

## **MOC 10263 Developing Windows Communication Foundation Solutions with Microsoft Visual Studio 2010**

### **Course Summary**

#### **Description**

This course provides participants with the knowledge and skills to develop distributed applications using WCF 4 and Microsoft Visual Studio 2010.

#### **Objectives**

At the end of this course, students will be able to:

- After completing this course, students will be able to:
- Implement Service-Oriented Architecture tenets in WCF services
- Host WCF services in a variety of Windows hosts
- Define and implement WCF service contracts, data contracts, and message contracts
- Use multiple endpoints with various messaging patterns
- Test, troubleshoot, monitor, and diagnose WCF services
- Ensure service reliability using transactions and message queues
- Secure WCF services using message and transport security
- Extend WCF using behaviors, dispatchers, inspectors, and formatters

#### **Topics**

- Service-Oriented Architecture
- Getting Started with WCF Development
- Hosting WCF Services
- Defining and Implementing WCF Contracts
- Endpoints and Behaviors
- Testing and Troubleshooting WCF Services
- Security
- Advanced Topics

#### **Audience**

This course is intended for professional .NET programmers who use Microsoft Visual Studio in a team-based, medium-sized to large development environment. Students should have experience consuming services within their Web and/or Windows client applications and be interested in learning to develop service-oriented applications (SOA) using WCF. Students should be experienced users of Microsoft Visual Studio 2008 SP1, as well as cursory familiarity with Microsoft Visual Studio 2010 for Windows client or Web application development.

#### **Prerequisites**

Before attending this course, students must have:

- Understanding of the problem-solving techniques that apply to software development.
- General understanding of the purpose, function and features of the .NET Framework.
- Experience developing software using Visual Studio 2008 or Visual Studio 2010.
- Experience in object-oriented design and development using the C# programming language.
- Experience in n-tier application design and development.

#### **Duration**

Three days

Due to the nature of this material, this document refers to numerous hardware and software products by their trade names. References to other companies and their products are for informational purposes only, and all trademarks are the properties of their respective companies. It is not the intent of ProTech Professional Technical Services, Inc. to use any of these names generically

## MOC 10263 Developing Windows Communication Foundation Solutions with Microsoft Visual Studio 2010 Course Outline

### I. Service-Oriented Architecture

This module explains how to design service-oriented applications, how to adhere to SOA tenets, and how to leverage the benefits of SOA scenarios using WCF.

- A. What Is SOA?
- B. The Benefits of SOA
- C. Scenarios and Standards
- D. Introduction to WCF

#### Lab: Service-Oriented Architecture

- Practice the SOA Tenets
- Implement Service Agility and Scalability
- Interoperability with Other SOA Technologies
- Use REST Services

**After completing this module, students will be able to:**

- Describe SOA tenets, scenarios, and benefits for distributed application development
- Design SOA-enabled applications
- Map SOA tenets to equivalent WCF concepts

### II. Getting Started with WCF Development

This module describes how to implement a WCF service from the ground up, including defining a contract, implementing the contract, hosting the service, configuring endpoints, and configuring bindings. It also explains how to create a proxy to a WCF service using a channel factory and using the Add Service Reference dialog in Visual Studio 2010.

- A. Service Contract and Implementation
- B. Hosting WCF Services
- C. WCF Behaviors
- D. Consuming WCF Services

#### Lab: Service Development Lifecycle

- Define Service and Data Contracts
- Create a Service Implementation
- Configure the Service

- Consume the Service Using Channel Factories
- Consume the Service Using Service References

**After completing this module, students will be able to:**

- Design and define service contracts and data contracts for a service
- Write a service implementation class that implements the service contract
- Host WCF services using a variety of endpoints and bindings
- Consume WCF services using client proxies

### III. Hosting WCF Services

This module explains how to host WCF services using Windows Services, IIS and WAS, and AppFabric. It describes how to choose the appropriate host and how to properly configure it for your service's optimal operation.

- A. WCF Service Hosts
- B. ServiceHost
- C. Hosting WCF Services in Windows Services
- D. IIS, WAS, and AppFabric
- E. Configuring WCF Hosts
- F. Service Hosting Best Practices

#### Lab: Hosting WCF Services

- Use Windows Server AppFabric
- Use Windows Services
- Host Services in a Windows Application
- Service Monitoring Using Performance Counters

**After completing this module, students will be able to:**

- Appreciate and compare different WCF service hosts
- Configure service hosts for optimal service operation
- Host WCF services in Windows Services

## MOC 10263 Developing Windows Communication Foundation Solutions with Microsoft Visual Studio 2010 Course Outline (cont'd)

- Host WCF services in IIS, WAS, and AppFabric

### IV. Defining and Implementing WCF Contracts

This module describes how to define WCF service contracts, data contracts, and message contracts. It explains how to design WCF contracts appropriately and how to modify WCF contracts according to the selected messaging pattern.

- A. What Is a Contract?
- B. Contract Types
- C. Messaging Patterns
- D. Designing WCF Contracts

#### Lab: Contract Design and Implementation

- Insert Description
- Create a Data Contract
- Implement Message Exchange

**After completing this module, students will be able to:**

- Design and implement WCF service contracts, data contracts, and message contracts
- Choose the appropriate message exchange pattern

### V. Endpoints and Behaviors

This module describes how to expose multiple endpoints from a WCF service, how to automatically discover services and make services discoverable, how to configure instancing and concurrency modes for services, and how to improve service reliability with transactions and message queues.

- A. Multiple Endpoints and Interoperability
- B. WCF Discovery
- C. WCF Default Endpoints
- D. Instancing and Concurrency
- E. Reliability

#### Lab: Endpoints and Behaviors

- Expose Multiple Endpoints
- Use Queued Services

- Use Transactions
- Use Reliable Messaging
- Configure Instancing and Concurrency
- Use WCF Discovery
- Verify MSMQ Topology

**After completing this module, students will be able to:**

- Improve service reliability by using transactions, queues, and reliable messaging
- Choose between the various concurrency and instancing modes and configure them
- Expose discoverable services and discover services using WS-Discovery

### Testing and Troubleshooting WCF Services

This module describes how to diagnose errors and problem root causes in WCF services and how to configure services to expose fault information. It also explains how to use tracing, message logging, and other diagnostic and governance tools for monitoring services at runtime.

- A. Errors and Symptoms
- B. WCF Faults
- C. Debugging and Diagnostics Tools
- D. Runtime Governance

#### Lab: Testing and Troubleshooting WCF Services

- View Unplanned SOAP Faults
- Use Fault Contracts
- Use Error Handlers and Handling Faults
- Use WCF Message Logging and Tracing
- Support Large Messages

**After completing this module, students will be able to:**

- Diagnose service errors and symptoms
- Expose fault information from WCF services and consume faults from client applications
- Use debugging and diagnostics tools for service monitoring and troubleshooting

## MOC 10263 Developing Windows Communication Foundation Solutions with Microsoft Visual Studio 2010 Course Outline (cont'd)

- Appreciate the importance of runtime governance

### **Security**

This module explains how to design secure applications, how to implement WCF security on the message level and the transport level, how to integrate authentication and authorization into service code, and how to apply claim-based identity management in federated scenarios.

- A. Introduction to Application Security
- B. The WCF Security Model
- C. Transport and Message Security
- D. Authentication and Authorization
- E. Claim-Based Identity

### **Lab: Implementing WCF Security**

- Implement Security Policy
- Configure Client
- Verify Security

### **After completing this module, students will be able to:**

- Appreciate the application security tenets
- Apply message and transport security to WCF services
- Use built-in and custom authentication and authorization providers
- Integrate claim-based identity into distributed systems

### **VI. Advanced Topics**

This module explains how to improve service throughput and responsiveness using the asynchronous invocation pattern, and how to extend WCF services using inspectors, behaviors, and host extensions. It also describes how to use the WCF routing service for improving service reliability, and how to use Workflow Services to orchestrate long-running, durable service work.

- A. The Asynchronous Invocation Pattern
- B. Extending WCF
- C. Routing

- D. Workflow Services

### **Lab: Advanced Topics**

- Use Message Inspectors and Behaviors
- Attach and Access Host Extensions
- Configure and Use Routing
- Implement Asynchronous Invocation
- Implement Workflow Services

### **After completing this module, students will be able to:**

- Apply the asynchronous invocation pattern to improve service and client performance
- Extend WCF using behaviors, inspectors, and host extensions
- Use the WCF routing service to balance load and mask service failures
- Use Workflow Services to implement long-running durable services