AMBIENT-IT

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Sign up

MS-SQL Advanced Training

2 days (14 hours)

Overview

Our training course introduces you to MS SQL Server, a relational database management system developed by Microsoft. At the heart of mission-critical application environments, it combines performance and security for demanding transactional and analytical workloads.

This MS SQL Advanced training course will enable you to optimize queries, design efficient indexes, profile performance and master T-SQL programming in real-life contexts.

You'll learn how to read execution plans, measure the impact of statistics, choose the right type of index and use Query Store to baseline your applications.

The course covers windowing functions, transactions and isolation levels, lock management and the sensible use of optimization hints.

You'll implement stored procedures, functions and triggers, while applying robust error handling and concurrency practices.

At the end of this course, you'll be able to accelerate costly queries, stabilize your performance and secure your transactions, by industrializing your T-SQL developments on SQL Server.

Like all our training courses, this one introduces you to the latest stable version and its new features, SQL Server 2022.

Objectives

- Read and analyze execution plans
- Manage statistics for optimization

- Design high-performance indexes (covering, filtering)
- Master windowing for analytics
- Manage concurrency (isolations, locks, RCSI/SNAPSHOT)
- Developing in T-SQL (SP, UDF, triggers, error handling)

Target audience

- SQL developers
- Database administrators
- Data engineers and technical analysts

Prerequisites

- SQL fundamentals (joins, aggregates, PK/FK keys)
- SQL Server/SSMS practice

MS-SQL Advanced Training Program

[Day 1 - Morning]

Performance and execution plans

- Understand SQL Server execution plans
- Identify common operators and their costs
- Differentiate between estimated and actual costs
- Analyze query cardinality
- Use diagnostic tools in SSMS
- Practical workshop: Reading and comparing real plans.

[Day 1 - Afternoon]

Statistics and advanced indexing

- Understand how to manage statistics (auto-creation, updating, histograms)
- Measure the effect of statistics on plan optimization
- Explore clustered and nonclustered indexes
- Design filtered and covering indexes
- Apply good sargability practices
- Practical workshop: Creating efficient indexes and measuring performance.

Performance monitoring and profiling

- Using Query Store and its main applications
- Analyze in real time with Live Query Stats
- Use DMVs to detect regression
- Track plan changes and optimize
- Build a performance baseline
- Practical workshop: Capture and compare plan revisions.

[Day 2 - Morning]

Advanced queries and optimization

- Using CTE and subqueries for performance
- Rewriting queries to improve sargability
- Implementing anti-joins and semi-joins (EXISTS / NOT EXISTS)
- Apply SQL refactoring best practices
- Optimizing correlated subqueries
- Practical workshop: Targeted rewrites to improve performance.

[Day 2 - Afternoon]

Analytical functions and windowing

- Introducing ROW_NUMBER, RANK, DENSE_RANK
- Using SUM() OVER (PARTITION BY)
- Discover LAG and LEAD
- Defining window frames (ROWS BETWEEN ...)
- Handling use cases: reporting, rankings, market share
- Practical workshop: Cumulative totals and detection of gaps and islands.

Transactions, programming and optimization

- Understanding isolation levels and locks
- Detecting and resolving deadlocks
- Programming in T-SQL: stored procedures, functions and triggers
- Handling errors with TRY...CATCH and transactions
- Using hints and plan guides (RECOMPILE, FORCESEEK, MAXDOP)
- Practical workshop: Implementing SP, UDF and triggers on WWI.

Companies concerned

This course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced IT technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as

On final registration, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the forthcoming training course, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

Practical training: 60% hands-on, 40% theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Certification

A certificate will be awarded to each trainee who has completed the entire course.