Azure Storage Services

Introduction

Azure Storage is a cloud-based storage solution provided by Microsoft Azure. It offers scalable, durable, and highly available storage for different types of data. Depending on the type of application or data, Azure provides multiple storage options. The four major ones are **Blob Storage, File Storage, Table Storage, and Queue Storage**. Each serves a different purpose and is optimized for a specific workload.

Azure Blob Storage

- Blob stands for **Binary Large Object**. Blob storage is used to store large amounts of unstructured data, such as text, images, audio, video, and backups.
- **Types of Blobs:**
    - Block Blobs (best for documents, media files).
    - Append Blobs (best for logging data).
    - Page Blobs (best for virtual hard drives).
- **Use Cases:**
    - Storing photos, videos, and documents.
    - Big data analytics.
    - Backup and disaster recovery.

Example: Uploading user profile pictures or storing log files from an application.

Azure File Storage

- Azure Files provides **fully managed shared storage in the cloud**, accessible using the **Server Message Block (SMB)** protocol. This means multiple machines can mount it like a normal network drive.
- **Key Features:**
    - Supports SMB protocol and REST API.

    - Can replace on-premises file servers.
    - Easy lift-and-shift for applications.
- **Use Cases:**
    - File shares across applications.
    - Shared configuration files.
    - Migrating existing apps without rewriting them.

Example: Multiple virtual machines sharing the same set of configuration files stored in Azure Files.

Azure Table Storage

- Table Storage is a **NoSQL key-value store** for structured, non-relational data. It is schema-less and highly scalable.
- **Key Features:**
    - Stores massive amounts of structured data.
    - Fast access using keys (PartitionKey + RowKey).
    - Low-cost and scalable.
- **Use Cases:**
    - User profiles.
    - IoT device data storage.
    - Metadata for web applications.

Example: Storing customer order history in a structured but flexible way without needing a traditional SQL database.

Azure Queue Storage

- Queue Storage provides a **messaging system** between components of an application. It stores messages that can be accessed asynchronously by different services.
- **Key Features:**
    - Message size up to 64 KB.
    - Millions of messages can be stored.

- Reliable communication between app components.

- **Use Cases:**
  - Decoupling front-end and back-end systems.
  - Job scheduling (queue messages for workers to process).
  - Distributed applications.

Example: A shopping website adds customer orders to a queue; background services then pick up the orders for processing.