

# DEVELOPING AND DEPLOYING JAVA WEB SERVICES WITH J2EE™ 1.4 SDK

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Ltd.



## Agenda

- Content of J2EE 1.4 SDK
- Web Services technologies in J2EE 1.4 SDK
  - ◆ Technical drill down
- Updates on other technologies in J2EE 1.4 SDK
- Q&A



# CONTENT OF J2EE™ 1.4 SDK



## J2EE 1.4 SDK

### Business goals

Accelerate J2EE and Java Web Service adoption momentum among developers and enterprises

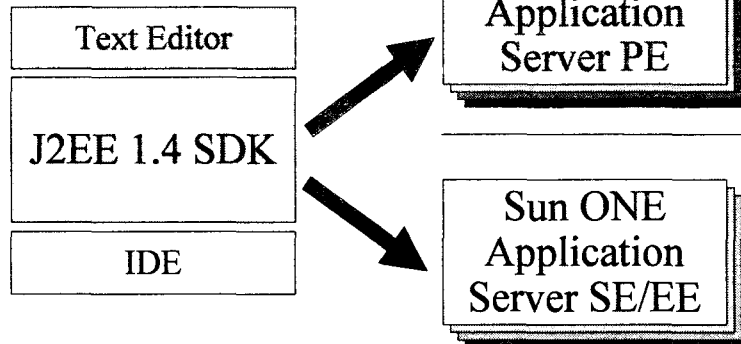
- Latest standards based technologies provided at no cost
- Production ready container designed for rapid development and immediate deployment
- Easy to learn, use, extend, and integrate



## J2EE Adoption Path

Development

Work Group Deployment



Enterprise Deployment



## J2EE 1.4 SDK

- Showcases latest J2EE technologies
- Tools to support development and deployment of J2EE and Java Web Service applications
- SDK content evolves overtime
- Deployable!
- Beta 2 since June 2003
- Public launch in late November 2003



## J2EE 1.4 SDK (Nov 2003)

- Java 2, Standard Edition 1.4.2
- J2EE 1.4 Application Server, Developer Release
  - ◆ J2EE 1.4 compatible container
  - ◆ Assembly and deployment tool
  - ◆ Server administration tools
  - ◆ Pointbase Database
- J2EE Tutorial
- Java Blueprints
- Java Web Services Developer Pack



## J2EE 1.4 SDK (Future)

- Java 2, Standard Edition 1.5
- Sun ONE Application Server 8, Platform Edition
- Migration tool
- Upgrade tool
- Java Web Service Developer Pack (.next)
  - ◆ Java Server Faces
  - ◆ WS-I Basic Profile
- IDE Plugins



## WEB SERVICES TECHNOLOGIES IN J2EE™ 1.4 SDK

A TECHNICAL DRILL  
DOWN

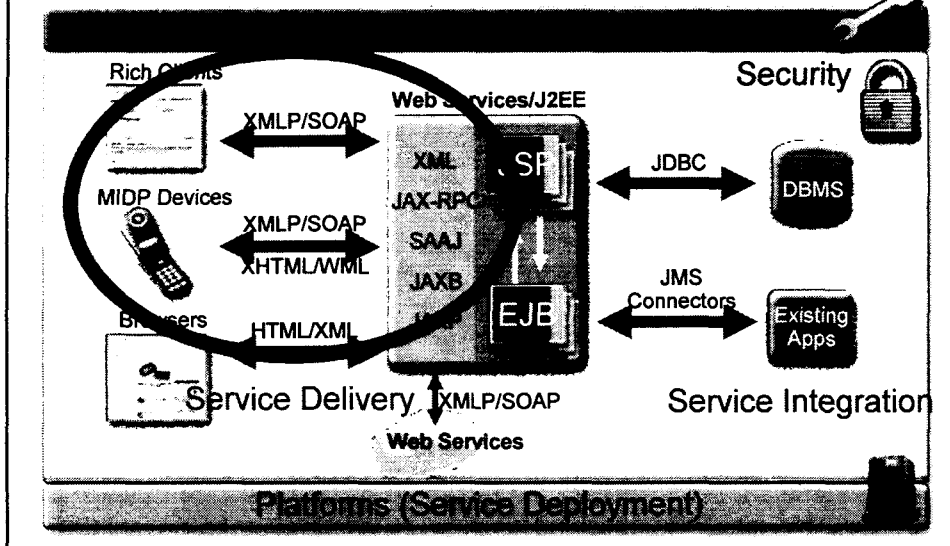


### What Is a Web Service?

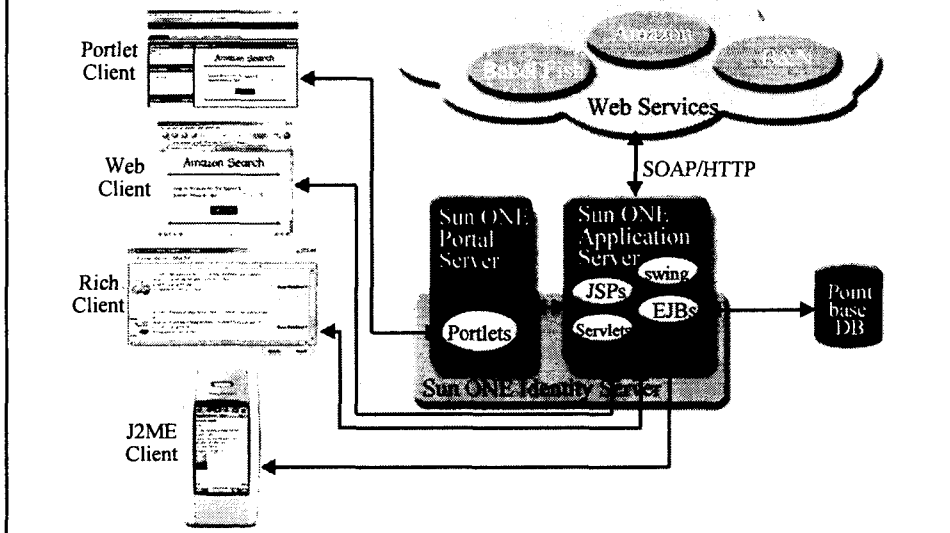
- A set of endpoints (ports) operating on messages using the SOAP protocol
- Ports are operating within a container
  - ◆ Container provides runtime environment
  - ◆ Contract for runtime environment are specified in JAX-RPC, EJB™ 2.1 specification, JSR 109
- Service is described abstractly in WSDL document and published to a registry
  - ◆ WSDL specifies a contract between service provider and client



# The Technology BIG Picture



# BIG Picture: End-to-End





## Brief Overview: SOAP

SOAP defines the general format of the messages and the encoding conventions

- XML-based protocol for exchange of information in a decentralized, distributed environment
- Transport binding framework for messages exchanges using an underlying protocol
- Encoding rules for expressing instances of application-defined data types
- Convention for representing RPC requests and responses



## Java Web Services Technologies

Document-oriented:

- JAXP: Java API for XML Processing
- JAXB: Java Architecture for XML Binding
- SAAJ: SOAP with Attachments API for Java

Procedure-oriented:

- JAXR: Java API for XML Registries
- JAX-RPC: Java API for XML based RPC
- JAXM: Java API for XML Messaging



## What Is JAXP?

- Processes XML documents using various parsers
  - ◆ SAX (Simple API for XML Parsing)
  - ◆ DOM (Document Object Model)
  - ◆ XSLT (XML Stylesheet Language Transformations)
- Use to parse documents that are not necessarily valid
- Insert/remove objects from an object tree representing XML data



## What Is JAXB?

2-way mapping of XML elements of Java classes = bridge between Java and XML

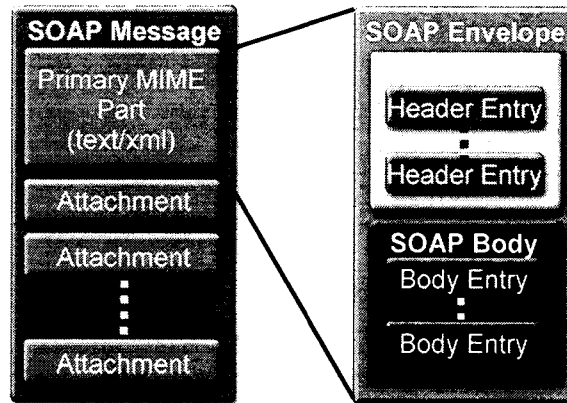
Use when you want to:

- Access data in memory (no tree manipulation)
- Process only data that is valid
- Convert data to different types
- Generate classes based on a DTD
- Build object representation of XML data



## What Is SAAJ?

- Enables developers to construct and consume SOAP w/ Attachment messages



## What Is JAXR?

- Standard Java™ API for performing registry operations over diverse set of registry providers
  - ◆ Service registration
  - ◆ Service discovery
- A unified information model for describing business registry content



## JAXRPC in the J2EE Platform

- Required part of the J2EE™ 1.4 platform:
- JAX-RPC provides the core web service support in the J2EE™ platform
- Servlet-based service endpoint model
- EJB™ model for JAX-RPC service endpoints
- J2EE™ programming model for web service clients
- Deployment and packaging model
- Extended security support



## WSDL and Java

JAX-RPC describes a Web Service as a collection of remote interfaces and methods

SunOne Application Server and SunOne Studio provides tools to convert between WSDL and Java files

WSDL describes a Web Service as a collection of ports and operations



## JAX-RPC Programming Model

- RMI-like conventions for service definition interfaces
- No Remote references allowed
- All objects are passed by copy

```
public interface MeetingManager
    extends java.rmi.Remote {

    public MeetingInfo scheduleMeeting(String requestor,
                                       String[] participants)
        throws java.rmi.RemoteException,
               CannotScheduleException;

}
```



## Sample Service Implementation

```
public class MeetingManagerImpl
    implements MeetingManager, ServiceLifecycle {

    public MeetingManagerImpl() { ... }

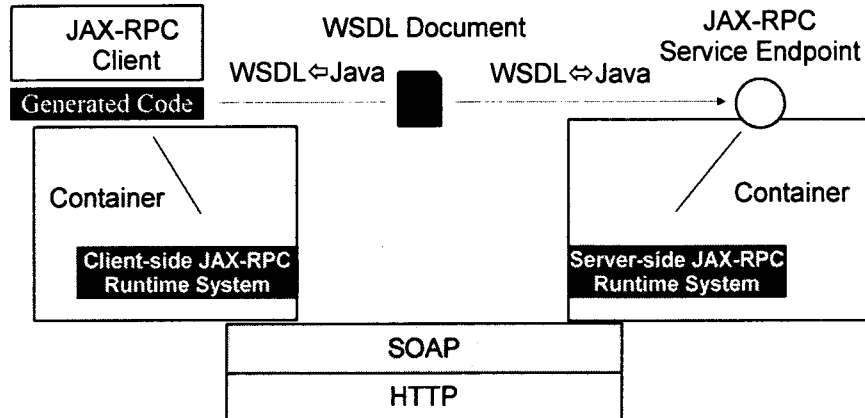
    public void init(Object ctx) {
        ServletContext context = (ServletContext) ctx;
        // obtain a connection to a database
        // ...
    }

    public void destroy() { ... }

    public MeetingInfo scheduleMeeting(String requestor,
                                       String[] participants)
        throws java.rmi.RemoteException, -
               CannotScheduleException { ... }

}
```

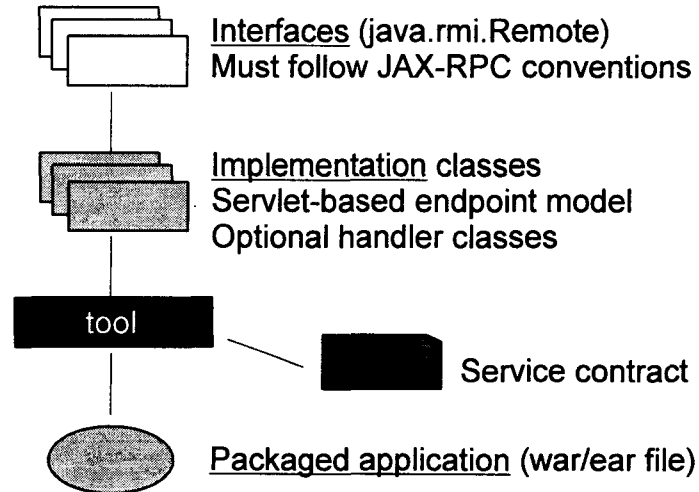
## JAX-RPC Architecture Diagram



## Java Web Service Component and Container

- Container vs. Component model
  - ◆ Web services components get executed within a container
  - ◆ Components are portable (under J2EE™ 1.4 container)
- Web service components
  - ◆ Web-tier (Servlet-based endpoint)
  - ◆ EJB™-tier (Stateless session bean-based endpoint)

## Developing a Java Web Service



## Web Services



### Interoperability Organization (WS-

I)

- An open industry effort chartered to promote Web Services interoperability across platforms, applications, and programming languages
- 160+ member companies
- Profiles existing specifications
- Basic Profile 1.0 (finalized) covers:
  - ◆ SOAP 1.1
  - ◆ WSDL 1.1
  - ◆ UDDI 2.0



## Java Web Services Future

- Performance: Enhance current Java web services transport performance
- Security : Enhance current security features of the J2EE platform
  - ◆ Messages encoding/signing
- Project Rave : RAD with web services
- Orchestration, choreography and collaboration in web services



## UPDATES ON OTHER TECHNOLOGIES IN J2EE™ 1.4 SDK



We make the not work.



## Other J2EE 1.4 SDK Features

- JSP Standard Tag Library 1.1
  - ◆ Debugging Support Across Languages
  
- ◆ Enhanced EJB Container:
  - ▶ Improve support for BLOB and CLOB types
  - ▶ Improved EJBQL
  - ▶ Timer Service



## Other J2EE 1.4 SDK Features

- Ease of development:
  - ◆ Drop-in auto deployment
  - ◆ Small footprint
  - ◆ Streamlined server processes
  - ◆ Sample domain/configuration
  - ◆ Assembly and deployment tool
  - ◆ Ant integration



## OS Platforms (November 2003)

- Windows 2003 / 2000 / XP
- Solaris SPARC / x86
- Red Hat Linux 8
- SuSE Linux 8



## Wrap Up

- J2EE 1.4 SDK ships November 2003
- J2EE 1.4 SDK is always free and deployable
- J2EE 1.4 SDK comes with tools to help developers learn, use, extend, and integrate latest J2EE technologies





Questions?

Thanks.

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