Course Content

Course Description:

This course describes how to design and monitor high performance, highly available data solutions with SQL Server 2012. This course focuses on creating plans and designs for database structure, storage, objects, and servers. Students will have the opportunity to practices hands-on skills and design tasks in a virtual lab environment and will learn about topics such as data compression, high availability, data migration, security, and scalability.

This course maps to skills and knowledge measured by Microsoft Exam 70-465, and in conjunction with on-the-job experience, can help prepare your for the exam.

Prerequisites:

Before attending this course, students must have:

- Windows Server 2008 R2 operating system
- Active Directory Domain Services (AD DS)
- Experience with PowerShell and SQL Server and SQL Server Reporting Services
- Familiarity with data center management processes
- Previous work with IT Infrastructure Library (ITIL)
- Previous work with Microsoft Operations Framework (MOF)
- Knowledge of previous versions of Operations Manager
- Knowledge of the product(s) that you plan to monitor

Students who attend this training can meet the prerequisites by attending the following courses, or obtaining equivalent knowledge and skills:

- MCSA: SQL Server 2012

Or attend

- Course 10774: Querying Microsoft SQL Server 2012
- Course 10775: Administering a Microsoft SQL Server 2012 Databases
- Course 10776: Developing Microsoft SQL Server 2012 Databases with Microsoft SQL Server 2012

Audience:

In addition to their professional experience, students who attend this training should already have the following technical knowledge:

- Experience with Transact-SQL
- Familiarity with SQL Server 2012 components and tools
- Familiarity with objects in a SQL Server database
- Familiarity with enterprise Windows network and security architecture

Topics:

Module 1: Designing a Database Server Infrastructure

This module explains how to design an appropriate database server infrastructure for a given business application scenario - including how to decide between on-premise, cloud-based, and hybrid database servers, hardware capacity planning, considerations for storage hardware, and strategies for consolidating database server hardware.

Lessons
- Planning a Database Server Infrastructure
- Planning Server Hardware
- Considerations for Database Server Consolidation
- Managing Server Resources in a Consolidated Database Infrastructure

Lab: Planning Database Server Consolidation

After completing this module, students will be able to:
- Describe the options and considerations for creating a database server infrastructure.
- Describe how to plan hardware requirements for SQL Server 2012.
- Describe the benefits of database and server consolidation and the different options for consolidating.
- Describe the methods of managing server resources in a range of database infrastructure consolidation scenarios.

Module 2: Designing a Logical Database Schema

This module explains how to design a logical schema for a database based on application requirements. This includes planning the level of normalization, and schema and table design, and the use of views.

Lessons
- Relational Database Design Techniques
- Planning Schemas and Tables

Lab: Designing a Logical Database Schema

After completing this module, students will be able to:
- Describe the key techniques for designing a logical database schema.
- Describe the considerations for table and schema design in a relational database.
- Describe how to use views to provide a denormalized view of database tables to enable users to work with data more easily.

Module 3: Designing a Physical Database Implementation

This module explains how to design the physical implementation of a database for a given set of requirements. The design will include data files, log files, filegroups, and data partitioning, as well as whether or not to use data compression.

Lessons
- Planning Files and Filegroups
- Planning a Partitioning Data
- Planning Compression

Lab: Designing a Physical Database Implementation

After completing this module, students will be able to:
- Describe the considerations for creating and placing SQL Server data and log files.
- Describe how to use partitioning to improve manageability.
- Describe the benefits of using compression to improve performance and storage efficiently.

Module 4: Incorporating Data Files into Databases

This modules discusses how to consider options for including data files in a database design.

Lessons
- Considerations for Working with Data Files in SQL Server 2012
- Implementing FileStream and FileTables
- Searching Data Files

Lab: Implementing a Solution for Storing Data Files

After completing this module, students will be able to:
- Describe the considerations for designing databases that incorporate data files.
- Describe the benefits and design considerations for using FileStream and FileTables to store data files.
- Describe the benefits of full text indexing and semantic search, and explain how to use these features to search data files in SQL Server.

Module 5: Tuning Database Performance

This module explains how to plan and manage indexes and how to use query plans to optimize database performance.

Lessons
- Optimizing Query Performance by Using Indexes
- Working with Query Plans
- Performance Monitoring

Lab: Using Indexes and Plan Guides

After completing this module, students will be able to:
- Describe how to plan indexes to optimize query performance.
- Describe how to use query plans to improve performance.
- Describe how to monitor performance.

Module 6: Designing Database Security

This module explains the key considerations for designing security for SQL Server instances and databases.

Lessons
- Introduction to Security Planning
- Planning Security
- Contained Databases
- Protecting Data with Encryption

Lab: Planning and Implementing Security

After completing this module, students will be able to:
- Describe the benefits of security planning.
- Describe the design considerations for planning security.
- Describe how to use contained databases.
- Describe the options for encrypting data.

Module 7: Policy Based Management

This module explains how to plan policy-based management to manage server instances, databases, and other SQL Server 2012 objects more efficiently.

Lessons
- Introduction to Policy-Based Management
- Planning and Implementing Policy-Based Management

Lab: Planning Policy-Based Management

After completing this module, students will be able to:
- Describe the benefits of policy-based management.
- Plan and implement policy-based management.

Module 8: Monitoring Server Health

This module explains how to plan SQL Server health monitoring and to implement health monitoring by using SQL Server Utility.

Lessons
- Introduction to Server Health Monitoring
- SQL Server Utility

Lab: Monitoring Server Health

After completing this module, students will be able to:
- Describe the benefits of health monitoring and considerations for planning health monitoring.
- Use SQL Server Utility to monitor server health.

Module 9: Designing a Database Backup Solution

This module explains how to identify and implement the appropriate backup strategy for a given scenario.

Lessons
- SQL Server Backup and Restore
- Planning a Recovery Strategy

Lab: Planning and Implementing a Backup Strategy

After completing this module, students will be able to:
- Plan a Backup and Restore Strategy.
- Describe the key features of a disaster recovery plan.

Module 10: Automating Multi-Server Maintenance

This module explains how to better plan and manage multi-server maintenance and automation.

Lessons
- Overview of Maintenance Automation
- Managing Multiple Servers

Lab: Automating Multi-Server Maintenance

After completing this module, students will be able to:
- Describe the benefits and components of multi-server maintenance.
- Manage multiple servers by using master and target servers.

Module 11: Managing SQL Server with PowerShell

This module provides an overview of PowerShell and describes the benefits of using PowerShell to manage SQL Server 2012.

Lessons
- Introduction to Windows PowerShell
- Scripting with Windows PowerShell

Lab: Managing SQL Server with Windows PowerShell

After completing this module, students will be able to:
- Describe the benefits of using PowerShell to maintain SQL Server and explain the fundamental concepts that underlie PowerShell.
- Explain how to create PowerShell scripts.

Module 12: Replicating Data

This module explains how to design an optimal replication strategy from a given set of business and technical requirements.

Lessons
- SQL Server Replication
- Planning Replication

Lab: Planning and Implementing SQL Server Replication

After completing this module, students will be able to:

- Describe the benefits of replication and the options for planning replication in SQL Server 2012.
- Identify the appropriate replication solution for a given scenario.

Module 13: Planning High Availability

This module explains how to plan and implement a high availability solution.

Lessons
- High Availability in SQL Server 2012
- AlwaysOn Availability Groups

Lab: Implementing High Availability

After completing this module, students will be able to:
- Choose a high availability strategy for a given scenario.
- Describe how to implement and test AlwaysOn Availability Groups.