

WLC-SQL1104: SQL Server Performance 2008/2012 Query Tuning

Three days, instructor-led

This three-day instructor-led training provides database developers working in enterprise environments using Microsoft SQL Server 2008 R2 and 2012 the knowledge and skills to evaluate and improve queries and query response times. The training focuses on systematic identification and optimization of database factors that impact query performance.

Additional topic for SQL Server Report Services (SSRS) have been included which covers best practices on report design and helps you avoid common mistakes when choosing a report layout and output format.

Audience

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

Prerequisites

- Have working knowledge of data storage. Specifically, knowledge about row layout, fixed length field placement and varying length field placement
- Be familiar with index structures and index utilization. Specifically, they must understand the interaction between non-clustered indexes, clustered indexes and heaps. They must know why a covering index can improve performance
- Have had hands-on database developer experience. Specifically, three years of experience as a full-time database developer in an enterprise environment
- Be familiar with the locking model. Specifically, students should have an understanding of lock modes, lock objects and isolation levels and be familiar with process blocking
- Understand Transact-SQL syntax and programming logic. Specifically, students should be completely fluent in advanced queries, aggregate queries, subqueries, user-defined functions, cursors, control of flow statements, CASE expressions, and all types of joins
- Have strong monitoring and troubleshooting skills, including using monitoring tools
- Be familiar with SQL Server 2008 or 2012 features, tools, and technologies
- Have had hands-on knowledge in the creation and designing reports using SSRS.

In addition, it is recommended, but not required, that students have completed:

- Course 2778A, Writing Queries Using Microsoft SQL Server 2008 Transact-SQL.
- Course 6231B, Maintaining a Microsoft SQL Server 2008 R2 Database.
- Course 6232B, Implementing a Microsoft SQL Server 2008 R2 Database.

- Course 10-774A, Querying Microsoft SQL Server 2012.
- Course 10-775A, Administering Microsoft SQL Server 2012 Databases.
- Course 10-776A, Developing Microsoft SQL Server 2012 Databases.

Course Objectives

At the end of the course, students will be able to:

- Describe how queries are processed by SQL Server
- Identify the role of the query optimizer
- Build efficient queries
- Optimize data storage
- Optimize an indexing strategy
- Identify and resolve performance-limiting problems
- Implement best practices on report design and helps you avoid common mistakes when choosing a report layout and output format

Course Content

Module 1: Introduction

A. Basic structure of indexes

- Pages
- Extents
- Heap
- Clustered Index
- Non-Clustered Index

B. Practical insights into index implementation and maintenance

- Primary Key
- Over indexing
- Duplicate Index
- Clustered Index
- Unique Index
- Included Columns
- Filtered Index
- Disabled Index

Module 2: Fundamentals of Indexing

A. Index Maintenance

- Index Maintenance
- Defragmentation

B. Trips and Tricks revolving around indexes

- Index and Page Types
- Index and Non Deterministic Columns
- Index and SET Values
- Importance of Clustered Index
- Effect of Compression and Fillfactor
- Index and Functions
- Dynamic Management Views (DMV's)
- Table Scan
- Index Scan
- Index Seek
- Index and Order of Columns

C. Introduction to Columnstore Index

- Concepts

Module 3: Execution Plan Basics

- Execution Plan types
- Clustered and Non-clustered Index
- Key Lookup
- Index Seek
- Index Scan
- Types of Joins

Module 4: Essential Indexing Techniques

- Index behaviors

Module 5: Query Design for Performance

- EXISTS vs. IN vs. JOIN
- Common Table Expression
- Order of Table and Query Hints
- Plan guide and parameter sniffing
- Dynamic SQL and Performance
- UDF and Views Performance

Module 6: Performance Tuning Tools

- SSMS Performance dashboard
- Error Logs
- SQL Server Best Practices Analyzer
- Database Tuning Advisor
- Performance Counters
- SQL Space Map
- SQL Server Profiler
- SQL Server Extended Events
- SQL Server Wait Stats
- Wait Stats

- Dynamic Management Views
- SQLDiag

Module 7: Tips and Tricks

- Functions and Computed Columns
- Cursors and Performance
- Multi Statement Table Value Functions
- Stored Procedure and Dynamic Query
- Stored Procedure and Transaction
- Performance Tips and Tricks

Module 8: Checklist Performance Tuning**Module 9: Report Design Tips and Tricks –
Additional topic that you requested Sir--**

- Introduction
- Best Practices and Tips
- Report Samples

Course Inclusions:

- Microsoft Official Curriculum (MOC) and/or Wizards Learning Courseware (WLC)
- Microsoft Certified Trainer (MCT)
- Lunch, AM and PM Snacks
- Certificate of Achievement
- Course Notes