



Web Tools for IBM System i5 developers

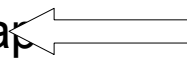
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IBM System i5 Technical conference 2006



WebTools agenda

iSeries AD, IBM Toronto

- ▶ WDS overview and AD roadmap 
- ▶ Website creation
- ▶ Webpage templates
- ▶ Designer for static WebPages
- ▶ Designer for Web objects
- ▶ Tool for Cascading Style Sheets
- ▶ Tools to create WebApplications
- ▶ Designer for dynamic WebPages
- ▶ Tools to create WebServices

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WebSphere Development Studio

Current 5722-WDS customers with software subscription for V5R3, to upgrade to WDSc V6.0 use feature #: 2656
Available after GA

Upgrade from WDS 6.0 to 6.0.1 using Rational Product updater

Unlimited Licenses


New WDS Lite
Technology preview

iSeries	iSeries	iSeries	iSeries	Web Facing WDHT support	iSeries Projects	+CODE +VisualAge RPG	
Java™	Debug	Struts Web	Web Service		RSE		
JSF	EGL Java generation	Trace	Profiling	DB	XML	App Server	HATS Toolkit

www.ibm.com/software/awdtools/iseries

WebSphere Development Studio Client V6.0.1 based on RWD V6

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WebSphere Development Studio Client Advanced Edition 6.0.1

Workstation License order through Passport Advantage
http://www.lotus.com/service/passport.nsf/WebDocs/Passport_Advantage_Home

Upgrade from WDS 6.0 to 6.0.1 using Rational Product updater

Workstation License

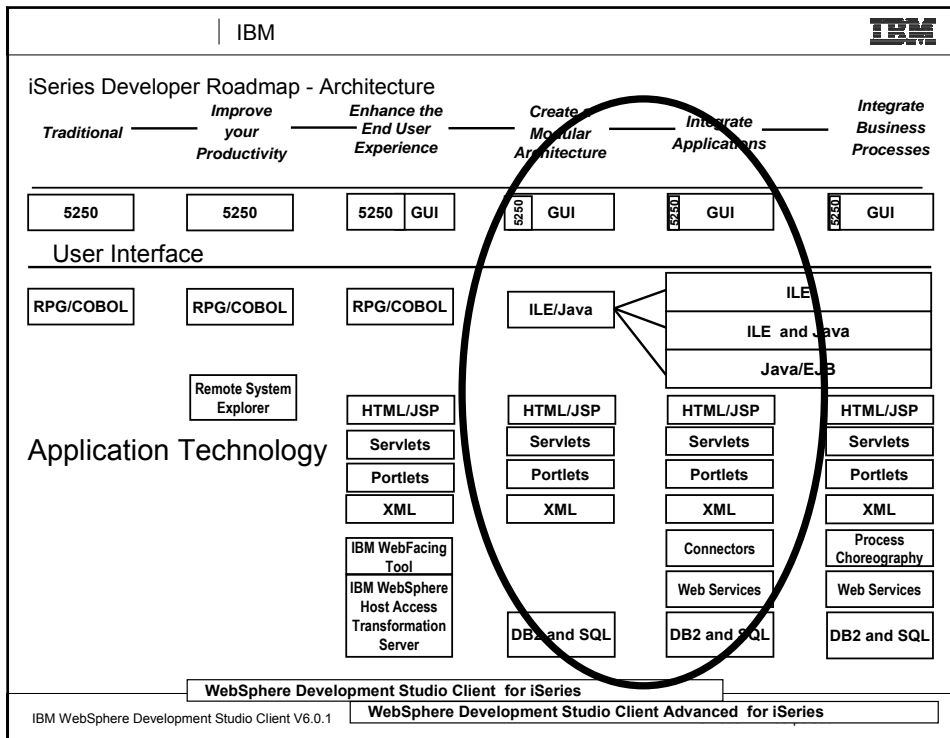
New WDS Lite
Technology preview

iSeries	iSeries	iSeries *	iSeries	Web Facing * WDHT support	iSeries Projects	+CODE +VisualAge RPG	
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	EGL * COBOL generation	EJB *	Test * Cases	Portal *			
		J2EE *					

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WebSphere Development Studio Client V6.0.1 based on RAD V6

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WebTools agenda

iSeries AD, IBM Toronto

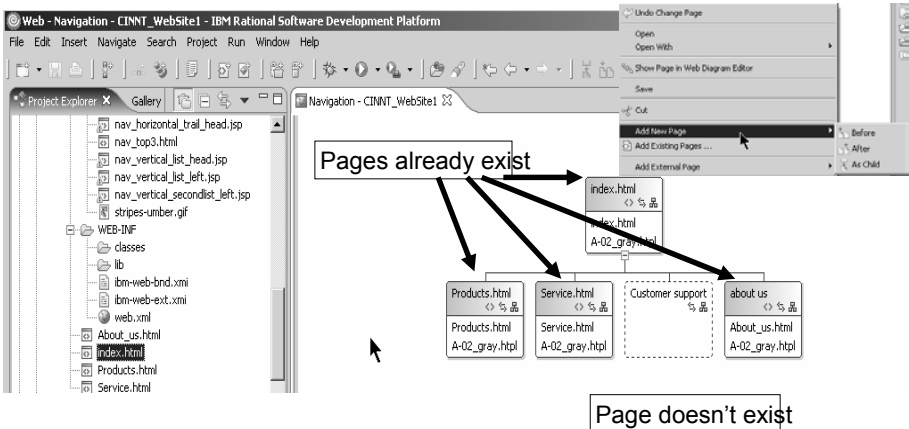
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IBM WebSphere Development Studio Client V6.0.1

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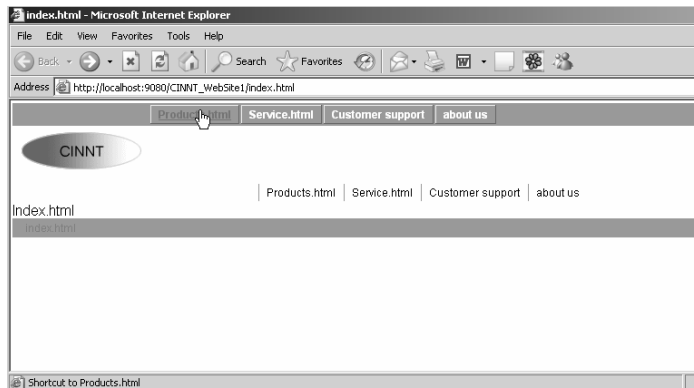
WebSite designer

Design page relations
Bind to real Webpages later

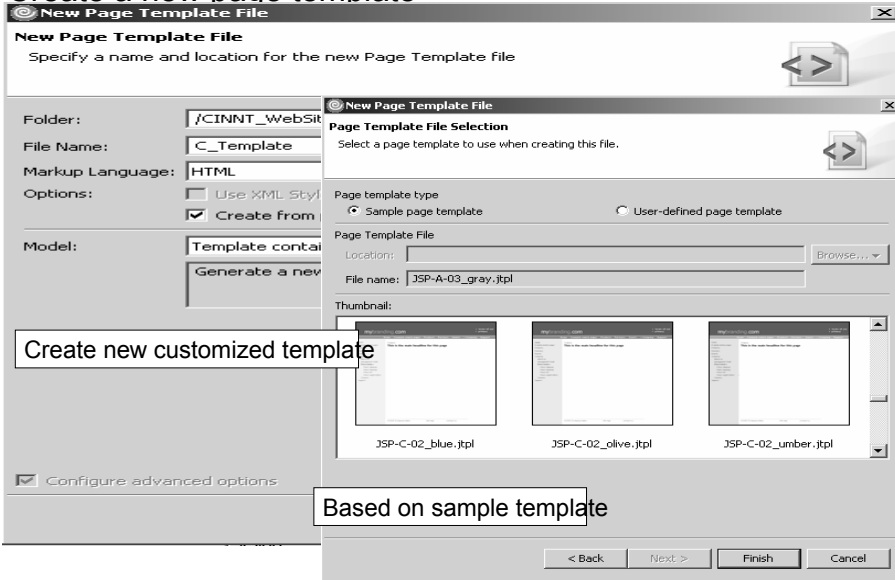


WebPage

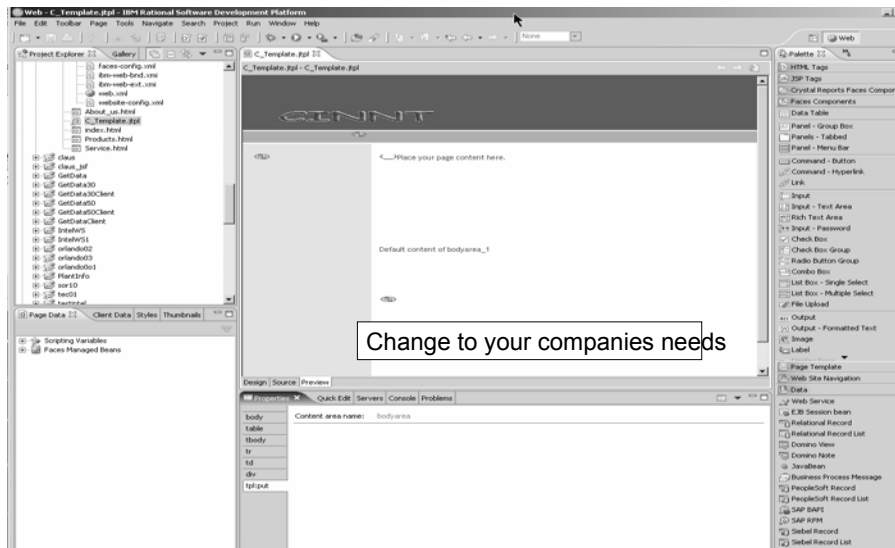
Template used with Navigation bar
Navigation bar automatically updated from WebSite designer



Create a new page template



Change page template



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Page designer tool

iSeries AD, IBM Toronto

- **Page Designer for JSPs & HTML**
 - **Frame wizard**
 - **WebArt designer**
 - **AnimatedGIF designer**
 - **Spell Checker**
 - **HTML validator**
 - **HTML to XHTML converter**
 - **Attribute dialog**
- **Link utilities**
 - o **fix broken links**
 - o **Convert links**

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PageDesigner

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The screenshot shows the IBM Page Designer interface with several key components highlighted:

- Project Navigator:** Located on the left, it displays a tree view of the project files. A callout box labeled "File View" points to this area.
- Design/Source/Preview:** A central area with three tabs. A callout box labeled "Design/Source/Preview" points to these tabs.
- Attribute editor:** Located at the bottom left, it allows for editing the attributes of the selected element. A callout box labeled "Attribute editor" points to it.
- Link view:** Located at the bottom right, it shows a graphical representation of the page's link structure. A callout box labeled "Link view" points to it.
- Three Frames:** A callout box labeled "Three Frames" points to the main design area, which is divided into three distinct frames.

Different Views

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Frame tools

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Set attributes of selected Frameset

IBM WebSphere Development Studio Client V6.0.1

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WebArt Designer

iSeries AD, IBM Toronto

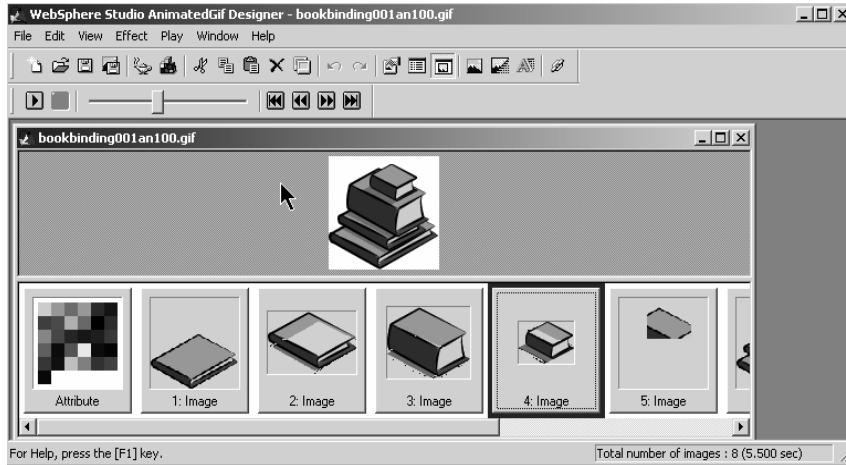
Wizards for Logo/Button/PhotoFrame/Rollover

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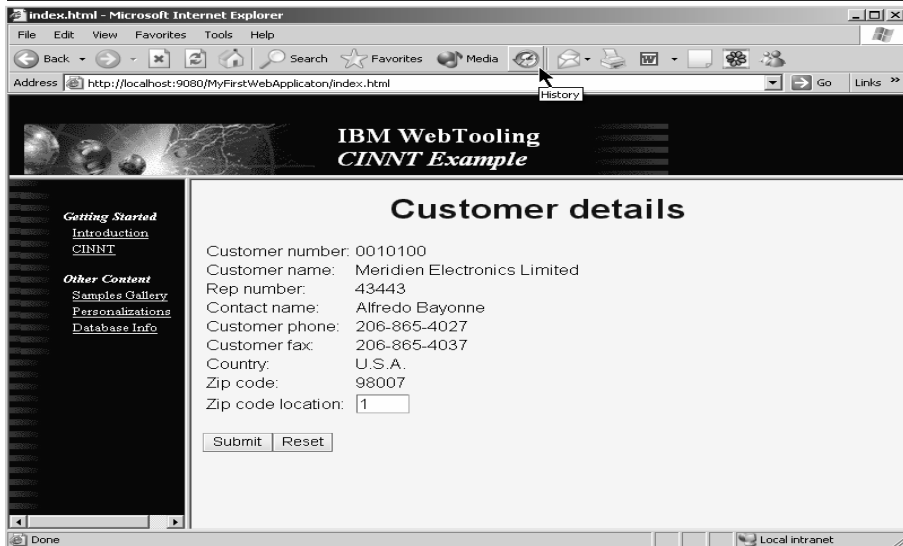
Animation GIF designer

iSeries AD, IBM Toronto



Running the improved application

iSeries AD, IBM Toronto



Stylesheet editor

Instant feedback how it will look on Webpage

IBM WebSphere Development Studio Client V6.0.1

Creating your own style classes

IBM WebSphere


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WebTools agenda

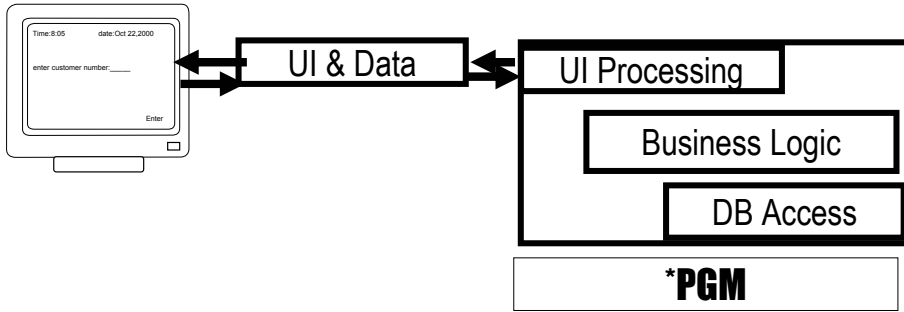
iSeries AD, IBM Toronto

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Web applications with dynamic webpages

- **Content of Webpages gets assembled at runtime**
 - 1. Applets (application running in a browser)**
 - 2. generate HTML at runtime on the fly**
 - 3. Use predefined HTML with leaving holes for runtime information**
 - Substitution variables
 - Java Server Page (jsp) standard way in J2EE (Java code on server fills holes)
 - Jsp with Struts framework (controller logic strictly separated)
 - Java Server Face (jsf) framework that also addresses UI) 

5250 Screens Today's Model

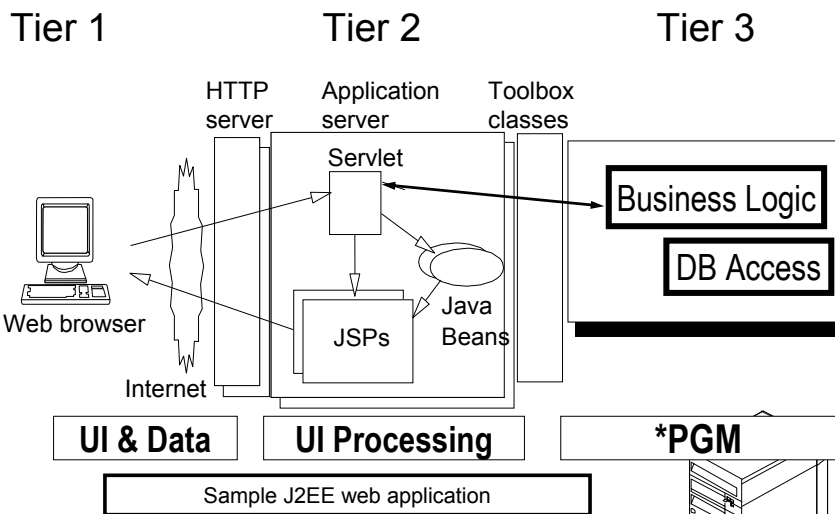


- Program puts up screen, waits for input
- Program processes input, does business logic

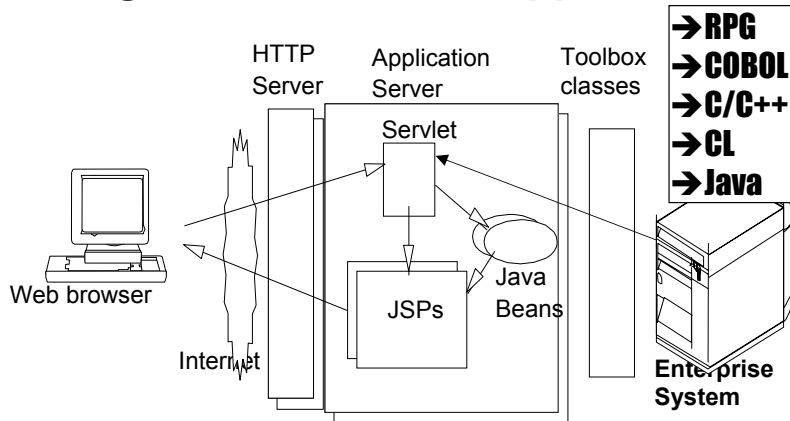


System i
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Modern Web App Architecture



Tooling for modern web applications



WDS → iSeries webtooling
 → Pagedesigner
 → Jsf tooling
 → Interaction wizard
 → WebServices wizard

→ iSeries 3 GL tooling
 → Remote system explorer
 → LPEX source editor
 → Integrated Debugger

What Are Servlets?

iSeries AD, IBM Toronto

- ▶ Servlets are . . .
 - Java classes (programs written in Java) that run . . .
 - On an application server (eg, WAS)
- ▶ Servlets are called . . .
 - By your HTTP Server software
 - From other Servlets
- ▶ The input to Servlets is . . .
 - User-entered data from a Web page
- ▶ The output of a Servlet is . . .
 - Java Bean, passed to a JavaServer Page

What Are JSPs?

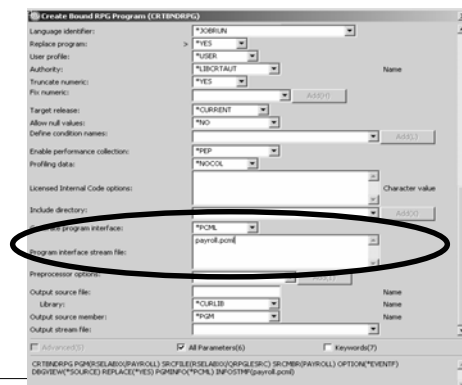
iSeries AD, IBM Toronto

- ▶ A way of describing dynamic web pages
- ▶ JavaServer Pages (JSPs) are . . .
 - .jsp files
 - ▶ containing html tags plus JSP tags
- ▶ JSP tags . . .
- Allow dynamic data to be inserted into the static HTML
- ▶ JSPs are invoked . . .
 - By a servlet
 - The input to JSPs are . . .
 - ▶ Java Beans passed from your Servlet
 - The output of a JSP is . . .
 - ▶ A full Web page, displayed to user

Calling native programs from Java

- A brief look at: IBM System i5 Java toolbox
- Java toolbox is included in WDS*c*
- Lets look at: Using Program Call Markup Language (PCML)

ILE RPG and COBOL compilers can create PCML for you
 → OS/400 V5R2 and higher:
 -New parameters in CRTxxxMOD and CRTBNDxxx



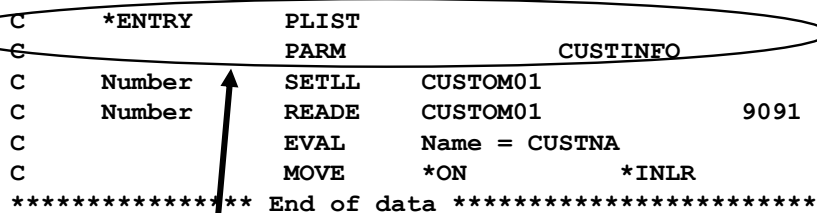
Java Calling RPG

Say we have the following RPG code ...

```

FCUSTOML3  IF    E                K DISK
DCUSTINFO                DS
D Number                1         7A
D Name                  8         47A
C *ENTRY                PLIST
C                        PARM                CUSTINFO
C Number                SETLL    CUSTOM01
C Number                READE    CUSTOM01    9091
C                        EVAL     Name = CUSTNA
C                        MOVE     *ON        *INLR
***** End of data *****

```



Pass in Customer ID and receive back customer name.

Use PCML to describe program interface

RPG/COBOL compilers create PCML

No need for you to write PCML

```

<pcml version="1.0">
  <!-- Create a Data Structure -->
  <struct name="custinfo">
    <data name="Number" type="char" length="7"
      usage="inputoutput" init="0014400"> </data>
    <data name="Name" type="char" length="40"
      usage="inputoutput" init=" "> </data>
  </struct>

  <!-- Program getcust -->
  <program name="getcust"
    path="/QSYS.lib/FARR.lib/GETCUST.pgm">
    <data name="gotback" type="struct"
      usage="inputoutput" struct="custinfo"> </data>
  </program>
</pcml>R

```

Program Call Markup Language (PCML)

Call RPG from Java Servlet

```
public static void main(String[] argv)
{
    AS400 as400System = new AS400();
    ProgramCallDocument pcml = null;
    String msgId, msgText;
    Object value = null;
    try {
        System.out.println(
            "Creating ProgramCallDocument for GetCust pgm.");
        pcml = new ProgramCallDocument(as400System, "GETCUST");
        boolean ok = pcml.callProgram("getcust");
        System.out.println(" rc is---> " + rc);
        if (!ok)
            { /* Retrieve list of AS/400 messages & display them */ }
        else
            {
                value = pcml.getValue("getcust.getback.Name");
                System.out.println("Customer name: " + value);
            }
    } catch (PcmlException exc) {
        System.out.println("*** Call to getcust failed. ***");
        System.exit(0);
    }
    System.exit(0);
} // end main method
```

IBM V

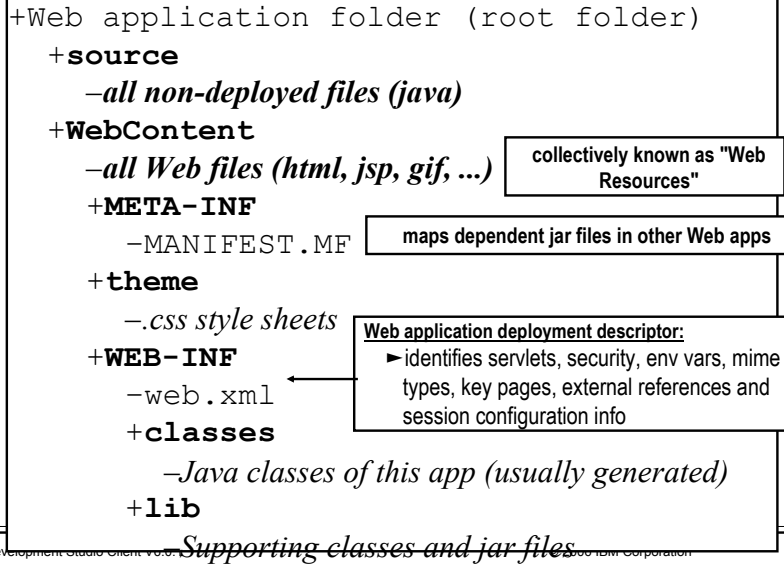
Using PCML to invoke native system I programs

1. First lets look at WebProjects
2. Interaction wizard
3. Jsf tooling
4. Web Services tooling

J2EE Web Application

► Standard Web App folder structure:

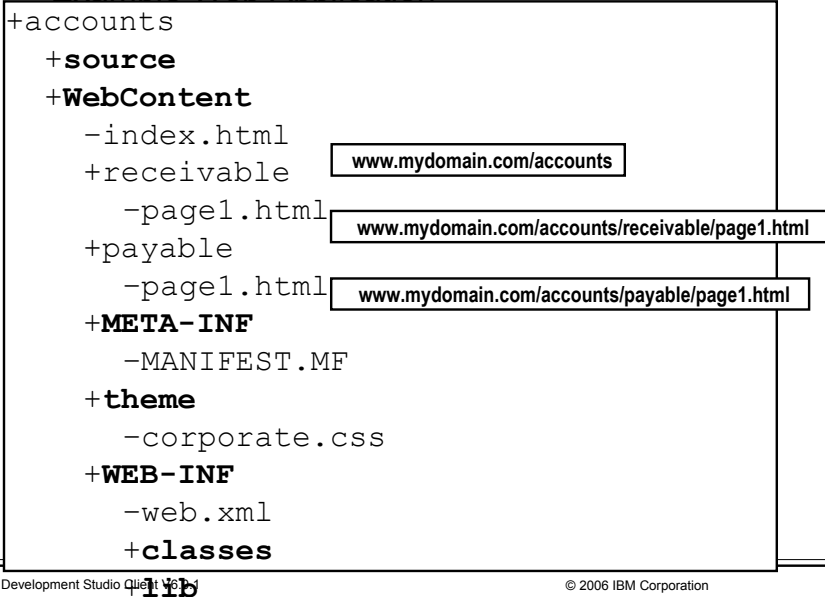
J2EE
1.3



Terms: Web Application

iSeries AD, IBM Toronto

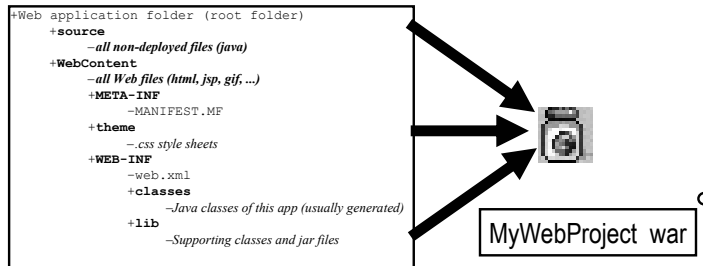
► Example Web Application



► Web Archive Files (WAR)

J2EE
1.3

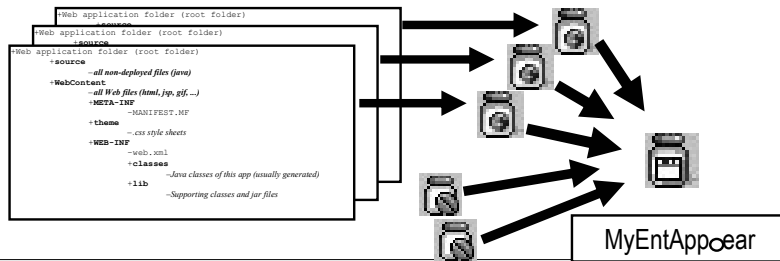
- **One file containing**
 - Whole folder structure of Web application
 - Including web.xml file
 - Optionally including source
- **Used to**
 - Install and configure Web application in an application server



► Enterprise Archive Files (EAR)

J2EE
EJB
Spec

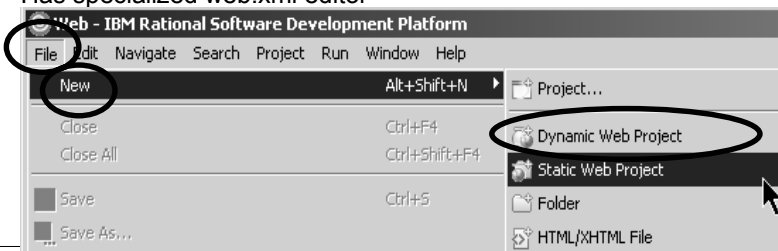
- **One file containing:**
 - Zero or more Web Archive (war) files
 - Zero or more EJB jar files
 - A J2EE deployment descriptor
- **Used to install and configure:**
 - All pieces of a J2EE Enterprise Application
 - ✓ Web application plus EJBs plus EJB clients
 - All Web applications for a Web site (say)



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Web Projects

- **Create new web applications in a web project**
- **One of the project types in WDSc**
 - ▶ With its own web perspective
 - ▶ With its own "new" wizard
 - ▶ With its own set of tools
- **Created with J2EE folder layout**
- **Created with simple web.xml file**
 - ▶ Automatically updated as resources are created
 - ▶ Has specialized web.xml editor

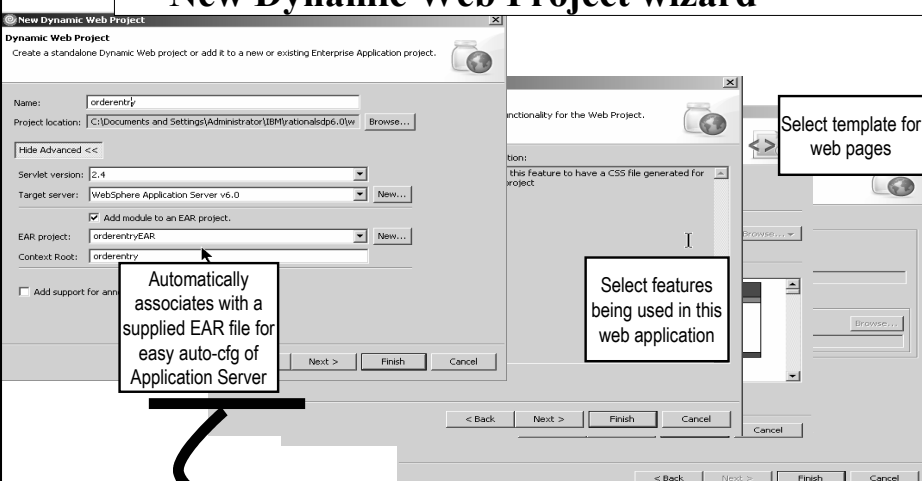


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Web projects

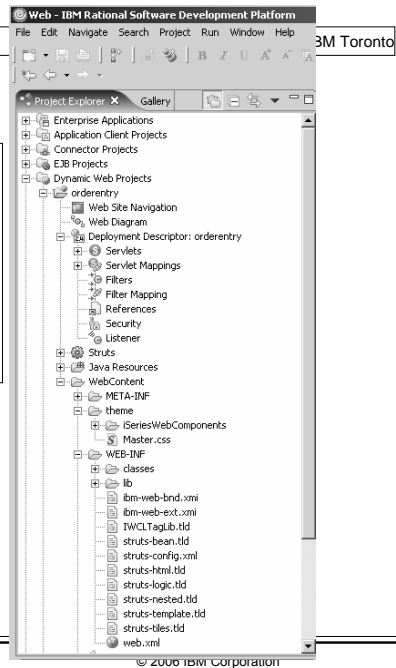
New Dynamic Web Project wizard



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Web projects

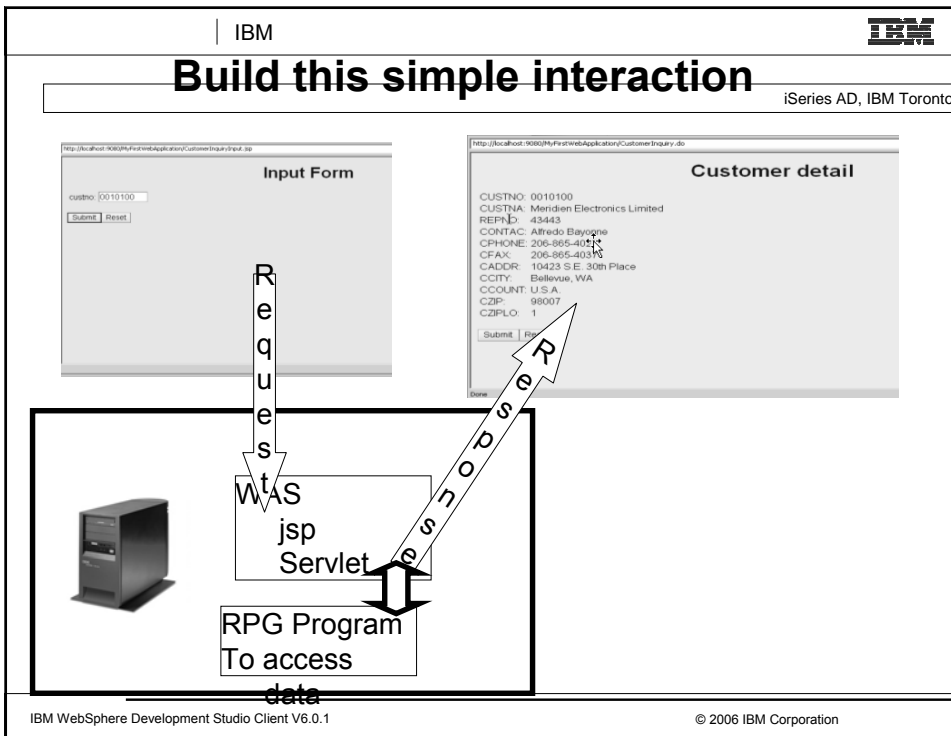
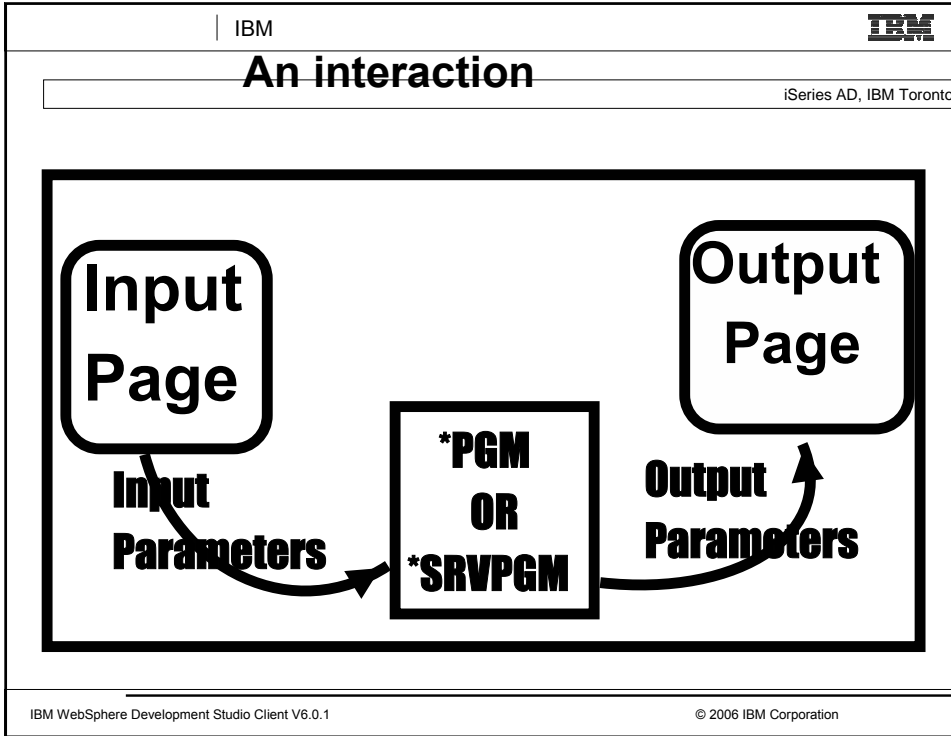
Web application structure is created from information provided in New Dynamic Web Project Wizard



Web Tool for iSeries

iSeries AD, IBM Toronto

- ✚ **Wizards to help create iSeries RPG/COBOL web applications**
 - Interaction wizard to build web application Struts based
 - JSF tooling
 - WebService wizard to build an iSeries WebService
 - JCA wizard to build an iSeries Java Connector Architecture (JCA) connector



Using the Interaction wizard

iSeries AD, IBM Toronto

- ✦ Interaction wizard specific for iSeries development (not extendable)
- ✦ Steps involved
 - ✦ Create a dynamic web project
 - ✦ Create Runtime configuration
 - iSeries server
 - User id/password
 - Library list setup
 - ✦ Create Interaction
 - ✦ Input screen
 - ✦ Program interface (PCML)
 - ✦ Output screen

New standard framework java server faces (jsf)

- **Wait something better than STRUTS is here**
- A new standard framework fully supported in WDS
 - Tool support for jsf
 - Page designer
 - Binding support of data beans and UI controls
 - Web diagram editor for jsf
 - Quick edit for small pieces of Java code

Java Server Faces (jsf)

- A specification and reference implementation for web applications
 - Components
 - Events
 - Validators & converters
 - Navigation
 - Back-end-data integration
- Standard
- Allows for extended tool support

Web Page Development

- JSF contains a collection of UI components to make Web page development easier
 - Each component has extensive properties for customizing look and behavior of component
 - Components can be bound to variables for automatically:
 - Displaying the value of variable
 - Assigning value to a variable on page submit
 - Components have associated “events” which you can write code for
 - JavaScript for client side events
 - onclick, ondblclick, onkeypress, ...
 - Java code for server side events
 - Value Changed, Command, ...

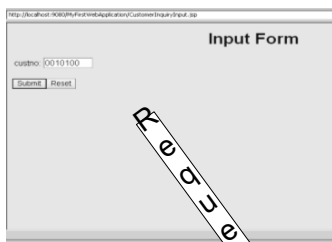
Creating a jsf based web application

■ Using

- Web diagram editor
- jsf controls and associated tools
- Program call wizard
- Jsf Data tools

Build this jsf web application

iSeries AD, IBM Toronto



Request

Response



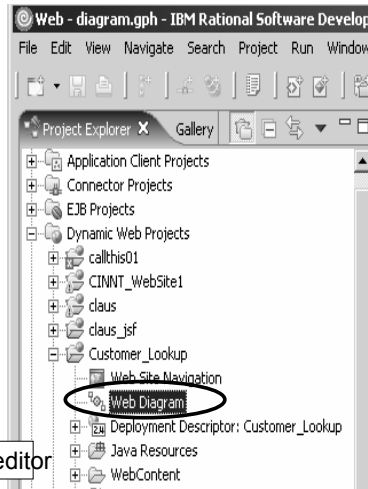
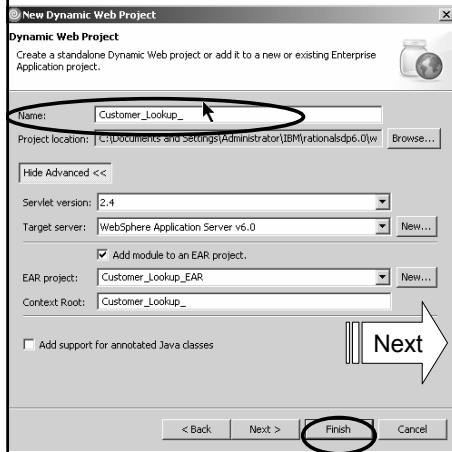
RPG Program
To access

jsf

Validation
 Conversion and put values from UI control
 into Program call bean
 Use Program call bean to invoke program
 Get return values from Program call bean
 into bound UI controls

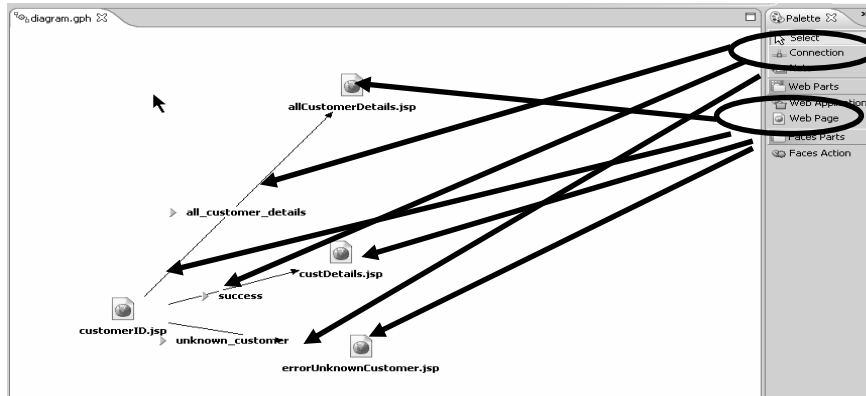
data

Create a Web project



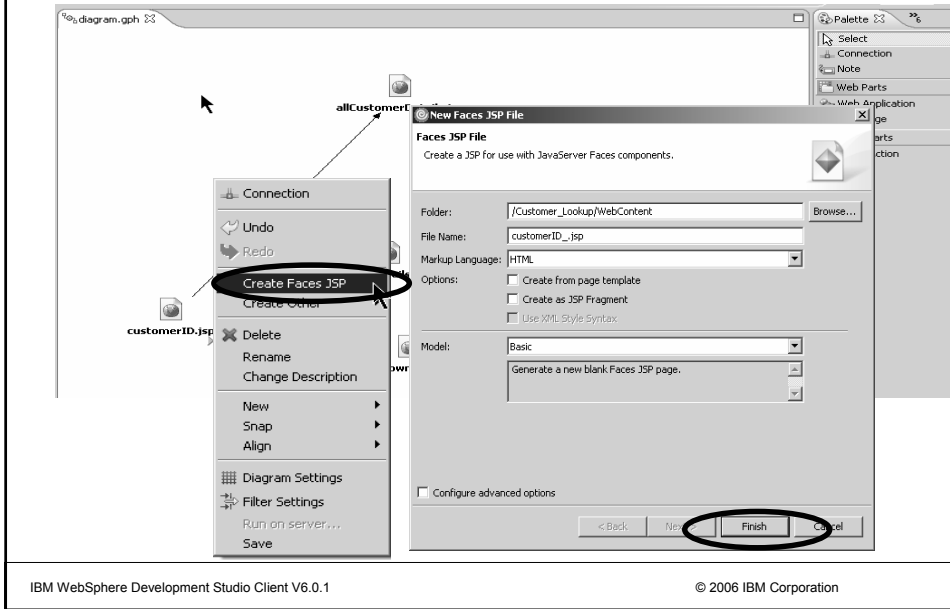
Create project and invoke WebDiagram editor

WebDiagram editor

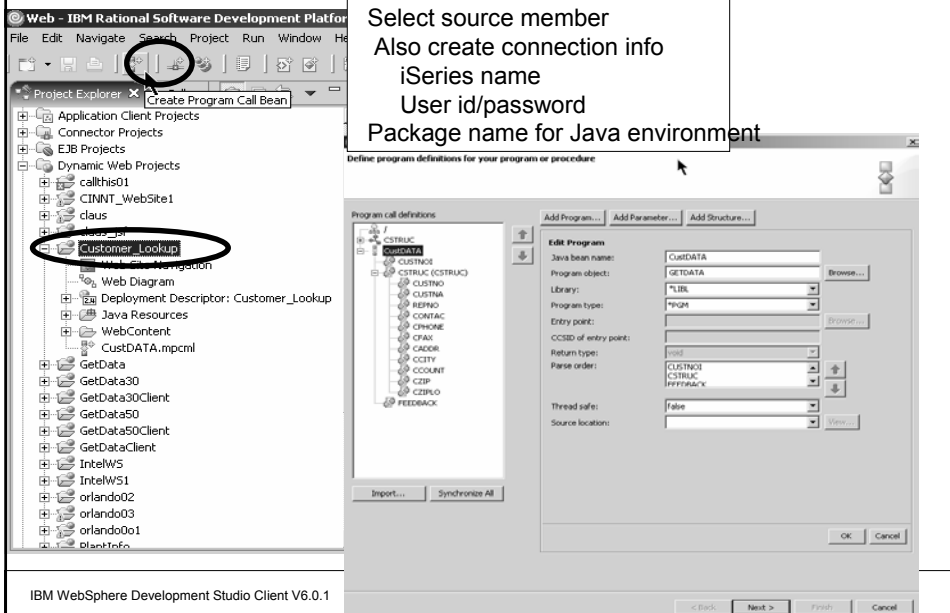


Create design of application layout
web pages and connections between pages with conditions

Create webpages from diagram as .jsp files



Create program call bean



Create Web page design and binding

Created by Program call wizard

Select JavaBean
 (1) The bean class cannot be empty.
 Add new JavaBean Add existing JavaBean
 Name: custdata_
 Class:
 Make this JavaBean reusable (Make this JavaBean reusable)
 Scope: session
 Initialize Properties...

Options
 Buttons Labels Advanced
 Buttons to create:
 Submit button
 Label: Get Customer Information

Scripting Variables
 Faces Managed Beans
 custdata (owbeans.CustDAT)

Add program call bean for binding to UI
 Creates input field bound to CUSTNOI
 Submit button to invoke program call

Add rules for submit button and map return code to forward condition

customerID.jsp

customerID.jsp - customerID.jsp

Place content here

Enter customer ID: [CUSTNOI] (Error Message for text1)

Get Customer Information

Beginning of code automatically generated
 But have to specify which return code from iSeries program means 'success'
 And which one means failure
 Very little Java skills required

Design Source Preview

```

try {
    getCustomdata().invoke();
} catch (Exception e) {
    logException(e);
}
//CUSTNOI programCallBeanData = getCustomdata();
if (programCallBeanData.getFEEDBACK().trim().equals("S"))
    return "success";
else
    return "unknown_customer";

```

Bind UI and java bean properties

The screenshot shows the 'Insert JavaBean' dialog box in the IBM WebSphere Development Studio. The dialog is titled 'Configure Data Controls' and 'Select Method'. It prompts the user to 'Specify the fields to display and how to display them'. The 'Select Method' list contains several methods, with 'invoke() (void) - powbeans.GETDATA' selected. The 'Fields to display' list also contains 'custNO() (java.lang.String)'. In the background, the project explorer shows the 'custData.java' file with 'custNO() (java.lang.String)' circled in red.

Jsf entry field validation

The screenshot shows the 'customerID.jsp' page in design view. The 'Enter customer' form field is circled in red. The 'Properties' window is open, showing the 'Validation' section with 'Constraint: [Digits Only (^([0-9]+)\$)]' circled in red. The 'Validation' section also includes 'Minimum length: [2] (characters)' and 'Maximum length: [2] (characters)'. The 'Display validation error messages in an error mes When value is invalid, redisplay page with error' checkbox is checked.

Creating the error page

Sorry customer ID, (CUSTNO) , we not found in the database

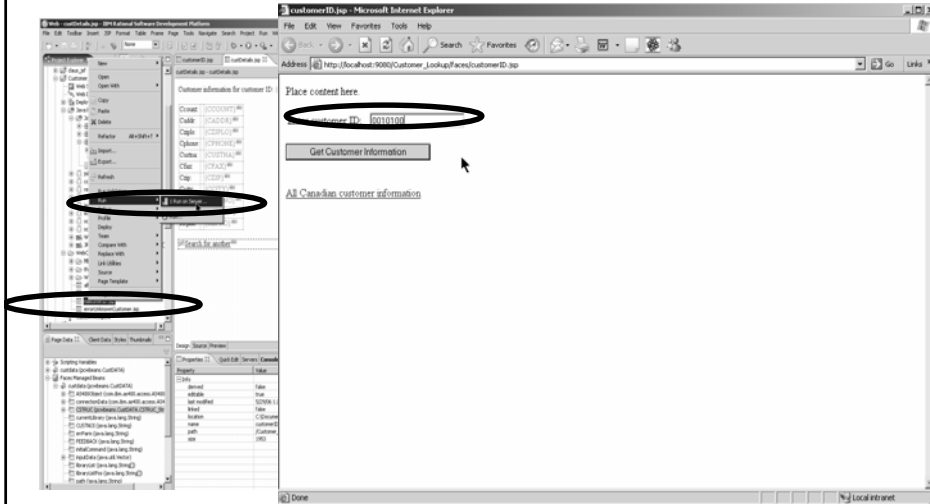
Create an output text control in the error message
Then bind it to the custnoi field so it gets filled at runtime with its value

Creating the customer detail page

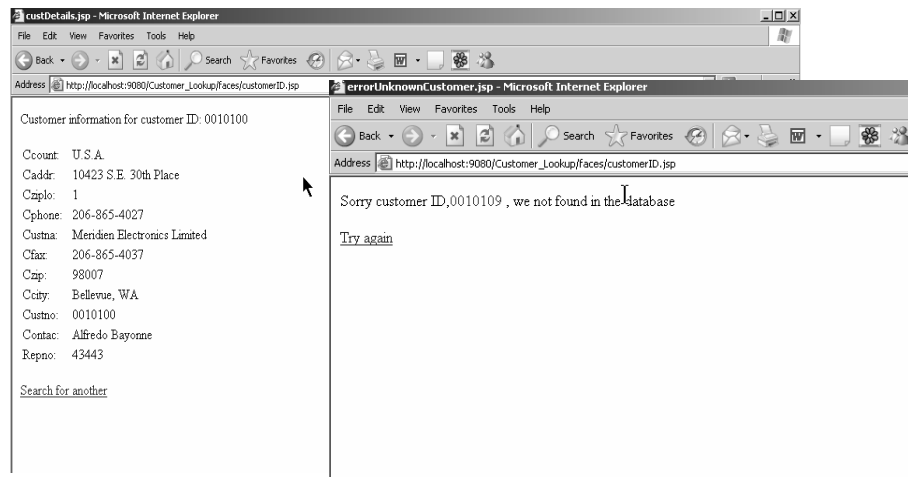
Drag structure from bean to designer
Select fields to be shown
Fields get added to page and are bound to bean

Field Name	Label	Control Type
<input checked="" type="checkbox"/> CPHONE (java.lang.String)	Cphone:	Output Field
<input checked="" type="checkbox"/> CUSTNA (java.lang.String)	Custna:	Output Field
<input checked="" type="checkbox"/> CFAX (java.lang.String)	CFax:	Output Field
<input checked="" type="checkbox"/> CZIP (java.lang.String)	Cap:	Output Field
<input checked="" type="checkbox"/> CCITY (java.lang.String)	CCity:	Output Field
<input checked="" type="checkbox"/> CUSTNO (java.lang.String)	Custno:	Output Field
<input checked="" type="checkbox"/> CONTACT (java.lang.String)	Contact:	Output Field
<input checked="" type="checkbox"/> REPNO (java.lang.String)	Repno:	Output Field
<input type="checkbox"/> parentIndices (int[])	ParentIndices:	Multi-Column D
<input type="checkbox"/> index: (int)	Index:	Output Field

Run it



Detail and result pages



Display list of records using Relational record list control

are Development Platform

Drag Relational record list
Fill out wizard pages

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Identify iSeries data base file

Add Schema Filter

Select a predicate and specify the filter. The filter can include the SQL wildcard %.

Target:

Predicate:

Filter:

OK Cancel

Connection name:

Table:

- WSSLAB01:ALLBACK
- WSSLAB01:ALLSALES
- WSSLAB01:APPSOURCE
- WSSLAB01:CUSTOMER
- WSSLAB01:PRODDTL
- WSSLAB01:PRODDTW
- WSSLAB01:PRODDLST
- WSSLAB01:PRODHOW
- WSSLAB01:PRODUCT
- WSSLAB01:QALLESBIC
- WSSLAB01:QODSSRC
- WSSLAB01:QPPLESRC
- WSSLAB01:QPPLESRCP
- WSSLAB01:SALES

< Back Next > Finish Cancel

Filter for library Select database file Specify primary key Almost done

Tasks

- Modify primary key
- Order results
- Filter results
- Advanced tasks
- Add another database table through a relationship

Edit primary keys

Table name: CUSTOMER

Available columns	Primary key columns
<ul style="list-style-type: none"> CUSTNA : String REFNO : String CONTACT : String CPHONE : String CFAX : String CADDR : String CCITY : String CCOUNT : String CZIP : String CZIPLO : String 	<ul style="list-style-type: none"> CUSTNO : String

Close

Specify the data to be shown

List page has been created
Specify SQL Query conditions
Specify sort etc
The run it

Running the query

Ccustno	Ccustna	Rrepno	Contact	Cphone	Cfxax	Caddr	City	CCount	Czip	Cziplo
0011300	Burnham Trading Inc	41480	Efrem Helasie	613-225-0753	613-225-0753	91 Baseline Road	Trenton, Ontario	Canada	C6B	9S3 2
0013400	Communications Fournier	13497	Larry Schweyer	514-534-2953	514-534-2977	3162 Rue Ste Catherine	Montreal, Quebec	Canada	E6P	2S3 1
0012200	Communications-R-U's Corporation	22004	Jack Deauson	416-695-3455	416-695-3458	82 Royal York Road	Toronto, Ontario	Canada	M7G	5C1 2
0012300	Danton Industries	98989	Jack Vance	905-316-2245	905-316-2255	78 John Street	Markham, Ontario	Canada	M0J	8G4 1
0012100	DeSira Novelties	17506	Henry Goldsmith	416-484-2766	416-484-2795	926 Danforth Avenue	Toronto, Ontario	Canada	M5R	6C1 2
0012500	Deplomat Sales and Liquidations	00488	Jim Due Wan	905-369-1234	416-343-1027	Gerrard Square, 54 Gerrard St	Toronto, Ontario	Canada	M5S	6F0 1
0012600	Down Under Electronics Supplies	42167	John Raley	416-694-1459	416-694-1469	206 Queen Street East	Toronto, Ontario	Canada	M5S	6G7 2
0012700	Dunsten Electronics Inc.	60585	Kerns Copper	416-633-1027	416-633-1029	1298 Victoria Park Avenue	North York, Ontario	Canada	M0K	8F4 2
0012800	Elite Communications	26489	Marilyn Myerson	416-343-2077	416-343-3079	257 Queen Street East	Toronto, Ontario	Canada	M5Y	3K9 2
0013000	Fantastic Future Supplies	63445	Mary Goodbar	905-316-4545	905-316-4572	Markham Place, 500 Steeles Ave E	Markham, Ontario	Canada	M9U	6M1 2
0013500	Gallery Sales and Liquidations	64616	Mostafa Egoary	416-961-2722	416-961-2752	73 University Avenue	Toronto, Ontario	Canada	M9K	6G7 1
0013300	Holiday Sales	14915	William Kuo	905-891-5677	905-891-5697	305 Appleby Lane	Mississauga, Ontario	Canada	M9B	7F5 1
0909090	I&B&M&A&B	12345	Mr Customer	416-448-9809	416-448-4545	1150 E&A Ave	North York	Canada	M1M	2N2 1
0010400	ProLine Building Supplies	13300	Bud Dobbs	905-403-4055	905-403-4059	73 Marchwood Road	Burlington, Ontario	Canada	D6G	3V6 2
0010200	Royal Hardware Supplies	20527	Anne Pedell	905-619-2045	905-619-2073	Maple View Plaza, 256 New St.	Ajax, Ontario	Canada	L8D	4S6 2
0011600	Sudbury Radio and TV	01900	Gary Morehouse	705-522-5044	705-522-5047	7 North Road	Sudbury, Ontario	Canada	P7G	5A3 2

WebSphere Test Environment

A full copy of WAS 6.0 is embedded in the IDE

- ▶ Integrated with Server Tools to enable instant and dead-easy testing of Web projects within WDS.
 - ✓ Standalone all-in-one testing
 - ✓ No dependency on WAS installation or availability
 - ✓ No dependency on an external database
- ▶ Provides the ability to debug live server-side code
- ▶ Supports configuring multiple Web applications
- ▶ Supports multiple servers that can be configured and run at the same time
- ▶ Provides access to the profiling feature that is available in the workbench
- ▶ Provides the ability to version Server Tools server configurations
- ▶ Provides access to the WAS Administration Client

WebTools agenda

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- ▶ WDS overview and AD roadmap
- ▶ Website creation
- ▶ Webpage templates
- ▶ Designer for static WebPages
- ▶ Designer for Web objects
- ▶ Tool for Cascading Style Sheets
- ▶ Tools to create WebApplications
 - ▶ Interaction wizard
 - ▶ Java server faces tooling
- ▶ Tools to create WebServices 

What Are Web Services

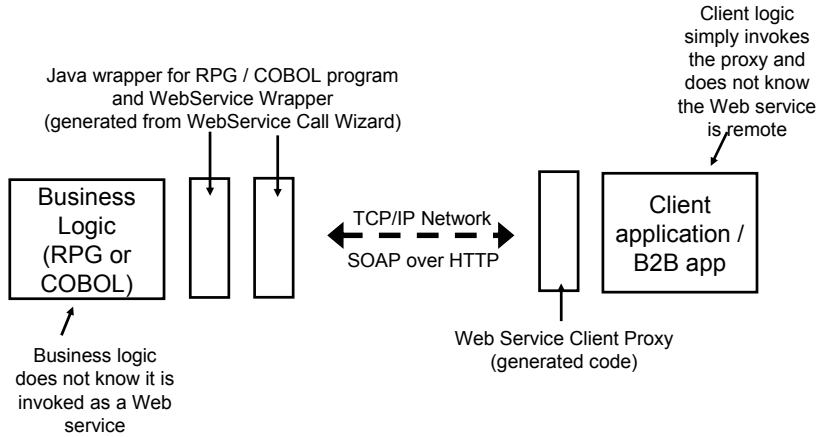
- Function that can be programmatically invoked over a network

- Basically remote procedure calls built on open standards and proven technologies
 - Lots of new standards around Web services to ensure interoperability in heterogeneous environments
 - Underlying implementations built on proven technologies like
 - XML
 - HTTP
 - Messaging middleware
 - Security standards

Why use Web Services

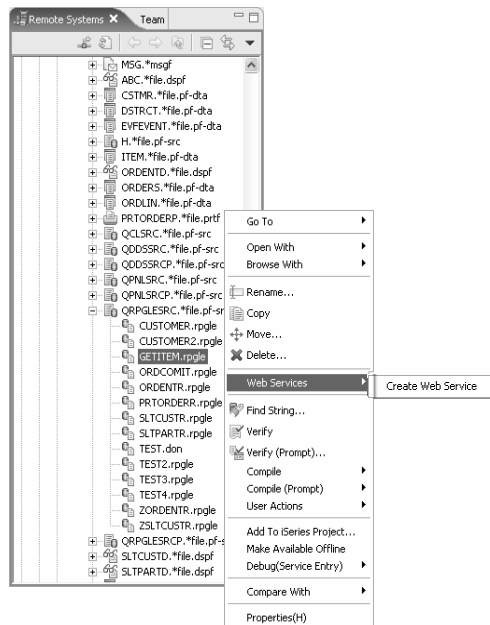
- Because:
 - They are the latest hype
 - They are hot
 - They are cool
 - They are useful
 - Somebody asks you to provide one for a certain task
 - Somebody provides one and asks you to use it

RPG/COBOL Program as Service Provider



System i5 Web Services Tools (new in V6.0.1)

- Single wizard to convert i5/OS program or service program procedure into a Web Service
 - Generates all required code for deploying Web Service to WebSphere Application Server
- Automatically determines program (or procedure) parameters when invoked from RSE
- Just point to RPGIV/ILE COBOL program source
- Go thru a couple of wizard pages and WSDL for the program or procedure will be generated



Tools

▪ Web Services Tools in WDS

– Create

- Web services from:
 - ILE RPG/COBOL source
 - Java Beans
 - Enterprise JavaBeans (advanced edition only)
 - SQL Queries
 - DB2 Stored Procedures
 - DB2 XML Extender calls
- Web service client proxy given a WSDL document

– Test

- Test your Web services in the WebSphere test environment
- Generate test code to test generated Web service client proxies

– TCP/IP Monitor

- Useful for debugging SOAP messages between provider and consumer

WebService Wizard Use Remote Systems Explorer to select member

The screenshot shows the 'Remote Systems Explorer' window in IBM Rational Software Development Platform. A tree view on the left lists various system members. A context menu is open over a selected member, with 'Web Services' highlighted. A callout box points to the menu with the text: 'Select member From popup select WebService option'. Below the menu, a table displays details for the selected member.

Name	Type	Attribute	Properties	Last modified	Created
GETDAASOL	RPGL	SRC		October 6, 2003 11:00...	April 22, 2004
GETDATAS	RPGL	SRC		October 6, 2003 11:00...	October 6, 2003
GETDATAS	RPGL	SRC		April 10, 2004 3:55...	October 6, 2003
SUBPRTM	RPGL	SRC		April 10, 2004 3:55...	October 6, 2003
WDSCSRVR	RPGL	SRC	Service progr...	February 28, 2005 ...	Februa...
WDSCSRVR2	RPGL	SRC	Service progr...	February 28, 2005 ...	Februa...

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Web Service Wizard

- Click Finish & Done!
- Drop-Dead Simple!

Default is iSeries Web Service type

The Java bean proxy will provide a remote procedure call interface to the Web service

We will test the Web service after it is created

We will monitor the SOAP traffic for this Web service

Web Service

Web Services
Review your Web service options and make any necessary changes before proceeding to the next page.

Service

Web service type: iSeries Program Web Service

Start Web service in Web project
 Launch the Web Services Explorer to publish this Web service to a UDDI Registry

Generate a proxy

Client proxy

Client proxy type: Java proxy

Test the Web service after it is created
 Monitor the Web service

< Back **Next >** Finish Cancel

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We could select Finish here and test the Service But lets specify some more details

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Configuring the Web Service- Edit Program/Parameters

- File name shows the Program source file the wizard was launched from (valid types incl. ILE RPG, COBOL, PCML)
- Browse files** to select a different file
- The default Runtime configuration is taken from the System i5 connection
- Edit** to change the configuration
- Browse** to choose an existing configuration (.config file)

- Selecting the Program (**CUSTINFO**), you can change the Library, Program type, Program Object etc. (in most cases the defaults are sufficient)
- Expand the program to see program parameters
- Selecting a parameter (e.g. **IN_CID**), you can change Usage type, CCSID

Web Service

Object Selection Page
Object Selection Page

File name: RVICE/QRPGLESRC(CUSTINFO) Browse files...

Runtime configuration: CUSTINFO Edit... Browse...

Program call definitions

Java bean name:	CUSTINFO
Program object:	CUSTINFO
Library:	*LIBL
Program type:	*SRVPGM
Entry point:	CUSTINFO
CCSID of entry point:	
Parse order:	OUT_STATUS O_DS
Thread safe:	false

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Configuring the Web Service- Runtime Configuration

Signon information is defaulted from System i5 connection

Alternatively, can use the Program Call Java Connection Architecture connector for signon and connection management (advanced product only)

iSeries Web Service Runtime Configuration

Configure Authentication
Specify how the program call runtime should connect and authenticate

Specify signon values

Host name: TORASCGM

User ID: ERICDP

Password: *****

Enable password encoding

Use program call JCA connector

JNDI name: _____

< Back Next > Finish Cancel

Testing the Web Service

After wizard completes, the generated Test Client JSPs are run on the server (selected option "Test the Web service" in the wizard)

Select one of the methods to test, then enter the input data, Customer ID "0001"

Click "Invoke" and the results of the Web service are displayed, Customer ID "0001" is associated with Annie O!

▪ As you will see shortly, there are many different ways to test the Web service

Web Browser: //TestClient.jsp

Methods

- `custinfo` (iSeries.wsbeans.c)
- `custinfo_XML` (iSeries.wsbeans.c)

Inputs

inputData:

iN_LNAME: _____

iN_CID: 0001

Invoke Clear

returnp:

oUT_STATUS: _____

o_DS: _____

rEC_FOUND: 1

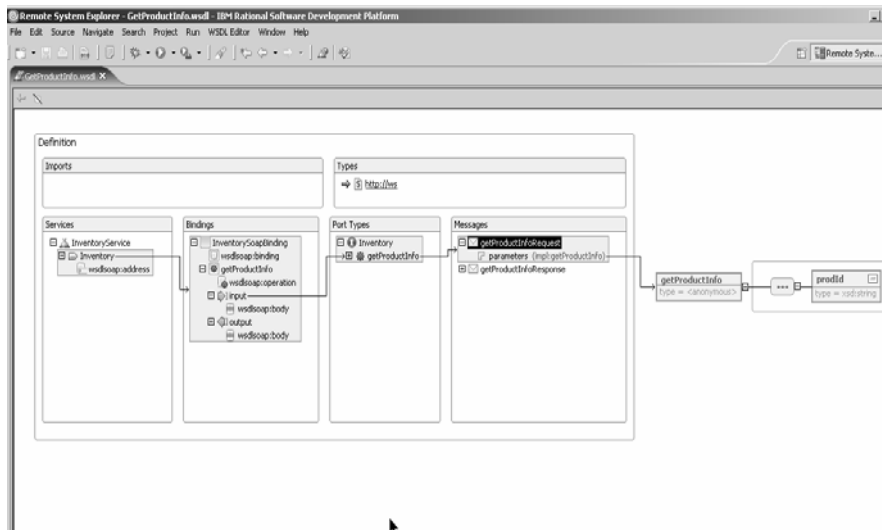
oUT_STATE: IO

oUT_FNAME: Annie O

oUT_COMMENTS: _____

00001

WSDL editor in WDS (graphical view)



Web Tool for iSeries

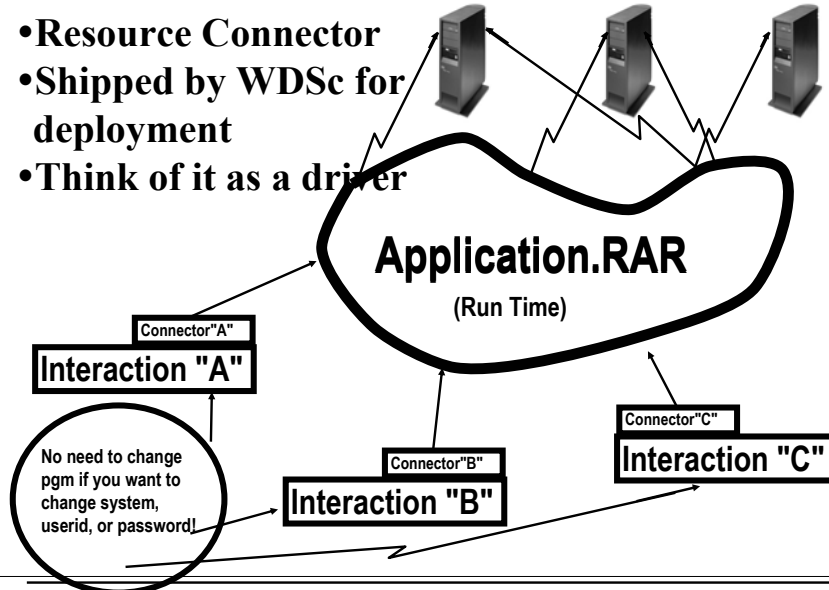
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- ✚ Wizards to help create iSeries RPG/COBOL web applications
 - Interaction wizard to build an RPG web application
 - WebService wizard to build an iSeries WebService
 - JCA wizard to build an iSeries Java Connector Architecture (JCA) connector

What is JCA Connectors?

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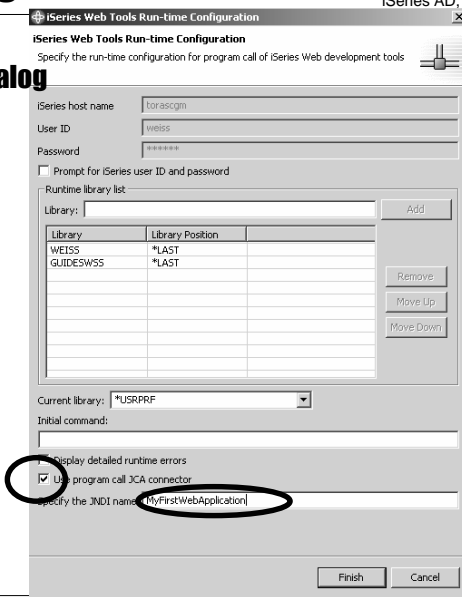
- Resource Connector
- Shipped by WDSc for deployment
- Think of it as a driver



Creating a connector

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- Use runtime configuration dialog
- Check JCA checkbox
- Specify JNDI name



SUMMARY

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- ▶ **System i5 web tools, at a glance**
 - **Tools optimized for System i5 developers!**
 - ▶ **Web Interaction wizard**
 - ✓ You define the parameters to a *PGM/*SRVPGM, wizard generates input JSP prompting for input parm, output JSP showing output parms, and all the glue in-between
 - ✓ Or you pre-create the input and/or output pages, and map the input/output fields on the pages to the input/output parameters in the *PGM/*SRVPGM, and it generates the glue to bind them
 - ✓ STRUTS based application
 - ▶ **New and enhanced Web Service wizard**
 - ✓ Make your system i5 programs available as a Web Service
 - ▶ **JCA wizard**
 - ✓ Create connectors for you system i5 programs

More Information?

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- ▶ **Information Sources**
 - **www.ibm.com/software/awdtools/iSeries**
 - ▶ For iSeries Application Development
 - **www.eclipse.org**
 - ▶ Eclipse and information about eclipse
 - **www.ignite400.org**
 - ▶ Introduction to eclipse article
 - **www.ibm.com/software/info1/websphere/partners/iseries.jsp**
 - ▶ WebSphere on iSeries home page for BPs
 - **eServer iSeries magazine, July 2002 issue**
 - ▶ 3 articles on WDS
 - **www.ibm.com/websphere/developer**
 - ▶ WebSphere Developer Domain
 - ▶ Many articles and tutorials on technology and tools, including eclipse and WSWB and WebSphere Studio configurations

Disclaimer

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Acknowledgement:

- This presentation is a collaborative effort of the IBM Toronto AS/400 Application Development presentation team, including work done by:

► *Phil Coulthard, George Farr, Claus Weiss, Don Wantz*

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