MOC 50400 Designing, Optimizing, and Maintaining a Database Administrative Solution for Microsoft SQL Server 2008

Course Summary

Description

This course provides the knowledge and skills to design, optimize, and maintain a database administrative solution for Microsoft SQL Server 2008.

Objectives
At the end of this course, students will be able to:

- Implement an administrative solution for SQL Server 2008.
- Deploy SQL Server 2008.
- Design the physical structure for SQL Server 2008.
- Design a strategy for maintaining SQL Server 2008.
- Design a strategy for managing SQL Server 2008.
- Automate the database managing strategy for SQL Server 2008.
- Design a strategy for securing databases in SQL Server 2008.
- Design a strategy for monitoring SQL Server 2008.
- Design a strategy for content distribution in SQL Server 2008.
- Design a strategy for replication in SQL Server 2008.
- Design a high availability solution for SQL Server 2008.
- Design a strategy for backup and recovery in SQL Server 2008.

Topics

- Designing an Administrative Solution for SQL Server 2008
- Deploying SQL Server 2008
- Designing the Physical Structure of SQL Server 2008
- Designing a Strategy for Maintaining a Database in SQL Server 2008
- Designing Solutions for Managing SQL Server 2008
- Automating the Database Management Strategy for SQL Server 2008
- Designing a Strategy for Securing SQL Server 2008

- Designing a Strategy for Monitoring SQL Server 2008
- Designing a Strategy for Content Distribution in SQL Server 2008
- Designing a Strategy for Replication in SQL Server 2008
- Designing a High-Availability Solution for SQL Server 2008
- Designing a Backup and Recovery Strategy for SQL Server 2008

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Course Summary (cont'd)

Audience

The primary audience of this course is IT professionals who design and maintain SQL Server databases. The audience can also comprise technical architects and consultants who design and implement SQL Server solutions. Students taking this course are expected to have three or more years of experience working on databases for two or more of the following phases in the product lifecycle - design, development, deployment, optimization, maintenance, or support.

Prerequisites

Before attending this course, students must:
- Understand the tradeoffs among the different redundant storage types. For example, what RAID levels mean, and how they differ from Storage Area Networks (SAN).
- Understand how replication works and how replication is implemented.
- Be familiar with reading user requirements and business-need documents. For example, development project vision/mission statements or business analysis reports.
- Have some knowledge of how queries execute. Must be able to read a query execution plan and understand what is happening.
- Have basic knowledge of the dependencies between system components.
- Be able to design a database to third normal form (3NF) and know the tradeoffs when backing out of the fully normalized design (denormalization) and designing for performance and business requirements in addition to being familiar with design models, such as Star and Snowflake schemas.
- Have monitoring and troubleshooting skills.
- Have knowledge of the operating system and platform. That is, how the operating system integrates with the database, what the platform or operating system can do, and how the interaction between the operating system and the database works. For example, how integrated authentication interacts with Active Directory directory service.
- Have knowledge of application architecture. That is, how applications can be designed in three layers, what applications can do interaction between applications and the database, interaction between the database and the platform or operating system.
- Must already know how to use:
  - A data modeling tool
  - Microsoft Office Visio (to create infrastructure diagrams)
- Be familiar with SQL Server 2005 features, tools, and technologies.
- Have a Microsoft Certified Technology Specialist: Microsoft SQL Server 2005 credential or equivalent experience.
- In addition, it is recommended, but not required, that students have completed:
  - Course 2779: Implementing a Microsoft SQL Server 2005 Database.
  - Course 2780: Maintaining a Microsoft SQL Server 2005 Database.
- In addition to their professional experience, students who attend this training should have technical knowledge equivalent to the following courses:
  - Course 6231: Maintaining a Microsoft SQL Server 2008 Database
  - Course 6232: Implementing a Microsoft SQL Server 2008 Database

Duration

Five days

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Course Outline

I. Designing an Administrative Solution for SQL Server 2008
This module provides an overview of an administrative solution and how it helps the administrator. It also describes the general process of designing and deploying an administrative solution in their environment.
   A. Overview of SQL Server 2008
   B. Designing an Administrative Solution
   C. Developing and Deploying an Administrative Solution for SQL Server 2008
   D. Implementing an Administrative Solution in SQL Server Management Studio (SSMS)

Lab: Designing an Administrative Solution for SQL Server 2008
   • Designing an Administrative Solution
   • Using SQL PowerShell to Automate SQL Server Configuration
   • Creating SQL Server PowerShell Scripts
   • Configuring FILESTREAM Support in SQL Server 2008

After completing this module, students will be able to:
   • Explain the basic concepts of SQL Server 2008.
   • Design an administrative solution.
   • Develop and deploy an administrative solution for SQL Server 2008.
   • Implement an administrative solution in SSMS.

II. Deploying SQL Server 2008
This module describes the considerations for implementing a new version of SQL Server 2008. This module also describes the steps for upgrading an existing installation to SQL Server 2008.
   A. System Requirements for SQL Server 2008
   B. Upgrading and Migrating to SQL Server 2008
   C. Configuring Instances in SQL Server 2008

Lab: Deploying SQL Server 2008
   • Planning a SQL Server Upgrade
   • Preparing for the Upgrade
   • Upgrading to SQL Server 2008
   • Performing Post-Upgrade tasks

After completing this module, students will be able to:
   • Describe the system requirements for SQL Server 2008.
   • Upgrade and migrate to SQL Server 2008.
   • Configure instances in SQL Server 2008.

Designing the Physical Structure of SQL Server 2008
This module describes file placement considerations for different functionalities in SQL Server 2008, which helps to improve performance and availability. This module covers the use of partitioning to improve database performance. This module also describes the importance of full-text indexing.
Introduction to the Physical Structure of a Database
   A. Planning for Partitioning
   B. Planning for Full-Text Indexing

Lab: Designing the Physical Structure of SQL Server 2008
   • Planning the Physical Structure of SQL Server 2008
   • Implementing the Physical Structure of a Database
   • Configuring Partitions
   • Configuring Full-Text Indexing

After completing this module, students will be able to:
   • Plan for database files and transaction logs.
   • Plan or partitions.
   • Plan for full-text indexing.

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Course Outline (cont'd)

III. Designing a Strategy for Maintaining a Database in SQL Server 2008

This module describes the importance of keeping the database up-to-date and the database performing in optimal state. This includes keeping statistics updated and ensuring that a proper index is deployed and implemented. This module also covers the use of database compression to save the disk consumption and to improve the overall performance of a database.

A. Designing a Strategy for Maintaining Statistics for a Database
B. Designing a Strategy for Maintaining Indexes
C. Designing a Strategy for Database Compression

Lab: Designing a Strategy for Maintaining a Database in SQL Server 2008

- Designing a Database Maintenance Strategy
- Maintaining Statistics
- Maintaining Indexes
- Implementing Database Compression

After completing this module, students will be able to:

- Design a strategy for maintaining statistics for a database.
- Design a strategy for maintaining indexes.
- Design a strategy for database compression.

IV. Designing Solutions for Managing SQL Server 2008

This module describes the new approach of managing SQL Servers that has been introduced in SQL Server 2008. It also describes the importance of having a centralized administrative model in your organization by implementing policy-based management. This module also describes how to prevent accidental database changes by using DDL triggers and how to use Change Data Capture (CDC) to monitor data changes in the database for compliance reasons.

A. Designing a Policy-Based Management Strategy
B. Controlling Resource Usage by using Resource Governor
C. Auditing Database Changes

Lab: Designing Solutions for Managing SQL Server 2008

- Designing a Management Strategy for SQL Server 2008
- Configuring Policies by Using Policy-Based Management
- Governing Resources Consumption
- Implementing DDL Triggers
- Implementing CDC

After completing this module, students will be able to:

- Design a policy-based management strategy.
- Control resource usage by using Resource Governor.
- Audit database changes.

V. Automating the Database Management Strategy for SQL Server 2008

This module describes the use of SQL Server Agent and scripts, such as VBScripts and SQL PowerShell, to automate some routine jobs which administrators perform often. This module also covers the use of event notification that helps you to monitor your database for specific events and notify the administrator when the event occurs.

A. Managing SQL Server Agent
B. Automating Administrative Tasks in SQL Server
C. Monitoring Events in SQL Server

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Course Outline (cont'd)

Lab: Automating the Database Management Strategy for SQL Server 2008
- Planning an Automated Database Management Strategy
- Using SQL Server Agent
- Creating Scripts to Automate Administrative Tasks
- Enabling Event Notification
- Setting up SQL Server Agent to Monitor Events

After completing this module, students will be able to:
- Manage SQL Server Agent.
- Automate administrative tasks in SQL Server.
- Monitor events in SQL Server.

VI. Designing a Strategy for Securing SQL Server 2008

This module presents information related to database access control and how SQL Server manages keys and certificates. This module also covers the use of database encryptions to prevent application data from being accessed by unauthorized users, including administrators.
- A. Securing SQL Server 2008 Instances
- B. Planning Database Security
- C. Managing Certificate and Keys in SQL Server 2008
- D. Implementing Database Encryption

Lab: Designing a Strategy for Securing SQL Server 2008
- Designing a strategy for Database Security
- Configuring Security in SQL Server
- Enabling Database Encryption

After completing this module, students will be able to:
- Secure SQL Server 2008 instances.
- Plan database security.

- Manage certificate and keys in SQL Server 2008.
- Implement database encryption.

VII. Designing a Strategy for Monitoring SQL Server 2008

This module describes the information on monitoring a SQL Server 2008 server to ensure that it is performing properly and is in a healthy state. This module also presents information on how to determine if there are any potential problems on the server.
- A. Overview of Monitoring SQL Server 2008
- B. Monitoring SQL Server Instances
- C. Monitoring SQL Server Databases
- D. Monitoring Multiple SQL Servers by Using Data Collection

Lab: Designing a Strategy for Monitoring SQL Server 2008
- Designing a Data Collection Architecture
- Monitoring SQL Server Instances
- Implementing Tracing in SQL Server 2008
- Using DTA
- Monitoring Performance by Using Data Collection

After completing this module, students will be able to:
- Explain the basic concepts of monitoring in SQL Server 2008.
- Monitor SQL Server instances.
- Monitor SQL Server databases.
- Monitor multiple SQL Servers by using Data Collection.

VIII. Designing a Strategy for Content Distribution in SQL Server 2008

This module describes the different methods of distributing data to multiple servers. This module describes how to use remote query with linked server and the considerations of using distributed transactions on query span across multiple servers.

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Course Outline (cont'd)

This module also discusses the use of SSIS to perform data transportation between servers and it covers the method for troubleshooting SSIS packages.

- A. Distributing Data in SQL Server 2008
- B. Working with Distributed Queries
- C. Managing Distributed Content by Using Distributed Transactions
- D. Managing SQL Server Integration Services (SSIS) Packages
- E. Setting Up Scalable Shared Databases

Lab: Designing a Strategy for Content Distribution in SQL Server 2008
- Selecting a Content Distribution Technology
- Performing a Remote Query
- Monitoring an SSIS Package

After completing this module, students will be able to:
- Explain the basic concepts of data distribution.
- Manage distributed content by using distributed queries.
- Manage distributed content by using distributed transactions.
- Manage SSIS packages.
- Set up scalable shared databases.

IX. Designing a Strategy for Replication in SQL Server 2008

This module provides more in-depth discussions on using replication. This module also talks about using replication, specifically snapshot and transactional replication, which is one-way replication, to replicate data to other servers. Finally, this module describes the way to set up merge and peer-to-peer replication, which should be used for multi-update origin scenarios.

- A. Designing a Database Replication Strategy
- B. Implementing Content Distribution by using Replication
- C. Configuring a High-Availability Solution by Using Replication

Lab: Designing a Strategy for Replication in SQL Server 2008
- Designing a Replication Strategy
- Setting up Snapshot Replication
- Setting up Peer-To-Peer Replication

After completing this module, students will be able to:
- Design a database replication strategy.
- Design content distribution by using replication.
- Configure a high-availability solution by using replication.

X. Designing a High-Availability Solution for SQL Server 2008

This module describes the different high-availability features available in SQL Server 2008. The module then covers the scenarios of using them in an organization. This module also covers the considerations for choosing the right high-availability solution for an organization.

- A. Introduction to High Availability
- B. Implementing Log Shipping
- C. Implementing Database Mirroring
- D. Implementing Failover Clustering
- E. Designing a High-Availability Strategy

Lab: Designing a High-Availability Solution for SQL Server 2008
- Designing a High-Availability Strategy
- Implementing Database Mirroring
- Designing a Failover Cluster

After completing this module, students will be able to:
- Explain the basic concepts of high availability.
- Implement log shipping.
- Implement database mirroring.
- Implement failover clustering.
- Design a high-availability strategy.

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Course Outline (cont'd)

XI. Designing a Backup and Recovery Strategy for SQL Server 2008
This module describes the importance of having a backup of your database. In case of a disaster, backing up the database helps to recover data that cannot be protected by using HA solutions mentioned in the previous module. This module also describes different online operations supported by SQL Server 2008, which helps to minimize the downtime when data restore is required. This module also describes the steps to repair system databases that are corrupted.
   A. Planning a Backup Strategy
   B. Planning a Recovery strategy
   C. Designing a Backup and Recovery Strategy
   D. Implementing a Repair Strategy

Lab: Designing a Backup and Recovery Strategy for SQL Server 2008
- Designing a Backup and Recovery Solution
- Backing up a Database
- Restoring a Database by Using Online Operations
- Restoring a System Database

After completing this module, students will be able to:
- Plan a backup strategy.
- Plan a recovery strategy.
- Design a backup and recovery strategy.
- Implement a repair strategy.