Azure Storage

Azure Storage Types

- Azure Blobs
- Azure Files
- Azure Queues
- Azure Tables
- Azure Disks

Azure Disks

- Azure Managed disks are block-storage volumes
- Used with Virtual Machines

Types of Disks

- Ultra Disks
- Solid State Drive (SSD)
- Standard Hard Drive(HDD)

Ultra Disks

- Highest-performing storage option for Azure VM's
- We can change the performance parameters without restarting the VM
- Suited for Data intensive workloads such as SAP HANA, transaction heavy work loads
- Ultra disks must be used as data disks and can only be created as empty disks. You should use Premium solid-state drives (SSDs) as operating system (OS) disks.
- Azure ultra disks offer up to 32-TiB per region per subscription by default
- Ultra disks support IOPS limits of 300 IOPS/GiB, up to a maximum of 160,000 IOPS per disk

Disk Size (GiB)	IOPS Cap	Throughput Cap (MBps)
4	1,200	300
8	2,400	600
16	4,800	1,200
32	9,600	2,400
64	19,200	4,000
128	38,400	4,000
256	76,800	4,000
512	153,600	4,000
1,024-65,536 (sizes in this range increasing in increments of 1 TiB)	160,000	4,000

Premium SSD V2

- Designed for IO-intense enterprise workloads that require consistent sub-millisecond disk latencies and high IOPS and throughput at a low cost
- Premium SSD v2 is suited for a broad range of workloads such as SQL server, Oracle, MariaDB, SAP, Cassandra, Mongo DB, big data/analytics, and gaming, on virtual machines or stateful containers
- Premium SSD v2 disks can't be used as an OS disk
- Currently, taking snapshots aren't supported, and you can't create a Premium SSD v2 from the snapshot of another disk type
- Azure Disk Encryption isn't supported for VMs with Premium SSD v2 disks
- Currently, Premium SSD v2 disks can't be attached to VMs in Availability Sets

Regional availability

Currently only available in the following regions:

- US East
- West Europe

Disk Size	Maximum available IOPS
1 GiB-64 TiBs	3,000-80,000 (Increases by 500 IOPS per GiB)

Premium SSD and Premium SSD v2

- Unlike Premium SSDs, Premium SSD v2 doesn't have dedicated sizes
- You can set a Premium SSD v2 to any supported size you prefer
- Premium SSD v2 doesn't support host caching

Standard SSD

- Azure standard SSDs are optimized for workloads that need consistent performance at lower IOPS levels
- They're an especially good choice for customers with varying workloads supported by on-premises hard disk drive (HDD) solutions
- Compared to standard HDDs, standard SSDs deliver better availability, consistency, reliability, and latency.
- Standard SSDs are suitable for web servers, low IOPS application servers, lightly used enterprise applications, and non-production workloads. Like standard HDDs, standard SSDs are available on all Azure VMs.

Billing

When using managed disks, the following billing considerations apply:

- Disk type
- Managed disk Size
- Snapshots
- Outbound data transfers
- Number of transactions

Disk Redundancy

- LRS
- ZRS

Locally-Redundant Storage(LRS)

- Replicates your data three times within a single datacenter in the selected region
- LRS protects your data against server rack and drive failures
- LRS disks provide at least 99.999999999% (11 9's) of durability over a given year

Failover Plan:

- Use applications that can synchronously write data to two zones, and automatically failover to another zone during a disaster
- Take frequent backups of LRS disks with ZRS snapshots
- Enable cross-zone disaster recovery for LRS disks via Azure Site Recovery.

ZRS- Zone Redundant Storage

- Zone-redundant storage (ZRS) synchronously replicates your Azure managed disk across three Azure availability zones in the region you select
- Each availability zone is a separate physical location with independent power, cooling, and networking

Limitations

- Only supported with premium solid-state drives (SSD) managed disks and standard SSDs.
- Currently available only in the West US 2, West Europe, North Europe, and France Central regions.

Azure Blob Storage

- Azure Blob Storage is Microsoft's object storage solution for the cloud
- Blob Storage is optimized for storing massive amounts of unstructured data
- Unstructured data is data that doesn't adhere to a particular data model or definition, such as text or binary data.

Azure Blob Storage

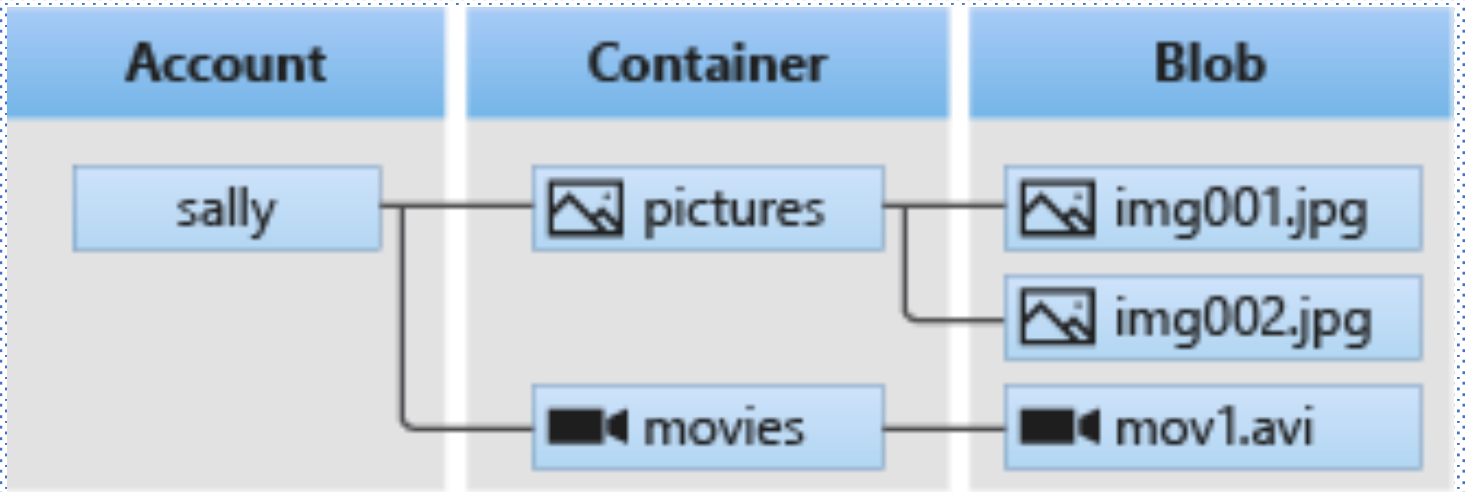
Blob Storage is designed for:

- Serving images or documents directly to a browser.
- Storing files for distributed access.
- Streaming video and audio.
- Writing to log files.
- Storing data for backup and restore, disaster recovery, and archiving.
- Storing data for analysis by an on-premises or Azure-hosted service

Blob Storage Resources

Blob Storage offers three types of resources:

- The **storage account**
- A **container** in the storage account
- A **blob** in a container



Storage accounts

- A storage account provides a unique namespace in Azure for your data
- Every object that you store in Azure Storage has an address that includes your unique account name
- The combination of the account name and the Blob Storage endpoint forms the base address for the objects in your storage account.
- For example, if your storage account is named *mystorageaccount*, then the default endpoint for Blob Storage is:

```
http://mystorageaccount.blob.core.windows.net
```

Storage Account Types

Type of storage account	Performance tier	Usage
General-purpose v2	Standard	Standard storage account type for blobs, file shares, queues, and tables. Recommended for most scenarios using Blob Storage or one of the other Azure Storage services.
Block blob	Premium	Premium storage account type for block blobs and append blobs. Recommended for scenarios with high transaction rates or that use smaller objects or require consistently low storage latency. Learn more about workloads for premium block blob accounts...
Page blob	Premium	Premium storage account type for page blobs only. Learn more about workloads for premium page blob accounts...

Containers

- A container organizes a set of blobs, similar to a directory in a file system.
- A storage account can include an unlimited number of containers, and a container can store an unlimited number of blobs.

- A container name must be a valid DNS name, as it forms part of the unique URI used to address the container or its blobs

```
https://myaccount.blob.core.windows.net/mycontainer
```

  - Container names can be between 3 and 63 characters long.
  - Container names must start with a letter or number, and can contain only lowercase letters, numbers, and the dash (-) character.
  - Two or more consecutive dash characters aren't permitted in container names.

Blobs

Azure Storage supports three types of blobs:

- **Block blobs** store text and binary data. Block blobs are made up of blocks of data that can be managed individually. Block blobs can store up to about 190.7 TiB.
- **Append blobs** are made up of blocks like block blobs, but are optimized for append operations. Append blobs are ideal for scenarios such as logging data from virtual machines.
- **Page blobs** store random access files up to 8 TiB in size. Page blobs store virtual hard drive (VHD) files and serve as disks for Azure virtual machines.