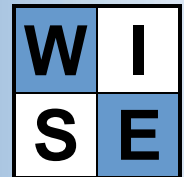


Advanced SQL Server Analysis Services (SSAS) & Performance



WISE LTD.

- COURSE CODE:** SQSAAS
- COURSE TITLE:** Advanced SQL Server Analysis Services (SSAS) & Performance
- CURRENCY:** SQL Server 2005, SQL Server 2008 & 2008 R2
- AUDIENCE:** Developers, DBAs and capacity planners.
- PREREQUISITES:** Completion of our course 'SQL Server Analysis Services 2005/2008/2008 R2' (SQSSAS) or equivalent knowledge.
- DURATION:** 3 days
- LEVEL:** Advanced
- SUMMARY:** This course emphasises improving the quality of the end-user experience by equipping the technical support team (developers, DBAs, etc.) with the requisite SSAS skills to design, implement, monitor and tune:
- Dimension attributes
 - Analysis Services query (MDX) performance
 - Processing performance
 - Aggregations performance
 - Indexes
 - Partitioning
 - Etc.
- The presentation also incorporates a gentle introduction to data mining, including hands-on.
- OBJECTIVES:** Upon completion of this presentation, the participant should be able to diagnose SSAS performance problems and design and implement, monitor and tune per the facilities under 'Core Topics' that follow.
- FORMAT:** Hands-on (about 55%).

1. REVIEW OF SSAS BASICS

- What is OLAP?
- Multidimensional space
- Client/server concepts
- Multidimensional model
- Cubes
- Measures
- The MDX role
- Data warehouse creation/role
- The Unified Dimensional Model (UDM)
- MOLAP vs. ROLAP vs. HOLAP

2. ANALYSIS SERVICES ARCHITECTURE

- Command execution
- Memory management
- Thread management
- Query execution and MDX expressions
- Query execution
- Query execution and data retrieval

3. OPTIMISING QUERY PERFORMANCE

- How to discover/determine query bottlenecks
- How to use and interpret the SQL Server Profiler
- How to diagnose query performance
- How to optimise dimension design
- How to optimise hierarchy design
- How to maximise the usefulness of aggregations
- How to interpret aggregations
- How to determine aggregation candidates
- How to use the Usage-Based Optimization Wizard
- How aggregation impacts parent-child relationships
- **Learn-by-doing exercises**

4. PARTITION & QUERY PERFORMANCE

- Measure groups
- Partition slicing
- Aggregation design
- Distinct Count design
- Partition sizing
- **Learn-by-doing exercises**

5. OPTIMISING MDX DESIGN & USAGE

- What is MDX?
- MDX queries
- MDX expressions
- MDX functions
- Calculated members
- Named sets
- Common calculations and solutions
- MDX query context and execution
- Sorting and ranking
- Optimising set operations
- Optimising summation
- Optimising scripts
- Cell-by-cell mode vs. subspace mode
- lif function
- Cache partial expression and cell properties
- Varying attributes in set operations
- **Learn-by-doing exercises**

6. TUNING SERVER RESOURCES

- Threadpool/query/maxthreads
- Threadpool/process/maxthreads
- Memory heap vs. Analysis Services heap

7. THE SSAS PROCESSING ARCHITECTURE

- XMLA commands
- Processing options
- Side-effects/ impact analysis
- Processing engine
- Lazy processing
- Out-of-line binding
- SSIS

8. CUBE PROCECSSING BASICS

- Definition
- Types of data changes
- Dimension processing
- Rebuilding dimensions
- Incrementally processing dimensions
- Rebuilding cubes
- Refreshing cubes
- Refreshing cubes incrementally
- Automating the processing tasks
- Push-mode processing
- **Learn-by-doing exercises**

9. OPTIMISING PROCESSING PERFORMANCE

- What is a processing job?
- How to establish process baselines
- Use of Windows Performance counters
- How to use Profiler Trace to optimise queries that participate in processing
- How to improve dimension processing performance
- Dimension processing and commands
- **Learn-by-doing exercises**

10. SOME PROCESSING BEST PRACTICES

- Dimensions
- Cubes
- Parallelism
- Troubleshooting
- Co-location (SSAS + data warehouse, for example) on the same server

11. PARTITION PROCESSING & PERFORMANCE

- Partition processing architecture
- Partition processing commands
- Partition processing best practices
- Tuning the relational partition query
- Controlling locking overhead

12. INTRODUCTION TO DATA MINING

- The data mining process
- Typical applications
- Common data mining algorithms
- The mining models
- **Learn-by-doing exercise**