

# Azure SQL Database Administration

## Course Overview

- This is **100% hands-on course**; students will learn about running SQL Server in Azure.
- **Helps to prepare 70-765 Microsoft exams.**
- We will discuss all the concepts with our on-premises data center and Azure platform.
- The primary focus of this course is SQL Server cloud and hybrid-cloud solutions on both Azure Platform as a Service (PaaS) and Azure Infrastructure as a Service (IaaS).
- This course will cover best practices for deploying SQL Server on Azure Virtual Machines including standalone SQL Servers and hybrid Availability Groups.

## Target Participants

- SQL Server Database Administrators
- Working people, Students, IT Professionals

## Learning Formats

- Online interactive and video based training

## Our Trainer (s)

This course is delivered by **SQL Server expert and SME Mr. Kareem Syed**. He has hands on working experience on various SQL Server versions and recent cloud platforms. Having 14+years hand on experience he is technical consultant for some of the MNCs. You can visit his blog **at**

**[www.azure-sql.blogspot.com](http://www.azure-sql.blogspot.com)** for more details.

## 1. Getting started with cloud and Microsoft Azure

- What is cloud computing?
- Cloud computing benefits as compared with on-premises environment.
- Different cloud services
  - IaaS, PaaS, SaaS
- Cloud computing deployment models.
  - Public, Private, Hybrid and Community
- Introduction to Microsoft Azure
- Benefits and Features
- **SQL database implementation in Azure**
  - Azure SQL Database
  - SQL Managed Instance
  - SQL VMs

## 2. Designing and implementing Azure SQL Databases (PaaS for SQL Server)

- What Azure SQL Database?
- Differences between Azure SQL Database and Azure SQL VM.
- Advantages and common features of SQL Database.
- Difference between on-premises and Azure SQL Database.
- Un-supported features in SQL Database.
- Step by Step process to create
  - Azure SQL Database using portal.
  - Azure SQL database using Azure CLI
  - Azure SQL database using Powershell
- Different service tiers for SQL Database
- Determining appropriate service tier for SQL databases.
- Changing service tiers.
- Common configurations
  - Configuring Instance level firewall rules.
  - Configuring database level firewall rules.
  - Verifying instance and SQL database properties.
  - Creating database users and configuring DNS to application access.
  - Verifying application access connection strings.

### 3. Designing and implementing Azure SQL Databases

- Migrating on-premises databases to Azure SQL Database.
- Migration considerations.
- Migration methodology.
- Migration Tools and options
  - Deploy database to Windows SQL Database wizard.
  - Export Data Tier application (.BACPAC)
  - Using Export and Import wizard.
  - Using DMA Tool.
  - SQLPackage.exe
- Optimizing data transfer
- Migration issues
- Implementing Transactional Replication

### 4. Post Migration Steps

- Set up server-level firewall rules for your server in the Azure portal
- Set up database-level firewall rules for your database using SSMS
- Connect to your database using a secure connection string
- Manage user access
- Dynamic Data Masking
- Protect your data with encryption
- Enable SQL Database auditing
- Enable SQL Database threat detection

### 5. Configuring and implementing security for Azure SQL Databases

- Authentication layers
- **Firewall rules**
  - Managing the Server-Level Firewall Rules using the Azure Portal
  - Managing the Server-Level Firewall Rules using Transact-SQL
  - Managing Database-Level Firewall Rules using Transact-SQL
- **Authentication Options**
  - SQL Authentication
  - Azure Active Directory Authentication
    - Azure SQL Database Authentication Structure
    - Azure SQL Database Authentication Considerations
    - Creating Contained Database Users for Azure AD Authentication Groups and Roles
- **Row-Level Security**

## 6. Microsoft Azure SQL Data Sync

- Exporting data from SQL server Azure SQL database.
- Sharing data between multiple locations.
- Scaling out
- Creating sync group.
- Creating sync rules.
- Running manual sync.
- Azure to Azure
- Azure to On-Premises
- Establishing conflict resolution.
- Creating an automated sync schedule.
- Creating sync agent.

## 7. Azure SQL Database Backups and Restore Options

- **Automatic Backups.**
  - Backup Types
  - Backup default schedules
  - Backup storage
  - Backup retention period
  - Configuring Long term backups
- **Manual Backups**
  - Backing up the Azure SQL Database using SSMS
  - DACPAC and BACPAC
  - Manual versus Automated Backups
- **Restore Types**
  - Point-in-time restores
  - Long-Term Database Restore
  - Restoring Deleted Databases
  - Geo-Restore Database
- **Elastic Pools**
  - Introducing Elastic Pools
  - When Should You Consider Elastic Pools?
  - Elastic Jobs

## 8. Designing and implementing High Availability, Disaster recovery

- Design and implement high availability solutions.
- Design and implement scalable solutions.
- Implement SQL Database data recovery.
- Implementing geo-replication for high availability.
- Verifying replication
- Configuring database level firewalls.
- Creating users and allowing apps to connect
- Monitoring using T-SQL commands
- Monitoring using Powershell
- Performing manual failover.
- Configuring multiple secondary sites.
- Configure an active geo-replication failover group.
- Removing replication.

## 9. Monitoring and Troubleshooting

- Manage SQL Server in Azure VMs with PowerShell,
- Manage Azure SQL Database with PowerShell,
- Configure Automation and Runbooks
- Scheduling backups.
- Designing and tuning for scalability and high performance
- Monitoring using Management portal.
- Microsoft Azure service dashboard.
- SQL database management portal.
- Using DMVs and DMFs

## 10. Designing and implementing Azure SQL VMs

- What is Azure SQL VM?
- Introduction to Storage Service.
- Working with Azure Networks.
- Provisioning SQL Server on Azure VM
- Configuring FireWalls
- Creating logins
- Verifying VM architecture
- Configuring common SQL instance features
- Migrating on-premises databases to Azure SQL VM.
- Backup and Restore to URL.

- Using AzCopy with detach attach approach
- Convert on-premises physical machine to Hyper-V VHD, upload to Azure Blob storage, and then deploy as new VM using uploaded VHD.
- Using on-premises AO primary replica with Azure secondary replica.
- Using transactional replication.
- Common Issues and troubleshooting
- Post migration steps.

## 11. Interview preparation FAQs and Exam Tips.

