

MS SQL Server Performance Tuning

Duration:

5 Days

What is the course about?

This course is designed to give the right amount of internal knowledge and wealth of practical tuning and optimization techniques that you can put into production. The 5 day class offers a comprehensive coverage of SQL Server architecture, indexing and statistics strategies, optimize transaction log operations, tempdb and data file configuration, transactions and isolation levels, and locking and blocking. The course also teaches how to create baselines and benchmark SQL Server performance, how to analyze workload and figure out where performance problems are, and how to fix them. The course has a special focus on SQL Server I/O, CPU usage, memory usage, query plans, statement execution, parameter sniffing and procedural code, deadlocking, plan cache, wait and latch statistics, Extended Events, DMVs and PerfMon

Duration

The course is run 5 days full time.

Technical Skill

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.

In addition to their professional experience, students who attend this training should already have 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.

Private Training

This course is offered only privately. The course can be run onsite or on our site. The course can be run from our office in Cape Town or Johannesburg. The course price is R12 599 onsite and R17 500 on our premises. There is no set date to run the course; we schedule the course on dates that suits your team. A minimum of 4 delegates is required to run the course.

Course Topics

Performance Tuning Overview

- The Performance-Tuning Process
- Performance vs. Price
- Performance Baseline
- Where to Focus Efforts
- SQL Server Performance Killers

SQL Performance Analysis

- Performance Monitor Tool
- Dynamic Management Views
- Hardware Resource Bottlenecks
- Memory Bottleneck Analysis
- Memory Bottleneck Resolutions
- Disk Bottleneck Analysis
- Disk Bottleneck Resolutions
- Processor Bottleneck Analysis
- Processor Bottleneck Resolutions
- Network Bottleneck Analysis
- Network Bottleneck Resolutions
- SQL Server Overall Performance
- Creating a Baseline
- System Behavior Analysis against Baseline

SQL Query Performance Analysis

- Extended Events Wizard
- Extended Events Automation
- Extended Events Recommendations
- Other Query Performance Metrics Methods
- Costly Queries Execution Plans

Index Analysis

- What Is an Index?
- Index Design Recommendations
- Clustered Indexes
- Non-clustered Indexes Clustered vs. Non-clustered Indexes Advanced Indexing Techniques
- ColumnStore Indexes
- Special Index Types
- Additional Characteristics of Indexes

Database Tuning Advisor

- Database Engine Tuning Advisor Mechanisms
- Database Engine Tuning Advisor Examples
- Database Engine Tuning Advisor Limitations

Bookmark Lookup Analysis

- Purpose of Bookmark Lookups
- Drawbacks of Bookmark Lookups

Analyzing the Cause of a Bookmark Lookup
Resolving Bookmark Lookups

Statistics Analysis

The Role of Statistics in Query Optimization
Statistics on an Indexed Column
Statistics on a Nonindexed Column
Analyzing Statistics
Statistics Maintenance
Analyzing the Effectiveness of Statistics

Index Fragmentation Analysis

Causes of Fragmentation
Fragmentation Overhead
Analyzing the Amount of Fragmentation
Fragmentation Resolutions
Significance of the Fill Factor
Automatic Maintenance

Execution Plan Cache Analysis

Execution Plan Generation
Execution Plan Caching
Components of the Execution Plan
Aging of the Execution Plan
Analyzing the Execution Plan Cache
Execution Plan Reuse
Query Plan Hash and Query Hash
Execution Plan Cache Recommendations

Query Recompilation

Benefits and Drawbacks of Recompilation
Identifying the Statement Causing Recompilation
Analyzing Causes of Recompilation
Avoiding Recompilations

Query Design Analysis

Query Design Recommendations
Operating on Small Result Sets
Using Indexes Effectively
Avoiding Optimizer Hints
Using Domain and Referential Integrity
Avoiding Resource-Intensive Queries
Reducing the Number of Network Round-Trips
Reducing the Transaction Cost

Blocking Analysis

Blocking Fundamentals
Understanding Blocking
Locks
Isolation Levels Effect of Indexes on Locking

- Capturing Blocking Information
- Blocking Resolutions
- Recommendations to Reduce Blocking
- Automation to Detect and Collect Blocking Informatio

Deadlock Analysis

- Deadlock Fundamentals
- Using Error Handling to Catch a Deadlock
- Deadlock Analysis
- Avoiding Deadlocks

Cursor Cost Analysis

- Cursor Fundamentals
- Cursor Cost Comparison
- Default Result Set
- Analyzing SQL Server Overhead with Cursors
- Cursor Recommendations

Database Performance Stress Testing

- Database Stressing with JMeter
- Replaying SQL Scripts with JMeter
- Performance Testing Overview
- Capturing Data with the Server Side Trace Distributed Replay for Database Testing
- Summary and SQL Server Optimization Checklist