Web Services
Education Overview

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Web Services - A Brief Overview

Web Services are business and consumer applications that users can select and combine through almost any device—from personal computers to mobile phones.

How do Web Services work?

Web Services use a set of internet-based protocols and standards to permit disparate systems to "talk," allowing them to share data and services. They implement the client/server computing model over the network:

- On the client side, the application sends commands to the server and receives replies. The messages sent between the client and server are written in XML (Extensible Markup Language.)
- On the server side, Web services works on the commands sent by the client and possibly sends back replies.

Web Services simplify application development. By using a common standard, different companies and organizations can quickly and easily make their existing programs work with each other as Web services. What's more, Web services may also be delivered by a number of providers, some of which are invisible to us.

What are the benefits of Web Services?

Where to begin! At their core, Web Services foster new interactions between businesses and people.

Web Services also reduce IT department expenses, particularly in systems integration. Businesses will be able to connect their operations quickly and cheaply.

What makes Web Services possible?

XML (Extensible Markup Language) is a key component of Web Services. It is used to "tag" digital content in standardized formats, allowing applications to reach beyond the confines of operating systems, programming languages, and middleware.

Universal User Profile stores passwords and other ID information, maintained by a service provider. As a result, it allows users access to a number of Web sites and services.

Web Services are registered and located via registries such as Universal Description, Discovery, and Integration (UDDI).

Terminology

Shareable Services
UUP: Universal User Profile - A set of user-specific data and preferences stored on the World Wide Web, and used by Web sites to perform tasks such as authentication and personalization. NOTE -- The standards have not been defined

Service Infrastructure

UDDI: Universal Description, Discovery, and Integration - A set of specifications for creating XML-based directories of Web services offerings.

Message transport

SOAP: Simple Object Access Protocol - A set of rules that facilitate XML exchange between applications over a network. Along with WSDL, SOAP performs message transport functions.

WSDL: Web Services Description Language - A common format for describing tasks performed by a Web service.

Language

XML: Extensible Markup Language - A universal language for describing data. XML makes it easier not only to exchange data among a variety of applications, but also to validate and interpret such data.

Service-oriented Architecture (SOA)

SOA is the concept that Web Services implements, and specifies that an application can be made up from a set of independent, yet cooperating, subsystems or services.

What are the high level features?
A framework isolates each service and exposes only the necessary declared interfaces to other services. Specifically, the SOA model isolates aspects of an application so that, as technology changes, services (components) can be updated independently, limiting the impact of changes and updates to a manageable scope.

Each component in a service-oriented architecture can play one (or more) of three roles:
- Service providers publishing the availability of their services
- Service brokers registering and categorizing published services and providing search services
- Service requesters using broker services to find a needed service and then employing that service

The collaborations among these roles are supported by a standardized network protocol. Service descriptions, in a standard XML format, are associated with each service. These service descriptions are key to all three roles in that they provide the information needed to

categorize, choose, and invoke an e-business service.

What are the benefits of SOA?
Simply put, SOA allows architects to organize and reduce dependencies in their products. It provides for a tailored mix of services in the deployed environment, supporting flexible and efficient systems.

Web Services Required Proficiencies

In this document we describe three different roles used to design, create and maintain a Web Service. These roles are the Web Services Architect, Web Services Developer, and Web Services System Management. Although there are areas where the skills required by these roles overlap, there are key differences in their responsibilities that warrants a focus in different areas. These roles require the following respective proficiencies:

Web Services Architect
• WebSphere Application Server system management
• Knowledge of Web Services using SOAP, WSDL and XML (level 3)
• Knowledge of general security, J2EE and WebSphere security and WS-Security (level 4)
• Knowledge of Web Services management and IBM related products (level 3)
• Experience in establishing Web Services infrastructures (level 4)

Web Services Developer
• Knowledge of SOAP (Level 3)
• Knowledge of XML (Level 3)
• Knowledge of UDDI (Level 3)
• Use WSDL to describe services (Level 3)
• Knowledge of services oriented architectures (Level 3)
• Knowledge of UML (Level 3)
• Perform as Lead Architect for e-business Solutions (Level 4)
• Knowledge of e-business patterns (Level 3)
• Knowledge of reference architectures (Level 3)

Web Services System Management
• WebSphere Application Server system management
• Web Services technologies - WSDL, UUDI, XML, SOAP
• Web Services application packaging and deployment
• Knowledge of general security and WS-Security
• Experience with setting J2EE security, and using security management tools

Note: "Experience" can only be acquired through on the job application.

Web Services Education Overview

The Following flow diagram provide an overview of the various technologies and skills that are needed to fill the roles outlined above. These tables provide three different approaches or resources that can provide these skills: Instructor led education, online education and publications.

Web Services Architect

Instructor Led Courses	Distance / e-Learning	Publications

Design Patterns and Architecutre

AU0101XS - Design Patterns and Architecture AUJV01XS - J2EE Design Patterns	LTU1321F - Architecture Patterns for Integration Server Design AZNW085K - Design Patterns LTU1320F ARF030 - Patterns for e-business: Early Experiences in Building Web Services	SG24-6591-00 Patterns: Self-Service Application Solutions Using WebSphere 5.0 Design Patterns - Addison-Wesley ISBN 0-201-63361-2

Model-Driven Application Development

OO & UML		UML
SW904p - J2EE Architecture Overview, incl. Object-Oriented Analysis and Design for Web Apps **OR** OOUML - Class covering OO Analysis & Design using UML, Java, Rational Rose and Design Patterns	WN268 - OO Analysis and Design with UML	ISBN: 047122729 Patterns in Java - A Catalog of Reusable Design Patterns Illustrated with UML

XDE		
AU0133XS - Mastering J2EE Development with Rational XDE **OR** DEV490 - Mastering J2EE Development with XDE & WSAD	DEV210 - Essentials of Rational XDE Modeling for Workbench and Java Users	TIPS0219 Round-trip Engineering with Rational XDE

WebSphere Studio

Web / Servlet / JSP		Web Application
WF311 - Servlet and JSP Development using WebSphere Studio Application Developer V5.x	WF317 - Servlet and JSP Development using WebSphere Studio V5 (e-Tutorial)	TIPS0208 WebSphere Application Server V5: Finding the URL for an Application Servlet or JSP

J2EE / EJB		EJB Enterprise Application
WF351 - EJB Development using WebSphere Studio Application Developer V5.x	WF357 - EJB Development using WebSphere Studio Application Developer V5 (e-Tutorial)	SG24-6819-00 EJB 2.0 Development with WebSphere Studio Application Developer

Web Services Architect

Instructor Led Courses	Distance / e-Learning	Publications

WebSphere Application Server System Management

WF381 - Administration of WebSphere Application Server WF611 - WebSphere Application Server Transitioning to V5 for Administrators	WF387 - Administration of WebSphere Application Server **	SG24-6198-00 IBM WebSphere V5.0 Performance Scalibility, and High Availability: WebSphere Handbook Series

Web Services

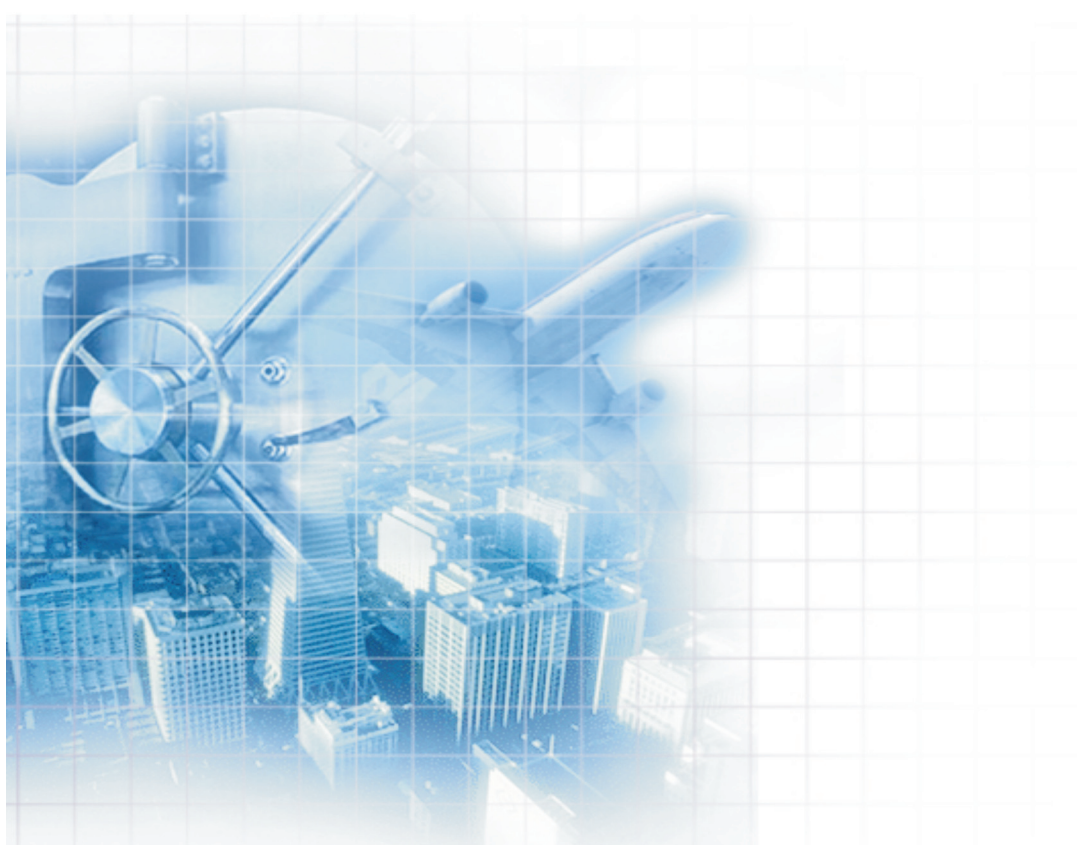|		
WF361 - Web Services for J2EE Developers * AU0250XS - Core Web Services for J2EE Developers	XM376 - Intro to Web Services * AZNW080K - Intro to Web Services, XML/XMI, UDDI, SOAP	SG24-6891-00 WebSphere Version 5 Web Services Handbook ISBN: 1-893115-58-5 Architecting Web Services

Educated Web Services Architect

Web Services Developer

Instructor Led Courses	Distance / e-Learning	Publications

WebSphere Studio

Java

SW232 - Intro to Java using WebSphere Studio	JA10A JAVA for OO Programmers	SG24-6957-00 WebSphere Studio Application Developer Version 5 Programming Guide Chapters: 1-5, 15-17

Web Application

WF311 - Servlet and JSP Development Using WebSphere Studio Application Developer	WF317 Servlet and JSP Development using WebSphere Studio	TIPS0208 WebSphere Application Server V5: Finding the URL for an Application Servlet or JSP

Enterprise Application

WF351 - EJB Development Using WebSphere Studio Application Developer	WF357 EJB Development using WebSphere Studio App Dev	SG24-6819-00 EJB 2.0 Development with WebSphere Studio Application Developer

XML

XM341 Intro to XML Programming	XML14W: A Conceptual Overview Intro to Web Services	SG24-6586-00 The XML Files: Development of XML/XSL Applications Using WebSphere Studio Version 5

Web Services

WF361 - Web Services for J2EE Application Developers SW255 - Web Services Development with IBM WebSphere Studio Application Developer V5.1 SW422 - Web Services Advanced Workshop	XM376 - Intro to Web Services AU0250XS - Core Web Services for J2EE Developers	SG24-6891-00 WebSphere Version 5 Web Services Handbook SG24-6292-00 Web Services Wizardry with WebSphere Studio Application Developer SG24-6200-00 Exploring WebSphere Studio Application Developer Integration Edition 5.0h

Educated Web Services Developer

Web Services System Management

Instructor Led Courses	Distance / e-Learning	Publications

WebSphere Application Server

Architecture and Administration

WF381 – Administration of WebSphere Application Server * OR WF611 – WebSphere Application Server Transitioning to V5 for Administrators	WF387 –Administration of WebSphere Application server **	SG24-6198-00 IBM WebSphere V5.0 Performance, Scalability, and High Availability: WebSphere Handbook Series, SG24-6573-00 IBM WebSphere V5.0 Security WebSphere Handbook Series

Web Services

SOA, WSDL, UDDI, XML, SOAP

WF361 – Web Services for J2EE Developers AU0250XS – Core Web Services for J2EE Developers	XM376 – Intro to Web Services AZNW080K – Intro to Web Services, XML/XMI, UDDI, SOAP	SG24-6891-00 WebSphere Version 5 Web Services Handbook

General Security

Java Security, WebSphere Security, Tivoli Access Manager		Java Security
TR440 - IBM Tivoli Access Manager for Business Integration 4.1 System Administration	Secure Your Web Resources with Access Manager	The Evolutions of Java Security SG24-6573-00 IBM WebSphere V5.0 Security WebSphere Handbook Series REDP-3677-00 IBM Tivoli Access Manager for e-business

Educated Web Services Manager

Web Resources

DeveloperWorks
http://www.ibm.com/developerworks/webservices/

DeveloperWorks WebSphere
http://www.ibm.com/developerworks/websphere/zones/
webservices/

World Wide Web Consortium
http://www.w3.org/

Sun Microsystems
http://www.sun.com/

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