Building Web Services Using Visual Basic 2005

Meet the expert: Barry Solomon has over 23 years of experience as a consultant. He has developed with Fortran, C, C , Visual Basic, Java, and Visual C#. His extensive database experience includes working with Microsoft Access, Microsoft SQL Server, MySQL, and Oracle. His expertise now includes working with big data, Hadoop in particular, and all of its attending ecosystems as the limitations have been exceeded in most modern database systems.

Prerequisites: This course assumes that students have some programming background using Visual Basic 2005 and Visual Studio 2005. Students are expected to have a working knowledge of Web development and ASP.NET 2.0.

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Course description: In this course, you will build a solid foundation for the development of Web Services using Visual Basic 2005 and gain an understanding of how commonly used protocols can impact your development effort. You will learn how to create and consume ASP.NET Web Services, work with XML serialization, and understand discovery and UDDI. You will also learn how current and evolving standards, such as Web Service Enhancements (WSE) 3.0 and Message Transmission Optimization Mechanism (MTOM), can be integrated in Web Service development. Discover how to secure your Web Services using different technologies like X.509 certificates and Kerberos. Learn how to increase reliability of your XML messages by locating bottlenecks and invoking delivery verification.

Course outline:

Intro to Web Services
- Introduction
- Overview: Web Services
- Web Service Technologies
- XML Data Representation
- SOAP
- Pub / Discovery Standards
- Web Service Design
- Use VS to Create WS
- Web Methods
- Web Service Namespace
- Demo: Create a WS
- Test the WS
- WSDL Files
- Demo: Test the WS
- View the WSDL File
- Test the Web Method
- View the SOAP Packets
- Summary

Web Service Example
- Introduction
- WS Example Details
- Test the WS
- Investigate the WSDL
- Test Web Methods
- Web Service Clients
- Web Reference
- Files VS Adds to WS
- Invoke the WS
- Demo: Add a Reference
- View the .discomap File
- View the .wsdl File
- Client App Code
- Invoke Web Method Code
- Test the Client
- UDDI
- Demo: Use a Public WS
- Summary

Creating Async Web Services
- Introduction
- The Need for Async WS
- One-Way Methods
- Async Web Methods
- Demo: Async Methods
- Call Web Methods Async.
- Callback Methods
- Demo: Calling WS Async
- Summary

Async Calls / WaitHandles
- Introduction
- Overview
- Demo: Async Processing
- AsyncResult Properties
- Async Calls using Polling
- Demo: Calls using Polling
- Things to Note
- Summary

XML Serialization
- Introduction
- Overview: Serialization
- Demo: Serialize a Class
- View a Serialized File
- Work with XML Serialization
- Demo: Serialize an Object
- Demo: Deserialize an Object
- Code: Serialize an Object
- Code: Deserialize an Object
- More Complex Data
- View Other Classes
- xmlAttributeAttribute
- xmlArrayAttribute
- Inheritance / Serialization
- Demo: More Complex Data
- WS Custom Serialization
- Demo: WS Serialization
- Summary

SOAP Formatting
- Introduction
- Overview: SOAP Formatting
- Basic SOAP Manipulation
- SOAPAction Attribute
- SOAP Encryption
- X509 Certificates
- Security Tokens
- Kerberos Tickets
- Custom Security
- Context Token Prog.
- Namespaces / Binding
- WebServicesBinding Attrib.
- Summary

SOAP Serialization
- Introduction
- Using Attributes
- Simple Web Method
- Demo: Sample WS
- Configuration Files
- Add / Remove Protocols
- Summary

Implementing WSE Security
- Introduction
- Overview WSE3.0
- Demo: Install WSE3.0
- Examine WSE3.0
- WSE3.0 Tool
- WSE3.0 Security
- Demo: WSE3.0 Tool
- WSE Security Wizard
- View New Policy File
- View web.config file
- Summary

Security Models
- Introduction
- X.509 Certificates
- Client Side
- Server Side
- Policy Assertion
- Client Configuration

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- Demo: Create Certificates
- Run Certificate Manager
- X.509 Cert. Settings
- Service Configuration
- Demo: Service Config
- Kerberos
- Kerberos Client Config.
- Demo: Client Config
- Kerberos Service Config.
- Demo: Server Config
- Set up Web Service
- Summary

UserName Authentication
- Introduction
- UserName Tokens
- Client Configuration
- Set Up Client Config
- Add a Policy
- Secure a Client
- Set up Protection Order
- Add Reference
- Service Configuration
- Set up Service Config.
- Secure a Service
- Perform Authorization
- Add Protection Order
- View the Policy File
- View / Run Client Application
- Database Use
- Config. a Web Service
- SecurityTokenManager
- Setup Custom Class
- Summary

Coding and Assertion
- Introduction
- Coding an Assertion
- Code: Assertion Class
- ReadXML
- GetExtensions
- ProcessMessage
- Coding SOAP Filters
- Securing of SOAP Messages
- ReceiveSecurityFilter
- SendSecurityFilter
- Code: Setup Filters
- Code: Security Filters
- Security Token State
- Code: Server Output Filter
- Code: Client Output Filter
- Code: Client Input Filter
- Code: SecurityPolicyAssertion
- Code: Function Overrides
- Review
- Client-side Security
- Summary

Custom Policies
- Introduction
- Use a Custom Policy
- Policy Files
- Extensions
- Secure WS with Assertions
- Custom Assertion Class
- View Filters
- Web Client with Assertions
- Secure WS with Policy
- Coding of Policies
- Demo: Coding of Policies
- x509TokenProvider
- EndpointProtection
- SignatureOptions
- MessageProtection
- Add the Assertion
- View Client Class Code
- Summary

Exploring MTOM
- Introduction
- Overview: MTOM
- MTOM Structure
- MTOM uses XOP
- Use / Non-use of MTOM
- Non-use of MTOM
- Use of MTOM
- MTOM and WSE3.0
- Summary

Large Data Transfer
- Introduction
- Overview
- Demo: Large Data Transfer
- Step through Code
- Stream / Not To Stream
- Complex Data Transfer Code
- Work with Schema Code
- Work with XML Code
- Demo: Complex Data Trans.
- Summary

SOAP Messaging
- Introduction
- TCP / Web Services
- W3C Specs for Messaging
- Endpoint Reference
- SOAP Message Addressing
- SoapMSMQ
- Two-Way Messaging
- Register Messaging Services
- Register Using TCP
- Register Using HTTP
- Install MSMQ
- Use SoapClient/SoapMSMQ
- Summary

SOAP Sender / Receiver
- Introduction
- Overview
- One-Way Messaging
- Register the SoapReceiver
- Demo: Register with TCP
- Code: Register with TCP
- Serialization Code
- Code: Start Up Form
- Code: Listener Class
- Code: Receiver Form
- Summary

SOAP Headers
- Introduction
- Overview
- Service Code
- SOAP Header Service Code
- Client Code
- SOAP Header Direction
- Header Direction Code
- View WSDL File
- Unknown Headers
- Client SOAP Headers
- SOAP Header Exceptions
- Unknown Header Code
- Header Exception Code
- Client Coding
- Summary

SOAP Extensions
- Introduction
- Overview: Functions
- Working with Streams
- Initialization
- Processing
- Web Method Attributes
- SOAPMessageStage Code
- Implementing Extensions
- Config. File Elements
- soapExtensionType Code
- Summary

Reliable Messaging
- Introduction
- Overview
- WS-RM Model
- RM Modes
- QueuedRM
- DirectRM
- RM Sequences
- Demo: Client Policy File
- Sequence Profiles
- Demo: Server Policy File
- Sequence Groups
- Sequence Managers
- RM Wrap-up
- Summary

WS RM Server
- Introduction
- Queue Bottlenecks
- Delivery Verification
- WS-RM Policy
- Sequence Acknowledgement
- Request Acknowledgement
- WS-RM Event Flow
- Correlating Replies
- Demo: Messaging Sample
- Demo: Server App Code
- IDuplexSequenceManager
- IInputSequence
- IOutputSequence
- View App Output
- Summary

WS RM Client
- Introduction
- Demo: Client App Code
- Retrieve Endpoints
- CreateSequence
- FullSequenceWasAcked
- FullSequenceWasDelivered
- Summary

Authentication and Validation
- Introduction
- MQ Encryption
- MQ Authentication
- Message Validation
- Summary