



Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

Duration: 5 days

Description

In this course, experienced developers who know the basics of data access (CRUD) in Windows client and Web application environments will learn to optimize their designs and develop better performing data access code by using the ADO.NET Entity Framework, LINQ, WCF Data Services, the Sync Framework, and ADO.NET.

Audience

This course is intended for professional .NET software developers who use Microsoft Visual Studio in a team-based, medium-sized to large development environment.

Prerequisites

Students should have:

- Experience developing n-tier applications that access various data sources
- Experience implementing data binding within their applications
- Some experience using LINQ and ADO.NET
- A conceptual understanding of the Entity Framework
- Experience writing scripts
- Experience using Visual Studio 2008 or 2010
- A general understanding of the purpose, function, and features the .NET Framework including:
 - Common Language Runtime
 - .NET Framework class library
 - Common Type System
 - Component interoperation
 - Cross-language interoperability
 - Assemblies in the Common Language Runtime
 - Application domains
 - Runtime hosts supported by the .NET Framework
- Experience in object oriented design and development
- Data access experience in Windows client application development
- Data access experience in Web application development

Topics

ARCHITECTURE AND DATA ACCESS

TECHNOLOGIES

This module describes the commonly used data access technologies and scenarios in which you are likely to use them.

Lessons

- Data Access Technologies
- Data Access Scenarios

Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

BUILDING ENTITY DATA MODELS

This module introduces the concepts of data modeling, and in particular, Entity Data Models (EDMs). It explains how you can use EDMs to decouple the conceptual data structure in your applications from the logical data structure in the data store.

Lessons

- Introduction to Entity Data Models
- Modifying the Entity Data Model
- Customizing the Entity Data Model

Lab: Using Entity Data Models

- Generating an EDM from the Adventure Works Database
- Adding Entities and Associations
- Using the Generate Database Wizard
- Mapping Entities to Multiple Tables
- Implementing an Inheritance Hierarchy
- Using Stored Procedures
- Creating a Complex Type

QUERYING ENTITY DATA

This module explains how to query an entity data model by using common methods such as LINQ to Entities, Entity SQL, and the classes in the Entity Client namespace.

Lessons

- Retrieving Data by Using LINQ to Entities
- Retrieving Data by Using Entity SQL
- Retrieving Data by Using Entity Client Provider
- Retrieving Data by Using Stored Procedures
- Unit Testing Your Data Access Code

Lab: Querying Entity Data

- Retrieving All Contact Entities
- Retrieving Contact Entities by Using a Filter
- Retrieving Rewards Claimed Entities
- Querying the Rewards Family of Entities
- Executing a Stored Procedure

CREATING, UPDATING, AND DELETING ENTITY DATA

This module introduces you to the ways that the Entity Framework enables you to modify the data in your database.

Lessons

- Understanding Change Tracking in the Entity Framework
- Modifying Data in an Entity Data Model

Lab: Creating, Updating, and Deleting Entity Data

- Maintaining Contact and Reward Data
- Maintaining Rewards Claim Data

HANDLING MULTI-USER SCENARIOS BY USING OBJECT SERVICES

This module introduces the concurrency model that the Entity Framework uses to address the issues faced by applications that must support multiple users who access the same data simultaneously. It also describes how the Entity Framework can make use of transactions to ensure data integrity.

Lessons

- Handling Concurrency in the Entity Framework

Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

- Transactional Support in the Entity Framework

Lab: Handling Multi-User Scenarios by Using Object Services

- Handling Concurrency of Rewards Claimed Data
- Updating the Rewards Claimed and Archived Rewards Claimed Information by Using a Transaction

BUILDING OPTIMIZED SOLUTIONS BY USING OBJECT SERVICES

This module explains best practices for designing and building a scalable, optimized data access layer by using Object Services. The module introduces several techniques that can be used to optimize the performance of queries that execute against the conceptual model.

Lessons

- The Stages of Query Execution
- Change Tracking and Object Materialization
- Using Compiled Queries
- Using Design-Time Generated Entity Framework Views
- Monitoring Performance
- Performing Asynchronous Data Modifications
- Understand the impact of tracking and object materialization on query performance.

Lab: Building Optimized Solutions by Using Object Services

- Improving the Performance of Query Operations
- Improving the Performance of Update Operations

CUSTOMIZING ENTITIES AND BUILDING CUSTOM ENTITY CLASSES

This module describes how to customize and extend entities with your own business logic.

Lessons

- Overriding Generated Classes
- Using Templates to Customize Entities
- Creating and Using Custom Entity Classes

Lab: Customizing Entities and Building Custom Entity Classes

- Using a Template to Add Custom Functionality to Entity Classes
- Creating Custom Entity Classes

USING POCO CLASSES WITH THE ENTITY FRAMEWORK

This module introduces the ways in which you can define custom entity classes in your Entity Framework application. By default, Microsoft Visual Studio generates a set of entity classes for you from the Entity Data Model (EDM). Instead of these generated classes, you may want to use an existing set of "plain old" CLR objects (POCO) business classes in your application. You can also extend the generated entity classes to add custom business functionality to your entity objects.

Lessons

- Requirements for POCO Classes
- POCO Classes and Lazy Loading
- POCO Classes and Change Tracking
- Extending Entity Types

Lab: Using POCO Classes with the Entity Framework

Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

- Using POCO Classes
- Extending Your POCO Classes

BUILDING AN N-TIER SOLUTION BY USING THE ENTITY FRAMEWORK

This module explains how to address the architectural issues that can arise when building an N-Tier enterprise application by using the Entity Framework.

Lessons

- Designing an N-Tier Solution
- Defining Operations and Implementing Data Transport Structures
- Protecting Data and Operations

Lab: Building an N-Tier Solution by Using the Entity Framework

- Creating the Contacts and Orders Data Access Tier Protecting Data Access Operations

HANDLING UPDATES IN AN N-TIER SOLUTION BY USING THE ENTITY FRAMEWORK

This module describes how you can handle data modifications in an n-tier solution. The module describes the different strategies for handling modifications that you should use for the different alternative formats for transporting data between tiers: data transfer objects (DTOs), self-tracking entities (STEs), and simple entities (SEs). The module also describes how to manage the exceptions that can occur during the data modification process

Lessons

- Tracking Entities and Persisting Changes
- Managing Exceptions in an N-Tier Solution

Lab: Handling Updates in an N-Tier Solution by Using the Entity Framework

- Handling Updates in the Data Access Tier
- Detecting and Handling Order Conflicts

BUILDING OCCASIONALLY CONNECTED SOLUTIONS

This module describes how to access offline or occasionally connected data in client applications.

Lessons

- Offline Data Caching by Using XML
- Using the Sync Framework

Lab: Building Occasionally Connected Solutions

- Modifying the Orders Application to Use Offline XML Data
- Modifying the Orders Application to Synchronize Locally Cached Data

QUERYING DATA BY USING WCF DATA SERVICES

Windows Communication Foundation (WCF) Data Services enable you to create highly flexible data services that can be used to provide access to data across the Internet or a corporate network. You can access these services by using REST-style URIs, and they can be easily consumed by a wide variety of applications. As WCF Data Services are built on top of standard Internet protocols such as HTTP and the Atom Publishing Protocol, they are an ideal choice for delivering data to AJAX applications and Rich Interactive Applications built using technologies such as Microsoft Silverlight.

Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

Lessons

- Introduction to WCF Data Services
- Creating a WCF Data Service
- Consuming a WCF Data Service
- Protecting Data and Operations in a WCF Data Service

Lab: *Creating and Using WCF Data Services*

- Exposing Order Data as a WCF Data Service
- Consuming a WCF Data Service
- Restricting Access to Data Exposed by a WCF Data Service
- Implementing a Business Operation in a WCF Data Service

UPDATING DATA BY USING WCF DATA SERVICES

This module describes how to use WCF Data Services to create, update, and delete data. WCF Data Services use standard internet protocols such as HTTP and the Atom Publishing Protocol to enable update access to data across the Internet or a corporate network.

- Creating, Updating, and Deleting Data in a WCF Data Service
- Preventing Unauthorized Updates and Improving Performance
- Using WCF Data Services with Non-relational Data

Lab: *Updating Data by Using WCF Data Services*

- Updating Entities by Using a WCF Data Service
- Creating and Deleting Entities by Using a WCF Data Service
- Restricting Create, Update, and Delete Requests Retrieving and Modifying Data by Using DataSets

USING ADO.NET

ADO.NET is a highly flexible framework for building applications that require access to data held in a data source. This module introduces ADO.NET and explains how you can use it to develop scalable, high-performance, data-driven applications.

Lessons

- Retrieving and Modifying Data by Using ADO.NET Commands
- Retrieving and Modifying Data by Using DataSets
- Managing Transactions and Concurrency in Multiuser Scenarios

Lab: *Using ADO.NET*

- Using ADO.NET to Retrieve Read-Only Information Quickly and Perform Simple Data Modifications
- Developing the Product List Web Application
- Enabling Data Modifications

USING LINQ TO SQL

ADO.NET provides a mechanism that enables you to build applications that can query and maintain data that is held in a variety of sources in a database-agnostic manner. However, building applications by using ADO.NET requires that you are familiar with the Structured Query Language (SQL) language and features of the database management system that you are connecting to. Language-Integrated Query (LINQ) to SQL provides a higher-level abstraction for managing data that is held in a Microsoft SQL Server database, and is an ideal stepping stone for migrating ADO.NET applications toward the ADO.NET Entity Framework. This module introduces LINQ to SQL and explains how you can use it to



Developing Data Access Solutions with Microsoft Visual Studio 2010 (MS10265)

abstract the low-level details of ADO.NET queries by developing against a logical data model.

Lessons

- Implementing a Logical Data Model by Using LINQ to SQL
- Managing Performance and Handling Concurrency

Lab: Using LINQ to SQL

- Using LINQ to SQL to Build a Data Access Layer
- Updating a Database by Using a Stored Procedure
- Building a Custom Entity Class