



Enterprise Computing Solutions - Education Services

TRAINING OFFERING

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Administering Microsoft Azure SQL Solutions

CODE:

MCS_DP-300T00

LENGTH:

32 Hours (4 days)

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.

Objectives

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

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

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:

AZ-900 Azure Fundamentals

DP-900 Azure Data Fundamentals

Programme

Module 1: Introduction to Azure Database Administration

This module explores the role of a database administrator in the world of Azure SQL. 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, SQL Managed Instance, and Azure SQL Database).

Lessons

Prepare to maintain SQL databases on Azure

After completing this module, students will be able to:

Understand the role of Azure Database Administrator as it fits in with other data platform roles

Be able to describe the key differences between the SQL Server-based database options

Describe other features for Azure SQL platforms available

Module 2: Plan and Implement Data Platform Resources

This module introduces methods for deploying data platform resources in Azure SQL. 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 SQL Managed Instance, and SQL Database. 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 understand hybrid approaches.

Lessons

Deploy IaaS solutions with Azure SQL Deploy PaaS solutions with Azure SQL Evaluate strategies for migrating to Azure SQL

Migrate SQL workloads to Azure SQL Databases Migrate SQL workloads to Azure Managed Instances

Lab : Provision SQL Server on an Azure Virtual Machine

Explore the Azure Portal

Deploy a SQL Server on an Azure Virtual Machine

Connect to SQL Server on an Azure Virtual Machine

Lab : Provision an Azure SQL Database

Create a Virtual Network

Deploy an Azure SQL Database

Connect to an Azure SQL Database using Azure Data Studio

Query an Azure SQL Database using SQL Notebook

After completing this module, students will be able to:

Explore the basics of SQL Server in an Infrastructure as a Service (IaaS) offering

Understand PaaS provisioning and deployment options Evaluate migration scenarios to SQL Managed Instance and SQL Database

Evaluate and implement a strategy for moving a database to Azure

Module 3: Implement a Secure Environment for a Database Service

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. Students will learn why security is crucial when working with databases, and explain authentication options for Azure SQL Database.

Lessons

Configure database authentication and authorization Protect data in-transit and at rest

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

Configure Azure SQL Database firewall rules

Validate access

Lab : Authorize Access to Azure SQL Database with Azure Active Directory

Create users

Manage access to database objects

Validate access

Lab : Enable Microsoft Defender for SQL and Data Classification

Enable Microsoft Defender for Azure SQL Database

Configure Data Classification for Azure SQL Database

Implement compliance controls for sensitive data After completing this module, students will be able to:

Understand the differences between Windows, SQL Server and Azure Active Directory Authentication

Describe and configure both data-at-rest encryption solutions as well as data-in-transit encryption

Implement a data sensitivity 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 Insights.

Lessons

Describe performance monitoring Configure SQL Server resources for optimal performance

Lab : Isolate performance problems through monitoring

Review CPU utilization in Azure portal

Identify high CPU queries

Lab : Detect and correct fragmentation issues

Investigate index fragmentation

Rebuild fragmented indexes

Validate performance improvements

Configure databases for optimal performance After completing this module, students will be able to:

Monitor activity and compare to a baseline Identify major causes of performance problems

Configure resources for optimal performance Configure a user database for optimal performance

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.

Lessons

Explore query performance optimization Explore performance-based database design Evaluate performance improvements

The factors that comprise a HADR strategy How to configure a high availability solution via a hands-on lab

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