

Windows Communication Foundation (WCF) is Microsoft’s new framework for building distributed systems. It unifies and builds on the diverse set of existing distribution mechanisms, which include ASP.NET Web services and .NET Remoting. WCF enables developers to produce highly configurable, secure, reliable and transactional services using a single simplified programming model. And since WCF supports the WS-\* series of Web service standards, it enables simple interoperability with other platforms and technologies.

This 3 day course provides a thorough grounding in this important technology. The first chapter covers the essential concepts and shows how to implement WCF services and clients. The “ABC” of address, binding and contracts are covered in detail. Service contracts and data contracts are elaborated, and instance management is covered. The course concludes with a discussion of error handling and security. A large number of working examples and lab exercises are provided. The course uses .NET 4.0 and Visual Studio 2010.

### Course Objectives:

- Learn what WCF is, and how it unites existing distribution mechanisms.
- Gain an understanding of addressing and binding in WCF services.
- Use service contracts and data contracts.
- Implement WCF services and clients.
- Perform configuration in both code and configuration files.
- Understand faults and handle errors in WCF applications.
- Implement security in WCF applications.

**Audience:** .NET Programmers who wish to use WCF to create and consume web services.

**Prerequisites:** Students should have a good working knowledge of building .NET applications with C#. Knowledge of building distributed systems and Web services will also be an advantage.

**Number of Days:** 3 days

<p><b>1. WCF Essentials</b></p> <ul style="list-style-type: none"> <li>What is WCF?</li> <li>Service Orientation</li> <li>Address, Binding, Contract</li> <li>WCF Services and Clients</li> <li>WCF Service Libraries</li> <li>WCF Test Host and Test Client</li> <li>Self-Hosting</li> <li>ServiceHost Class</li> <li>Host Life Cycle</li> <li>WCF Clients</li> <li>Channel Factories</li> <li>Base Address</li> </ul>	<ul style="list-style-type: none"> <li>Uri Class</li> <li>Configuration Files</li> <li>Simplified Host Code</li> <li>Proxy Initialization</li> <li>Metadata Exchange</li> <li>Behaviors</li> <li>A Service in a Browser</li> <li>Standard Endpoints</li> <li>WCF Architecture</li> </ul> <p><b>2. Addresses and Bindings</b></p> <ul style="list-style-type: none"> <li>Addresses</li> <li>Bindings</li> <li>Message Exchange Patterns (MEPs)</li> </ul>
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- Security
- Choosing a Binding
- Inter-operating with ASMX Web Services
- Default Endpoints and Bindings
- Service Description
- Multiple Endpoints
- Simple Host Code
- 3. Service Contracts**
  - Service Contracts at Class Level
  - Benefits of Interface Level Definition
  - Services with Multiple Contracts
  - Attributes in WSDL
  - Contract Inheritance
  - Operation Overloading
  - Enabling Operation Overloading
- 4. Instance Management**
  - Behaviors
  - WCF Behaviors
  - Configuring Behaviors
  - WCF Instancing Models
  - Using Per-Call Instancing
  - Using Per-Session Instancing
  - Sessions and Threading
  - Singleton Instancing
  - Which Model to Use?
  - Windows Forms WCF Clients
- 5. Data Contracts**
  - Implementing Data Contracts
  - XSD for Data Contract
  - Arrays
  - Array in XML Schema
  - Array in Proxy
  - Generic Collections
  - Enumerations in Data Contracts
  - Employee Client Program
  - Saving and Restoring
    - Serialization in WCF and .NET
  - SOAP Serialization
  - DataContract Serialization
  - JSON Serialization
  - Using XmlSerializer
  - Restoring Data
  - Versioning
  - New and Missing Members
  - New Client of Old Service
- 6. More About Service Contracts**
  - Versioning Service Contracts
  - New Operations
  - Message Exchange Patterns
  - Request-Reply
  - Oneway / Duplex
  - Callbacks
  - Asynchronous Proxies
  - Threading Considerations
- 7. Handling Errors**
  - Errors in Distributed Systems
  - Errors in .NET and WCF
  - Service Library Code
  - Client Code
  - Client Exception Handling
  - Faults and Exceptions
  - Exception Details
  - Fault Contracts
  - Custom Faults
  - Faulted Channels
- 8. WCF Security**
  - Security Aspects of Services
  - Transport Security
  - Configuring Transport Security
  - Host and Client Security Configuration
  - Message Security
  - Certificates
  - Managing Certificates
  - Exception Details
  - Client Certificate Configuration
  - Sending Credentials
  - Username Credentials
- 9. Appendix A – Learning Resources**
- 10. Appendix B – Hosting in IIS 7.5**
  - Internet Information Services
  - Installing IIS 7.5
  - WCF with IIS 7.5
  - .NET Framework Version
  - Service Contract
  - Referencing the Class Library
  - WCF Clients
  - Service as an IIS Application
  - Converting to an Application
  - Moving a WCF Solution