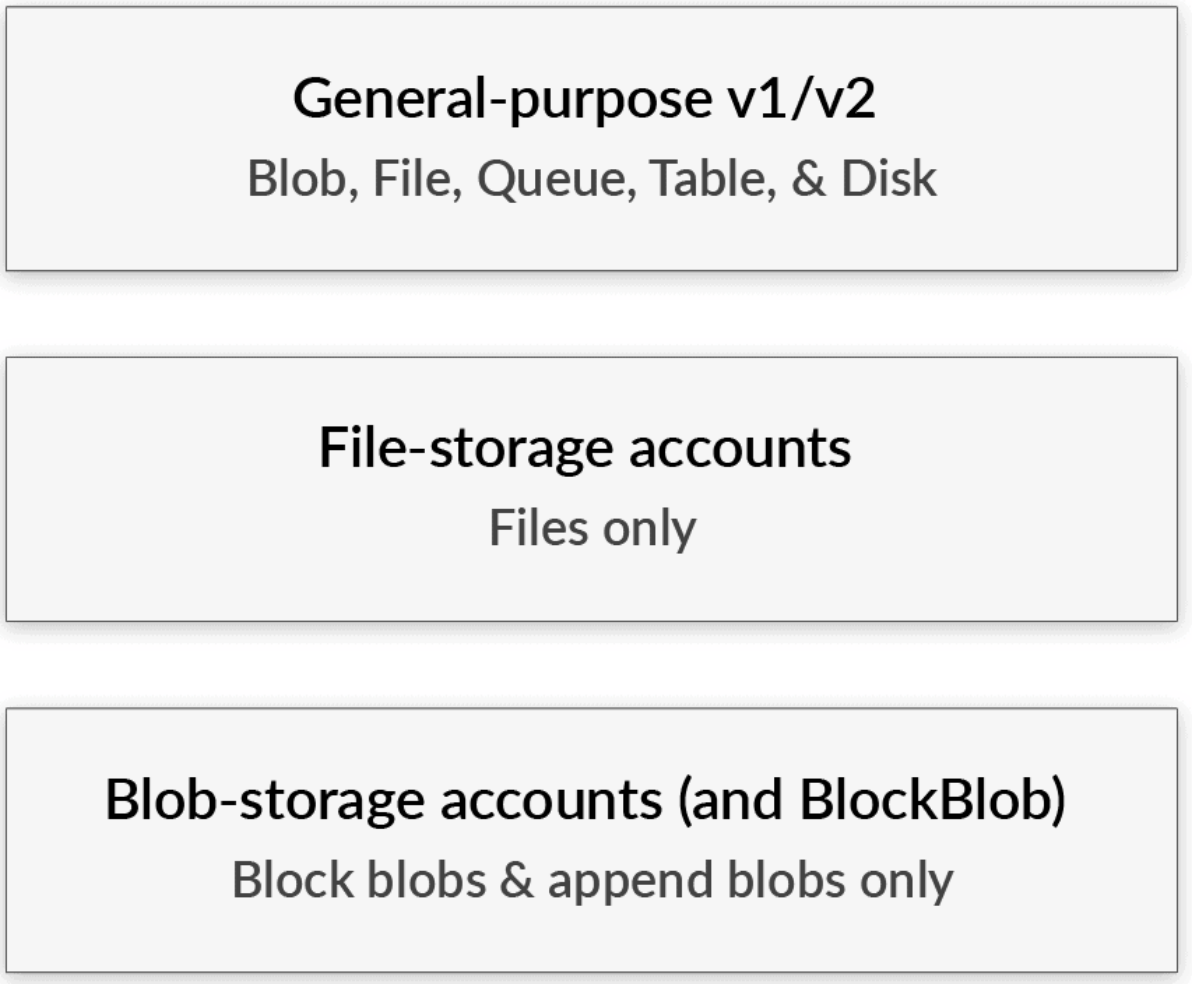
Azure Storage Accounts

What is Azure storage account?

The Azure storage account is durable, highly available and scalable. By using Azure storage account services, we don't need to worry about space because it will be scaled upon our demand. The Azure storage account is a container that groups a set of Azure storage services together. Only data services from Azure storage can be included in a storage account.

Storage account in Azure is a method of creating storage service for storing data in it. It contains all the all azure storage objects decided to single resource group. It contains Blob, queue, tables and files with disk images. It uniquely provides namespace and service access to functions of storage.



Storage Account types

Storage type defines the methodology for storing data in Azure infrastructure. it gives the solution to question what type and how to store data in Azure.

There are two Groups of storage account :

A) Accessible via REST API: Queue storage, table storage, Blob storage
B) Designed for Microsoft Azure Virtual machines: File storage, Disk storage.

Storage Account Type	Supported Services	Supported Performance Tiers	Replication Options
BlobStorage	Blob (block blobs and append blobs only)	Standard	LRS, GRS, RA-GRS
General-purpose VI	Blob, File, Queue, Table, and Disk	Standard premium	LRS, GRS, RA-GRS
General-purpose V2	Blob, File, Queue, Table, and Disk	Standard premium	LRS, GRS, RA-GRS, ZRS, ZGRS (preview), RA-ZGRS (preview)
Block blob storage	Blob (block blobs and append blobs only)	premium	LRS, ZRS (limited regions)
FileStorage	Files only	premium	LRS, ZRS (limited regions)

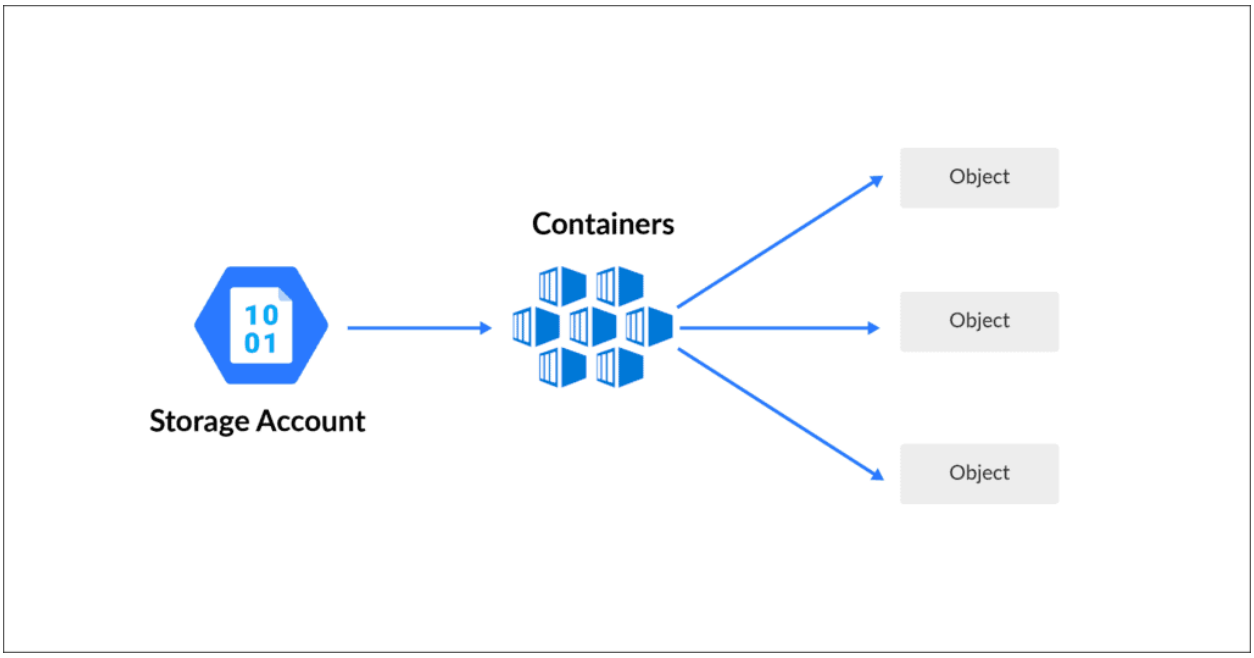
Azure Storage Services

The basis of Microsoft Azure storage account is, of course, the storage type you need to choose. The type is defining **how** you store **what** and **which** options and features you can use. There are five storage types in Microsoft Azure and they can be divided into two groups by their design.

A) Azure Blob Storage

When a file is stored in block blob – it means that it reached on the storage in chunks and only after completion of the upload – the blob puts itself together in a single chunk. With that architecture, the file cannot be modified without a complete re-upload. This is the most basic and the cheapest way to store your files in Azure.

1. It is an object storage solution in Azure.
2. It is used to storing unstructured data.
3. This is ideal when you have storage solutions for file, videos, log files and images
4. It has different tier levels:
1.
    1. **Hot storage tier**: It is ideal for objects that are accessed frequently
    2. **Cool storage tier:** It is optimized for data that are infrequently accessed. This is a less expensive option than the hot storage tier
    3. **Achieve storage tier:** It is optimized for data that is rarely accessed. Mostly used for archive or backup data. It is the least expensive service

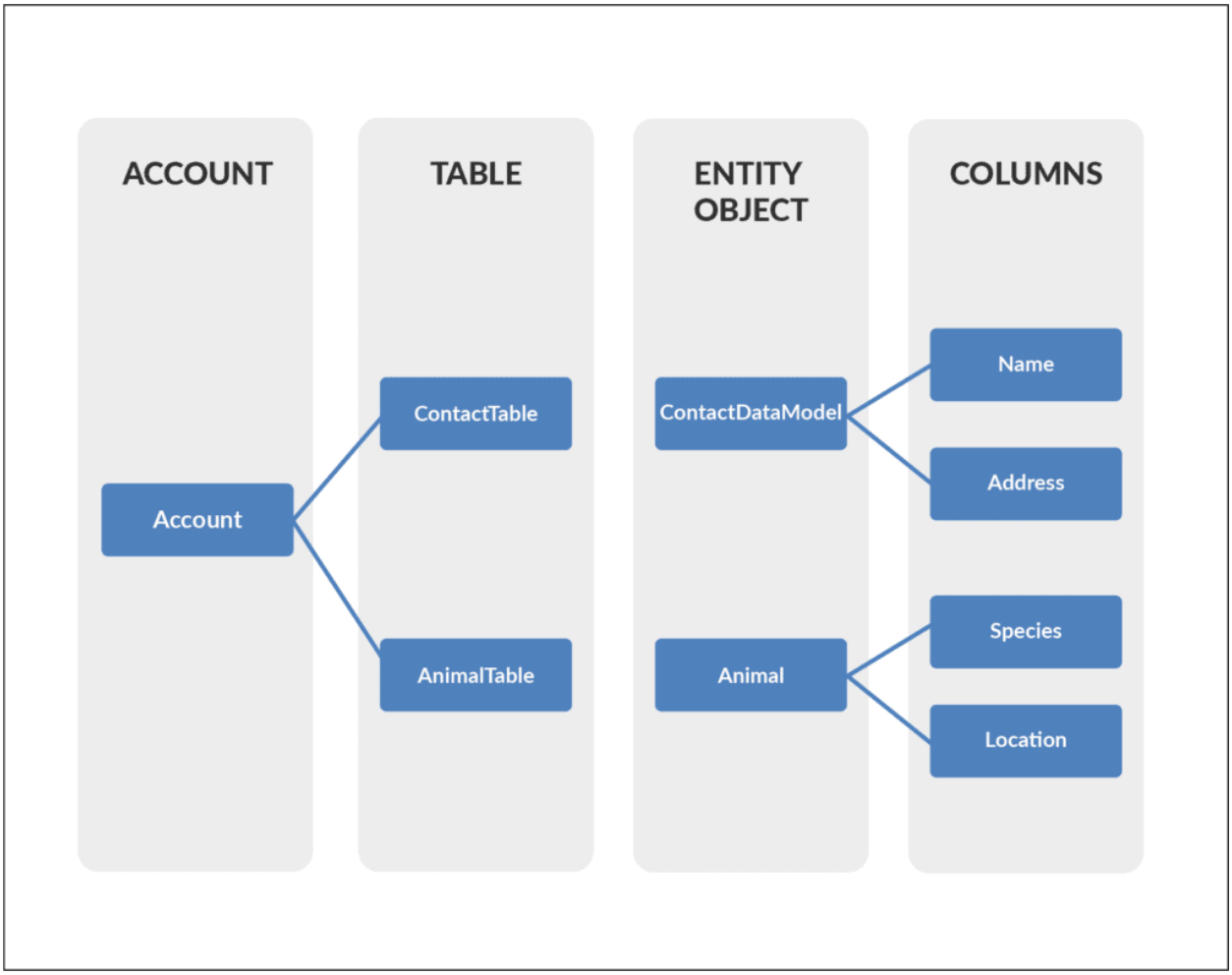


B) Azure Table Storage

Microsoft Azure Table Storage was made to store structured NoSQL data. The storage is very scalable and, at the same time, very cheap to keep data in. However, it set off more expensive when you access files frequently.

1. It is used for storing structured NoSQL data
2. It is a key attribute store
3. It is a cost-effective option for storage of table-like data for applications

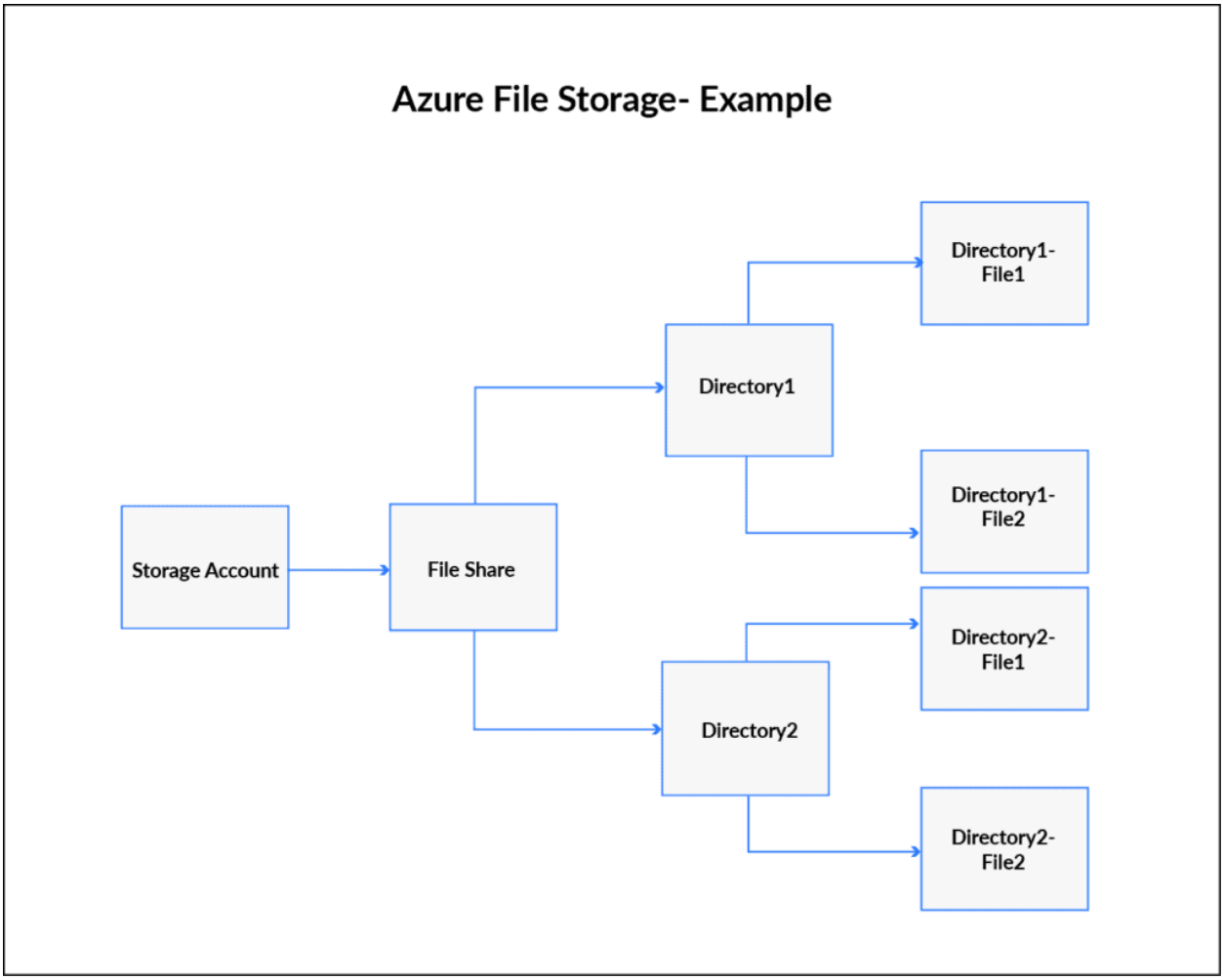
Instead of using SQL database to storing data, you can use Azure table storage in a more cost-effective manner



C) Azure File Storage

Microsoft Azure File storage is a type of Azure service that was designed to support the needs of the Azure VM environment. That storage is, in essence, a network share. You can store files there that can be accessed from different Virtual Machines. It is similar to Amazon EFS and is its direct competitor.

1. It allows for retrieval of files via the server message block protocol
2. Using file storage, you can mount file shares on Windows, Linux and Mac-based machines
3. Here you don't need to manage file servers



D) Azure Queue Storage

Queue Storage is a type of storage that is built to connect components of your application. It allows you to build flexible applications with decoupled and independent components that rely on asynchronous message queuing.

1. This service used for storage and retrieval of messages
2. This service is good when you want to decouple components of an application
3. A single message in the queue can be up to 64kb size
4. You can store millions of messages in the queue

4. Storage of virtual images

It is similar to OS **Images**, a VM **Image** is a collection of metadata and pointers to a set of VHDs (one VHD per disk) **stored** as page blobs in **Azure Storage**. This include disk and files. Files are fully managed by using file share in the cloud

A) Unstructured data

This includes blob and data lake store. Blobs are highly scalable. Data Lake is a Hadoop distributed file system as a service. The unstructured data is different than structured data in that its structure is

unpredictable. Documents, e-mails, blogs, digital images, videos, and satellite imagery all are examples of unstructured data. It also includes some data generated by machines or sensors.

B) Structured data

Cosmos DB, Azure SQL DB, Tables all handles structured data. Tables are key-value auto-scaling no value store, Cosmos DB is a globally distributed database service and Azure SQL DB is a fully-managed database as a service that is built on SQL. The structured data is referred to data that has a defined length and format for big data. Numbers, dates, and groups of words all are examples of structured data

5. Performance Tiers In Storage Account

A) Standard

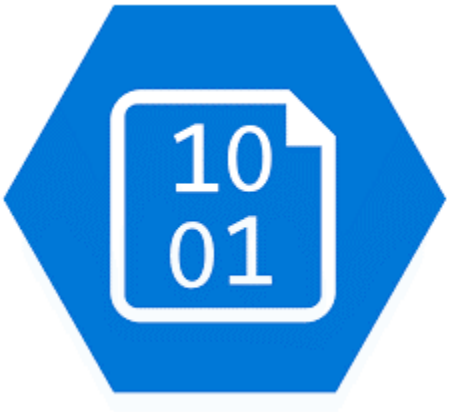
Standard storage is backed by magnetic hard drives like HDD and provides the lowest cost per GB. they are best for applications that required bulk of data storage where data is access infrequently because read-write speeds are less as compare to premium.

B) Premium

Premium storage accounts are backed by SSD (Solid-state drives) and offers low latency performance. They are mostly used with high-end systems and high-intensity applications like databases. You can not switch from standard storage account to premium storage account, you must create a new storage account with premium or standard base on your requirement and then copy the data

Azure Blob Storage

Binary **L**arge **Ob**ject is the storage arena for text, audio, images, and video. Every blob resides inside a container. Blob storage act as the persistent store, where the data is stored for a long time. Three options include Private, Public Container, and Public Blob.
One of the advantages of Blob Storage is that it offers zone-wise redundant processes. Different copies of data are created in the same zone or across two separate zones in a zone redundant. So, creating copies in two distinct zones helps in data recovery. If one of the zones faces any failure, then the Azure redundant process can still help retain data. It even allows data read options from another location.



There are many ways to access data in Blob Storage, for example, through Storage Explorer, by building an SDK tool kit or using PowerShell. With the help of PowerShell, we can also manage and supervise the Azure storage account.

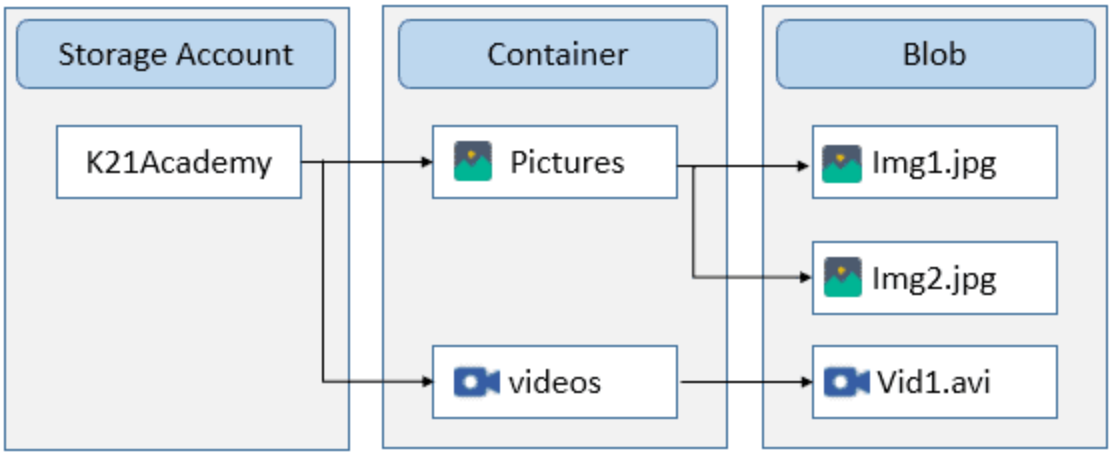
Blob Storage Features

The vital features of Blob Storage are as follows:

- **Store Unstructured Data –** All the unstructured data like images, videos, and audio can be stored in Blob.
- **Scalable and Availability –** It has a zone replication process that helps store the copy of data and stands on high availability characteristics.
- **Secured –** Blob provides utmost security by following encryption technology, RBAC, and Active Directory.
- **Data Lake Optimisation –** It also supports a multi-protocol access system that helps provide insights into the workloads. File namespace and WORM also help in optimising the data.
- **Cloud Applications –** Moreover, it is built keeping in mind the storage demand for developing mobile and web applications. Blob Storage also supports various languages such as Python, Java, Node.Js, and .Net. To conduct low-latency sessions, Blob is built with SSD storage toes.
- **Cost-effectiveness –** Blob storage contains different tiers that help store a massive amount of data in a cost-efficient manner. Due to its lifecycle management, it becomes easy to manage those huge volume data.

Resources of Blob Storage

Blob storage includes three types of resources explained below:



- **Storage Account** – In Storage Account, you specify the namespace for the data. Objects stored in Azure Storage will have unique address linked to the individual account.
- **Container** – It acts as a directory that helps establish and manage the blobs. The storage account can contain numerous containers, which can hold blobs of various range. Container's names are always specified in lowercases.
- **Blob** – Blobs are objects in the form of unstructured data, including images, audio, video, and files. The different solutions for migrating the data into the Azure Blob Storage include Azure Data Factory, AzCopy, BlobFuse, Azure service, Azure Data Box, etc.

Types of Blob Storage

There are three types of Blob Storage, as explained below:

- **Block Blobs** – In this storage option, individual blocks with unique IDs are created. It is mainly used for uploading big-size data. Block Blob stores data in block series and then conglomerate them into a single document file. Block Blob helps in achieving throughput and uploading the process faster. The size of the Block Blob is 200 GB.
- **Page Blobs** – They are the default type and used for page compilation. Page Blob is used for conducting a read and write operation. Data of the virtual machines are stored as virtual documents and files on the page blob. It can store files of size 8 TiB. For the virtual machine, it acts as disks.
- **Append Blobs** – The Append Blob is specifically customized to increase efficiency. It can also help in logging the data directly from the VMs.

Blob Storage Pricing

Hot Access – Data that is frequently used is stored in hot storage. It stores data utilized during migration processing. The storage cost is higher than Cool and Archive access but, the access cost is lower than the other two.

Cool Access – This tier helps store the data that is not accessed frequently. Its storage cost is lower, but the access cost is more than the Hot tier. It contains data that is going to stay for 30 days or more.
Archive Access – Data in this tier is stored for more than 180 days. The data stored in this tier are seldom accessed. It has a lower storage cost but a higher accessing cost. Also, it takes time while retrieving the data because data is often considered to be in offline mode.

Why Choose Azure Blob Storage?

Microsoft provides so many storage options, like File, Disk, Archive, etc. Hence it is necessary to understand when should one opt for Blob Storage. Here are the following instances:

- Azure Blob Storage is created for storing unstructured data. One can opt for Blob Storage for streaming audio and video files.
- Likewise, Blob storage is also used for storing data during backup, archiving, restoring, and recovering. Extensive volume data used for analysis by Azure services are also stored here.
- Similarly, one can go for Blob Storage when uploading large files. Azure Blob storage breaks the large files into smaller chunks, and these chunks get uploaded individually. After uploading these chunks, they get merged into a single initial file.
- Blob storage is also used to serve images directly to gateways.
- Azure Blob storage also allows the storage of files and documents for providing distributed access.
- In addition to it, it can also be used for off-loading excess content from the servers to minimise the load.
- It is also used for Big Data analysis by Azure Data Lake, an extension of Azure Blob Storage.