AWS Cloud Storage Lab: Modeling Storage Solutions

Cloud Architecture Exercise

November 25, 2025

Overview

This laboratory exercise provides a comparative analysis of the primary storage services offered by Amazon Web Services (AWS): Simple Storage Service (S3), Elastic Block Store (EBS), and Elastic File System (EFS). Understanding the fundamental differences in access methods (object vs. block vs. file) and durability models is critical for designing scalable and cost-effective cloud architectures.

Objective

Master the selection criteria for AWS storage services by implementing the following requirements:

1. Differentiating the core functionalities and access patterns of AWS S3, EBS, and EFS.
2. Identifying appropriate use cases for each service based on performance, durability, and concurrency needs.
3. Defining the concept of **shared storage** versus **instance-specific storage** within the cloud.

Concepts Covered

This lab focuses on the three foundational pillars of AWS storage:

1. **Object Storage (S3):** Unlimited scalability, high durability, and accessed via HTTP APIs. Best suited for unstructured data.
2. **Block Storage (EBS):** High-performance storage volumes persistently attached to a single EC2 instance. Ideal for operating systems and transactional databases.
3. **File Storage (EFS):** A managed Network File System (NFS) that provides scalable, shared file access across multiple EC2 instances concurrently.

Use Cases and Selection Criteria

Reflection

Understanding the distinction between object, block, and file storage paradigms is essential for effective cloud resource provisioning. Block storage (EBS) is tightly coupled to a single compute instance, acting like a local disk drive, which is necessary for traditional operating systems

Table 1: Comparison of Primary AWS Storage Services

Service	Access Type	Primary Use Cases
S3	Object (API/HTTP)	Data backups, static websites, data lake storage.
EBS	Block (Device/OS)	Boot volumes for EC2, relational databases, high-performance application
EFS	File (NFS Protocol)	Content management systems, shared configuration files, media processi

and databases. Conversely, file storage (EFS) facilitates highly available, shared data access for multiple servers, while object storage (S3) provides massive, highly durable, and cost-effective storage for unstructured data and large-scale archives. Selecting the correct storage primitive directly impacts application performance, reliability, and cost efficiency.