two components (nodes, HBAs, power supplies, disks) without service interruption or data loss.
- No decrease in required equipment efficiency or performance in case of a failure of half of the controllers.

2.5. Controllers & Cache

- Minimum two controllers/nodes in all-active high availability (HA) mode.
- If controller cache is used, minimum 128GB per controller, with battery backup.

3. Availability & Performance

3.1. High Availability

- All-active architecture: all nodes have direct access to all drives.
- 100% data availability guarantee (vendor must provide public documentation).
- No single point of failure (hardware or software).
- Non-disruptive hardware and software upgrades.

3.2. Replication & Failover

- Support for replication and transparent failover to support continuous data availability, including site-wide or disaster scenarios.
- Replication modes: asynchronous periodic, synchronous, synchronous long distance.
- Automatic failover mechanism at data center level, ensuring near-zero RTO/RPO.
- Synchronous replication must be supported using standard protocols (e.g., FC, iSCSI) for interoperability with existing enterprise storage systems.

Important: **The proposed storage MUST be able to create synchronous replication configuration with HPE 3PAR StoreServ 8000 Storage (P/N K2Q36B) used now as primary production storage. If it is not possible, the second storage system (in same configuration) must be included in the solution with synchronous data replication over FC with installation in two data centers.**

3.3. Performance

- Minimum combined performance: 160,000 IOPS (random 70/30 read/write, 16K block size, ≤1ms latency, with active deduplication and compression, using FC connection protocol).
- Vendor must provide a sizing report for the proposed configuration.

4. Data Management & Protection

4.1. Data Reduction & Encryption

- In-line deduplication and compression, applicable globally and per volume.
- No restrictions on simultaneous use of deduplication/compression with other features (replication, thin provisioning, backups, cloning).
- Data-at-rest encryption with advanced mechanisms; encryption must not affect performance.
- Encryption keys must be stored securely on the equipment, preventing data access if drives are removed.

4.2. Snapshots & Migration

- Point-in-time snapshot functionality, supporting at least 365 snapshots per volume.
- Efficient snapshot mechanism (redirect-on-write or equivalent), with minimal impact on I/O performance (≤5%).
- Snapshots must be space-efficient, storing only differences from original data.
- Non-disruptive data migration from other storage systems, without external appliances.
- Snapshot functionality should be applicable to at least volumes, without imposing restrictions on the use of other functions.

5. Monitoring & Management

5.1. Analytics & Monitoring Platform

- Web-based portal or VM for monitoring, reporting, and event collection.
- Automatic log collection, graphical and report-based presentation.
- Monitoring of used space, data reduction indicators, and prediction of future expansion.
- Performance history and real-time data for latency, IOPS, bandwidth (device-wide and per volume/LUN).
- Storage QoS mechanisms at volume level.
- Reporting functions for capacity, performance, future space prediction, authorization logs, support levels, and technical support time.
- Status display for operations (snapshots, synchronous replication, etc.).
- Configuration verification and upgrade possibility analysis.

5.2. Management Interfaces

- Minimum CLI and GUI for on-premises management; no external appliances required.

- Integration with VMware vCenter, supporting VMware vSphere Virtual Volumes and vStorage APIs for Storage Awareness (VASA).
- OpenStack integration.
- Built-in ransomware detection mechanism.

6. Host & Compatibility Requirements

- Support for major operating environments: Microsoft Windows Server, VMware ESX, Red Hat Enterprise Linux.
- Support for standard storage protocols: FC, iSCSI, NVMe over FC.
- Minimum 4x 32Gbps FC ports per controller for host connections and replication.
- Dedicated management interfaces; all required media converters included.

7. Warranty & Support

- Minimum 3-year warranty, including technical support, software updates, and spare parts.
- Local manufacturer official service center presence with at least two authorized and certified technical staff (bidder must provide confirmative evidence).
- Repair, return, or replacement services for faulty parts.

8. Implementation Services

- Implementation services must be provided by the vendor.
- Qualified staff (minimum two certified engineers) for installation, configuration, integration, replication setup, and **data migration from existing system HPE 3PAR StoreServ 8000 Storage.**
- Implementation services include at least: installation and configuration of system/systems, integration with existing environment, configuration of replication and failover, migration of data from existing system.

9. Documentation & Bill of Materials

- Detailed Bill of Materials must be attached to the offer.
- All components must be current and not advertised as End of Sale (EOS) or End of Life (EOL).