



Web Tools for IBM System i5 developers

ibm.com
the power of one

IBM System i5 ITSO Technical Forum 2006



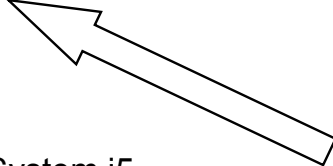
© 2006 IBM Corporation



AGENDA

iSeries AD, IBM Toronto

- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard
 - JSF (JavaServer Faces)



ibm.com/redbooks | International Technical Support Organization **IBM**

WebSphere Development Studio

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

RPG

COBOL

C/C++

PDM
SEU
SDA
RLU

Upgrade from WDS 6.0 to 6.0.1 using Rational Product updater

Unlimited Licenses

New WDSc 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

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

ibm.com/redbooks | International Technical Support Organization **IBM**

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

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
	EGL * COBOL generation	EJB *	Test * Cases	Portal *	<div style="border: 2px solid black; padding: 5px; display: inline-block;"> New WDSc Lite <small>Technology preview</small> </div>		

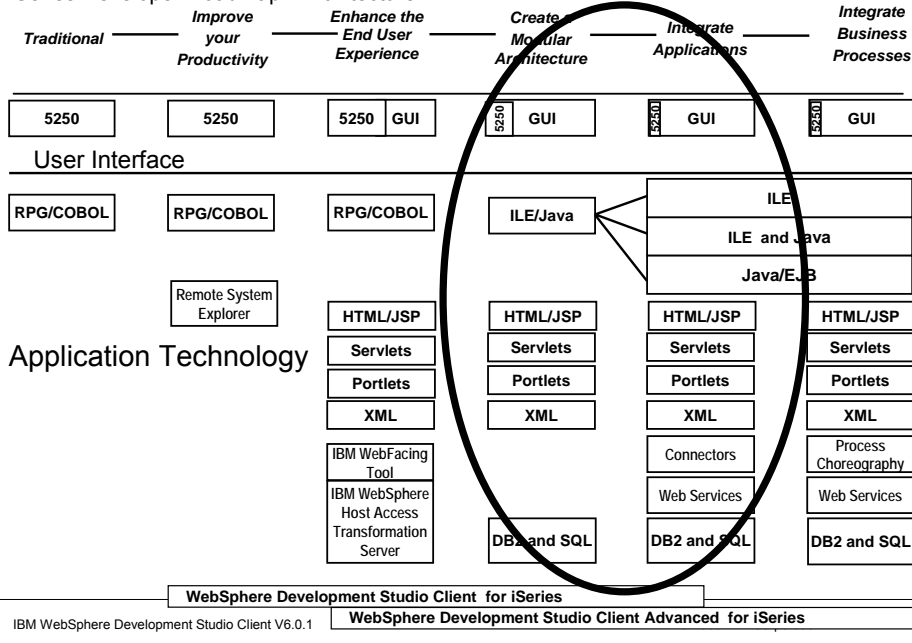
www.ibm.com/software/awdtools/iseries

WebSphere Development Studio Client V6.0.1 based on RAD V6

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation



iSeries Developer Roadmap - Architecture



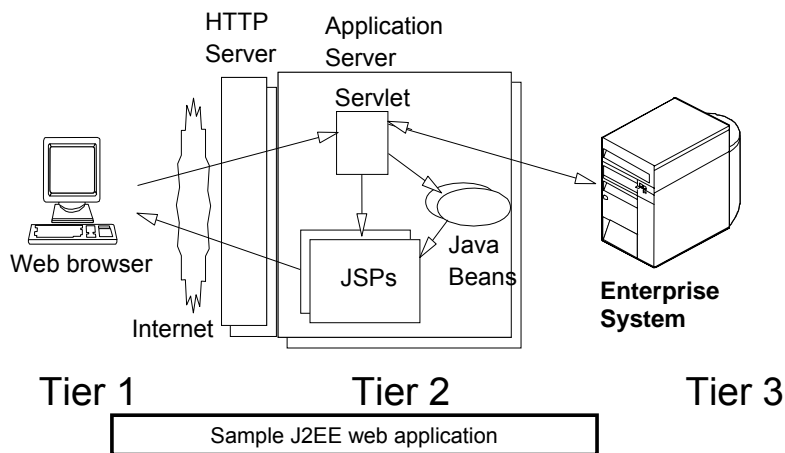
AGENDA

iSeries AD, IBM Toronto

- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard

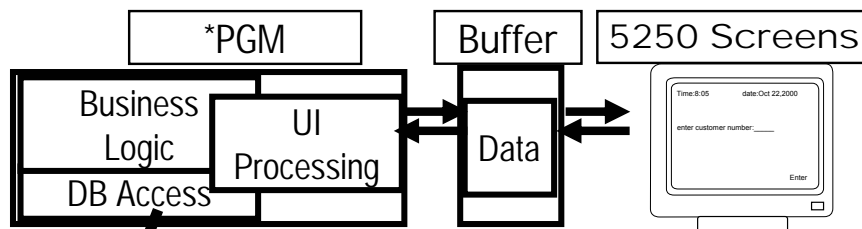


Modern App Architecture



Today's Model

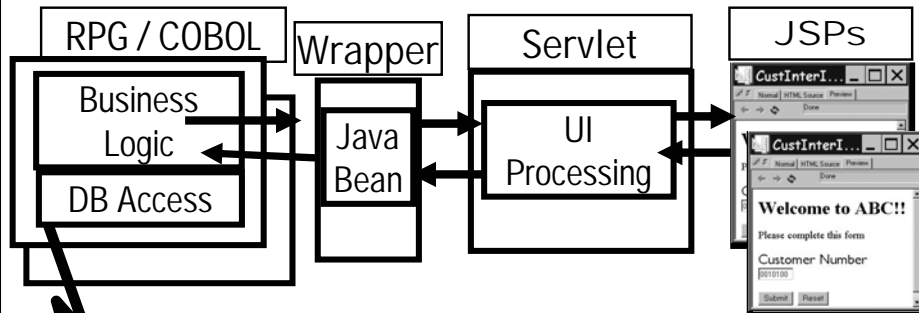
iSeries AD, IBM Toronto



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

eBusiness Application

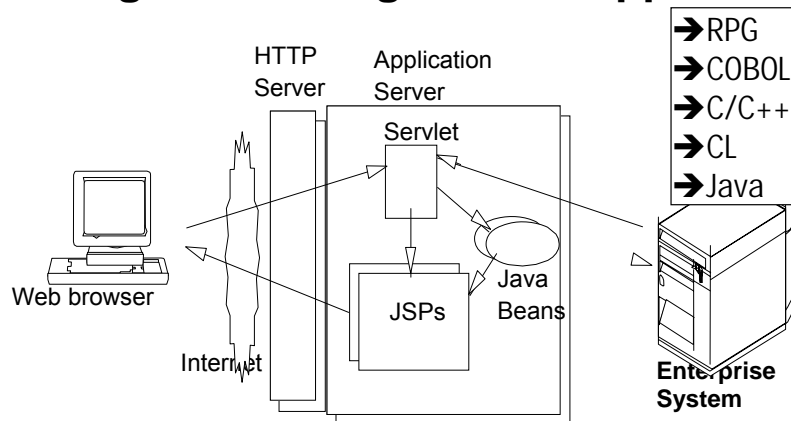
iSeries AD, IBM Toronto



DB2 UDB

- **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**

Tooling for building modern applications



WDSc

→ iSeries webtooling

→ iSeries 3 GL tooling

→ Pagedesigner

→ Remote system explorer

→ Interaction wizard

→ LPEX source editor

→ WebServices wizard

→ 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**

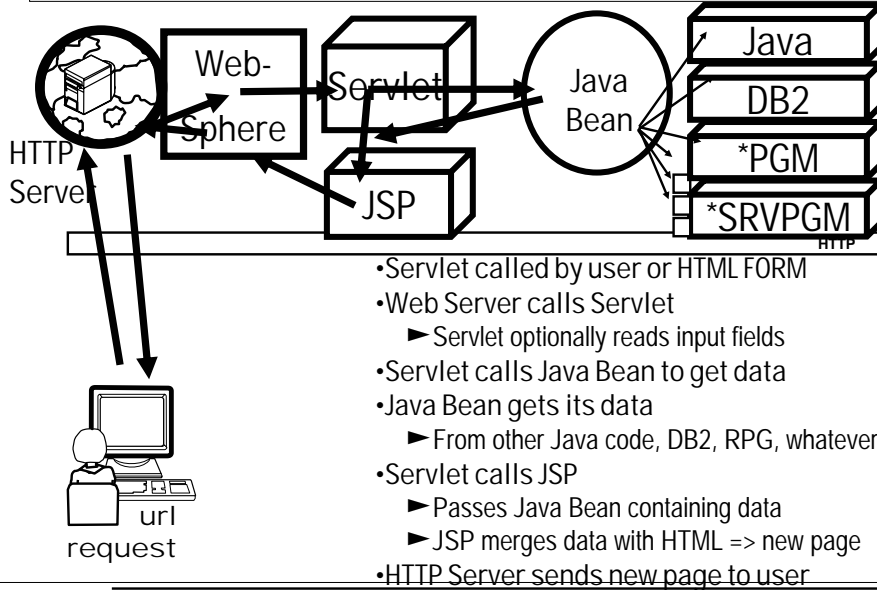
What Are JSPs?

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

Web Model

iSeries AD, IBM Toronto



Calling native programs from Java

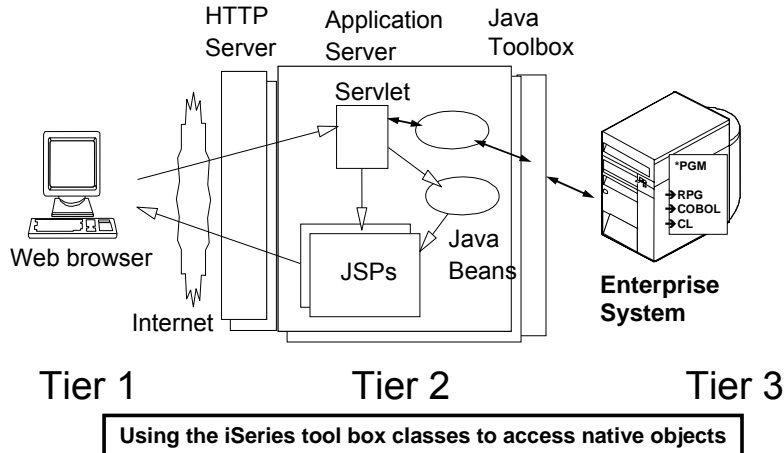
iSeries AD, IBM Toronto

A brief look at:

IBM System i5 Java toolbox

- Using Program Call Markup Language (PCML)

Calling native programs from Java



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.

Use PCML to describe program interface

iSeries AD, IBM Toronto

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

iSeries AD, IBM Toronto

```

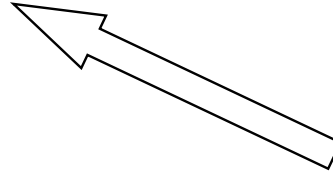
public static void main(String[] argv)
{
  AS400 as400System = new AS400();
  ProgramCallDocument pcml = null;
  String msgId, msgText;
  Object value = null;
  try {
    System.out.println(
      "Creating ProgramCallDocument for GetCust pgm.");
    pcml = new ProgramCallDocument(as400System, "GETCUST");
    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.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

```

AGENDA

iSeries AD, IBM Toronto

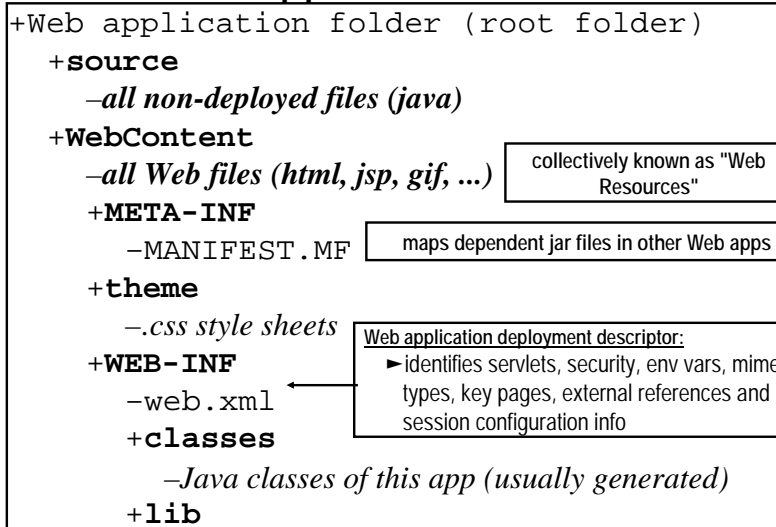
- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard



Web Application

iSeries AD, IBM Toronto

► Standard Web App folder structure:



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

J2EE
1.3

Terms: Web Application

iSeries AD, IBM Toronto

▶ Example Web Application

```

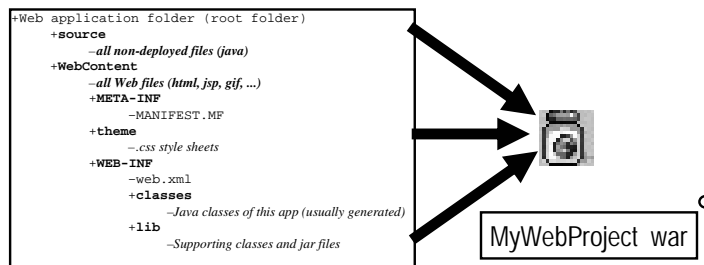
+accounts
  +source
  +WebContent
    -index.html
    +receivable www.mydomain.com/accounts
      -page1.html www.mydomain.com/accounts/receivable/page1.html
    +payable
      -page1.html www.mydomain.com/accounts/payable/page1.html
  +META-INF
    -MANIFEST.MF
  +theme
    -corporate.css
  +WEB-INF
    -web.xml
  +classes
  
```

iSeries AD, IBM Toronto

▶ 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)

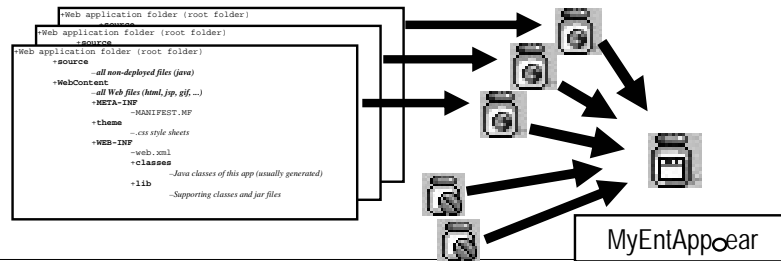
J2EE
EJB
Spec

•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)



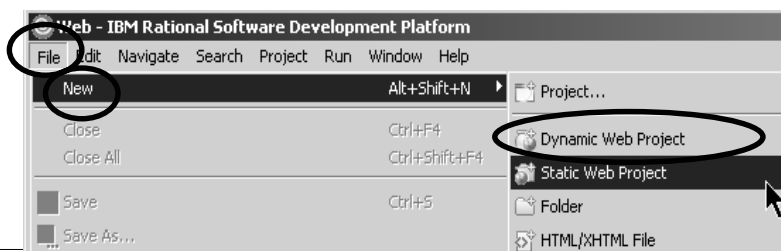
WDS Web Tools At A Glance

- ▶ Web projects
- ✓ Created with J2EE-defined folder structure for Web Applications
 - ✓ Superset of Java projects (so contain all Java Tool support too)
- ▶ Automatic creation/maintenance of web.xml file
- ▶ Editor support
 - ✓ JSP and HTML files
 - ✓ Support for creating, validating, editing and debugging
 - ✓ Including WYSIWYG PageDesigner
 - ✓ Custom JSP tags (taglib) support
 - ✓ based on the Sun Microsystems JSP 1.1 Specification
 - ✓ Images and animation
 - ✓ Cascading Style Sheets (CSS)
- ▶ Import/Export from/to a variety of sources
 - ✓ HTTP/FTP/WAR
- ▶ Link viewing and management
 - ✓ Converting links, flagging broken links, and fixing up links as linked resources are moved or renamed
- ▶ Wizard for servlets, Web pages from DB or JavaBean
- ▶ Integration with WebSphere Test Environment

Web Projects

iSeries AD, IBM Toronto

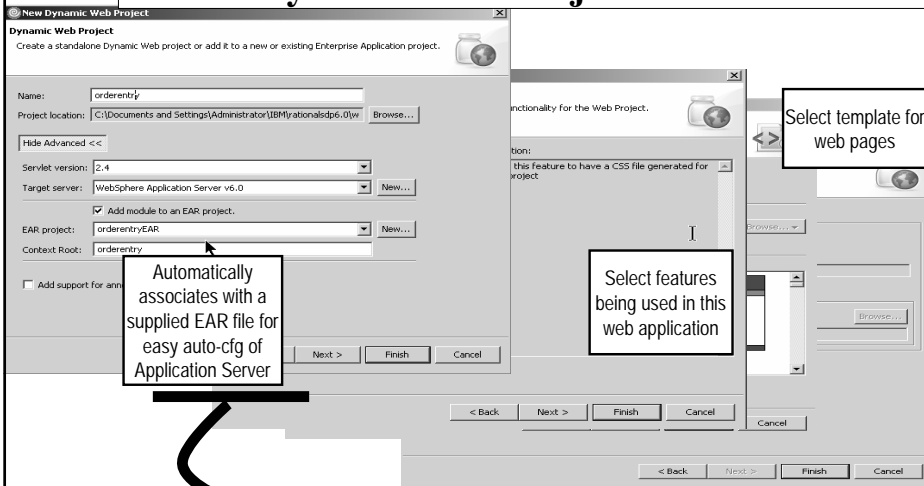
- **One of the project types in WDS**
 - ▶ With its own perspective
 - ▶ With its own "new" wizard
 - ▶ With its own set of tools
- **Created with J2EE folder layout**
- **Created with simple web.xml file**
 - ▶ Automatically updated as resources are created
 - ▶ Has specialized web.xml editor



Web projects

iSeries AD, IBM Toronto

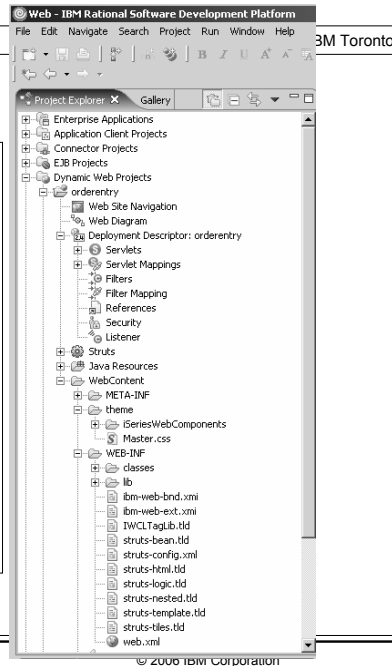
New Dynamic Web Project wizard



Web projects

**To create a new web project
Select New Dynamic
Web Project in Web
perspective**

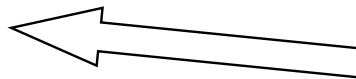
**Web application structure
is created from information
provided in New Dynamic
Web Project Wizard**



AGENDA

iSeries AD, IBM Toronto

- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard



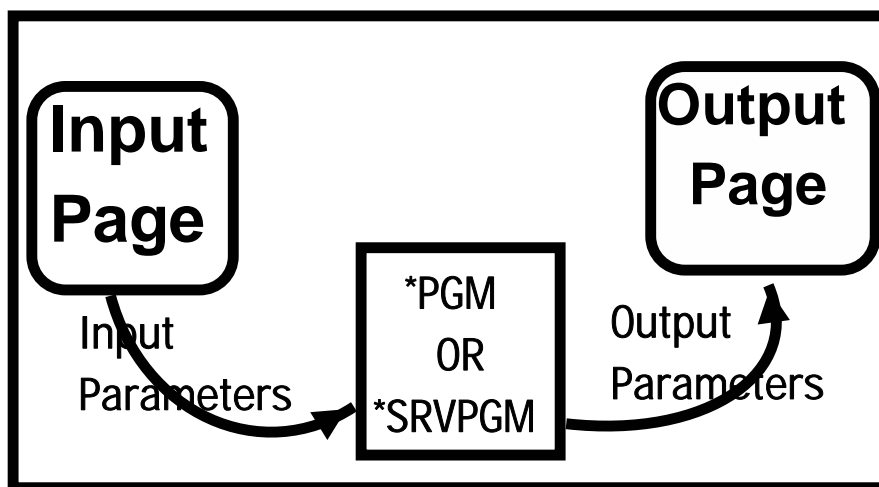
Web Tool for iSeries

iSeries AD, IBM Toronto

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

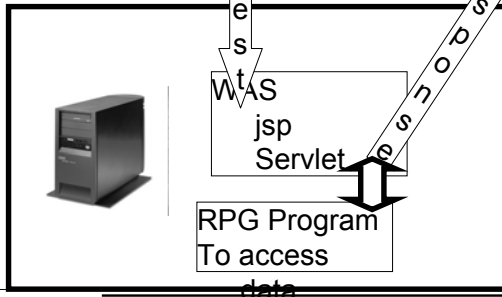
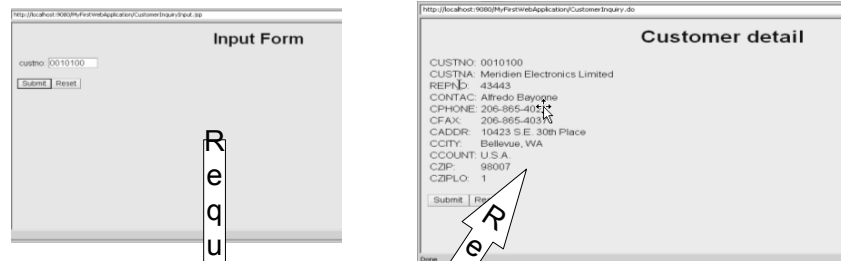
An interaction

iSeries AD, IBM Toronto



Build this simple interaction

iSeries AD, IBM Toronto



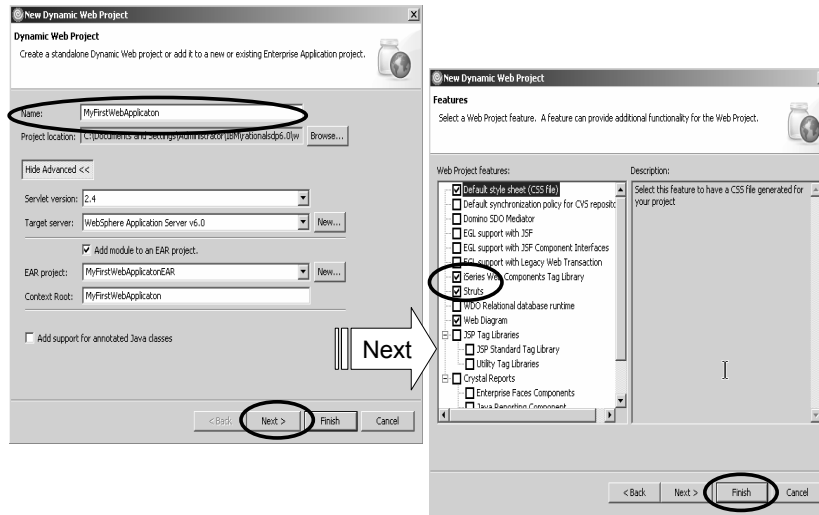
Using the Interaction wizard

iSeries AD, IBM Toronto

- ✦ 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

Create a Web project

iSeries AD, IBM Toronto



Using the Interaction wizard

iSeries AD, IBM Toronto

- ✓ Create a Webproject
- ✚ Create Runtime configuration ←
- iSeries server
 - User id/password
 - Library list setup
- ✚ Create Interaction
- ✚ Input screen
 - ✚ Program interface
 - ✚ Output screen

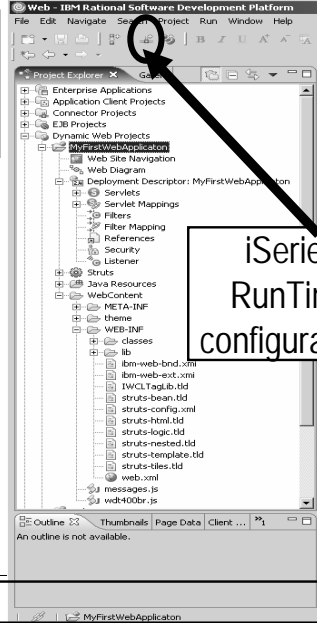
Runtime configuration

iSeries AD, IBM Toronto

Created Dynamic Web project:
→ MyFirstWebApplication
Now create the runtime environment

• Information used at runtime by all generated Web servlets in this Web project

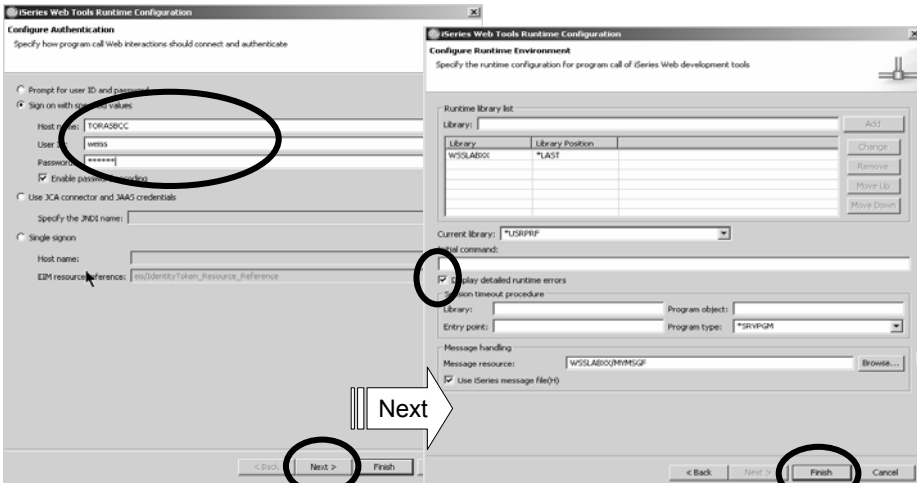
- ▶ Name of host containing *PGM or ILE Procedure
- ▶ User ID and password for signing on
- ▶ Library list to set for *PGM/Proc job



IBM WebSphere Development Studio Client V6.0.1

iSeries Web Tools

▶ iSeries Web Host Information Wizard



IBM WebSphere Development Studio Client V6.0.1

© 2006 IBM Corporation

Using the Interaction wizard

iSeries AD, IBM Toronto

- ✓ Create a Webproject
- ✓ Create Runtime configuration
 - ✓ iSeries server
 - ✓ User id/password
 - ✓ Library list setup
- ✚ Create Interaction ←
- ✚ Input screen
- ✚ Program interface
- ✚ Output screen

WDS*c*: iSeries Web Tools

iSeries AD, IBM Toronto

► iSeries Web Interaction Wizard

```

To enable the iSeries Webtooling detailed runtime
<param-name>WDT_FLGERRORDETAILS</param-name>
<param-value>true</param-value>
</context-param>
<description>
Program type:</description>
<param-name>WDT_PROGRAMTYPE</param-name>
<param-value>*SRVPGM</param-value>
</context-param>
<description>
Message resource for message
<param-name>WDT_MSRESOURCE</param-name>
<param-value>WSSLABXX/MYMSGF
</context-param>
<description>
Use iSeries Message File</de
<param-name>WDT_USEISERIESMS
<param-value>true</param-value>
</context-param>
<description>
iSeries program call host name</description>
<param-name>WDT_HOSTNAME</param-name>
<param-value>TOPASBCC</param-value>
</context-param>

```

WDS*c*: iSeries Web Tools

iSeries AD, IBM Toronto

► iSeries Web Interaction Wizard

Web Interaction - New

Specify a Name and Location for your Web Interaction

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

Destination folder: MyFirstWebApplicationWebContent

Web Interaction name: CustomerInquiry

Java package prefix: com.ibm.myfirstwebapplication

Use error page: /error.jsp

Invalidate session

Terminate Geres connection

Web Interaction - CustomerInquiry

Specify the Input and Output Pages for your Web Interaction

You can use previously designed input and output pages for the Web interaction or you can have the wizard generate them.

Generate input pages

Use input pages:

CustomerInquiryInput.jsp

Generate output pages

Use output pages:

CustomerInquiryResults.jsp

Generate input/output pages using a page template

Generate input and output Web pages. Accept default page names

Next >

IBM WebSphere Development Studio Client V6.0.1

Web Interaction Wizard

iSeries AD, IBM Toronto

- Two modes to interaction wizard:
 - **Generate input/output Web pages**
 - Given the parameter description of the API to call (In this sample we are using this mode)
 - **Generate mappings**
 - Given the input/output pages
 - Given the parameter description of the API to call
 - Given the mappings
 - ✓ between input parms & input fields
 - ✓ between output parms & output fields

iSeries Web Interaction Wiz

iSeries AD, IBM Toronto

Get call interface from source member

Import PCML

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

Select PCML file from: Remote/Local File System

PCML file: C:\Documents and Settings\Administrator\IBM\rationalsdp6.0\worksp

Select programs or structures to import

- CSTRUC
- GETDATA

Tree view of PCML file

- CZPIO
- GETDATA
- CUSTNOI
- CSTRUC (CSTRUC)
 - CUSTNO
 - CUSTNA
 - REPNO
 - CONTAC
 - CPHONE
 - CFAX
 - CADOR
 - CCITY
 - CCOUNT
 - ccm

Select All **Deselect All**

OK **Cancel**

- ▶ Press import
- ▶ Select member
- ▶ PCML interface description gets generated

RPG IV Program GETDATA

iSeries AD, IBM Toronto

NOTE: Parameters to be passed

```

FCUSTOML3 IF E          K Disk
DCustnoi   s              like(CUSTNO)
D*
D CSTRUC   E DS          extname(customl3:custom01)
d field2
D return   s              20
D*-----
c          *entry      plist
c          parm        custnoi
c          parm        cstruc
c          parm        return
c          eval        return=blank
c          chain       customl3          5050
c          if          *in50
c          eval        return='CUS0001 ' + CUSTNOI
c          else
c          eval        return='0'
c          endif
c          return
    
```

iSeries Web Interaction Wiz

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

Program call definitions

GETDATA

Add Program... Add Parameter... Add Structure...

Edit Program

Program alias: GETDATA

Program object: GETDATA

Library: *LIB

Program type: *PRGM

Entry point:

CCSID of entry point:

Return type: void

Parse order: CSTRUC FEEDBACK

Thread safe:

location:

Update this program with the interaction

Changes applied.

OK Cancel

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

- Make changes as required
- For example if calling a program instead of procedure in service program

- Associate program GETDATA with this interaction
- Adjust program information
- Next step
 - Adjust parameter information

iSeries Web Interaction Wiz

iSeries AD, IBM Toronto

Web Interaction - CustomerInquiry

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

CSTRUC GETDATA CUSTNO1 CSTRUC (CSTRUC) FEEDBACK

Add Program... Add Parameter... Add Structure...

Edit Parameter

Parameter name: CUSTNO1

Data type: character

Structure name:

Length: 7

Precision:

Count:

Usage: Input

Initial value:

Advanced... Specify database reference field Show database field definition

Specify... Synchronize Show... OK Cancel

Next

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

Change program interface information:

- Input parameter
 - Customer number
- Output parameters
 - Structure
 - Feedback

ibm.com/redbooks | International Technical Support Organization **IBM**

Input page

Select input parameters to prompt user for, in input page

Property	Value
Label:	custno
Data Type:	Character(7)
Input Style:	Text
Input Choices:	...
Size:	7
Name in Session:	custno
Restore from Session:	false
Save to Session:	false
Get Browser Info.:	false
Message ID:	

Input Form

custno:

Immediately see results of tailoring parameter and page attributes

Property	Value
Page Title	Input Form
Background Color	RGB (236, 238, 134)
Title Color	RGB (0, 0, 255)
Field Color	■ (0,0,0)

Tailor attributes of overall input page

Tailor attributes of generated prompt per parameter

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

ibm.com/redbooks | International Technical Support Organization **IBM**

Output page

iSeries AD, IBM Toronto

Select output parameters to display in output page

Customer detail

Immediately see results of tailoring parameter and page attributes

Select output parameters to display in output page

Property	Value
Page Title	Customer detail
Background Color	RGB (244, 249, 72)
Title Color	RGB (0, 0, 255)
Field Color	

Tailor attributes of overall output page

Tailor attributes of generated prompt per parameter

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

You are done! What's Next?

iSeries AD, IBM Toronto

- **What did you do so far?**

- ✓ Created your Files on the iSeries
- ✓ Created your RPG Program
- ✓ Created an 'iSeries Web Interaction' to link your program parameters to the input page and output page
 - ✓ The input page was generated for you
 - ✓ The output page was generated for you

- **Next?**

- ▶ Run locally to test your application Or
- ▶ Publish all your files to the iSeries server

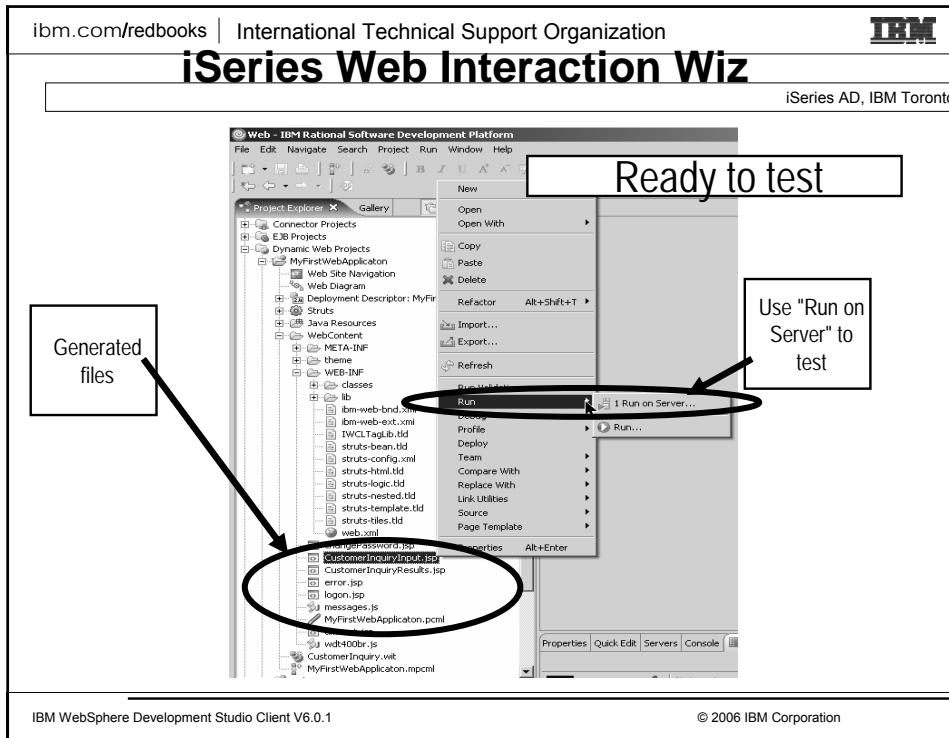
WDS*c*: Run On Server

iSeries AD, IBM Toronto

- ▶ **Run On Server**
 - **Now this is VERY COOL!**
- ▶ **When ready to test your Web app**
 - **Right click on initial html or jsp file**
 - **Select "Run... --> Run on Server"**
 - **Wait for the magic...**
- ▶ **Your Web application will run!**
 - **Opens Server perspective**
 - ▶ Publishes it to built-in copy of WAS
 - ▶ Starts built-in copy of WAS
 - ▶ Brings up a Web Browser
 - ▶ **Runs your application!!**

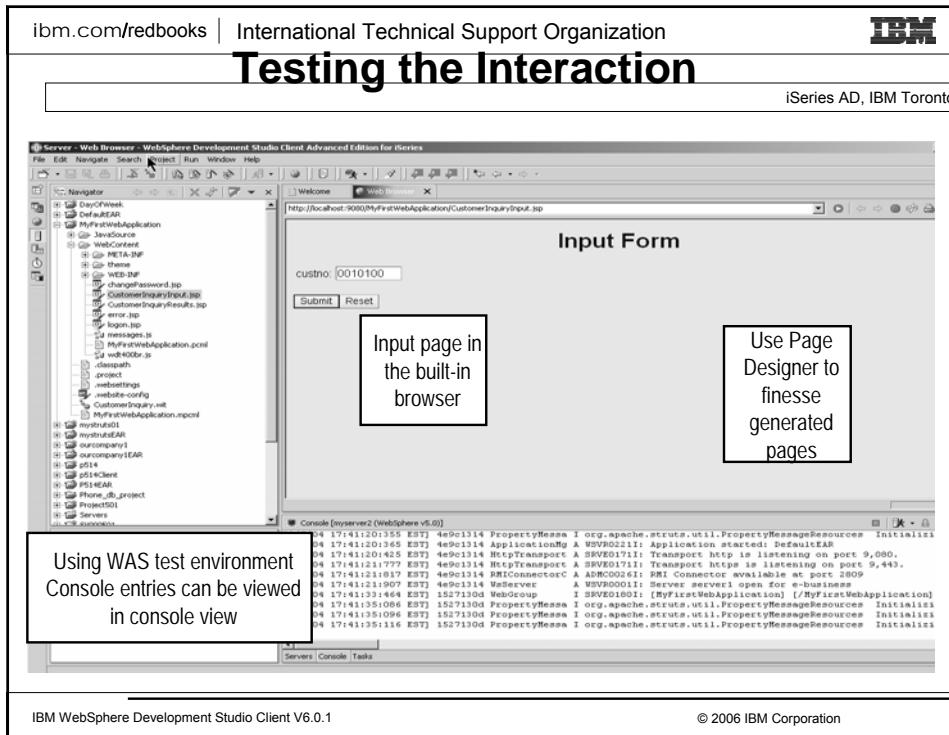
iSeries Web Interaction Wiz

iSeries AD, IBM Toronto



Testing the Interaction

iSeries AD, IBM Toronto



Testing the Interaction

iSeries AD, IBM Toronto

Customer detail

CUSTNO: 0010100
 CUSTNA: Meridien Electronics Limited
 REPN: 43443
 CONTAC: Alfredo Bayonne
 CPHONE: 206-865-4027
 CFA: 206-865-4037
 CADDR: 10423 S.E. 30th Place
 CCITY: Bellevue, WA
 CCOUNT: U.S.A.
 CZIP: 98007
 CZIPLO: 1

Application fetched data from database

Output page in the built-in browser

Submit Reset

Console [myserver2 (WebSphere v6.0)]

```
[2/5/04 17:41:20:365 EST] 4e9e1314 ApplicationMy A WSV80211: Application started
[2/5/04 17:41:20:425 EST] 4e9e1314 HttpTransport A SRVE01711: Transport http is
[2/5/04 17:41:21:777 EST] 4e9e1314 HttpTransport A SRVE01711: Transport http is
[2/5/04 17:41:21:817 EST] 4e9e1314 RMICConnectorC A ADMC00261: RMI Connector avail
[2/5/04 17:41:21:907 EST] 4e9e1314 WebServer A WSV800011: Server server1 open
[2/5/04 17:41:33:464 EST] 1527130d WebGroup I SRVE01801: [MyFirstWebApplica
[2/5/04 17:41:35:086 EST] 1527130d PropertyMessa I org.apache.struts.util.Propert
[2/5/04 17:41:35:096 EST] 1527130d PropertyMessa I org.apache.struts.util.Propert
[2/5/04 17:41:35:116 EST] 1527130d PropertyMessa I org.apache.struts.util.Propert
[2/5/04 17:44:59:240 EST] 4e31d31e WebGroup I SRVE01801: [MyFirstWebApplica
```

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

WebSphere Test Environment

iSeries AD, IBM Toronto

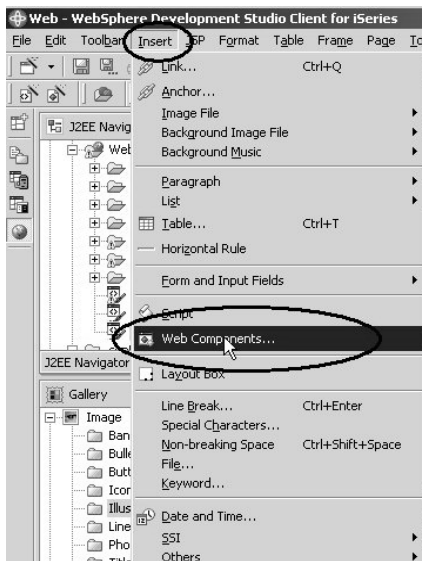
A full copy of WAS 6.0 is embedded in the IDE

- ▶ 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

Web UI with Web components

iSeries AD, IBM Toronto

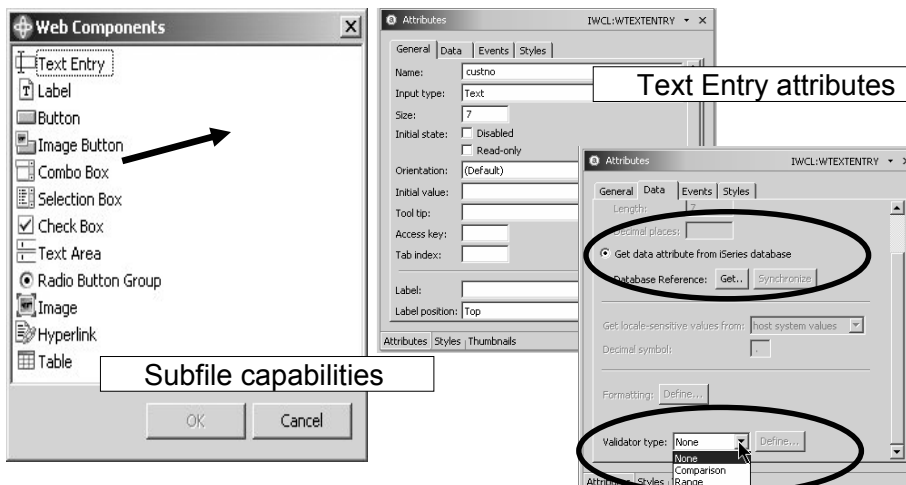
- **Web components:**
Visual Control Tags (VCT)
- **Tag library defined by:**
 ▶ www.sun.com
- **Extendable**



Web components ...

iSeries AD, IBM Toronto

◆ **With iSeries built in capabilities!**



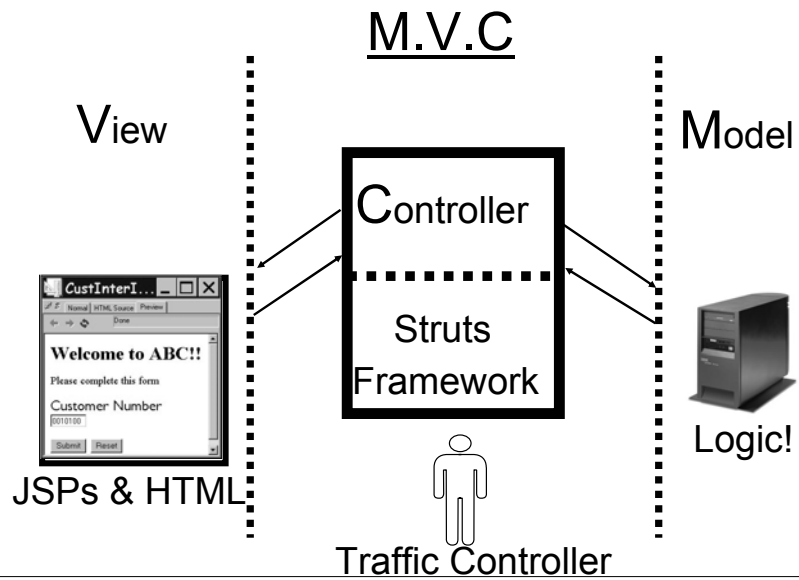
Struts

iSeries AD, IBM Toronto

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

Web Wizard Struts based ...

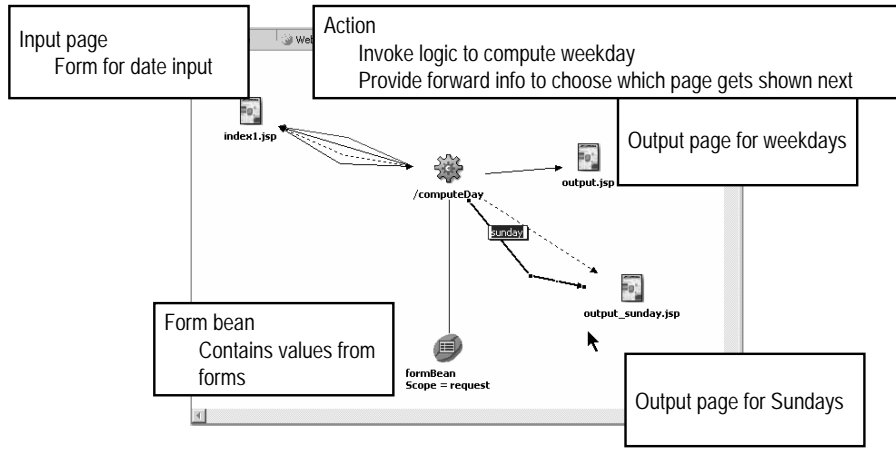
iSeries AD, IBM Toronto



Simple Struts application

iSeries AD, IBM Toronto

Web diagram of a simple Struts application



Input is date, output is day of week for that date
or if the day of week is a **Sunday**, output is a special Sunday page

Simple Struts web application

iSeries AD, IBM Toronto

→ Determine weekday from date

- One input page
- Two different Output pages

```

<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>
    
```

Define in the Struts config file

Which page to show
The action just returns different

It Is A Sunday Wonderful

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

PageDesigner

iSeries AD, IBM Toronto

The screenshot shows the IBM WebSphere Page Designer tool interface. The main window displays a web page titled "IBM WebTool CINNT Exam" with a "Three Frames" layout. The central frame contains an "Input Form" with a text input field labeled "%CustomerInquiryInput label_Enter_customer_number" and two buttons: "%CustomerInquiryInput.button.submit" and "%CustomerInquiryInput.button.reset".

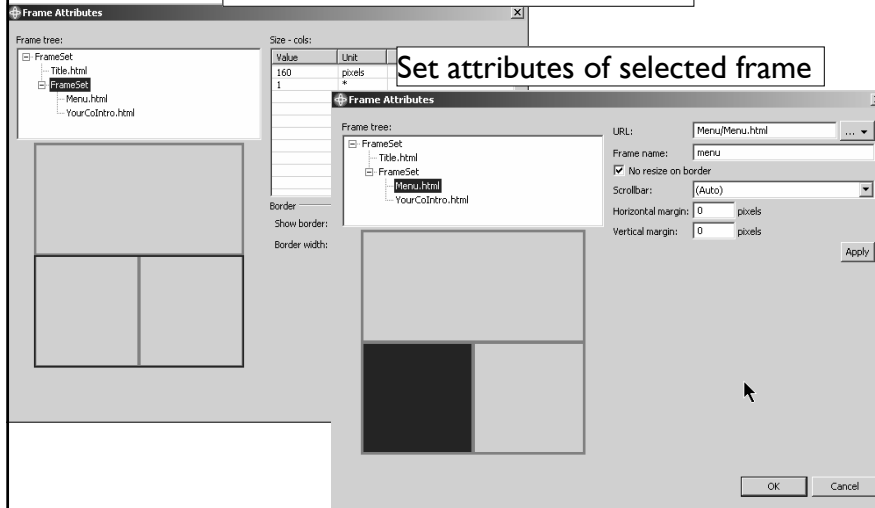
Annotations include:

- Project Navigator**: A box pointing to the left-hand tree view showing a project structure with folders like "Struts", "META-INF", and "theme", and files like "index.html", "login.jsp", and "messages.js".
- File View**: A box pointing to the "index.html" file in the Project Navigator.
- Design/Source/Preview**: A box pointing to the bottom status bar of the main editor window.
- Attribute editor**: A box pointing to the "Attribute" tab in the bottom status bar.
- Link view**: A box pointing to the "Link" tab in the bottom status bar.
- Different Views**: A box pointing to the "Design/Source/Preview" and "Attribute/Link" tabs.

Frame tools

iSeries AD, IBM Toronto

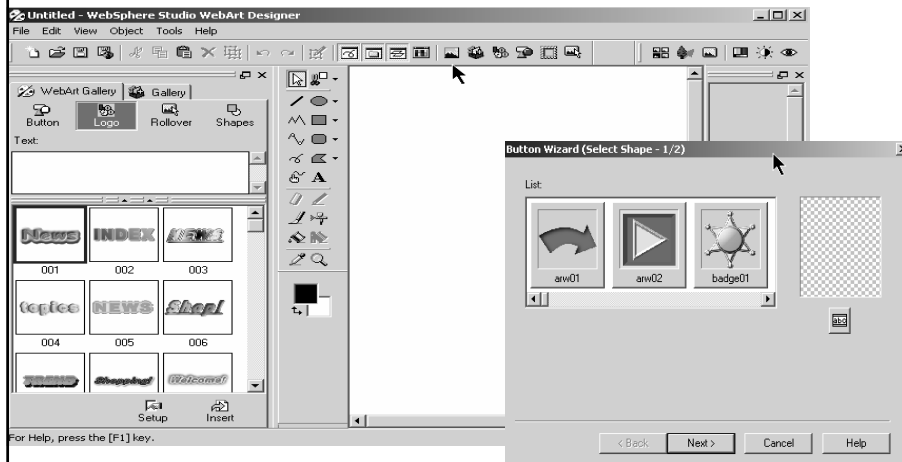
Set attributes of selected Frameset



WebArt Designer

iSeries AD, IBM Toronto

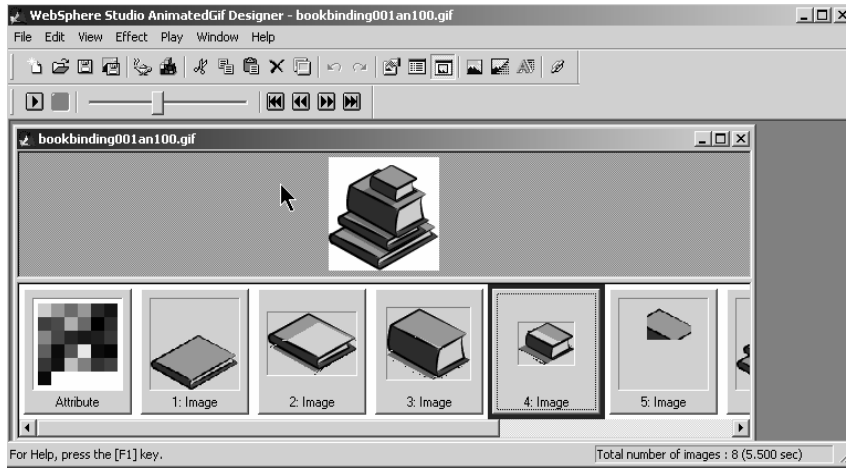
Wizards for Logo/Button/PhotoFrame/Rollover



For Help, press the [F1] key.

Animation GIF designer

iSeries AD, IBM Toronto



Running the improved application

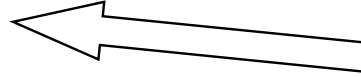
iSeries AD, IBM Toronto



AGENDA

iSeries AD, IBM Toronto

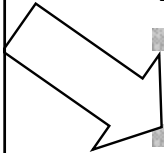
- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard



Web Tool for iSeries

iSeries AD, IBM Toronto

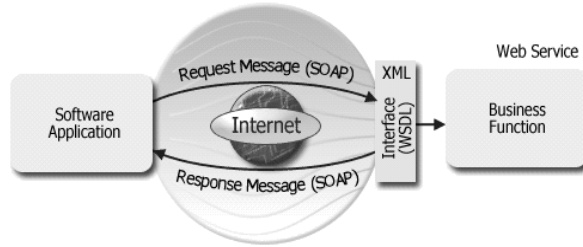
- ± Wizards to help create iSeries RPG/COBOL web applications
 - Interaction wizard to build an RPG web application
 - WebService wizard to build an iSeries WebService
 - JCA wizard to build an iSeries Java Connector Architecture (JCA) connector



Webservice overview

iSeries AD, IBM Toronto

- Industry standard
- A way to interchange data in a non-proprietary way
- Self-contained software components, with a well-defined interface
- The interface describes a set of operations accessible over the internet
- UDDI Universal Description, Discovery and Integration
- WSIL Web Services Inspection Language
- WSDL Web Services Description Language
- SOAP Simple Object Access Protocol

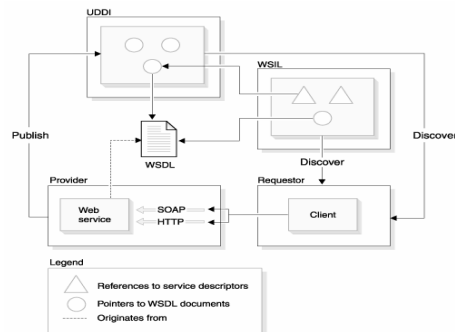


Web Service and IBM System i5

iSeries AD, IBM Toronto

- Describe the Program interface that provides the Service

- New in 6.0.1
- Web Service Wizard in WDS*c* generates
- for a given program source member on IBM System i5:
 - WSDL to describe the service interface
 - Test client to test the Web Service

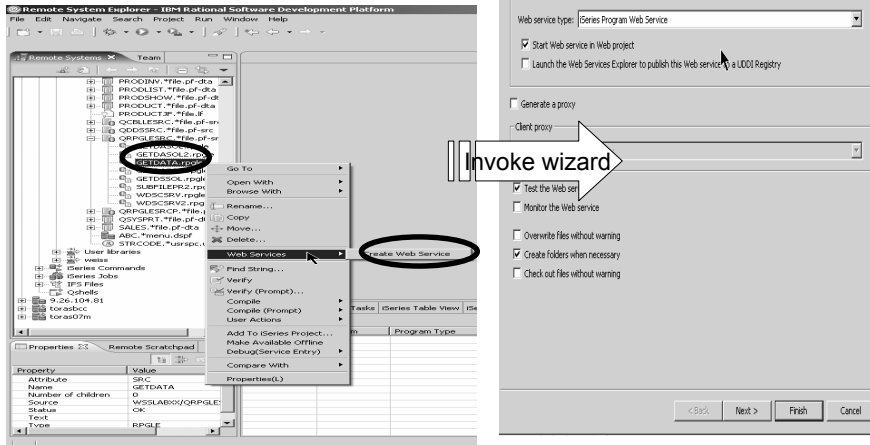


Create Web Service for RPG program

iSeries AD, IBM Toronto

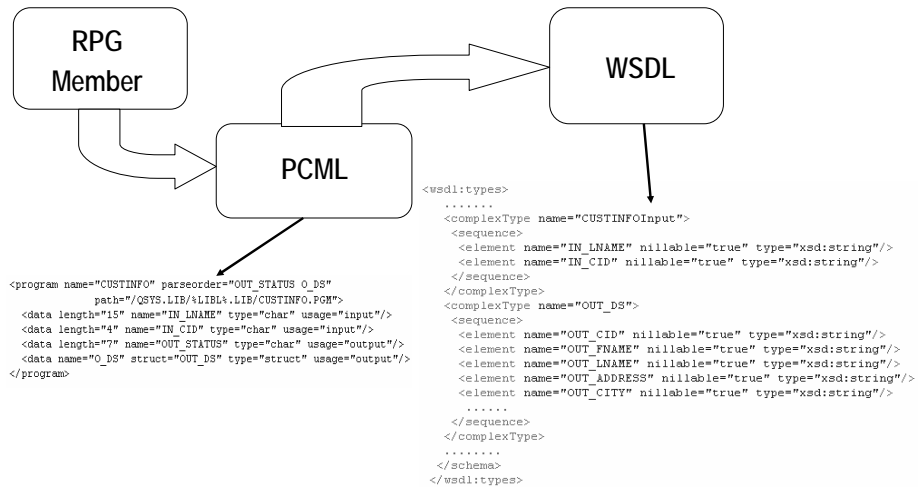
→ In RSE:

- select member
- choose Web Service wizard



Create Web Service for RPG program

iSeries AD, IBM Toronto



JSP Test client for Web Service

iSeries AD, IBM Toronto

→ Select method

→ Generated client page

→ Input for Web Service

→ Output from Web Service

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

Test the Web service - Web Service Explorer

- Right-click on the WSDL document.
- Web Services explorer opens WSDL document.
- Select an operation from the Web Service (custinfo), enter program input, Go!

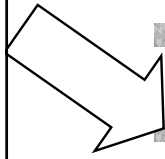
Open WSDL

IBM WebSphere Development Studio Client V6.0.1 © 2006 IBM Corporation

Web Tool for iSeries

iSeries AD, IBM Toronto

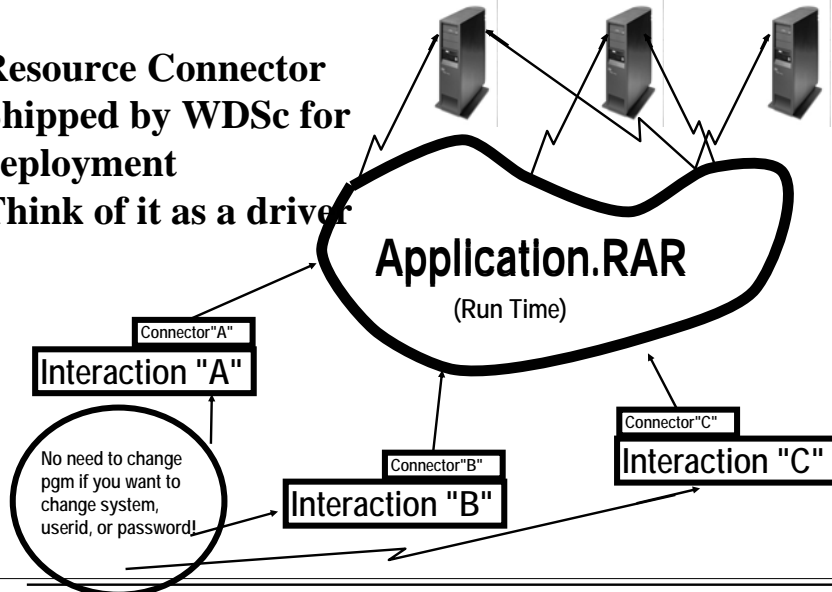
- ✦ Wizards to help create iSeries RPG/COBOL web applications
 - Interaction wizard to build an RPG web application
 - WebService wizard to build an iSeries WebService
 - JCA wizard to build an iSeries Java Connector Architecture (JCA) connector



What is JCA Connectors?

iSeries AD, IBM Toronto

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



Configuring a JCA connector

iSeries AD, IBM Toronto

- First you add the connector to the server configuration (all JCA info can be defined either through admin console)
- The userid(s) you want to use for program calls using JCA are defined via a JAAS authentication entry
- You map JAAS entry to a JNDI name.

1

Resource Adapter Name	Display Name
iseriesqpcall	iSeries Program Call Resource Adapter

2

Alias	User ID
JAASAlias	ericdp
JAASAlias2	ericdp2

3

Name: *	JNDI1
JNDI name: *	eis/JNDI1
Min connections:	0
Max connections:	0
Connection timeout:	0
Reap time:	0
Unused timeout:	0
Aged timeout:	0
Purge Policy:	FailingConnectionOnly
Container-managed authentication alias:	JAASAlias
Component-managed authentication alias:	JAASAlias2

Using JCA connector

iSeries AD, IBM Toronto

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

iSeries Web Tools Run-time Configuration

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

Series host name: torseign

User ID: ericdp

Password: *****

Prompt for iSeries user ID and password

Runtime library list

Library	Library Position
WAL150	*LAST
GUIDECPW55	*LAST

Current library: *USRPRF

Initial commands:

Use program call JCA connector

Specify the JNDI name: MyFirstWebApplication

Buttons: Finish, Cancel

AGENDA

iSeries AD, IBM Toronto

- WebSphere Development Studio WDS V5R4
- e-business primer
 - AD Model, traditional and web
 - Web Applications
 - Mixing Java and RPG
- Introducing WebTools for IBM System i5
 - Web projects
 - Interaction wizard
 - Page designer
 - Web Service wizard
 - JCA wizard
 - JSF - JavaServer Faces



Java Server Faces Overview

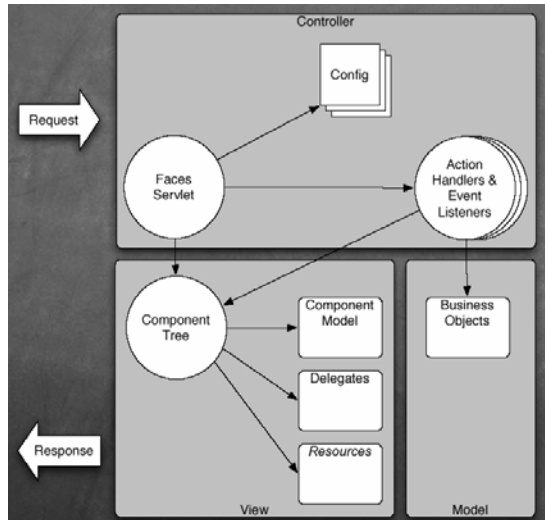
What JSF?

- Defines the Programming Model
- Reusable Components
- Builds HTML from Components
- Validation & Conversion
- Component Tree

Why JSF?

- Ease/Simplify Development
- Support from/by tools
- Events easily tied to server side code
- Ease of extension
- Manage UI state

Java Server Faces MVC on the Web



- Controller
 - FacesServlet
 - LifeCycle
 - Application
 - NavigationHandler
 - ActionListener
 - Conversion and Validation
- View
 - RenderKit
 - Renderers
- Model
 - JavaBeans
 - EJBs
- Extension Points
 - View & Controller are extensible

Java Server Faces Custom Component Examples

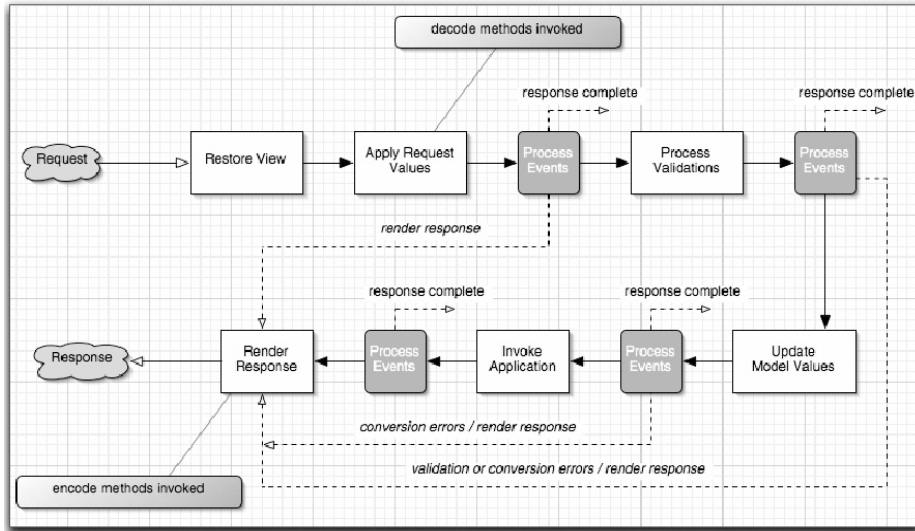
Project Summary	Start	2004	2005
Call for Requirements	Jan 10, 2004	Jan 10, 2004	Jan 10, 2004
Talk to customers	Jan 10, 2004	Jan 10, 2004	Jan 10, 2004
Contact customer	Jan 10, 2004	Jan 10, 2004	Jan 10, 2004
Write up requirements	Jan 20, 2004	Jan 20, 2004	Jan 20, 2004
Review requirements	Jan 22, 2004	Jan 22, 2004	Jan 22, 2004
Marketing Specification	Jan 27, 2004	Jan 27, 2004	Jan 27, 2004
First Draft Specification	Jan 27, 2004	Jan 27, 2004	Jan 27, 2004
Second Draft Specifc	Jan 4, 2004	Jan 4, 2004	Jan 4, 2004
Engineering Review	Jan 9, 2004	Jan 9, 2004	Jan 9, 2004

# of Items	Task Name
4	Customer Request
2	Automatic Processing
4	1st Level Support
5	Expert Support
1	Dispatching
0	Genr Support

History of Pending Items

Customer Request: 10
Automatic Processing: 5
Expert Support: 5
1st Level Support: 5
Dispatching: 5
Genr Support: 5

Java Server Faces Life Cycle



IBM Page Designer Tool

SUMMARY

iSeries AD, IBM Toronto

► 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?

iSeries AD, IBM Toronto

► 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

iSeries AD, IBM Toronto

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*

Disclaimer:

- The information contained in this document has not been submitted to any formal IBM test and is distributed on an as is basis without any warranty either express or implied. The use of this information or the implementation of any of these techniques is a customer responsibility and depends on the customers' ability to evaluate and integrate them into the customers' operational environment. While each item may have been reviewed by IBM for accuracy in a specific situation, there is no guarantee that the same or similar results will result elsewhere. Customers attempting to adapt these techniques to their own environment do so at their own risk.

Reproduction:

- The base presentation is the property of IBM Corporation. Permission must be obtained PRIOR to making copies of this material for any reason.



Trademarks and Disclaimers

© IBM Corporation 1994-2006. All rights reserved.
 References in this document to IBM products or services do not imply that IBM intends to make them available in every country.
 The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

AS/400	e-business on demand	i5/OS
AS/400e	IBM	OS/400
eServer	IBM (logo)	System i5
@server	iSeries	

Rational is a trademark of International Business Machines Corporation and Rational Software Corporation in the United States, other countries, or both.
 Intel, Intel Logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
 Linux is a trademark of Linus Torvalds in the United States, other countries, or both.
 Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.
 UNIX is a registered trademark of The Open Group in the United States and other countries.
 Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.
 Other company, product or service names may be trademarks or service marks of others.

Information is provided "AS IS" without warranty of any kind.

All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics may vary by customer.

Information concerning non-IBM products was obtained from a supplier of these products, published announcement material, or other publicly available sources and does not constitute an endorsement of such products by IBM. Sources for non-IBM list prices and performance numbers are taken from publicly available information, including vendor announcements and vendor worldwide homepages. IBM has not tested these products and cannot confirm the accuracy of performance, capability, or any other claims related to non-IBM products. Questions on the capability of non-IBM products should be addressed to the supplier of those products.

All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Contact your local IBM office or IBM authorized reseller for the full text of the specific Statement of Direction.

Some information addresses anticipated future capabilities. Such information is not intended as a definitive statement of a commitment to specific levels of performance, function or delivery schedules with respect to any future products. Such commitments are only made in IBM product announcements. The information is presented here to communicate IBM's current investment and development activities as a good faith effort to help with our customers' future planning.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

Photographs shown are of engineering prototypes. Changes may be incorporated in production models.