



10987: Performance Tuning and Optimizing SQL Databases

Duration: 4 Days

Method: Instructor-Led Training (ILT) | Live Online Training

Course Description

This course provides attendees, who manage and maintain SQL Server databases, with the knowledge and skills to performance tune and optimize their databases.

Target Audience

This course is intended for:

- Individuals who administer and maintain SQL Server databases and are responsible for the 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.
- Individuals who develop applications that deliver content from SQL Server databases.

Prerequisites

To attend this course, candidates must have professional experience in addition to the following technical knowledge:

- Basic knowledge of the Microsoft® Windows® operating system and its core functionality.
- Working knowledge of database administration and maintenance
- Working knowledge of Transact-SQL.

Course Objectives

Upon successful completion of this course, attendees 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.



Course Objectives *Continued*

- 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 analyse collected data.
- Understand techniques to identify and diagnose bottlenecks to improve overall performance.

Course Topics

Module 1: SQL Server Architecture, Scheduling, and Waits

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

Module 2: SQL Server I/O

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

Module 3: Database Structures

- Database Structure Internals
- Data File Internals
- TempDB Internals

Module 4: SQL Server Memory

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

Module 5: SQL Server Concurrency

- Concurrency and Transactions
- Locking Internals

Module 6: Statistics and Index Internals

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

Module 7: Query Execution and Query Plan Analysis

- Query Execution and Optimizer Internals
- Query Execution Plans
- Analysing Query Execution Plans
- Adaptive Query Processing

Module 8: Plan Caching and Recompilation

- Plan Cache Internals
- Troubleshooting Plan Cache Issues
- Automatic Tuning
- Query Store

Module 9: Extended Events

- Extended Events Core Concepts
- Working with Extended Events

Module 10: Monitoring, Tracing, and Baselineing

- Monitoring and Tracing
- Baselineing and Benchmarking

LABS INCLUDED

