

COURSE OUTLINE



Course Name: Administering Relational Database On Microsoft Azure

Course Code: MS-DP300T00

DURATION	SKILL LEVEL	DELIVERY METHOD	TRAINING CREDITS	TECHNOLOGY
4 Day	Intermediate	VIL/TILT	N/A	Analytics & Data Management

Course Overview

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.

Audience profile:

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.

Pre-requisites:

Successful Azure Database Administrators start this role with professional experience in database management and technical knowledge of cloud technologies.

Specifically:

- Working with, maintaining, and developing with SQL Server
- Experience with Azure, such as deploying and managing resources

At a minimum, you should know the information in the following online training before attending the course:

- Introduction to Azure SQL
- AZ-900 Azure Fundamentals
- DP-900 Azure Data Fundamentals

Course Objectives:

After completing this course, students will be able to:

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Course Content

Module 1: The Role of the Azure Database Administrator

This module explores the role of a database administrator in the world of Azure. It also provides some foundational information relevant to the overall content. This includes a review of the various SQL Server-based options (SQL Server in a VM, Managed Instances, and Azure SQL Database.) Students will learn why compatibility level is a crucial concept when working with SQL databases in Azure. Students are also introduced to other database platforms available on Azure in addition to those based on SQL Server, in particular PostgreSQL and MySQL

Lesson

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Lab: Using the Azure Portal and SQL Server Management Studio

- Plan, deploy and configure Azure SQL offerings
 - Monitor database performance and tune a database and queries for optimum performance
 - Plan and configure a High Availability Solution
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Module 2: Plan and Implement Data Platform Resources

This module introduces methods for deploying data platform resources in Azure. You will learn about options for both upgrading and migrating existing SQL databases to Azure. You will learn how to set up Azure resources to host SQL Server on a Virtual Machine, a Managed Instance, Azure SQL Database and either PostgreSQL or MySQL. You will learn how to determine which options are best based on specific requirements including the High Availability and Disaster Recovery (HADR) needs. They will learn to calculate resource requirements and create templates for their deployments.

Lesson

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Lab: Deploying Azure SQL Database

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Module 3: Implement a Secure Environment

This module explores the practices of securing your SQL Server Database as well as an Azure SQL database. This includes a review of the various SQL Server-based options as well as the various Azure options for securing Azure SQL Database as well as the databases with reside within Azure SQL Database. . Students will lean why security is crucial when working with databases. . Students are also introduced to other database platforms available on Azure in addition to those based on SQL Server, in particular, Azure Database for MariaDB/MySQL/PostgreSQL.

Lesson

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Lab: Implement a Secure Environment

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Module 4: Monitor and Optimize Operational Resources

This module will teach you about resource optimization for your databases created using either IaaS or PaaS services. The module also covers monitoring server and hardware resources. It will familiarize you with the various tools available for monitoring performance and establishing a baseline. You will learn how to interpret performance metrics for the most critical resources. You will also learn how to troubleshoot database performance using Azure SQL Database Intelligent Insights.

Lesson

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Lab: Monitor and Optimize Resources

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Module 5: Optimize Query Performance

Query execution plans are potentially the most important aspect of database performance. Improving bad plans is certainly an area where a small amount of effort can bring huge improvements. While hardware issues can limit query performance, improving hardware usually yields performance improvements in the 10-20% range, at most. More commonly database administrators encounter queries that are not optimized, have stale or missing statistics, have missing indexes, or poor database design choices that lead to the database engine doing more work than is necessary to return results for a given query. Improving the plans can sometimes yield performance improvements in the 100-200% range or even more, meaning that after improving a plan with better indexes or statistics, a query could run twice or three times as fast! This module provides details on how to analyze individual query performance and determine where improvements can be made.

Lesson

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Lab: Query Performance Troubleshooting

- Plan, deploy and configure Azure SQL offerings
- Monitor database performance and tune a database and queries for optimum performance
- Plan and configure a High Availability Solution

Module 6: Automation of Tasks

A common goal for database administrators in many environments is to automate as many of their repetitive tasks. This can be as simple as using scripting to automate a backup process, and as complex as building a fully automated alerting system. This module provides details of automating tasks to simplify the DBA's job. Methods include scheduling tasks for regular maintenance jobs, as well as multi-instance administration and configuration of notifications for task success or failure or non-completion.

Lesson

- Setting up Automatic Deployment
- Defining Scheduled Tasks
- Managing Azure PaaS resources Using Automated Methods

Lab: Automating Tasks

- Deploy an Azure template from a Quickstart template on GitHub
- Configure notifications based on performance metrics
- Deploy an Azure Automation Runbook (or elastic job) to rebuild indexes on an Azure SQL Database

Module 7: Plan and Implement a High Availability and Disaster Recovery Environment

Data must be available when the business needs it. That means the solutions hosting the data must be designed with availability and recoverability in mind. Suppose you work for a company that sells widgets both in stores and online. Your main application uses a highly transactional database for orders. What would happen if the server or platform hosting the transactional database had a problem that made it unavailable or inaccessible for some reason? What impact would it have on the business? If the right solution is put in place, the database would come online in a reasonable timeframe with minimal effort, thus allowing business to continue with little-to-no impact. This module and its associated lab cover configuring, testing, and managing a solution for high availability and disaster recovery (HADR) in Azure, for both Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) deployments. This module will not only cover basic requirements, but also the various options available to achieve HADR.

Lesson

- High Availability and Disaster Recovery Strategies
- IaaS Platform and Database Tools for HADR
- PaaS Platform and Database Tools for HADR
- Database Backup and Recovery

Lab: Plan and Implement a High Availability and Disaster Recovery Environment

- Create an Always On Availability Group
- Enable Geo-Replication for Azure SQL Database
- Backup to URL and Restore from URL

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