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## Information Technology & Training

Course 10263A:

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

**Course Length:** 3 days

#### **Overview**

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

**Important Note:** Course 10263A is designed for experienced .NET developers who are interested in becoming Technology Specialists in the area of WCF application development (see intended audience and prerequisites in this syllabus). For classrooms that include less experienced students, instructors may choose to adjust the course timings and establish a slower pace through the training material. To deliver this course at a reduced pace, Microsoft Learning suggests teaching Modules 1-7 during the three days of classroom training and leaving module 8 for the students to explore on their own after the course is completed. This will enable the instructor to spend more time ensuring that students fully understand the concepts taught in the earlier modules. Learning Partners may also choose to extend the course materials and establish a 4-day customized training course that progresses at a slower pace.

#### **Target Student**

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.

#### **Objectives**

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

#### **Prerequisites**

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Before attending this course, students must have:

- Understanding of the problem-solving techniques that apply to software development.
- General understanding of the purpose, functions, 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.

### Course Content

#### Module 1: Service-Oriented Architecture

This module explains how to design SOAs, how to adhere to SOA tenets, and how to leverage the benefits of SOA scenarios using WCF.

Lessons

What Is SOA?

The Benefits of SOA

Scenarios and Standards

Introduction to WCF

Lab : Service-Oriented Architecture

Practicing the SOA Tenets

Implementing Service Agility and Scalability

Interoperating with Other SOA Technologies

Using 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

#### Module 2: Getting Started with Microsoft Windows Communication Foundation

Development

This module describes how to implement a WCF service from the beginning, 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 box in Visual Studio 2010.

Lessons

Service Contract and Implementation

Hosting WCF Services

WCF Behaviors

Consuming WCF Services

Lab : Service Development Life Cycle

Defining Service and Data Contracts

Creating a Service Implementation

Configuring the Service

Consuming the Service Using Channel Factories

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Consuming 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

Module 3: Hosting Microsoft Windows Communication Foundation Services

This module explains how to host WCF services using Windows Services, Internet Information Services (IIS) and Windows Process Activation Service (WAS), and Windows Server AppFabric. This module describes how to choose the appropriate host, and how to configure it properly for your service's optimal operation.

Lessons

WCF Service Hosts

ServiceHost

Hosting WCF Services in Windows Services

IIS, WAS, and AppFabric

Configuring WCF Hosts

Service Hosting Best Practices

Lab : Hosting WCF Services

Using Windows Server AppFabric

Using Windows Services

Hosting Services in a Windows Application

Using Performance Counters for Service Monitoring

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

Host WCF services in IIS, WAS, and AppFabric

Module 4: Defining and Implementing Microsoft Windows Communication Foundation Contracts

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

Lessons

What Is a Contract?

Contract Types

Messaging Patterns

Designing WCF Contracts

Lab : Contract Design and Implementation

Creating Service Contracts

Creating Data Contracts

Implementing Message Exchange

After completing this module, students will be able to:

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

### Module 5: 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.

#### Lessons

Multiple Endpoints and Interoperability

WCF Discovery

WCF Default Endpoints

Instancing and Concurrency

Reliability

Lab : WCF Endpoints and Behaviors

Exposing Multiple Endpoints

Using Queued Services

Using Transactions

Using Reliable Messaging

Configuring Instancing and Concurrency

Using WCF Discovery

Verifying 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

### Module 6: Testing and Troubleshooting Microsoft Windows Communication Foundation 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.

#### Lessons

Errors and Symptoms

WCF Faults

Debugging and Diagnostics Tools

Runtime Governance

Lab : Testing and Troubleshooting WCF Services

Viewing Unplanned SOAP Faults

Using Fault Contracts

Using Error Handlers and Handling Faults

Using WCF Message Logging and Tracing

Supporting Large Messages

After completing this module, students will be able to:

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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

Appreciate the importance of runtime governance

### Module 7: Security

This module explains how to design secure applications, how to implement WCF security on both 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.

Lessons

Introduction to Application Security

The WCF Security Model

Transport and Message Security

Authentication and Authorization

Claim-Based Identity

Lab : Implementing WCF Security

Implementing Security Policy

Configuring Client

Verifying 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

### Module 8: Introduction to Advanced Microsoft Windows Communication Foundation 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.

Lessons

The Asynchronous Invocation Pattern

Extending WCF

Routing

Workflow Services

Lab : Advanced Topics

Using Message Inspectors and Behaviors

Attaching and Access Host Extensions

Configuring and Use Routing

Implementing Asynchronous Invocation

Implementing Workflow Services

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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