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Post Graduate Program in Cloud Computing

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PG CC - Microsoft Azure Architect Technologies: AZ:303

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Implement Azure SQL Databases

Learning Objectives

By the end of this lesson, you will be able to:

- Describe Azure SQL database service
- Implement Azure SQL managed instance
- Configure SQL Database high availability
- Implement the Deployment Models
- Configure Hyperscale Service tier availability

A Day in the Life of an Azure Architect

You are working for an organization as an Azure Architect that is looking for a database solution that will automate most database maintenance tasks such as updating, patching, backups, and monitoring without user involvement.

Also, the solution must have different deployment options available to easily migrate your database to Azure.

To achieve all of the above along with some additional features, we will be learning a few concepts in this lesson that will help you find a solution for the given scenario.

Azure SQL Database

Azure SQL Database Service

- The Azure SQL Database is a completely managed platform as a service (PaaS) database that automates most of the database management tasks.
- Advanced query processing capabilities, such as high-performance in-memory technology and intelligent query processing are available.

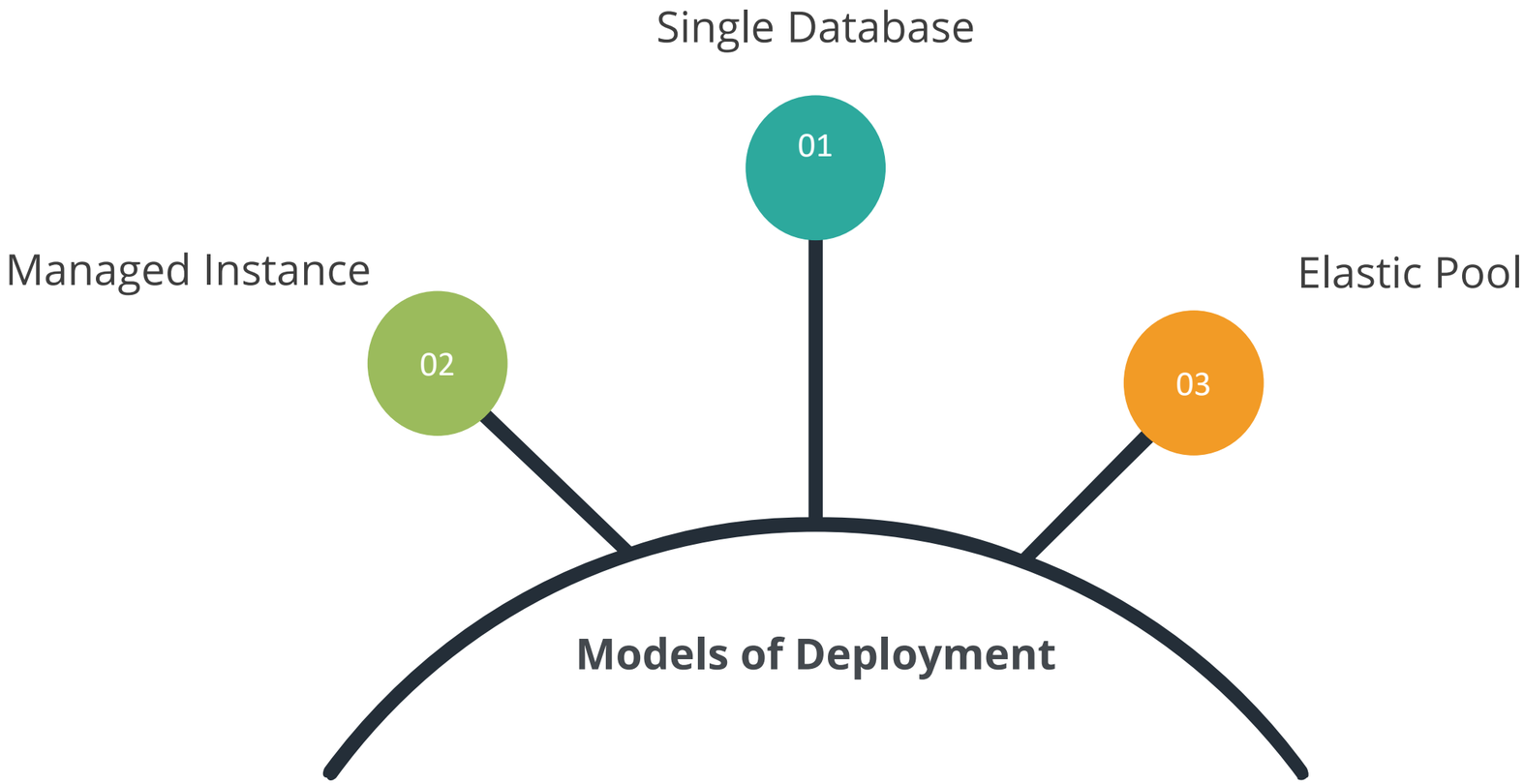
Azure SQL Database Service

The benefits of Azure SQL Database Service are:

- The future of scalability
- High-speed operation with little downtime
- Improved usability
- Easy-to-use migration tools

Deployment Models

There are three types of deployment models:



Deployment Models

Single Database

- This is the simplest deployment method.
- A single database maintained by a SQL Database server and deployed on an Azure VM

Managed Instance

- A database instance that is fully managed
- It is made to make migrating on-premise SQL databases simple.

Elastic Pool

- A collection of interconnected databases that pool resources
- Individual databases can be added and removed from an elastic pool.

Deploy Azure SQL Database

There are basically five sections in the Azure portal to fill out during a deployment for Azure SQL Database and Azure SQL Managed Instance:

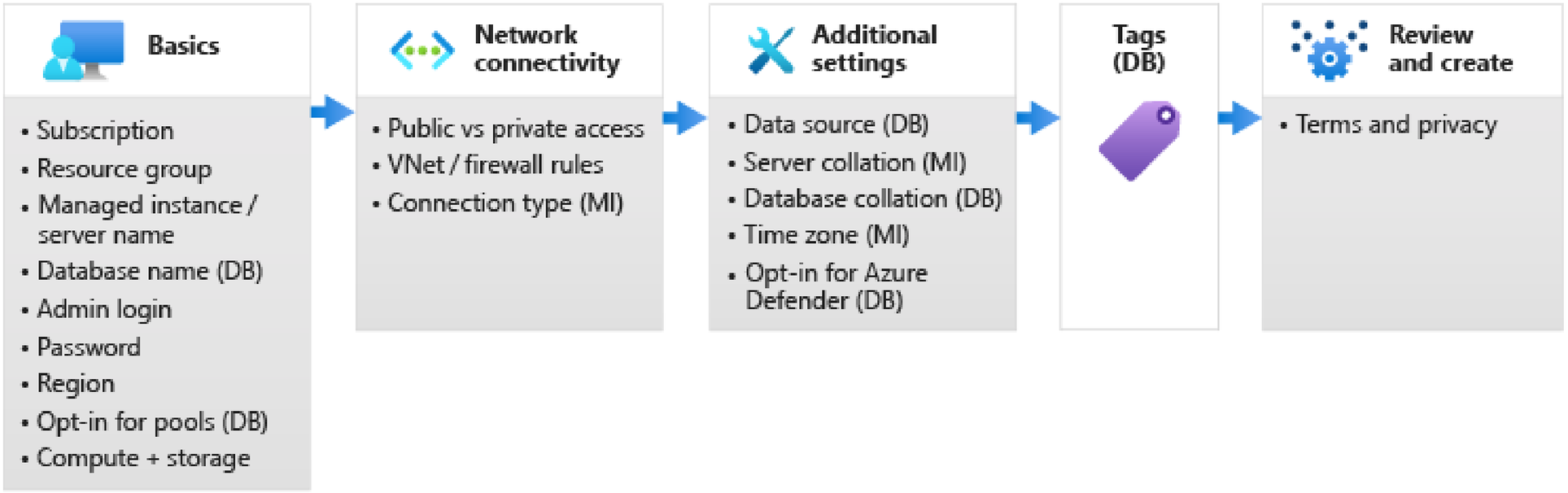
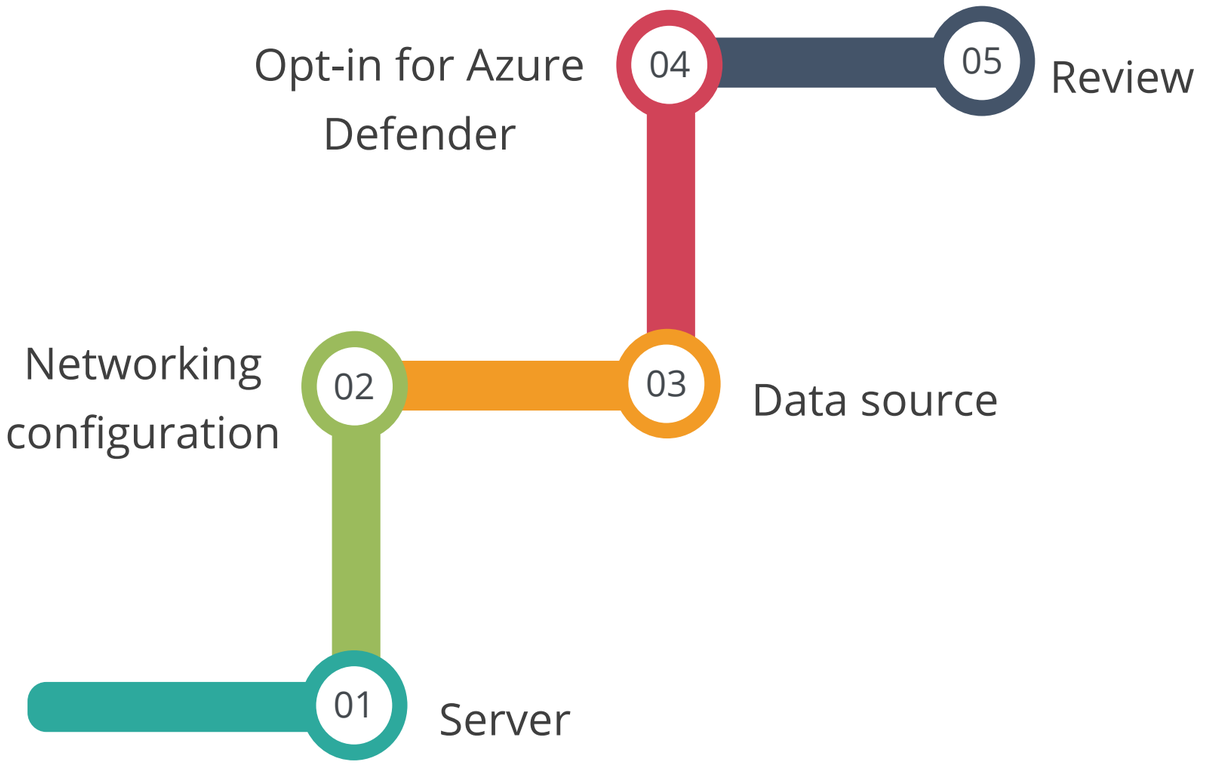


image source: https://docs.microsoft.com/en-in/

Deploy Azure SQL Database

These are the five options from the sections in the Azure portal:



Deploy Azure SQL Database

These are the explanations for the options:

Server

The name of the server must be unique across Azure.

Networking Configuration

A public endpoint can be allowed to link to a controlled instance over the internet.

Data Source

The user deploys the instance first, then the databases within it.

Opt-in for Azure Defender

After the instance has been deployed, the user can allow Azure Defender.

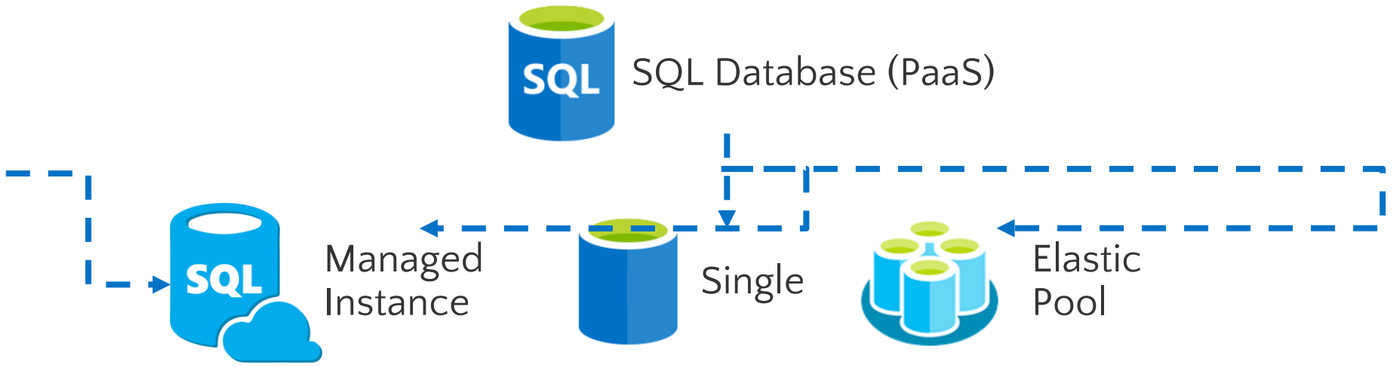
Review

The user can check the deployment choices in the Review section.

Implement Azure SQL Managed Instances

Azure SQL Database Managed Instance

It is a new deployment option that enables frictionless migration for SQL apps and modernization in a fully managed service.



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Azure SQL Database Managed Instance

Easy lift and shift

- Fully-fledged SQL instance with 100% compatibility with on-premise

Fully managed PaaS

- Built on the same PaaS service infrastructure
- All PaaS features

Full isolation and security

- Native VNet implementation
- Private IP addresses

New business model

- Competitive
- Transparent
- Frictionless

Azure SQL Database Managed Instance Benefits

PaaS benefits

- No hardware purchasing and management
- No management overhead for managing the underlying infrastructure
- Quick provisioning and service scaling
- Automated patching and version upgrade
- Integration with other PaaS data services

Business continuity

- 99.99% uptime SLA
- Built in high-availability
- Data protected with automated backup
- Customer configurable backup retention period
- User-initiated backups
- Point in time database restore capability

Azure SQL Database Managed Instance Features

Feature	Description
SQL Server version / build	SQL Server Database Engine (latest-stable)
Managed automated backups	Yes
Built-in instance and database monitoring and metrics	Yes
Automatic software patching	Yes
Latest database engine features	Yes
Number of data files (ROWS) per the database	Multiple
Number of log files (LOG) per database	1
VNet - Azure Resource Manager deployment	Yes
VNet - Classic deployment model	No
Portal support	Yes
Built-in Integration Service (SSIS)	No - SSIS is a part of Azure Data Factory PaaS
Built-in Analysis Service (SSAS)	No - SSAS is separate PaaS
Built-in Reporting Service (SSRS)	No - uses Power BI paginated reports instead or host SSRS on Azure VM

SQL Database High Availability

High Availability and Azure SQL Database

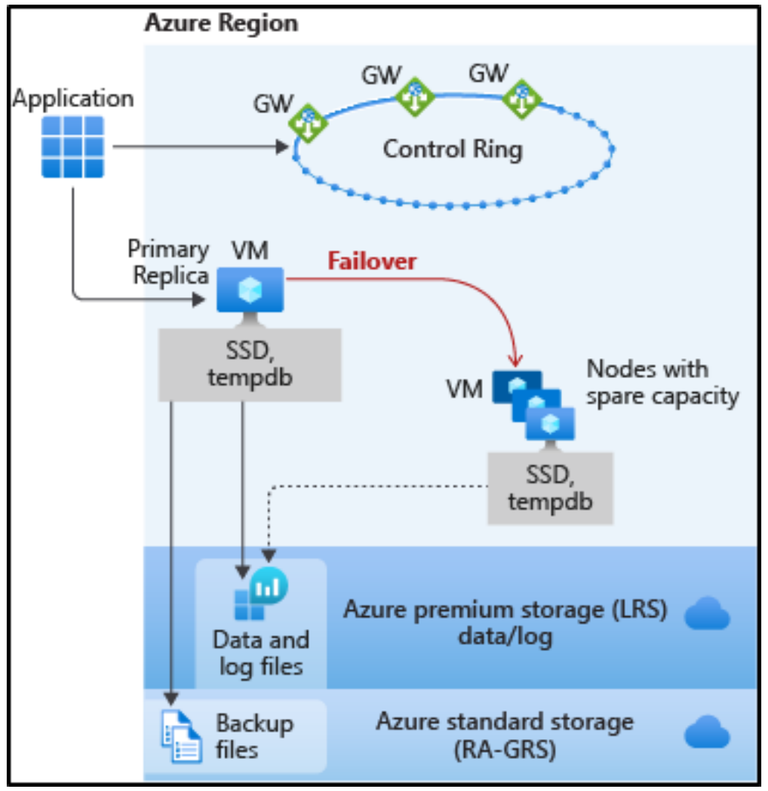
There are two types of high availability models:

Standard Availability Model

Premium Availability Model

Standard Availability Model

The following figure shows four different nodes with separate compute and storage layers:



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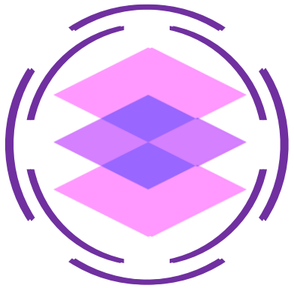
Standard Availability Model

The Standard and General Purpose service tier availability includes two layers:

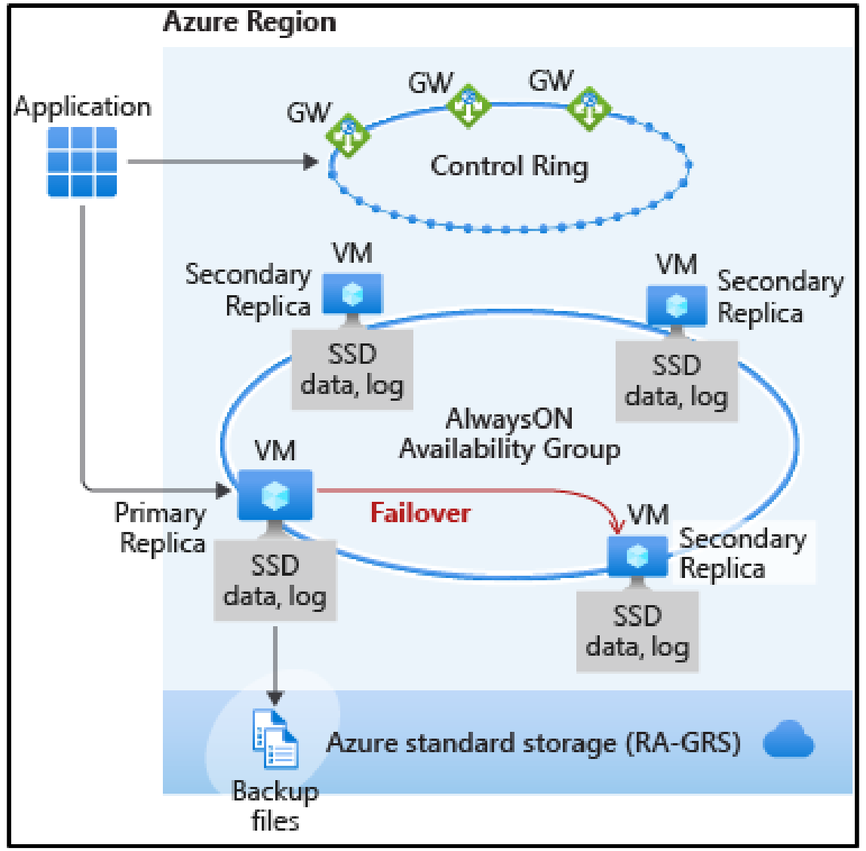


Stateless compute layer

Stateful data layer

Premium and Business Critical Service Tier Availability

The Premium model of high availability is achieved by creating a four-node cluster as shown below:



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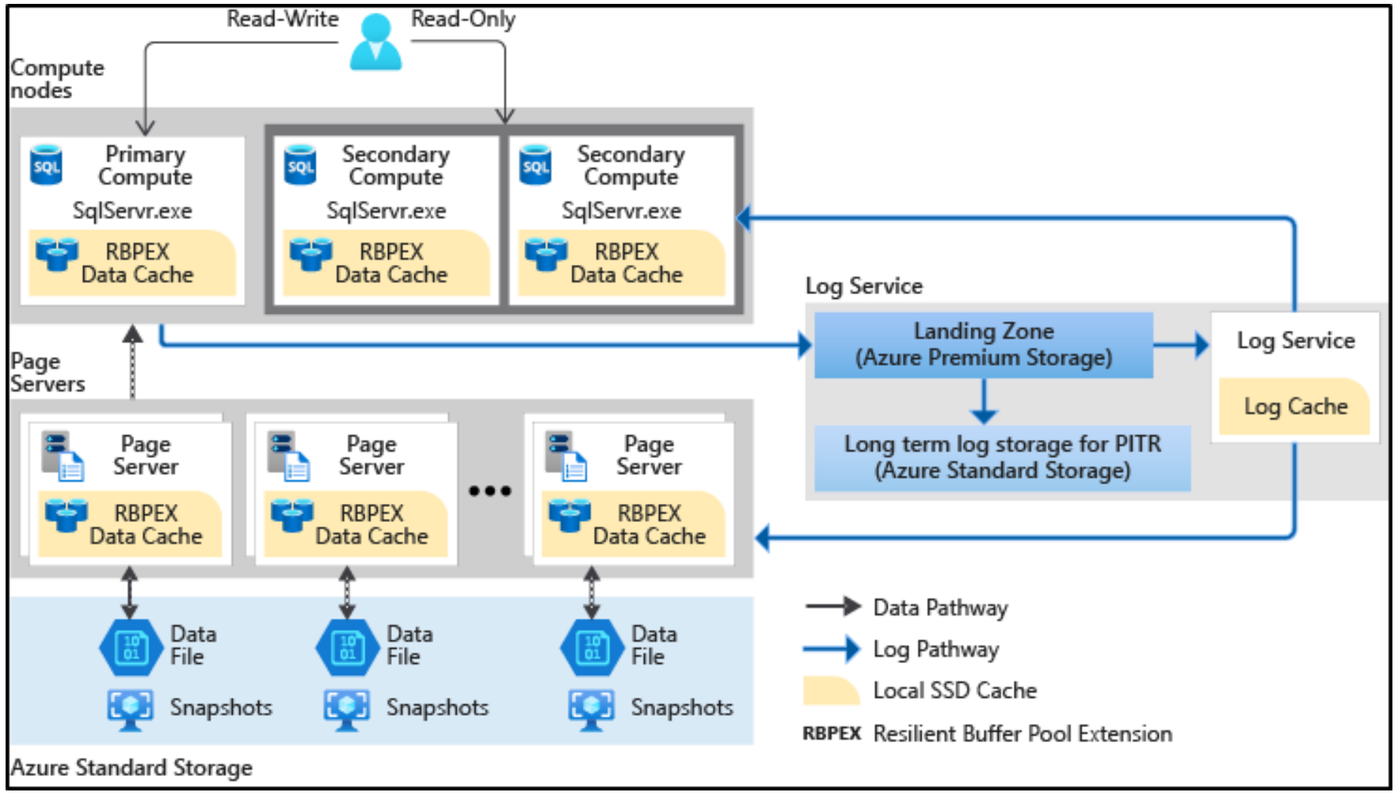
Hyperscale Service Tier Availability

The diagram given below will help you to understand the Hyperscale service tier:



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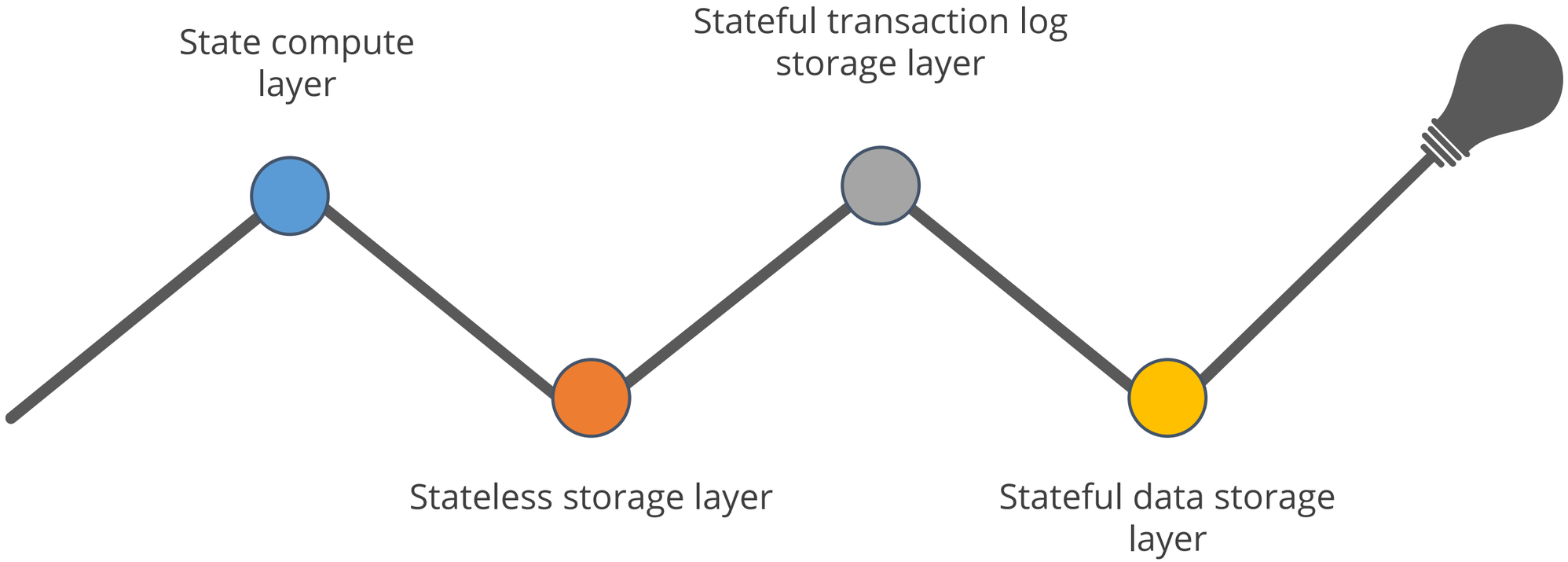
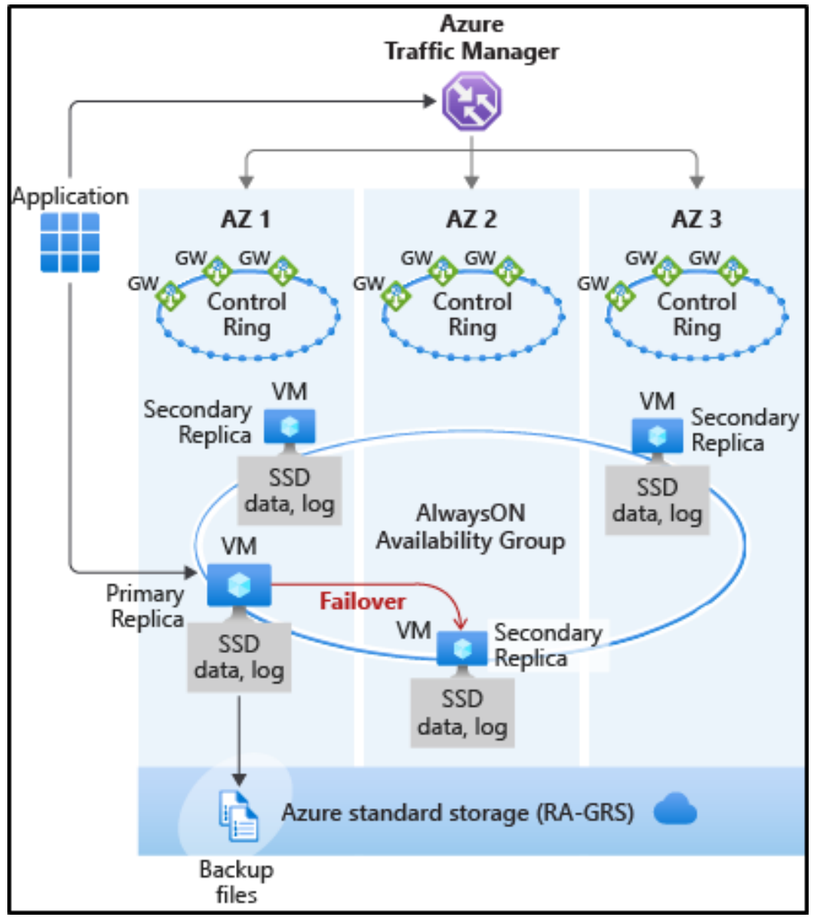
Hyperscale Service Tier Availability

The availability model in Hyperscale includes four layers:



Zone Redundant Configuration

The following figure shows the zone redundant version of high availability:



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Assisted Practice

Azure SQL DB **Duration: 10 Min.**

Problem Statement:

You've been assigned a project to construct an Azure SQL DB that will automate most database maintenance tasks such as updating, patching, backups, and monitoring without user involvement.

Assisted Practice: Guidelines

Steps to create an Azure SQL DB are:

1. Login to your Azure portal
2. Search and select Azure SQL
3. Select the SQL databases tile
4. Fill in the required fields and create SQL DB

Key Takeaways

- The Azure SQL Database is a completely managed platform as a service (PaaS) database that automates most of the database management tasks.
- Basics, Network Connectivity, Additional Settings, Tags, Review and Create are the five sections required during deploying Azure SQL Database.
- Standard and premium are two types of high availability models.
- The Premium model of high availability is achieved by creating a four-node cluster.

Create a SQL Database

Duration: 10 Min.

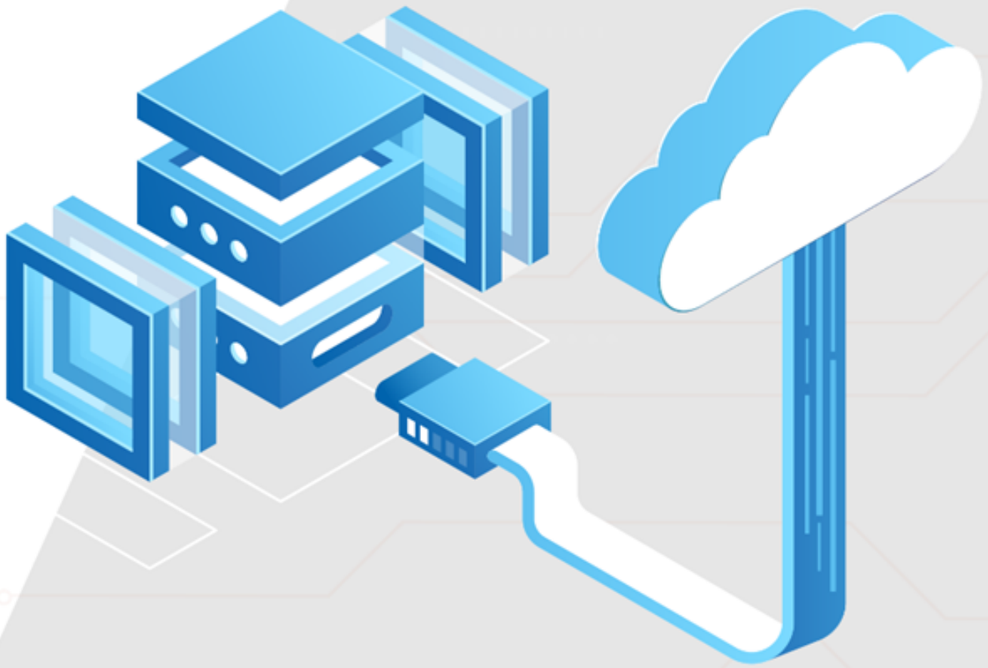
Project agenda: To create a SQL database as per the requirement

Description: You have been given a project to create a SQL Database. You need to ensure that during an adverse event like a catastrophic failure or natural disaster the users are still able to read the data. You need to configure Geo-replication so that you have a secondary database in place.

Perform the following:

Create a SQL database and configure Geo-Replication.

LESSON-END PROJECT



Thank you