

Designing a Microsoft SQL Server 2005 Infrastructure

Course 2786: Two days; Instructor-Led

Introduction

This two-day instructor-led course provides database administrators working in enterprise environments with the knowledge and skills to design a Microsoft SQL ServerT 2005 database infrastructure. The course focuses on the development of strategies for data archiving, consolidation, distribution, and recovery. The course also stresses the importance of capacity analysis and emphasizes the tradeoffs that need to be made during design.

This is the first course in the database administration curriculum and will serve as the entry point for other courses in the curriculum.

Audience

This course is intended for current professional database administrators who have three or more years of on-the-job experience administering SQL Server database solutions in an enterprise environment.

At Course Completion

After completing this course, students will be able to:

- Analyze storage, CPU, memory, and network capacity needs.
- Design a strategy for data archiving.
- Design a strategy for database server consolidation.
- Design a strategy for data distribution.
- Design a database server infrastructure.
- Design a strategy for data recovery.
- Establish database conventions and standards.

AVANTUS TRAINING PTE LTD

79 Robinson Road #15-04 CPF Building Singapore 068897

Sales Hotline: (65)64163078

Email: enquiries@AvantusTraining.com

www.AvantusTraining.com

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 2778: Writing Queries Using Microsoft SQL Server 2005 Transact-SQL.
- Course 2779: Implementing a Microsoft SQL Server 2005 Database.
- Course 2780: Maintaining a Microsoft SQL Server 2005 Database.

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Course Outline

Module 1: Analyzing Capacity Needs

This module explains how to gather data about the current capacity of key system resources such as storage, CPU, memory, and network bandwidth. It also explains how the resulting data can be used to estimate future capacity needs.

Lessons

- Estimating Storage Requirements
- Estimating CPU Requirements
- Estimating Memory Requirements
- Estimating Network Requirements

Lab 1: Analyzing Capacity Needs

- Gathering Requirements that Impact or Affect Capacity Needs
- Estimating Capacity Needs

After completing this module, students will be able to:

- Estimate disk storage requirements.
- Estimate CPU requirements.
- Estimate memory requirements.
- Estimate network bandwidth requirements.

Module 2: Designing a Strategy for Data Archiving

This module explains how to identify the requirements that affect data archiving, determine the structure of archival data, select an appropriate storage format, and develop a data movement strategy. It also describes the key elements of a data archival plan and the process of creating it.

Lessons

- Identifying Requirements that Affect Data Archiving
- Determining the Structure of Archival Data
- Creating a Data Archival Plan

Lab 2: Designing a Strategy for Data Archiving

- Designing an Archiving Solution
- Defending Your Archiving Solution

After completing this module, students will be able to:

- Identify the requirements that affect data archiving.
- Determine the structure of archival data.
- Create a data archival plan.

Module 3: Designing a Strategy for Database Server Consolidation

This module describes the benefits of consolidating database servers in various ways and explains how to use multiple SQL Server instances to optimize the design of a database server infrastructure. It also details the process of designing a database server consolidation plan.

Lessons

- Overview of Database Server Consolidation
- Designing a Strategy for SQL Server Instances
- Designing a Database Server Consolidation Plan

Lab 3: Designing a Database Server Consolidation Strategy

- Designing a Consolidation Strategy
- Defending Your Consolidation Strategy

After completing this module, students will be able to:

- Identify the benefits of different ways to consolidate database servers.
- Design a strategy for SQL Server instances.
- Design a database server consolidation plan.

Module 4: Designing a Strategy for Data Distribution

This module describes the various tools that are provided by SQL Server 2005 for data distribution and explains how to select an appropriate tool based on the requirements of an organization. It also details the process of creating a data distribution plan specifically for replication.

Lessons

- Overview of Data Distribution
- Creating a Data Distribution Plan Using Replication

Lab 4: Designing a Data Distribution Strategy Using Replication

- Designing a Data Distribution Strategy
- Defending Your Data Distribution Strategy

After completing this module, students will be able to:

- Select an appropriate tool for data distribution.
- Create a data distribution plan using replication.

Module 5: Designing a Database Server Infrastructure

This module explains how to evaluate the current database server infrastructure of an organization and gather requirements for modifying it. It also provides guidelines and best practices for designing modifications to the current infrastructure and describes the hardware and software tradeoffs involved in the design process.

Lessons

- Evaluating the Current Database Server Infrastructure
- Gathering Requirements for Changing a Database Server Infrastructure
- Designing Modifications to a Database Server Infrastructure

Lab 5: Designing a Database Server Infrastructure

- Choosing a Database Server Hardware and Software
- Defending Your Database Server Hardware and Software Choices

After completing this module, students will be able to:

- Evaluate the current database server infrastructure.
- Gather requirements for changing a database server infrastructure.
- Design modifications to a database server infrastructure.

Module 6: Designing a Strategy for Data Recovery

This module explains how to create a backup and recovery strategy. It also describes the key components of a database disaster recovery plan and the process of creating it.

Lessons

- Creating a Backup and Restore Strategy
- Creating a Database Disaster Recovery Plan

Lab 6: Designing a Data Recovery Solution

- Devising a Recovery Strategy
- Sharing Lessons Learned from Disaster Recovery

After completing this module, students will be able to:

- Create a backup and restore strategy.
- Create a database disaster recovery plan.

Module 7: Establishing Database Conventions and Standards

This module describes how well a database naming convention simplifies administration, and provides guidelines for establishing such a convention. It also explains how to define Transact-SQL coding, database access, and deployment process standards.

Lessons

- Establishing Database Naming Conventions
- Defining Database Standards

Lab 7: Establishing Database Conventions and Standards

- Proposing Improved Object Naming Conventions
- Proposing Improved Coding Standards

After completing this module, students will be able to:

- Create database naming conventions.
- Define database infrastructure standards.