



Azure

DP-300T00: Administering Microsoft Azure SQL Solutions

\$2,595.00

- 4 Days

Upcoming Dates

Jul 08 - Jul 11

Sep 09 - Sep 12

Nov 04 - Nov 07

Dec 16 - Dec 19

Course Description

This course provides students with the knowledge and skills to administer a SQL Server database infrastructure for cloud, on-premises and hybrid relational databases and who work with the Microsoft PaaS relational database offerings. Additionally, it will be of use to individuals who develop applications that deliver content from SQL-based relational databases.

Course Outline

Prepare to maintain SQL databases on Azure

Explore the role of a database administrator on Azure. Describe SQL Server-based offerings on Azure.

Lessons

- Describe Microsoft Intelligent Data Platform roles
- Understand SQL Server in an Azure virtual machine
- Design Azure SQL Database for cloud-native applications
- Explore Azure SQL Database Managed Instance

Lab:

- None

Deploy IaaS solutions with Azure SQL

Configure virtual machine sizing, storage, and networking options to ensure adequate performance for your database workloads. Choose and configure appropriate high availability options.

Lessons

- Explain IaaS options to deploy SQL Server in Azure
- Understand hybrid scenarios
- Explore performance and security
- Explain high availability and disaster recovery options

Lab:

- Provision a SQL Server on an Azure Virtual Machine

Deploy PaaS solutions with Azure SQL

Provision and deploy Azure SQL Database and Azure SQL managed instance. Select the appropriate options when performing a migration to the SQL PaaS platform.

Lessons

- Explain PaaS options for deploying SQL Server in Azure
- Explore single SQL database
- Deploy SQL database elastic pool
- Understand SQL database hyperscale
- Examine SQL managed instance
- Describe SQL Edge

Lab:

- Deploy an Azure SQL Database

Evaluate strategies for migrating to Azure SQL

Describe database migration options and tools on Azure. Understand how compatibility level affects database behavior. Describe Azure private and public preview options.

Lessons

- Understand compatibility level
- Understand Azure preview features
- Describe Azure database migration options

Lab:

- None

Migrate SQL Server workloads to Azure SQL Database

You will explore different migration tools and migrate SQL Server databases to Azure SQL Database.

Lessons

- Choose the right Azure SQL Database feature
- Use Azure SQL migration extension to migrate to Azure SQL Database
- Explore Data Migration Assistant to migrate to Azure SQL Database
- Migrate to Azure SQL Database using BACPAC
- Use an online method to migrate to Azure SQL Database
- Move data to Azure SQL Database

Lab:

- Migrate a SQL Server database to Azure SQL Database

Migrate SQL Server workloads to Azure SQL Managed Instance

You'll explore different migration tools and migrate SQL Server databases to Azure SQL Managed Instance.

Lessons

- Evaluate migration scenarios
- Use Log Replay Service (LRS) to migrate
- Migrate using Managed Instance link
- Migrate using Managed Instance link

Lab:

- Migrate a SQL Server database to Azure SQL Managed Instance

Configure database authentication and authorization

Contrast authentication using Microsoft Entra ID (Formerly Azure AD), Windows Active Directory, and SQL Server authentication. Implement various security principals and configure permissions.

Lessons

- Describe Active Directory and Microsoft Entra ID (Formerly Azure AD)
- Describe authentication and identities
- Describe Security Principals
- Describe database and object permissions
- Identify authentication and authorization failures

Lab:

- Authorize Access to Azure SQL Database with Microsoft Entra ID (Formerly Azure AD)

Protect data in-transit and at rest

Explore encryption options available within Azure SQL, including firewall rules, Always Encrypted, and Transport Layer Security. Understand how SQL Injection works.

Lessons

- Explore Transparent Data Encryption
- Configure server and database firewall rules
- Explain object encryption and secure enclaves
- Enable encrypted connections
- Describe SQL injection
- Understand Azure Key Vault

Lab:

- Configure a server-based firewall rule using the Azure portal

Implement compliance controls for sensitive data

Explore data classification capabilities and degrees of confidentiality. Implement security options to maintain private data safe, including Azure SQL auditing, Microsoft Defender for SQL, row-level security, Dynamic Data Masking and Azure SQL Database Ledger.

Lessons

- Explore data classification
- Explore server and database audit
- Implement Dynamic Data Masking
- Implement Row Level security
- Understand Microsoft Defender for SQL
- Explore Azure SQL Database Ledger
- Implement Azure Purview

Lab:

- Enable Microsoft Defender for SQL and Data Classification

Describe performance monitoring

Compare Azure, and on-premises tools for monitoring and measuring performance. Determine critical metrics. Understand the purpose of a baseline for comparative analysis. Configure extended event sessions for tracing activities.

Lessons

- Describe performance monitoring tools
- Describe critical performance metrics
- Establish baseline metrics
- Explore extended events
- Describe Azure SQL Insights
- Explore Query Performance Insight

Lab:

- Isolate problems with monitoring

Configure SQL Server resources for optimal performance

Choose the appropriate size and storage options for your Azure SQL databases. Configure server resources such as tempdb. Understand the usage of Resource Governor.

Lessons

- Explain how to optimize Azure storage for SQL Server virtual machines
- Describe virtual machine resizing
- Optimize database storage
- Control SQL Server resources

Lab:

- None

Configure databases for optimal performance

Implement tasks for both IaaS and PaaS to maintain indexes, and statistics. Explore the automatic tuning features of Azure SQL Database. Control database-level configuration options. Explore Intelligent Query Processing.

Lessons

- Explore database maintenance checks

- Describe database scoped configuration options
- Describe automatic tuning
- Describe intelligent query processing

Lab:

- Detect and correct fragmentation issues

Explore query performance optimization

Read and understand various forms of execution plans. Compare estimated vs actual plans. Learn how and why plans are generated. Understand the purpose and benefits of the Query Store.

Lessons

- Understand query plans
- Explain estimated and actual query plans
- Describe dynamic management views and functions
- Explore Query Store
- Identify problematic query plans
- Describe blocking and locking

Lab:

- Identify and resolve blocking issues

Evaluate performance improvements

Evaluate possible changes to indexes. Determine the impact of changes to queries and indexes. Explore Query Store hints.

Lessons

- Describe wait statistics
- Tune and maintain indexes
- Understand query hints

Lab:

- Isolate problem areas in poorly performing queries

Explore performance-based design

Explore normalization for relational databases. Investigate the impact of proper datatype usage. Compare types of indexes.

Lessons

- Describe normalization
- Choose appropriate data types
- Choose appropriate data types

Lab:

- Identify database design issues

Automate deployment of database resources

Explore multiple deployment models available on Azure. Use Azure Resource Manager (ARM) templates and Bicep files for deploying Azure SQL resources. Understand how to use PowerShell and Azure CLI for automation purposes.

Lessons

- Describe deployment models in Azure
- Automate deployment by using Azure Resource Manager templates and Bicep
- Automate deployment by using PowerShell
- Automate deployment by using Azure CLI

Lab:

- Deploy an Azure SQL Database using an Azure Resource Manager template

Create and manage SQL Agent jobs

Explore SQL automation for scheduled tasks, and automatic alerts for SQL Server and Azure SQL Managed Instance.

Lessons

- Create a SQL Server maintenance plan
- Describe task status notifications

Lab:

- Create a CPU status alert for a SQL Server

Manage Azure PaaS tasks using automation

Explore automation for Azure SQL platform. Configure elastic jobs, explore Azure Automation, and evaluate different strategies for monitoring automation tasks.

Lessons

- Explore Elastic jobs
- Understand Azure Automation
- Build an automation runbook
- Automate database workflows by using Logic Apps
- Monitor automated tasks

Lab:

- Deploy an automation runbook to automatically rebuild indexes

Describe high availability and disaster recovery strategies

Plan an appropriate high availability and disaster recovery strategy based on recovery time objective and recovery point objective. Choose the best solution for IaaS or PaaS deployments or hybrid workloads.

Lessons

- Describe recovery time objective and recovery point objective
- Explore high availability and disaster recovery options
- Describe Azure high availability and disaster recovery features for Azure Virtual Machines
- Describe high availability and disaster recovery options for PaaS deployments
- Explore an IaaS high availability and disaster recovery solution

- Describe hybrid solutions

Lab:

- None

Explore IaaS and PaaS solutions for high availability and disaster recovery

Deploy Windows Server Failover Cluster and availability groups in Azure and hybrid environments. Configure temporal tables, geo-replication, and auto-failover groups.

Lessons

- Describe failover clusters in Windows Server
- Configure Always-on availability groups
- Describe temporal tables in Azure SQL Database
- Describe active geo-replication for Azure SQL Database
- Explore auto-failover groups for Azure SQL Database and Azure SQL Managed Instance

Lab:

- Configure geo replication for Azure SQL Database

Back up and restore databases

Plan and implement policy for recovering data if user errors occur or the technology fails. Explore various options for how and where to back up and restore databases.

Lessons

- Back up and restore SQL Server running on Azure virtual machines
- Back up a SQL Server virtual machine
- Back up and restore a database using Azure SQL Database

Lab:

- Backup to URL

Audience

The audience for this course is data professionals managing data and databases who want to learn about administering the data platform technologies that are available on Microsoft Azure. This course is also valuable for data architects and application developers who need to understand what technologies are available for the data platform with Azure and how to work with those technologies through applications.

Prerequisites

Before attending this course, students must have:

- A foundational knowledge of core data concepts and how they're implemented using Azure data services. For more information see Azure Data Fundamentals.
- Experience designing and building scalable databases, configuring, monitoring, and optimizing databases in order to increase business value using Microsoft SQL Server. For more information see Azure Database Administrator

What You Will Learn