MOC 6231 B Maintaining a Microsoft SQL Server 2008 R2 Database

Course Summary

Description

This course provides students with the knowledge and skills to maintain a Microsoft SQL Server 2008 R2 database. The course focuses on teaching individuals how to use SQL Server 2008 R2 product features and tools related to maintaining a database.

Objectives

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

- Explain SQL Server 2008 R2 architecture, resources requirements and perform pre-checks of I/O subsystems
- Plan, install and configure SQL Server 2008 R2
- Backup and restore databases
- Import and export wizards and explain how they relate to SSIS
- Use BCP and BULK INSERT to import data
- Manage security
- Assign, configure fixed database roles and create and assign user defined database roles
- Configure and assign permissions
- Implement SQL Server 2008 R2 Audits
- Manage SQL Server 2008 R2 Agent and Jobs
- Configure database mails, alerts and notifications
- Maintain databases
- Configure SQL Profiler Traces and Use the Database Tuning Advisor
- Monitor data by using Dynamic Management Views
- Execute multi-server queries and configure a central management server
- Deploy a data-tier-application
- Troubleshoot common issues

Topics

- Introduction to SQL Server 2008 R2 and its Toolset
- Preparing Systems for SQL Server 2008 R2
- Installing and Configuring SQL Server 2008 R2
- Working with Databases
- Understanding SQL Server 2008 R2 Recovery Models
- Backup of SQL Server 2008 R2 Databases
- Restoring SQL Server 2008 R2 DatabasesThis module describes the restoration of databases.Lessons
- Importing and Exporting Data
- Authenticating and Authorizing Users
- Assigning Server and Database Roles
- Authorizing Users to Access Resources
- Auditing SQL Server Environments
- Configuring Security for SQL Server Agent
- Monitoring SQL Server 2008 R2 with Alerts and Notifications
- Performing Ongoing Database Maintenance
- Tracing Access to SQL Server 2008 R2
- Monitoring SQL Server 2008 R2
- Managing Multiple Servers
- Troubleshooting Common SQL Server 2008 R2 Administrative Issues

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Course Summary (cont'd)

Audience

The primary audience for this course is individuals who administer and maintain SQL Server databases. This course can also be helpful for individuals who develop applications that deliver content from SQL Server databases.

Prerequisites

- Basic knowledge of the Microsoft Windows operating system and its core functionality.
- Working knowledge of Transact-SQL.
- Working knowledge of relational databases.
- Some experience with database design.
- Completed Course 2778: Writing Queries Using Microsoft SQL Server 2008 Transact-SQL

Duration

Five days

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Course Outline

I. Introduction to SQL Server 2008 R2 and its Toolset

This module introduces you to the entire SQL Server platform and its major tools. This module also covers editions, versions, basics of network listeners, and concepts of services and service accounts.

A. Introduction to SQL Server Platform
B. Working with SQL Server Tools
C. Configuring SQL Server Services

Lab: Introduction to SQL Server 2008 R2 and its Toolset

- Verify SQL Server Component Installation
- Alter Service Accounts for New Instance
- Enable Named Pipes Protocol for Both Instances
- Create Aliases for AdventureWorks and Proseware
- Ensure SQL Browser is Disabled and Configure a Fixed TCP/IP Port
- Describe the SQL Server Platform
- Work with SQL Server Tools
- Configure SQL Server Services

II. Preparing Systems for SQL Server 2008 R2

This module covers planning for an installation related to SQL Server I/O requirements, 32 bit vs 64 bit, memory configuration options and I/O subsystem pre-installation checks using SQLIOSim and SQLIO.

A. Overview of SQL Server 2008 R2 Architecture
B. Planning Server Resource Requirements
C. Pre-installation Testing for SQL Server 2008 R2

Lab: Preparing Systems for SQL Server 2008 R2

- Adjust memory configuration
- Perform Pre-installation Stress Testing
- Check Specific I/O Operations
- Describe the SQL Server architecture
- Plan for server resource requirements
- Conduct pre-installation stress testing for SQL Server

III. Installing and Configuring SQL Server 2008 R2

This module details installing and configuring SQL Server 2008 R2.

A. Preparing to Install SQL Server 2008 R2
B. Installing SQL Server 2008 R2
C. Upgrading and Automating Installation

Lab: Installing and Configuring SQL Server 2008 R2

- Review installation requirements
- Install the SQL Server instance
- Perform Post-installation Setup and Checks
- Configure Server Memory
- Prepare to install SQL Server
- Install SQL Server
- Upgrade and automate the installation of SQL Server

IV. Working with Databases

This module describes the system databases, the physical structure of databases and the most common configuration options related to them.

A. Overview of SQL Server Databases
B. Working with Files and Filegroups
C. Moving Database Files

Lab: Working with Databases

- Adjust tempdb configuration
- Create the RateTracking database
- Attach the OldProspects database
- Add multiple files to tempdb
- Describe the role and structure of SQL Server databases
- Work with files and filegroups
- Move database files within servers and between servers

V. Understanding SQL Server 2008 R2 Recovery Models

This module describes the concept of the transaction log and SQL Server recovery models. It introduces the different backup strategies available with SQL Server 2008 R2.

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MOC 6231 B Maintaining a Microsoft SQL Server 2008 R2 Database

Course Outline (cont'd)

A. Backup Strategies
B. Understanding SQL Server Transaction Logging
C. Planning a SQL Server Backup Strategy

Lab: Understanding SQL Server 2008 R2 Recovery Models

- Plan a backup strategy
- Configure recovery models
- Review recovery models and strategy
- Describe the critical concepts surrounding backup strategies
- Explain the transaction logging capabilities within the SQL Server database engine
- Plan a SQL Server backup strategy

VI. Backup of SQL Server 2008 R2 Databases

This module describes SQL Server 2008 R2 Backup and the backup types.

A. Backing up Databases and Transaction Logs
B. Managing Database Backups
C. Working with Backup Options

Lab: Backup of SQL Server 2008 R2 Databases

- Investigate backup compression
- Transaction log backup
- Differential backup
- Copy only backup
- Partial backup
- Back up databases and transaction logs
- Manage database backups
- Work with more advanced backup options

VII. Restoring SQL Server 2008 R2 Databases

This module describes the restoration of databases. Understanding the Restore Process

A. Restoring Databases
B. Working with Point-in-time Recovery
C. Restoring System Databases and Individual Files

Lab: Restoring SQL Server 2008 R2 Databases

- Determine a restore strategy
- Restore the database
- Using STANDBY mode
- Understand the restore process
- Restore databases
- Work with Point-in-time Recovery
- Restore system databases and individual files

Importing and Exporting Data

This module covers the use of the import/export wizards and explains how they relate to SSIS. Also introduces BCP.

A. Transferring Data To/From SQL Server 2008 R2
B. Importing & Exporting Table Data
C. Inserting Data in Bulk

Lab: Importing and Exporting Data

- Import the Excel spreadsheet
- Import the CSV file
- Create and test an extraction package
- Compare loading performance
- Transfer data to and from SQL Server
- Import and export table data
- Insert data in bulk and optimize the bulk insert process

Authenticating and Authorizing Users

This module covers SQL Server 2008 R2 security models, logins and users.

A. Authenticating Connections to SQL Server
B. Authorizing Logins to Access Databases
C. Authorization Across Servers

Lab: Authenticating and Authorizing Users

- Create Logins
- Correct an Application Login Issue
- Create Database Users
- Correct Access to Restored Database
- Describe how SQL Server authenticates connections
- Describe how logins are authorized to access databases
- Explain the requirements for authorization across servers

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Course Outline (cont'd)

VIII. Assigning Server and Database Roles
This module covers fixed server roles, fixed database roles and user-defined database roles.
A. Working with Server Roles
B. Working with Fixed Database Roles
Creating User-defined Database Roles

Lab: Assigning Server and Database Roles
- Assign Server Roles
- Assign Fixed Database Roles
- Create and Assign User-defined Database Roles
- Check Role Assignments
- Work with server roles
- Work with fixed database roles
- Create user-defined database roles

IX. Authorizing Users to Access Resources
This module covers permissions and the assignment of permissions.
A. Authorizing User Access to Objects
B. Authorizing Users to Execute Code
C. Configuring Permissions at the Schema Level

Lab: Authorizing Users to Access Resources
- Assign Schema-level Permissions
- Assign Object-level Permissions
- Test Permissions
- Authorize user access to objects
- Authorize users to execute code
- Configure permissions at the schema level

X. Auditing SQL Server Environments
This module covers SQL Server Audit.
A. Data Access in SQL Server
B. Implementing SQL Server Audit
C. Managing SQL Server Audit

Lab: Auditing SQL Server Environments
- Determine audit configuration and create audit
- Create server audit specifications
- Create database audit specifications
- Test audit functionality
- Describe the options for auditing data access in SQL Server
- Implement SQL Server Audit
- Manage SQL Server Audit

XI. Automating SQL Server 2008 R2 Management
This module covers SQL Server Agent, jobs and job history.
A. Automating SQL Server Management
B. Working with SQL Server Agent
C. Managing SQL Server Agent Jobs

Lab: Automating SQL Server 2008 R2 Management
- Create a Data Extraction Job
- Schedule the Data Extraction Job
- Troubleshoot a Failing Job
- Automate SQL Server Management
- Work with SQL Server Agent
- Manage SQL Server Agent jobs

XII. Configuring Security for SQL Server Agent
This module covers SQL Server agent security, proxy accounts and credentials.
A. Understanding SQL Server Agent Security
B. Configuring Credentials
C. Configuring Proxy Accounts

Lab: Configuring Security for SQL Server Agent
- Troubleshoot job execution failure
- Resolve the security issue
- Perform further troubleshooting
- Explain SQL Server Agent security
- Configure credentials
- Configure Proxy accounts

XIII. Monitoring SQL Server 2008 R2 with Alerts and Notifications
This module covers the configuration of database mail, alerts and notifications.
A. Configuration of Database Mail
B. Monitoring SQL Server Errors
C. Configuring Operators, Alerts and Notifications

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Course Outline (cont'd)

Lab: Monitoring SQL Agent Jobs with Alerts and Notifications

- Configure Database Mail
- Implement Notifications
- Implement Alerts
- Configure database mail
- Monitor SQL Server errors
- Configure operators, alerts and notifications

XIV. Performing Ongoing Database Maintenance

This module covers database maintenance plans.

A. Ensuring Database Integrity
B. Maintaining Indexes
C. Automating Routine Database Maintenance

Lab: Ongoing Database Maintenance

- Check database integrity using DBCC CHECKDB
- Correct index fragmentation
- Create a database maintenance plan
- Investigate table lock performance
- Ensure database integrity
- Maintain indexes
- Automate routine database maintenance

XV. Tracing Access to SQL Server 2008 R2

This module covers SQL Profiler and SQL Trace stored procedures.

A. Capturing Activity using SQL Server Profiler
B. Improving Performance with the Database Engine Tuning Advisor
C. Working with Tracing Options

Lab: Tracing Access to SQL Server 2008 R2

- Capture a trace using SQL Server Profiler
- Analyze a trace using Database Engine Tuning Advisor
- Configure SQL Trace
- Capture activity using SQL Server Profiler
- Improve performance with the Database Engine Tuning Advisor
- Work with tracing options

XVI. Monitoring SQL Server 2008 R2

This module introduces DMVs and the configuration of data collection.

A. Monitoring Activity
B. Capturing and Managing Performance Data
C. Analyzing Collected Performance Data

Lab: Monitoring SQL Server 2008 R2

- Investigating DMVs
- Configure Management Data Warehouse
- Configure Instances for Data Collection
- Work with Data Collector Reports
- Monitor current activity
- Capture and manage performance data
- Analyze collected performance data

XVII. Managing Multiple Servers

This module covers Central Management Servers and Multi-Server queries, Virtualization of SQL Server and Data-Tier Applications.

A. Working with Multiple Servers
B. Virtualizing SQL Server
C. Deploying and Upgrading Data-Tier Applications

Lab: Managing Multiple Servers

- Configure CMS and execute multi-server queries
- Deploy a data-tier application
- Register and extract a data-tier application
- Upgrade a data-tier application
- Work with multiple servers
- Describe options for virtualizing SQL Server
- Deploy and upgrade Data-Tier Applications

XVIII. Troubleshooting Common SQL Server 2008 R2 Administrative Issues

This module covers common issues that require troubleshooting and gives guidance on where to start looking for solutions.

A. SQL Server Troubleshooting Methodology
B. Resolving Service-related Issues
C. Resolving Concurrency Issues
D. Resolving Login and Connectivity Issues

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Course Outline (cont'd)

Lab: Troubleshooting Common Issues

- Troubleshoot and resolve SQL Server administrative issues
- Explain SQL Server troubleshooting methodology
- Resolve service-related issues
- Resolve concurrency issues
- Resolve login and connectivity issues

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