

Performance Tuning and Optimizing SQL Databases - MOC On Demand (MS-10987)

Modality: On Demand

Duration: 2 Days

SATV Value: 2

About this course:

If the course purchase individually, or you have annual subscription this Microsoft Official On-Demand course available for ninety days after the date when it request. Course access will terminate following ninety days of course enlistment.

This course designed for the candidates who maintain and manage SQL Server databases with the skills and knowledge to optimize and improve their databases.

Salary Estimate:

The DBA (Database Administrator) having Microsoft SQL server knowledge and skills can earn an average salary of \$77,428 per annum.

Course Objective:

After successful completion of this course, candidates can:

- Explain the SQL Server execution queues, model, and waits.
- Explain the architectural theory of the Optimizer and ways to detect and diagnose query plan problems.
- Explain architectural best practices and concepts associated with data files for Temp DB and user databases.
- Explain architectural best practices, ideas, and troubleshooting scenarios associated with Plan Cache.
- Explain the high-level architectural summary of SQL Server and its different parts.
- Describe data collection techniques and strategy to examine gathered data.
- Explain performance testing, Storage Area Networks and main I/O concepts.
- Explain architectural usage scenarios, concepts, and troubleshooting strategy for Extended Events.
- Explain architectural practices and concepts associated with Transactions, Concurrency Locking, and Isolation Levels.
- Learn methods to detect and fix bottlenecks to streamline overall performance.

Audience:

This course is designed for:

- People who maintain and oversee SQL Server DB and are answerable for the performance of SQL Server instances that they oversee. These people additionally write queries against data and have to ensure ideal performance of the workloads/

Prerequisites:

The candidates who are appearing in this exam must have the following technical knowledge and experience:

- Practical understating of database maintenance and administration.
- Practical understanding of Transact-SQL.
- Fundamental knowledge of the Microsoft Windows OS and its main functions.

Recommended prerequisites courses:

[SQL Database \(for Beginners\)](#)

Course Outline:

Module 1: SQL Server Architecture, Scheduling, and Waits

This module covers high level architectural overview of SQL Server and its various components. It dives deep into SQL Server execution model, waits and queues.

Lessons

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

Lab : SQL Server Architecture, Scheduling, and Waits

After completing this module, you will be able to:

- Describe the SQL Server components and SQL OS
- Describe the differences between Windows Scheduling and SQL scheduling
- Describe waits and queues

Module 2: SQL Server I/O

This module covers core I/O concepts, Storage Area Networks and performance testing. It focuses on SQL Server I/O operations and how to test storage performance.

Lessons

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

Lab : Testing Storage Performance

After completing this module, you will be able to:

- Describe the core concepts of SQL I/O
- Describe storage solutions
- Setup and test I/O

Module 3: Database Structures

This module covers Database Structures, Data File and TempDB Internals. It focuses on architectural concepts and best practices related to data files for user databases and TempDB.

Lessons

- Database Structure Internals
- Data File Internals
- TempDB Internals

Lab : Database Structures

After completing this module, you will be able to:

- Describe the internal setup of database structures
- Describe the internal setup of data files.
- Describe the internal setup of TempDB

Module 4: SQL Server Memory

This module covers Windows and SQL Server Memory internals. It focuses on architectural concepts and best practices related to SQL Server Memory Configuration.

Lessons

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

Lab : SQL Server Memory

After completing this module, you will be able to:

- Describe the components of Windows memory
- Describe the components of SQL Server memory
- Describe In-Memory OLTP

Module 5: Concurrency and Transactions

This module covers Transactions and Locking Internals. It focuses on architectural concepts and best practices related to Concurrency, Transactions, Isolation Levels and Locking.

Lessons

- Concurrency and Transactions
- Locking Internals

Lab : Concurrency and Transactions

After completing this module, you will be able to:

- Explain concurrency and transactions
- Describe locking

Module 6: Statistics and Index Internals

This module covers Statistics and Index Internals. It focuses on architectural concepts and best practices related to Statistics and Indexes.

Lessons

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

Lab : Statistics and index Internals

After completing this module, you will be able to:

- Describe statistics internals
- Explain cardinality estimation
- Describe why you would use Columnstore indexes and be able to implement one

Module 7: Query Execution and Query Plan Analysis

This module covers Query Execution and Query Plan Analysis. It focuses on architectural concepts of the Optimizer and how to identify and fix query plan issues.

Lessons

- Query execution and optimizer internals
- Analyzing query plans

Lab : Query execution and query plan analysis

After completing this module, you will be able to:

- Describe query execution and optimizer
- Analyze query plans and resolve common issues

Module 8: Plan Caching and Recompilation

This module covers Plan Caching and Recompilation. It focuses on architectural concepts, troubleshooting scenarios and best practices related to Plan Cache.

Lessons

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

Lab : Plan caching and recompilation

After completing this module, you will be able to:

- Describe plan cache
- Troubleshoot plan cache issues
- Describe query store and why you would use it

Module 9: Extended Events

This module covers Extended Events. It focuses on architectural concepts, troubleshooting strategy

and usage scenarios for Extended Events.

Lessons

- Extended events core concepts
- Implementing extended events

Lab : Extended events

After completing this module, you will be able to:

- Describe the core concepts of extended events
- Implement extended events

Module 10: Monitoring, Tracing, and Baselining

This module covers tools and techniques to monitor, trace and baseline SQL Server performance data. It focuses on data collection strategy and techniques to analyze collected data.

Lessons

- Monitoring and tracing
- Baselining and benchmarking

Lab : Monitoring, Tracing and Baselining

After completing this module, you will be able to:

- Describe various options for monitoring and tracing
- Describe various options for benchmarking and baselining

Module 11: Troubleshooting Common Performance Issues

This module covers common performance bottlenecks related to CPU, Memory, IO, TempDB and Concurrency. It focuses on techniques to identify and diagnose bottlenecks to improve overall performance.

Lessons

- Troubleshoot CPU performance
- Troubleshoot memory performance
- Troubleshoot I/O performance
- Troubleshoot Concurrency performance

- Troubleshoot TempDB performance

Lab : Troubleshooting common performance issues

After completing this module, you will be able to:

- Troubleshoot common performance issue