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Getting Started with Web Services

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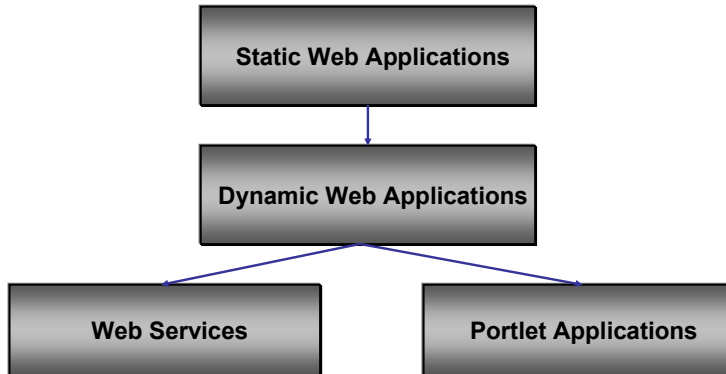
Agenda

- Web services overview
- Web services technologies
- Building RPG Web Services with WebSphere Development Studio Client for iSeries

iSeries. mySeries.

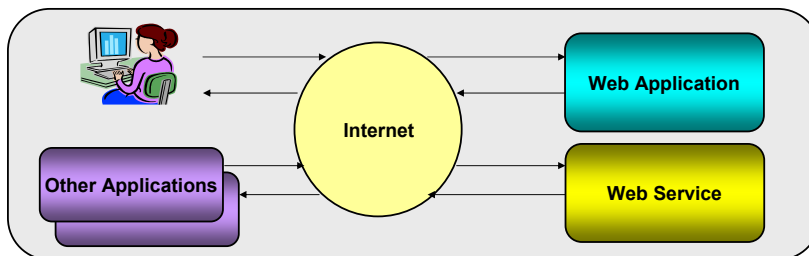
Web Services Overview

- Evolution of the Web
 - Document-centric => Application-centric => Service-centric



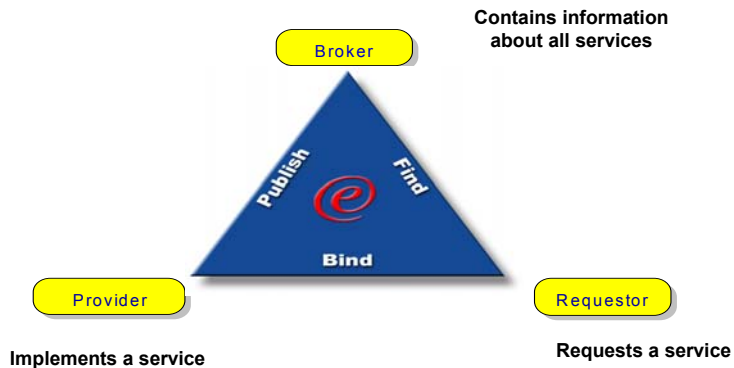
Web Services Overview

- Web services
 - Applications that are invoked over the Web
 - Contain only business logic, do not have a user interface
 - Self-contained
 - Self-describing



Web Services Overview

- Service Oriented Architecture (SOA)



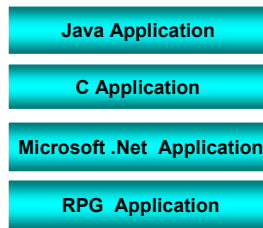
Service Oriented Architecture (SOA)

- SOA provides dynamic integration between a Web service and a Web service client
- Web services technologies provide the infrastructure for inter-program communication
- Platform and programming language independence: a Web service can be written in any programming language and run on any OS
- Broker participation is optional: a Web service client can invoke a Web service directly

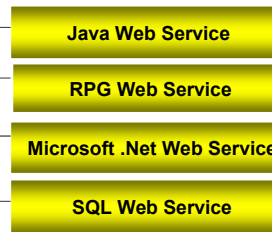
Web Services Overview

- Web services and interoperability
 - Web services are the new interoperability standard

Sample Web Service Clients



Sample Web Services



Types of Web Services

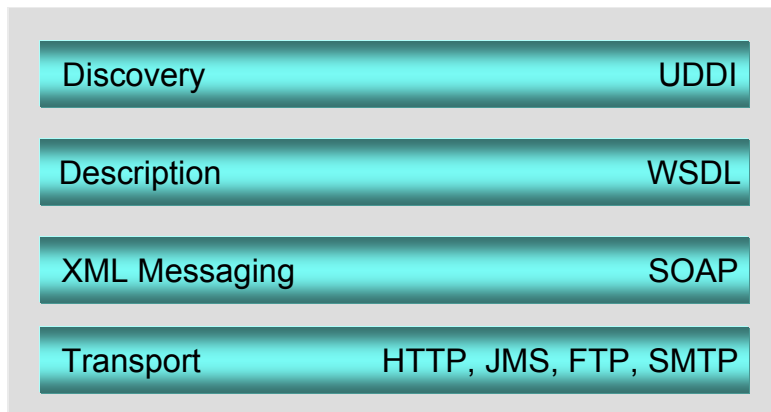
- **Business Information:** access to a database or rapidly changing contents
 - Stock quotes
 - Currency conversion rates
 - Address book
 - Geographical data
- **Business Integration:** implementing a function or outsourcing a business process
 - Reservations system
 - Credit check
 - Payment system
 - Loan service
 - Product catalog



Web Services Technologies



Web Services Technology Stack

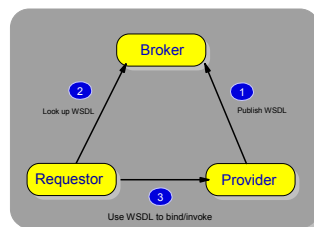


Web services : Transport Layer

- HTTP
 - Simple, stable, widely deployed
 - Travels through firewalls
 - Currently the most popular option for Web services communication transport
- Other transport protocols can be used
 - JMS, FTP, SMTP

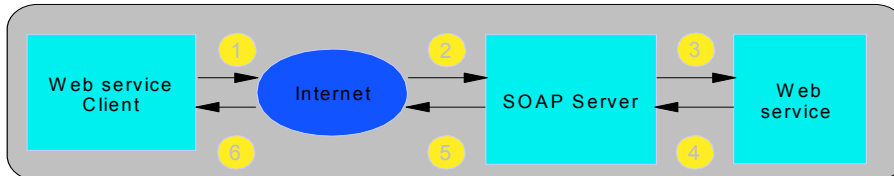
Web services : Description Layer

- WSDL: Web Services Definition Language
 - XML schema (vocabulary) describing a Web service interface
 - Methods
 - Parameters
 - How to invoke the service



Web services : XML Messaging Layer

- SOAP is a flavor of XML
- SOAP message contains a Remote Procedure Call (RPC) or any XML document



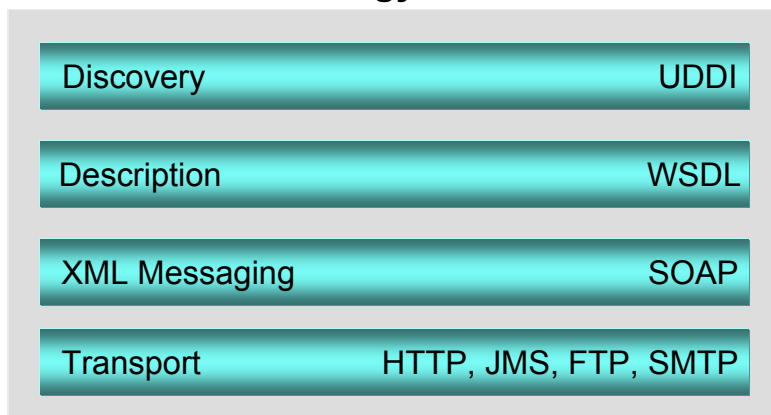
1. The Web service client creates and sends a SOAP message
2. The SOAP server listens for SOAP messages
3. The SOAP server processes the SOAP messages and passes the request to a Web service
4. The Web service runs the specified method and returns the result to the SOAP server
5. The SOAP server forwards the result back to the Web service client
6. The Web service client parses SOAP response.

Web services : Discovery

- UDDI: Universal Description, Discovery and Integration
 - Registry of Web Services (the White and Yellow pages)
 - Information categorized by company and by service type
 - Can be private or public
 - Several public UDDI registries exist
- IBM UDDI Business Registry:
<https://uddi.ibm.com/ubr/registry.html>

Web services Development and Deployment

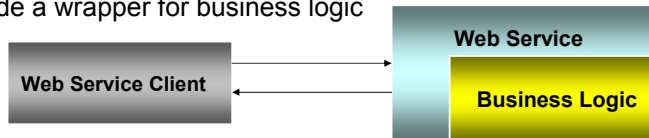
Web Services Technology Stack



What about implementation?

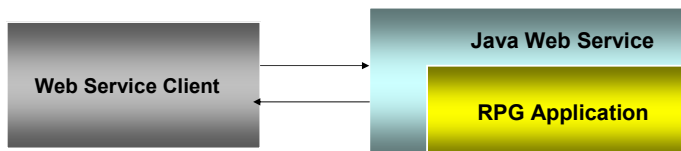
Web Services Development

- Web services are platform and language independent
- The following applications and components can be converted to a Web services
 - JavaBean
 - EJB
 - RPG application
 - SQL Stored Procedure
 - C++ Application
 - In general, any language that can process XML
- Web Services define the communications infrastructure, they provide a wrapper for business logic



RPG Web Services Development

- RPG application requirements
 - No presentation logic
 - Callable program that takes and returns parameters
 - Can be an RPG stored procedure
 - Stateless



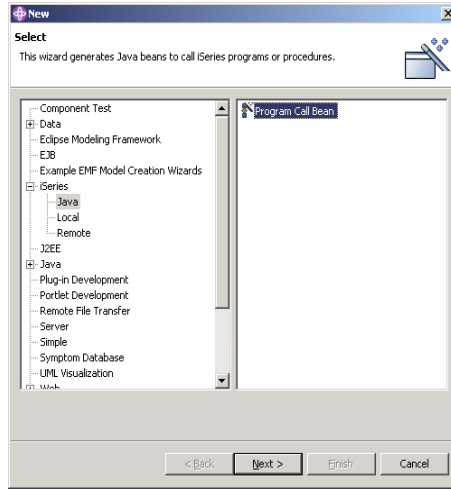
RPG Web Services Development

- Development steps
 - Modify an RPG program to comply with the specified requirements
 - Use WDSC Program Call Wizard to create a Java Web service wrapper
 - Use WDSC Web services wizard to create and test the Web service
 - Lines of Java code to write: 0

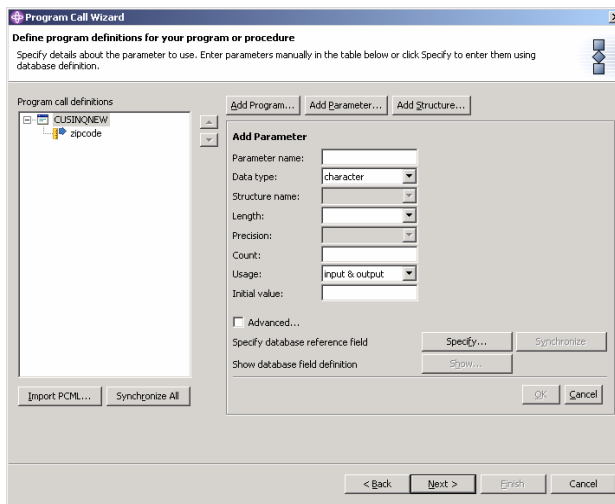
RPG Program Call Wizard



Web Services Development: RPG programs

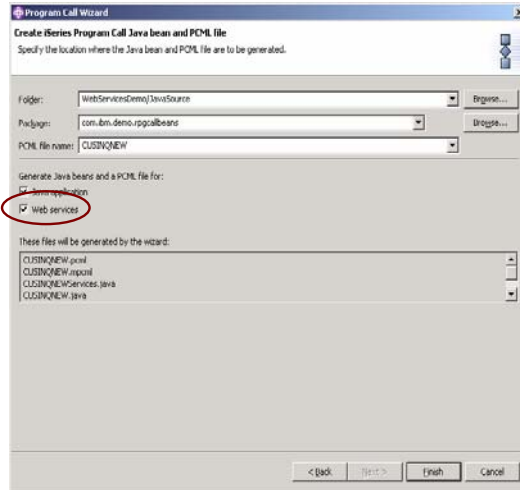


Web Services Development: RPG programs

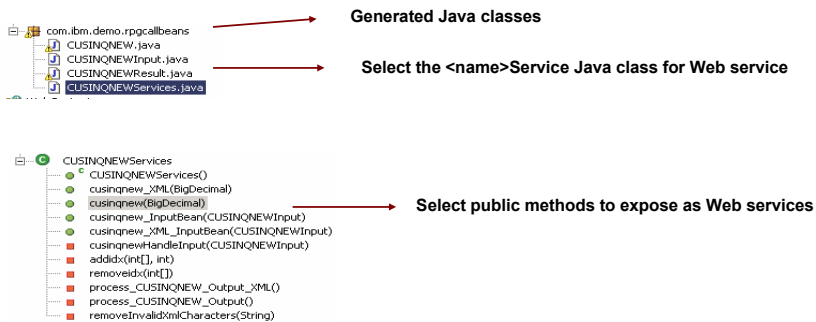


Specify RPG program name and parameters

Web Services Development: RPG programs



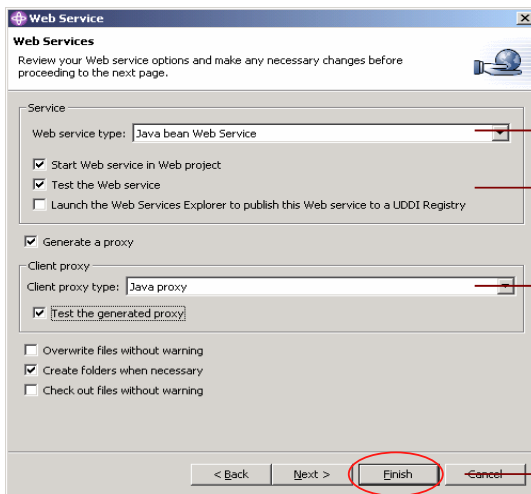
Web Services Development: RPG programs



After completing this step, use the Web services Wizard to create a Web service from the RPG Program Call Java Bean

Web Services Wizard

Web Services Development with WDS



Web service type

Web service test options

Proxy encapsulates SOAP call

Can be a completed in one step

Web Services Development with WDSC

The dialog box is titled "Web Service" and "Service Deployment Configuration". It contains two sections: "Server-Side Deployment Selection" and "Client-Side Environment Selection". Both sections have fields for "Web service runtime" (IBM WebSphere 5.0.2), "Server" (WebSphere v5.0 Test Environment), and "Service Web Project". In the Server-Side section, the "Edit..." button is circled in red. At the bottom are buttons for "< Back", "Next >", "Finish", and "Cancel".

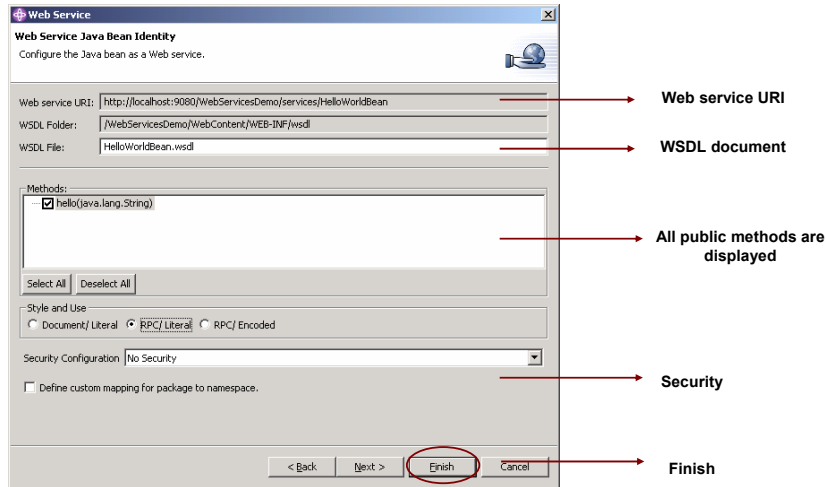
SOAP Server

Web Services Development with WDSC

The dialog box is titled "Web Service" and "Web Service Java Bean Selection". It has a "Bean:" text field containing "com.ibm.demo.beans.HelloWorldBean". To the right of this field are "Browse classes..." and "Browse files..." buttons. Below is a checkbox "Use an existing service endpoint interface" and a "Service endpoint interface:" text field with "Browse classes..." and "Browse files..." buttons. At the bottom are buttons for "< Back", "Next >", "Finish", and "Cancel".

Java class name

Web Services Development WDCS



Web Service Development with WDCS

- Web services wizard generates
 - Java code that processes Web service requests
 - WSDL file that describes the Web service
 - Test client code that can be used to test the Web service
 - No code changes are required to test the Web service

Web Service Deployment

- Web services are Web application, they need to run in an Application Server
- Deploy Web services in any edition of WebSphere Application Server
- Web services are packaged as a Web project, use IBM Web Administration for easy deployment

Web Services Integration

- Send the generated WSDL file to the Web service client developer
- Web Service client integration with WDSC: WDSC provides a wizard for generating Web service clients from a WSDL file
- Web services are becoming the industry standard, many tool vendors support Web services

Business Cases for Web services

- Interoperability
 - Web services can integrate applications written in any programming language. No additional software is required for integration
- Extend usability of existing applications
 - Legacy applications can be integrated with newer technologies
- New application development
 - Allow users to integrate your application's business logic in their applications or build a new user interface

Web Services Customer References

ABN AMRO

Bank of Tokyo-Mitsubishi

Canadian Imperial Bank of Commerce

Credit Union Electronic Transaction Services

Wachovia Corporation

J.P. Morgan Chase & Co.

Huntington Bank

Advanced Technology Systems

Hitachi Software Engineering Co., Ltd.

Staples, Inc

DaimlerChrysler

Resources

- iSeries Developer Roadmap
http://www-1.ibm.com/servers/eserver/education/cust/iseries/paths/j2ee/ests_islp_portalst.html
- IBM DeveloperWorks Web Service Zone
<http://www-136.ibm.com/developerworks/webservices/>

Questions and Answers



Need Help? Have a Question?

- Work with your IBM Business Partner for your WebSphere on iSeries needs.
- Encourage them to use the IBM Virtual Innovation Center (VIC) to obtain WebSphere on iSeries assistance
 - All IBM Business Partners can register with the VIC at no additional charge
 - For the exclusive use of Business Partners selling, installing, implementing IBM software on iSeries. All software defect related support still should be directed through Supportline and is built into the maintenance of the Software and you can obtain that support from calling 1-800-IBM-SERV or your local country support lines.