

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.

Audience: NET programmers who want to be able to create rich Windows applications.

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

Number of Days: 3 days

1. WCF Essentials

- What is WCF?
- WCF Services
- Service Orientation
- WCF = ABC
- Address, Binding, Contract
- Hosting Services
- A Service Contract
- Visual Studio WCF Test Host
- WCF Test Client
- Closing the Test Host Manually
- Self Hosting
- ServiceHost Class
- Host Life Cycle
- WCF Clients
- Channels
- ChannelFactory
- Base Address
- Uri Class
- Configuration Files
- Proxy Initialization
- Metadata Exchange
- Behaviors
- Standard Endpoints
- WCF Architecture

2. Addresses and Bindings

- Addresses
- Transports
- Bindings
- Message Exchange Patterns (MEPs)
- Security
- Choosing a Binding
- HTTP Bindings
- TCP and Named Pipe Bindings
- MSMQ Bindings
- Importance of BasicHttpBinding
- Working with Endpoints
- Default Endpoints and Bindings
- Helper Methods
- ServiceDescription Class
- Multiple Endpoints
- Simple Host Code

3. Service Contracts

- Service Contracts at Class Level
- Service Contracts at Interface Level
- Benefits of Interface Level Definition

- A Service with Multiple Contracts
- ServiceContractAttribute
- Attributes in WSDL
- Viewing WSDL Files
- Contract Inheritance
- Operation Overloading
- Enabling Operation Overloading
- 4. Instance Management**
- Behaviors
- Configuring Behaviors
- Configuring Behaviors in Code
- WCF Instancing Models
- Per-Call Instancing
- Per-Session Instancing
- Sessions and Threading
- Singleton Instancing
- Windows Forms WCF Clients
- 5. Data Contracts**
- XSD for Data Contract
- Arrays
- Array in XML Schema
- Array in Proxy
- Generic Collections
- Generic Collection in XML Schema
- Generic Collection in Proxy
- Enumerations in Data Contracts
- Employee Client Program
- Saving and Restoring
- Serialization in WCF, .NET
- SOAP Serialization
- JSON Serialization
- Using XmlSerialization
- Restoring Data
- Versioning
- New and Missing Members
- New Client of Old Service
- Required Members
- OnDeserializing Event
- 6. More about Service Contracts**
- Versioning Service Contracts
- New Operations
- Message Exchange Patterns
- Request-Reply
- Oneway
- Duplex
- Callbacks
- Invoking a Callback
- Callback on the Client
- Asynchronous Proxies
- Threading Considerations
- 7. Handling Errors**
- Errors in Distributed Systems
- Errors in .NET and WCF
- Service Library Code
- Client Code
- Client Exception Handling
- Fault Exceptions
- Faults
- Exception Details & Dialog
- Fault Contracts
- Custom Faults
- Faulted Channels
- 8. WCF Security**
- Services and Security
- Security Aspects of Services
- Transfer Security
- Transport Security
- Scenarios for Transport Security
- Other security Modes
- Certificates
- Exception Details
- Sending Credentials
- Appendix A: Learning Resources**
- Appendix B: Hosting in IIS 7.5**
- Internet Information Services
- Installing IIS 7.5
- WCF with IIS 7.5
- .NET Framework Version
- Registering ASP.NET
- A Service Contract
- A Website for the Service
- WCF Service Template
- Service Configuration
- Referencing the Class Library
- WCF Clients
- Creating WCF Clients
- Service as an IIS Application
- Converting to an Application
- Moving a WCF Solution