



Microsoft Azure Administrator Associate Training (AZ-103)

Module 2



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What is Azure CDN?



Benefits of Microsoft Azure Storage

Benefits of Azure Storage

Security

Azure provides top-notch security, as data stored or written in Azure Storage is encrypted. Azure Storage offers full control over who can and cannot access our data

Accessibility



Scalability

High availability

Benefits of Azure Storage



Security

Accessibility

Scalability

High availability

The data stored in Microsoft Azure Storage is made accessible over HTTP or HTTPS from anywhere in the world

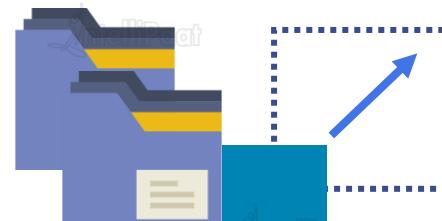


Benefits of Azure Storage

Security

Azure Storage is highly scalable in order to meet the on-demand requirements of modern applications

Accessibility



Scalability

High availability

Benefits of Azure Storage

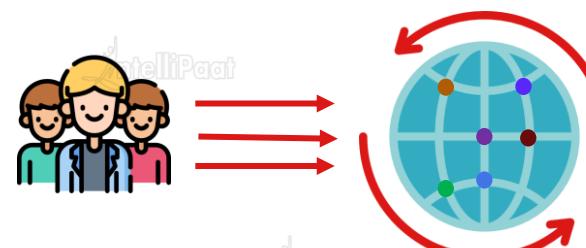
Security

Users are given the option of replicating their data in multiple data centers so that the data stays available even in the event of outages

Accessibility

Scalability

High availability

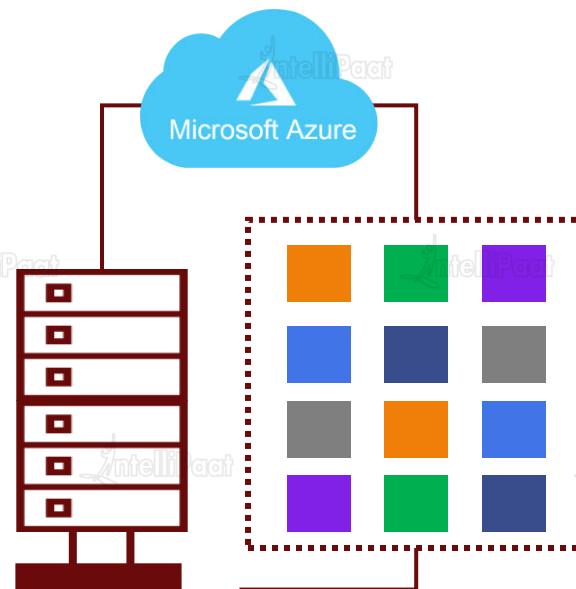




Introduction to Microsoft Azure Storage

Microsoft Azure Storage

Microsoft Azure Storage is an umbrella term that represents a suite of cloud-based, highly available and durable storage services that are fully managed by Microsoft and is curated for modern data storage scenarios



Microsoft Azure Storage

Microsoft Azure Storage is an umbrella term that represents a suite of cloud-based, highly available and durable storage services that are fully managed by Microsoft and is curated for modern data storage scenarios

This suite of cloud-based Microsoft-managed storage services mainly comprises four types of storage services in Azure:



Azure Blob
Storage



Azure Table
Storage



Azure Queue
Storage



Azure File
Storage



Overview of Storage Account

What is Azure Storage Account?

In order to use any type of Azure Storage, you will need to create an account first which is referred to as storage account

- Using this account, you will be able to manage and access the storage resources
- All your storage data, including blobs, files, queues, and tables, resides in your storage account
- The storage account provides a unique namespace for your storage data which will be accessible from anywhere in the world over HTTP and HTTPS



Types of Azure Storage Accounts

- General Purpose

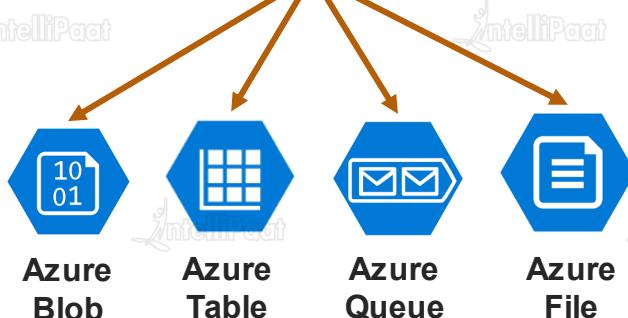
- Blob Storage

General Purpose Storage Account

Microsoft offers multiple type of storage accounts, each capable of handling different types of storage data.

General Purpose Storage account, as the name suggests, is a storage account that can store any type of storage data in general such as object data, NoSQL, queues or files.

General Purpose Storage Account



Blob Storage Account

Microsoft offers multiple type of storage accounts, each capable of handling different types of storage data.

As the name suggests, this is "**Blob-only**" storage account. Blob storage accounts also let you choose the access tier that suits you the best.



Blob Storage Account



Access Tiers

Hot

Cool

Access tier



Access tier is an option provided by Blob storage account that can be used to optimize the costs for using Azure storage based on how frequently the stored data is accessed. The access tier can be changed at any time by the user



Hot

Hot tier is typically used for storing data that is accessed regularly. This access tier provides low latency, and hence it's comparatively more expensive than cool tier



Cool

Cool tier is used to store less accessed data or archived data. Cool tier provides higher latency than hot tier which is why it's best suited for data that is not accessed frequently



Hands-on: Creating a Storage Account



Hands-on: Accessing Storage Account Using Azure Portal



Azure Blob Storage





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Why Blob Storage

Why Blob Storage



Blob Storages are usually used to store large Binary Files such as audio, video, text etc.

✓ Can be used to store data for archiving, backups, or restoring

✓ Can be used for serving images or documents directly to a given browser

✓ Can be used for writing log files



Azure Blob



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What is Azure Blob Storage



What is Azure Blob Storage

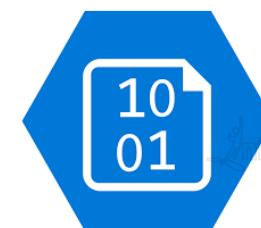
Azure Blob Storage is Microsoft's Object storage solution. Azure Blob is used to store unstructured data which means that it can be used to store data of any format such as document, video files, audio files, and more



Blobs is an abbreviation for Binary Large Objects



Stores data of any format for distributed access



Azure Blob



Hands-on: Create and Configure Azure Blob Storage

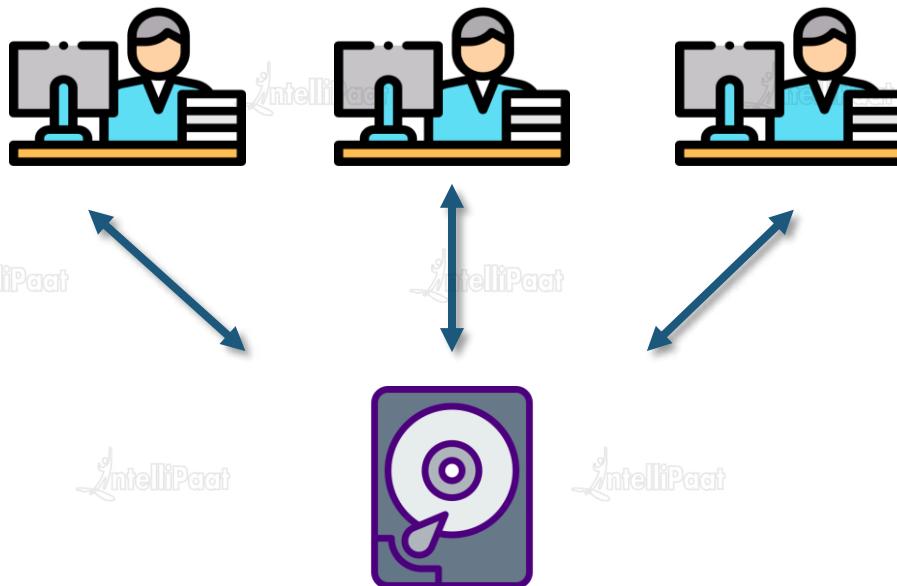


Azure File Storage



Why Azure File Storage?

Why Azure File Storage?



Azure File Storage is used when we want to share a common storage mount point among multiple computers

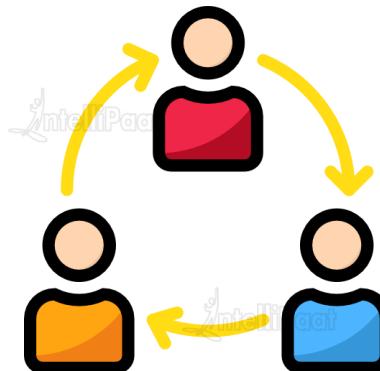
Why Azure File Storage?

Shared application settings

Diagnostic share

Dev./Test/Debug

We can store configuration files in a centralized location where they can be accessed from many application instances via File Rest API or SMB



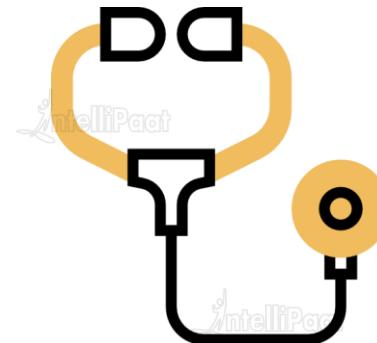
Why Azure File Storage?

Shared application settings

Diagnostic share

Dev./Test/Debug

You can have applications store their logs, metrics, and crash dumps in a File Share



Why Azure File Storage?

Shared application settings

Diagnostic share

Dev./Test/Debug

Azure File Storage can be used to store commonly used tools and utilities, which can then be accessed by developers and administrators.





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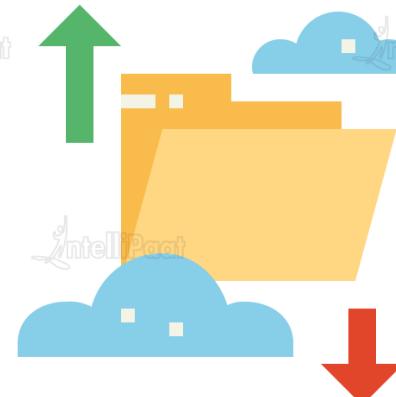


What is Azure File Storage?



What is Azure File Storage?

Azure File Storage is a Cloud Service that offers fully managed file shares in the cloud that are accessible via the Server Message Block (SMB) protocol. Azure file shares can be mounted concurrently by cloud or on-premises deployments of Windows, Linux, and macOS.

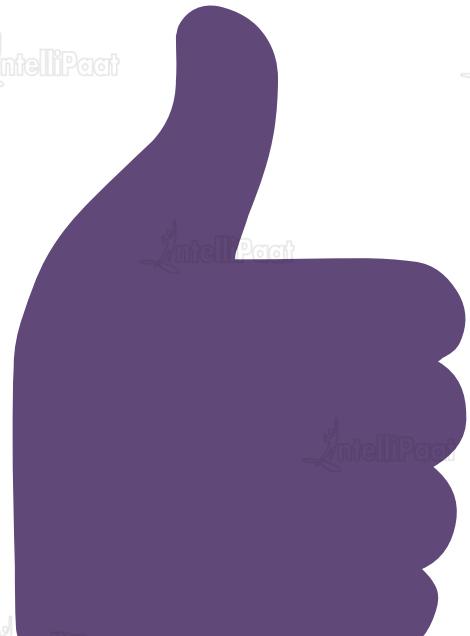




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Benefits of Azure File Storage

Benefits of Azure File Storage



Shared access: Since Azure file shares support SMB protocol, you can easily replace your on-premises file shares with Azure file shares



Fully managed: File shares can be created without the need to manage hardware or an OS



Resiliency: Azure files are extremely reliable and fault tolerant



Hands-on: Create Azure File Share



Hands-on: Connect to Azure File Share Using Windows PC



Hands-on: Connect to Azure File Share Using Linux PC



Azure Table Storage



Why Azure Table Storage?

Why Azure Table Storage?

01

Stores Structured NoSQL data in the cloud

02

Fast and cost-effective

03

Can be used to store flexible datasets

04

Can store any number of entities in a table

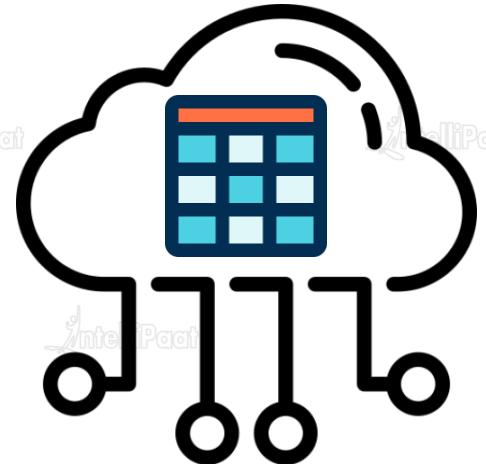


What is Azure Table Storage?

What is Azure Table Storage?



Azure Table Storage is an Azure Cloud Service that allows you to stores large amounts of structured data in a NoSQL Key Value Store. Azure tables are ideal for storing structured, non-relational data





When to Use Azure Table Storage?

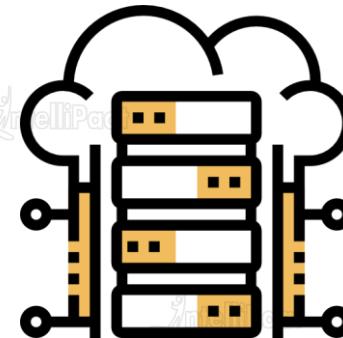
When to Use Azure Table Storage?

Large amount of data

De-normalized data

Fast access

Azure Table Storage is used to store large amounts (Terabytes) of data capable of serving web scale applications



When to Use Azure Table Storage?

Large amount of data

De-normalized data

Fast access

Azure Table Storage is used to store datasets that don't require complex joins, foreign keys, etc.



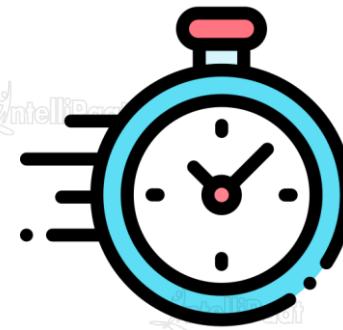
When to Use Azure Table Storage?

Large amount of data

De-normalized data

Fast access

Azure Table Storage is used in quickly querying data using a clustered index





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Azure Table Storage Concepts



Azure Table Storage Concepts



1 URL format

Azure Table Storage accounts use this URL format to be accessed:

http://<storage account>.table.core.windows.net/<table>

2 Accounts

All access to Azure Storage is done through a storage account

3 Table

A table is a collection of entities

5 Properties

A property is a key-value pair that is contained in an entity. Each entity has three system properties, these are: a partition key, a row key, and a timestamp. Entities with the same partition key can be queried more quickly

4 Entity

An entity is a set of properties, like a database row



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Azure Table Storage Keys

Azure Table Storage Keys

In Azure Table Storage system, every entity has a primary key. This primary key is a composite primary key that is made up of two parts:

1. Partition key

2. Row key



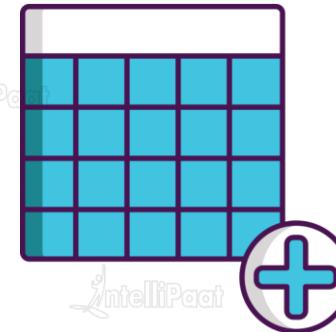
Azure Table Storage Keys

Partition key

A Partition key is used to partition a table to support load balancing

A Partition key is used to identify the partition that an entity belongs to

Row key



Azure Table Storage Keys

Partition key

Row key

A Row key is used to uniquely identify an entity (record) in a given partition

The Partition key and the Row key together form the primary key for the entity

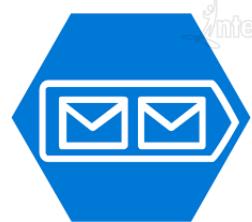




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Hands-on: Table Storage



Azure Storage Queue



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Why Storage Queues?

Why Storage Queue?

Storage Queues allow us put messages in them so other processes can read and process those messages. For e.g. a message might contain email address of newly signed up user. Other processes can take messages from the queue and send those messages emails.

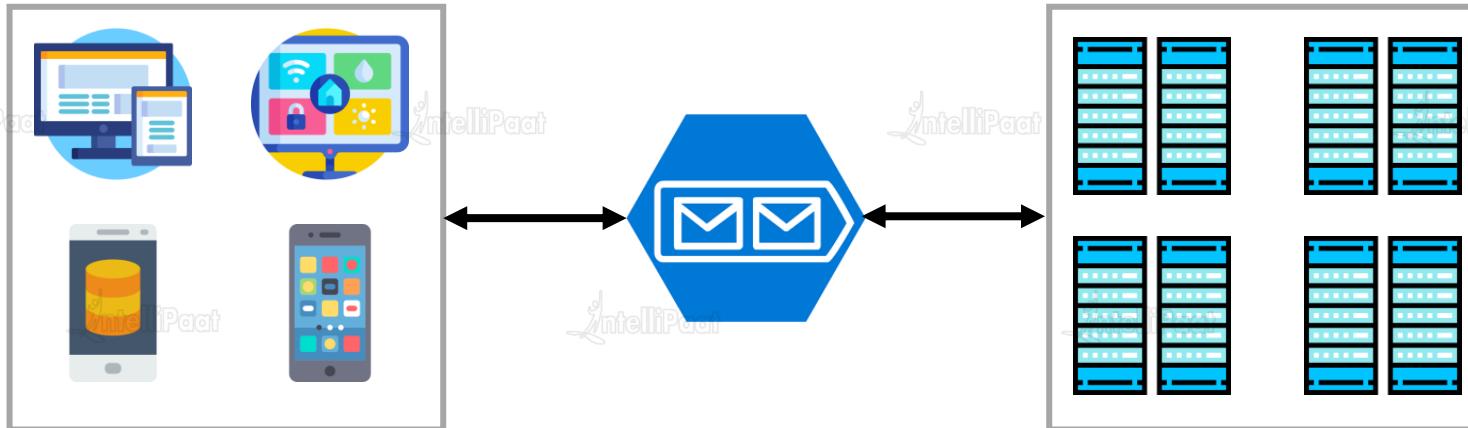




What are Storage Queues?

What is Azure Queue Storage?

Azure Queue storage is a service for storing large numbers of messages that can be accessed from anywhere in the world





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Queue Service Concepts

Queue Service Concepts



1 Accounts

All access to Azure Storage is done through a storage account

3 Queue

A queue contains a set of messages. The queue name must be in lowercase



2 URL format

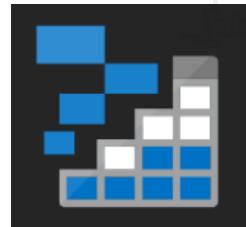
Queues are addressable using the following URL format: `https://<storage account>.queue.core.windows.net/<queue>`

4 Message

A message can be in any format and up to 64 KB. The maximum time-to-live allowed can be any positive number, or -1 indicating that the message doesn't expire. The default time-to-live is seven days.



Hands-On: Implement Azure Queues



Azure Storage Explorer



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What is Azure Storage Explorer?



Why Azure Storage Explorer?



01

Azure Storage Explorer is a standalone app that enables you to easily work with Azure Storage data on Windows, macOS, and Linux

02

It is free to download from Microsoft Website

03

You need to connect to your storage account via Azure Storage Explorer to be able to use it



What can you do with Azure Storage Explorer?

What can you do with Azure Storage Explorer?



Blob storage

View, delete, and copy Blobs and folders

Queue storage

Upload and download Blobs

Table storage

Manage snapshots for Blobs

File storage

What can you do with Azure Storage Explorer?



Blob storage

Queue storage

Table storage

File storage

Peek most recent 32 messages

View, add, and dequeue messages

Clear queue

What can you do with Azure Storage Explorer?



Blob storage

Queue storage

Table storage

File storage

Query entities with OData or query builder

Add, edit, and delete entities

Import and export tables and query results

What can you do with Azure Storage Explorer?



Blob storage

Queue storage

Table storage

File storage

Navigate files through directories

Upload, download, delete, and copy files and directories

View and edit file properties



Hands-On: Attach or Detach an External Storage Account



Hands-On: Access and Manage Azure Storage Services using Storage Explorer



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Azure Shared Access Signature





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Why Shared Access Signature?



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Why Shared Access Signature?

A shared access signature (SAS) is a token that grants restricted access rights to Azure Storage resources. With SAS, we can grant clients access to resources in our storage account, without sharing our account keys



Granting Access to clients
Using SAS

Clients Accessing
Resource Groups in
Storage Account



What is SAS in Blob Storage



Shared Access Signature



A shared access signature (SAS) is a secure token that allows you to specify the time span and permissions allowed for access to a storage resource such as a blob or container.

If you wish to grant someone access to a storage resource for a specified time you can generate an SAS token that the person or application will need to provide to gain access to the specified resource within the specified time.

SAS token

```
?sv=2018-03-28&ss=b&srt=sco&sp=r&se=2019-08-06T11:30:17Z&st=2019-08-06T11:03:17Z&sip=49.204.69.206&spr=https&sig=khwXjZag...
```



Demo: Use of SAS in Blob Storage



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Azure Storage Replication



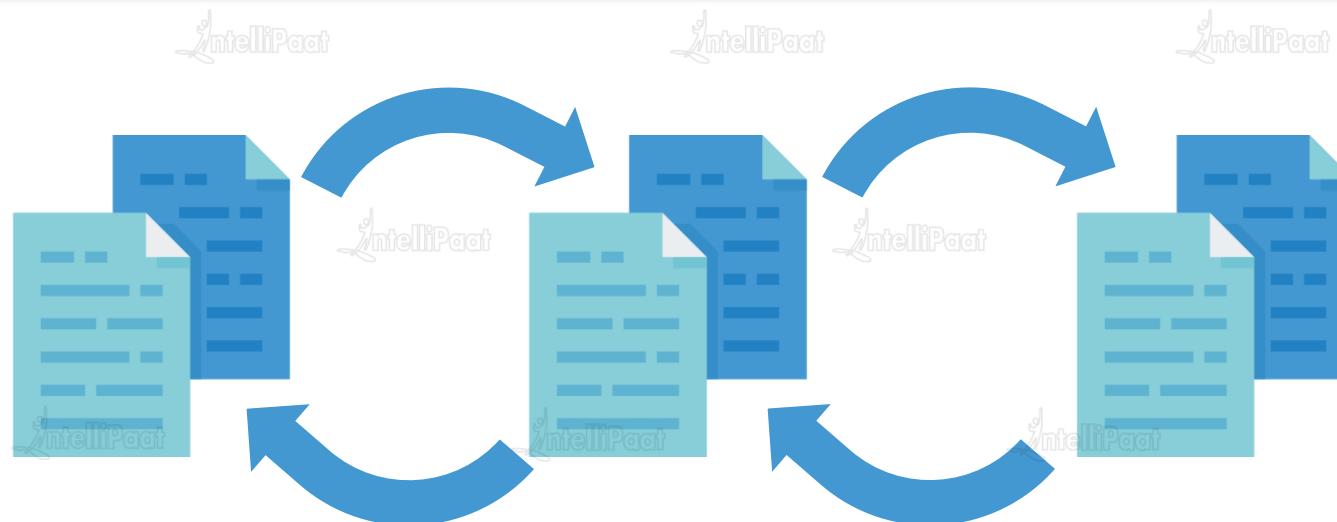
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Why Azure Storage Replication?

Why Azure Storage Replication?

Storage Replication ensures that you always have access to your data stored on Azure Storage even in the face of failures. Replication is how Azure Storage guarantees durability and availability





What is Azure Storage Replication?

What is Azure Storage Replication?



The data in your Microsoft Azure Storage account is always replicated to ensure durability and high availability

Azure Storage copies your data so that it is protected from planned and unplanned events, including hardware failures, network or power outages, and massive natural disasters

You can choose to replicate your data within the same data center, across zonal data centers within the same region, or across geographically separated regions



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Data Replication Options



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Data Replication Options

Locally redundant storage (LRS)

Replicates three copies of your data within the same data center where you have your data

Zone-redundant storage (ZRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)



Data Replication Options

Locally redundant storage (LRS)

Zone-redundant storage (ZRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)

Replicates your data synchronously across three storage clusters in a single region



Data Replication Options

Locally redundant storage (LRS)

Zone-redundant storage (ZRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)

Replicates your data to a secondary region that is hundreds of miles away from the primary region



Data Replication Options

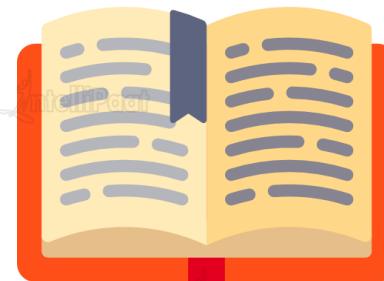
Locally redundant storage (LRS)

Zone-redundant storage (ZRS)

Geo-redundant storage (GRS)

Read-access geo-redundant storage (RA-GRS)

Provides read-only access to the data in the secondary location





Azure Import/Export Service



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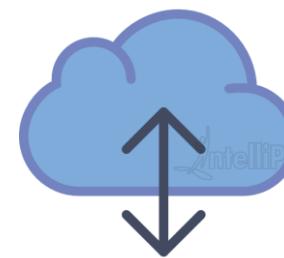
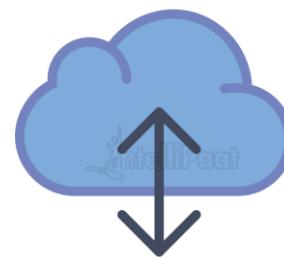
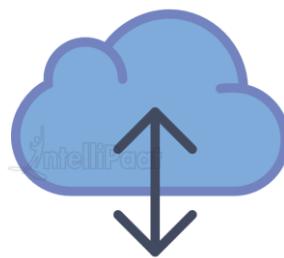
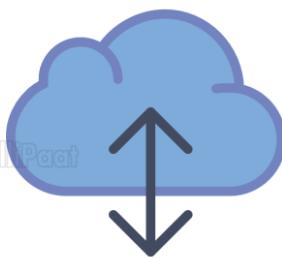


Why Azure Import/Export service?



Why Azure Import/Export service?

Transferring the data over the Internet can take days, weeks, or even months. To avoid this issue, Microsoft provides the Import/Export service where you ship your physical disks directly to Azure data center, and they will upload them for you





What is Azure Import/Export service?

What is Azure Import/Export Service?



Azure Import/Export service is used to securely import large amounts of data to Azure Blob Storage and Azure Files by shipping disk drives to an Azure data center

This service can also be used to transfer data from Azure Blob Storage to disk drives and ship to your on-premises sites

Data from one or more disk drives can be imported either to Azure Blob Storage or Azure Files

Supply your own disk drives and transfer data with the Azure Import/Export service. You can also use disk drives supplied by Microsoft



Azure Import/Export Use Cases

Azure Import/Export Use Cases



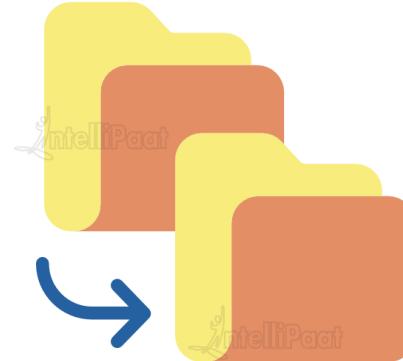
Data migration to the cloud

Content distribution

Backup

Data recovery

Move large amounts of data to Azure quickly and cost effectively



Azure Import/Export Use Cases

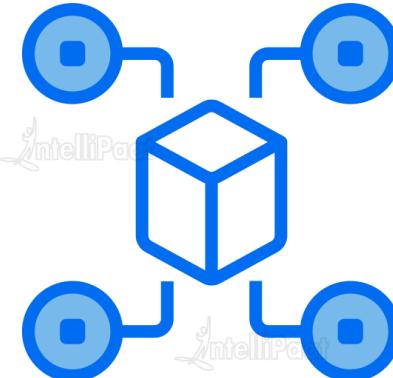
Data migration to the cloud

Content distribution

Backup

Data recovery

Quickly send data to your customer sites



Azure Import/Export Use Cases

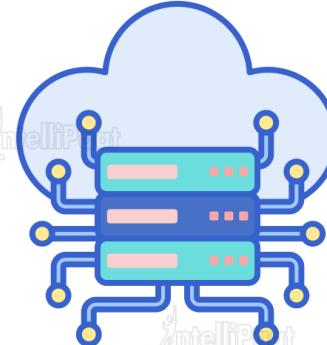
Data migration to the cloud

Content distribution

Backup

Data recovery

Take backups of your on-premises data to store in Azure Storage



Azure Import/Export Use Cases

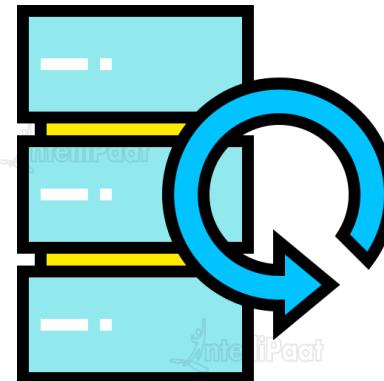
Data migration to the cloud

Content distribution

Backup

Data recovery

Recover large amounts of data stored in storage and have it delivered to your on-premises location





Azure Import Export Job Flow

Azure Import Export Job Flow



Creating

1. Prepare the Hard Drive using Import / Export Client Tool and Encrypt the drive with Bit Locker
2. Create an Import Export Job using Azure Portal



Shipping

3. Ship the hard drives to Microsoft Data Center.
4. The Carrier Delivers the hard drive to the data center.



Complete

8. Hard Drives are shipped back to the customer.



Transferring

5. Hard Drives are processed at the data centers.
6. Data is copied from Hard Drive to Storage Account.



Packaging

7. Hard Drives are packages for return shipping.



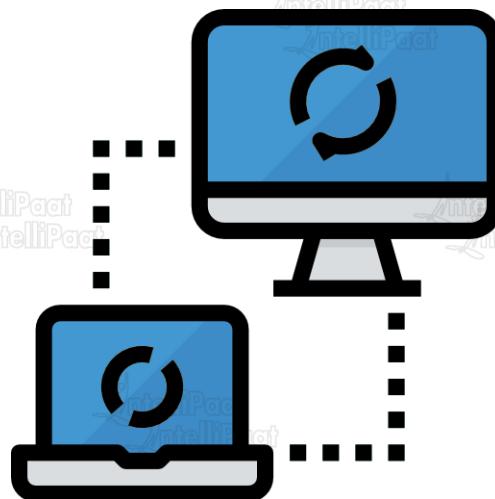
Azure File Sync

Why Azure File Sync?

Why Azure File Sync?



Azure File Sync allows the synchronization of on-premises file servers with Azure Files supported by Storage Accounts





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What is Azure File Sync?



What is Azure File Sync?



Azure File Sync provides on-premises users and applications with quicker access to cloud files

Azure File Sync is powered by local caches and continually synchronizes with Windows Server

This helps organizations with multiple sites to centralize their files onto a single shared server or VM



Azure Blob Storage Backup



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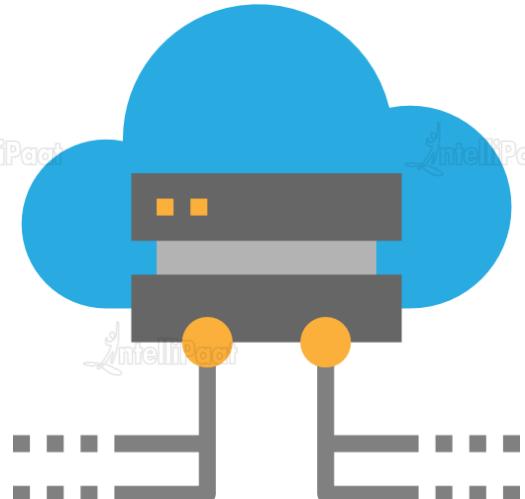


Azure Blob Storage Backup



Azure Blob Storage Backup

The Azure Backup service backs up data to the Microsoft Azure cloud. Data can be backed up and recovered at a granular level, including backup of files and folders



Azure Blob Storage Backup Options

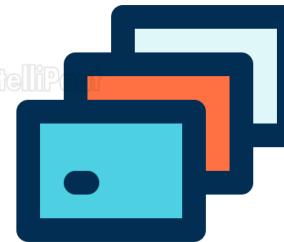
Azure Blob Storage Backup options

AZ Copy

You can copy Blobs to a second storage account using the AZ Copy

Snapshots

Azure archive storage



Azure Blob Storage Backup options

AZ Copy

Snapshots

Azure archive storage

Blob storage can create snapshots. These are snapshots of individual blobs, not the whole account. They exist only in the storage account, and you cannot store them in a vault



Azure Blob Storage Backup options

AZ Copy

Snapshots

Azure archive storage

It is used mostly to store data that is used quite rarely. It is the lowest-priced storage tier. Data at rest is automatically encrypted





Hands-on: Implement Azure Backup Service



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Why CDN?

Content Delivery Network (CDN) provides alternative server nodes for users to download resources (usually static content like images). These nodes are spread throughout the world

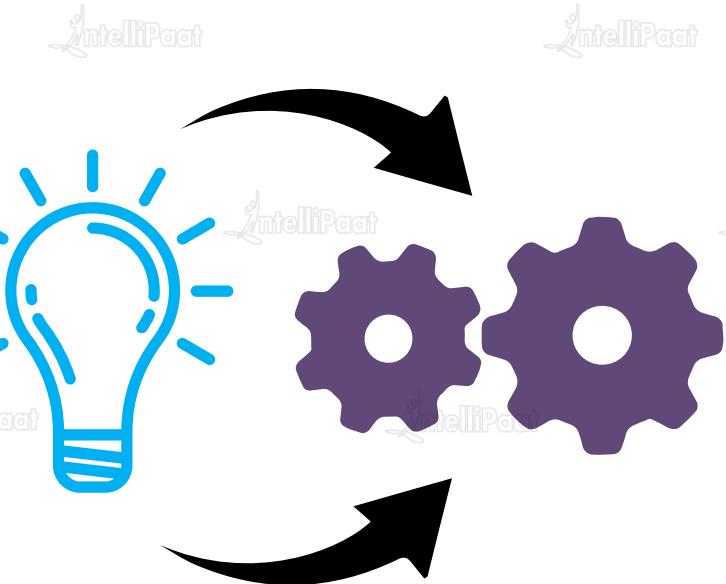




What is Azure CDN?



What is Azure CDN?



01

Azure CDN is a global CDN solution for delivering high-bandwidth content

02

You can cache static objects loaded from Azure Blob storage by using the closest point of presence (POP) server

03

Azure CDN can also accelerate dynamic content, which cannot be cached, by leveraging various network and routing optimizations



Hands-on: Implement Azure CDN

Quiz



1. Which of these storage services can you mount on as a drive on your desktop?

A. Blob Storage

B. File Storage

C. Table Storage

D. Queue Storage



Quiz



2. Which of the following access tiers should be used for low latency access?

A. Hot

B. Cool

C. Archived

D. All of the above



Quiz



3. Which of these storage services is used to store structured data?

A. Blob Storage

B. File Storage

C. Table Storage

D. Queue Storage



Quiz

4. Which of the following is a type of key used by Azure Table Storage?

A. Partition Key

B. Sample Key

C. Cluster Key

D. Storage Key



Quiz



5. Azure file sync can work with both windows and ubuntu server.

A. True

B. False



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