

# TERMS OF REFERENCE

## Department of Agrarian Reform (DAR) Centralized Scale-Out Storage Solution (NAS Storage) Project

### SECTION 1: BACKGROUND AND RATIONALE

The Department of Agrarian Reform (DAR), through its Management Information Systems Service (MISS), is actively pursuing modernization projects to support its Information Systems Strategic Plan (ISSP). DAR requires a **highly available, scalable, and secure storage platform** to serve as the central repository for critical digital assets, including digitized records, AI-driven Document Management System (DMS), and other modernization initiatives.

The current storage infrastructure is insufficient to handle DAR's rapidly growing requirements for data protection, file sharing, interoperability with other government agencies, and integration with DAR's modernization roadmap.

To address these gaps, DAR proposes the procurement and deployment of a **500 TB scale-out storage solution** with hybrid Flash and HDD capacity, providing both high performance and long-term scalability. This project will serve as the foundation of DAR's digital ecosystem, ensuing seamless operations across the Central, Regional, and Provincial Offices.

### SECTION 2: OBJECTIVES

This project aims to:

- 2.1. Deploy a scale-out storage solution with at least 500 TB usable capacity, provisioned as 50% Flash and 50% HDD.
- 2.2. Provide a single namespace storage platform scalable to exabytes, ensuring consistent performance and management.
- 2.3. Ensure high availability and linear performance scaling to support DAR's Document Management System and other applications.
- 2.4. Strengthen DAR's data protection and security posture through AES-256 encryption, FIPS 140-2 compliance, and secure access controls.
- 2.5. Enable seamless integration with DAR's digitization systems, applications, and cloud platforms.

### SECTION 3: EXPECTED OUTPUTS

- 3.1. A fully deployed 500 TB scale-out storage system with hybrid Flash and HDD architecture.
- 3.2. A centralized and secure data repository for DAR, capable of serving millions of files and billions of directory objects.
- 3.3. Improved efficiency in file access, retrieval, and management across DAR offices.
- 3.4. Full compliance with government IT standards and DICT guidelines on digital infrastructure.
- 3.5. Enhanced data analytics and monitoring with built-in file system insights.

### SECTION 4: SCOPE OF WORKS

The Contractor shall –

- 4.1. **Assessment and Planning**
  - 4.1.1. Conduct technical consultation with MISS.

- 4.1.2. Evaluate DAR's existing storage and compute environment.
- 4.2. **System Design and Supply**
  - 4.2.1. Deliver a multi-controller, scale-out NAS appliance with required compute, network, and storage hardware.
  - 4.2.2. Configure 500 TB usable storage ( $\geq 250$  TB Flash,  $\geq 250$  TB HDD).
  - 4.2.3. Provide a system capable of scaling from 4 nodes up to 250+ nodes.
- 4.3. **Deployment and Integration**
  - 4.3.1. Install, configure, and integrate the storage system with DAR's infrastructure.
  - 4.3.2. Ensure compatibility with DAR's DMS, AI systems, virtualization platforms, and cloud services.
- 4.4. **Testing and Validation**
  - 4.4.1. Conduct functional and performance testing.
  - 4.4.2. Ensure compliance with redundancy, erasure, coding, and failover requirements.
- 4.5. **Training and Knowledge Transfer**
  - 4.5.1. Provide hands-on training to DAR technical staff.
  - 4.5.2. Deliver documentation for operations, management, and troubleshooting.
- 4.6. **Maintenance and Support**
  - 4.6.1. Provide three (3) years warranty on hardware and software.
  - 4.6.2. Ensure dedicated slack support channel and assignment of a Customer Success Manager (CSM).
  - 4.6.3. Provide preventive maintenance, on-site and remote support.

## **SECTION 5: TECHNICAL SPECIFICATIONS**

The proposed solution is **required to meet or exceed the specifications** listed below to ensure full compatibility with DAR requirements.

**Capacity:** 500 TB Usable (50% Flash, 50% UDD)

**Quantity:** One (1) Lot

### **5.1. General Requirements**

- 5.1.1. The scale-out storage solution must be a multi-controller scale-out Network Attached Storage (NAS) sold as an integrated appliance with required compute, network, and storage hardware.
- 5.1.2. The vendor of the storage solution must be listed as a Leader in Gartner's 2022 Magic Quadrant for Distributed File Systems and Object Storage.
- 5.1.3. The storage solution must have a scale-out capability that can provide linear performance and capacity growth, node by node.
- 5.1.4. The system must scale from at least 4 nodes up to 250+ nodes, with zero downtime and no data migration.
- 5.1.5. The system must be able to load balance requests from multiple clients across nodes in the cluster.
- 5.1.6. Each node must support at least 10 Floating IP addresses.

### **5.2. Capacity & Media Configuration**

- 5.2.1. The system must provide at least 500 TB usable capacity after applying desired protection and performance policies.
- 5.2.2. Capacity must be provisioned in a 50% Flash / 50% HDD ratio:
  - 5.2.2.1. ≥ 250 TB usable Flash capacity
  - 5.2.2.2. ≥ 250 TB usable HDD capacity
- 5.2.3. All writes must first land on SSD before being staged to HDD for long-term storage.
- 5.2.4. The system must allow 100% of usable capacity consumption with no performance impact.
- 5.2.5. The usable capacity must be presented as a single namespace, scalable to exabytes.

### **5.3. Node Specifications**

- 5.3.1. Each node must be supplied with:
  - 5.3.1.1. ≥ 64 GB DDR4 memory
  - 5.3.1.2. ≥ 240 GB Flash capacity (per node)
  - 5.3.1.3. ≥ 8 TB HDD capacity (per node)
  - 5.3.1.4. ≥ 2x Network Ports (10/25/40/100 GbE options)
- 5.3.2. Each node must contribute to both performance and capacity in the cluster.

### **5.4. File System & Data Management**

- 5.4.1. Must support billions of files and millions of directories.
- 5.4.2. Must support extremely large file sizes, up to 8 exabytes.
- 5.4.3. Must support 4+ billion files in a directory.
- 5.4.4. Must eliminate resource-intensive file system tree walks for events like drive or node failure and expansion.
- 5.4.5. Must support erasure coding for data protection at the block layer.
- 5.4.6. Must support instantaneous directory renaming and directory-level snapshots.
- 5.4.7. Must support at least 40,000 snapshots.
- 5.4.8. Must include built-in file system analytics (capacity, performance, trends).
- 5.4.9. Must include programmable REST API for full system programmability and monitoring.
- 5.4.10. Must allow instant quota enforcement on existing directories without scans.

### **5.5. Protocols & Interoperability**

- 5.5.1. Must support:
  - 5.5.1.1. NFS v3 & v4.1
  - 5.5.1.2. SMB 3
  - 5.5.1.3. S3 API (native)
- 5.5.2. Must support ≥ 64,000 NFS exports and ≥ 40,000 SMB shares.
- 5.5.3. Must support NTFS ACLs and SHACLs with integration to LDAP and Active Directory.
- 5.5.4. Must support Kerberos authentication for NFSv4 clients.
- 5.5.5. Must support cross-protocol permissions (NFS + SMB concurrent access).
- 5.5.6. Must support Container Storage Interface (CSI) for Kubernetes.

### **5.6. Security & Compliance**

- 5.6.1. Must provide AES-256 encryption (data-at-rest, in-transit, replication).
- 5.6.2. Must support key rotation.
- 5.6.3. Must be FIPS 140-2 certified (NIST).
- 5.6.4. Must support audit logging with forwarding to Syslog.
- 5.6.5. Must support multi-tenancy, enabling virtual tenants with separate management access.

## **5.7. Reliability & Expansion**

- 5.7.1.** Must support non-disruptive node expansion.
- 5.7.2.** Must handle small files (<128 KB) efficiently with <50% protection overhead.
- 5.7.3.** Drive rebuild times must not materially increase as file sizes decrease.
- 5.7.4.** Must support hybrid SSD/HDD tiering with SSD-first writes.
- 5.7.5.** Must support exabyte scalability in namespace growth.

## **5.8. Licensing, Support, & Subscription**

- 5.8.1.** All existing and future software features must be included for the duration of the subscription.
- 5.8.2.** Must include a dedicated Slack support channel and a Customer Success Manager (CSM) upon procurement.
- 5.8.3.** Must be deployable on-premises.

## **SECTION 6: PROJECT TIMELINE**

The project shall be completed within **ninety (90) calendar days** from the issuance of the Notice to Proceed (NTP), with the following milestones:

- |             |  |                      |
|-------------|--|----------------------|
| <b>6.1.</b> | Project Kick-off                       | Five (5) Days        |
| <b>6.2.</b> | Delivery of Equipment                  | Fifty-five (55) Days |
| <b>6.3.</b> | Configuration, Testing & Commissioning | Fifteen (15) Days    |
| <b>6.4.</b> | Training & Knowledge Transfer          | Ten (10) Days        |
| <b>6.5.</b> | Final Acceptance & Turnover            | Five (5) Days        |

## **SECTION 7: WARRANTY AND LICENSE**

The Contractor shall provide comprehensive warranty, technical support, and service level commitments to ensure the DMS and its components operate reliably and meet DAR's operational needs.

### **7.1. Hardware Warranty**

- 7.1.1.** The Contractor shall provide a minimum of three (3) years warranty on all supplied storage hardware, including compute, networking, and storage components.
- 7.1.2.** Warranty must include –
  - 7.1.2.1.** Parts replacement for defective components.
  - 7.1.2.2.** Labor and on-site support for warranty-related services.
  - 7.1.2.3.** Firmware and microcode updates for storage controllers, SSDs, HDDs, and network interface cards during the warranty period.
- 7.1.3.** The Contractor must guarantee non-disruptive replacement procedures for faulty components.

### **7.2. Software License and Subscription**

- 7.2.1.** The Contractor shall provide a minimum of three (3) years software license for the storage operating system, scale-out file system, management software, and all related modules.
- 7.2.2.** All existing and future software features (protocols, analytics, APIs, CSI, support, etc.) must be included in the subscription/license during the covered term.
- 7.2.3.** Software support must include –
- 7.2.4.** No additional license cost shall be required for multi-protocol support (NFS, SMB, S3), cloud deployment, or container storage interface (CSI) integrations.

### **7.3. Security Compliance**

- 7.3.1.** Encryption features (AES-256, data-at-rest, data-in-transit, replication) must be licensed and activated by default.
- 7.3.2.** FIPS 140-2 certification must be supported and validated.
- 7.3.3.** Support for key rotation and integration with DAR's key management policies must be included in the license.

### **7.4. Support and Service Level Agreement (SLA) – The Contractor shall provide –**

- 7.4.1.** 24x7 vendor support with a dedicated Customer Success Manager (CSM) and a slack support channel for DAR.
- 7.4.2.** Guaranteed next-business-day (NBD) on-site support or better.
- 7.4.3.** Preventive maintenance visits and system health checks, at least twice per year.

## **SECTION 8: BIDDER'S QUALIFICATION**

- 8.1.** Legally registered entity in the Philippines.
- 8.2.** At least five (5) years experience in supplying and implementing ICT/security solutions.
- 8.3.** Authorized reseller or distributor certification for the offered Storage System.
- 8.4.** Must have completed at least one (1) similar project equivalent to 50% of the ABC.

## **SECTION 9: MANPOWER REQUIREMENTS**

The Contractor shall provide the necessary technical manpower to ensure successful implementation, deployment, and support of the DAR Centralized Scale-Out Storage Solution. The team must have relevant certifications and proven experience in handling large-scale storage systems, enterprise IT infrastructure, and government ICT projects.

### **9.1. Minimum Personnel Requirements**

#### **9.1.1. Project Manager (1)**

- 9.1.1.1.** Responsible for overall project delivery, coordination with DAR-MISS, and compliance with project timelines and requirements.
- 9.1.1.2.** Must have at least **five (5) years of project management experience** in ICT infrastructure projects.
- 9.1.1.3.** Preferably **PMP, PRINCE2, or ITIL certified**.

#### **9.1.2. Lead Storage Engineer (1)**

- 9.1.2.1.** Responsible for design, deployment, and configuration of the scale-out storage system.
- 9.1.2.2.** Must have at least five (5) years experience in enterprise storage systems (NAS, SAN, Object Storage).
- 9.1.2.3.** Must hold relevant vendor certifications.

#### **9.1.3. System/Network Engineer (1)**

- 9.1.3.1.** Responsible for integration of the storage system into DAR's existing infrastructure, ensuring compatibility with DMS, servers, and network environment.
- 9.1.3.2.** Must have at least three (3) years experience in enterprise networking and system integration.
- 9.1.3.3.** Must be proficient in NFS, SMB, S3 protocols, Active Directory/LDAP integration, and security hardening.

#### **9.1.4. Support Engineer (1)**

- 9.1.4.1. Provides on-site/remote troubleshooting, health checks, and preventive maintenance.
- 9.1.4.2. Must have at least two (2) years of experience in enterprise IT support.

**9.1.5. Trainer/Technical Documentation Specialist (1)**

- 9.1.5.1. Responsible for preparing training materials, conducting training sessions, and delivering system documentation.
- 9.1.5.2. Must have experience in enterprise system training and knowledge transfer.