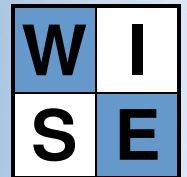


SQL Server: Advanced T-SQL Tuning via Execution Plan (Showplan)



WISE LTD.

- COURSE CODE:** SQSATS
- COURSE TITLE:** SQL Server: Advanced T-SQL Tuning via Execution Plan (Showplan)
- AUDIENCE:** Experienced T-SQL developers, DBAs and administrators
- PREREQUISITES:** At least one year of T-SQL experience
- DURATION:** 3 days
- SUMMARY:** This presentation details T-SQL tuning and best practices. To these ends, its mainly hands-on approach uses SQL Server's Execution Plan and Database Engine Tuning Advisor (DTA) to optimize index and query selection, including features such as:
- Join optimisation
 - Grouping sets
 - Correlated vs. non-correlated subqueries
 - Common Table Expressions (CTEs)
 - Indexed views
 - Index design and usage
 - Isolation levels
 - Locking and concurrency
 - Elapsed, CPU and I/O times
- OBJECTIVES:** Upon completion of this course, the participant should be able to use SQL Server's Execution Plan and DTA to assist in making efficient T-SQL and index choices for both OLTP and data warehousing environments.
- LAB:** About 65% hands-on, using Execution Plan (Showplan) facilities

1. SQL SERVER OPERATION & ARCHITECTURE – OVERVIEW

- Components
- Memory
- Configuration
- Databases
- Files
- Logging and recovery
- Tables
- Indexes
- T-SQL logical vs. physical processing

2. PLAN CACHING & RECOMPILATION

- Plan caching and Autoparameterization
- Causes of recompilation
- T-SQL hints
- Plan guides
- Plan statistics

3. INDEX ORGANISATION & USAGE GUIDELINES

- Non-clustered indexes
- Clustered indexes
- Covering (Include) indexes
- Filtered indexes (SQL Server 2008)
- Indexed views
- Bitmap vs. optimised bitmap filters (SQL Server 2008)
- Index access methods

4. EXECUTION PLANS/SHOWPLAN: USAGE & INTERPRETATION

- Formats (e.g., graphical vs. text)
- Logical vs. physical operators
- Information boxes
- Statistics (e.g., I/O timing)

5. TUNING SELECTS VIA SHOWPLAN

- SEELCT *
- TOP *n*
- SELECT ... CROSS APPLY
- Column functions (e.g., SUM())
- Scalar functions (e.g., COALESCE)
- ORDER BY
- GROUP BY
- GROUP BY ... HAVING

6. TUNING JOINS VIA SHOWPLAN

- Join types (LEFT, RIGHT, FULL, etc.)
- Hash
- Nested loop
- Merge
- Semi-join
- Table expressions

7. TUNING SET OPERATIONS VIA SHOWPLAN

- UNION
- UNION vs. CASE
- EXCEPT
- INTERSECT

8. TUNING USING VIEWS

- Regular view
- Common Table Expression (CTE)
- Indexed view

9. TUNING SUBQUERIES VIA SHOWPLAN

- Non-correlated
- Correlated
- EXISTS vs. NOT EXISTS
- IN vs. NOT IN

10. LOCKING & CONCURRENCY

- Reasons for
- Pessimistic vs. optimistic locking
- Transaction concepts via ACID
- Isolation levels
- Lock modes
- Application locks
- Lock duration
- Lock metadata
- Lock compatibility
- Deadlocks
- Row vs. page locks
- Lock escalation
- Row versioning
- Snapshot isolation
- Lock hints

11. DATABASE ENGINE TUNING ADVISOR (DTA) USAGE

- Exploratory analysis
- Index selection and recommendations
- Analyse proposed changes