MOC 50401 B Designing and Optimizing Database Solutions with Microsoft SQL Server 2008

Course Summary

Description

This instructor-led course provides the knowledge and skills that IT Professionals need to design, optimize, and maintain SQL Server 2008 database.

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

- Design a database design strategy
- Design a database for optimal performance
- Design security for a database
- Design programming objects
- Design queries for performance
- Design a transaction and concurrency strategy
- Design an XML strategy

Topics

- Designing a Conceptual Database Model
- Designing a Logical Database Model
- Designing a Physical Database Model
- Designing Databases for Optimal Performance
- Designing Security for SQL Server 2008
- Designing a Strategy for Database Access
- Designing Queries for Optimal Performance
- Designing a Transaction and Concurrency Strategy
- Designing an XML Strategy
- Designing SQL Server 2008 Components

Audience

This course is designed for developers who implement database solutions or perform development utilizing the programming features and functionality of SQL Server. 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. They should possess a four-year college degree, BS or BA, in the computer field.

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Course Summary (cont'd)

Prerequisites

Before attending this course, students should have:

- Working knowledge of data storage. Specifically, they should know about row layout, fixed length field placement and varying length field placement.
- Knowledge about index structures and index utilization. Specifically, they must understand the interaction between non-clustered indexes, clustered indexes and heaps. They must know why a covering index can improve performance.
- Hands-on database developer experience. Specifically, they should have three years of experience as a full-time database developer in an enterprise environment.
- Knowledge about the locking model. Specifically, students should have an understanding of lock modes, lock objects and isolation levels and be familiar with process blocking.
- Understanding of Transact-SQL syntax and programming logic. Specifically, students should be completely fluent in advanced queries, aggregate queries, subqueries, user-defined functions, cursors, control of flow statements, CASE expressions, and all types of joins.
- Knowledge about the trade offs when backing out of the fully normalized design and designing for performance and business requirements in addition to being familiar with design models, such as Star and Snowflake schemas. They should be able to design a database to third normal form (3NF).
- Strong monitoring and troubleshooting skills, including usage of monitoring tools.
- Basic 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 interaction between the operating system and the database works.
- Basic knowledge of application architecture. That is, how applications can be designed in three layers, what applications can do, how interaction between the application and the database works, and how the interaction between the database and the platform or operating system works.
- Knowledge of using a data modeling tool.
- Knowledge of SQL Server 2005 features, tools, and technologies.

Duration

Five days

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Course Outline

I. Designing a Conceptual Database Model
This module explains the guidelines for designing a conceptual database model with a systematic perspective. A systematic approach involves formulating your database design process, following guidelines on how to gather and document database requirements, and following best practices when formulating a conceptual design. Finally, you will learn the guidelines for using Entity Framework

A. Overview of Database Design
B. Gathering Database Requirements
C. Creating a Conceptual Database Design
D. Overview of Entity Framework

II. Designing a Logical Database Model
This module explains the best practices followed when you build a new logical database model. You will also learn the guidelines for normalization when designing an OLTP model and when designing a data warehouse database. Finally, you will learn to evaluate the existing logical model of a database

A. Guidelines for Building a Logical Database Model
B. Planning for OLTP Activity
C. Evaluating Logical Models

III. Designing a Physical Database Model
This module explains the guidelines to be followed when designing physical database objects and constraints. The module also covers the best practices for designing database tables and for designing data integrity.

A. Selecting Data Types
B. Designing Database Tables
C. Designing Data Integrity

IV. Designing Databases for Optimal Performance
This module explains the considerations for designing indexes. The module also covers the guidelines for designing scalable databases, and choosing additional optimization techniques, including designing for plan guide and partition.

A. Guidelines for Designing Indexes
B. Designing a Partitioning Strategy
C. Designing a Plan Guide
D. Designing Scalable Databases

V. Designing Security for SQL Server 2008
This module explains the best practices to be followed when designing for security in a database. The module will cover the guidelines for designing security for identity and access control, SQL development, database deployment. Finally, this module explains the guidelines for designing secure operations.

A. Exploring Security in SQL Server 2008
B. Implementing Identity and Access Control
C. Guidelines for Secure Development in SQL Server 2008
D. Guidelines for Secure Deployment of SQL Server 2008
E. Guidelines for Secure Operations

VI. Designing a Strategy for Database Access
This module explains the best practices to be followed when designing a database access strategy. The module will cover the guidelines for designing views, stored procedures, and user defined function. Finally, this module explains the guidelines for CLR development.

A. Guidelines for Designing Secure Data Access
B. Designing Views
C. Designing Stored Procedures
D. Designing User-Defined Functions

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Course Outline (cont'd)

VII. Designing Queries for Optimal Performance
This module will explain the considerations for optimizing and tuning queries to improve performance. The module will cover the design considerations to refactor cursors into queries.

A. Considerations for Optimizing Queries for Performance
B. Refactoring Cursors into Queries
C. Extending Set-Based Operations

VIII. Designing a Transaction and Concurrency Strategy
This module describes considerations and guidelines for defining a transaction strategy for a solution. It also shows the guidelines to specify isolation levels for data stores.

A. Guidelines for Defining Transactions
B. Defining Isolation Levels
C. Guidelines for Designing a Resilient Transaction Strategy

IX. Designing an XML Strategy
This module describes the guidelines to design XML techniques. This module will cover the design considerations for XML storage, XQuery, XPath, and FOR XML clause. Finally, this module will cover the considerations for converting data between XML and relational formats.

A. Designing XML Storage
B. Designing an XML Query Strategy
C. Designing a Data Conversion Strategy

X. Designing SQL Server 2008 Components
This module provides an overview of SQL Server 2008 architecture and the various considerations for choosing SQL Server components to be included in a solution. The module will also cover the considerations for designing service broker and full text search

A. Overview of SQL Server 2008 Components
B. Designing a Service Broker Architecture
C. Designing the Service Broker Data Flow
D. Designing the Service Broker Availability
E. Exploring Full-Text Search
F. Designing a Full-Text Search Strategy

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