

- COURSE CODE:** SQSDIS
- COURSE TITLE:** Advanced SQL Server 2005/2008 Integration Services (SSIS) for DBAs
- LEVEL:** Advanced
- AUDIENCE:** SQL Server DBAs (and SSIS developers).
- PREREQUISITES:** Completion of our course 'SQL Server 2005/2008 Integration Services Fundamentals' (SQSSIS) or equivalent knowledge.
- DURATION:** 3 days
- SUMMARY:** Designed mainly for SQL Server DBAs (and SSIS developers whose job description spans both SSIS developer and DBA tasks), this scenario-oriented presentation concentrates on the more esoteric features of SSIS:
- Deployment internals
  - Runtime engine
  - Data Flow engine
  - Execution trees
  - Parallelism
  - Source and destination adapters
  - Advanced transformations (synchronous vs. asynchronous)
  - Performance and tuning
  - Performance measurement
  - Partitioned tables (in data warehouses)
  - Partition maintenance
  - ETL planning and development
- OBJECTIVES:** Upon completion of this course, the delegate should be competent to develop, deploy, tune and source a diverse mix of complex SSIS package solutions.
- FORMAT:** Lecture and hands-on

## 1. REVIEW OF BI TERMS & CONCEPTS

- The data warehousing (DW) environment
- The DW computing context
- What is a data warehouse?
- What is a data mart?
- What is Business Intelligence (BI)?
- How do OLTP & OLAP differ?
- What is data mining?
- Operational vs. historical data
- Dimensional modelling
- Some dimensional modelling characteristics
- What is a star schema?
- What is a snowflake schema?
- What is metadata?

## 2. REVIEW OF SSIS BASICS

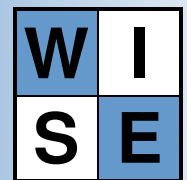
- Architecture
- Tools
- Wizards
- Packages
- Control Flows
- Data Flows
- SSIS in operational/data warehousing environments
- SSIS data types
- SSIS transformation types
- Containers
- Precedence constraints
- Variables
- Expressions

## 3. REVIEW OF MICROSOFT BI FRAMEWORK

- Relational DB
- SQL Server Management Studio
- SQL Profiler
- Reporting Services (SSRS)
- Analysis Services (SSAS)
- Integration Services (SSIS)
- Microsoft Office: Excel, etc.
- PerformancePoint

## 4. CHANGES PER SQL SERVER 2008

- Change Data Capture (CDC)
- Data Profiling
- Cache transform
- Managing cache files



## 5. SSIS 64-BIT CONSIDERATIONS

- Defined (e.g., 32-bit vs. 64-bit)
- SSIS features installed
- Tools installed
- Message Queue Task
- DTS packages
- SSIS packages (e.g., running)
- SQL Server Agent jobs

## 6. SSIS STORAGE ENGINE

- Data flow vs. control flow
- Package execution
- Buffer architecture
- Transformation types

## 7. RAW FILE SOURCE/DESTINATION

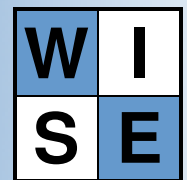
- Why consider
- Raw File Source adapter
- Raw File Destination adapter
- Staging area

## 8. DATA FLOW PERFORMANCE & TUNING

- Buffers optimisation
- Pipeline execution optimisation
- Logging optimisation
- Use of indexes
- Optimise inserts

## 9. COMPREHENSIVE ETL DESIGN & DEVELOPMENT WORKSHOP

- Top-level planning
- Source-to-destination mapping
- Data profiling
- Load frequency
- Historical vs. incremental loads
- Extraction design
- Staging area
- Recovery considerations
- Dimension table processing
- Slowly Changing Dimensions (SCD)
- Late arriving (inferred) dimensions
- Fact table processing
- Extracting fact updates and deletes
- Transforming dimension/fact data
- Fact data aggregation
- Confirmed dimensions/facts
- Surrogate key maintenance



## 9. COMPREHENSIVE ETL DESIGN & DEVELOPMENT WORKSHOP, cont'd.

- Fact table load
- Periodic vs. accumulating snapshot fact considerations
- Audit considerations
- Parent package/child package considerations
- Event handling
- Unit testing

## 10. DW PARTITIONING

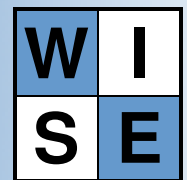
- When to partition
- Benefits
- How to design and create
- Sliding window
- Management advantage
- Parallelism
- Indexes
- Partition switching archiving

## 11. SSIS PACKAGE MANAGEMENT

- SSIS – the big picture
- Integration Services service
- Managing SSIS packages
- Configuring the SSIS service
- Importing and exporting packages
- Backing up and restoring packages
- Adding and removing packages
- Deleting a package
- Create an SSIS package template

## 12. SSIS TROUBLESHOOTING

- Package design-time troubleshooting options
- Control Flow troubleshooting
- Data Flow troubleshooting
- Package execution troubleshooting: after deployment
- Script troubleshooting
- Setting Breakpoints: task or container
- Adding a Data Viewer: Data Flow
- Viewing event loops: Event Viewer
- Logging package execution
- Execution trees



## 13. SSIS MAINTENANCE TASKS

- Backup Database
- Check Database Integrity
- Execute SQL Server Agent Job
- Execute T-SQL Statement
- History Cleanup
- Maintenance Cleanup
- Notify Operator
- Rebuild Index
- Reorganize Index
- Shrink Database
- Update Statistics

## 14. ADVANCED DEPLOYMENT CONSIDERATIONS

- Package configuration
- What does the Deployment Wizard do?
- When should the deployment utility be used vs. import/Export, XCopy, etc?
- How to override configurations
- How to deploy and account for security

## 15. SECURITY & PACKAGE EXECUTION

- Roles, protection levels and passwords
- Package execution via command line
- Automatic package scheduling

## 16. SSIS PERFORMANCE & TUNING

- Tools and techniques
- Buffer usage
- Buffer signing
- Execution trees
- Data transformation design alternatives
- Parallelism
- Performance measurement (e.g., performance counters, SQL Server Profiler)