Microsoft Azure Administrator Associate Training (AZ-104)

Module 3

Agenda

01 Azure Table Storage

02 Azure Storage Queues

03 Azure Storage Explorer

04 Azure Shared Access Signature

05 Azure Data Factory Copy Data Tool

06 Azure Databox

07 Azure Import/Export Service

08 Azure Blob Storage Backup

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 Used to store flexible datasets

04 Stores 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 us to store 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 amounts 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 amounts 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 amounts of data**
- **De-normalized data**
- **Fast access**

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

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 via a storage account

3 Tables

A table is a collection of entities

4 Entities

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

5 Properties

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

Azure Table Storage Keys

Azure Table Storage Keys

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

1. Partition key

2. Row key

Azure Table Storage Keys

Partition Key

Row Key

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

It is used to identify the partition that an entity belongs to

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 an entity

Hands-on: Table Storage

Hands-on

1. Go to the Storage account in the Azure portal

    a) Select Tables under services and Deploy it.

Azure Storage Queue

Why Storage Queues?

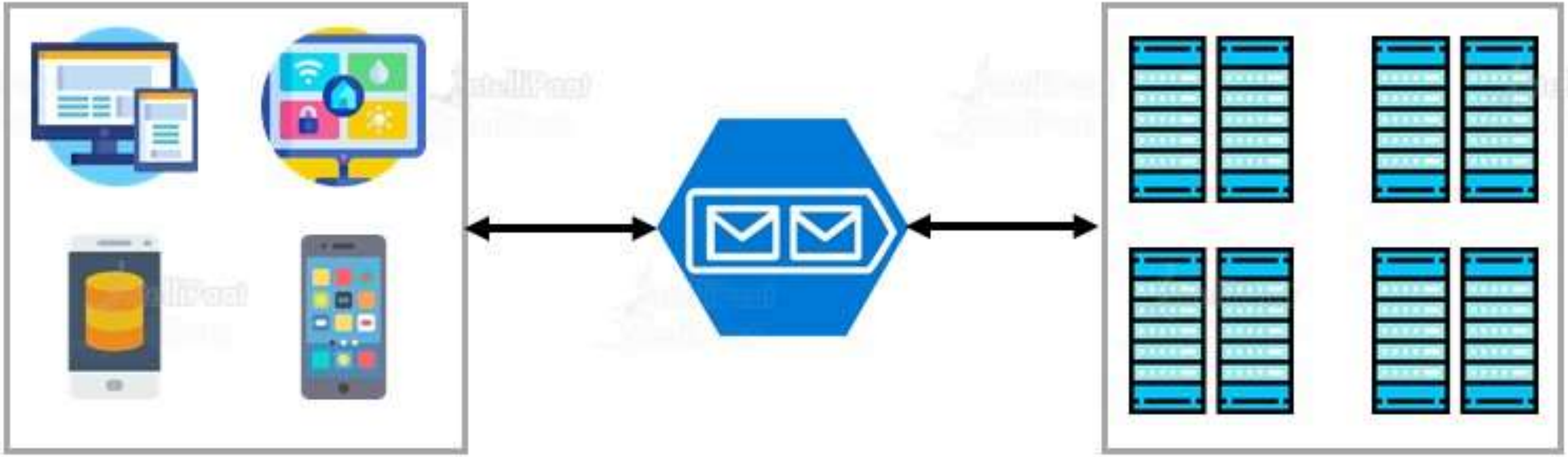
Why Storage Queues?

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



Queue Service Concepts

Queue Service Concepts

1 **Accounts**

All access to Azure Storage is done via a storage account

2 **URL format**

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

3 **Queues**

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

4 **Messages**

A message can be in any format and up to 64 KB. The maximum time-to-live allowed is any positive number or '-1' indicating that the message doesn't expire. The default time-to-live is 7 days

Hands-on: Implementing Azure Queues

Hands-on

1. Go to Azure Storage services in the Azure portal

   a) Deploy Queues using .js code

2. Pop and Push messages to the Queue created on the Azure Portal using an HTML webpage

Azure Storage Explorer

What is Azure Storage Explorer?

What is Azure Storage Explorer?

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

02 It is free to download from the Microsoft website

03 We need to connect to our storage account via Azure Storage Explorer to be able to use it

What can we do with Azure Storage Explorer?

What can we do with Azure Storage Explorer?

- **Blob Storage**
- **Queue Storage**
- **Table Storage**
- **File Storage**

View, delete, and copy Blobs and folders

Upload and download Blobs

Manage snapshots for Blobs

What can we do with Azure Storage Explorer?

Blob Storage

Queue Storage

Table Storage

File Storage

Peek at most recent 32 messages

View, add, and dequeue messages

Clear queue

What can we 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 we 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: Attaching/Detaching an External Storage Account

Hands-on

1. Download Azure Storage Explorer and connect Azure portal Storage account to Storage Explorer using the access keys

2. Detach the Storage explorer account from the Azure Portal

https://www.storageexplorer.com/

Hands-on: Accessing & Managing Azure Storage Services Using Storage Explorer

Hands-on

1. Using Blob Storage with Storage Explorer
2. Using Fileshare with Storage Explorer
    a) Connecting Fileshare with Storage Explorer
3. Using Tables with Storage Explorer
4. Using Queues with Storage Explorer

Azure Shared Access Signature

Why Shared Access Signature?

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

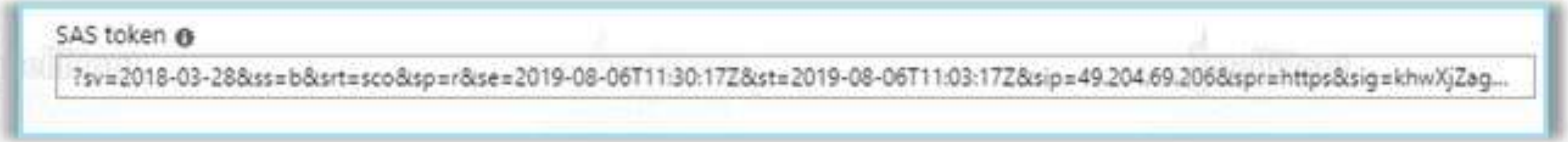
Clients accessing resource groups in storage account

What is SAS in Blob Storage?

Shared Access Signature

SAS is a secure token that allows us to specify the timespan and permissions allowed for accessing a storage resource such as a blob or a container

If we want to grant someone/application access to a storage resource for a specified time, we can generate an SAS token that the person/application would need to provide for gaining 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...
```

Hands-on: Using SAS in Blob Storage

Hands-on

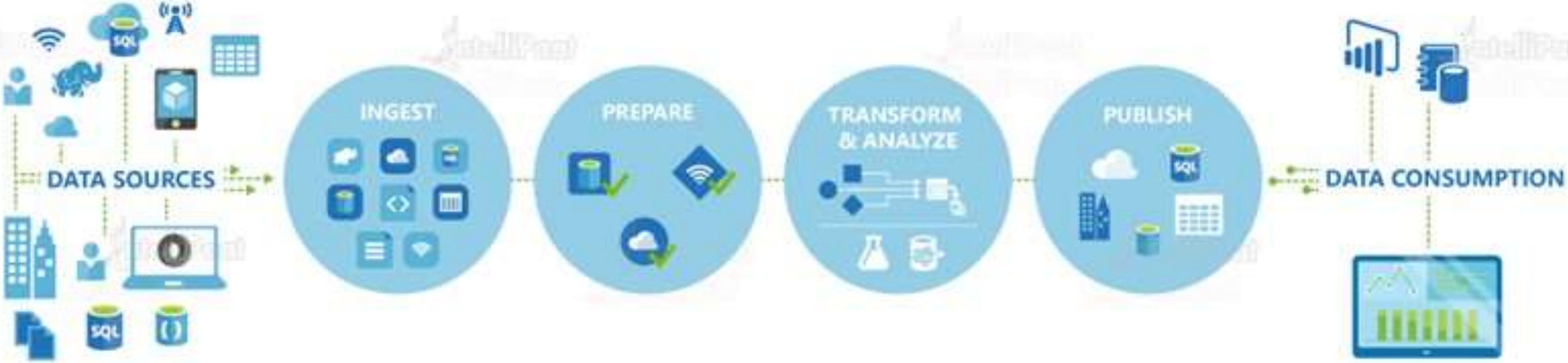
1. Go to Shared Access Signature under Storage Accounts

    a) Generate an SAS Key for certain set of resources

2. Access that resource from the browser to verify the permissions

What is Azure Data Factory?

Azure Data Factory is a cloud-based data integration service that allows us to create data-driven workflows in the cloud for orchestrating and automating data movement and data transformation. These data-driven workflows that can ingest data from various data stores



Copy Data Tool

The Azure Data Factory Copy Data tool eases and optimizes the process of transferring data between the source and the destination data store

For example, it may be used **to copy data from a Blob storage to an SQL database**

Some of the benefits of using the Copy Data tool are:

- ✓ No need to understand the Data Factory workflow to use this tool
- ✓ The tool creates required resources to transfer data automatically
- ✓ It helps us avoid errors by validating the data that is being ingested

Copy Data tool

Hands-on: Using Azure Data Factory to Transfer data to Azure

Hands-on

1. Go to the Azure Portal and create a Data Factory Resource

    a) Set up Copy data to Copy data from one Blob Storage to another

Data Transfer

Why Transfer Data ?

Why Transfer Data ?

Transferring data over the Internet can take days, weeks, or even months. To avoid this, Microsoft provides the Import/Export service and Azure Databox service, where we ship the physical disks directly to Azure data centers, and they will upload the data for us

Azure Data Transfer Use Cases

Azure Data Transfer Use Cases

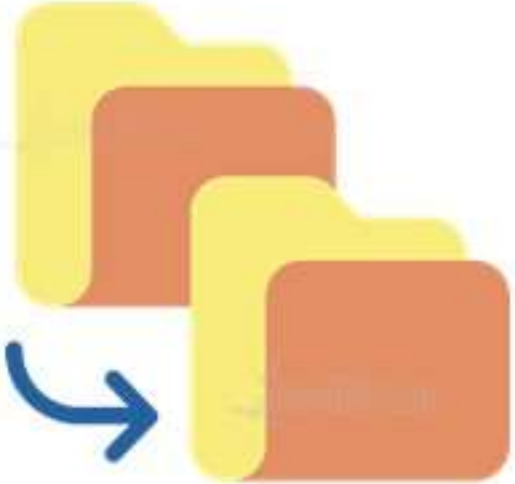
Data Migration to Cloud

Content Distribution

Backup

Data Recovery

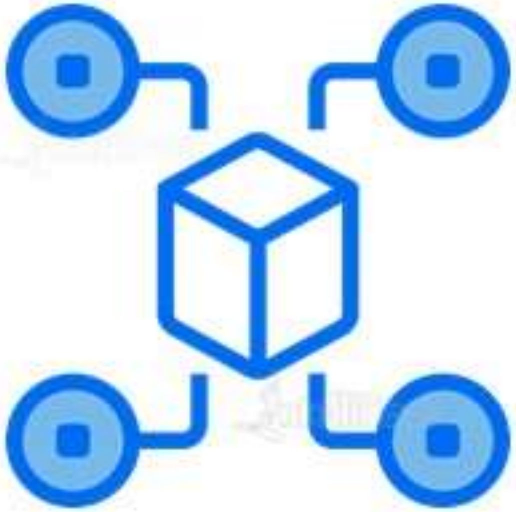
Moves large amounts of data to Azure quickly and cost effectively



Azure Data Transfer Use Cases

- Data Migration to Cloud
- **Content Distribution**
- Backup
- Data Recovery

Quickly sends data to our customer sites



Azure Data Transfer Use Cases

- Data Migration to Cloud
- Content Distribution
- Backup
- Data Recovery

Takes backups of our on-premises data to store in Azure Storage

Azure Data Transfer Use Cases

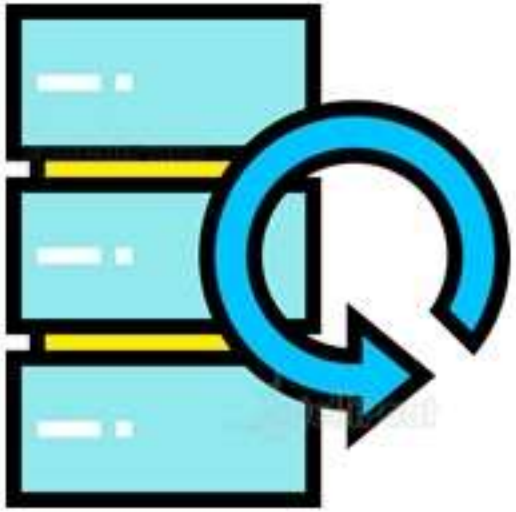
Data Migration to Cloud

Content Distribution

Backup

Data Recovery

Recovers large amounts of data stored in the storage and gets it delivered to our on-premises location



Which service to use?

Microsoft azure provides us with two main options for physically transporting data to Azure. These are:

Azure Import/Export Service

Azure Data box

What is Azure Import/Export Service?

What is Azure Import/Export Service?

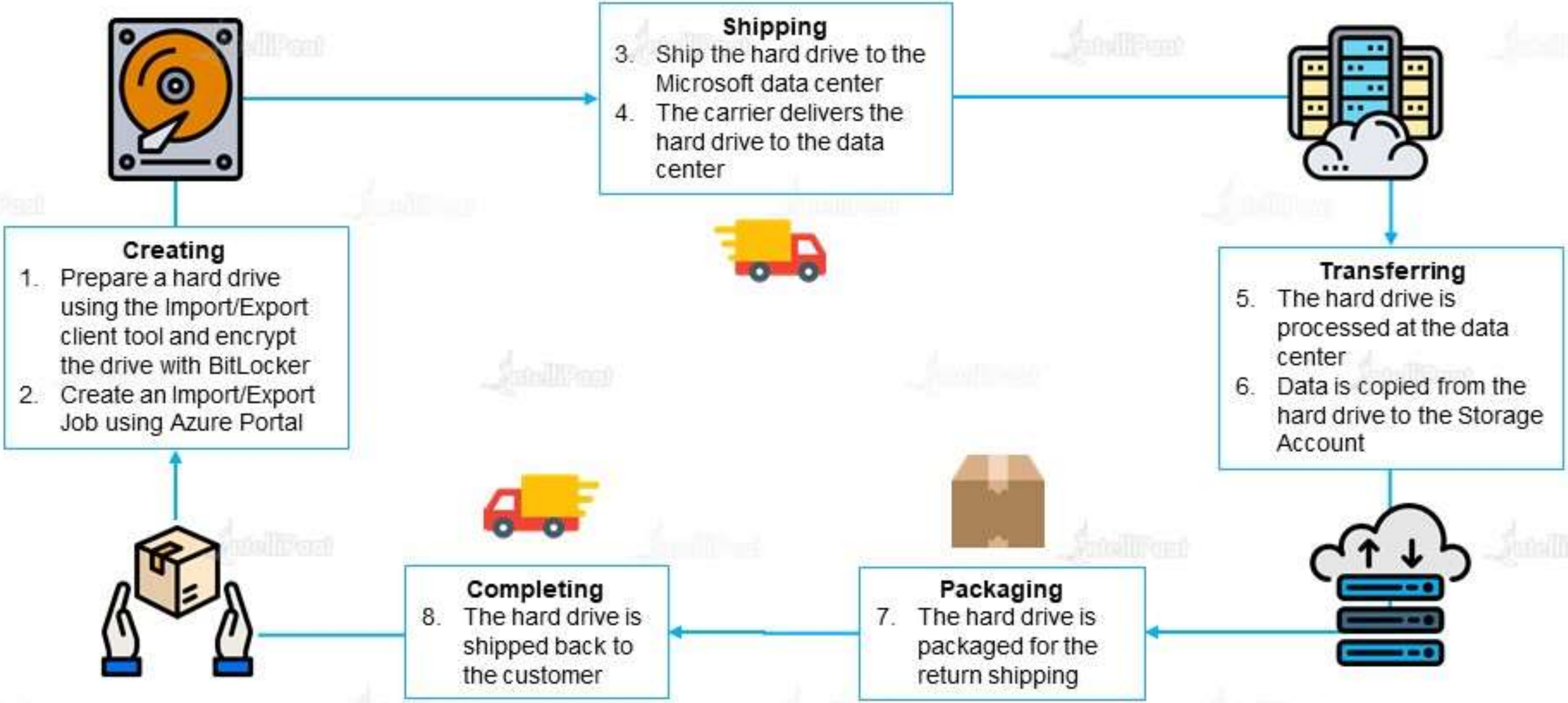
Azure Import/Export service is used to securely import large amounts of data to Azure Blob Storage and Azure Files by shipping disk drives to an Azure data center

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

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

We can supply our own disk drives and transfer data with the Azure Import/Export service, and we can also use disk drives supplied by Microsoft

Azure Import/Export Job Flow



Creating

1. Prepare a hard drive using the Import/Export client tool and encrypt the drive with BitLocker
2. Create an Import/Export Job using Azure Portal

Shipping

3. Ship the hard drive to the Microsoft data center
4. The carrier delivers the hard drive to the data center

Transferring

5. The hard drive is processed at the data center
6. Data is copied from the hard drive to the Storage Account

Packaging

7. The hard drive is packaged for the return shipping

Completing

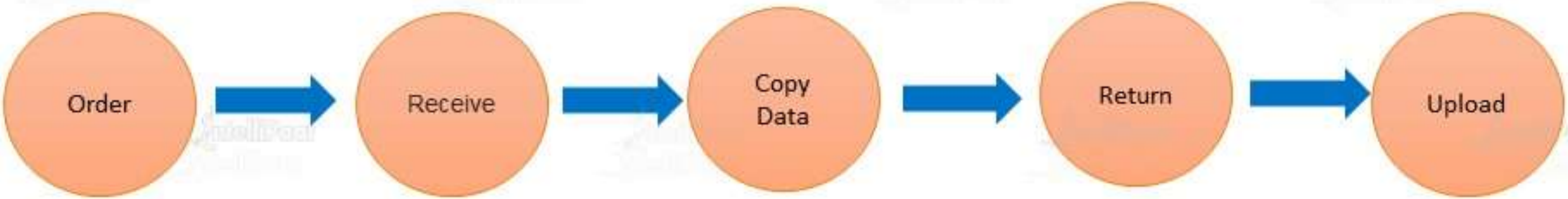
8. The hard drive is shipped back to the customer

Azure Data Box

Azure Data Box

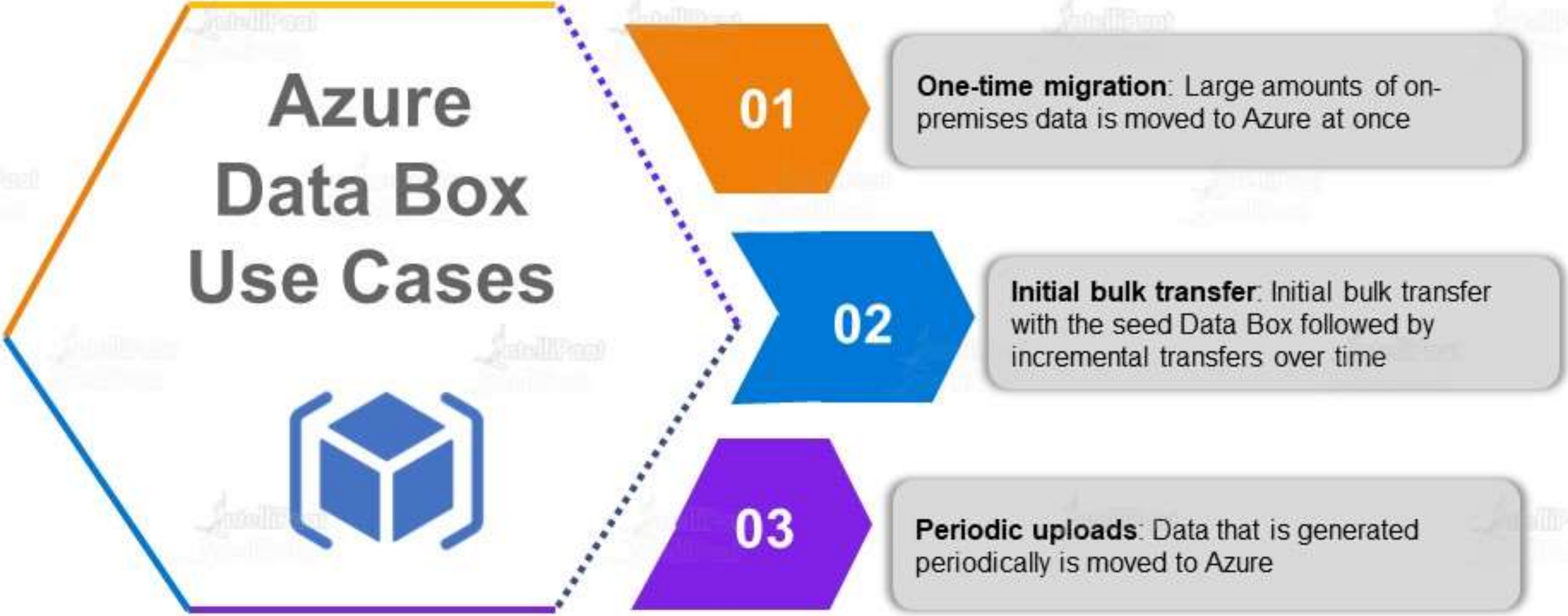
Azure Data Box is a service offered by Microsoft Azure that lets us transfer terabytes of data to Azure in a quick, inexpensive and reliable way

Data transfer takes place by shipping us a proprietary Data Box storage device. The device is transported to our data center through a regional carrier and has a rugged casing to protect and secure the data during the transit



Order → Receive → Copy Data → Return → Upload

Use Cases



Azure Data Box Use Cases

01 **One-time migration**: Large amounts of on-premises data is moved to Azure at once

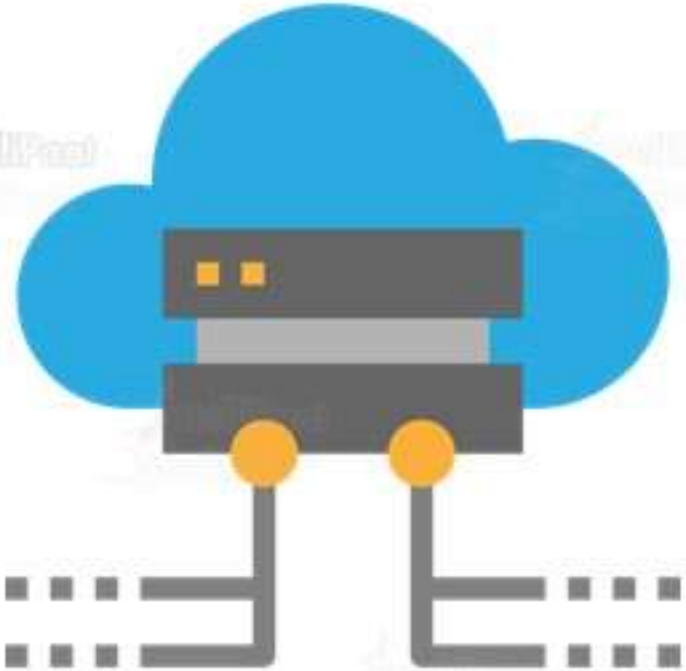
02 **Initial bulk transfer**: Initial bulk transfer with the seed Data Box followed by incremental transfers over time

03 **Periodic uploads**: Data that is generated periodically is moved to Azure

Azure Blob Storage Backup

Azure Blob Storage Backup

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



Azure Blob Storage Backup Options

Azure Blob Storage Backup Options

AZ Copy

Snapshots

Azure Archive Storage

We can copy Blobs to a second storage account using AZ Copy

Azure Blob Storage Backup Options

AZ Copy

Snapshots

Azure Archive Storage

Blob storage can create snapshots. These are snapshots of individual blobs, not of the whole account. They exist only in the storage account, and we 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: Implementing Azure Backup Service

Hands-on

1. Go to the Blob service on the Storage account

    a) Change access tier to Archive

2. Create a Snapshot of the Blob Storage

3. Create an AZ Copy of the Blob Storage to transfer contents from source blob to destination blob

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