

Performance Tuning and Optimizing SQL Databases

Course: 10987

Course Details

Audience(s): IT Professional(s)

Technology: Microsoft SQL Server 2016

Duration: 32 Hours

ABOUT THIS COURSE

This 32 hours instructor-led course provides students who manage and maintain SQL Server databases with the knowledge and skills to performance tune and optimize their databases.

AUDIENCE PROFILE

The primary audience for this course is individuals who administer and maintain SQL Server databases and are responsible for optimal performance of SQL Server instances that they manage. These individuals also write queries against data and need to ensure optimal execution performance of the workloads. The secondary audiences for this course are individuals who develop applications that deliver content from SQL Server databases.

Course Content

Module 1: SQL Server Architecture, Scheduling, and Waits

Lessons

- SQL Server Components and SQL OS
- Windows Scheduling vs SQL Scheduling
- Waits and Queues

Lab: SQL Server Architecture, Scheduling, and Waits

Module 2: SQL Server I/O

Lessons

- Core Concepts
- Storage Solutions
- I/O Setup and Testing

Lab: Testing Storage Performance

Module 3: Database Structures

Lessons

- Database Structure Internals
- Data File Internals
- TempDB Internals

Lab: Database Structures

Module 4: SQL Server Memory

Lessons

- Windows Memory
- SQL Server Memory
- In-Memory OLTP

Lab: SQL Server Memory

Module 5: SQL Server Concurrency

Lessons

- Concurrency and Transactions
- Locking Internals

Lab: SQL Server Concurrency

Module 6: Statistics and Index Internals

Lessons

- Statistics Internals and Cardinality Estimation
- Index Internals
- Columnstore Indexes

Lab: Statistics and index Internals

Module 7: Query Execution and Query Plan Analysis

Lessons

- Query execution and optimizer internals
- Query execution plans
- Analyzing query execution plans

Lab: Query execution and query plan analysis

Module 8: Plan Caching and Recompilation

Lessons

- Plan cache internals
- Troubleshooting plan cache issues
- Query store

Lab: Plan caching and recompilation

Module 9: Extended Events

Lessons

- Extended events core concepts
- Working with extended events

Lab: Extended events

Module 10: Monitoring, Tracing, and Baselineing

Lessons

- Monitoring and tracing
- Baselineing and benchmarking

Lab: Monitoring, Tracing and Baselineing

At This Course Completion

At completing this course, the student will be able to:

- Describe the high level architectural overview of SQL Server and its various components.
- Describe the SQL Server execution model, waits and queues.
- Describe core I/O concepts, Storage Area Networks and performance testing.
- Describe architectural concepts and best practices related to data files for user databases and TempDB.
- Describe architectural concepts and best practices related to Concurrency, Transactions, Isolation Levels and Locking.
- Describe architectural concepts of the Optimizer and how to identify and fix query plan issues.
- Describe architectural concepts, troubleshooting scenarios and best practices related to Plan Cache.
- Describe architectural concepts, troubleshooting strategy and usage scenarios for Extended Events.
- Explain data collection strategy and techniques to analyze collected data.
- Understand techniques to identify and diagnose bottlenecks to improve overall performance.