



Implementing a Data Warehouse with MS SQL Server

This five-day instructor-led course describes how to implement a data warehouse platform to support a BI solution. Participants will learn how to create a data warehouse with Microsoft SQL Server 2014, implement ETL with SQL Server Integration Services, and validate and cleanse data with SQL Server Data Quality Services and SQL Server Master Data Services.

Note: This course is designed for customers who are interested in learning SQL Server 2012 or SQL Server 2014. It covers the new features in SQL Server 2014, but also the important capabilities across the SQL Server data platform.

Who Should Attend:

This course is intended for database professionals who need to create and support a data warehousing solution. Primary responsibilities include implementing a data warehouse, developing SSIS packages, enforcing data integrity, and cleansing data.

Course Prerequisites:

Before attending this course, participants are required to have:

- At least 2 years' experience of working with relational databases, including:
- Designing a normalized database.
- Creating tables and relationships.
- Querying with Transact-SQL.
- Some exposure to basic programming constructs (such as looping and branching).
- An awareness of key business priorities such as revenue, profitability, and financial accounting is desirable.

Course Objectives:

After completing this course, participants will be able to:

- Describe data warehouse concepts & architecture considerations.
- Select an appropriate hardware platform for a data warehouse.
- Design & implement a data warehouse.
- Implement Data Flow & Control Flow in an SSIS Package.
- Debug & Troubleshoot SSIS packages.
- Implement an ETL solution that supports incremental data extraction & loading
- Implement data cleansing by using Microsoft Data Quality Services.
- Implement Master Data Services to enforce data integrity.
- Extend SSIS with custom scripts and components.
- Deploy and Configure SSIS packages.
- Describe how BI solutions can consume data from the data warehouse.

Course Code: 20463c
Course Duration: 5 Days

Course Summary

- Module 1:** Introduction to Data Warehousing
- Module 2:** Planning Data Warehouse Infrastructure
- Module 3:** Designing and Implementing a Data Warehouse
- Module 4:** Creating an ETL Solution with SSIS
- Module 5:** Implementing Control Flow in an SSIS Package
- Module 6:** Debugging and Troubleshooting SSIS Packages
- Module 7:** Implementing a Data Extraction Solution
- Module 8:** Loading Data into a Data Warehouse
- Module 9:** Enforcing Data Quality
- Module 10:** Master Data Services
- Module 11:** Extending SQL Server Integration Services
- Module 12:** Deploying and Configuring SSIS Packages
- Module 13:** Consuming Data in a Data Warehouse

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Course Outline

Module 1: Introduction to Data Warehousing

This module provides an introduction to the key components of a data warehousing solution and the high-level considerations you must take into account when you embark on a data warehousing project.

Lessons

- Overview of Data Warehousing
- Considerations for a Data Warehouse Solution

Lab

- Exploring Data Sources
- Exploring and ETL Process
- Exploring a Data Warehouse

Module 2: Planning Data Warehouse Infrastructure

This module discusses considerations for selecting hardware and distributing SQL Server facilities across servers.

Lessons

- Considerations for Data Warehouse Infrastructure
- Planning Data Warehouse Hardware

Lab

- Planning Data Warehouse Hardware

Module 3: Designing and Implementing a Data Warehouse

This module describes the key considerations for the logical design of a data warehouse, and then discusses best practices for its physical implementation.

Lessons

- Data Warehouse Design Overview
- Designing Dimension Tables
- Designing Fact Tables
- Physical Design for a Data Warehouse

Lab

- Implement a Star Schema
- Implement a Snowflake Schema
- Implement a Time Dimension

Module 4: Creating an ETL Solution with SSIS

This module discusses considerations for implementing an ETL process, and then focuses on Microsoft SQL Server Integration Services (SSIS) as a platform for building ETL solutions.

Lessons

- Introduction to ETL with SSIS
- Exploring Data Sources
- Implementing Data Flow

Lab

- Exploring Data Sources
- Transferring Data by Using a Data Flow Task
- Using Transformations in a Data Flow

Module 5: Implementing Control Flow in an SSIS Package

This module describes how to implement ETL solutions that combine multiple tasks and workflow logic.

Lessons

- Introduction to Control Flow
- Creating Dynamic Packages
- Using Containers
- Managing Consistency

Lab - Implementing Control Flow in an SSIS Package

- Using Tasks and Precedence in a Control Flow
- Using Variables and Parameters
- Using Containers

Lab - Using Transactions and Checkpoints

- Using Transactions
- Using Checkpoints

Module 6: Debugging & Troubleshooting SSIS Packages

This module describes how you can debug packages to find the cause of errors that occur during execution. It then discusses the logging functionality built into SSIS that you can use to log events for troubleshooting purposes. Finally, the module describes common approaches for handling errors in control flow and data flow.

Lessons

- Debugging an SSIS Package
- Logging SSIS Package Events
- Handling Errors in an SSIS Package



Module 6 cont...

Lab

- Debugging an SSIS Package
- Logging SSIS Package Execution
- Implementing an Event Handler
- Handling Errors in a Data Flow

Module 7 : Implementing a Data Extraction Solution

This module describes the techniques you can use to implement an incremental data warehouse refresh process.

Lessons

- Planning Data Extraction
- Extracting Modified Data

Lab

- Using a Datetime Column
- Using Change Data Capture
- Using the CDC Control Task
- Using Change Tracking

Module 8 : Loading Data into a Data Warehouse

This module describes the techniques you can use to implement data warehouse load process

Lessons

- Planning Data Loads
- Using SSIS for Incremental Loads
- Using Transact-SQL Loading Techniques

Lab

- Loading Data from CDC Output Tables
- Using a Lookup Transformation to Insert or Update Dimension Data
- Implementing a Slowly Changing Dimension
- Using the MERGE Statement

Module 9 : Enforcing Data Quality

This module introduces Microsoft SQL Server Data Quality Services (DQS), and describes how you can use it to cleanse and deduplicate data.

Lessons

- Introduction to Data Quality
- Using Data Quality Services to Cleanse Data
- Using Data Quality Services to Cleanse Data

Lab

- Creating a DQS Knowledge Base
- Using a DQS Project to Cleanse Data
- Using DQS in an SSIS Package

Module 10 : Master Data Services

Master Data Services provides a way for organizations to standardize data and improve the quality, consistency, and reliability of the data that guides key business decisions. This module introduces Master Data Services and explains the benefits of using it.

Lessons

- Introduction to Master Data Services
- Implementing a Master Data Services Model
- Managing Master Data
- Creating a Master Data Hub

Lab

- Creating a Master Data Services Model
- Using the Master Data Services Add-in for Excel
- Enforcing Business Rules
- Loading Data Into a Model
- Consuming Master Data Services Data

Module 11 : Extending SQL Server Integration Services

This module describes the techniques you can use to extend SSIS. The module is not designed to be a comprehensive guide to developing custom SSIS solutions, but to provide an awareness of the fundamental steps required to use custom components and scripts in an ETL process that is based on SSIS.

Lessons

- Using Scripts in SSIS
- Using Custom Components in SSIS

Lab

- Include custom scripts in an SSIS package
- Describe how custom components can be used to extend SSIS

Module 12 : Deploying and Configuring SSIS Packages

In this module, participants learn how to deploy packages and their dependencies to a server, and how to manage and monitor the execution of deployed packages

Lessons

- Overview of SSIS Deployment
- Deploying SSIS Projects
- Planning SSIS Package Execution

Lab

- Creating an SSIS Catalog
- Deploying an SSIS Project
- Running an SSIS Package in SQL Server Management Studio
- Scheduling SSIS Packages with SQL Server Agent



Module 13 : Consuming Data in a Data Warehouse

This module introduces business intelligence (BI) solutions and describes how you can use a data warehouse as the basis for enterprise and self-service BI.

Lessons

- Introduction to Business Intelligence
- Enterprise Business Intelligence
- Self-Service BI and Big Data

Lab

- Exploring an Enterprise BI Solution
- Exploring a Self-Service BI Solution