# Get the best out of Live Sessions

# HOW?

e!

## Check your Internet Connection

**Log in 10 mins before,** and check your internet connection to avoid any network issues during the LIVE session.

## Speak with the Instructor

By default, you will be on mute to avoid any background noise. However, if required you will be **unmuted by instructor**.


## Clear Your Doubts

Feel free to clear your doubts. Use the "**Questions**" tab on your webinar tool to interact with the instructor at any point during the class.

## Let us know if you liked our content

Please share feedback after each class. It will help us to enhance your learning experience.

edureka!

edureka!

# Microsoft Azure Developer Associate (AZ-204)

# COURSE OUTLINE
# MODULE 07

- Introduction to Azure IaaS Compute Solutions
- Implementing Azure Batch Service and Disk Encryption
- Designing and Developing Applications That Use Containers
- Implementing Azure App Service Web Apps and Mobile Apps
- Implementing Azure App Service API Apps and Azure Functions
- Developing Solutions That Use Azure Table Storage and Cosmos DB

- **Developing Solutions That Use Relational Database and Azure Blob Storage**
- Implementing Authentication and Access Control In Azure
- Implementing Secure Data Solutions and Integrate Caching & CDN
- Instrument Monitoring, Logging and Scalability Of Apps & Services
- Connecting to and Consuming Azure and Third-party Services
- Developing Event-based and Message-based Solutions in Azure

# Module 7 – Developing Solutions That Use Relational Database and Azure Blob Storage

edureka!

# Topics

- Azure SQL Database Service
- Database Purchasing Models
- Azure Elastic Pools
- CRUD operations on Database
- Azure Blob Storage
- Types and Uses of Blob Storage
- Storage Properties and Metadata
- Copy Blobs Using AzCopy
- Blob Leasing in Azure
- Implement Hot, Cool, and Archive Storage

# Objectives

After completing this module, you should be able to:

- Know how the Azure SQL Database service works
- Configure elastic pools for Azure SQL Database
- Perform database operations by using code
- Understand when and why to use Azure Blob storage
- Know how to set and retrieve Blob storage properties and metadata
- Replicate and copy Blobs
- Implement Blob Leasing
- Implement Hot, Cool, and Archive Storage

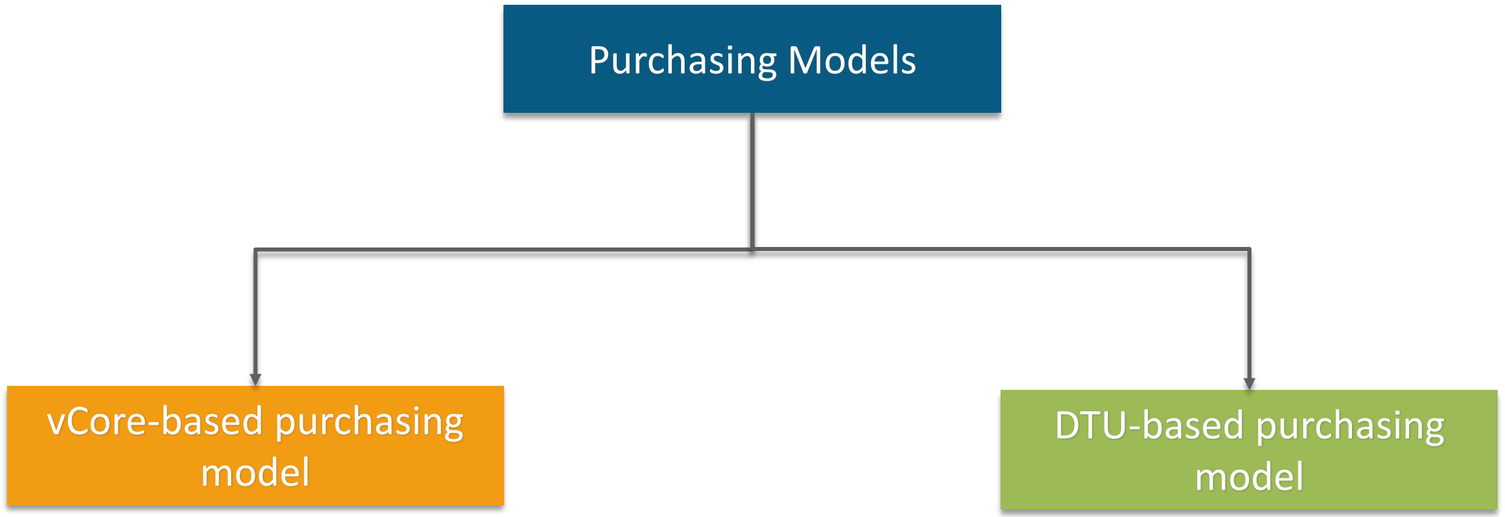

edureka!

# Azure SQL Database Service

edureka!

# Azure SQL Database Service

SQL Database is a general-purpose relational database managed service in Microsoft Azure that supports structures such as relational data, JSON, spatial, and XML.



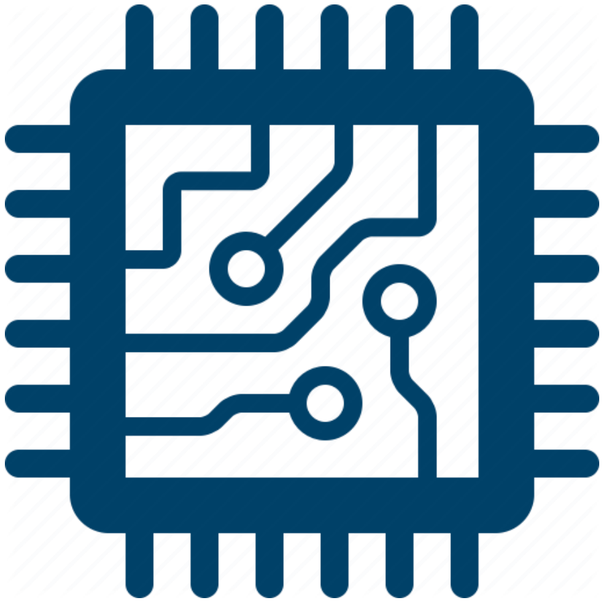

edureka!

# vCore Based Purchasing Model

edureka!

# vCore Based Purchasing Model

1. **A virtual core represents the logical CPU offered with an option to choose between generations of hardware and physical characteristics of hardware (for example, number of cores, memory, storage size)**
2. The vCore-based purchasing model gives you flexibility, control, transparency of individual resource consumption and a straightforward way to translate on-premises workload requirements to the cloud
3. This model allows you to choose compute, memory, and storage based upon their workload needs
4. In the vCore-based purchasing model, you can choose between General Purpose and Business critical service tiers for both single databases, managed instances, and elastic pools

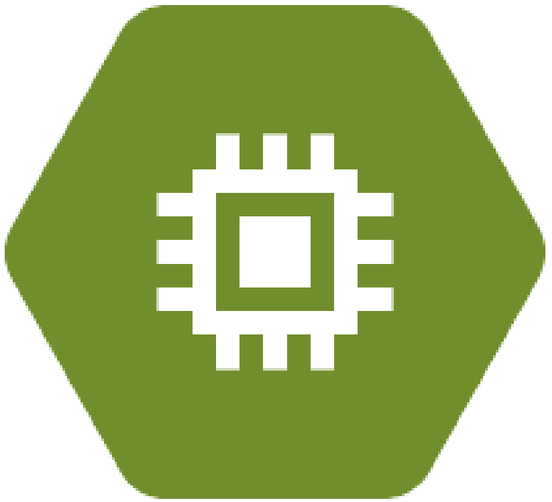


# vCore Based Purchasing Model (Cont.)

1. A virtual core represents the logical CPU offered with an option to choose between generations of hardware and physical characteristics of hardware (for example, number of cores, memory, storage size)
2. **The vCore-based purchasing model gives you flexibility, control, transparency of individual resource consumption and a straightforward way to translate on-premises workload requirements to the cloud**
3. This model allows you to choose compute, memory, and storage based upon their workload needs
4. In the vCore-based purchasing model, you can choose between General Purpose and Business critical service tiers for both single databases, managed instances, and elastic pools

# vCore Based Purchasing Model (Cont.)

1. A virtual core represents the logical CPU offered with an option to choose between generations of hardware and physical characteristics of hardware (for example, number of cores, memory, storage size)
2. The vCore-based purchasing model gives you flexibility, control, transparency of individual resource consumption and a straightforward way to translate on-premises workload requirements to the cloud
3. **This model allows you to choose compute, memory, and storage based upon their workload needs**
4. In the vCore-based purchasing model, you can choose between General Purpose and Business critical service tiers for both single databases, managed instances, and elastic pools



# vCore Based Purchasing Model (Cont.)

1. A virtual core represents the logical CPU offered with an option to choose between generations of hardware and physical characteristics of hardware (for example, number of cores, memory, storage size)
2. The vCore-based purchasing model gives you flexibility, control, transparency of individual resource consumption and a straightforward way to translate on-premises workload requirements to the cloud
3. This model allows you to choose compute, memory, and storage based upon their workload needs
4. **In the vCore-based purchasing model, you can choose between General Purpose and Business critical service tiers for both single databases, managed instances, and elastic pools**

# DTU Based Purchasing Model

edureka!

# Understanding Database Transaction Units (DTUs)

01

For a single Azure SQL database at a specific compute size within a service tier, **Microsoft guarantees a certain level of resources for that database** providing a predictable level of performance.

02

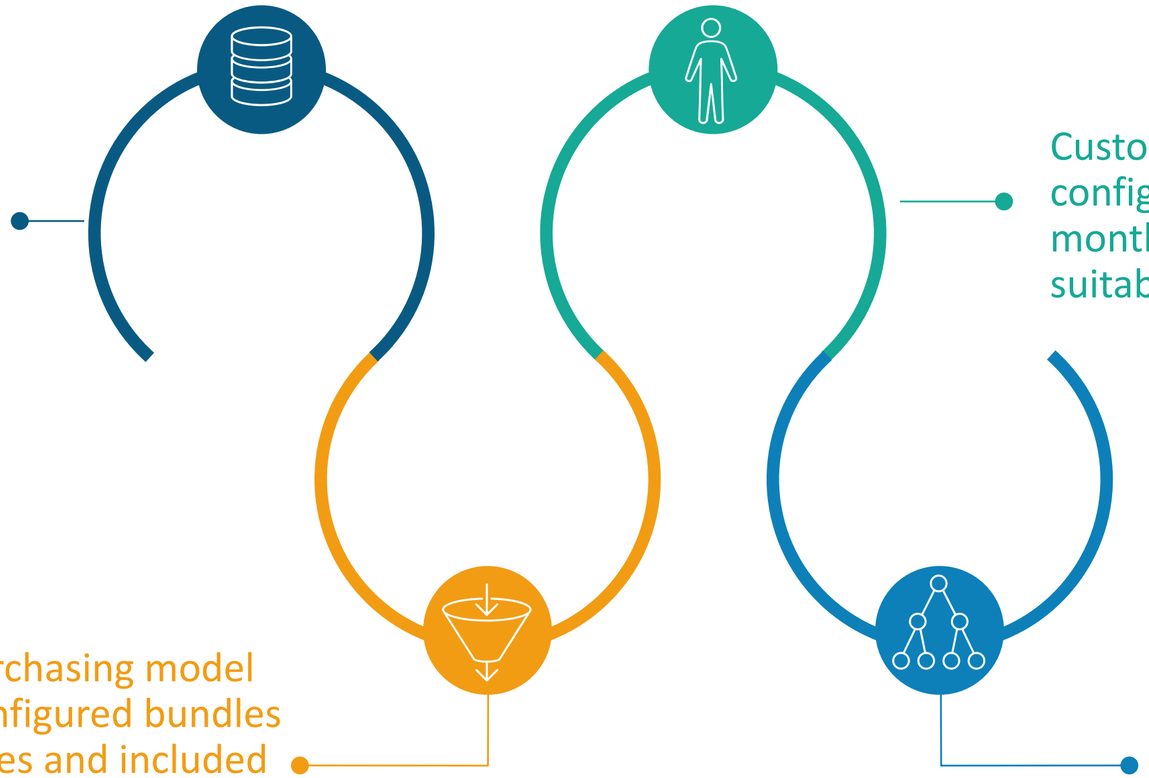
When your workload exceeds the amount of any of these resources, your throughput is throttled - resulting in slower performance and timeouts but **the resources used by your workload do not impact the resources available to other SQL databases** in the Azure cloud.

03

**The amount of resources is calculated as a number of Database Transaction Units or DTUs** and is a bundled measure of compute, storage, and IO resources.

# DTU Based Purchasing Model

The Database Transaction Unit (DTU) represents a blended measure of CPU, memory, reads, and writes



Customers who prefer the simplicity of a pre-configured bundle and fixed payments each month, may find the DTU-based model more suitable for their needs.

The DTU-based purchasing model offers a set of preconfigured bundles of compute resources and included storage to drive different levels of application performance

In the DTU-based purchasing model, customers can choose between **Basic**, **Standard**, and **Premium** service tiers for both single databases and elastic pools

edureka!

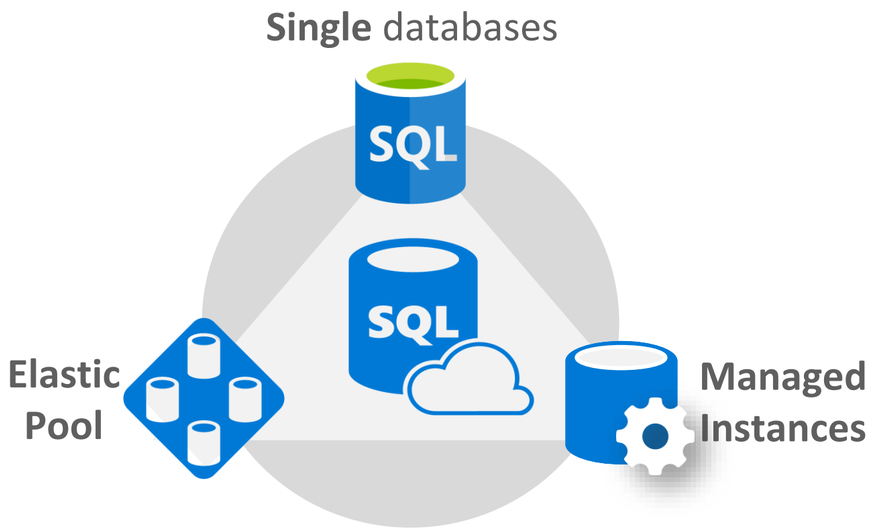
# Azure SQL Database: Database As A Service

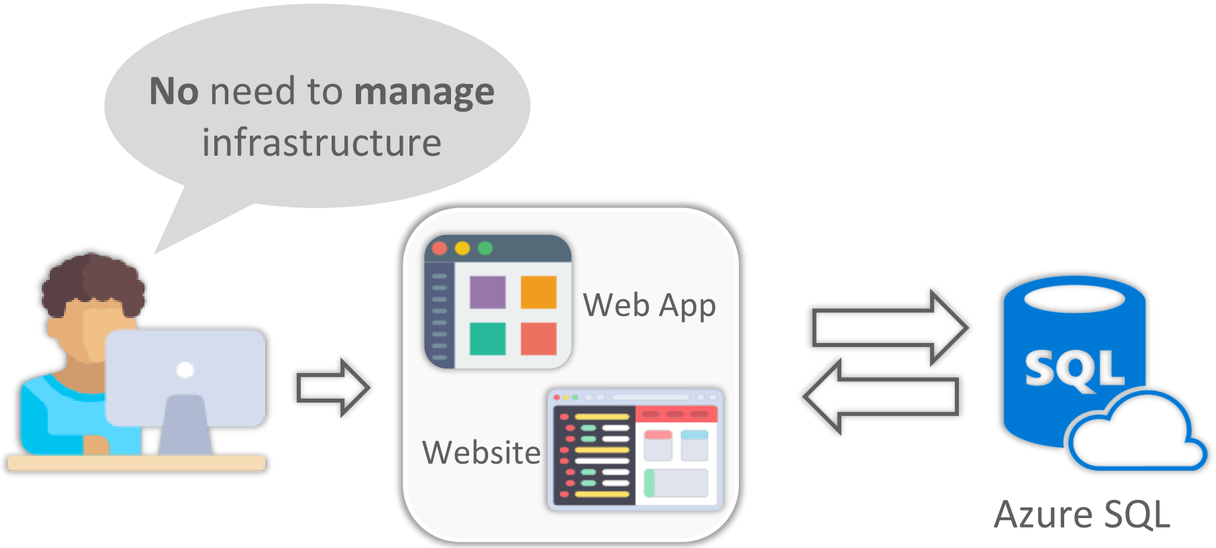
- Relational Database As A Service
- Uses Microsoft SQL Server DB Engine
- You can create **three** types of Azure SQL database as:

Reliable

High Performance

Secure



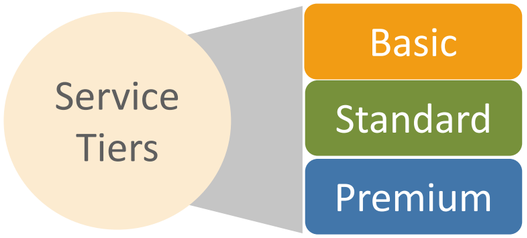




edureka!

# Azure Single Database: Pricing Tiers

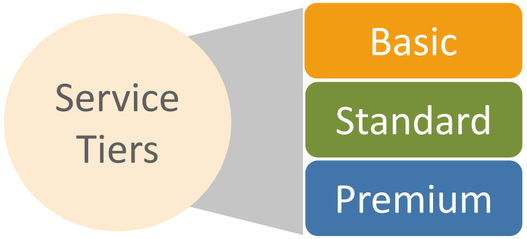
Single database inside resource group

Resources assigned are measured in DTU i.e. Database Transaction Units or V-Core


edureka!

# Azure Elastic Pool


Database inside pool of databases on a resource group

Defines maximum resource limit per group of databases

All databases inside an elastic pool shares resources assigned to the pool

Prefer this in case of unpredictable database demand

# Demo 1 – Configure Elastic Pool on Portal

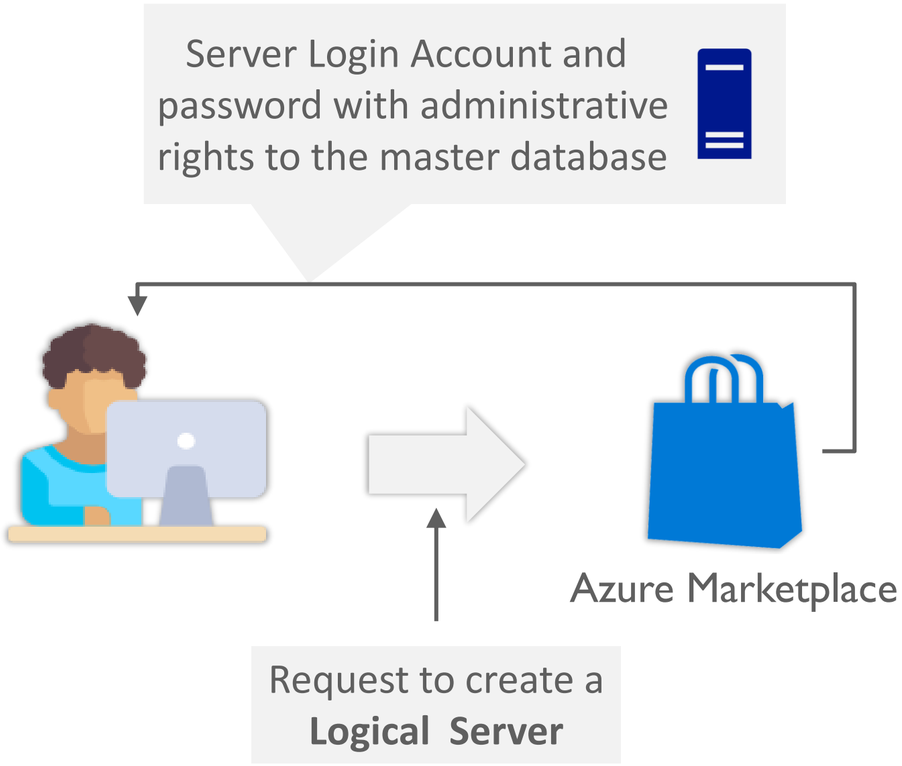
edureka!

# Azure Managed Instances

- Similar to On-premise SQL Server
- Uses V-Core model
- Prefer in case of migrating existing application to azure
- General Purpose Service Tier

# Azure SQL Database – Logical Server

You need to use logical server prior to create Single database or Elastic Pool



# Why Azure SQL Database?


## Fully Managed

- **Platform As A Service** Database
- Each database is **isolated** and **portable**
- Managed instances are isolated and guaranteed resources

## Scalability

- **Dynamically** add more resources to the service
- Easily Scale Up, Scale Out and Shard Database
- Scales with **minimum** downtime
- **Auto scale** and **Dynamic Scalability**


## Price/ Performance Tier

- DTU based model – **Preconfigured** and **Simple** model
- V-Core model is preferred for **flexibility**, **transparency** and control

## Advanced Security

- Data Protection
- Control Access
- Proactive Monitoring

edureka!

# Why Azure SQL Database? (Cont.)

## Dev/Test Environment

- Replication of live production environment to the development/test environment using a **database copy**

## Backup And Recovery

- Regular automatic database backup
- Backup can be recovered
- **Backup to URL**

## Business Continuity

- Azur SQL Database provides an SLA of up to 99.99%
- Maintains several copies of the data
- It allows you to **restore** Geo Redundant copies of data which provides business continuity

## Advance Analytics

- Users reference data from various data sources
- After performing transformation activities finally the data gets loaded onto **Azure Data Warehouse** for BI

# Demo 2 – Perform CRUD operation on Azure SQL Table Using ASP.NET MVC

edureka!

# Azure Blob Storage

edureka!

# What is Blob Storage?

A service stores **unstructured data** in the cloud as objects/blobs

Blob storage is also referred to as **object storage**

Blob storage can store any **type of text or binary data**, such as a document, media file, or application installer, that can be accessed from anywhere in the world via HTTP or HTTPS

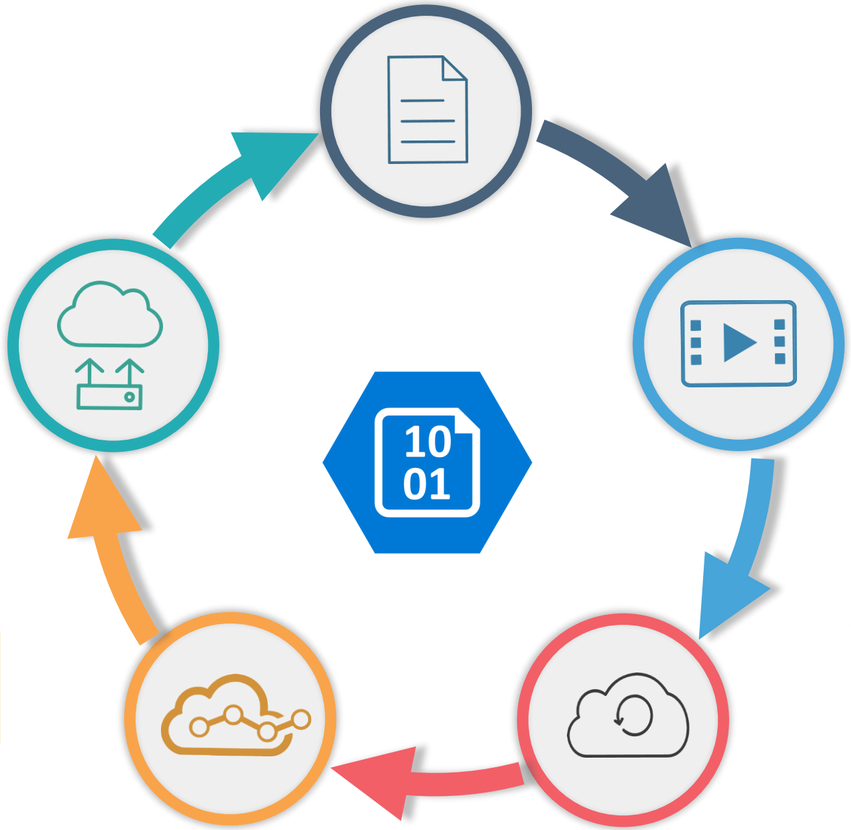
You can use Blob storage to expose data **publicly** to the world, or to store application data **privately**

# Common Uses of Blob Storage

Storing files for distributed access

Serving images or documents directly to a browser

Streaming video and audio




Storing data for analysis by an on-premises or Azure-hosted service

Storing data for backup and restore, disaster recovery, and archiving

edureka!

# Blob Storage Resources

### Storage Account

- All access to Azure Storage is done through a storage account
- The storage account can be a **General-purpose storage account** or a **Blob storage account** which is specialized for storing objects/blobs

### Container

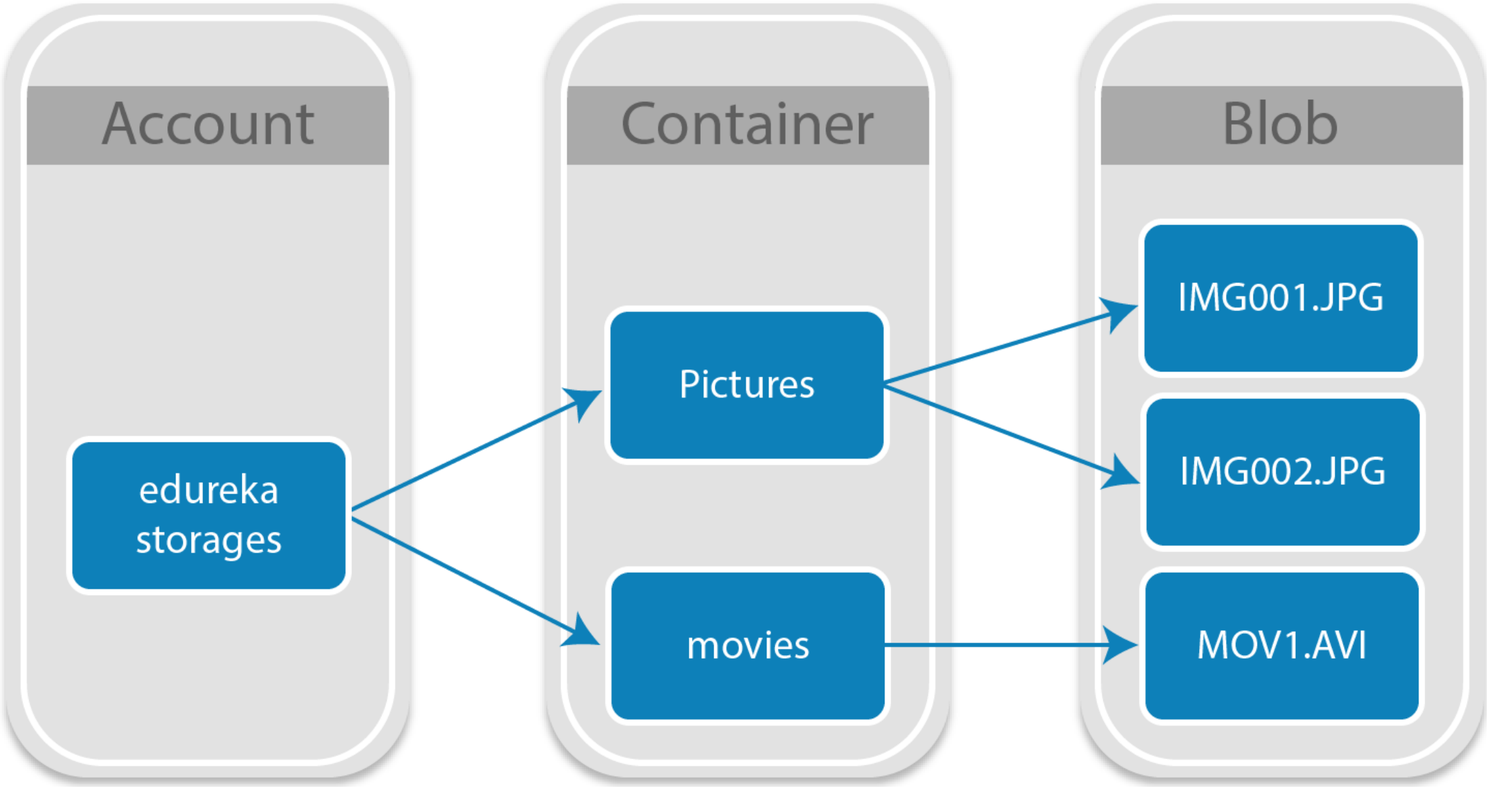
- A container provides a grouping of a set of blobs
- All blobs must be in a container
- An account can contain an unlimited number of containers
- A container can store an unlimited number of blobs


### Blob

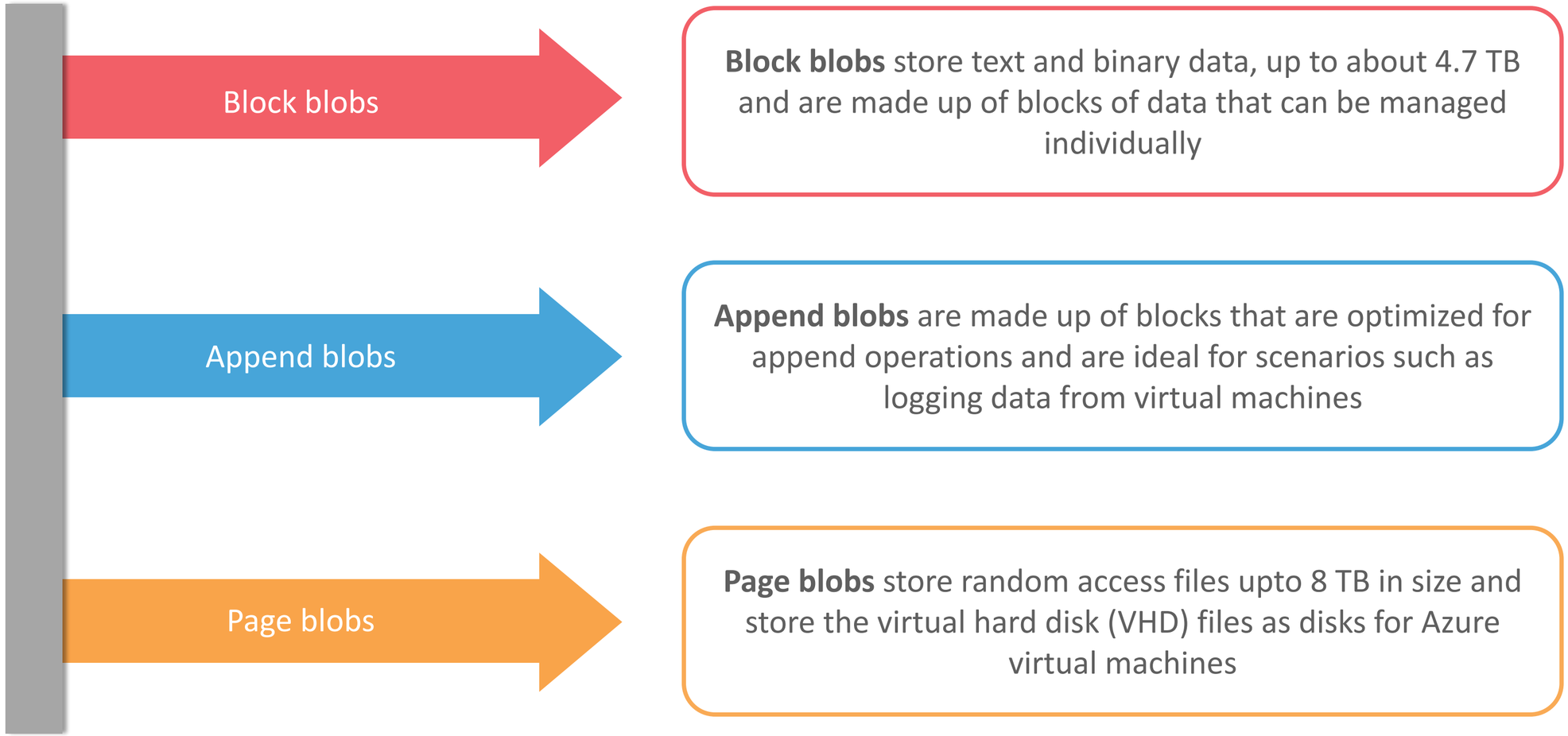
- A file of any type and size
- Can be of three types: block blobs, page blobs, and append blobs

# Blob Storage Resources

Blob storage resources have the following relationship:



# Types of Blob Storage




**Block blobs** store text and binary data, up to about 4.7 TB and are made up of blocks of data that can be managed individually

**Append blobs** are made up of blocks that are optimized for append operations and are ideal for scenarios such as logging data from virtual machines

**Page blobs** store random access files upto 8 TB in size and store the virtual hard disk (VHD) files as disks for Azure virtual machines

# Set and Retrieve Properties and Metadata of Storage

Objects in Azure Storage support **System Properties** and **User-defined Metadata**, in addition to the data they contain

## System Properties

- System properties exist on each storage resource, some of them can be **read** or **set**, while others are ***read-only***
- Under the covers, some system properties correspond to certain standard HTTP headers
- Azure Storage client libraries maintain these properties for you

## User-defined Metadata

- User-defined metadata consists of one or more **name-value pairs** that you specify for an Azure Storage resource
- You can use metadata to ***store additional values*** with a resource
- Metadata values are for your **own** purposes only, and ***do not*** affect how the resource behaves

**NOTE**:

- Retrieving property and metadata values for a storage resource is a **two-step** process
- Before you can read these values, you must explicitly fetch them by calling the ***FetchAttributes*** or ***FetchAttributesAsync*** method

# Use .NET to Create and Manage Blob in Object Storage

In the upcoming demo, you learn how to use the Azure Storage client library for .NET to:

1. Create a Container and Set Permissions
2. Upload Blobs to the Container
3. List the Blobs in a Container
4. Download Blobs
5. Set and Retrieve Properties and Metadata

# Demo 3 – Use .NET to Create and Manage Blob in Object Storage

edureka!

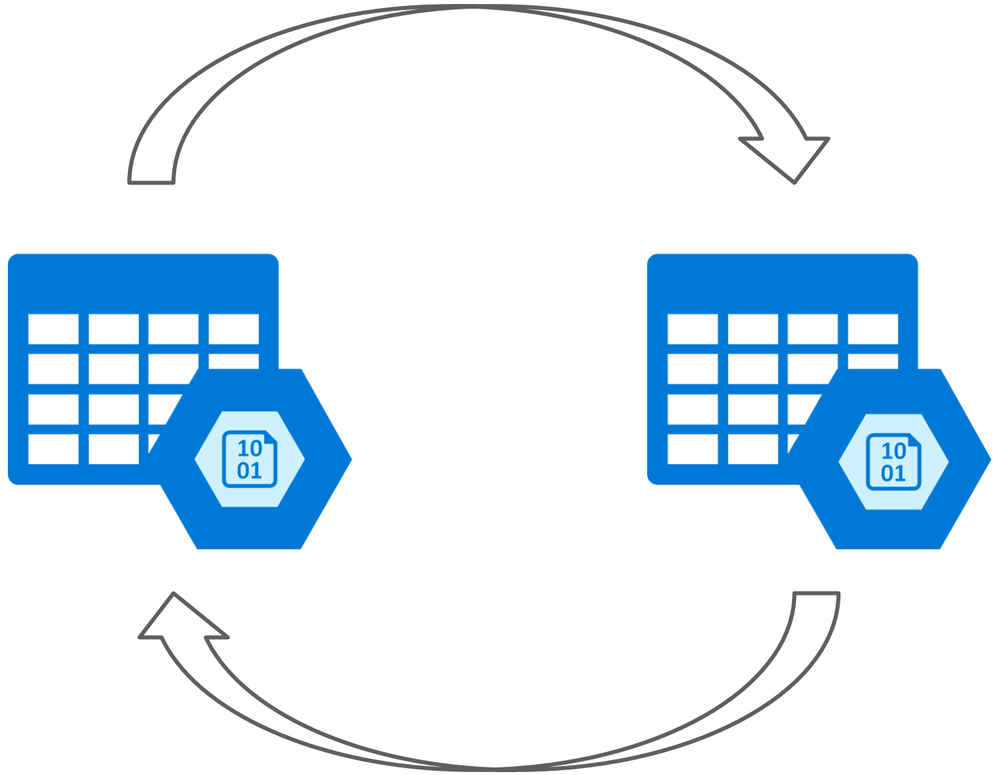
# Copy Blobs Using AzCopy

edureka!

# Move Items in Blob Storage Between Storage Accounts

- **AzCopy** is a **command-line utility** that you can use to copy blobs or files ***to or from*** a storage account
- **AzCopy V10** is the currently supported version of AzCopy
- Download AzCopy:
  - Windows (zip)
  - Linux (tar)
  - MacOS (zip)
- The following demo shows you how to:

1. Download **AzCopy**
2. Connect to your storage account
3. Transfer files



# Demo 4 – Move Items in Blob Storage Between Storage Accounts Using AzCopy

edureka!

# Understanding Blob Leasing

edureka!

# Blob Leasing in Azure Storage

The **Lease Blob** operation establishes and manages a ***lock*** on a blob for **write and delete** operations

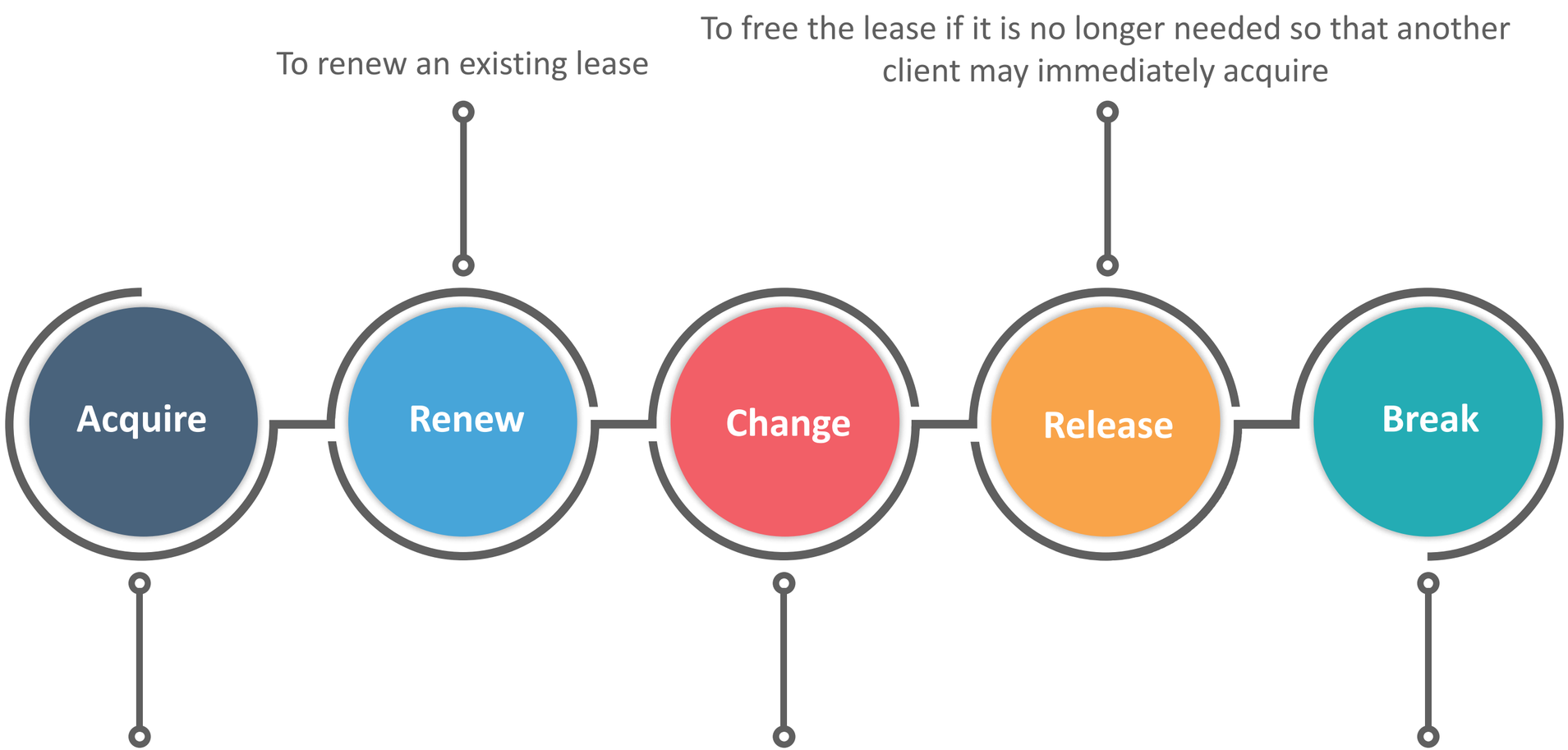
The lock duration can be **15 to 60** seconds or it can be **Infinite**

Once having the lease, you can ***update*** the Blob or ***delete*** the Blob **without** worrying about another process changing it underneath you

When a Blob is leased, other processes ***can still read*** it but any attempt to update it will ***fail***

You can also update Blobs without taking a lease first, but you do run the chance of another process also attempting to modify it at the same time

# Lease Blob – Operation Modes



# Demo 5 – Implement Blob Leasing on Portal

edureka!

# Implement Hot, Cool, and Archive Storage

edureka!

# Understand Storage Access Tiers

As of today, data stored in cloud is growing and managing the cost for the storage services becomes very important. To manage cost, it is important to organize data based on the frequency of access and data retention period.

Below are some of the storage tiers :

- **Hot**

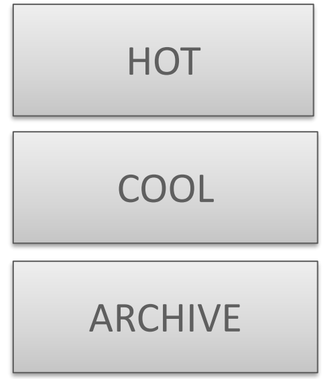
This storage tier is mainly used for data stored in Storage account that is accessed Frequently.

- **Cool**

This storage tier is mainly used for data stored in Storage account that is infrequently accessed and stored for at least 30 days.

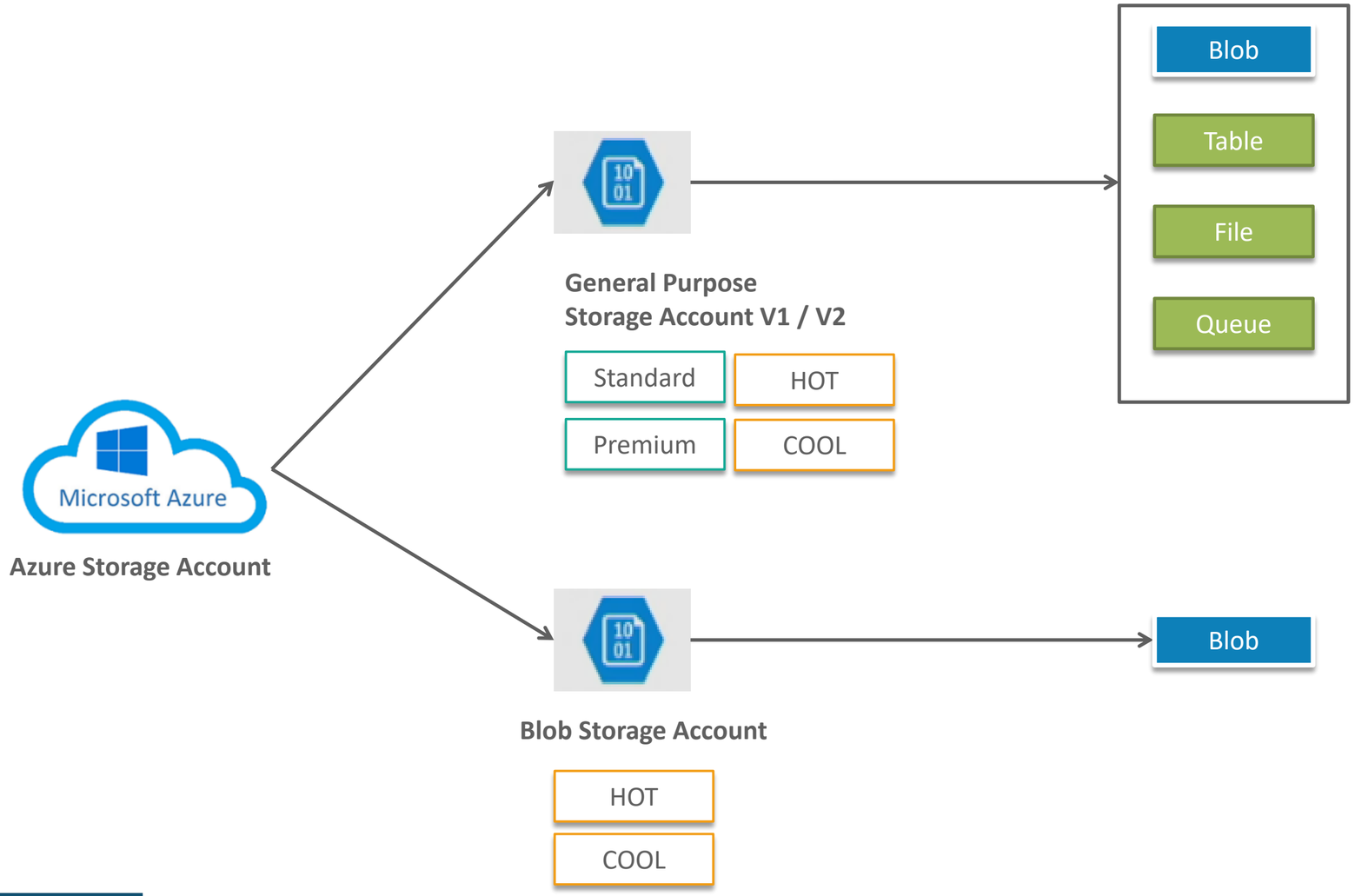
- **Archive**

This storage tier is mainly used for data stored in Storage account that is rarely accessed and stored for at least 180 days and amounts for some level of latency.




**Storage Access Tiers**

# Understand Storage Access Tiers (Cont.)

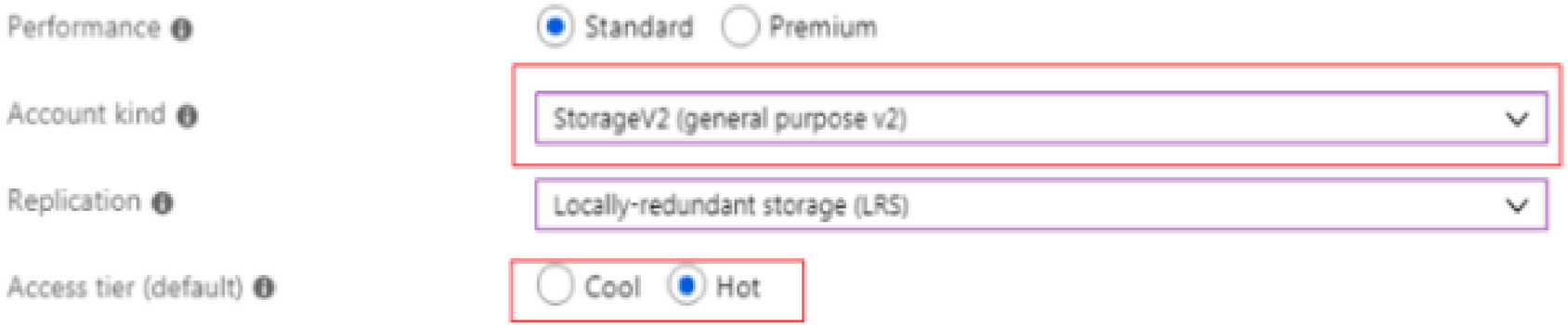


# Hot Vs. Cool Vs. Archive Storage

| Hot Storage | Cool Storage | Archive Storage |
|---|---|---|
| Data readily accessible | Data is not frequently accessed | Hardly accessed data |
| Any time accessibility | 30 days storage period (More cost) | 180 days storage period (More cost) |
| High storage cost | Lower storage cost | Lower storage cost |
| Lower access cost | Higher access cost | Higher access cost |
| Default Tier | Non-default Tier | Non-default Tier |

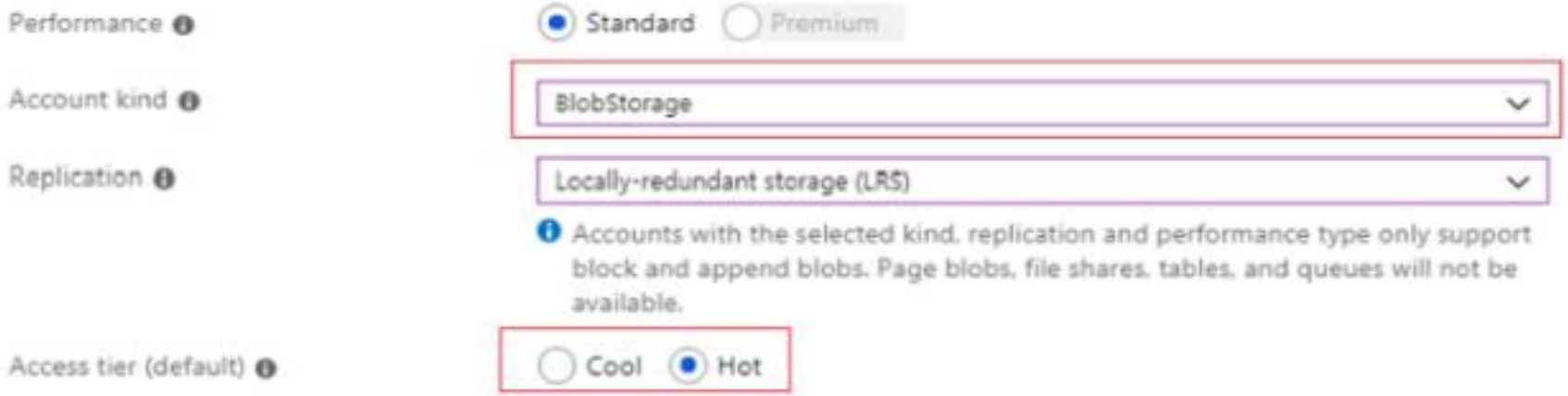
# Access Tier Support

- **Storage V2 - Hot & Cool Tier**




**Note** - Premium Performance support is available for Hot, Cool or Archive Tier in V1/V2 Storage Account

- **Blob Storage - Hot & Cool Tier**




**Note** - Premium Performance doesn't support Hot, Cool or Archive Tier in Blob Storage Account

edureka!

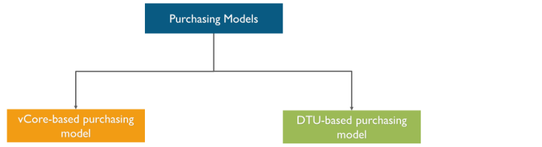
# Demo 6 – Implement Hot, Cool, and Archive Storage

edureka!

# Summary

## Azure SQL Database Service

SQL Database is a general-purpose relational database managed service in Microsoft Azure that supports structures such as relational data, JSON, spatial, and XML.

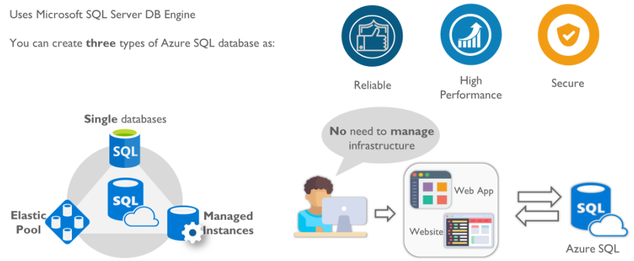



edureka!



## Azure SQL Database : Database As A Service

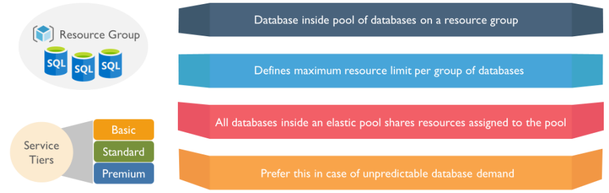
- Relational Database As A Service
- Uses Microsoft SQL Server DB Engine
- You can create **three** types of Azure SQL database as:




edureka!



## Azure Elastic Pool




edureka!



## What Is Blob Storage?


edureka!



## Set And Retrieve Properties And Metadata Of Storage

Objects in Azure Storage support **System Properties** and **User-defined Metadata**, in addition to the data they contain

**System Properties**

- System properties exist on each storage resource, some of them can be **read** or **set**, while others are ***read-only***
- Under the covers, some system properties correspond to certain standard HTTP headers
- Azure Storage client libraries maintain these properties for you

**User-defined Metadata**

- User-defined metadata consists of one or more **name-value pairs** that you specify for an Azure Storage resource
- You can use metadata to ***store additional values*** with a resource
- Metadata values are for your **own** purposes only, and ***do not*** affect how the resource behaves

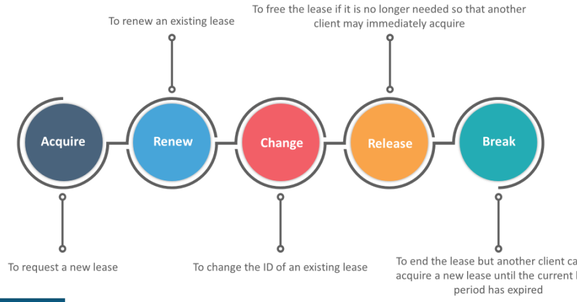
**NOTE:**

- Retrieving property and metadata values for a storage resource is a **two-step** process
- Before you can read these values, you must explicitly fetch them by calling the ***FetchAttributes*** or ***FetchAttributesAsync*** method

edureka!



## Lease Blob – Operation Modes




edureka!



edureka!


edureka!


edureka!

# Thank You

For more information please visit our website
www.edureka.co