# Azure Storage Services

- Azure Storage Services are highly scalable, durable, and secure cloud storage solutions.

- The key storage types, use cases, and step-by-step practical examples using Azure CLI are presented in next slide

# 1.Azure Blob Storage (For Unstructured Data)

What is Blob Storage?

- Azure Blob Storage is for storing unstructured data like images, videos, backups, and logs.

It supports three types of blobs:

- Block Blob (default) is used for larger objects, like documents or videos.
- Append Blob is optimized for append operations; useful for logging.
- Page Blob is used for virtual machine disks.

## Example Use Case: Uploading a File to Blob Storage

### Step 1: Create a Storage Account

```
az storage account create \
--name mystorageaccount \
--resource-group StorageRG \
--location eastus \
--sku Standard_LRS
```

### Step 2: Create a Blob Container

```
az storage container create \
 --name mycontainer \
--account-name mystorageaccount
```

### Step 3: Upload a File to Blob Storage

```
az storage blob upload \
--container-name mycontainer \
--file myimage.jpg \
--name myimage.jpg \
--account-name mystorageaccount
```

### Step 4: Generate a Public URL for Access

```
az storage blob url \
--container-name mycontainer \
--name myimage.jpg \
--account-name mystorageaccount
```

**Use Case: Backup, images, videos, and logs.**

# 2.Azure Table Storage (For NoSQL Data)

## What is Table Storage?

- Azure Table Storage is a NoSQL key-value store optimized for storing large amounts of structured data.
- It is useful for storing logs, metadata, and IoT data.

## Practical Example: Insert and Query Data in Table Storage

### Step 1: Create a Table

```
az storage table create \
--name MyTable \
--account-name mystorageaccount
```

### Step 2: Insert Data into the Table

```
az storage entity insert  \
--table-name MyTable  \
--account-name mystorageaccount \
 --entity PartitionKey=Users RowKey=1 Name=John
Age=30
```

### Step 3: Query Data

```
 az storage entity query \
 --table-name MyTable \
--account-name mystorageaccount
```

**Use Case: Store IoT telemetry data, logs, and non-relational structured data.**

# 3. Azure File Storage (For Shared File Systems)

## What is File Storage?

- Azure File Storage offers a fully managed file share that can either be mounted in the cloud or on-premises.

- It supports the SMB protocol, that makes it simple to integrate with Windows and Linux systems.

## Practical Example: Mount an Azure File Share on Linux

### Step 1: Create a File Share

```
az storage share create \
    --name myfileshare \
    --account-name mystorageaccount
```

### Step 2: Upload a File to Azure File Share

```
az storage file upload \
    --share-name myfileshare \
    --source mydocument.txt \
    --account-name mystorageaccount
```

### Step 3: Mount the File Share on a Linux Machine

```
sudo mkdir /mnt/azurefileshare
sudo mount -t cifs
//mystorageaccount.file.core.windows.net/myfileshare
/mnt/azurefileshare \
    -o
vers=3.0,username=mystorageaccount,password=
<storage-key>,dir_mode=0777,file_mode=0777
```

**Use Case: Centralised file sharing between multiple applications or teams**.

# Azure Disk Storage (For Virtual Machines)

What is Disk Storage?

Disk storage is persistent, high-performance storage for virtual machines.

It is available in four varieties:

- Ultra Disk (for high IOPS workloads)
- Premium SSD (for high-performance applications)
- Standard SSD (for general-purpose workloads)
- Standard HDD (for cost-effective workloads)

## Practical Example: Attach a Managed Disk to a VM

### Step 1: Create a Managed Disk

```
az disk create \
    --resource-group StorageRG \
    --name mydatadisk \
    --size-gb 50
    --sku Premium_LRS
```

### Step 2: Attach the Disk to a Virtual Machine

```
az vm disk attach  \
    --resource-group StorageRG  \
    --vm-name MyVM  \
    --name mydatadisk
```

### Step 3: Connect to the VM and Format the Disk

```
sudo mkfs -t ext4 /dev/sdc
sudo mkdir /mnt/datadisk
sudo mount /dev/sdc /mnt/datadisk
```

**Use Case: Persistent storage for databases and high-performance applications.**

# Comparison of Azure Storage Services

| Feature | Blob Storage | Table Storage | File Storage | Disk Storage |
|---|---|---|---|---|
| Type | Object storage | NoSQL key-value store | Shared file system | VM-attached storage |
| Best For | Images, backups, logs | IoT, telemetry, logs | Centralized file share | Virtual machine disks |
| Access | REST API, Azure SDK | REST API, Azure SDK | SMB, NFS, REST API | Attached to VM |
| Scalability | Petabytes of data | Large-scale datasets | Multiple VM access | Dependent on VM size |