



Designing Database Solutions with Microsoft SQL Server 2012

This course describes how to design and monitor high performance, highly available data solutions with SQL Server 2012. The course focuses on creating plans and designs for database structure, storage, objects, and servers. Participants will have the opportunity to practice 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.

Who Should Attend

This course is intended for individuals who design database solutions for organisations and have experience with database development and administering SQL Server databases.

These individuals design databases as their primary area of responsibility. They are responsible to plan and design database structure, storage, objects, and servers. They also create the plan for the environment in which the database solution runs.

Course Prerequisites

Before attending this course, participants should have, in addition to their professional experience:

- 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

Course Objectives

After completing this course, participants will be able to:

- Design an appropriate database server infrastructure for a given business application scenario
- Design a logical schema for a database based on application requirements
- Design the physical implementation of a database for a given set of requirements
- Evaluate options for including binary large object data in a database design
- Plan and manage indexes to optimise performance
- Describe the key considerations for designing security for SQL Server instances and databases
- Plan policy-based management to manage server instances, databases, and other SQL Server 2012 objects more efficiently
- Plan SQL Server health monitoring
- Implement SQL Server health monitoring by using SQL Server Utility
- Identify and implement the appropriate backup strategy for a given scenario
- Plan and manage multi-server maintenance and automation
- Understand the benefits of using PowerShell to manage SQL Server 2012
- Design an optimal replication strategy from a given set of business and technical requirements
- Plan and implement a high availability solution

Course Code: 20465B
Course Duration: 5 Days

Course Summary

Module 1: Designing a Database Server Infrastructure

Module 2: Designing a Logical Database Schema

Module 3: Designing a Physical Database Implementation

Module 4: Incorporating Data Files into Databases

Module 5: Tuning Database Performance

Module 6: Designing Database Security

Module 7: Policy-Based Management

Module 8: Monitoring Server Health

Module 9: Designing a Database Backup Solution

Module 10: Automating Multi-Server Maintenance

Module 11: Managing SQL Server with PowerShell

Module 12: Replicating Data

Module 13: Designing High Availability

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Course Outline

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

- Exercise 1: Planning for Consolidation
- Exercise 2: Managing Resources for an Instance of SQL Server
- Exercise 3: Managing Resources for Multiple SQL Server Instances on a Single Windows Server

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 normalisation, and schema and table design, and the use of views.

Lessons

- Relational Database Design Techniques
- Planning Schemas and Tables

Lab

- Exercise 1: Plan a Database Schema
- Exercise 2: Create a View to Display Employee Payment Information

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 Partitioning Data
- Planning Compressing Data

Lab

- Exercise 1: Planning Files and Filegroups
- Exercise 2: Implement the Timesheet Archive Strategy

Module 4: Incorporating Data Files into Databases

This module 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 File Tables
- Searching Data Files

Lab

- Exercise 1: Creating a FileTable
- Exercise 2: Creating and using a Full-Text Index

Module 5: Tuning Database Performance

This module explains how to plan and manage indexes to optimise database performance.

Lessons

- Optimising Query Performance by Using Indexes
- Working with Query Plans
- Performance Monitoring

Lab

- Exercise 1: Planning Indexes
- Exercise 2: Testing Indexing Strategies
- Exercise 3: Working with Execution Plans



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

- Exercise 1: Planning Server and Database Security
- Exercise 2: Implementing a Data Access Strategy
- Exercise 3: Implementing Transparent Data Encryption

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 & Implementing Policy-Based Management

Lab

- Exercise 1: Planning a Policy-Based Strategy
- Exercise 2: Implementing Policy-Based Management
- Exercise 3: Testing Policy Compliance

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

- Exercise 1: Creating a Utility Control Point
- Exercise 2: Configuring Health Policies

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

- Exercise 1: Planning a Backup and Restore Strategy
- Exercise 2: Implementing a Backup Strategy
- Exercise 3: Performing a Piecemeal Restore

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

- Exercise 1: Planning and Implementing a Multi-Server Environment
- Exercise 2: Planning Multi-Server Jobs

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

- Exercise 1: Using PowerShell to Manage SQL Server
- Exercise 2: Creating PowerShell Scripts

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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

- Exercise 1: Planning Replication
- Exercise 2: Implementing Replication

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

- Exercise 1: Creating a High Availability Group
- Exercise 2: Using an AlwaysOn Availability Group
- Exercise 3: Testing Failover for an AlwaysOn Availability Group

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