Azure Storage Accounts and Services – Overview

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1. 🔹 Introduction to Azure Storage

Azure Storage is a Microsoft-managed cloud storage solution that provides scalable, durable, and highly available storage for a wide range of data objects. It supports all modern cloud storage scenarios, such as:

- Storing data for websites and applications
- Backups and disaster recovery
- Archiving
- Big data analytics

Azure Storage is accessible via REST APIs and SDKs for multiple platforms (.NET, Java, Python, etc.).

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2. 🔸 Azure Storage Account

✅ What is a Storage Account?

An **Azure Storage Account** is a container that gives you access to Azure Storage services. It acts as a namespace for your storage data and allows you to manage and secure your storage resources.

Every storage account has a unique name and endpoint, e.g.:

https://<storage_account_name>.blob.core.windows.net/

✅ Types of Storage Accounts

Type	Description
General-purpose v2 (GPv2)	Supports all storage types (Blob, File, Table, Queue) with all features
General-purpose v1 (GPv1)	Legacy accounts, limited features and pricing flexibility
Blob Storage Account	Optimized specifically for storing blob data
BlockBlobStorage Account	Premium performance tier for block blobs
FileStorage Account	Premium performance tier for file shares
Azure Data Lake Storage	Hierarchical namespace for big data analytics (based on Blob Storage)

💡 *Use GPv2 unless there's a specific use case for other types.*

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3. 🔸 Azure Storage Services

Azure provides different types of storage services under the storage account umbrella:

✅ 1. Blob Storage

Use Case: Unstructured data like documents, images, videos, backups.

- **Blob Types:**
    - **Block Blobs:** For files and media
    - **Append Blobs:** Optimized for logs and append operations
    - **Page Blobs:** Used by Azure VM disks
- **Features:**
    - REST API access
    - Lifecycle management
    - Tiered storage (Hot, Cool, Archive)

✅ 2. File Storage

Use Case: File shares accessible via SMB protocol – suitable for lift-and-shift scenarios.

- Supports **Azure File Sync** for hybrid file server scenarios.
- Supports both **Standard (HDD-backed)** and **Premium (SSD-backed)** tiers.

✅ 3. Queue Storage

Use Case: Messaging and decoupling between application components.

- Simple message-based communication
- FIFO (First In, First Out) model

- REST-based interface

✅ 4. Table Storage

Use Case: NoSQL key-value store for structured, non-relational data.

- Scalable, schema-less storage
- Azure Cosmos DB Table API offers premium capabilities (e.g., global distribution)

✅ 5. Disk Storage

Use Case: Persistent disks for Azure Virtual Machines.

- Managed Disks (Standard HDD, Standard SSD, Premium SSD, Ultra Disk)
- Snapshots and backup support
- Integration with VM high availability

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4. 🔹 Storage Tiers

Azure Blob Storage offers tiered storage based on access frequency:

Tier	Description	Use Case
Hot	Frequently accessed data	Active files, media
Cool	Infrequently accessed, stored for ≥30 days	Backups, older data

Archive	Rarely accessed, stored for ≥180 days	Archival, compliance

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5. 🔸 Redundancy Options

Azure provides redundancy options to ensure high availability and disaster recovery:

Type	Description
LRS (Locally Redundant Storage)	3 copies within a single datacenter
ZRS (Zone-Redundant Storage)	Replicated across 3 AZs in the same region
GRS (Geo-Redundant Storage)	LRS + replication to a secondary region
GZRS (Geo-Zone-Redundant Storage)	ZRS + replication to a secondary region
RA-GRS	Read-access enabled GRS for disaster recovery scenarios

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6. 🔒 Security Features

Azure Storage includes multiple layers of security:

- **Encryption at rest** (using Microsoft-managed or customer-managed keys)
- **Encryption in transit** (HTTPS enforced)
- **Shared Access Signatures (SAS)**
- **Azure AD Integration** for RBAC
- **Private Endpoints** for secure access
- **Firewalls and Virtual Networks**

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7. 🛠️ Use Cases

Scenario	Azure Storage Feature
Hosting images/videos	Blob Storage
Application state management	Table Storage / Queue Storage
File shares for legacy applications	File Storage
VM disks	Disk Storage
Archival of compliance data	Blob Archive Tier

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8. 💰 Pricing Considerations

Costs depend on:

- Storage capacity (GB/month)
- Operations (read/write/delete)
- Data retrieval and transfer
- Redundancy level (LRS, GRS, etc.)
- Performance tier (Standard vs. Premium)

👉 Use the Azure Pricing Calculator to estimate costs.

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9. ✅ Best Practices

- Use **GPv2** accounts for flexibility.
- Use **ZRS or GZRS** for high availability.
- Implement **SAS tokens** for secure temporary access.
- Configure **lifecycle management** for cost optimization.
- Enable **Azure Monitor** and **Storage Analytics** for monitoring.
- Use **Private Endpoints** for secure internal access.

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10. 📌 Summary

Feature	Description
Scalability	Azure Storage can handle vast amounts of data across multiple services.
Security	Built-in encryption, access control, and compliance.
Durability	Multiple redundancy models ensure data resiliency.
Flexibility	Supports various data types and storage tiers for different workloads.

📎 Further Reading

- Azure Storage Documentation
- Azure Storage Explorer Tool
- Azure Storage Security Guide