Exam DP-300: Administering Relational Databases on Microsoft Azure

Introduction

The Administering Relational Databases on Microsoft Azure (DP-300) certification course is curated for aspirants who wish to gain expertise in managing on-premises and cloud relational databases built with Microsoft SQL Server and Microsoft Azure Data Services. The training program ensures that candidates successfully learn to manage the operational aspects of cloud-native and hybrid data platform solutions built on Azure Data Services and SQL Server. Furthermore, the candidate gets equipped with the newest innovations of the IT domains including, advancements in data storing software and technologies.

Course Outline

MODULE 1: Plan and implement data platform resources (15-20%)

- Deploy resources by using manual methods
  - deploy database offerings on selected platforms
  - configure customized deployment templates
  - apply patches and updates for hybrid and IaaS deployment

- Recommend an appropriate database offering based on specific requirements
  - evaluate requirements for the deployment
  - evaluate the functional benefits/impact of possible database offerings
  - evaluate the scalability of the possible database offering
  - evaluate the HA/DR of the possible database offering
  - evaluate the security aspects of the possible database offering

- Configure resources for scale and performance
  - configure Azure SQL database/elastic pools for scale and performance
  - configure Azure SQL managed instances for scale and performance
  - configure SQL Server in Azure VMs for scale and performance
  - calculate resource requirements
  - evaluate database partitioning techniques, such as database sharding
  - set up SQL Data Sync

- Evaluate a strategy for moving to Azure
  - evaluate requirements for the migration
  - evaluate offline or online migration strategies
  - evaluate requirements for the upgrade
  - evaluate offline or online upgrade strategies

- Implement a migration or upgrade strategy for moving to Azure
  - implement an online migration strategy
  - implement an offline migration strategy
  - implement an online upgrade strategy
  - implement an offline upgrade strategy

MODULE 2: Implement a secure environment (15-20%)

- Configure database authentication by using platform and database tools
  - configure Azure AD authentication
  - create users from Azure AD identities
  - configure security principals

- Configure database authorization by using platform and database tools
    - configure database and object-level permissions using graphical tools
    - apply the principle of least privilege for all securable

- Implement security for data at rest
    - implement Transparent Data Encryption (TDE)
    - implement object-level encryption
    - implement Dynamic Data Masking
    - implement Azure Key Vault and disk encryption for Azure VMs

- Implement security for data in transit
    - configure server and database-level firewall rules
    - implement Always Encrypted

- Implement compliance controls for sensitive data
    - apply a data classification strategy
    - configure server and database audits
    - implement data change tracking
    - perform a vulnerability assessment

MODULE 3: Monitor and optimize operational resources (15-20%)

- Monitor activity and performance
    - prepare an operational performance baseline
    - determine sources for performance metrics
    - interpret performance metrics
    - configure & monitor activity & performance at the infrastructure, service, & database levels

- Implement performance-related maintenance tasks
    - implement index maintenance tasks
    - implement statistics maintenance tasks
    - configure database auto-tuning
    - automate database maintenance tasks
    - manage storage capacity

- Identify performance-related issues
    - configure Query Store to collect performance data
    - identify sessions that cause blocking
    - assess growth/fragmentation of databases and logs
    - assess performance-related database configuration parameters

- Configure resources for optimal performance
    - configure storage and infrastructure resources
    - configure server and service account settings for performance
    - configure Resource Governor for performance

- Configure a user database for optimal performance
    - implement database-scoped configuration
    - configure compute resources for scaling
    - configure Intelligent Query Processing (IQP)

MODULE 4: Optimize query performance (5-10%)

- Review query plans
    - determine the appropriate type of execution plan
    - identify problem areas in execution plans
    - extract query plans from the Query Store
- Evaluate performance improvements
    - determine the appropriate DMVs to gather query performance information
    - identify performance issues using DMVs
    - identify and implement index changes for queries
    - recommend query construct modifications based on resource usage
    - assess the use of hints for query performance

- Review database table and index design
    - identify data quality issues with duplication of data
    - Identify the normal form of database tables

- assess index design for performance
- validate data types defined for columns
- recommend table and index storage including filegroups
- evaluate table partitioning strategy
- evaluate the use of compression for tables and indexes

MODULE 5: Perform automation of tasks (10-15%)

- Create scheduled tasks
  - manage schedules for regular maintenance jobs
  - configure multi-server automation
  - configure notifications for task success/failure/non-completion

- Evaluate and implement an alert and notification strategy
  - create event notifications based on metrics
  - create event notifications for Azure resources
  - create alerts for server configuration changes
  - create tasks that respond to event notifications

- Manage and automate tasks in Azure
  - perform automated deployment methods for resources
  - automate backups
  - automate performance tuning and patching
  - implement policies by using automated evaluation modes

MODULE 6: Plan and implement a High Availability and Disaster Recovery (HADR) environment (15-20%)

- Recommend a HADR strategy for a data platform solution
  - recommend HADR strategy based on RPO/RTO requirements
  - evaluate HADR for hybrid deployments
  - evaluate Azure-specific HADR solutions
  - identify resources for HADR solutions

- Test a HADR strategy by using platform, OS, and database tools
  - test HA by using failover
  - test DR by using failover or restore

- Perform backup and restore a database by using database tools
  - perform a database backup with options
  - perform a database restore with options
  - perform a database restore to a point in time
  - configure a long-term backup retention

- Configure HA/DR by using OS, platform, and database tools
  - configure replication
  - create an Always On Availability Group
  - configure auto-failover groups
  - integrate a database into an Availability Group
  - configure quorum options for a Windows Server Failover Cluster
  - configure an Availability Group listener

MODULE 7: Perform administration by using T-SQL (10-15%)

- Examine system health
  - evaluate database health using DMVs
  - evaluate server health using DMVs
  - perform database consistency checks by using DBCC

- Monitor database configuration by using T-SQL
  - assess proper database auto growth configuration
  - report on database free space
  - review database configuration options

- Perform backup and restore a database by using T-SQL
  - prepare databases for Always On Availability Groups
  - perform a transaction log backup
  - perform a restore of user databases

    - perform database backups with options

- Manage authentication by using T-SQL
    - manage certificates
    - manage security principals

- Manage authorization by using T-SQL
    - configure permissions for users to access database objects
    - configure permissions by using custom roles

Prerequisites

- Initial experience in Azure
- Upon completion of this course, you will be able to accomplish:
- To plan, deploy, and configure on Azure SQL offerings
- Monitoring performance on database
- Tuning a database and queries for optimum performance
- Planning and configuring a High Availability Solution

Target Audience

Candidates for this exam are database administrators and data management specialists that manage on-premises and cloud relational databases built with SQL Server and Azure Data Services.

The Azure Database Administrator implements and manages the operational aspects of cloud-native and hybrid data platform solutions built on Azure Data Services and SQL Server. The Azure Database Administrator uses a variety of methods and tools to perform day-to-day operations, including applying knowledge of using T-SQL for administrative management purposes.

This role is responsible for management, availability, security and performance monitoring, and optimization of modern relational database solutions. This role works with the Azure Data Engineer role to manage operational aspects of data platform solutions.

Candidates for this role should understand all concepts covered in Exam DP-900: Microsoft Azure Data Fundamentals.

Duration

32 Hours