Implement Scalable Database Solutions Using Azure SQL (DP-300)

Duration: 4 Days

COURSE DESCRIPTION

This course provides students with the knowledge and skills to create 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

Module 1: Plan and Implement Data Platform Resources

- Prepare to maintain SQL Server-based databases on Azure
  - Understand the role of Azure Database Administrator as it fits in with other data platform roles.
  - Describe the key differences between the SQL Server-based database options in Azure.
  - Describe other features for Azure SQL platforms available.
- Deploy IaaS solutions with Azure SQL
  - Explore the basics of SQL Server in an Infrastructure as a Service (IaaS) offering
  - Learn the available options for provisioning and deployment
  - Deploy SQL Server into an Azure Virtual Machine
- • Deploy PaaS solutions with Azure SQL
  - Gain an understanding SQL Server in a Platform as a Service (PaaS) offering
  - Understand PaaS provisioning and deployment options
  - Understand elastic pools
  - Examine Azure SQL Managed Instances
  - Configure a template for PaaS deployment
- Migrate SQL Server workloads to Azure SQL Database
  - Explore the advantages, capabilities, and migration possibilities offered by Azure SQL Database.
  - Migrate databases using Azure Database Migration Service with Azure CLI and tracking database migration activities.
  - Use transactional replication as an online method to migrate to Azure SQL Database.
  - Explore several other methods for migrating SQL Server databases to Azure SQL Database.
- Migrate SQL Server workloads to Azure SQL Managed Instance
  - Explore the advantages, capabilities, and migration possibilities offered by Azure SQL Managed Instance.
  - Learn how Log Replay Service works to migrate to Azure SQL Managed Instance.
  - Understand how Managed Instance link feature works in a migration scenario.
  - Load and move data to and from Azure SQL Managed Instance.
  - Explore several other methods for migrating SQL Server databases to Azure SQL Database.

Module 2: Implement a secure environment for a database service

- Configure database authentication and authorization
  - Learn about authentication options for Azure SQL
  - Create various security principals
  - Configure permissions within a SQL database
  - Identify authentication and authorization failures
- Protect data in-transit and at rest
  - Understand the data encryption options available in the various platforms
  - Implement object level encryption
  - Understand the difference between database and server firewall rules for Azure SQL Database
  - Explore Always Encrypted with secure enclaves
- Implement compliance controls for sensitive data
  - Plan and implement data classification in Azure SQL Database
  - Understand and configure row-level security and dynamic data masking
  - Understand the usage of Microsoft Defender for SQL
  - Explore how Ledger works

Module 3: Monitor and optimize operational resources in Azure SQL

- Describe performance monitoring
  - o Review potential performance issues.
  - o Identify critical Azure metrics.
  - o Learn how to collect metrics for an established baseline.
  - o Use extended events for performance analysis.
  - o Understand database watcher for Azure SQL Database and Azure SQL Managed Instance.
- Configure SQL Server resources for optimal performance
  - o Understand your options for configuration of Azure storage
  - o Learn how to configure TempDB data files in SQL Server
  - o Learn how to choose the right type of VM for SQL Server workloads
  - o Understand the use cases and configuration of Resource Governor in SQL Server
- Configure databases for optimal performance
  - o Understand database scoped configuration options
  - o Understand maintenance tasks related to indexing and statistics
  - o Understand the features of Intelligent Query Processing (IQP)
  - o Explore the automatic tuning feature in Azure

Module 4: Optimize query performance in Azure SQL

- Explore query performance optimization
  - Generate and save execution plans
  - Compare the different types of execution plans
  - Understand how and why query plans are generated
  - Explain the purpose and benefits of the Query Store
  - Investigate the available reports and data in the Query Store
- Explore performance-based database design
  - Explore normal forms and how they affect database design
  - Choose appropriate datatypes for your data
  - Evaluate appropriate index types

- Evaluate performance improvements
    - Determine when changing indexes or defining new ones can affect performance
    - Evaluate wait statistics as an aid in finding areas for performance improvement
    - Understand how query hints work, and when to use them

Module 5: Automate database tasks for Azure SQL

- Automate database deployment
    - Describe the deployment models available on Azure
    - Deploy database resources using PowerShell and Azure CLI
    - Deploy an Azure Resource Manager template and Bicep
    - Understand the difference between multiple command-line options
- Create and manage SQL Agent jobs
    - Schedule necessary maintenance activities for your databases.
    - Configure notifications and alerts on SQL Server Agent jobs, and SQL Server.
    - Configure alerts based on performance monitor values.
- Manage Azure PaaS tasks using automation
    - Undersand the benefits of Azure policy
    - Explore the capabilities of Azure Automation
    - Configure elastic jobs
    - Use Logic Apps for database workflow

Module 6: Plan and Implement a High Availability and Disaster Recovery Environment

- Describe high availability and disaster recovery strategies
    - Define recovery time objective and recovery point objective
    - Explore the available high availability and disaster recovery options for both IaaS and PaaS
    - Devise an appropriate high availability and disaster recovery strategy
- Explore IaaS and PaaS solutions for high availability and disaster recovery
    - Explore options for deploying a WSFC in Azure
    - Explore options for deploying an AG in Azure
    - Plan active geo-replication and auto-failover groups
    - Monitor high availability
- Back up and restore databases
    - Explore backup and restore options for IaaS
    - Implement backup and restore for PaaS

WHO SHOULD ATTEND

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.

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Call us today 0-2634-7993-4
177/1 BUI Bldg., 14th Fl., Unit 1, 3 & 4, Surawongse Rd., Suriyawongse, Bangrak, Bangkok, THAILAND | Email: sales@trainingcenter.co.th