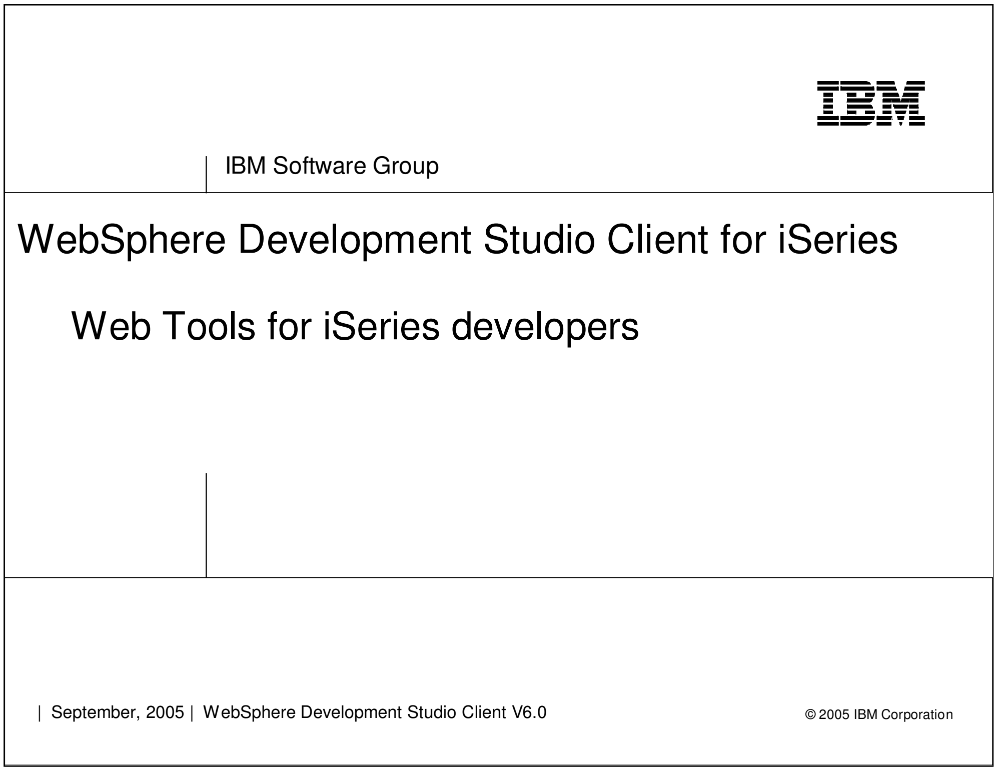
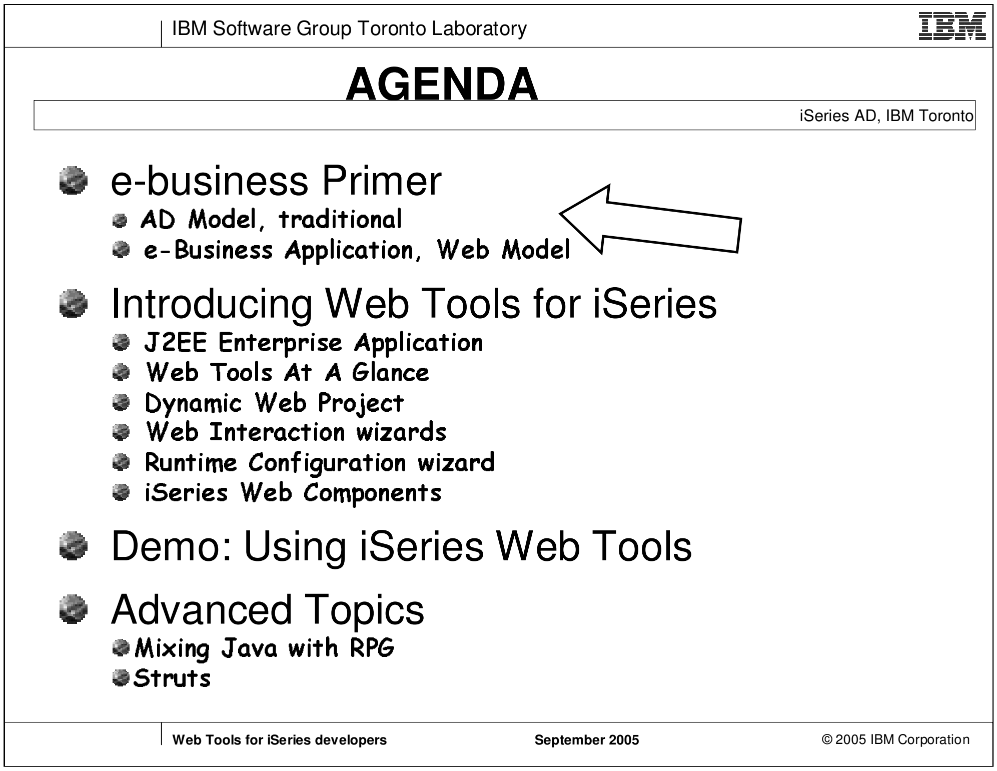


WebSphere Development Studio Client for iSeries

Web Tools for iSeries developers



IBM Software Group Toronto Laboratory

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AGENDA

iSeries AD, IBM Toronto

- e-business Primer
  - AD Model, traditional
  - e-Business Application, Web Model
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  - J2EE Enterprise Application
  - Web Tools At A Glance
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  - Web Interaction wizards
  - Runtime Configuration wizard
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- Demo: Using iSeries Web Tools
- Advanced Topics
  - Mixing Java with RPG
  - Struts

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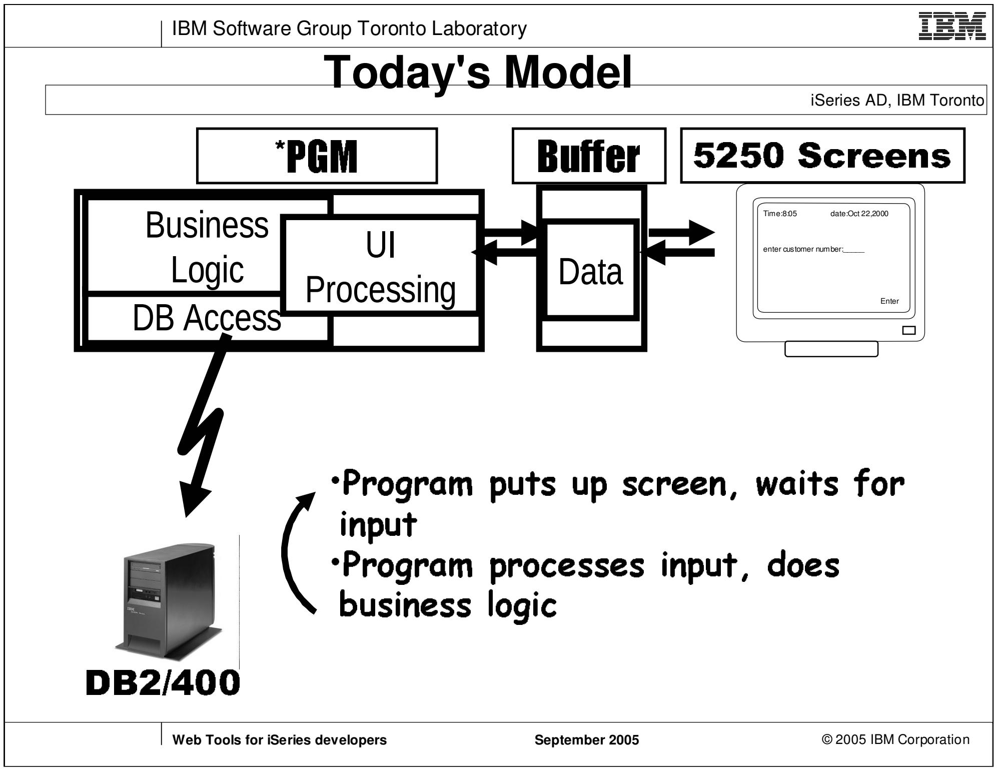
Next couple slides compare how many iSeries ILE applications look today vs. what the typical web application looks like



Today's Model

iSeries AD, IBM Toronto

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

The iSeries ILE program (e.g. RPG *PGM), performs the business logic, accesses program data (File I/O, or DB2 installed on iSeries for example).

PGM does UI processing, outputs UI information to a buffer. 5250 reads the buffer to display UI.

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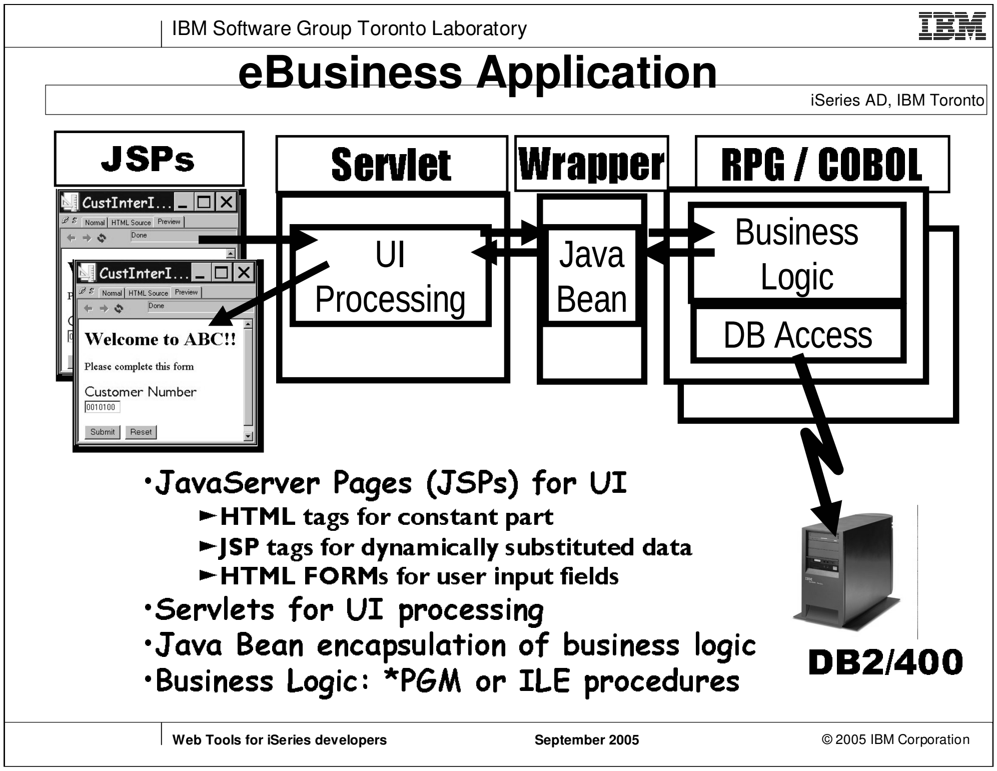
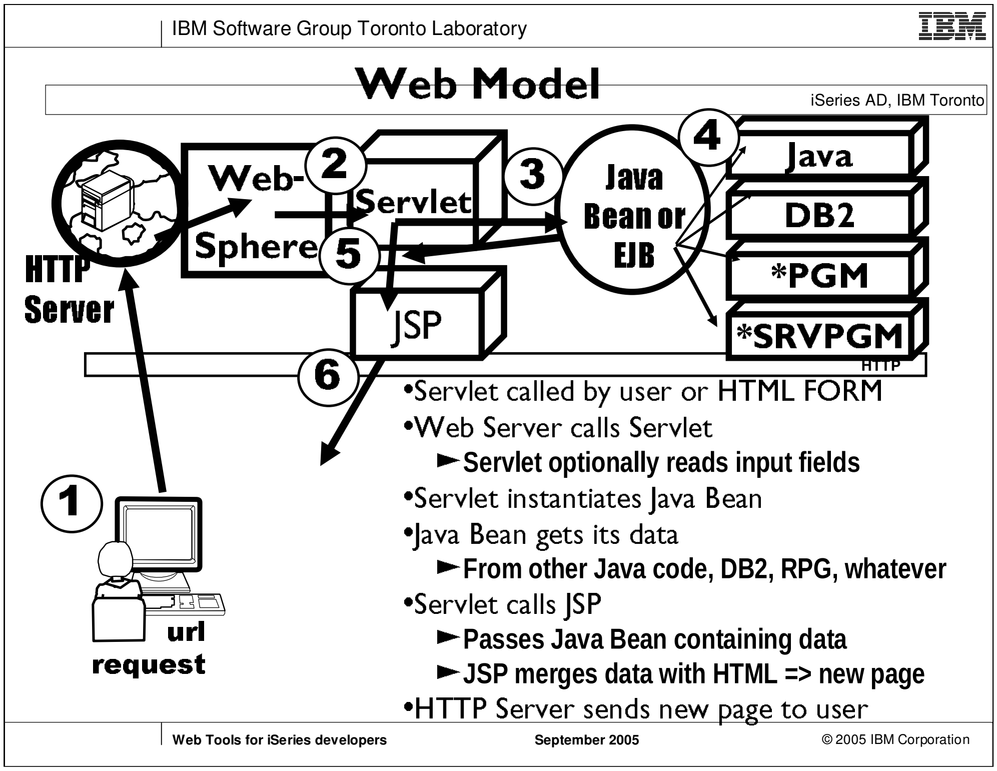


eBusiness Application

iSeries AD, IBM Toronto

- JavaServer Pages (JSPs) for UI
  - ►HTML tags for constant part
  - ►JSP tags for dynamically substituted data
  - ►HTML FORMs for user input fields
- Servlets for UI processing
- Java Bean encapsulation of business logic
- Business Logic: *PGM or ILE procedures

Typical e-Business application (JSP Model 2 architecture).



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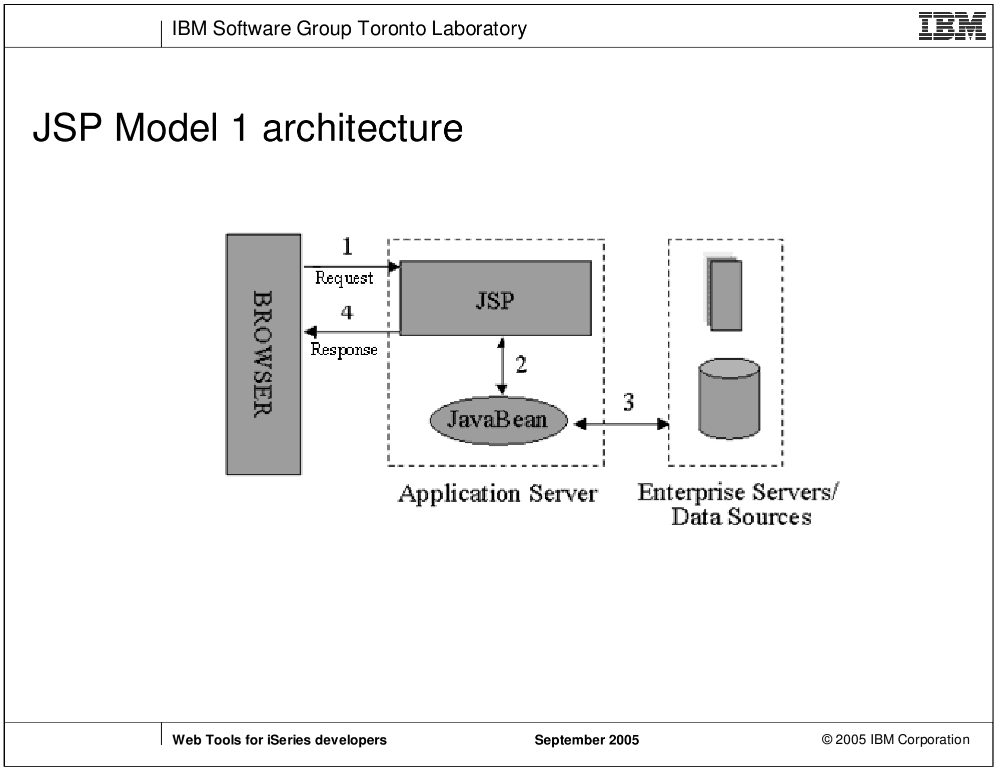
Web Model

iSeries AD, IBM Toronto

- Servlet called by user or HTML FORM
- Web Server calls Servlet
  - ►**Servlet optionally reads input fields**
- Servlet instantiates Java Bean
- Java Bean gets its data
  - ►**From other Java code, DB2, RPG, whatever**
- Servlet calls JSP
  - ►**Passes Java Bean containing data**
  - ►**JSP merges data with HTML => new page**
- HTTP Server sends new page to user

Web Tools for iSeries developers **September 2005** © 2005 IBM Corporation

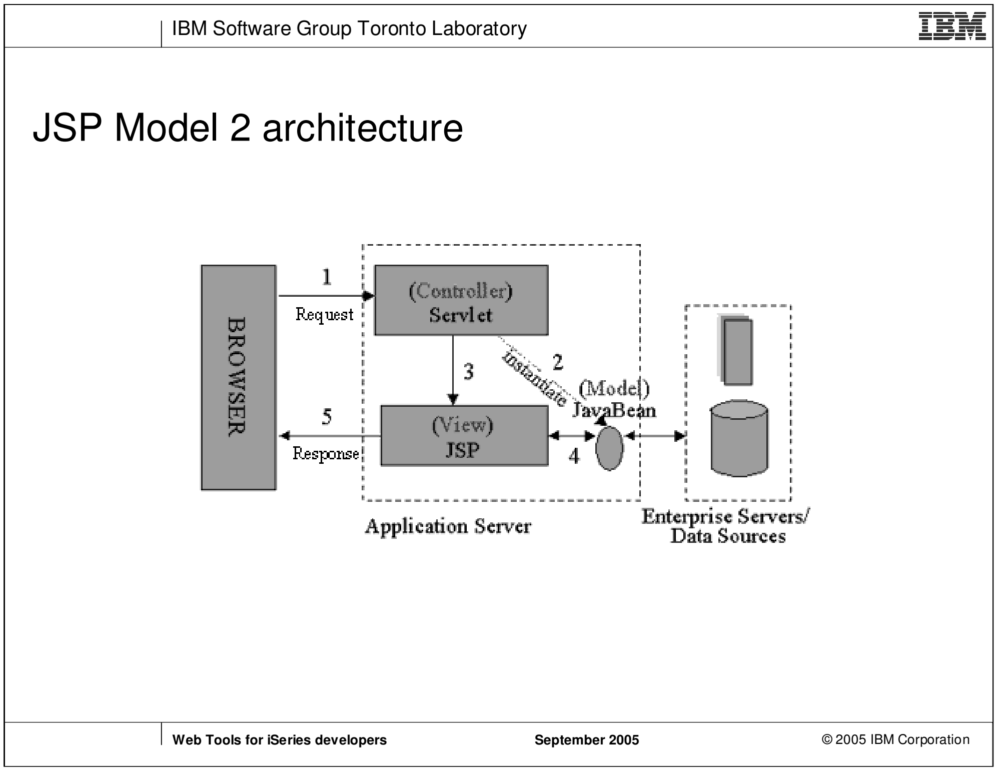
Above is typical Model 2 JSP architecture



JSP Model 1 architecture

Two approaches for building web applications using JSP technology- Model 1 & Model 2. The goal of a well designed web application (or any application) is to separate data presentation from content (or the model (business logic & data) from the view).

-M1 & M2 differ essentially in where the bulk of the processing is performed. In Model 1 the JSP alone is responsible for taking incoming requests and replying back to client. Results in lots of scriplets and Java Code in the JSP.



JSP Model 2 architecture

It takes advantage of the predominant strengths of both technologies, using JSP to generate the presentation layer and servlets to perform process-intensive tasks (controller).

Here, the servlet acts as the *controller* and is in charge of the request processing and the creation of any beans or objects used by the JSP, as well as deciding, depending on the user's actions, which JSP page to forward the request to. Note particularly that there is no processing logic within the JSP page itself; it is simply responsible for retrieving any objects or beans that may have been previously created by the servlet, and extracting the dynamic content from that servlet for insertion within static templates. This approach typically results in the cleanest separation of presentation from content.

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Terms: Web Application

J2EE 1.4

- ► Web App folder structure:

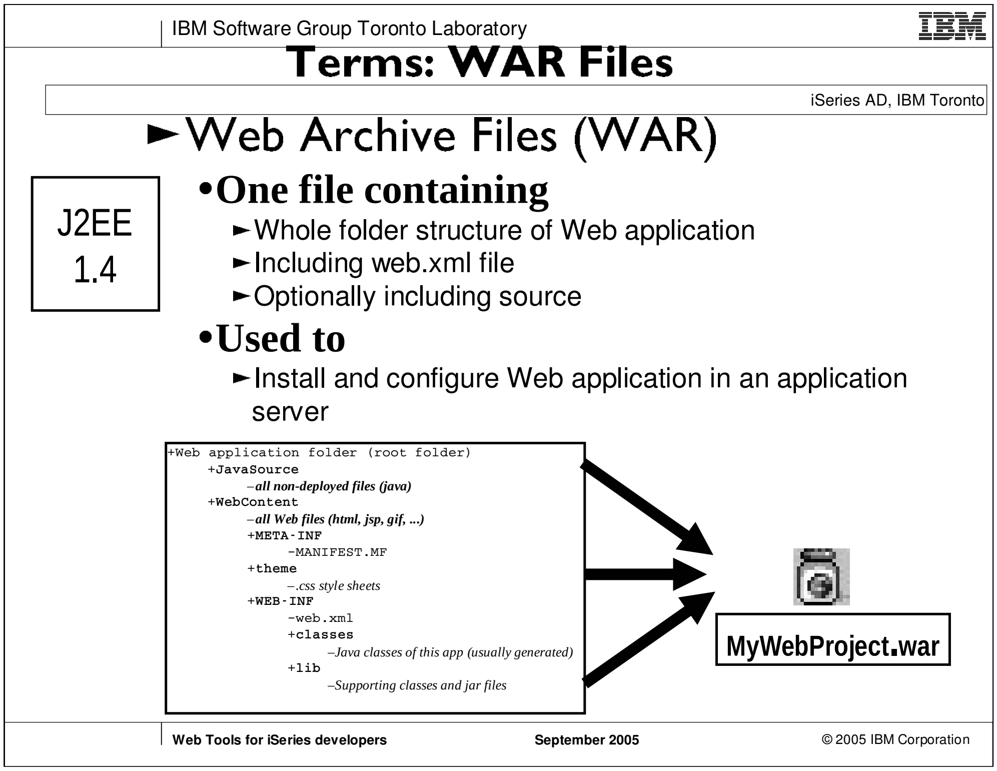
```
+Web application folder (root folder)
  +JavaSource
    –all non-deployed files (java)
  +WebContent
    –all Web files (html, jsp, gif, ...)
    +META-INF
      -MANIFEST.MF
    +theme
      –.css style sheets
    +WEB-INF
      -web.xml
      +classes
        –Java classes of this app (usually generated)
      +lib
        –Supporting classes and jar files
```

collectively known as "Web Resources"

maps dependent jar files in other Web apps

Web application deployment descriptor:

- ► identifies servlets, security, env vars, mime types, key pages, external references and session configuration info



Terms: WAR Files

iSeries AD, IBM Toronto

J2EE 1.4

►Web Archive Files (WAR)

- **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

```
+Web application folder (root folder)
     +JavaSource
          –all non-deployed files (java)
     +WebContent
          –all Web files (html, jsp, gif, ...)
          +META-INF
               -MANIFEST.MF
          +theme
               –.css style sheets
          +WEB-INF
               -web.xml
               +classes
                    –Java classes of this app (usually generated)
               +lib
                    –Supporting classes and jar files
```

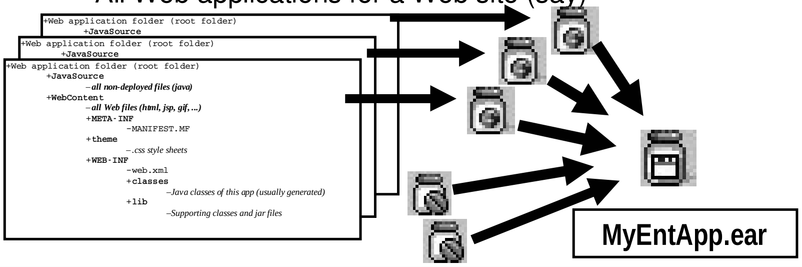
If you want to distribute and/or deploy a Web application, you package it as a WAR file (similar to a .jar file used to distribute java class libraries). J2EE specification defines what the WAR can contain → top-level WEB-INF folder contains web.xml and lib, class folders.

Terms: EAR Files

► Enterprise Archive Files (EAR)

J2EE 1.4

- •One file containing:
  - ►Zero or more Web Archive (war) files
  - ►Zero or more EJB jar files
  - ►Zero or more JCA resource adapter modules (rar) 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)



```
+Web application folder (root folder)
        +JavaSource
+Web application folder (root folder)
        +JavaSource
+Web application folder (root folder)
        +JavaSource
                –all non-deployed files (java)
        +WebContent
                –all Web files (html, jsp, gif, ...)
                +META-INF
                        –MANIFEST.MF
                +theme
                        –.css style sheets
                +WEB-INF
                        –web.xml
                        +classes
                                –Java classes of this app (usually generated)
                        +lib
                                –Supporting classes and jar files
```

Publish the EAR to the app server

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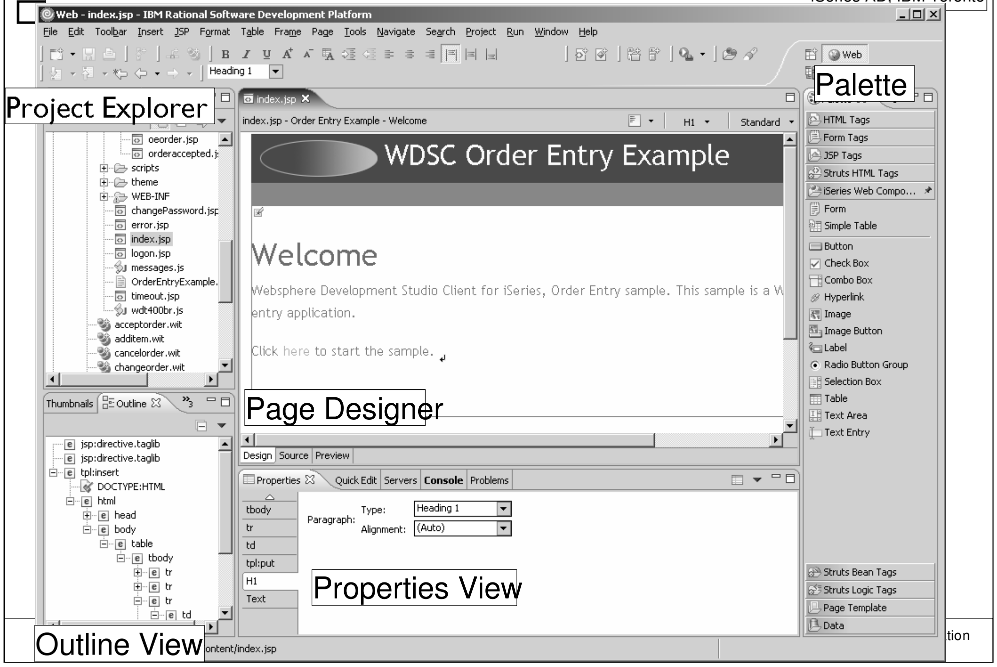
WDSc Web Tools At A Glance

- ► **Web projects**
  - ✓Dynamic Web project - Created with J2EE-defined folder structure for Web Applications
    - ✓Superset of Java projects (so contain all Java Tool support too)
- ► **Automatic creation/maintainence of web.xml file**
- ► **Editor support**
  - ✓JSP and HTML files
    - ✓Support for creating, validating, editing with content assist, and debugging
    - ✓Including WYSIWYG PageDesigner
    - ✓Custom JSP tags (taglib) support
  - ✓Images and animation
  - ✓Cascading Syle Sheets (CSS)
  - ✓Web Diagram Editor
    - ✓To visualize and change the flow of a Struts-based application
- ► **WAR file import, export, and validation**
- ► **Integration with WebSphere Test Environment**

Web Perspective with Page Designer



Web - index.jsp - IBM Rational Software Development Platform

index.jsp - Order Entry Example - Welcome

WDSC Order Entry Example

Welcome

Websphere Development Studio Client for iSeries, Order Entry sample. This sample is a W entry application.

Click here to start the sample.

Paragraph: Type: Heading 1 Alignment: (Auto)

Project Explorer

Palette

Page Designer

Properties View

Outline View

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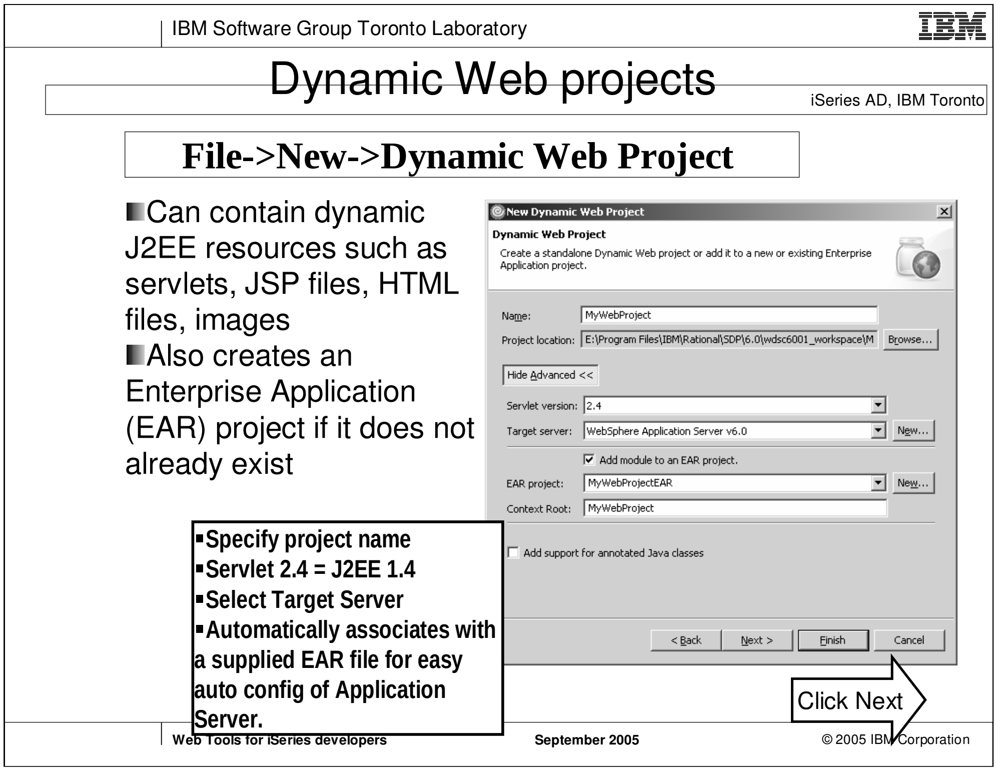

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Dynamic Web projects

iSeries AD, IBM Toronto

File->New->Dynamic Web Project

- Can contain dynamic J2EE resources such as servlets, JSP files, HTML files, images
- Also creates an Enterprise Application (EAR) project if it does not already exist

New Dynamic Web Project

Dynamic Web Project

Create a standalone Dynamic Web project or add it to a new or existing Enterprise Application project.

Name: MyWebProject

Project location: E:\Program Files\IBM\Rational\SDP\6.0\wdsc6001_workspace\M

Servlet version: 2.4

Target server: WebSphere Application Server v6.0

☑ Add module to an EAR project.

EAR project: MyWebProjectEAR

Context Root: MyWebProject

☐ Add support for annotated Java classes

- **Specify project name**
- **Servlet 2.4 = J2EE 1.4**
- **Select Target Server**
- **Automatically associates with a supplied EAR file for easy auto config of Application Server.**

Click Next

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•Special type of project

•Created with J2EE folder layout

•Created with simple web.xml file

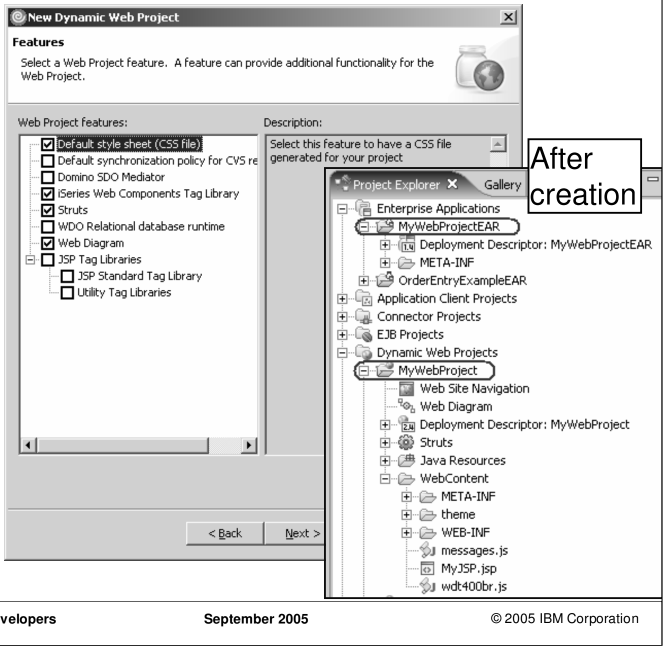
►Automatically updated as resources are created

►Has specialized web.xml editor

Dynamic Web projects

iSeries AD, IBM Toronto

- Optionally creates a CSS style for whole Web app
- Add iSeries Web Components Tag Library
- Add Struts feature
- Add Web Diagram feature



New Dynamic Web Project

Features

Select a Web Project feature. A feature can provide additional functionality for the Web Project.

Web Project features:

- ☑ Default style sheet (CSS file)
- □ Default synchronization policy for CVS re
- □ Domino SDO Mediator
- ☑ iSeries Web Components Tag Library
- ☑ Struts
- □ WDO Relational database runtime
- ☑ Web Diagram
- □ JSP Tag Libraries
  - □ JSP Standard Tag Library
  - □ Utility Tag Libraries

Description:

Select this feature to have a CSS file generated for your project

After creation

- Enterprise Applications
  - MyWebProjectEAR
    - Deployment Descriptor: MyWebProjectEAR
    - META-INF
  - OrderEntryExampleEAR
- Application Client Projects
- Connector Projects
- EJB Projects
- Dynamic Web Projects
  - MyWebProject
    - Web Site Navigation
    - Web Diagram
    - Deployment Descriptor: MyWebProject
    - Struts
    - Java Resources
    - WebContent
      - META-INF
      - theme
      - WEB-INF
      - messages.js
      - MyJSP.jsp
      - wdt400br.js

- ►**In Dynamic Web Project:**
  - ►**JavaSource**
    - ►for Java classes and resources
  - ►**WebContent**
    - ►for deployed files
    - ►.jsps and .html files go here
  - ►**.../theme**
    - ►for style sheets
  - ►**../WEB-INF**
    - ►run-time dependencies
    - ►jar files go here

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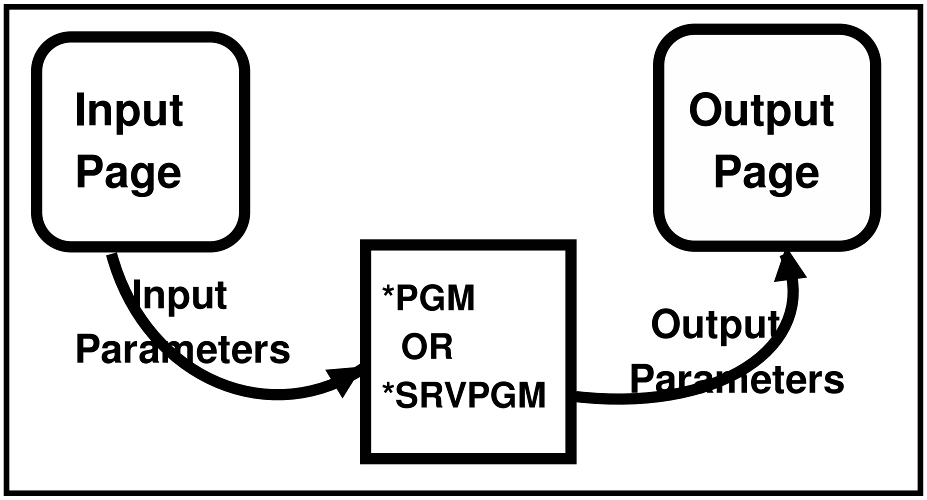
Web Interaction Wizard

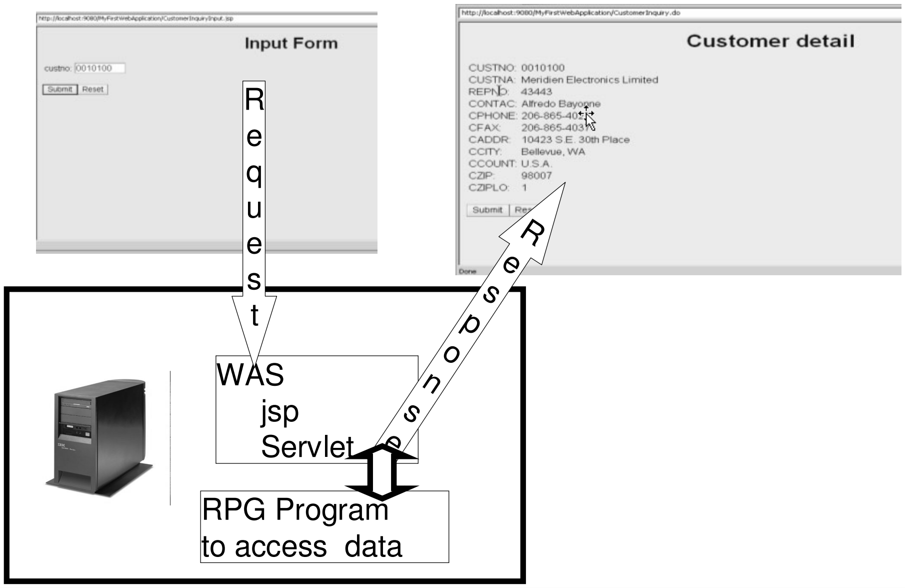
- Wizard to help create iSeries RPG/COBOL web applications
  - To build a Web interaction from iSeries RPG/COBOL business logic, or with Java bean methods

A Web Interaction



Build simple interaction

iSeries AD, IBM Toronto



http://localhost:9080/MyFirstWebApplication/CustomerInquiryInput.jsp

Input Form

custno: 0010100

Submit Reset

http://localhost:9080/MyFirstWebApplication/CustomerInquiry.do

Customer detail

CUSTNO:	0010100
CUSTNA:	Meridien Electronics Limited
REPNO:	43443
CONTAC:	Alfredo Bayonne
CPHONE:	206-865-402
CFAX:	206-865-4037
CADDR:	10423 S.E. 30th Place
CCITY:	Bellevue, WA
CCOUNT:	U.S.A.
CZIP:	98007
CZIPLO:	1

Submit Res

Done

Request

Response

WAS
jsp
Servlet

RPG Program
to access data

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 provide 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
- ►Can optionally define message handling for Web pages, and specify flow control of pages
- ►STRUTS based application

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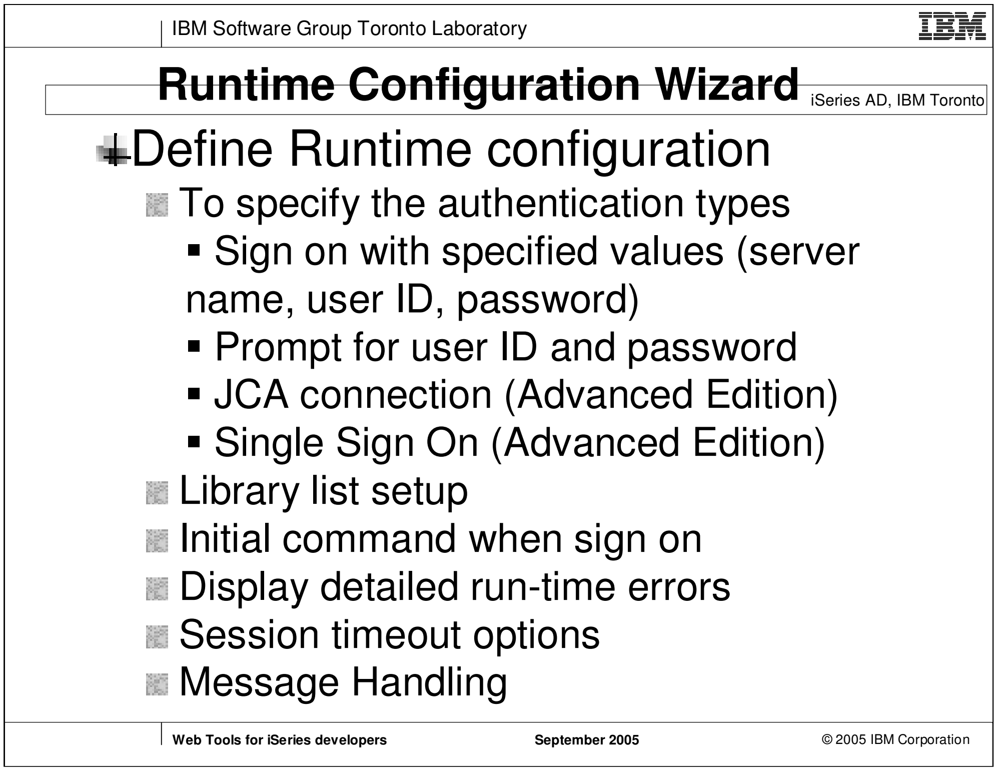

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Runtime Configuration Wizard

iSeries AD, IBM Toronto

- Define Runtime configuration
  - To specify the authentication types
    - Sign on with specified values (server name, user ID, password)
    - Prompt for user ID and password
    - JCA connection (Advanced Edition)
    - Single Sign On (Advanced Edition)
  - Library list setup
  - Initial command when sign on
  - Display detailed run-time errors
  - Session timeout options
  - Message Handling

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•The J2EE Connector architecture provides a Java technology solution to the problem of connectivity between the many application servers and enterprise information systems (e.g. iSeries host).

•Single sign-on (SSO) - Only prompted to signon once across multiple Web applications. It is a mechanism whereby a single action of user authentication and authorization to a given server can permit a user to access all computers and systems where he has access permission, without the need to enter multiple passwords. Single sign-on reduces human error, a major component of systems failure and is therefore highly desirable but difficult to

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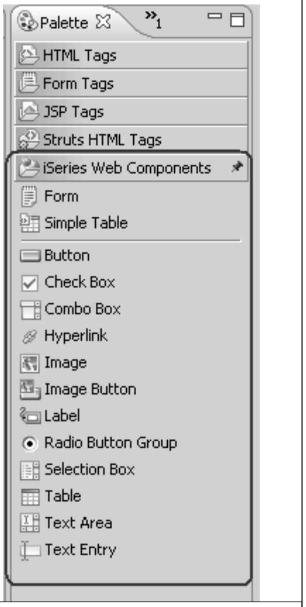
iSeries Web components

iSeries AD, IBM Toronto

- Web UI components that allow visualization in Page Designer
- With iSeries built-in features
- Allows typical iSeries data formatting, e.g. edit code, edit word
- Table with Subfile capabilities to display a list of records from an iSeries database



•WC’s implemented as VCT’s so can be used in Page designers and viewed/edited in one of 3 views (design/source/preview)

•Formatting and validation defined for the WC in attribute view (e.g. format data as a date, numeric, currency etc. and specify that locale sensitive information, e.g. decimal symbol, currency symbol, to come from either the web client or the iSeries host defined in web.xml)

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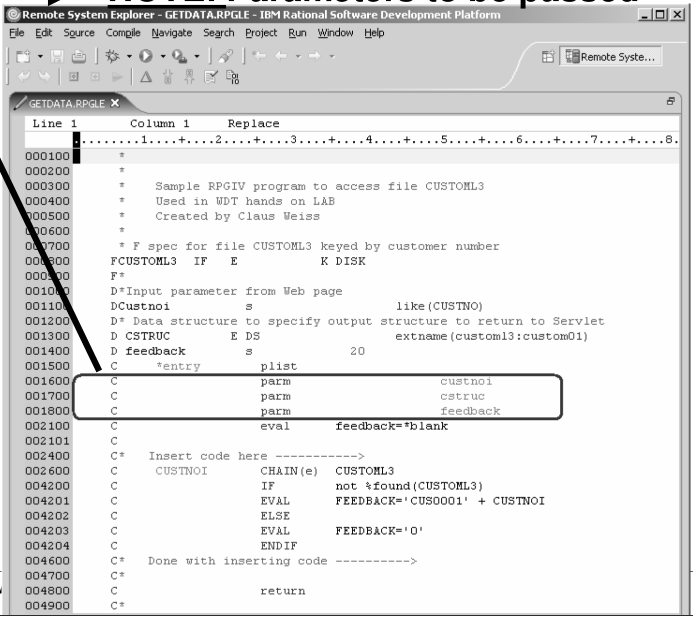
Using iSeries Web Tools

To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

- Create or reuse RPG program ⇦
- Create a Dynamic Web project
- Create Runtime configuration
- Design with Web Diagram Editor
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

RPG Program

NOTE: Parameters to be passed


Remote System Explorer - GETDATA.RPGLE - IBM Rational Software Development Platform
File Edit Source Compile Navigate Search Project Run Window Help
Remote Syste...
GETDATA.RPGLE
Line 1 Column 1 Replace

```
      *
      *
      *    Sample RPGIV program to access file CUSTOML3
      *    Used in WDT hands on LAB
      *    Created by Claus Weiss
      *
      * F spec for file CUSTOML3 keyed by customer number
     FCUSTOML3  IF   E           K DISK
     F*
     D*Input parameter from Web page
     DCustnoi          s                   like(CUSTNO)
     D* Data structure to specify output structure to return to Servlet
     D CSTRUC        E DS                  extname(customl3:custom01)
     D feedback        s             20
     C     *entry        plist
     C                   parm                    custnoi
     C                   parm                    cstruc
     C                   parm                    feedback
     C                   eval      feedback=*blank
     C
     C*   Insert code here ----------->
     C     CUSTNOI       CHAIN(e)  CUSTOML3
     C                   IF        not %found(CUSTOML3)
     C                   EVAL      FEEDBACK='CUS0001' + CUSTNOI
     C                   ELSE
     C                   EVAL      FEEDBACK='0'
     C                   ENDIF
     C*   Done with inserting code ---------->
     C*
     C                   return
     C*
```

custnoi is customer number

cstruc is customer informaton

feedback is program return code

Using iSeries Web Tools

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- Create or reuse RPG program
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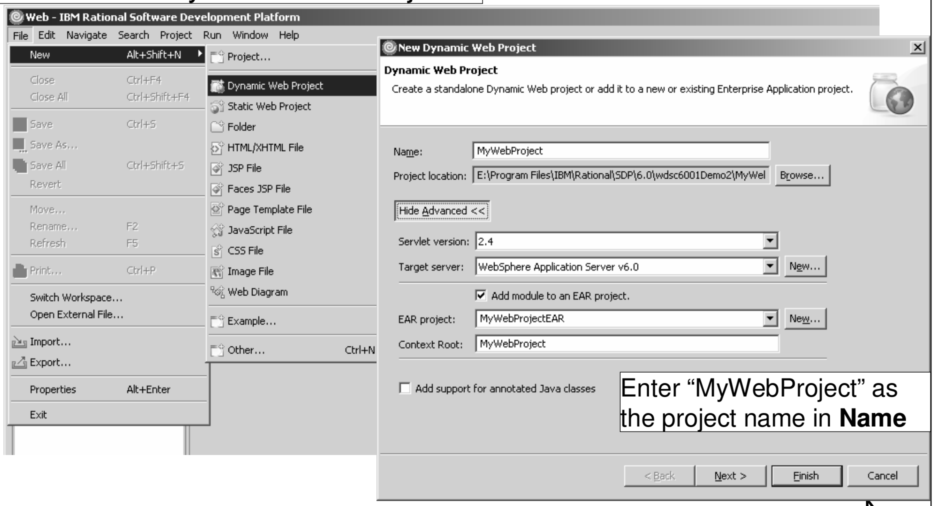
Create a Dynamic Web project

iSeries AD, IBM Toronto

File > New > Dynamic Web Project



New Dynamic Web Project

Dynamic Web Project

Create a standalone Dynamic Web project or add it to a new or existing Enterprise Application project.

Name: MyWebProject

Project location: E:\Program Files\IBM\Rational\SDP\6.0\wdsc6001Demo2\MyWel

Servlet version: 2.4

Target server: WebSphere Application Server v6.0

☑ Add module to an EAR project.

EAR project: MyWebProjectEAR

Context Root: MyWebProject

☐ Add support for annotated Java classes

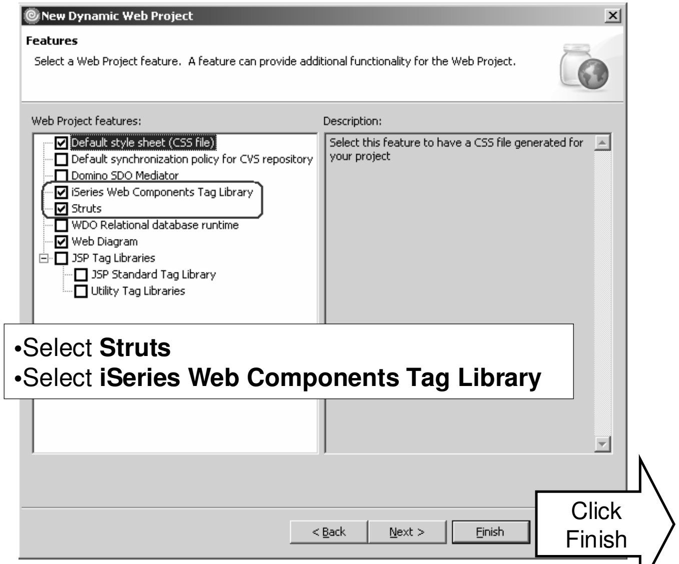
Enter “MyWebProject” as the project name in **Name**

Click Next

- **Servlet 2.4 = J2EE 1.4**
- **Servlet 2.3 = J2EE 1.3**
- **Servlet 2.2 = J2EE 1.2**

- creates an Enterprise Application (EAR) project if it does not already exist

Create a Dynamic Web Project



New Dynamic Web Project

Features

Select a Web Project feature. A feature can provide additional functionality for the Web Project.

Web Project features:

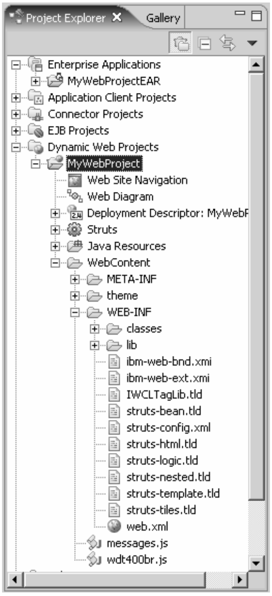
- ☑ Default style sheet (CSS file)
- □ Default synchronization policy for CVS repository
- □ Domino SDO Mediator
- ☑ iSeries Web Components Tag Library
- ☑ Struts
- □ WDO Relational database runtime
- ☑ Web Diagram
- □ JSP Tag Libraries
  - □ JSP Standard Tag Library
  - □ Utility Tag Libraries

Description:

Select this feature to have a CSS file generated for your project

•Select **Struts**
•Select **iSeries Web Components Tag Library**

Click Finish



- Enterprise Applications
  - MyWebProjectEAR
- Application Client Projects
- Connector Projects
- EJB Projects
- Dynamic Web Projects
  - MyWebProject
    - Web Site Navigation
    - Web Diagram
    - Deployment Descriptor: MyWebP
    - Struts
    - Java Resources
    - WebContent
      - META-INF
      - theme
      - WEB-INF
        - classes
        - lib
        - ibm-web-bnd.xmi
        - ibm-web-ext.xmi
        - IWCLTagLib.tld
        - struts-bean.tld
        - struts-config.xml
        - struts-html.tld
        - struts-logic.tld
        - struts-nested.tld
        - struts-template.tld
        - struts-tiles.tld
        - web.xml
      - messages.js
      - wdt400br.js

•Select **Struts** for a Struts-based application

•Select **iSeries Web Component Tag Library** to add the tag library to the project

Using iSeries Web Tools

To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

- Create or reuse RPG program
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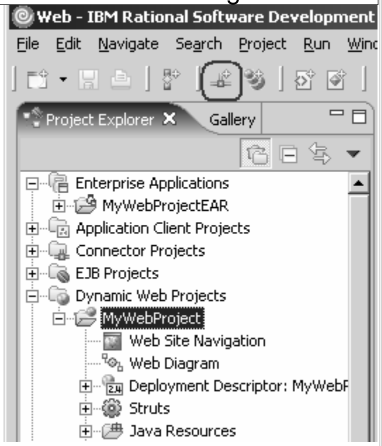
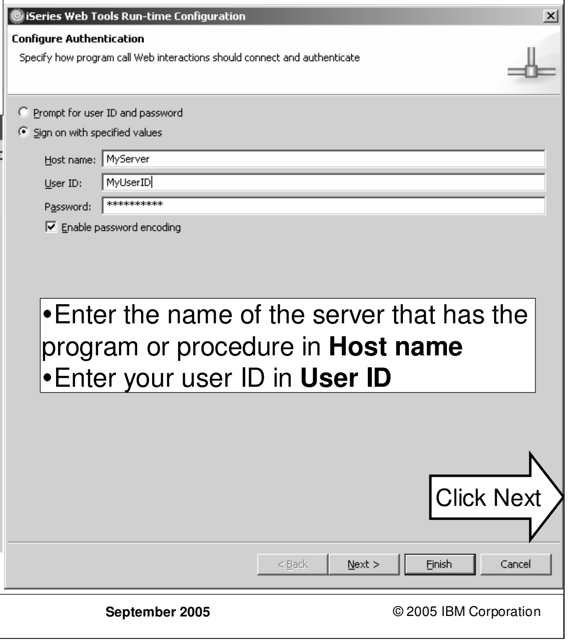
- Create Runtime configuration ⇦
- Design with Web Diagram Editor
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

Runtime Configuration Wizard

- Select the project “MyWebProject” in **Project Explorer**
- Click Runtime Configuration icon




iSeries Web Tools Run-time Configuration

Configure Authentication

Specify how program call Web interactions should connect and authenticate

○ Prompt for user ID and password

● Sign on with specified values

Host name: MyServer

User ID: MyUserID

Password: **********

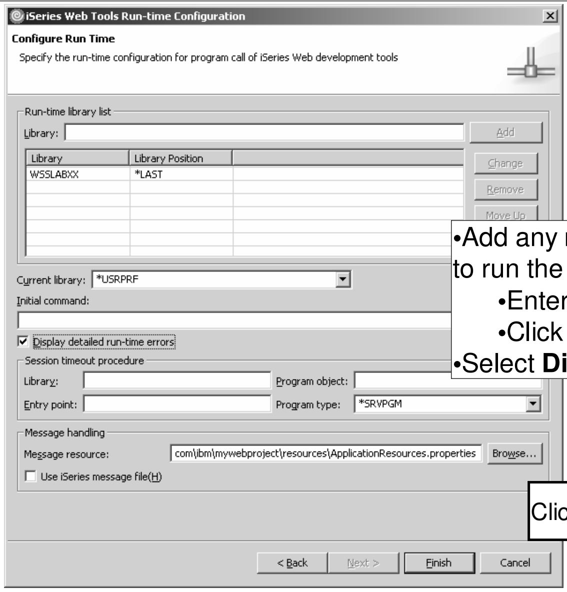
☑ Enable password encoding

- Enter the name of the server that has the program or procedure in **Host name**
- Enter your user ID in **User ID**

Click Next

JCA Connector and Single Signon are available in advanced version.

Runtime Configuration Wizard



iSeries Web Tools Run-time Configuration

Configure Run Time

Specify the run-time configuration for program call of iSeries Web development tools

Run-time library list

Library:

Library	Library Position
WSSLABXX	*LAST

Current library: *USRPRF

Initial command:

☑ Display detailed run-time errors

Session timeout procedure

Library:

Program object:

Entry point:

Program type: *SRVPGM

Message handling

Message resource: com\ibm\mywebproject\resources\ApplicationResources.properties

☐ Use iSeries message file(H)

- Add any runtime library that are required to run the host program or procedure
  - Enter library “wsslabxx” in **Library**
  - Click **Add**
- Select **Display detailed run-time errors**

Click Finish

Using iSeries Web Tools

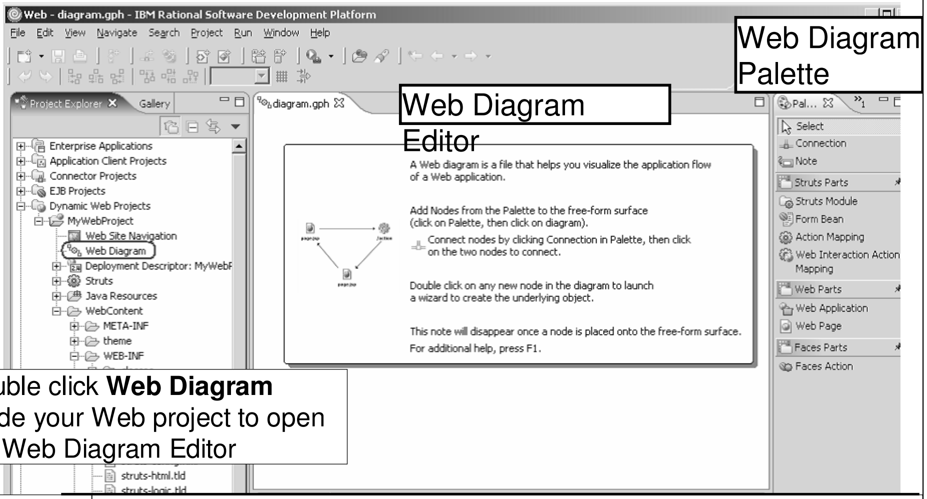
To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

- Create or reuse RPG program
- Create a Dynamic Web project
- Create Runtime configuration
- Design with Web Diagram Editor ⇦
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

Web Diagram Editor

iSeries AD, IBM Toronto

A Web diagram helps you to design the flow of a Web application. It consists of *nodes* and *connections* between nodes. A node is an icon that represents a resource such as a Web page, Java bean.



A Web diagram is a file that helps you visualize the application flow of a Web application.

Add Nodes from the Palette to the free-form surface (click on Palette, then click on diagram).

Connect nodes by clicking Connection in Palette, then click on the two nodes to connect.

Double click on any new node in the diagram to launch a wizard to create the underlying object.

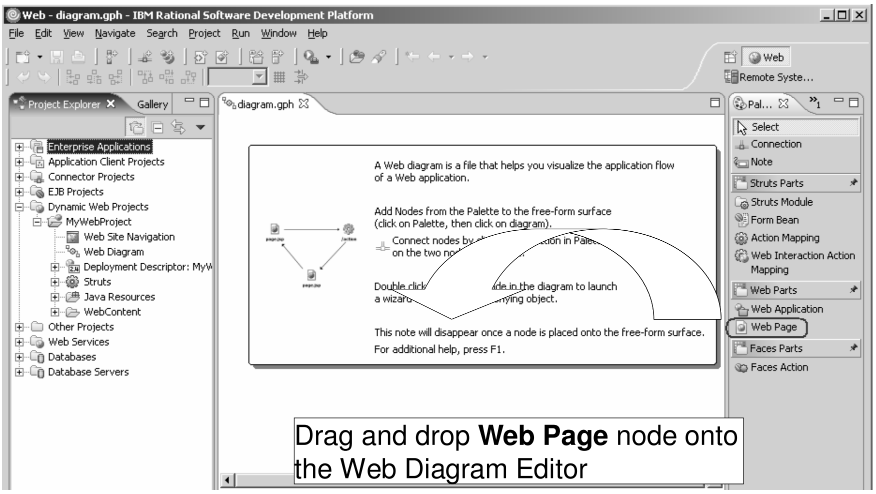
This note will disappear once a node is placed onto the free-form surface. For additional help, press F1.

Web Diagram Palette

Web Diagram Editor

Double click **Web Diagram** inside your Web project to open the Web Diagram Editor

Web Diagram Editor



A Web diagram is a file that helps you visualize the application flow of a Web application.

Add Nodes from the Palette to the free-form surface (click on Palette, then click on diagram).

Connect nodes by c ction in Pale on the two no

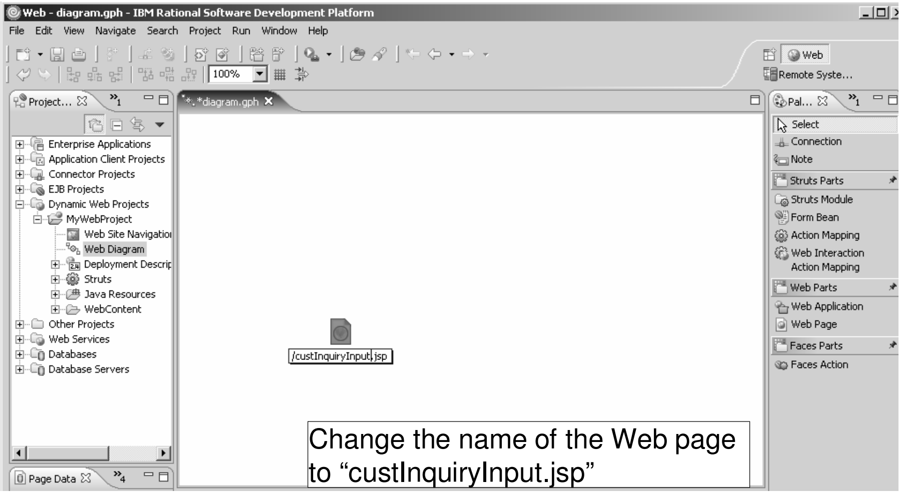
Double click de in the diagram to launch a wizard ying object.

This note will disappear once a node is placed onto the free-form surface.

For additional help, press F1.

Drag and drop **Web Page** node onto the Web Diagram Editor

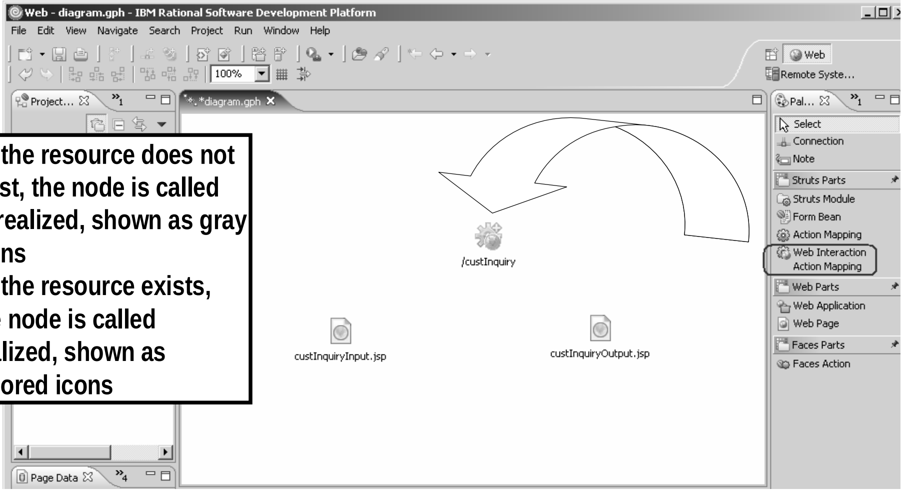
Web Diagram Editor



Change the name of the Web page to “custInquiryInput.jsp”

Web Diagram Editor

iSeries AD, IBM Toronto

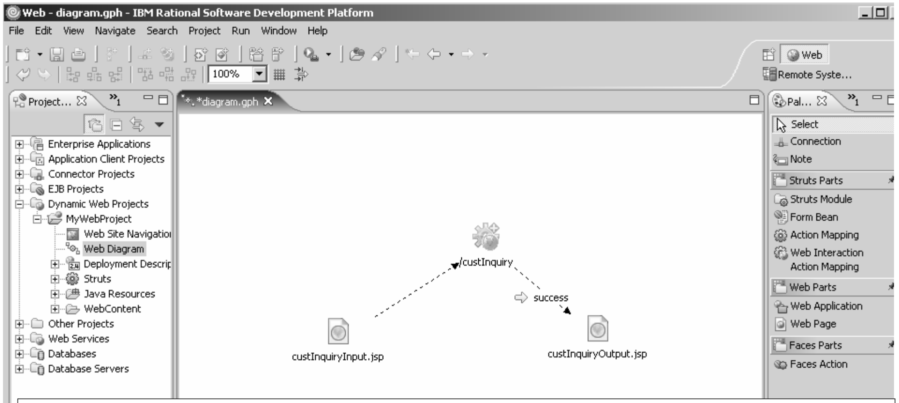


- if the resource does not exist, the node is called unrealized, shown as gray icons
- If the resource exists, the node is called realized, shown as colored icons

•Drop a second **Web Page** node and name it as “custInquiryOutput.jsp”
•Then drag and drop a **Web Interaction Action Mapping** node to represent the interaction, and name it as “custInquiry”

Web Diagram Editor

iSeries AD, IBM Toronto



- •Right click on custInquiryInput node, select **Connection**
- •Draw a connection line from custInquiryInput node to custInquiry node
- •Right click on custInquiry node, select **Connection**
- •Draw a connection line from custInquiry node to custInquiryOutput node
- •Give a name “success” to the local forward connection
- •A local forward connection represents the possibility that this action can go to a new destination, “custInquiryOutput.jsp” through a forward

Using iSeries Web Tools

To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

- Create or reuse RPG program
- Create a Dynamic Web project
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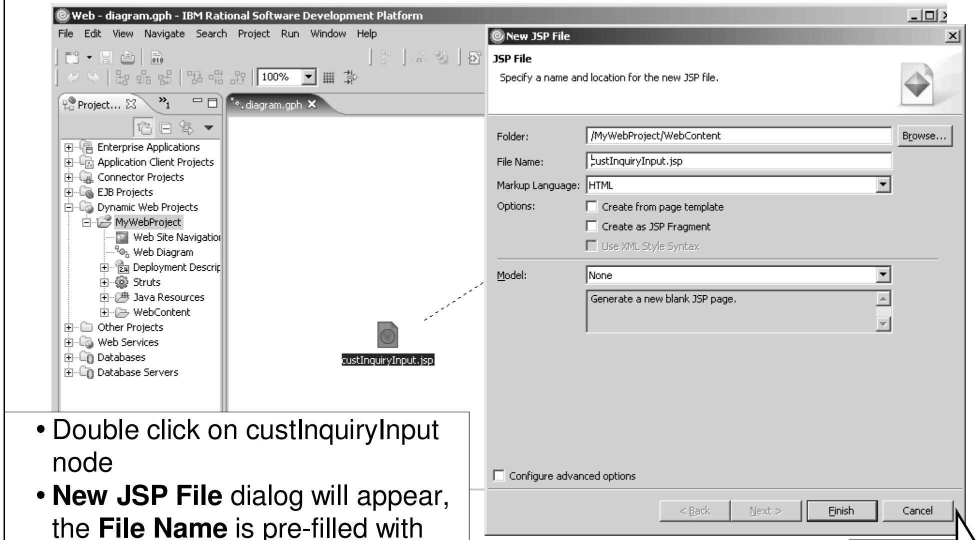
- Design with Web Diagram Editor
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

Create Web Page



JSP File

Specify a name and location for the new JSP file.

Folder: /MyWebProject/WebContent

File Name: custInquiryInput.jsp

Markup Language: HTML

Options:
☐ Create from page template
☐ Create as JSP Fragment
☐ Use XML Style Syntax

Model: None

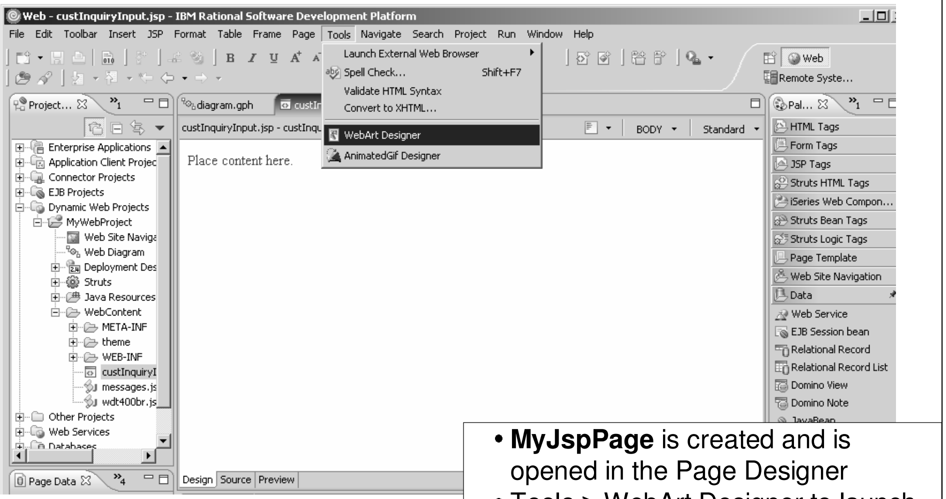
Generate a new blank JSP page.

☐ Configure advanced options

- Double click on custInquiryInput node
- **New JSP File** dialog will appear, the **File Name** is pre-filled with the name of the node
- Click **Finish**

Click Finish

Design Web Page

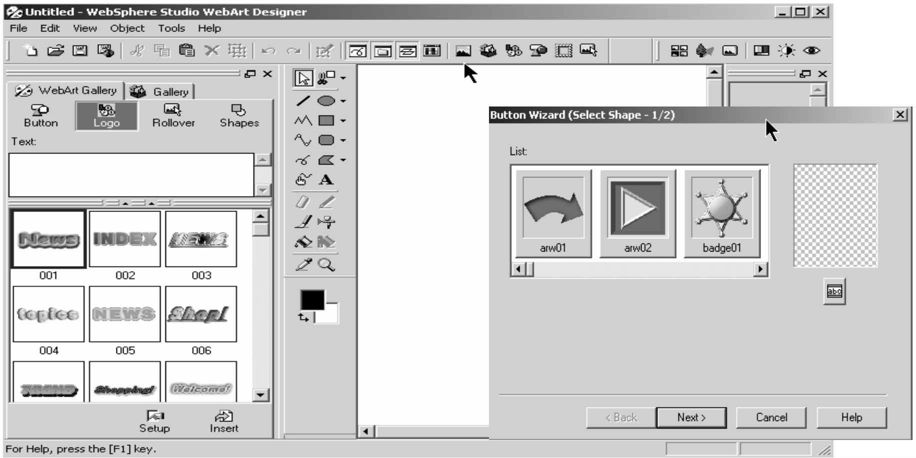


- **MyJspPage** is created and is opened in the Page Designer
- Tools > WebArt Designer to launch the WebArt Designer to design a logo

WebArt Designer

iSeries AD, IBM Toronto

- Wizards for Logo/Button/PhotoFrame/Rollover
- Supports MIF, GIF, JPEG, PNG, Bitmap, Windows Metafile, TIFF, FlashPix, Photo CD file types

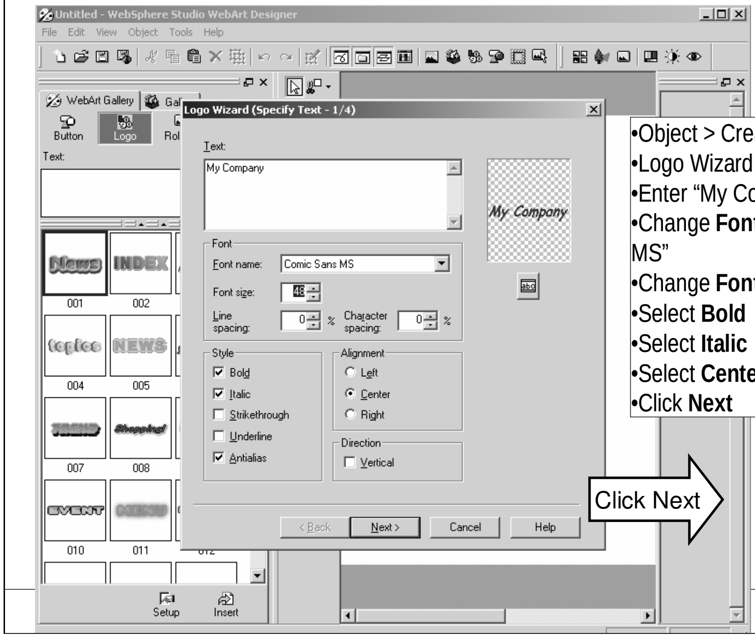

Untitled - WebSphere Studio WebArt Designer
File Edit View Object Tools Help
WebArt Gallery
Gallery
Button
Logo
Rollover
Shapes
Text:
001
002
003
004
005
006
Setup
Insert
Button Wizard (Select Shape - 1/2)
List:
arw01
arw02
badge01
< Back
Next >
Cancel
Help
For Help, press the [F1] key.

•WebArt Designer assists you in creating, manipulating, and editing graphics and image files that you can import to Page Designer.

•Use this application to edit the color tone and contrast of imported photographs

WebArt Designer

iSeries AD, IBM Toronto


Untitled - WebSphere Studio WebArt Designer
File Edit View Object Tools Help
WebArt Gallery
Button
Logo
Text:
001
002
004
005
007
008
010
011
Setup
Insert
Logo Wizard (Specify Text - 1/4)

Text: My Company

Font
Font name: Comic Sans MS
Font size: 48
Line spacing: 0 %
Character spacing: 0 %

Style
☑ Bold
☑ Italic
☐ Strikethrough
☐ Underline
☑ Antialias

Alignment
○ Left
● Center
○ Right

Direction
☐ Vertical

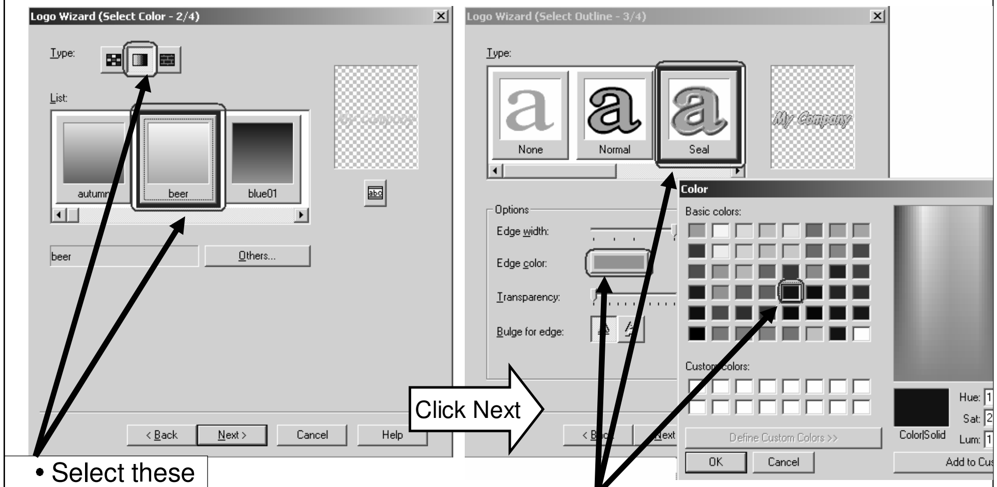
< Back | Next > | Cancel | Help

- •Object > Create Logo
- •Logo Wizard opens
- •Enter “My Company” in **Text**
- •Change **Font name** to “Comic Sans MS”
- •Change **Font size** to “48”
- •Select **Bold**
- •Select **Italic**
- •Select **Center**
- •Click **Next**

Click Next

To create a logo

WebArt Designer

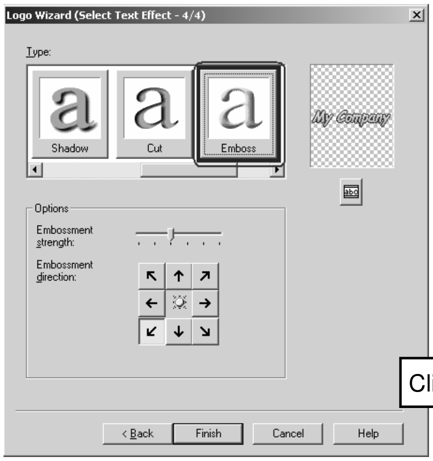


Click Next

- Select these

- Select **Seal**
- Click **Edge color**
- Select blue color
- Click **OK**
- Click **Next**

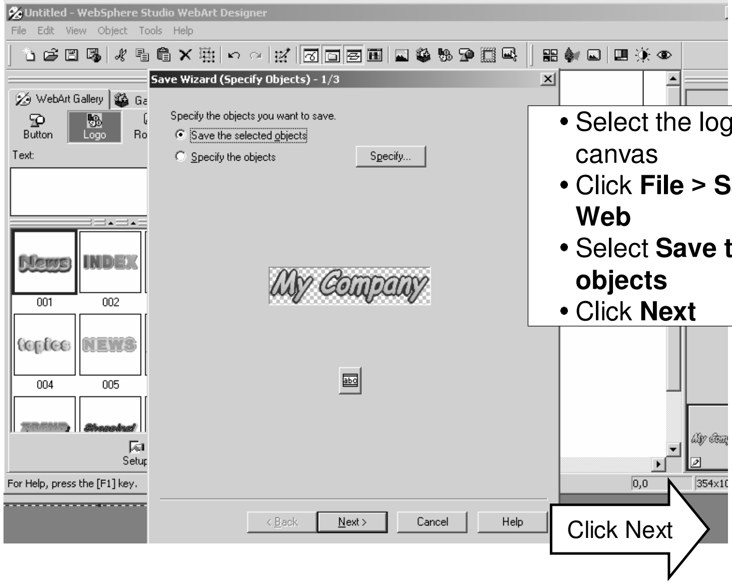
WebArt Designer



- Select **Emboss**
- Click **Finish**

Click Finish

WebArt Designer



Untitled - WebSphere Studio WebArt Designer
File Edit View Object Tools Help
WebArt Gallery
Button
Logo
Text:
001
002
004
005
Setup
For Help, press the [F1] key.
Save Wizard (Specify Objects) - 1/3
My Company
< Back
Next >
Cancel
Help
0,0
354x10

Specify the objects you want to save.

● Save the selected objects

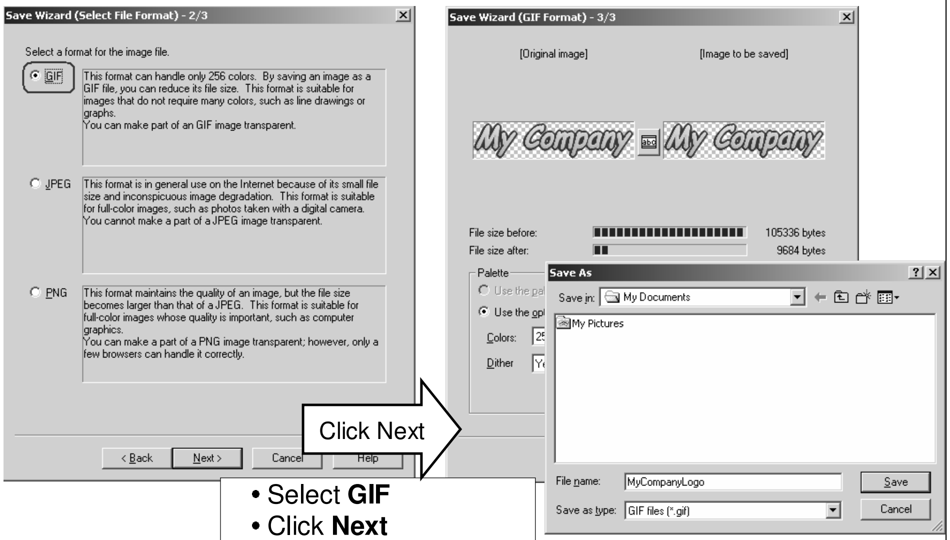
○ Specify the objects Specify...

- Select the logo object on the canvas
- Click **File > Save Wizard for Web**
- Select **Save the selected objects**
- Click **Next**

Click Next

WebArt Designer

iSeries AD, IBM Toronto



Save Wizard (Select File Format) - 2/3

Select a format for the image file.

● GIF — This format can handle only 256 colors. By saving an image as a GIF file, you can reduce its file size. This format is suitable for images that do not require many colors, such as line drawings or graphs.
You can make part of an GIF image transparent.

○ JPEG — This format is in general use on the Internet because of its small file size and inconspicuous image degradation. This format is suitable for full-color images, such as photos taken with a digital camera.
You cannot make a part of a JPEG image transparent.

○ PNG — This format maintains the quality of an image, but the file size becomes larger than that of a JPEG. This format is suitable for full-color images whose quality is important, such as computer graphics.
You can make a part of a PNG image transparent; however, only a few browsers can handle it correctly.

Save Wizard (GIF Format) - 3/3

File size before: 105336 bytes

File size after: 9684 bytes

Palette

○ Use the pal

● Use the opt

Colors: 25

Dither: Ye

Save As

Save in: My Documents

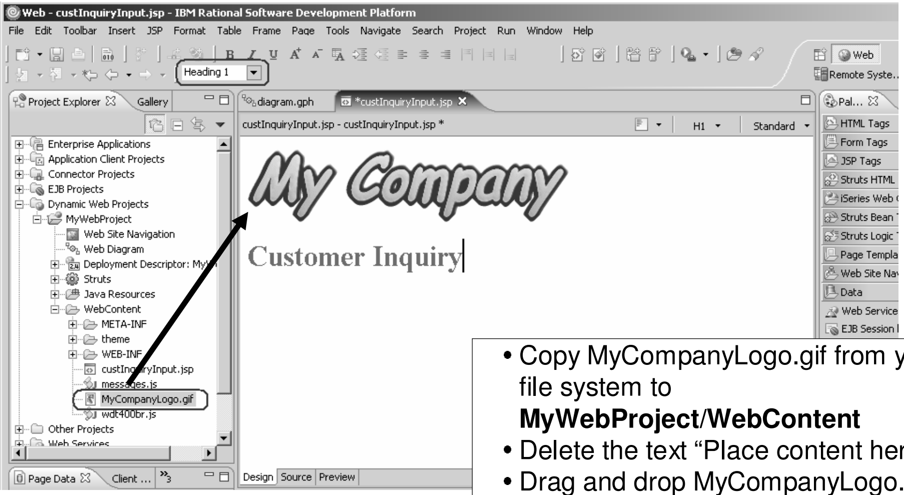
File name: MyCompanyLogo

Save as type: GIF files (*.gif)

Click Next

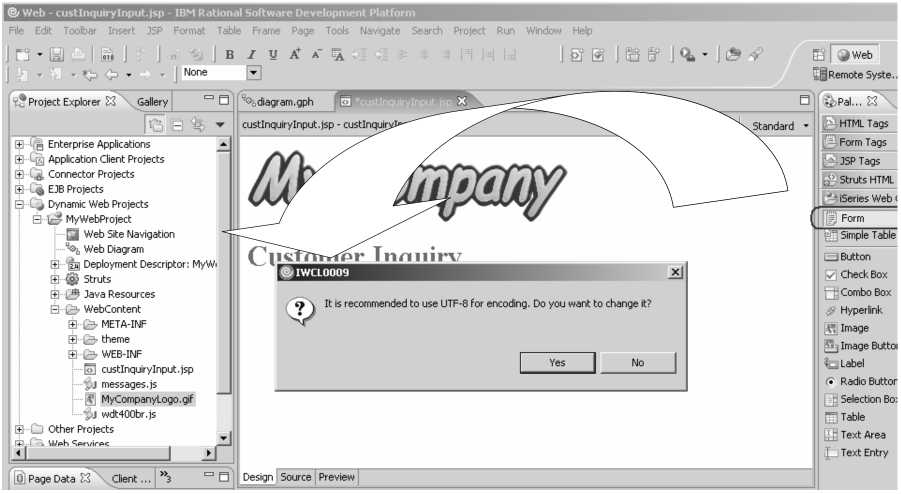
- Select **GIF**
- Click **Next**
- Click **Finish**
- Save to **MyCompanyLogo.gif**

Design Web Page



- Copy MyCompanyLogo.gif from your file system to **MyWebProject**/**WebContent**
- Delete the text “Place content here”
- Drag and drop MyCompanyLogo.gif to the canvas
- Place cursor under the logo
- Select **Heading 1** from drop down
- Type “Customer Inquiry”

Design Web Page



It is recommended to use UTF-8 for encoding. Do you want to change it?

- Drag and drop **Form** from **iSeries Web Components** drawer to a location under the page heading
- A dialog will appear, click **Yes**

•When you create a JSP page, the default workbench encoding is used for the page.

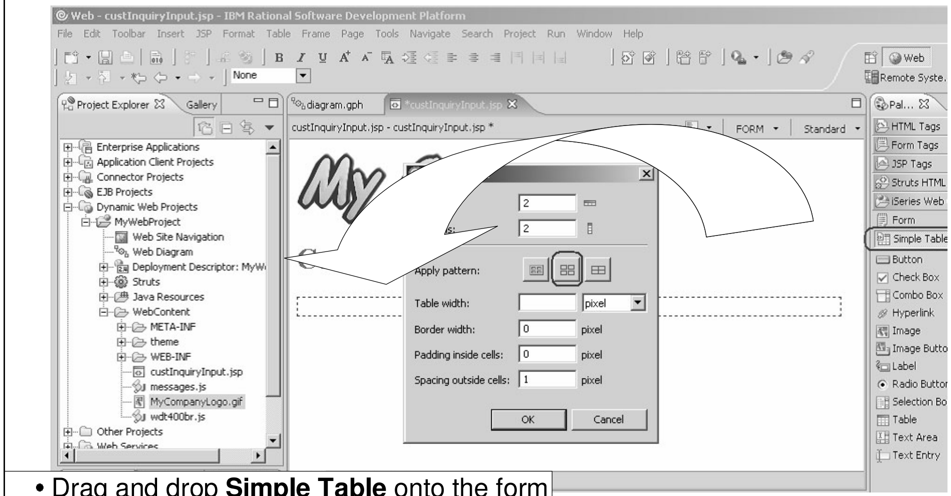
•When you insert an iSeries Web Component the very first time, it will prompt you this message, “It is recommended to use UTF-8 for encoding. Do you want to change it?”

•By selecting Yes will change the page encoding and the charset values to UTF-8.

•UTF-8 encoding enables you to have globalization support in your Web application.

Design Web Page

iSeries AD, IBM Toronto



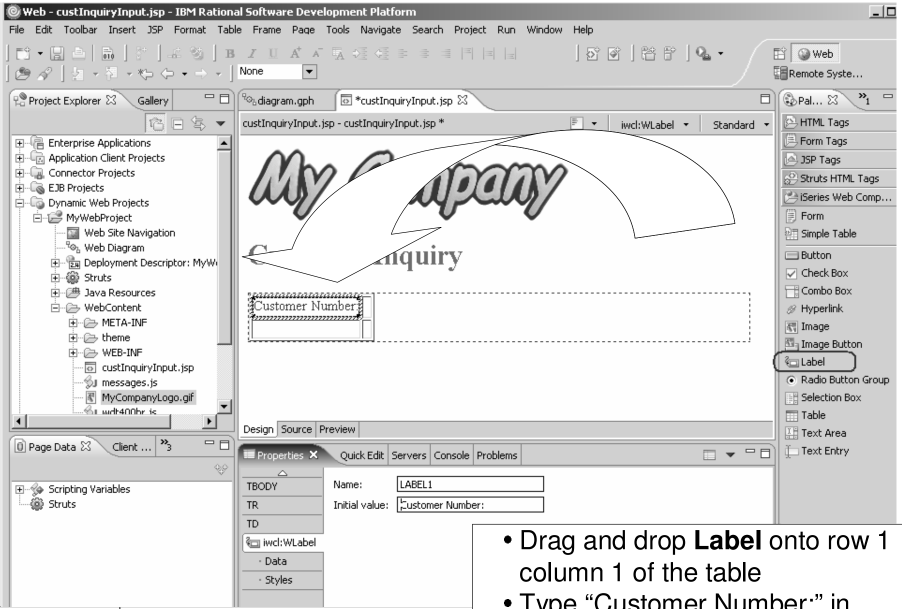
2
s: 2
Apply pattern:
Table width: pixel
Border width: 0 pixel
Padding inside cells: 0 pixel
Spacing outside cells: 1 pixel

- Drag and drop **Simple Table** onto the form to insert a table for alignment
- A dialog will appear, select the button in the centre of **Apply pattern**
- click **OK**

•The button in the centre of **Apply pattern** means no border for the table, that is the table is invisible.

Design Web Page

iSeries AD, IBM Toronto



Name: LABEL1

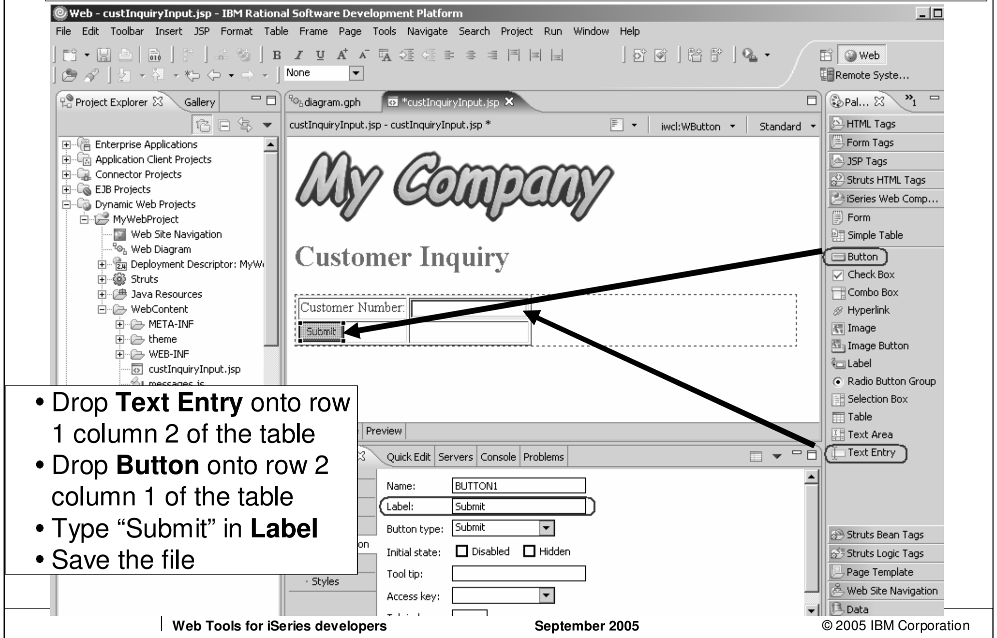
Initial value: Customer Number:

- Drag and drop **Label** onto row 1 column 1 of the table
- Type “Customer Number:” in properties view

•As you enter the **Initial Value** field, the value is shown on the Page Designer right away.

Design Web Page

iSeries AD, IBM Toronto



Name: BUTTON1

Label: Submit

Button type: Submit

Initial state: □ Disabled □ Hidden

Tool tip:

Access key:

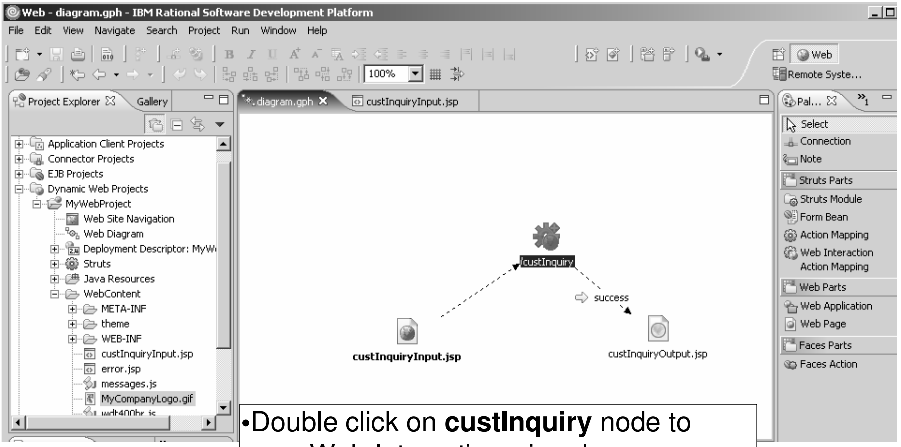
- Drop **Text Entry** onto row 1 column 2 of the table
- Drop **Button** onto row 2 column 1 of the table
- Type “Submit” in **Label**
- Save the file

Using iSeries Web Tools

To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

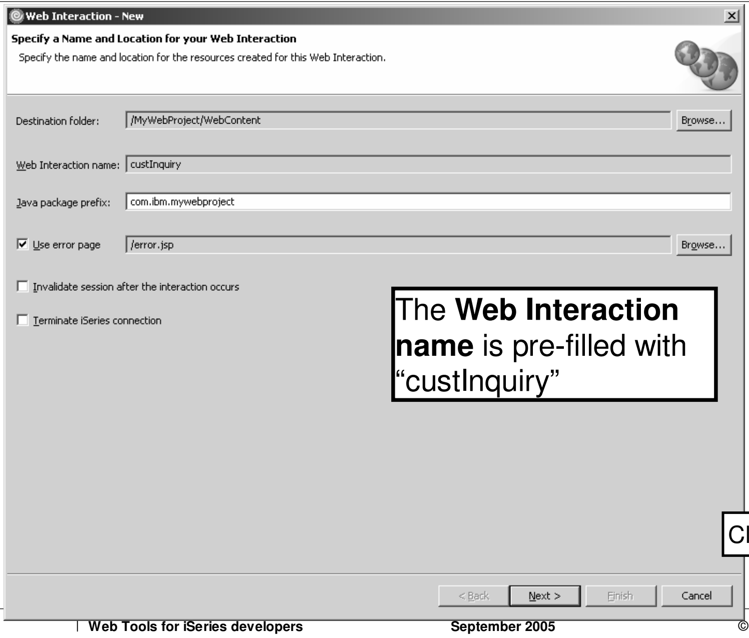
- Create or reuse RPG program
- Create a Dynamic Web project
- Create Runtime configuration
- Design with Web Diagram Editor
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

Web Interaction Wizard



- Double click on **custInquiry** node to open Web Interaction wizard
- **Note: custInquiryInput.jsp** node is now shown as color for it is *realized*

Web Interaction Wizard



Specify a Name and Location for your Web Interaction

Specify the name and location for the resources created for this Web Interaction.

Destination folder: /MyWebProject/WebContent

Web Interaction name: custInquiry

Java package prefix: com.ibm.mywebproject

☑ Use error page /error.jsp

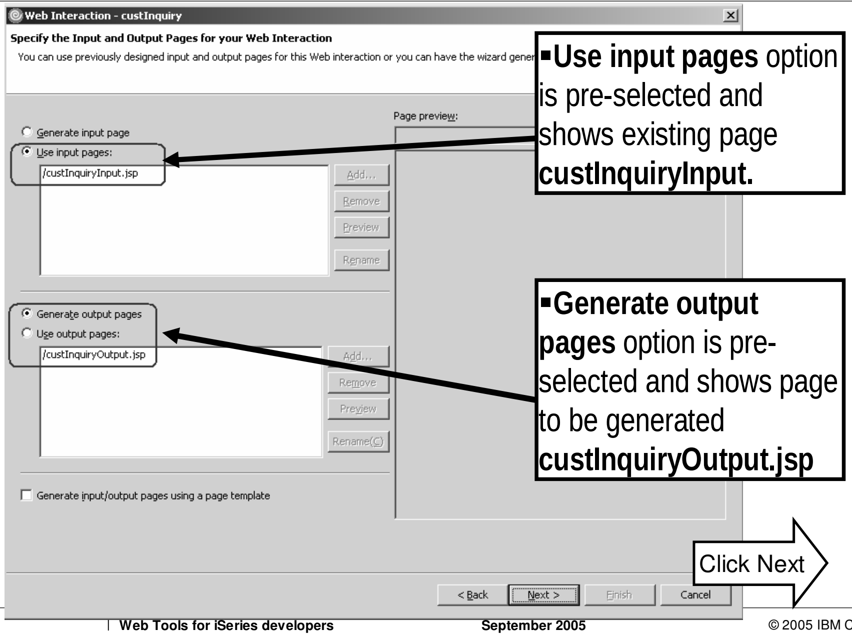
□ Invalidate session after the interaction occurs

□ Terminate iSeries connection

The **Web Interaction name** is pre-filled with “custInquiry”

Click Next

Web Interaction Wizard



Web Interaction - custInquiry

Specify the Input and Output Pages for your Web Interaction

You can use previously designed input and output pages for this Web interaction or you can have the wizard gener

○ Generate input page

● Use input pages:

/custInquiryInput.jsp

● Generate output pages

○ Use output pages:

/custInquiryOutput.jsp

□ Generate input/output pages using a page template

▪**Use input pages** option is pre-selected and shows existing page **custInquiryInput.**

▪**Generate output pages** option is pre-selected and shows page to be generated **custInquiryOutput.jsp**

Click Next

To define input and output pages.

2 modes:

•Let wizard to generate the Web pages for you

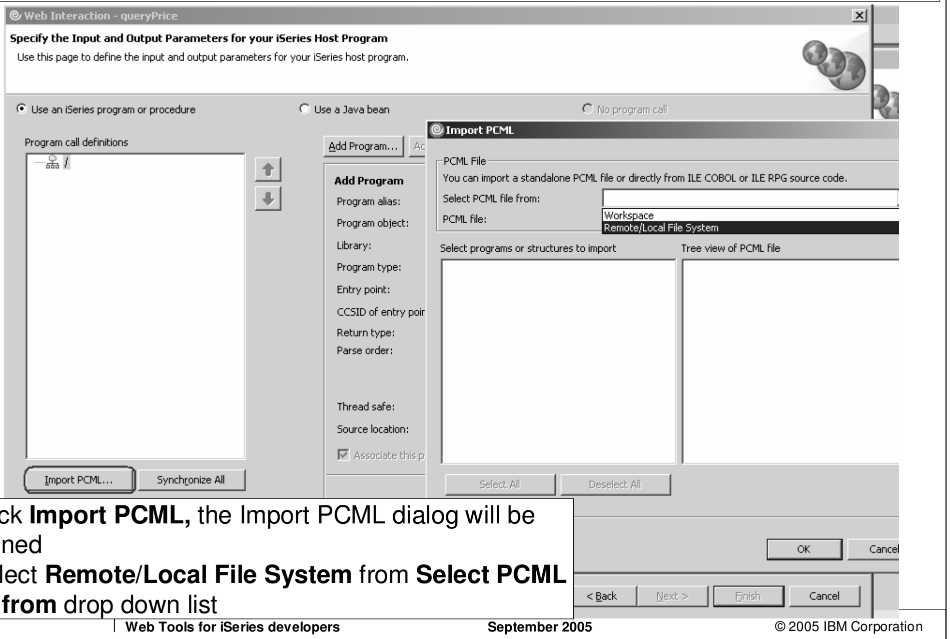
•You specify existing pages

You can specify multiple **output** pages or the wizard can generate multiple **output** pages for you.

Select **Generate input/output pages using a page template** allows you to provide a page template, and the wizard will generate Web pages using the specified page template. This open is only available if **Generate input page** or **Generate output pages** is selected

Web Interaction Wizard

iSeries AD, IBM Toronto



Web Interaction - queryPrice

Specify the Input and Output Parameters for your iSeries Host Program

Use this page to define the input and output parameters for your iSeries host program.

● Use an iSeries program or procedure ○ Use a Java bean ○ No program call

Import PCML

PCML File

You can import a standalone PCML file or directly from ILE COBOL or ILE RPG source code.

Select PCML file from: Workspace / Remote/Local File System

•Click **Import PCML,** the Import PCML dialog will be opened

•Select **Remote/Local File System** from **Select PCML file from** drop down list

•To identify the host program or Java bean to call for each interaction.

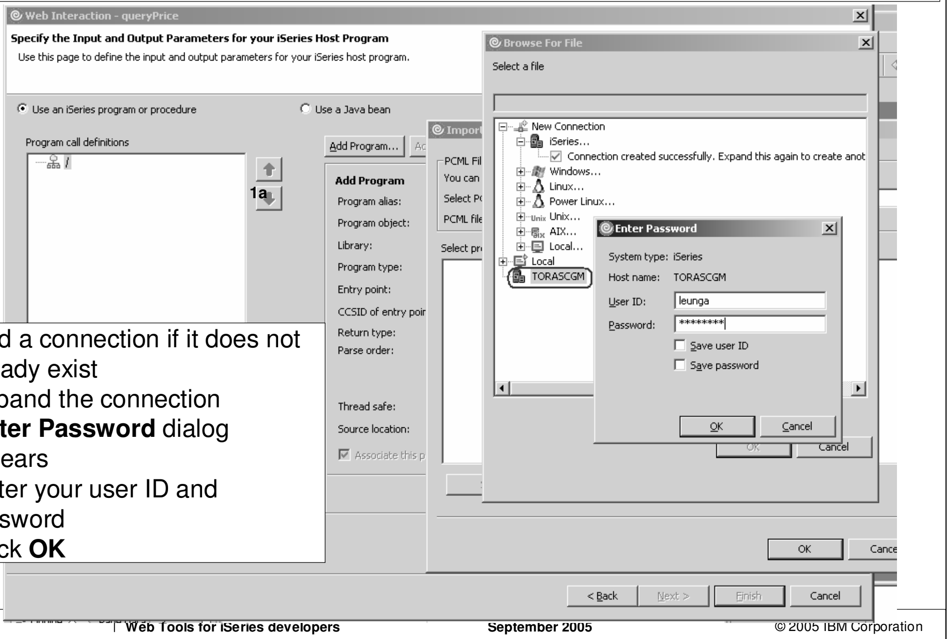
•You can import the definitions from a program source

•you can also specify program and parameter definitions manually if you do not have the source

•Or you can import a pcml file if it has already been generated by the RPG/COBOL compiler or Program Verifier

Web Interaction Wizard

iSeries AD, IBM Toronto



Web Interaction - queryPrice

Specify the Input and Output Parameters for your iSeries Host Program

Use this page to define the input and output parameters for your iSeries host program.

● Use an iSeries program or procedure ○ Use a Java bean

Program call definitions

Add Program

Program alias:
Program object:
Library:
Program type:
Entry point:
CCSID of entry poin
Return type:
Parse order:
Thread safe:
Source location:
☑ Associate this p

Browse For File

Select a file

- New Connection
  - iSeries...
    - ☑ Connection created successfully. Expand this again to create anot
  - Windows...
  - Linux...
  - Power Linux...
  - Unix...
  - AIX...
  - Local...
- Local
- TORASCGM

Enter Password

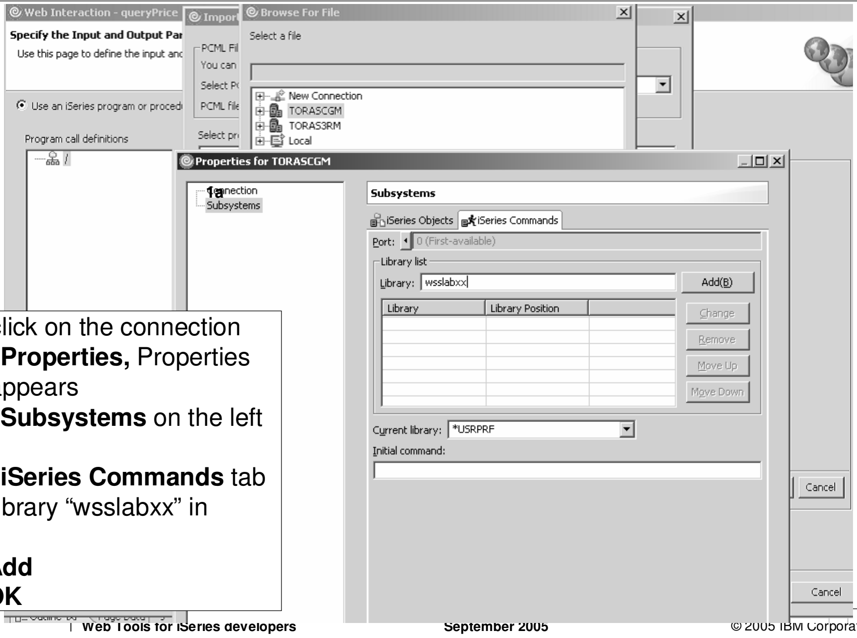
System type: iSeries
Host name: TORASCGM
User ID: leunga
Password: ********

□ Save user ID
□ Save password

- Add a connection if it does not already exist
- Expand the connection
- **Enter Password** dialog appears
- Enter your user ID and password
- Click **OK**

Look up the program source from the host

Web Interaction Wizard



Subsystems

Port: 0 (First-available)

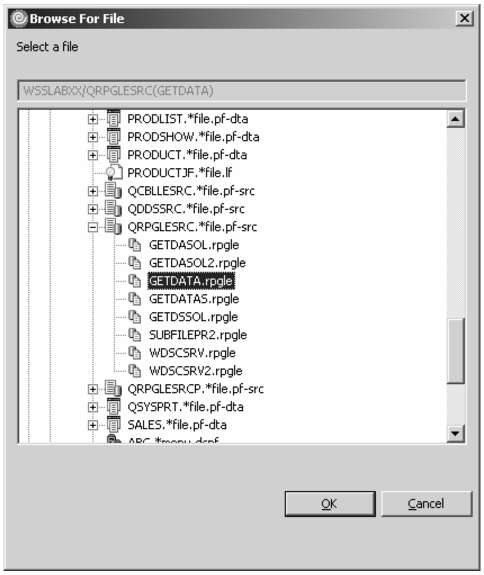
Library: wsslabxx

Current library: *USRPRF

Initial command:

- •Right click on the connection
- •Select **Properties,** Properties dialog appears
- •Select **Subsystems** on the left pane
- •Select **iSeries Commands** tab
- •Enter library “wsslabxx” in **Library**
- •Click **Add**
- •Click **OK**

Web Interaction Wizard



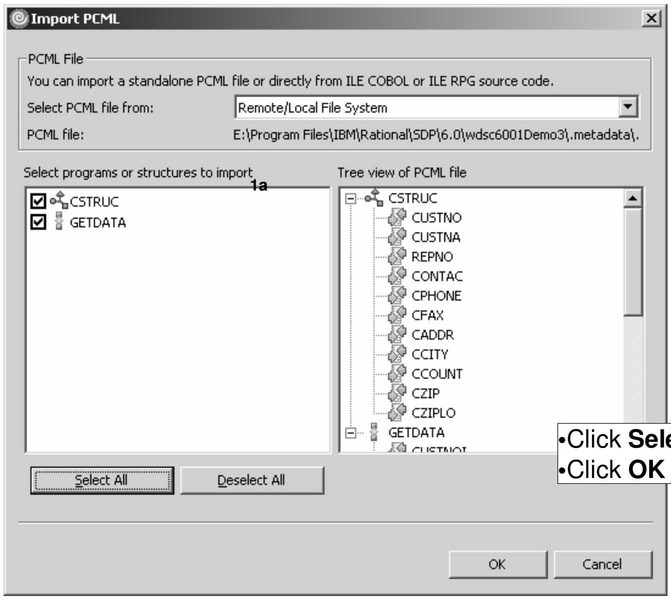
WSSLABXX/QRPGLESRC(GETDATA)

- Expand ***LIBL**
- Expand “wsslabxx”
- Locate the program source /QRPGLESRC.FILE/GETDATA.RPGLE
- Click **OK**

Can also import PCML, or import iSeries ILE source

Web Interaction Wizard

iSeries AD, IBM Toronto



Import PCML

PCML File

You can import a standalone PCML file or directly from ILE COBOL or ILE RPG source code.

Select PCML file from: Remote/Local File System

PCML file: E:\Program Files\IBM\Rational\SDP\6.0\wdsc6001Demo3\.metadata\.

Select programs or structures to import

☑ CSTRUC
☑ GETDATA

Tree view of PCML file

```
CSTRUC
    CUSTNO
    CUSTNA
    REPNO
    CONTAC
    CPHONE
    CFAX
    CADDR
    CCITY
    CCOUNT
    CZIP
    CZIPLO
GETDATA
    CUSTNOI
```

- Click **Select All**
- Click **OK**

A tree representation of program and parameter relationship

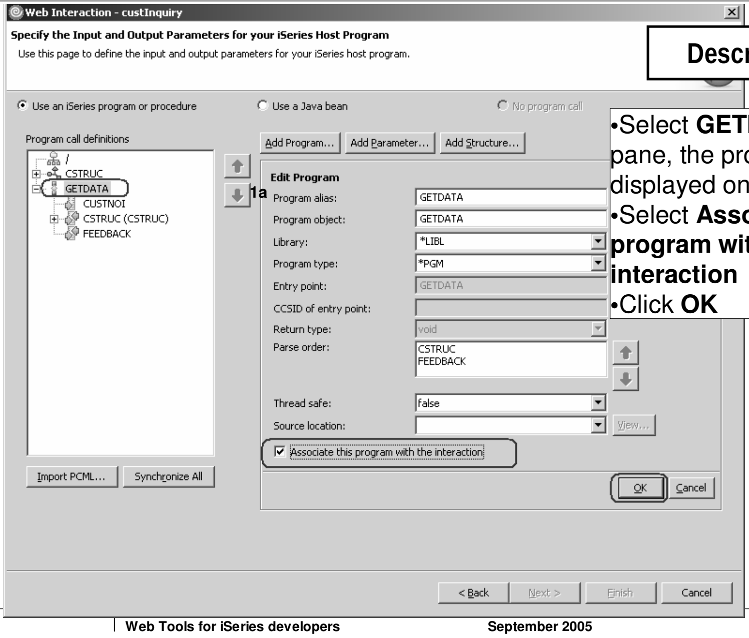
CSTRUC is a structure

GETDATA is a program

The tree of the right shows all the fields in the structure and the program.

Web Interaction Wizard

iSeries AD, IBM Toronto



Web Interaction - custInquiry

Specify the Input and Output Parameters for your iSeries Host Program

Use this page to define the input and output parameters for your iSeries host program.

● Use an iSeries program or procedure ○ Use a Java bean ○ No program call

Program call definitions

- /
  - CSTRUC
  - GETDATA
    - CUSTNOI
    - CSTRUC (CSTRUC)
    - FEEDBACK

1a

Edit Program

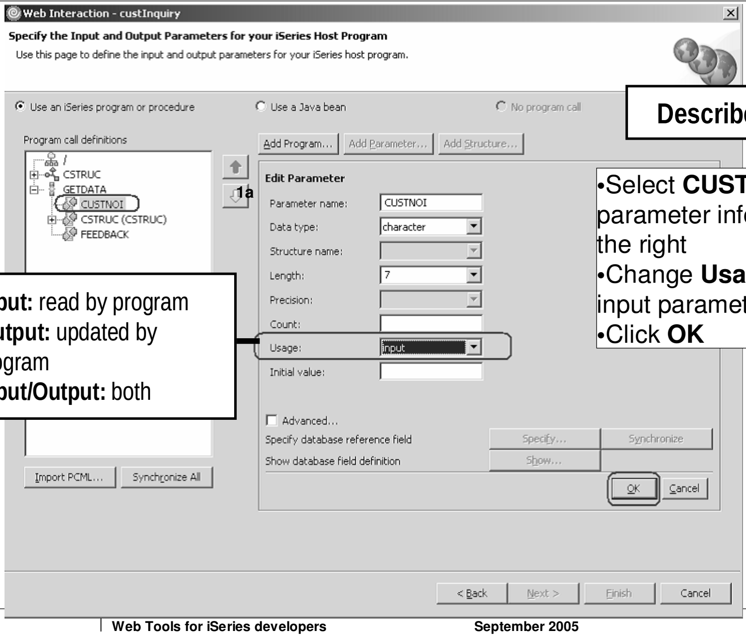
Program alias:	GETDATA
Program object:	GETDATA
Library:	*LIBL
Program type:	*PGM
Entry point:	GETDATA
CCSID of entry point:	
Return type:	void
Parse order:	CSTRUC FEEDBACK
Thread safe:	false
Source location:	

☑ Associate this program with the interaction

Describe program

- •Select **GETDATA** on the left pane, the program info is displayed on the right
- •Select **Associate this program with the interaction**
- •Click **OK**

Web Interaction Wizard



Web Interaction - custInquiry

Specify the Input and Output Parameters for your iSeries Host Program

Use this page to define the input and output parameters for your iSeries host program.

● Use an iSeries program or procedure ○ Use a Java bean ○ No program call

Program call definitions

- /
- CSTRUC
- GETDATA
  - CUSTNOI
  - CSTRUC (CSTRUC)
  - FEEDBACK

Edit Parameter

Parameter name: CUSTNOI

Data type: character

Structure name:

Length: 7

Precision:

Count:

Usage: input

Initial value:

□ Advanced...

Specify database reference field

Show database field definition

Describe parameter

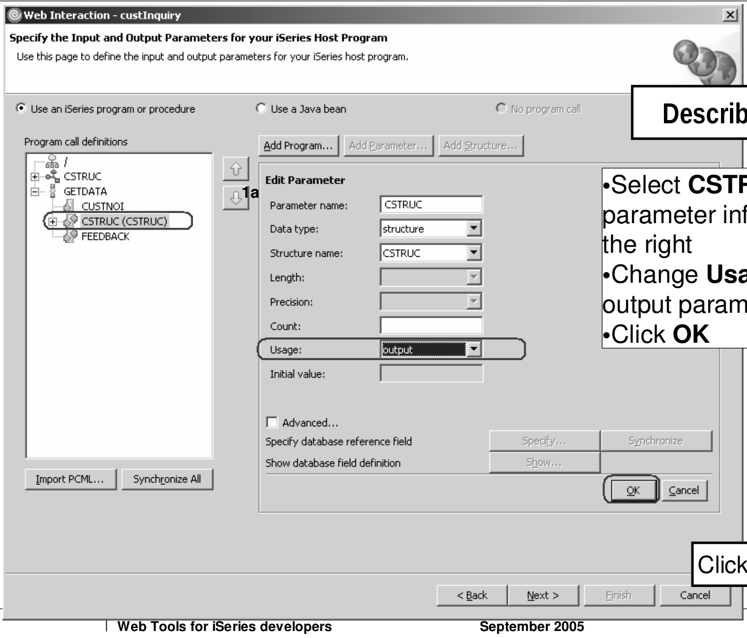
•Select **CUSTNOI**, the parameter info is display on the right
•Change **Usage** to **input** for input parameter
•Click **OK**

- ►**Input:** read by program
- ►**Output:** updated by program
- ►**Input/Output:** both

Parameters imported from source are all default to “input/output” usage type.

Web Interaction Wizard

iSeries AD, IBM Toronto



Specify the Input and Output Parameters for your iSeries Host Program

Use this page to define the input and output parameters for your iSeries host program.

● Use an iSeries program or procedure ○ Use a Java bean ○ No program call

Edit Parameter

Parameter name: CSTRUC

Data type: structure

Structure name: CSTRUC

Length:

Precision:

Count:

Usage: output

Initial value:

□ Advanced...

Specify database reference field

Show database field definition

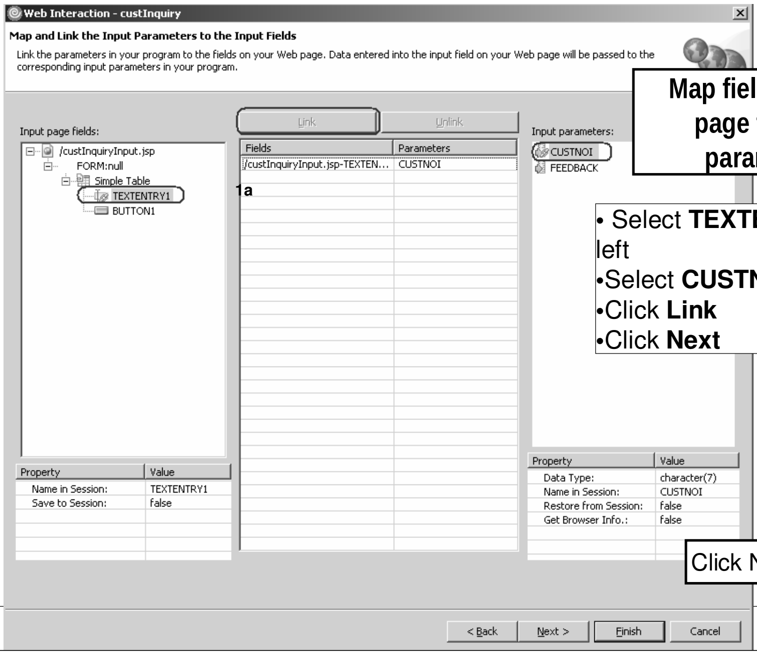
Describe parameter

- Select **CSTRUC**, the parameter info is display on the right
- Change **Usage** to **output** for output parameter
- Click **OK**

Click Next

CSTRUC is a structure

Web Interaction Wizard



Web Interaction - custInquiry

Map and Link the Input Parameters to the Input Fields

Link the parameters in your program to the fields on your Web page. Data entered into the input field on your Web page will be passed to the corresponding input parameters in your program.

Input page fields:

```
/custInquiryInput.jsp
  FORM:null
    Simple Table
      TEXTENTRY1
      BUTTON1
```

Property	Value
Name in Session:	TEXTENTRY1
Save to Session:	false

Fields	Parameters
/custInquiryInput.jsp-TEXTEN...	CUSTNOI

1a

Input parameters:

- CUSTNOI
- FEEDBACK

Property	Value
Data Type:	character(7)
Name in Session:	CUSTNOI
Restore from Session:	false
Get Browser Info.:	false

Map fields in Web page to input parameters

• Select **TEXTENTRY1** on the left
•Select **CUSTNOI** on the right
•Click **Link**
•Click **Next**

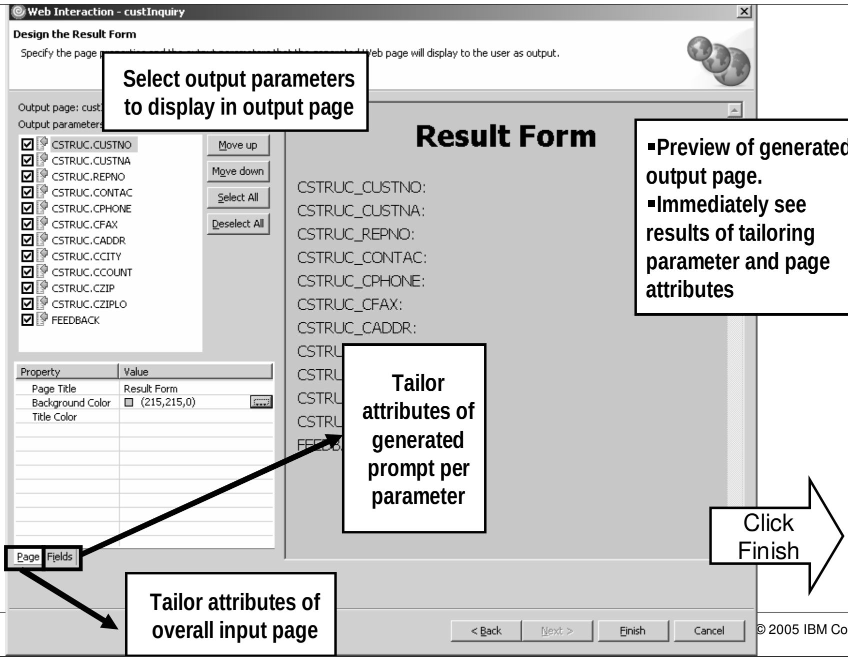
Click Next

•The input page is created by user, the wizard has no clue of which field is for which parameter, so field mappings are required

•TEXTENTRY1 is the name of the text entry field for Customer Number in custInquiryInput.jsp, it is mapped to CUSTNOI input parameter

•When the Web application is run, data from this TEXTENTRY1 field will be passed to the RPG program as input parameter, and the host program will process it and return the data in the output parameters.

Web Interaction Wizard



Web Interaction - custInquiry

Design the Result Form

Specify the page p… Web page will display to the user as output.

Output page: cust…

Output parameters…

- ☑ CSTRUC.CUSTNO
- ☑ CSTRUC.CUSTNA
- ☑ CSTRUC.REPNO
- ☑ CSTRUC.CONTAC
- ☑ CSTRUC.CPHONE
- ☑ CSTRUC.CFAX
- ☑ CSTRUC.CADDR
- ☑ CSTRUC.CCITY
- ☑ CSTRUC.CCOUNT
- ☑ CSTRUC.CZIP
- ☑ CSTRUC.CZIPLO
- ☑ FEEDBACK

Property	Value
Page Title	Result Form
Background Color	▨ (215,215,0)
Title Color	

Result Form

CSTRUC_CUSTNO:
CSTRUC_CUSTNA:
CSTRUC_REPNO:
CSTRUC_CONTAC:
CSTRUC_CPHONE:
CSTRUC_CFAX:
CSTRUC_CADDR:
CSTRU
CSTRU
CSTRU
CSTRU
FEEDB

Select output parameters to display in output page

- Preview of generated output page.
- Immediately see results of tailoring parameter and page attributes

Tailor attributes of generated prompt per parameter

Tailor attributes of overall input page

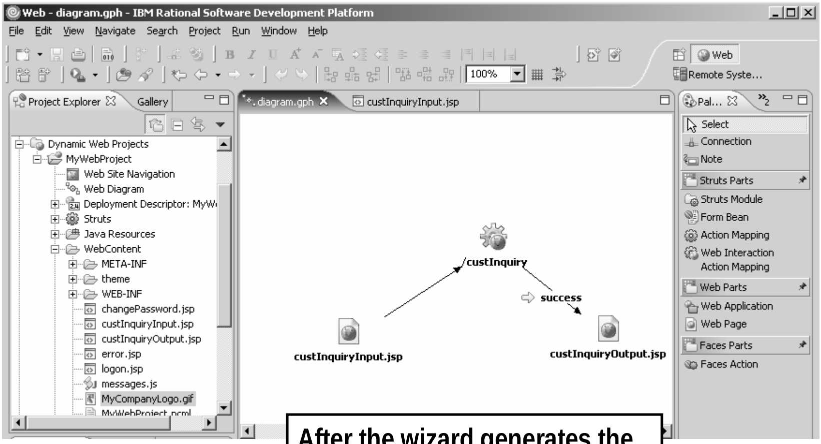
Click Finish

Page Tab – allows you change the page title, background color of the page, and title color

Fields Tab – allows you to the label, web component type, size of each field

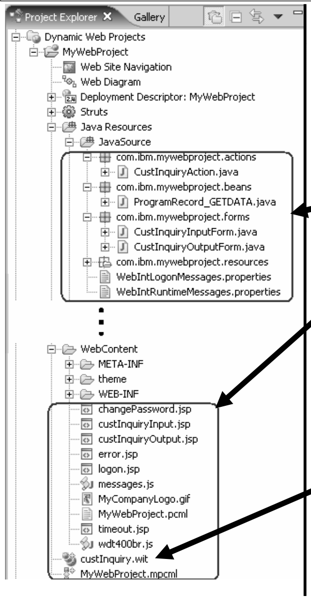
Web Diagram Editor

iSeries AD, IBM Toronto



After the wizard generates the Web pages, Java Action classes, icons are *realized* and are shown as colored

Web Interaction Wizard



```
Dynamic Web Projects
  MyWebProject
    Web Site Navigation
    Web Diagram
    Deployment Descriptor: MyWebProject
    Struts
    Java Resources
      JavaSource
        com.ibm.mywebproject.actions
          CustInquiryAction.java
        com.ibm.mywebproject.beans
          ProgramRecord_GETDATA.java
        com.ibm.mywebproject.forms
          CustInquiryInputForm.java
          CustInquiryOutputForm.java
        com.ibm.mywebproject.resources
        WebIntLogonMessages.properties
        WebIntRuntimeMessages.properties
      ⋮
    WebContent
      META-INF
      theme
      WEB-INF
      changePassword.jsp
      custInquiryInput.jsp
      custInquiryOutput.jsp
      error.jsp
      logon.jsp
      messages.js
      MyCompanyLogo.gif
      MyWebProject.pcml
      timeout.jsp
      wdt400br.js
    custInquiry.wit
    MyWebProject.mpcml
```

Files that are generated by the wizard: Java classes, properties files, JSP files, JavaScript files, PCML file

.wit file is generated per interaction for round-tripping purpose.

You can double click on custInquiry.wit to reopen the Web Interaction wizard with custInquiry interaction information.

What's Next?

- **What did you do so far?**
  - ►Created a Dynamic Web project
  - ►Set runtime configuration to call your RPG Program remotely
  - ►Design your Web application using Web Diagram Editor
  - ►Design your input page
  - ►Created an 'iSeries Web Interaction' to link your RPG program parameters to the input page and output page
    - ►The input page was created by you
    - ►The output page was generated for you
- **Next?**
  - ►Run locally to test your application <u>Or</u>
  - ►Publish all your files to the iSeries server

Using iSeries Web Tools

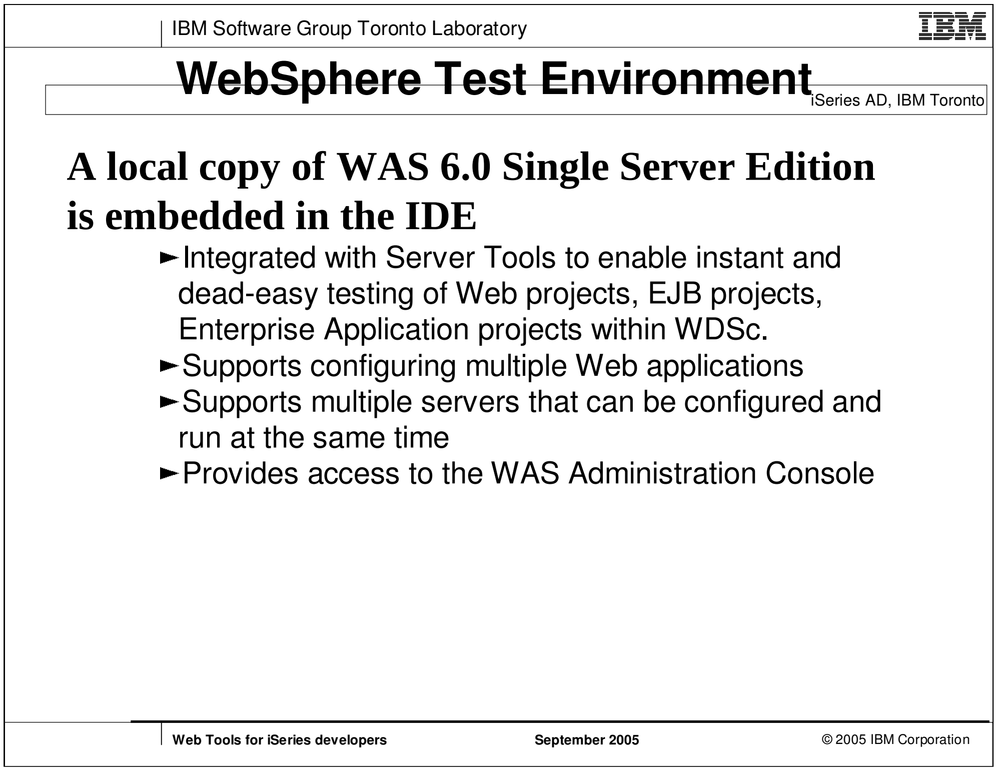
iSeries AD, IBM Toronto

To create a Web-based front-end customer inquiry application that uses RPG business logic residing on an iSeries server

- Create or reuse RPG program
- Create a Dynamic Web project
- Create Runtime configuration
- Design with Web Diagram Editor
- Design a Web page
- Create Web Interaction
- Test Run the Web Application

WDSc: Run On Server

- ► Run On Server
  - •**Now this is VERY COOL!**
- ► When ready to test your Web app
  - •**Right click on initial html or jsp file**
    - ►or whole project, which implies the index.html file
  - •**Select "Run on Server"**
  - •**Wait for the magic...**
- ► Your Web application will run!
  - •**Opens Server perspective**
    - ►Publishes it to the built-in copy of WAS (and starts WAS)
    - ►Brings up a Web Browser
    - ►**Runs your application!!**
      - ✓Tip: you can set breakpoints in your Java code!



WebSphere Test Environment

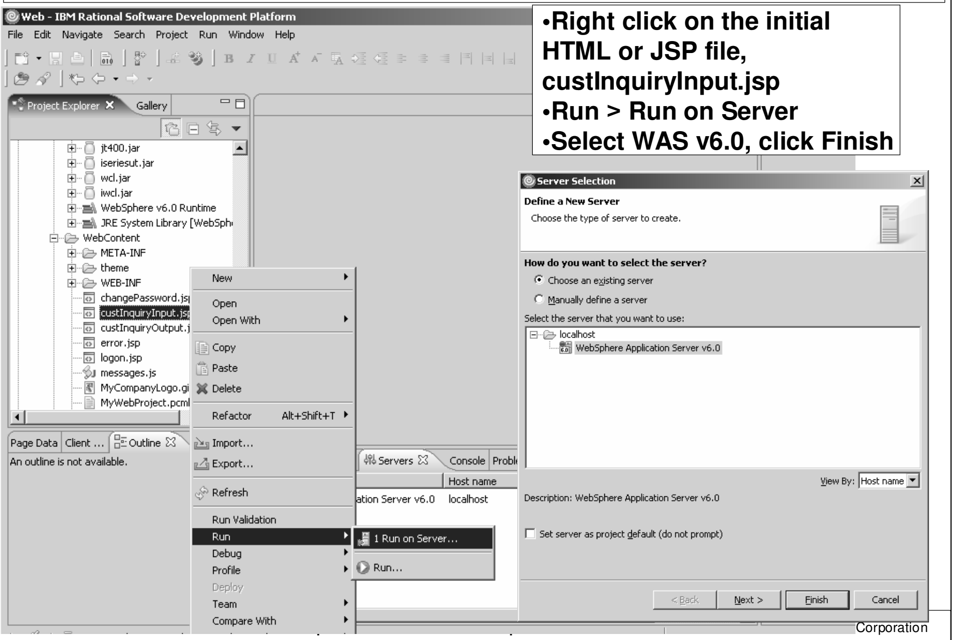
A local copy of WAS 6.0 Single Server Edition is embedded in the IDE

- ►Integrated with Server Tools to enable instant and dead-easy testing of Web projects, EJB projects, Enterprise Application projects within WDSc.
- ►Supports configuring multiple Web applications
- ►Supports multiple servers that can be configured and run at the same time
- ►Provides access to the WAS Administration Console

Can create a server instance for deploying e.g. EAR 1-5, another for EAR 1-4

Can create a server instance for deploying with security configuration “1”, another for security configuration “2”

Test Run Locally on WTE



Server Selection

Define a New Server

Choose the type of server to create.

How do you want to select the server?

● Choose an existing server

○ Manually define a server

Select the server that you want to use:

- localhost
  - WebSphere Application Server v6.0

View By: Host name

Description: WebSphere Application Server v6.0

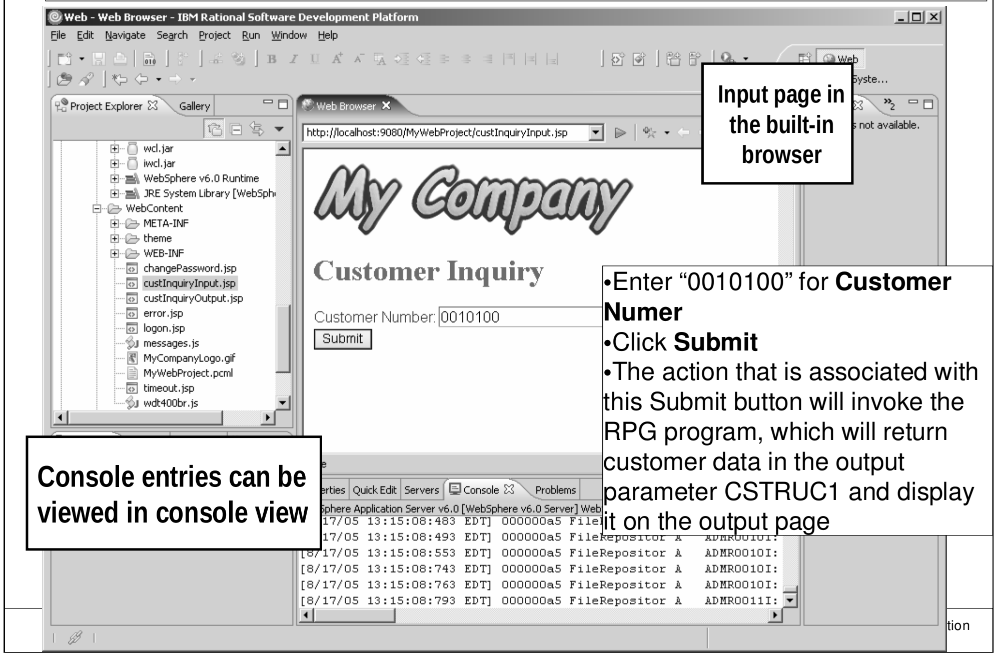
□ Set server as project default (do not prompt)

< Back | Next > | Finish | Cancel

- Right click on the initial HTML or JSP file, custInquiryInput.jsp
- Run > Run on Server
- Select WAS v6.0, click Finish

You can select to test run on other versions of WAS if they are installed.

Testing the Interaction



Customer Number: 0010100

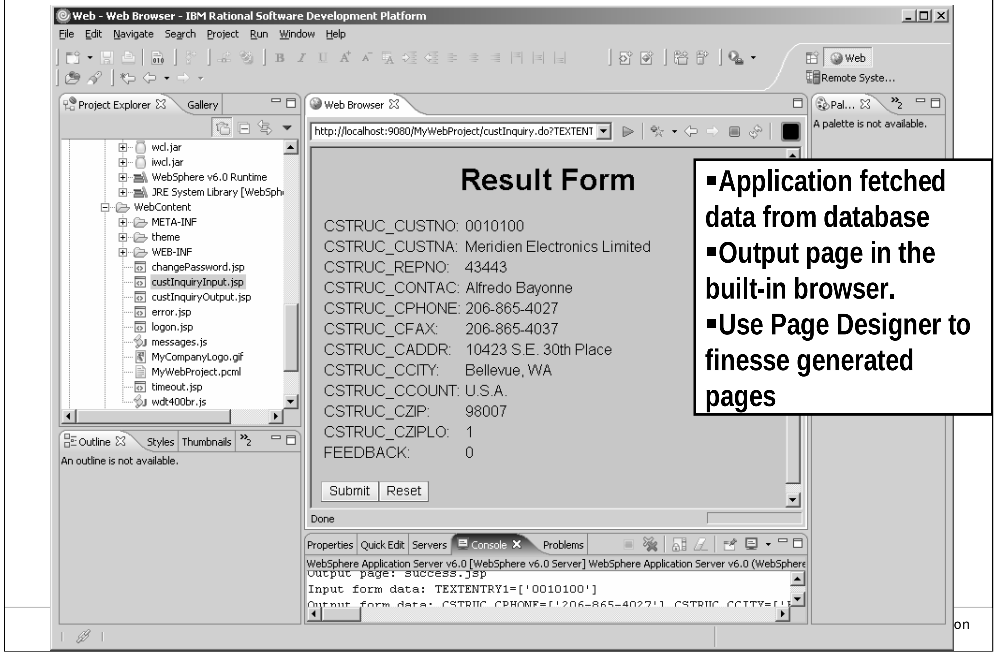
```
Sphere Application Server v6.0 [WebSphere v6.0 Server] Web
 17/05 13:15:08:483 EDT] 000000a5 File
 17/05 13:15:08:493 EDT] 000000a5 FileRepositor A   ADMR0010I:
[8/17/05 13:15:08:553 EDT] 000000a5 FileRepositor A   ADMR0010I:
[8/17/05 13:15:08:743 EDT] 000000a5 FileRepositor A   ADMR0010I:
[8/17/05 13:15:08:763 EDT] 000000a5 FileRepositor A   ADMR0010I:
[8/17/05 13:15:08:793 EDT] 000000a5 FileRepositor A   ADMR0011I:
```

Input page in the built-in browser

- Enter “0010100” for **Customer Numer**
- Click **Submit**
- The action that is associated with this Submit button will invoke the RPG program, which will return customer data in the output parameter CSTRUC1 and display it on the output page

Console entries can be viewed in console view

Testing the Interaction


Web - Web Browser - IBM Rational Software Development Platform
File Edit Navigate Search Project Run Window Help
Web
Remote Syste...
Project Explorer
Gallery
wcl.jar
iwcl.jar
WebSphere v6.0 Runtime
JRE System Library [WebSph
WebContent
META-INF
theme
WEB-INF
changePassword.jsp
custInquiryInput.jsp
custInquiryOutput.jsp
error.jsp
logon.jsp
messages.js
MyCompanyLogo.gif
MyWebProject.pcml
timeout.jsp
wdt400br.js
Outline
Styles
Thumbnails
An outline is not available.
Web Browser
http://localhost:9080/MyWebProject/custInquiry.do?TEXTENT
Pal...
A palette is not available.
Done
Properties
Quick Edit
Servers
Console
Problems
WebSphere Application Server v6.0 [WebSphere v6.0 Server] WebSphere Application Server v6.0 (WebSphere

Result Form

CSTRUC_CUSTNO:	0010100
CSTRUC_CUSTNA:	Meridien Electronics Limited
CSTRUC_REPNO:	43443
CSTRUC_CONTAC:	Alfredo Bayonne
CSTRUC_CPHONE:	206-865-4027
CSTRUC_CFAX:	206-865-4037
CSTRUC_CADDR:	10423 S.E. 30th Place
CSTRUC_CCITY:	Bellevue, WA
CSTRUC_CCOUNT:	U.S.A.
CSTRUC_CZIP:	98007
CSTRUC_CZIPLO:	1
FEEDBACK:	0

Submit Reset

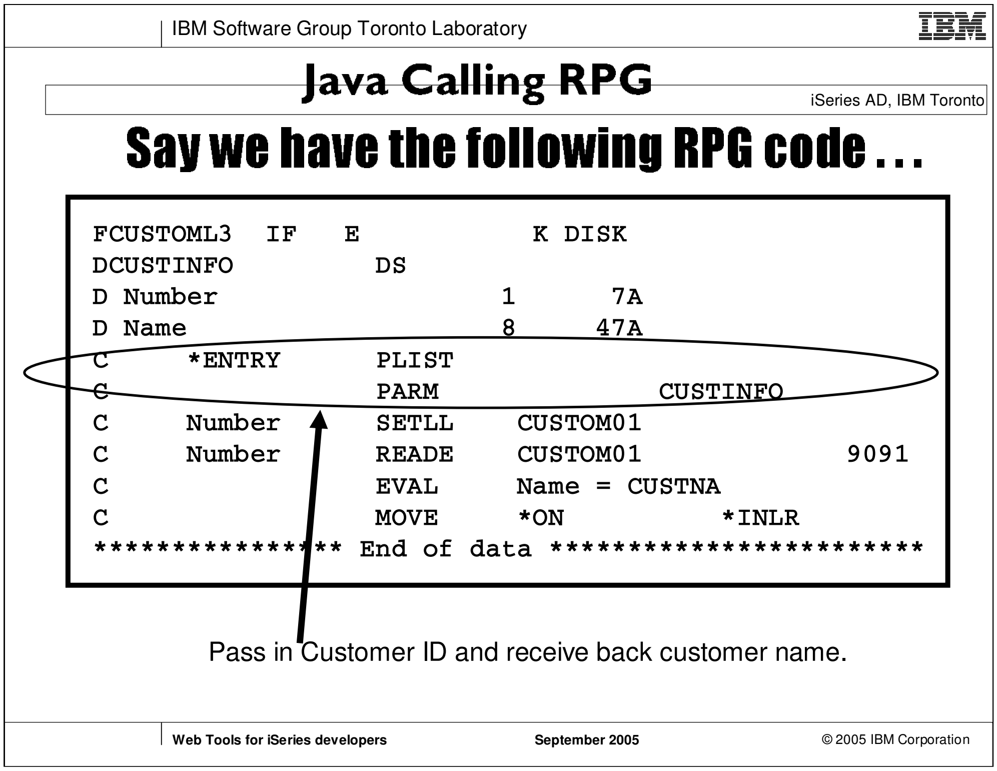
```
Output page: success.jsp
Input form data: TEXTENTRY1=['0010100']
Output form data: CSTRUC_CPHONE=['206-865-4027'] CSTRUC_CCITY=['
```

- ▪Application fetched data from database
- ▪Output page in the built-in browser.
- ▪Use Page Designer to finesse generated pages

You can customize the generated output page using the Page Designer.

AGENDA

- e-business Primer
  - AD Model, traditional
  - e-Business Application, Web Model
- Introducing Web Tools for iSeries
  - J2EE Enterprise Application
  - Web Tools At A Glance
  - Dynamic Web Project
  - Web Interaction wizards
  - Runtime Configuration wizard
  - iSeries Web Components
- Demo: Using iSeries Web Tools
- Advanced Topics
  - Mixing Java with RPG
  - Struts



Java Calling RPG

iSeries AD, IBM Toronto

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.

F-spec defines the database File containing customer information records

D-spec defines data structure CUSTINFO, containing two fields, Name, Number.

C-spec defines one parameter, the struct- type inputoutput

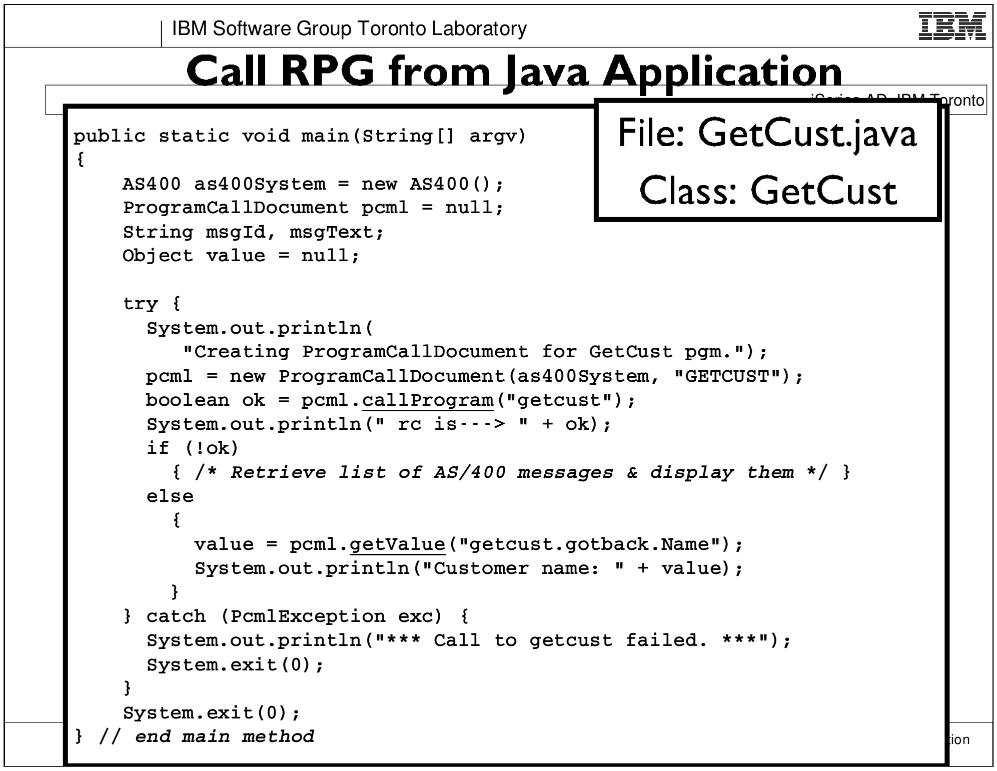
Create XML required tags

```
<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>
```



Call RPG from Java Application

File: GetCust.java

Class: GetCust

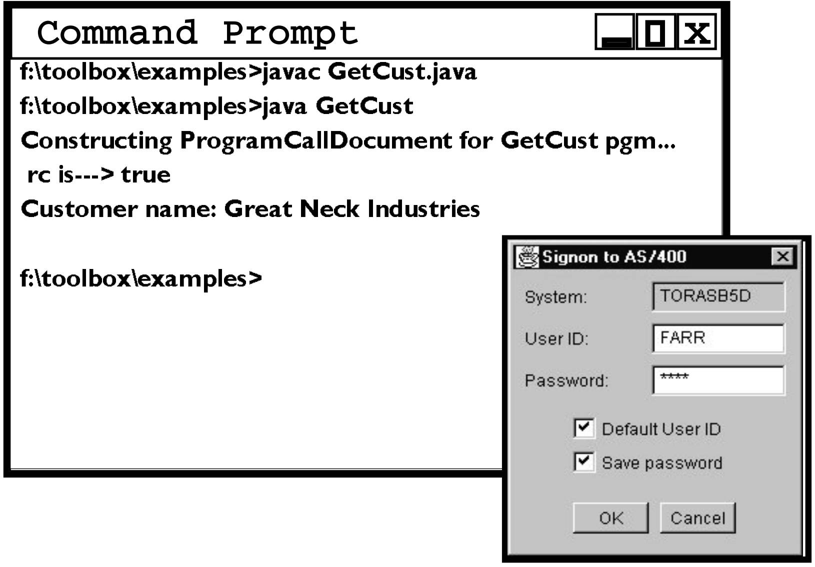
```
public static void main(String[] argv)
{
    AS400 as400System = new AS400();
    ProgramCallDocument pcml = null;
    String msgId, msgText;
    Object value = null;

    try {
      System.out.println(
         "Creating ProgramCallDocument for GetCust pgm.");
      pcml = new ProgramCallDocument(as400System, "GETCUST");
      boolean ok = pcml.callProgram("getcust");
      System.out.println(" rc is---> " + ok);
      if (!ok)
        { /* Retrieve list of AS/400 messages & display them */ }
      else
        {
          value = pcml.getValue("getcust.gotback.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
```

Toolbox classes used for making program calls.

Mixing Java and RPG

Results . . .



Command Prompt

```
f:\toolbox\examples>javac GetCust.java
f:\toolbox\examples>java GetCust
Constructing ProgramCallDocument for GetCust pgm...
 rc is---> true
Customer name: Great Neck Industries

f:\toolbox\examples>
```

Signon to AS/400

System: TORASB5D

User ID: FARR

Password: ****

☑ Default User ID

☑ Save password

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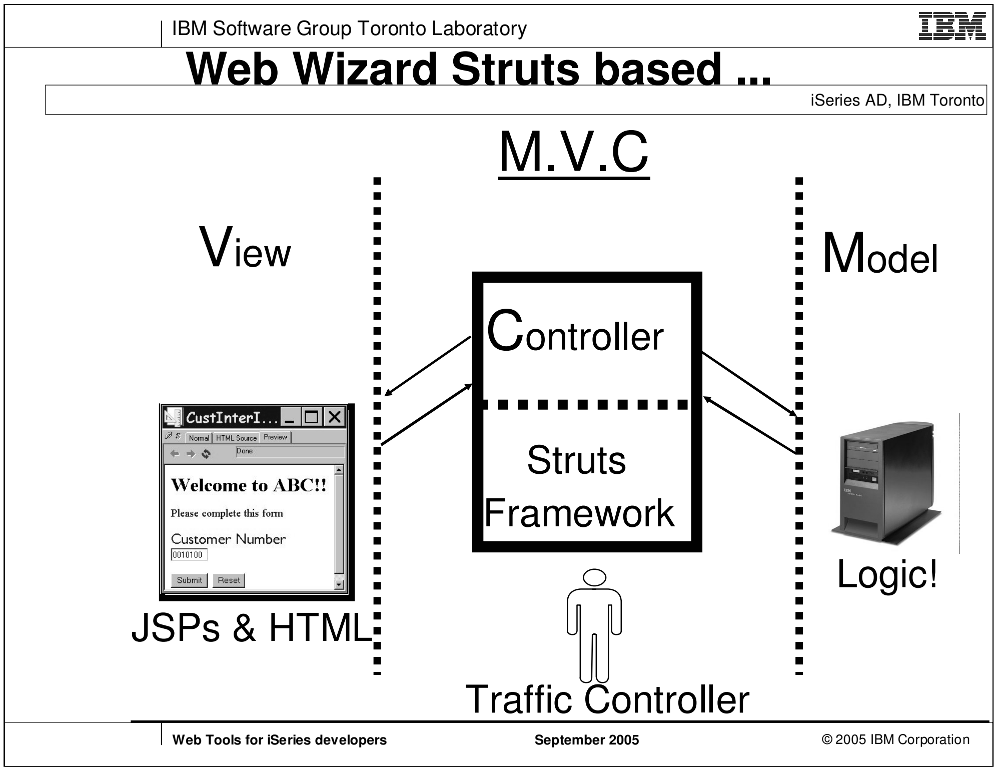
  - Struts

Struts

- Web Interactions are Struts based!
  - Struts environment
  - Simple Struts application
  - iSeries Interaction and Struts



Web Wizard Struts based ...

iSeries AD, IBM Toronto

M.V.C

View

Model

Controller

Struts Framework

JSPs & HTML

Logic!

Traffic Controller

Welcome to ABC!!

Please complete this form

Customer Number

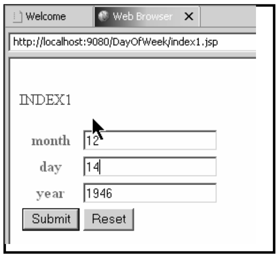
0010100

What is Struts? A development framework for Java servlet applications based upon the Model-View-Controller (MVC) design paradigm.

Simple Struts web application

iSeries AD, IBM Toronto

➔Determine weekday from date



http://localhost:9080/DayOfWeek/index1.jsp

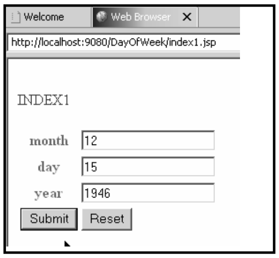
INDEX1

month 12

day 14

year 1946

Submit Reset



http://localhost:9080/DayOfWeek/index1.jsp

INDEX1

month 12

day 15

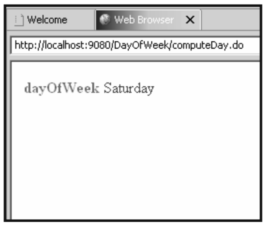
year 1946

Submit Reset

- ➔One input page
- ➔Two different Output pages

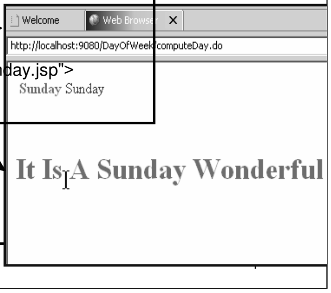
Struts-config file

```
<action-mappings>
<action name="formBean" path="/computeDay"
      scope="request"
      type="com.ibm.dayofweek.actions.ComputeDayAction"
      input="index1.jsp">
<forward name="success" path="/output.jsp">
</forward>
<forward name="failure" path="/index1.jsp">
</forward>
<forward name="sunday" path="/output_sunday.jsp">
</forward>
</action>
</action-mappings>
```



http://localhost:9080/DayOfWeek/computeDay.do

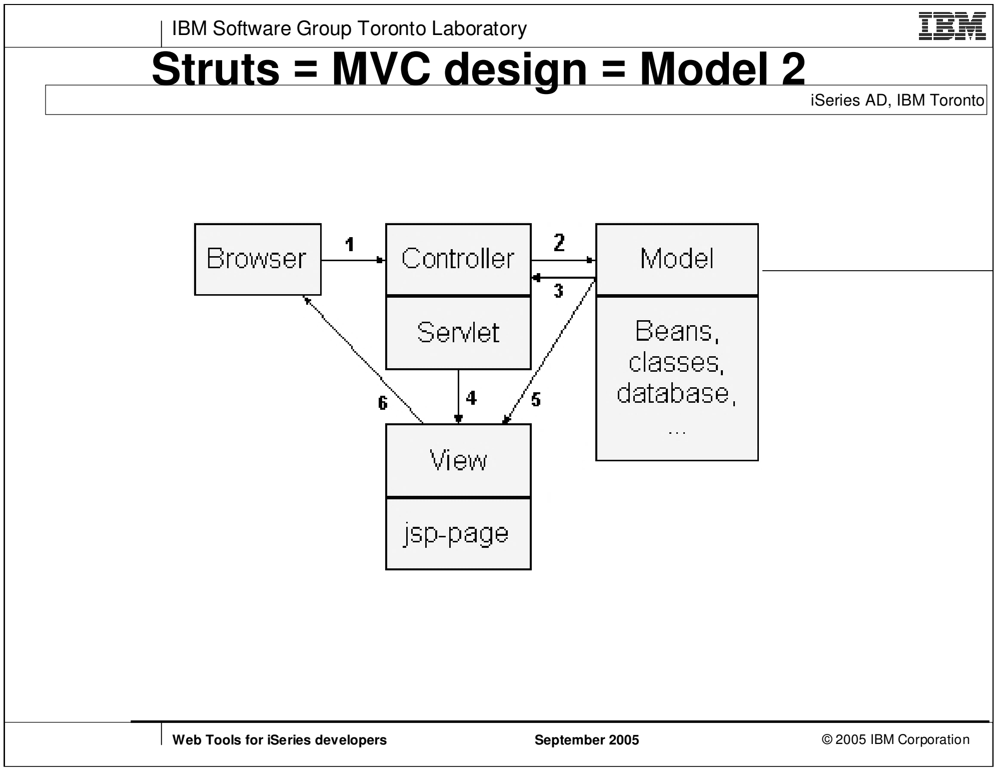
dayOfWeek Saturday



http://localhost:9080/DayOfWeek/computeDay.do

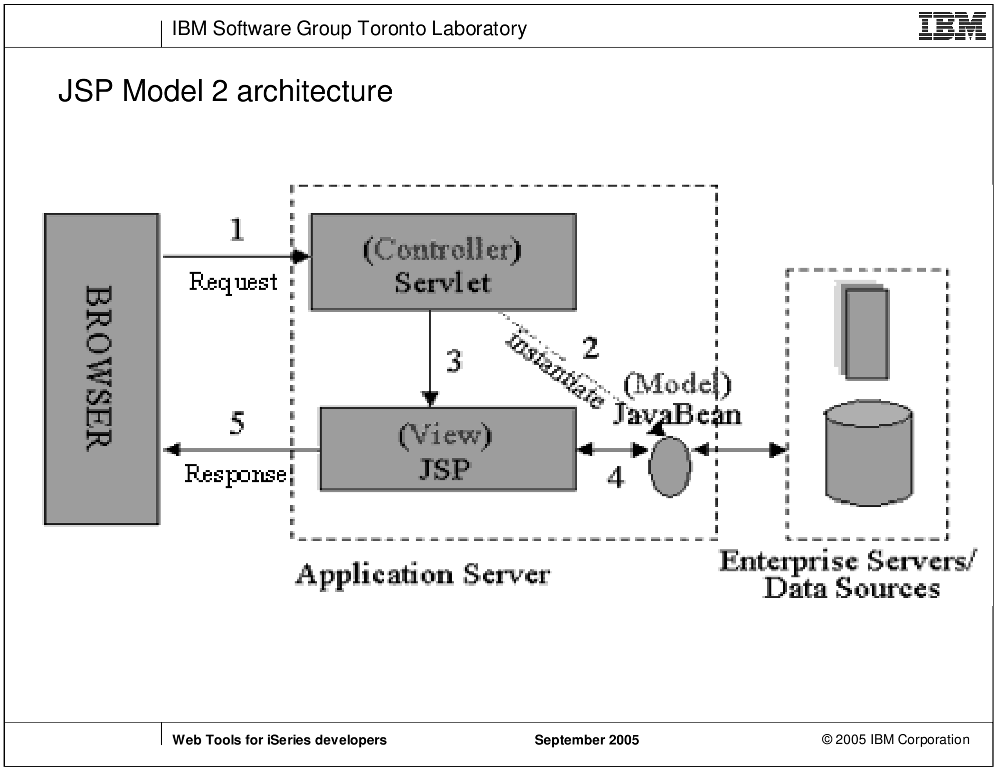
Sunday Sunday

It Is A Sunday Wonderful



Struts = MVC design = Model 2

- the Struts “action” servlet acts as a common controller for the whole application
- Model includes Action classes, Form Beans
- The web.xml file contains: the definition of the Struts servlet named "ActionServlet“, the URL mapping for the calls to this servlet (*.do)



IBM Software Group Toronto Laboratory

JSP Model 2 architecture

Web Tools for iSeries developers September 2005 © 2005 IBM Corporation

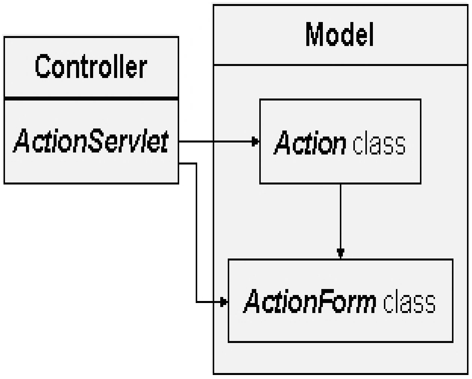
It takes advantage of the predominant strengths of both technologies, using JSP to generate the presentation layer and servlets to perform process-intensive tasks (controller).

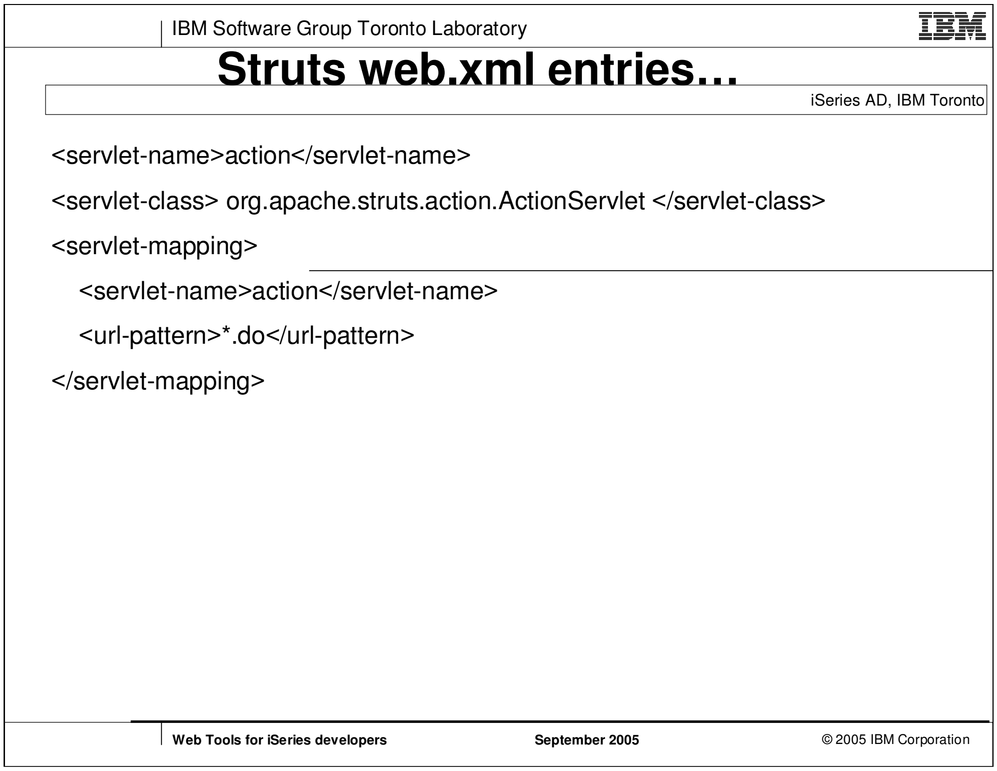
Here, the servlet acts as the *controller* and is in charge of the request processing and the creation of any beans or objects used by the JSP, as well as deciding, depending on the user's actions, which JSP page to forward the request to. Note particularly that there is no processing logic within the JSP page itself; it is simply responsible for retrieving any objects or beans that may have been previously created by the servlet, and extracting the dynamic content from that servlet for insertion within static templates. This approach typically results in the cleanest separation of presentation from content.

What the “action” servlet does

a. Automatically transfers data from your form into a JavaBean (ActionForm)

b. Calls the Action class you specify. This class may use the data in the ActionForm bean. When this class finishes it returns control to the ActionServlet, passing it a “forward”- as defined in the struts-config.xml- the next page to be displayed in the browser.





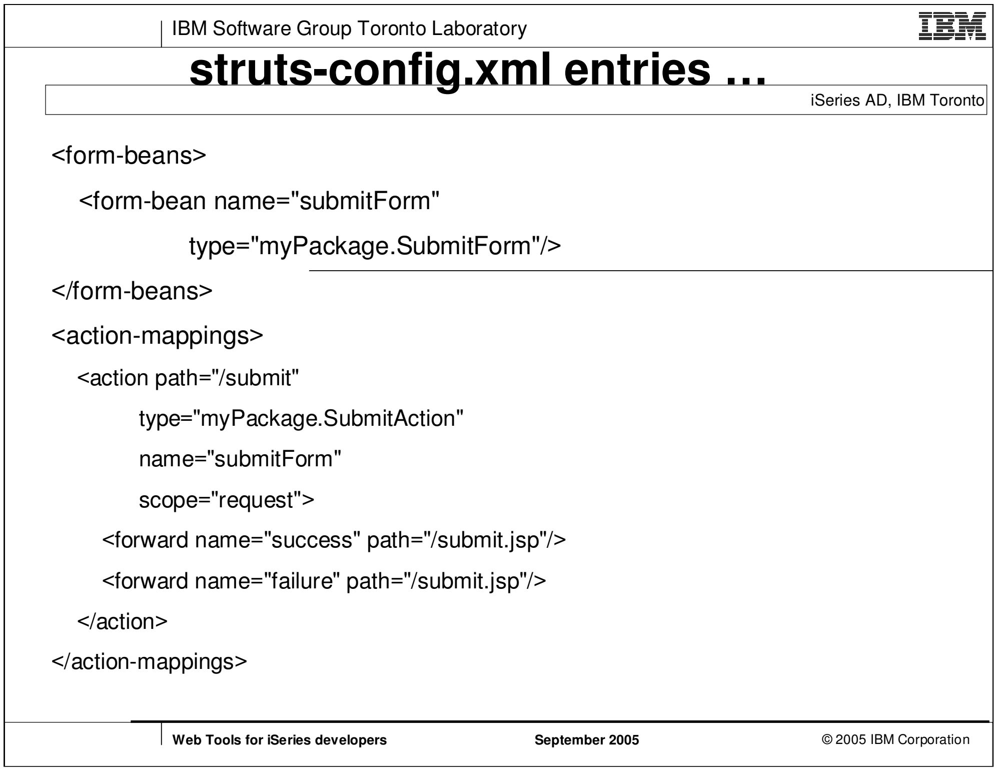
Struts web.xml entries…

```
<servlet-name>action</servlet-name>
<servlet-class> org.apache.struts.action.ActionServlet </servlet-class>
<servlet-mapping>
  <servlet-name>action</servlet-name>
  <url-pattern>*.do</url-pattern>
</servlet-mapping>
```

•the Struts “action” servlet acts as a common controller for the whole application

•Model includes Action classes, Form Beans

•The web.xml file contains: the definition of the Struts servlet named "ActionServlet“, the URL mapping for the calls to this servlet (*.do)



struts-config.xml entries …

iSeries AD, IBM Toronto

```
<form-beans>
   <form-bean name="submitForm"
                type="myPackage.SubmitForm"/>
</form-beans>
<action-mappings>
   <action path="/submit"
          type="myPackage.SubmitAction"
          name="submitForm"
          scope="request">
      <forward name="success" path="/submit.jsp"/>
      <forward name="failure" path="/submit.jsp"/>
   </action>
</action-mappings>
```

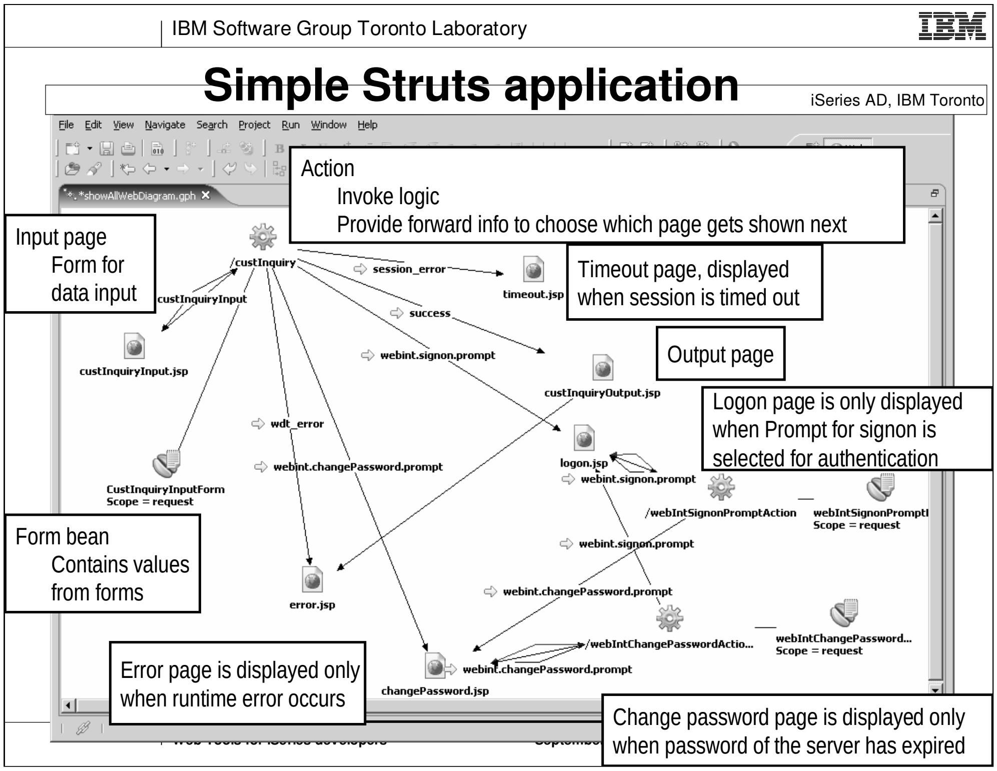
path - name of the request: "submit.do". You don't enter the ".do"-part here.

type - the path for the Action class file

name - is the logical name of the form bean (from the form-bean section)

input - validation errors should be shown on this page

forward- tag tells the “action” servlet where to go if it receives either "success" or "failure" from the Action class.



IBM Software Group Toronto Laboratory

Simple Struts application

iSeries AD, IBM Toronto

Action
- Invoke logic
- Provide forward info to choose which page gets shown next

Input page
- Form for data input

Timeout page, displayed when session is timed out

Output page

Logon page is only displayed when Prompt for signon is selected for authentication

Form bean
- Contains values from forms

Error page is displayed only when runtime error occurs

Change password page is displayed only when password of the server has expired

After Web Interaction wizard generates all the classes, SP files and connections, you can drop the initial JSP page (custInquiryInput.jsp) onto the web diagram and right click > Draw All, then the entire flow of the application is drawn for you. These information are based on struts-config.xml.

More Information?

►Information Sources

www-306.ibm.com/software/awdtools/iseries

- ►For iSeries Applicaton Development

www.eclipse.org

- ►Eclipse and information about eclipse

www.ibm.com/software/info1/websphere/partners/iseries.jsp

- ►WebSphere on iSeries home page for BPs

eServer magazine (iSeries edition)

- ►Articles on WDSc

Disclaimer

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Acknowledgement:

- This presentation is a collaborative effort of the IBM Toronto iSeries Application Development team.

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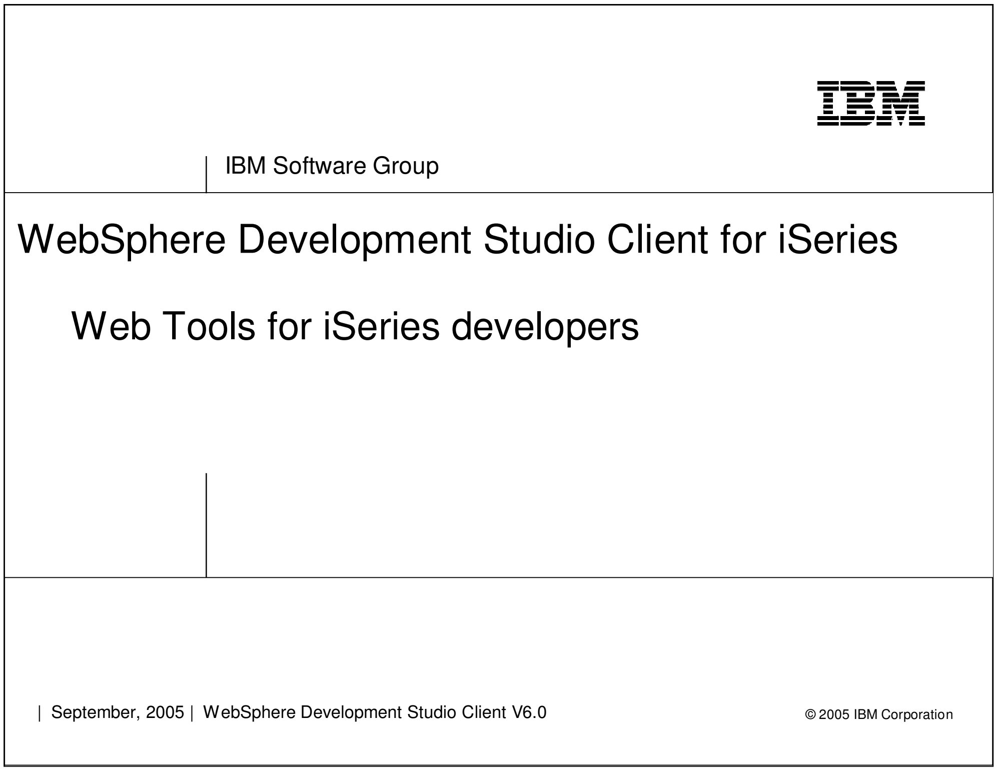

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WebSphere Development Studio Client for iSeries

Web Tools for iSeries developers