

## **DOT.NET: Module 4 WCF**

### **UNIT 1 Basics**

- 1) Why WCF Matters
- 2) Introduction
- 3) Implementing a WCF Service
- 4) Just the ABCs
- 5) Writing a WCF Service Entirely in Code
- 6) Writing a Service with Code and Configuration Files
- 7) More on Configuration Files
- 8) More on Service Hosting
- 9) Exposing the Metadata Exchange (MEX) Endpoint
- 10) Implementing a Client for a WCF Service
- 11) Writing a WCF Client Entirely in Code
- 12) Writing a Client with Code and Configuration
- 13) Hosting a Service in IIS
- 14) Hosting a Service in IIS in Three Steps
- 15) Implementing a WCF Client for an ASMX Service
- 16) Tools Support
- 17) Generating Client Proxy Class and Configuration Files

### **UNIT 2 Contracts**

- 1) Service Contracts
- 2) Synchronous Request-Response Operations
- 3) Asynchronous Request-Response Operations
- 4) One-Way Operations
- 5) Duplex Operations
- 6) Multiple Contracts and Endpoints in a Service
- 7) Names of Operations, Types, Actions, and Namespaces in WSDL
- 8) Data Contracts
- 9) Defining XML Schema for a .NET Class
- 10) Defining Class Hierarchies
- 11) Exposing Additional Types in WSDL with KnownTypes
- 12) Versioning Data Contracts
- 13) Data Contract Equivalence
- 14) Working with Collections
- 15) Message Contracts
- 16) Typed Messages
- 17) Untyped Messages
- 18) Using SOAP Headers with Untyped Messages

### **UNIT 3 Channels**

- 1) Channel Shapes

- 2) One-Way Communication Pattern
- 3) Duplex Communication
- 4) Request-Reply Communication
- 5) Shape Changing
- 6) Operation Contract and Channel Shapes
- 7) Channel Listeners
- 8) Channel Factories
- 9) ChannelFactory<>
- 10) ICommunicationObject

#### **UNIT 4 Bindings**

- 1) Choosing an Appropriate Binding
- 2) Sample Application
- 3) Cross-Machine Communication Between .NET Applications
- 4) netTcpBinding
- 5) Local Machine Communication Between .NET Applications
- 6) netNamedPipeBinding
- 7) Communication Using Basic Web Services
- 8) basicHttpBinding
- 9) Communication Using Advanced Web Services
- 10) wsHttpBinding
- 11) ws2007HttpBinding
- 12) wsDualHttpBinding
- 13) Comparing Binding Performance and Scalability
- 14) Communication Using Queued Services
- 15) netMsmqBinding
- 16) msmqIntegrationBinding
- 17) Creating a Custom Binding
- 18) User-Defined Bindings
- 19) Binding Elements
- 20) Transports
- 21) Encoders
- 22) Security
- 23) Transport Upgrades/Helpers
- 24) Shape Change
- 25) Other Protocols
- 26) Exposing a Service Contract over Multiple Bindings

#### **UNIT 5 Behaviors**

- 1) Concurrency and Instancing (Service Behavior)
- 2) Default Concurrency and Instancing with Sessionless Binding
- 3) Multithreading a Single Instance
- 4) Implementing a Singleton
- 5) Session-Level Instances

- 6) Controlling the Number of Concurrent Instances
- 7) Controlling the Number of Concurrent Calls
- 8) Controlling the Number of Concurrent Sessions
- 9) Exporting and Publishing Metadata (Service Behavior)
- 10) Implementing Transactions (Operation Behavior)
- 11) Transactional Operations Within a Service
- 12) Flowing Transactions Across Operations
- 13) Choosing a Transaction Protocol—OleTx or WS-AT
- 14) Transaction Service Behaviors
- 15) Implementing Custom Behaviors
- 16) Implementing a Message Inspector for Service Endpoint Behavior
- 17) Exposing a Parameter Inspector for Service Operation Behavior
- 18) as an Attribute
- 19) Exposing a Service Behavior Through Configuration
- 20) Security Behaviors

## **UNIT 6 Serialization and Encoding**

- 1) Serialization Versus Encoding
- 2) Comparing WCF Serialization Options
- 3)DataContractSerializer
- 4) NetDataContractSerializer
- 5) XmlSerializer
- 6) DataContractJsonSerializer
- 7) Choosing a Serializer
- 8) Preserving References and Cyclical References
- 9) Sharing Type with the NetDataContractSerializer
- 10) Roundtrip Serialization Using IExtensibleDataObject
- 11) Serializing Types Using Surrogates
- 12) Streaming Large Data
- 13) Using the XmlSerializer for Custom Serialization
- 14) Custom XmlSerialization Using Attributes
- 15) Custom XmlSerialization Using IXmlSerializable
- 16) Choosing an Encoder
- 17) Text Versus Binary Encoding
- 18) Sending Binary Data Using MTOM Encoding
- 19) Getting to Know the WebMessageEncoder

## **UNIT 7 Hosting**

- 1) Hosting a Service in Windows Process Activation Services
- 2) Hosting a Service in IIS 7
- 3) Enabling ASMX Features in an IIS-Hosted Service
- 4) Self-Hosting
- 5) Self-Hosting in a Managed Windows Service
- 6) Hosting Multiple Services in One Process

## 7) Defining Service and Endpoint Addresses

### **UNIT 8 Security**

- 1) WCF Security Concepts
- 2) Authentication
- 3) Authorization
- 4) Confidentiality
- 5) Integrity
- 6) Transport and Message Security
- 7) Certificate-Based Encryption
- 8) Concepts
- 9) Setup
- 10) Transport-Level Security
- 11) Encryption Using SSL
- 12) Client Authentication
- 13) Service Identity
- 14) Message-Level Security
- 15) Authenticating with wsHttpBinding
- 16) Securing Services with Windows Integrated Security
- 17) Section Examples Introduction
- 18) Authenticating Users with Windows Credentials
- 19) Authorizing Users with Windows Credentials
- 20) Authorization Using AzMan
- 21) Impersonating Users
- 22) Securing Services over the Internet
- 23) ASP.NET Integration
- 24) Authentication Using Membership Providers
- 25) Role-Based Authorization Using Role Providers
- 26) Using Forms Authentication
- 27) Logging and Auditing

### **UNIT 9 Diagnostics**

- 1) Sample WCF Application
- 2) Tracing
- 3) End-to-End Tracing
- 4) Activities and Correlation
- 5) Enabling Tracing
- 6) Verbosity Recommendations
- 7) Message Logging
- 8) Enabling Message Logging
- 9) Additional Configuration Options
- 10) Shared Listeners
- 11) Message Filters
- 12) Trace Source Auto Flushing

- 13) Performance Counters
- 14) Windows Management Instrumentation (WMI)
- 15) Using the Service Configuration Editor
- 16) Tracing Options
- 17) Logging Options
- 18) Configuring Sources
- 19) Configuring Listeners
- 20) Service Trace Viewer
- 21) Activity View
- 22) Project View
- 23) Message View
- 24) Graph View
- 25) Analyzing Logs from Multiple Sources
- 26) Filtering Results

### **UNIT 10 Exception Handling**

- 1) Introduction to WCF Exception Handling
- 2) WCF Exception Communication via SOAP
- 3) Unhandled Exception Example
- 4) Detecting and Recovering a Faulted Channel
- 5) Communicating Exception Details
- 6) Managing Service Exceptions with FaultException
- 7) Using FaultCode and FaultReason to Extend FaultException
- 8) Limitations of Basic FaultExceptions
- 9) Creating and Consuming Strongly Typed Faults
- 10) Declaring Fault Definitions with FaultContract
- 11) Defining a FaultContract
- 12) Throwing a FaultException<> with a Defined FaultContract
- 13) Fault Contract Strategies
- 14) Implementing Client Fault Handlers
- 15) Error-Handling Application Block
- 16) Exception Shielding

### **UNIT 11 Peer Networking**

- 1) Approaches to Building Distributed Applications
- 2) Client/Server Applications
- 3) N-Tier Applications
- 4) Peer-to-Peer Applications
- 5) Comparison of Distributed Approaches
- 6) Peer-to-Peer Applications
- 7) Mesh Networks
- 8) Resolving Peer Meshes
- 9) Message Flooding Versus Directional Messaging
- 10) Creating Peer-to-Peer Applications

- 11) netPeerTcpBinding
- 12) Resolving Peers Using PNRP
- 13) PNRP Bootstrap Process
- 14) Windows Internet Computer Names
- 15) PnrpPeerResolver
- 16) Mesh Authentication
- 17) Registering Names Using PNRP
- 18) System.Net.Peer
- 19) Implementing a Custom Peer Resolver
- 20) Limiting the Number of Hops for a Message
- 21) Collaboration Using Windows Vista
- 22) People Near Me
- 23) Windows Contacts
- 24) Invitations
- 25) System.Net.PeerToPeer.Collaboration
- 26) Directional Messaging Using Custom Binding

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