



IBM Software Group

IBM® WebSphere® Everyplace® Deployment for Windows and Linux Version 6

Web Services



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Updated October 3, 2005

This presentation explains the Web Services capabilities in IBM WebSphere Everyplace Deployment for Windows and Linux Version 6.

Goals

- Understand the Web Services support provided by IBM WebSphere Everyplace Deployment for Windows and Linux Version 6 client

The goal of this presentation is to understand the Web Services support provided by IBM WebSphere Everyplace Deployment for Windows and Linux Version 6.

Agenda

- Key Concepts
- Web Services Support

The agenda of this presentation is to explain key concepts and describe the Web Services support provided by the client.

Section

Key Concepts

Let's start with an overview of key Web Services concepts.

Mobile Web Services

Web Services 101

Web Services

- **Web Services Description Language (WSDL)**
 - ▶ Describes the Web Services interface
 - ▶ Top-down approach - Generate code from WSDL, typically used to develop Web Services clients
 - ▶ Bottom-up approach - Generate WSDL from code, typically used to develop Web Services providers
- **Simple Object Access Protocol (SOAP)**
 - ▶ Message format of a Web Services transaction
- **Java API for XML-based Remote Procedure Call (JAX-RPC)**
 - ▶ Build Web Services using XML-based RPC function
- **Lightweight Web Services**
 - ▶ Similar to JSR 172 (Web Services for J2ME)

Mobile Web Services enable you to develop applications that consume and provide Web Services. Before we explain the details of Mobile Web Services, let's review some basic concepts.

Web Services Description Language (WSDL) A WSDL document provides the description of the Web Services interface. Web Services can be created using a top-down or bottom-up approach. A top-down approach is used to generate code from a WSDL (typically used for developing Web services clients), whereas a bottom-up approach is used to generate a WSDL from code (typically used for developing Web Services providers). However, the IBM WebSphere Everyplace Client Toolkit Version 6 Web Services plug-in currently supports only the top-down approach. For more information about WSDL, please visit <http://www.w3.org/TR/wsdl>.

Simple Object Access Protocol (SOAP) SOAP is the message format of the transaction that takes place when a Web Services client that communicates with a Web Services provider. The WSDL defines the restrictions on the format of these messages. For more information about SOAP please see <http://www.w3.org/TR/soap>.

JAX-RPC The Java API for XML-Based Remote Procedure Call (JAX-RPC) enables developers to build Web Services using XML-based RPC functionality according to the SOAP 1.1 specification. For more information about JAX-RPC, please visit <http://java.sun.com/xml/jaxrpc>.

Mobile Web Services is a light weight implementation that provides functionality similar to libraries that implement the Java 2 Micro Edition Web Services Specification (JSR-172).

Section

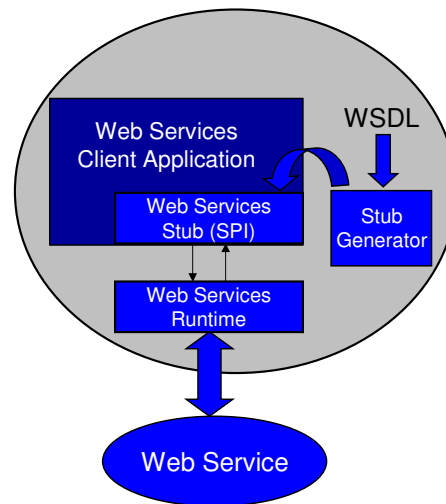
Web Services Support

Next, let's explore the Web Services support provided by the client platform.

Mobile Web Services Similar to JSR 172

Web Services

- Defines a standard interface for client to access Web Services
- Supports top-down approach
- Minimizes memory footprint
- Supports primitive and complex data types
- Plus IBM extensions...



JSR 172 defines a standard interface for a client application to access Web Services. Consistent with JSR 172, the Mobile Web Services Client wizard generates a static client stub class using the WSDL that is exported from the Web Services provider as its input. The stub is then used by a Web Services client application to invoke the Web Services provider. JSR 172 specifies support for primitive and complex data types e.g. boolean, byte, short, int, long, float, double, String, complex types (a type that allows elements in its content and may carry attributes), and arrays of primitive and complex types. IBM adds several important value-add extensions...

Mobile Web Services IBM Extensions

Web Services

- **Web Services Client**
 - ▶ Dynamic stub
 - Provides Java interface to build applications
 - Creates Web Services stub at runtime
 - Allows support for custom serialization
- **Web Services Provider**
 - ▶ Publishes an OSGi service as a Web Service
 - Must implement a Java interface
 - Generation of WSDL occurs at runtime
 - Allows support for custom serialization
 - Registers a servlet with the Web container
- **Custom serialization (marshalling)**
 - ▶ Required to handle non-bean classes and types not supported by JSR-172
 - ▶ Developers must provide and register custom marshallers

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A **dynamic stub** allows you to decide to use web services at runtime rather than build time i.e. dynamic stub allows web services to be configured and deployed in the field without involving a build team. A dynamic stub also allows a Web Services client to create and use custom marshallers for WSDL types that are non-bean classes or incompatible with JSR-172.

Web Services Provider. Any OSGi service can be exposed as a Web Services provider using the toolkit, provided that the service implements a Java interface. Generation of a WSDL-document occurs at runtime using Java reflection into the OSGi service class.

Custom serialization. If Web Services needs to handle non-bean classes or types that are incompatible with JSR-172, then you can provide and register custom marshallers to handle these classes or types.

Mobile Web Services IBM Extensions (continued)

Web Services

- **Web Services Security (WS-Security)**
 - ▶ Based on the WS-Security Minimalist Profile spec by OASIS
 - ▶ Protects Web Services messages for clients and providers through support of the following OASIS Web Services Security Scenarios
 - Basic Authentication
 - Basic Authentication with Encryption
 - Sign and Encrypt
 - Encrypt and Sign
 - ▶ Works with WebSphere Application Server 5.1.x and 6.0

WS-Security. Web Services security is based on the WS-Security Minimalist Profile specification from OASIS (Organization for the Advancement of Structured Information Standards), which is used to secure SOAP messages. Web Services protects messages through support of 4 key OASIS Web Services scenarios, which we will explain on the next slide.

Web Services security works with WAS 5.1.x and 6.0.

Web Services Security Scenarios

Web Services

- **Scenario #1: Basic Authentication** - The request header contains a Username and Password. The response does not contain a security header.
- **Scenario #2: Basic Authentication with Encryption** - The request header contains a Username and Password that have been encrypted using a public key provided out-of-band. The response does not contain a security header.
- **Scenario #3: Sign and Encrypt** - The request body contains data that has been signed and encrypted. The certificate used to verify the signature is provided in the header. The certificate associated with the encryption is provided out-of-band. The response body is also signed and encrypted, reversing the roles of the key pairs identified by the certificates.
- **Scenario #6: Encrypt and Sign** - The request body contains data that has been encrypted and signed. The certificate associated with the encryption is provided out-of-band. The certificate used to verify the signature is provided in the header. The response body is also encrypted and signed, reversing the roles of the key pairs identified by the certificates.

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This slide explains the 4 Web Services Security scenarios from OASIS that are supported by Mobile Web Services.

SSL Support

Web Services

- Support on the client side
 - ▶ You can specify the following properties for the client:
 - Djavax.net.ssl.keyStore=<path_to_keystore_file>
 - Djavax.net.ssl.keyStoreType=<keystore_type>
 - Djavax.net.ssl.keyStorePassword=<keystore_password>
 - Djavax.net.ssl.trustStore=<path_to_truststore_file>
 - Djavax.net.ssl.trustStoreType=<truststore_type>
 - Djavax.net.ssl.trustStorePassword=<truststore_password>
 - ▶ Specified in the rpcinstall.properties file
 - ▶ See System Admin Guide or Developer's Guide for additional information
- Support on the provider side
 - ▶ SSL connection managed by web container
 - ▶ Configure the web container

This slide explains how SSL support is available for Web Services clients and providers.

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