

Integrating XML, Web Services and SOA (TT4400)

Length: 5 days

Description

This course is programming language independent, making it useful for Java, .NET, C++, and any other programming orientation. Graduates will hit the ground running, applying XML to projects at both an architectural as well as a line by line coding level. This course can be easily adapted to specific industry and client needs.

Audience

This is an **intermediate and beyond** level XML and web services training course, designed for those needing in-depth knowledge and a working knowledge of XML, XML Schema, XSLT, web services, and XML-related security. This course is for **Web developers and Web Services developers**.

Prerequisite

Previous experience or knowledge of HTML is helpful but not essential.

Topics

XML CONTENT REVIEW

XML Review

- XML Document Structure
- Well-Formed and Valid XML Documents
- Structure, Content and Format

XML STRUCTURE

Structure Using DTDs

- Document Type Definition (DTD)
- DOCTYPE Statement
- Complex Content Models
- Useful DTD Constructs
- Designing and Modifying DTDs

Namespaces

- Namespaces Associate an Alias with a URI
- Declaring Namespaces
- Namespaces Best Practices

Structure Using Schemas

- XML Schemas: Objectives
- Schemas Data Types
- Complex Types
- Schema Components
- Global and Local Components
- Derived Complex Types
- Derivation by extension
- Associating Schemas with XML Instances
- Using Target Namespaces
- Using schemaLocation
- Reuse and Manageability of Schemas
- Schema Composition
- Reusable Groups
- Designing and Modifying Schemas
- Lifecycle Design Principles for Schemas

XML FORMATTING

XSL Transformations Review

- XSL Version Issues

Integrating XML, Web Services and SOA (TT4400)

- XPath Describes Locations Within XML
- XSLT is Rule-Based Transformation Language
- XSL is Oriented Towards Formatting
- XPath Accesses Parts of Document
- XSLT Templates Specify Output Replacement
- XSLT Uses XPath Expressions Within Templates

XSLT and XPath

- XPath Expressions
- Abbreviated Axis Forms
- Predicates As Optional Filters
- XPath Operators; Functions; Examples
- Working With XPath
- XSLT Stylesheet Structure
- Templates: Rules in a Stylesheet
- Apply-Templates Directs Processing
- value-of to Extract Values
- Built-in Templates
- Text Handling
- Calling Templates
- Passing Parameters
- Conditional Processing Constructs
- Looping With `<xsl:for-each>`
- Sorting
- Constructing A New Node
- Designing and Implementing XSLT Modifications

ADVANCED XML FORMATTING

XSL FO (Formatting Objects)

- XSLT Designed to Support XSL-FO
- XSL Family Working Together
- XSL-FO Support for Paged Media
- XSL-FO Document Root Common Overall Structure
- Define A Page Type

- Page Types Can Be Conditional
- Content Flows Into Page Regions
- Flow Goes to Defined Regions
- Working With XSL-FO

Advanced XSL Topics

- Advanced Features
- Entities Used For Parameter Sets
- `<xsl:message>`
- `generate-id()` for Endpoints
- Create Unique Identifier for Each Node
- Grouping by Keys Used in Output
- `preceding-sibling:: axis`
- `<xsl:key>` and `key()` to Select Groups
- `<xsl:copy-of>`
- `<xsl:copy>`
- `name()`
- Whitespace and Why We Care
- Parser Can Perform Whitespace Actions
- Stripping Whitespace
- Whitespace in Stylesheet
- Whitespace Creep into Output
- Whitespace Coming From Source
- Whitespace Coming From Stylesheet
- Import or Include Statements
- Compose Stylesheets
- Generating linked TOC

APPLYING XML

- XML Performance Improvements
- Review of best practices

PATH TO USEFUL WEB SERVICES

- Services via the Web
- Web Services Overview
- Web Services in Action

BINDING: SOAP

- SOAP Overview
- SOAP in Action
- SOAP in Detail

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DESCRIPTION: WSDL

- WSDL Overview
- WSDL in Action

REST

- REST Overview
- Principles and Best Practices with REST Web Services
- Publishing and Consuming REST Web Services

FINDING WEB SERVICES

- UDDI
- Discovery in Action

SECURITY - WS-SECURITY AND DEFENSES

- XML Digital Signatures
- Standard For Digital Signature
- XML Encryption
- XML Encryption Protects Data
- Securing a Web service
- Web Service Security Exposures
- Transport-Level Security
- When to Use Transport-Level Security
- Message-Level Security
- Web Services Security Roadmap
- SOAP Message Security
- WS-Security Enables Interoperability
- XML Signature and Encryption
- XML Attacks Against Schemas
- XML Attacks Absent Parsers
- XML Injection
- XPath Injection
- CDATA Injection
- Known SOAP and Web Service Attacks
- Web Service Denial of Service Attacks
- OWASP Top Ten
- Picture is Evolving

WRAP-UP

- W3C Activities
- Benefits of XML
- Drawbacks of XML
- XML Separates Structure, Content and Format
- Crossing Boundaries
- XML: Lightweight Databases
- From Tag to Architecture