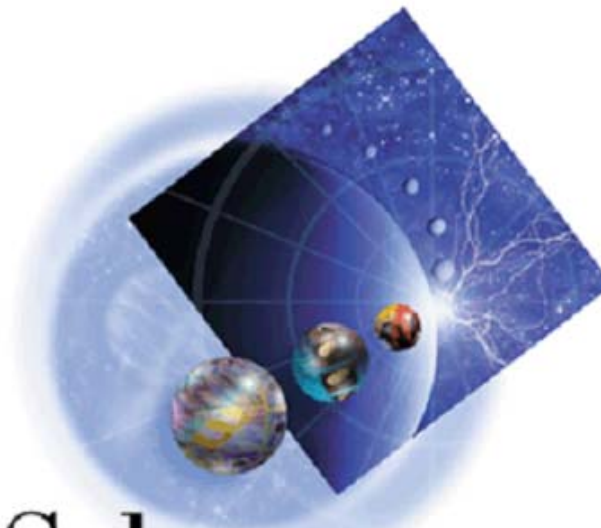


WebFacing

5250 Applications

with

Leonardo LLames
IBM Advanced Technical Support
Rochester, MN



WebSphere[®]
Development Studio
for iSeries[™]

Disclaimer



Acknowledgement:

- This presentation is a collaborative effort of the IBM Toronto iSeries Application Development presentation team, including work done by:
 - ▶ Phil Coulthard, George Farr, John Steinbacher, Claus Weiss,
 - ▶ Satish Gungabeeson

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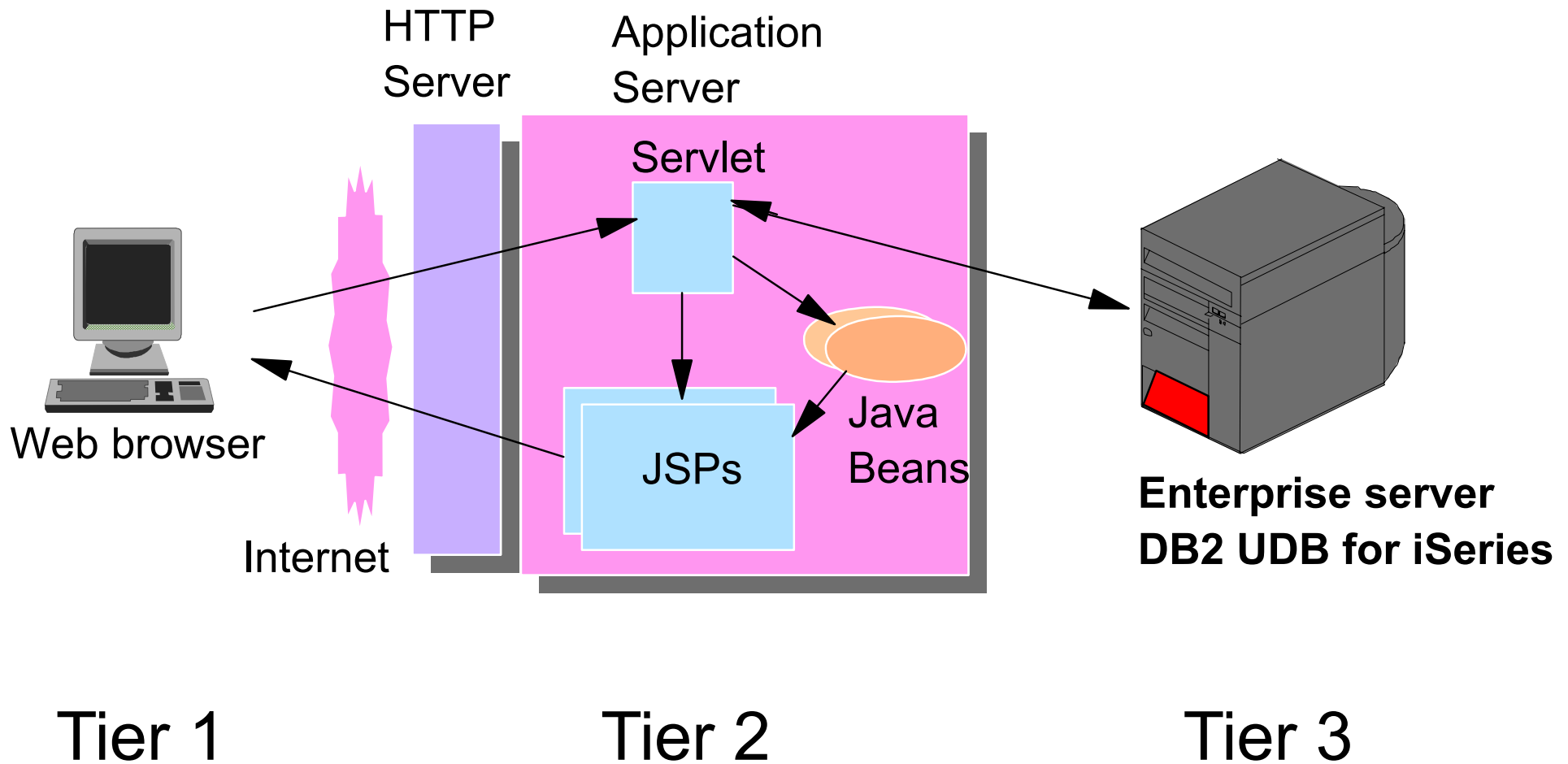
AGENDA



- **Web Application Architecture**
- **Introduction to WebFacing**
- **How WebFacing Works**
- **Development Time Tooling**
- **Some Final Comments**
- **Screen Cam Demo ?**



Web App Architecture



Servlets and JSPs

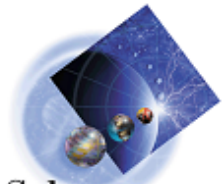


- **Servlets**
 - A Java class plug-in to the application server
 - Acts as the Web application controller
 - Processes and routes browser requests to Java helper objects
- **JavaServer Pages (JSPs)**
 - Encapsulate the presentation (view) of the application
 - Allows a clean separation between presentation and dynamic content
 - Use Java scriptlets to reference Java beans for dynamic application data
- **Java Beans**
 - Encapsulate dynamic application data
 - Populated by the servlet

Servlets , JSPs, and Beans are the resources of Web applications. They allow the generation of dynamic web pages.



Key Messages



WebSphere
Development Studio
for iSeries

- **Development (Build) & Deployment (Run) Platforms**
 - ▶ *Standards*
 - ▶ *Tools that use standards*
 - ▶ *Deploy on secure, reliable, scalable iSeries*
- **Integration Options With Core Applications & Data**
 - ▶ *Java & WebSphere*
- **GUI Development & Administration, e.g.,**
 - ▶ *WebSphere Development Studio*
 - ▶ *WebSphere Administrative Console*



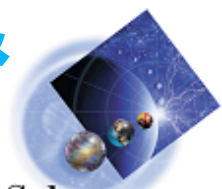
Agenda



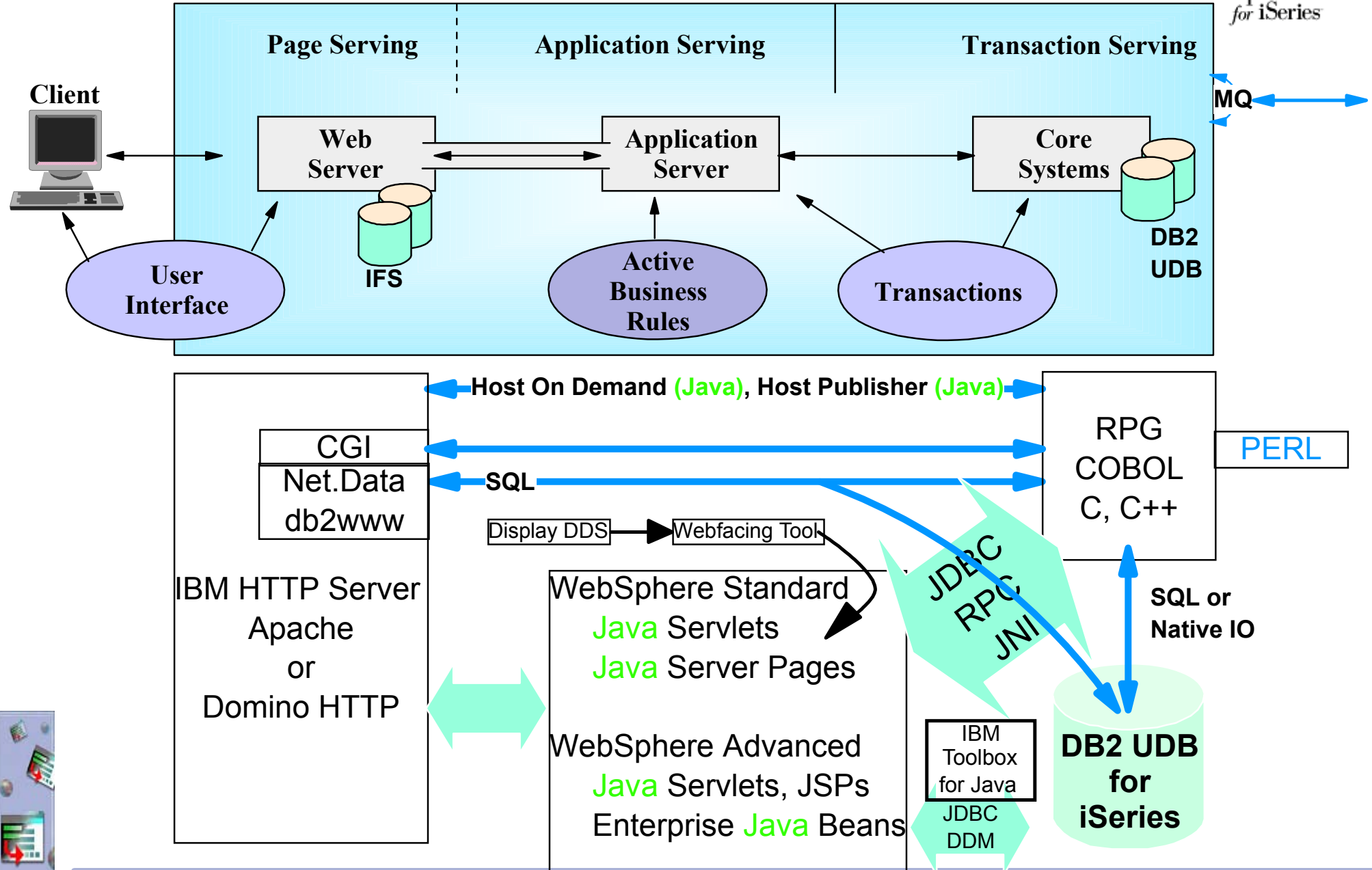
- **How to leverage / integrate your applications in these new business scenarios**
 - ▶ *Drive existing applications*
 - ▶ *Modify and extend existing applications*
- **What options do you have available**
 - ▶ *5250 datastream capture*
 - IBM & 3rd party software
 - ▶ *WebFacing*
 - ▶ *Java access to traditional application logic as services*
 - IBM Toolbox for Java
 - Middleware, e.g., MQ Series, etc.

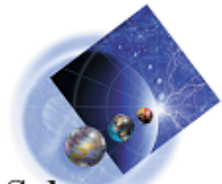


Common Options - Application Server & Integration



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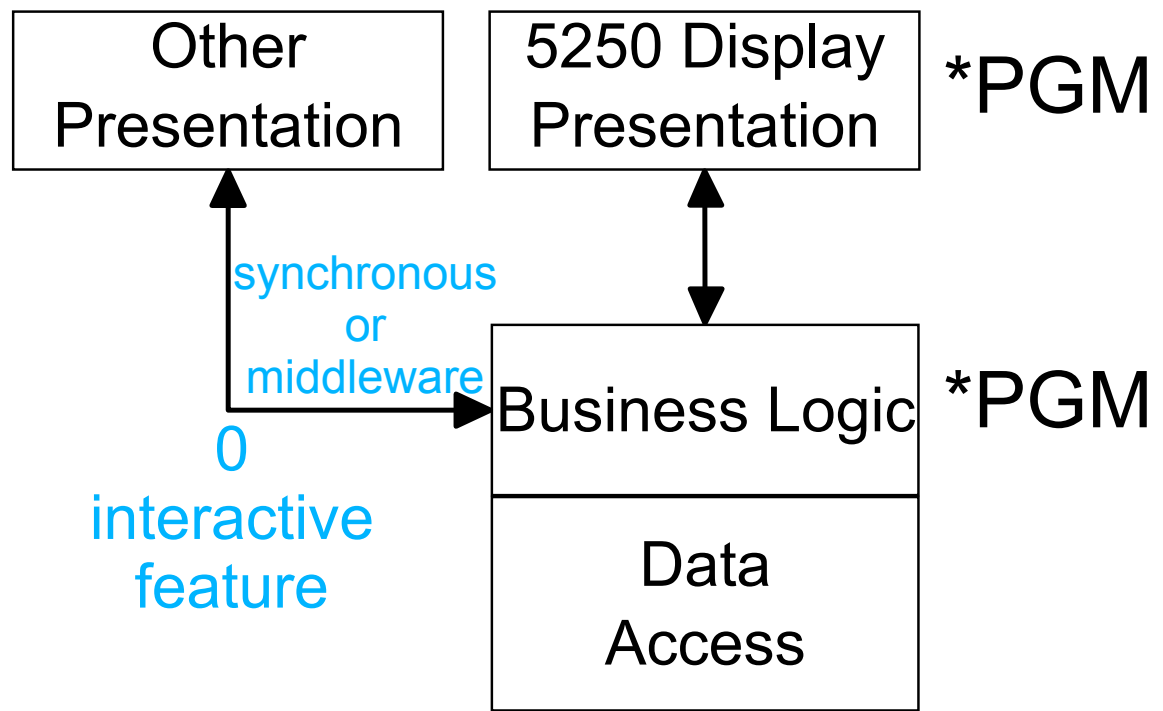
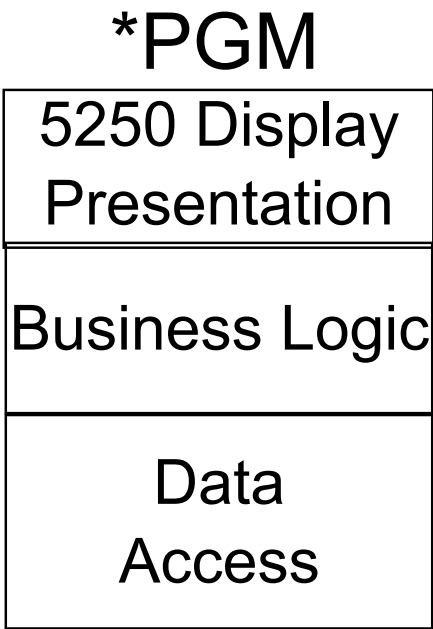
How embedded is presentation layer?

Monolithic Program Design, 5250 cannot be EASILY bypassed

- Host Integration
 - IBM or 3rd party SW, e.g., Host Publisher
- WebFacing

Modular Program Design, can either use or bypass 5250

- Host Integration
- WebFacing
- CGI or Net.Data (non-Java)
- New Java logic can call existing business programs
 - Example: WebSphere Studio Web Interaction Wizard

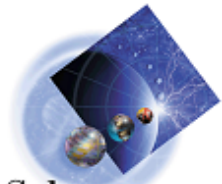


Introduction to WebFacing

- ▶ What is WebFacing ?
- ▶ A quick example
- ▶ How do I get it ?
- ▶ What do I need ?



What is WebFacing ?



WebSphere
Development Studio
for iSeries

New !

RPG Program

```
D/Copy DOWProto
P DayOfWeek B
D PI 1P0
D WorkDate D
D AnySunday S D INZ(D'1995-04-02')
D WorkNum S 7 0
D WorkDay S 1P 0

C WorkDate SubDur AnySunday WorkNum:*D
C WorkNum Div 7 WorkNum
C MvR WorkDay
C If WorkDay < 1
C Return WorkDay + 7
C Else
C Return WorkDay
C EndIf
P DayOfWeek E
```

Workstation
manager



5250

5250 to Web
conversion

Web



You can use both the 5250 and web UI !



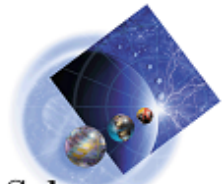
Before WebFacing



```
Session A - [24 x 80]
File Edit Transfer Appearance Communication Assist Window Help
PrtScr Copy Paste Send Recv Display Color Map Record Stop Play Quit Clipbrd Supp
A0570075 Cost Model Maintenance... Header
Syr Style. . . . . Customer . . Color Fob Change
F98 YP1998 1 ARG Status . . -
Htsus#/Harmonizing : 6201.93.3000
Type information. Then press Enter.
Description...
ARGENTINA
Country . . . . . ARG 0000484.
Mix % . . . . .
Htsus#/Harmonizing 1111.11.1111
Approved by . . . .
Approval date . . . .
Mâ a Ml A 11/004
Connected to remote server/host 206.96.12.34 using port 23
```



After WebFacing



WebSphere
Development Studio
for iSeries

AppSphere - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print Copy Paste

Links IBM Standard Software IBM Standard Software Installer IBM Business Transformation IBM Internal Help Customize Links

Address http://206.96.12.34:6600/appsphere/servlet/com.ibm.as400ad.webfacing.runtime.httpcontroller.ControllerServlet?inv=APPCON Go

APPCON
Simplifying the Complex

AppSphere

Enter A0570075 **Cost Model Maintenance... Header**

Syr	Style.	Customer . .	Color	Fob	Change
F98	YP1998	1		ARG	Status .. <input type="checkbox"/>

Htsus#/Harmonizing : 6201.93.3000

Type information. Then press Enter.

Description...


Country

Mix %

Htsus#/Harmonizing

Approved by

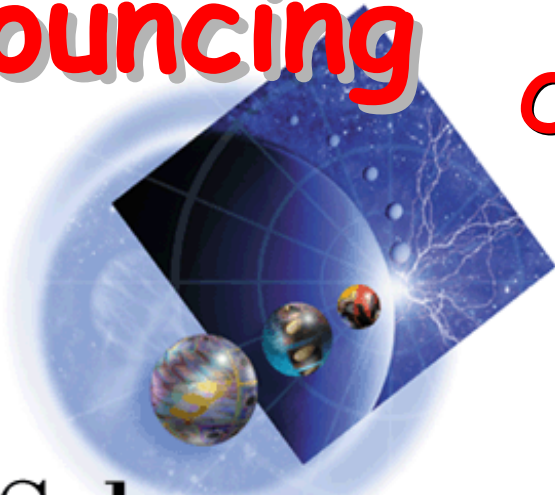
Approval date



How Do I Get It ?



Announcing



WebSphere[®]
Development Studio
for iSeries[™]

ONE PRODUCT: ALL TOOLS

- All host compilers and tools
 - ✓ RPG, COBOL, C, C++
 - ✓ ADTS (PDM, SEU, SDA, RLU, DFU)

- All client tools - unlimited

WebSphere Development Tools

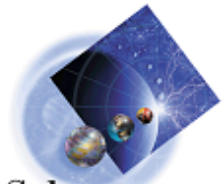
- ✓ CODE/400
- ✓ VisualAge for RPG
- ✓ VisualAge for Java Pro plus ET/400
- ✓ WebSphere Studio plus iSeries extensions

New

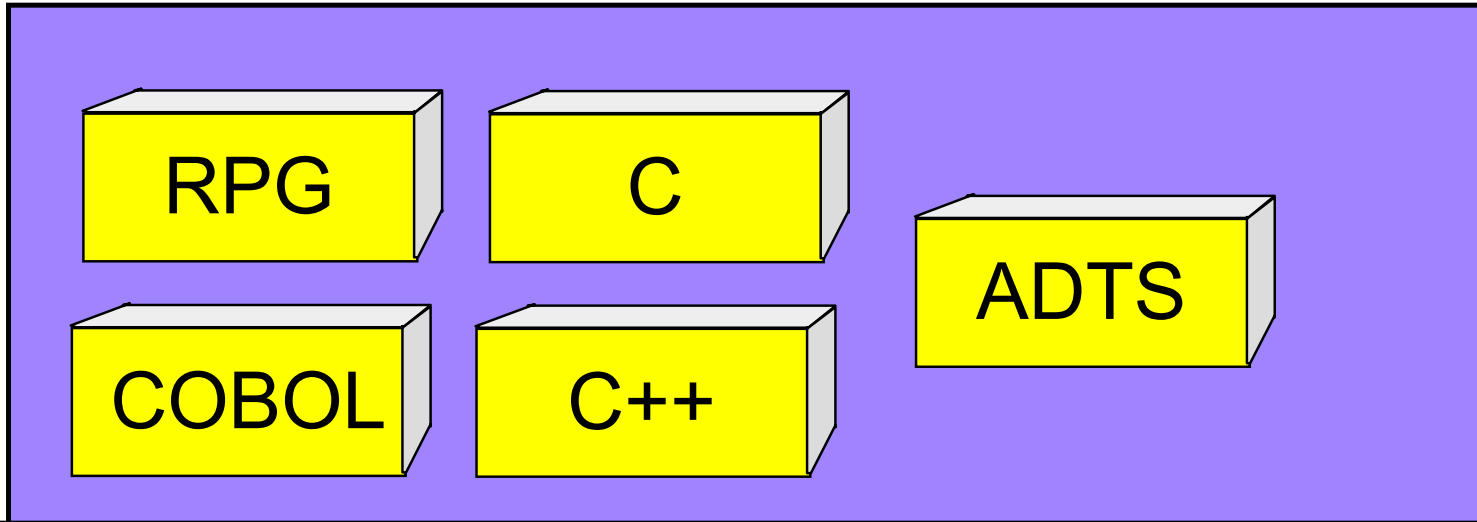
- 5769-WDS: V4R5
- 5722-WDS: V5R1
- ibm.com/software/ad/wds400 ✓ WebFacing



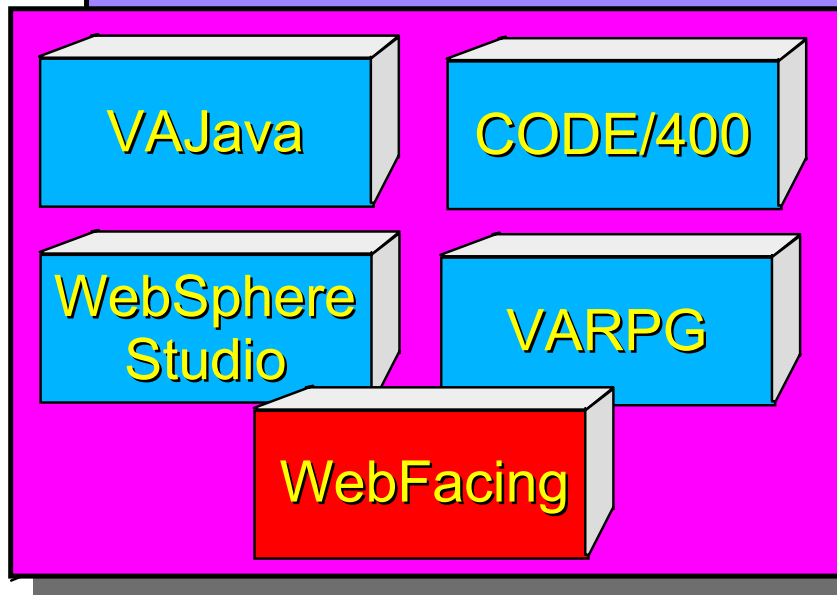
WebSphere Dev Studio



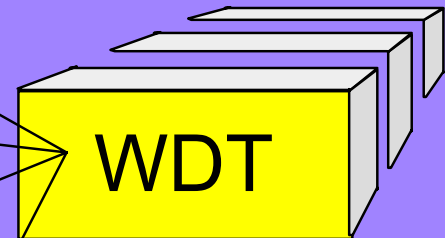
WebSphere
Development Studio
for iSeries



Host



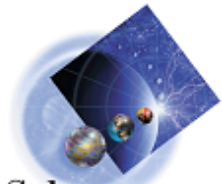
Client



(Unlimited licenses)



Goals of WebFACING



WebSphere
Development Studio
for iSeries

- ✓ **Quickly convert existing interactive applications into **web apps****
 - Browser based user interface
 - Minimal change to underlying applications
 - Minimal initial investment in skills

- ✓ **Allow iterative **improvement** for the Web**

- ✓ **Changing the face of the iSeries**

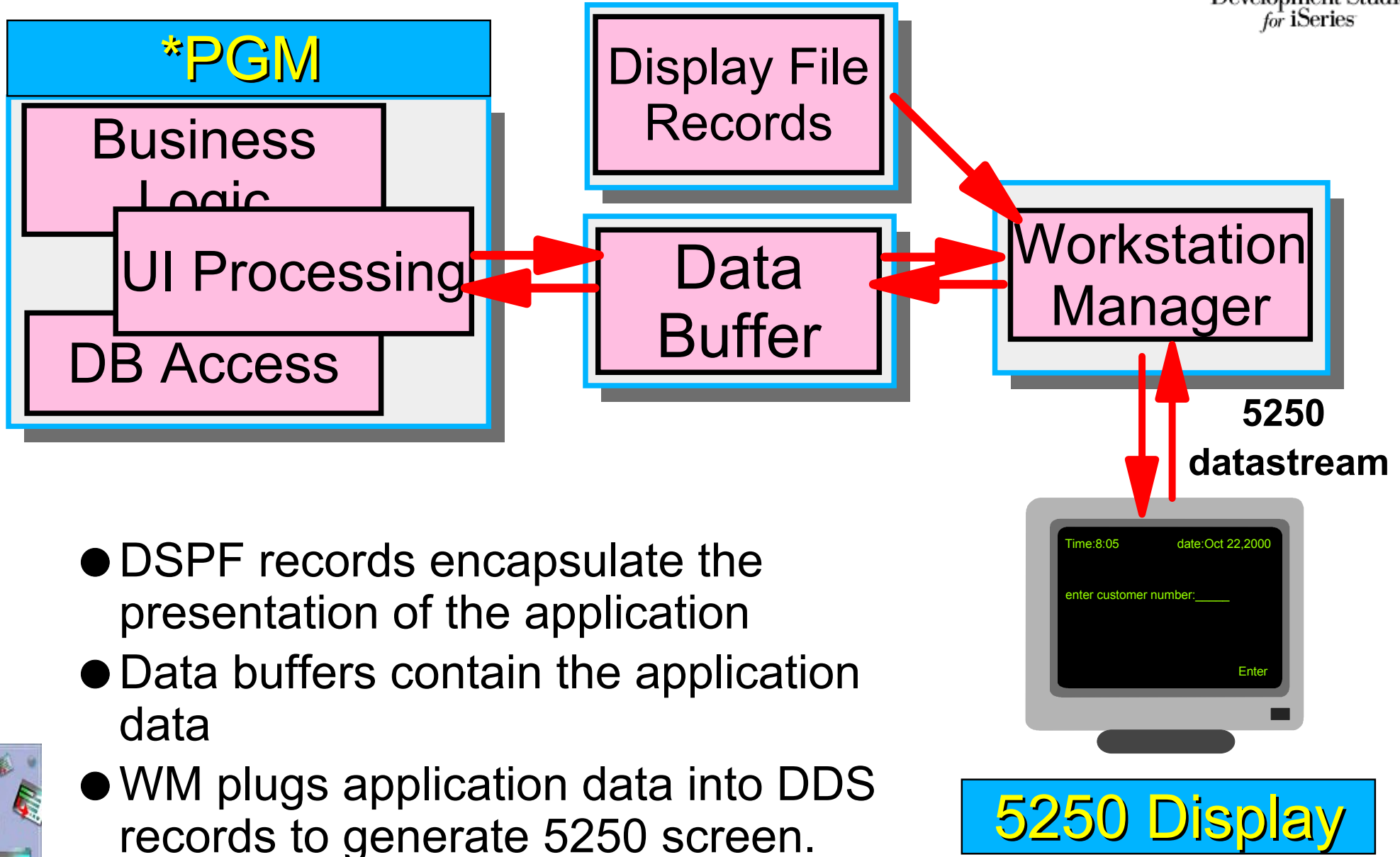


How WebFacing Works

- ▶ Development time: Converting DDS --> JSPs
- ▶ Runtime: Putting the pieces together...



Interactive *PGM Model



- DSPF records encapsulate the presentation of the application
- Data buffers contain the application data
- WM plugs application data into DDS records to generate 5250 screen.

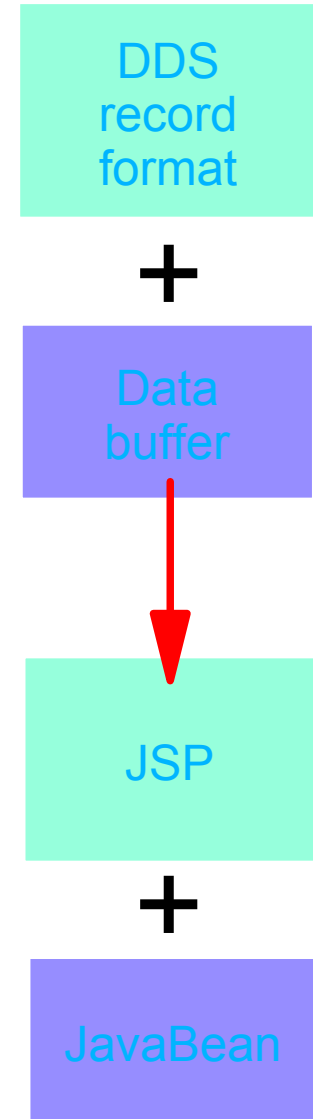


5250 Display

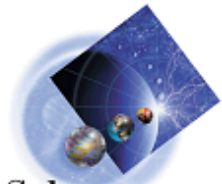
Convert DDS to JSPs & Beans



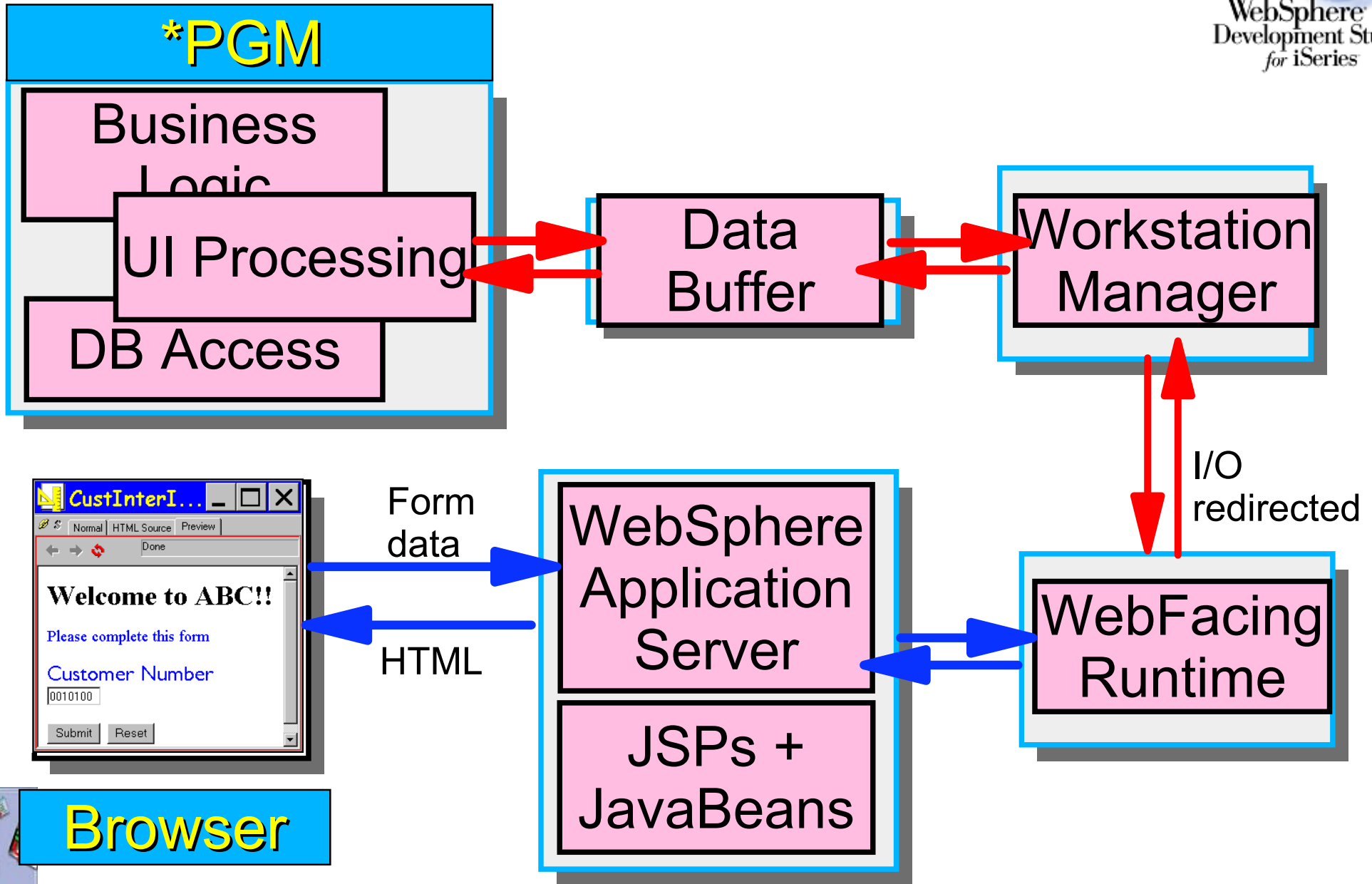
- Development time wizard:
 - Converts DDS to JSPs:
 - Select DDS members to convert
 - Creates one Java server page and 3 java beans per record format:
 - Bean holds data, view, and feedback for record format
 - JSP displays output and prompts for input
 - Select from various look-and-feels
 - Creates an "invocation page" per conversion: (index.html)
 - Web page with links
 - Each link results in starting a job, running the user-supplied CL command which starts the application contained the converted DSPFs



WebFacing Model



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WebFacing Runtime

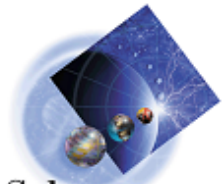


● WebFacing Servlet Runtime

- ▶ Called by generated Invocation Web Page
- ▶ Starts OS/400 job, calls your application
 - Using invocation and signon information supplied in the web application. (Password is encrypted)
 - Operating system recognizes special WebFacing mode
 - Redirects writes and reads of DSPF to WebFacing servlet, via the WebFacing server
- ▶ Maps *PGM "writes" and "reads" to previously generated JSPs
 - Merges multiple writes into single JSP
 - On "read" sends merged JSP to user, waits for "Submit" from the browser
 - Returns input data to waiting *PGM

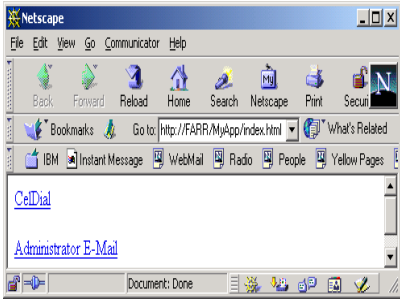


How does it all work?

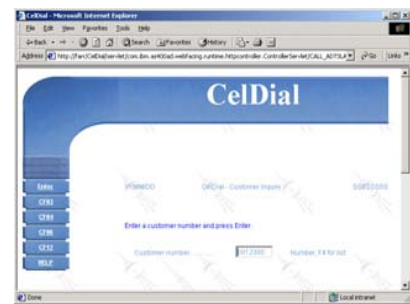


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Tier 1

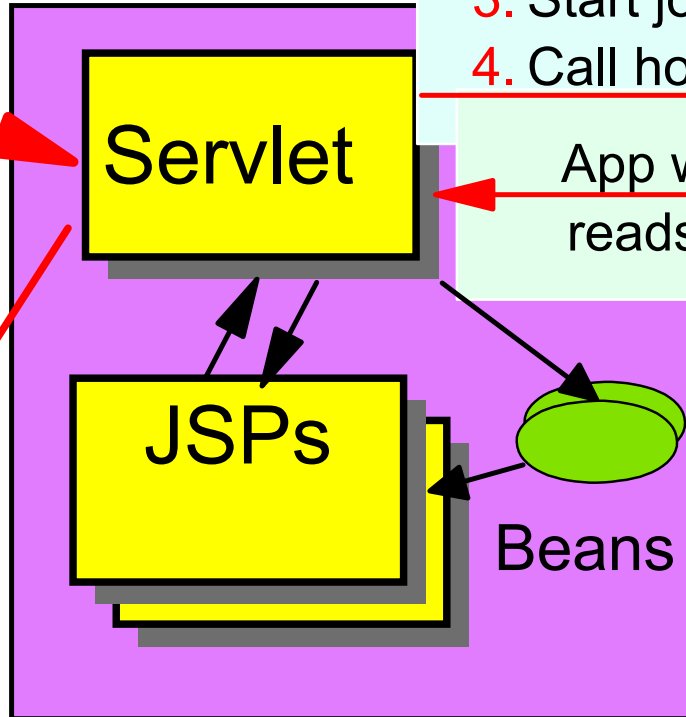


User issues the URL:
`http://server:port/web-path/index.html`



JSP page output.
User enters data, and presses Submit...

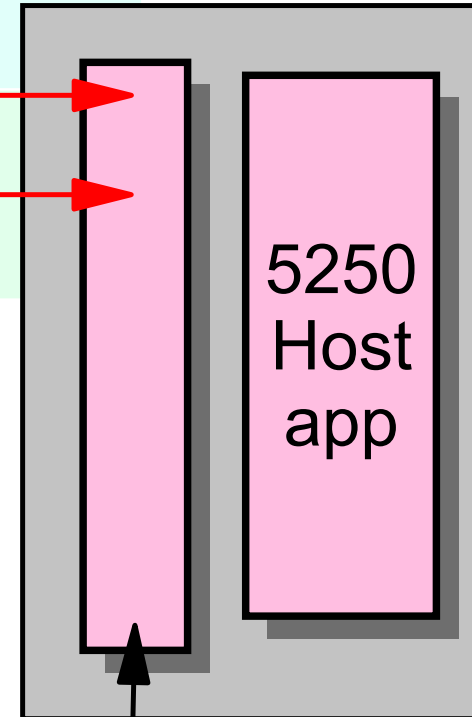
Tier 2



1. Open socket
2. Flip WM switch
3. Start job
4. Call host app

App writes,
reads data

Tier 3



WebFacing
Server



Development Time Tooling

- ▶ Create WebFacing Project wizard
- ▶ Publishing information
- ▶ Deployment to WebSphere Application Server
- ▶ Test it out !



What are the steps?



- Start the new IDE
- Run the Create WebFacing Project wizard
 - Import DDS Source from the server
 - Specify the CL command used to start the app and the text for the Web page link
 - Select style
- Convert DDS to JSPs, beans
- Update publishing information
- Deploy the files to WebSphere App Server
- Ensure that WAS instance is up and running
- Invoke the first page - Invocation page = index.html
- Iteratively improve the look ...



New IDE . . .



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for iSeries

Create new WF project
or
Go to workbench

Property	Value
1) Host	TORAS14M
2) Userid	web
	684QA3295783B73E4A
	admin@ibm.com
	3

What would you like to do?

- Create a new WebFacing Project
- Go to the workbench

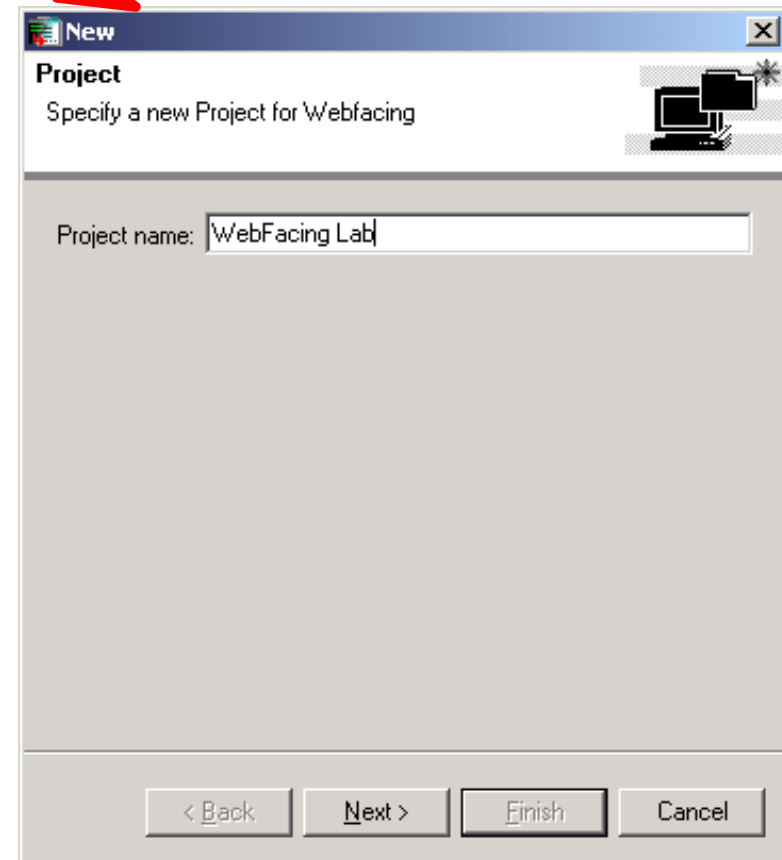
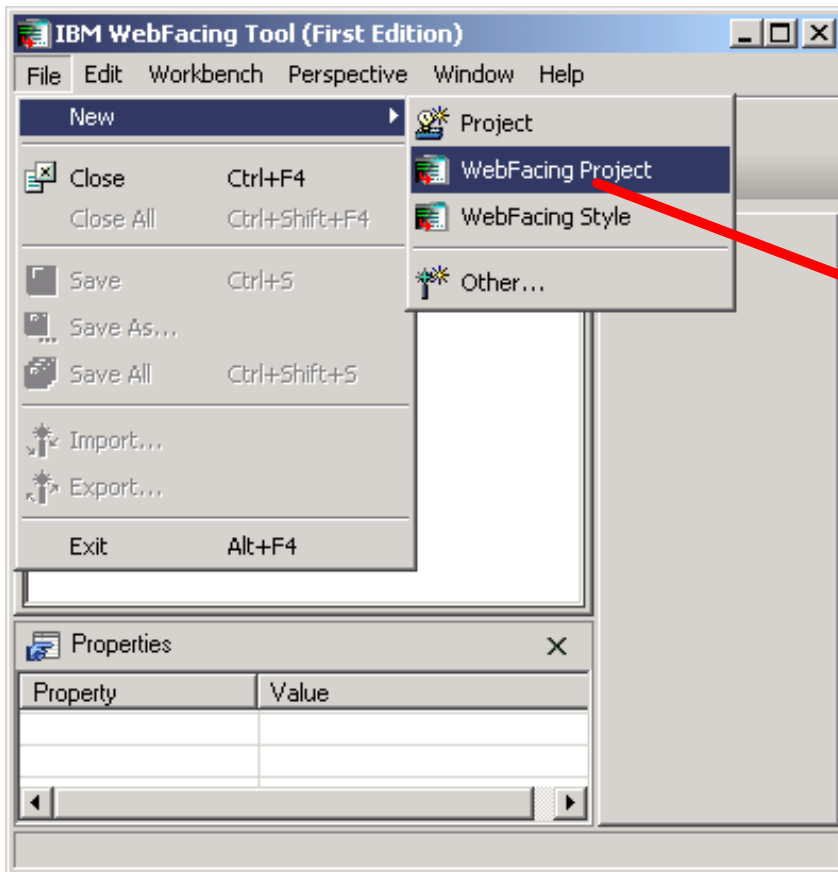
Show this window at startup.

OK Cancel

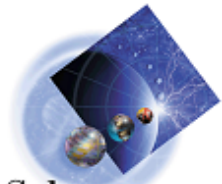
WebFacing
Projects



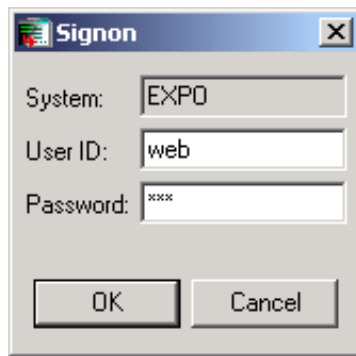
Create a New Project !



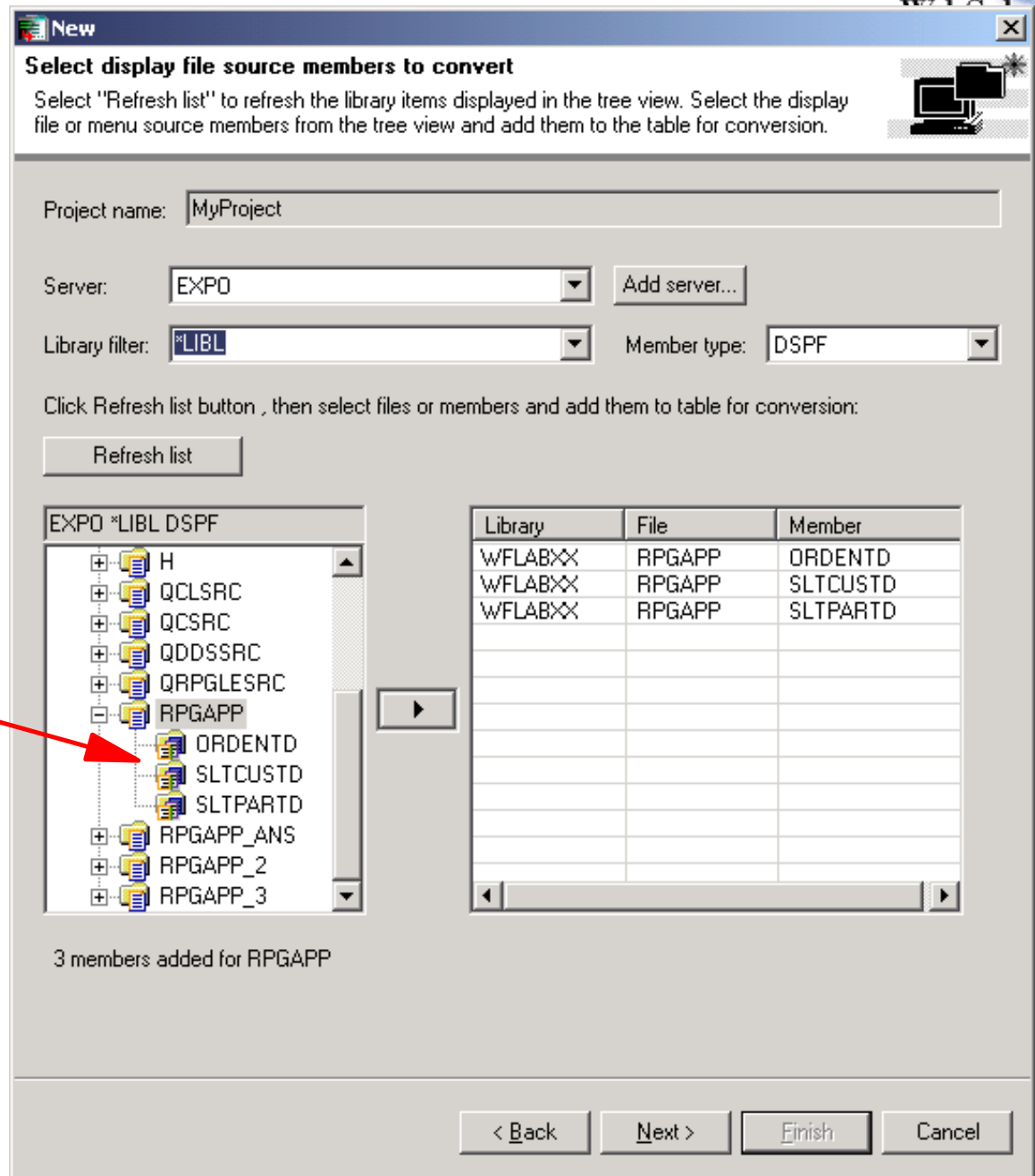
Select DDS source



- Select server
- Sign on



- Select DDS



Command to Call App

New Specify CL commands

Enter the CL commands that are used to start your application, and the command labels you want to use for the generated hypertext links.

Project name:

WebFacing generates hypertext links that you can use to launch your application from the web. In order to do this, WebFacing needs to know the text that will be shown for each link and the CL command that each link will invoke. On this page you can define multiple links, in case several CL commands are used to launch your application.

Command label:

CL command:

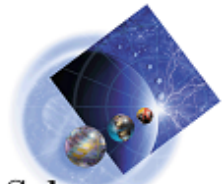
Command Label	Command
Start my order entry pr...	CALL ORDENTR

Text for web page link

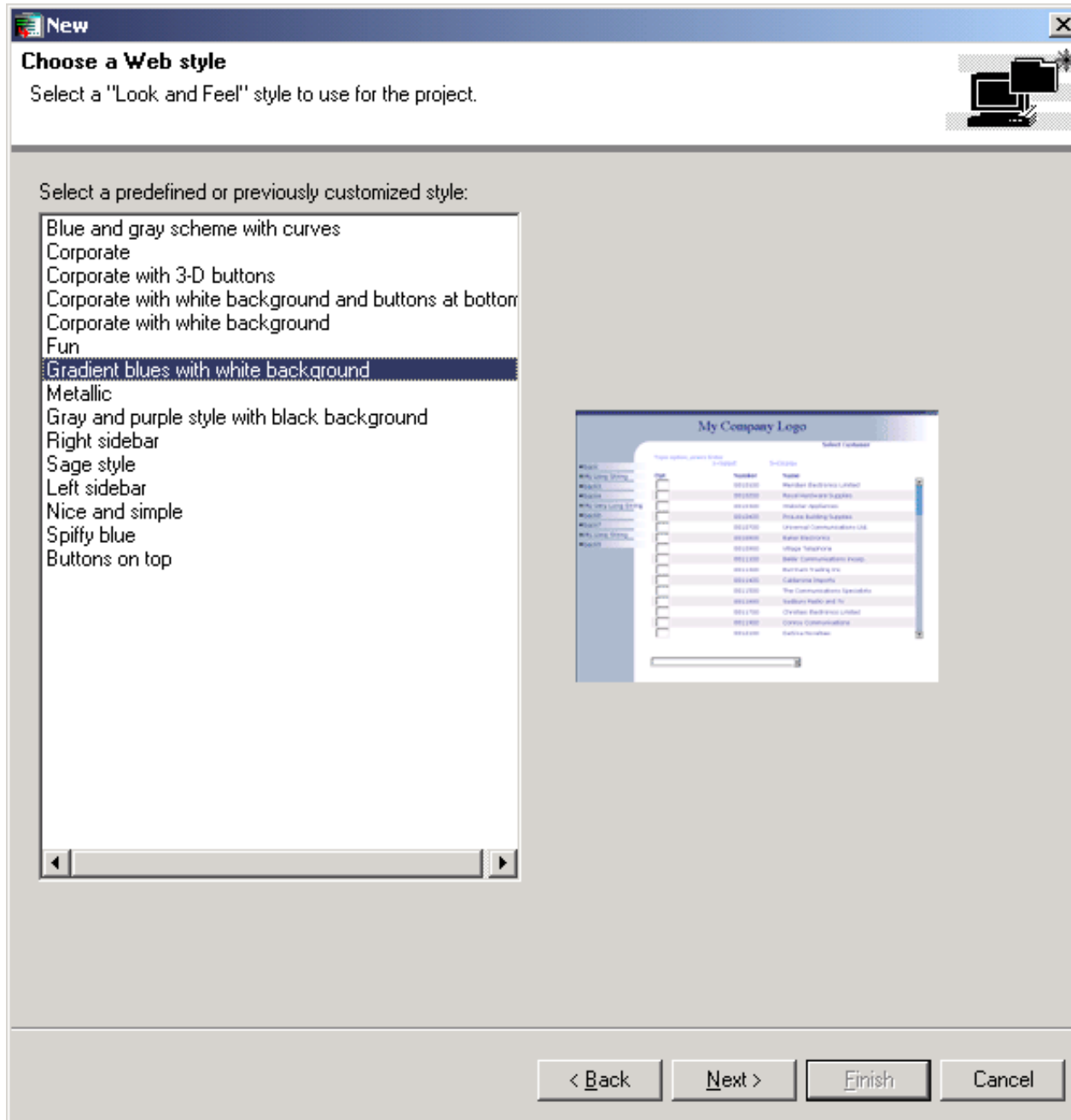
CL command



Select Presentation Style



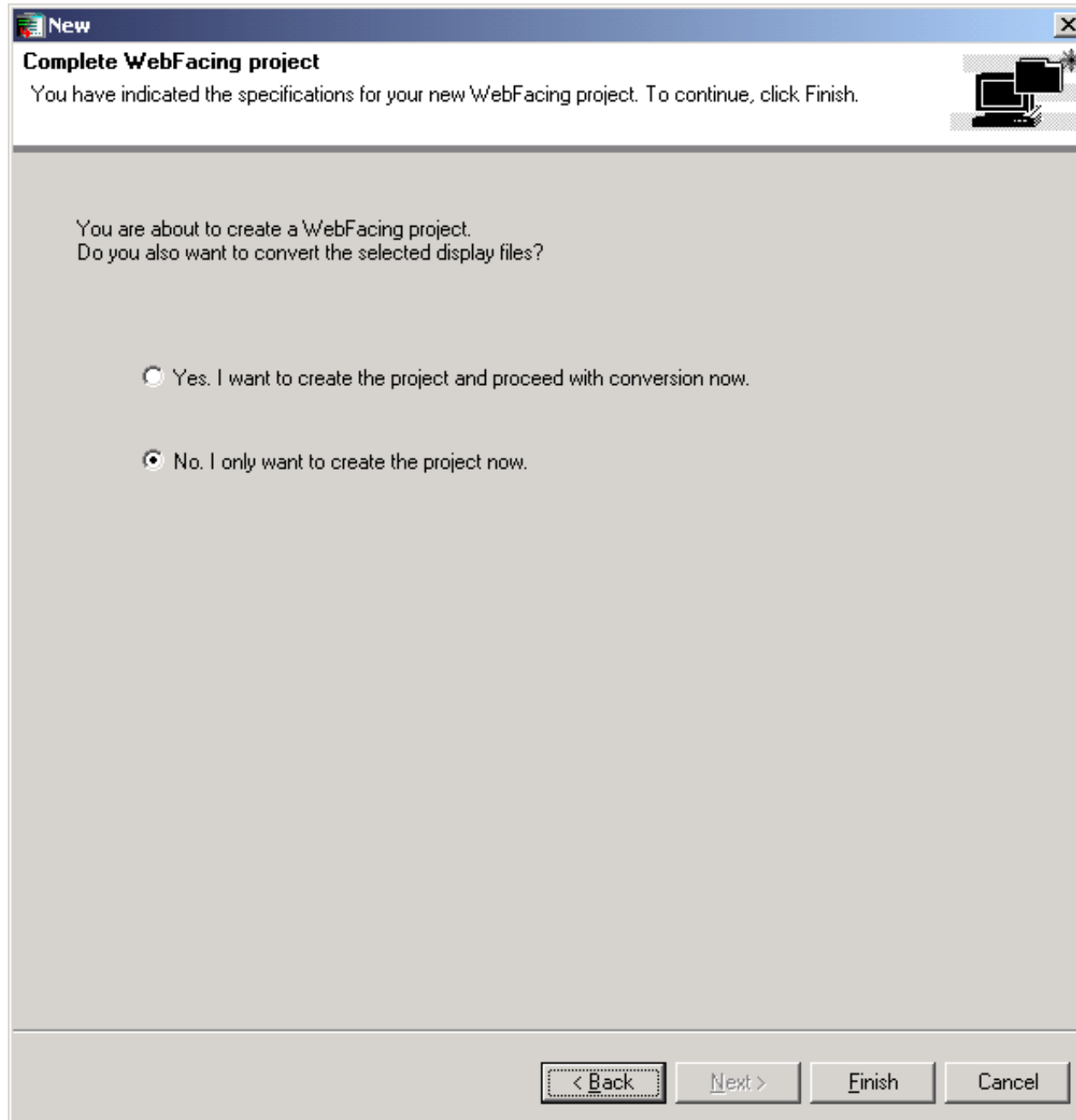
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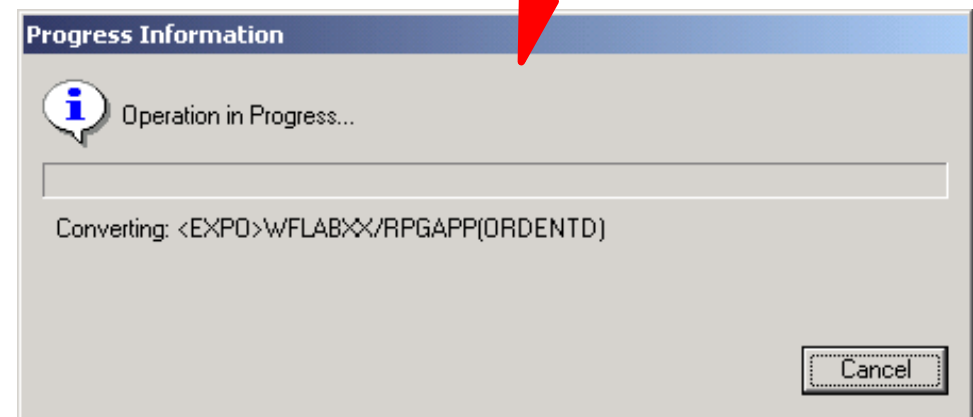
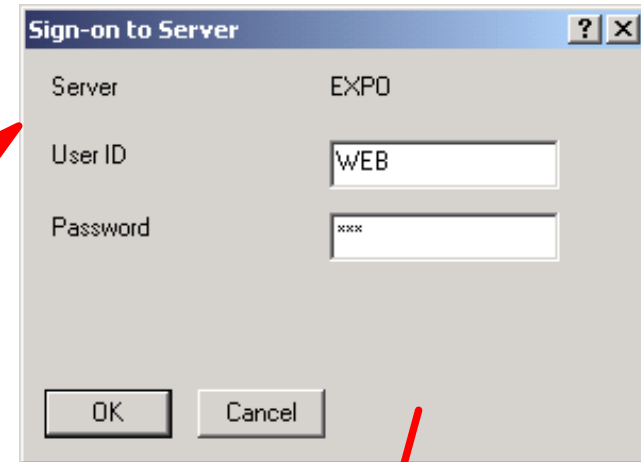
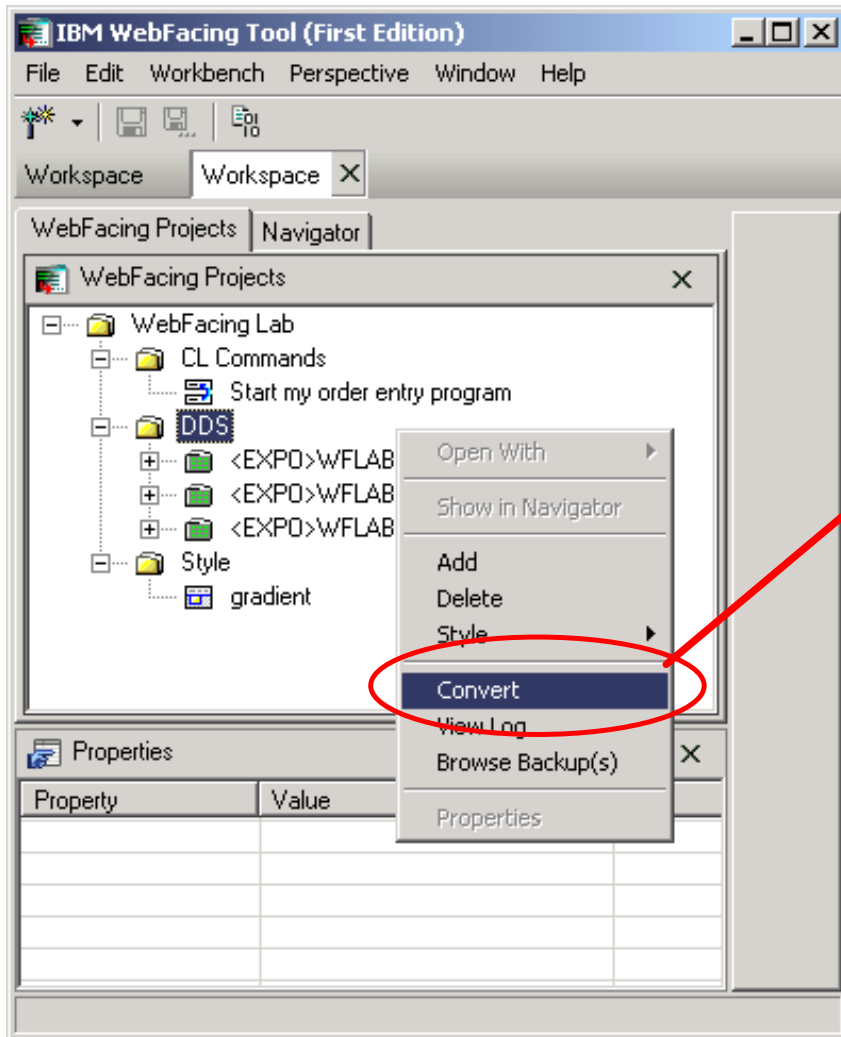
- Lots of styles that you can modify !
- Cascading style sheets



Done!



Convert DDS to JSPs



Conversion Log



Conversion Report - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Personal Bar Search Favorites

Links Customize Links Free Hotmail IBM Business Transformation IBM Internal Help

Address D:\WDT400\Webfacing\log\webfacinglog.html Go

Conversion Report for Program

- First Image Compile status
- Second Image Conversion status
- Meaning of Images:
 - Successful
 - May or may not be successful, see messages
 - Failure, see messages
 - ? No conversion and no compile messages

- [<EXPO>WFLABXX/ RPGAPP\(ORDENTD\) 200](#)
- [<EXPO>WFLABXX/ RPGAPP\(SLTCUSTD\) 200](#)
- [<EXPO>WFLABXX/ RPGAPP\(SLTPARTD\) 200](#)

Member: <EXPO>WFLABXX/ RPGAPP(ORDENTD)
Loaded at: 2001-05-14-20:05:13

Converted at: 2001-05-14-20:05:13

Conversion MessageID	Line Number	Severity	First Level Help
DDX0021	10	Warning	Keyword HELP text is not yet su

HELP (with HLPARA) Keyword - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History

Links IBM Standard Software IBM Standard Software Installer IBM Business Transformation IBM Internal Help

Address http://localhost:49213/cgi-bin/vahwebx.exe/vahelp/va400/Extract/0/qwebface/ref/rwfdd80.htm Go

HELP (with HLPARA)

Visible to Application
Yes

Category
Function Keys

Limitations and Workarounds
One of the following actions occurs when the Help key is pressed:

(2nd lev msg) Second level text for a message is displayed if the cursor is located in a message subfile or on a field which specified either the ERRMSGID or SFLMSGID keyword.

(with HLPARA) Online help information associated with either the entire display or an area on the display. This function is indicated by H specifications (refer to "HLPARA (Help Area) Keyword" in topic 3.66 HLPDOC keyword.

(return to PGM) Control is returned to the user's program. This occurs when there are no H specifications or file-level HLPDOC, HLPPNLGRP, or HLPRCD keywords in the file.

DDS Reference
<http://localhost:49213/cgi-bin/vahwebx.exe/vahelp/va400/Extract/0/qcodemrm/evfsr400306.htm#HDRDFHELP>

Expected support date

© Copyright IBM Corporation 1992, 2001

Done Local intranet

Generated Output



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The screenshot shows the IBM WebFacing Tool (First Edition) interface. The main window displays the generated JSP code for a file named PROMPT.jsp. The code includes HTML headers, a META tag for the generator, and a body section with JSP tags and Java code. The code is as follows:

```
<% /* %><HTML>
<HEAD>
<META name="GENERATOR" content="AS/400 WebFacing
</HEAD>
<BODY><% /* %>
<% System.out.println("Processing Record PROMPT"
<% @ page import="com.ibm.as400ad.webfacing.runti
<jsp:useBean id='PROMPT' scope='session' type="c
<% final int QUOTED_TRANSFORM = HTMLStringTransf
<% final int UNQUOTED_TRANSFORM = HTMLStringTrar
<% final int ZORDER_INCREMENT = 1; %>
<% int lastCol = 0; %>
<% int lastCol = 0; %>
<% /* %><TABLE border="1">
<TR>
<% lastCol = 0; %>
<TD id="1<%=zOrder%>r1c1" colspan=31>&nbsp;</TD>
<TD id="1<%=zOrder%>r1c32" NOWRAP colspan=17 row
<span id='const0' <%=DisplayAttributeBean dspl
</TD>
<% lastCol = 48; %>
</TR>
<TR><TD id="1<%=zOrder%>r2c1" >&nbsp;</TD></TR>
<TR>
<% lastCol = 0; %>
<TD id="1<%=zOrder%>r3c1" colspan=1>&nbsp;</TD>
<TD id="1<%=zOrder%>r3c2" NOWRAP colspan=26 row
<span id='const0' <%=DisplayAttributeBean dspl
</TD>
<% lastCol = 48; %>
</TR>
<TR>
<% lastCol = 0; %>
<TD id="1<%=zOrder%>r4c1" colspan=3>&nbsp;</TD>
<TD id="1<%=zOrder%>r4c4" NOWRAP colspan=8 row
```

Annotations in the image:

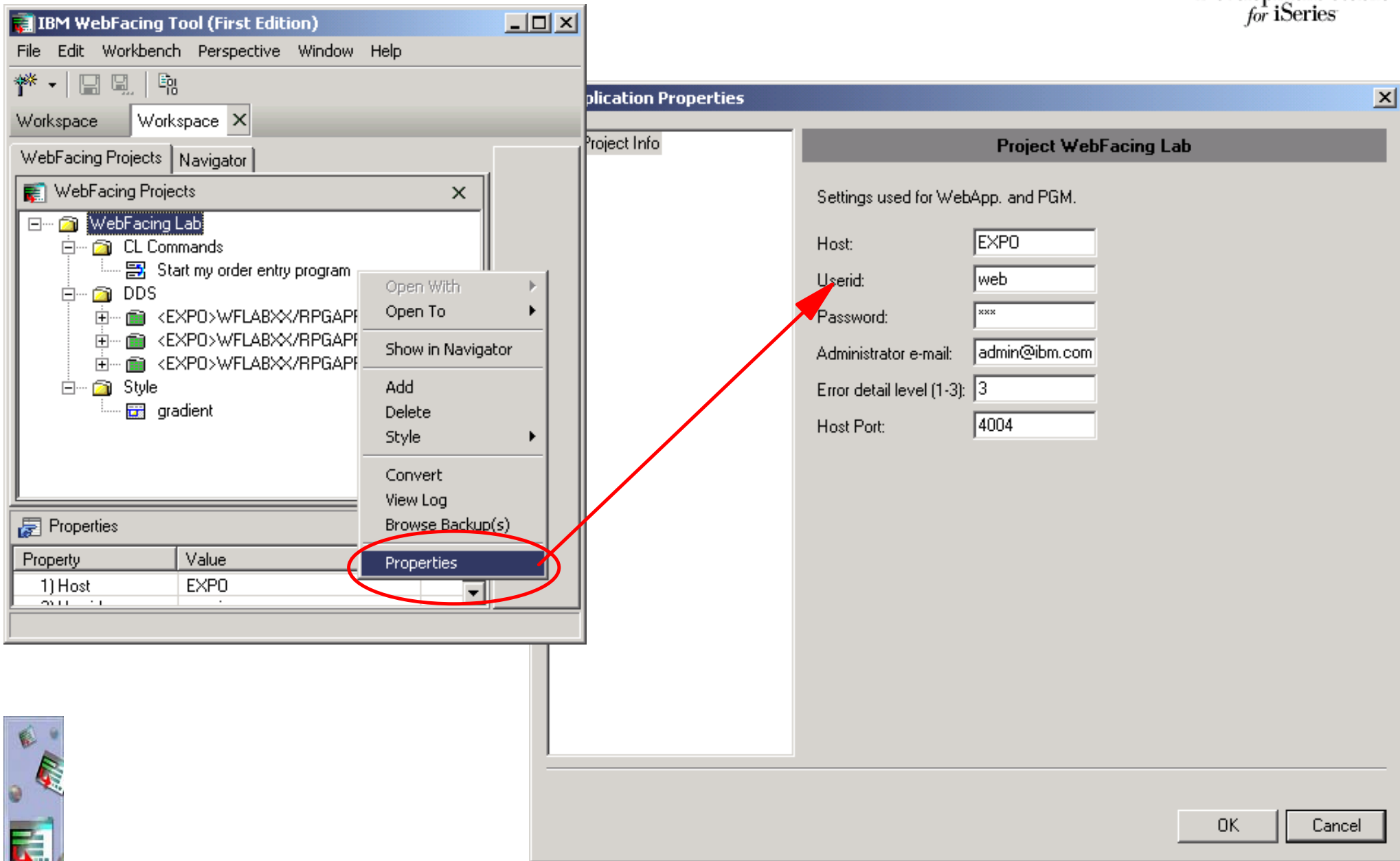
- Command to call**: Points to the "Start my order entry program" command in the Navigator.
- JSPs**: Points to the "PROMPT.jsp" file in the Navigator.
- DDS source**: Points to the JSP code in the editor.
- Publishing Information**: Points to the "Properties" table at the bottom.

Property	Value
1) Host	EXPO
2) Userid	masri
3) Password	383F08546AB554D4D33AC1...
4) Administrator e...	admin@ibm.com
5) Error detail lev...	3
6) Host Port	4004

Almost
done !



Update Publish Information



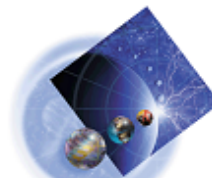
The screenshot shows the IBM WebFacing Tool (First Edition) interface. The 'WebFacing Projects' tree on the left shows a project named 'WebFacing Lab' selected. A context menu is open over it, with the 'Properties' option circled in red. A red arrow points from this 'Properties' option to the 'Application Properties' dialog box on the right. The dialog box is titled 'Project WebFacing Lab' and contains the following settings:

Property	Value
Host:	EXPO
Userid:	web
Password:	****
Administrator e-mail:	admin@ibm.com
Error detail level (1-3):	3
Host Port:	4004

Buttons for 'OK' and 'Cancel' are visible at the bottom of the dialog box.



Deploy to Server



WebSphere
Development Studio

File → Export

The screenshot shows the IBM WebFacing Tool (First Edition) interface. The Navigator pane on the left displays a project structure for 'WebFacing Lab' with folders like 'config', 'RecordBeanSource', 'servlets', 'trace', and 'web', and various files. The Properties pane below it shows 'name: WebFacing Lab' and 'path: /WebFacing Lab'. The 'Wizard' dialog is open, showing the 'Select' step where 'File system' is chosen as the export destination. The 'What resources do you want to export?' section shows 'Container: /WebFacing Lab' and 'All types' selected. The 'Where do you want to export resources to?' section shows 'Directory: H:\UserData\WebASAdv\default\hosts\default_host\WebFac'. The 'Options' section has 'Create directory structure' checked. The 'Ready to run!' text is overlaid in blue. Red arrows point from the 'File' menu to the 'Export' option and from the 'Next >' button to the 'Next >' button in the wizard's footer.

IBM WebFacing Tool (First Edition)

File Edit Workbench Perspective Window Help

Workspace Workspace X

WebFacing Projects Navigator

Navigator

- WebFacing Lab
 - config
 - RecordBeanSource
 - servlets
 - trace
 - web
 - cl507247.invocation
 - codedsu.evt
 - commandkey.keynames
 - DSPFObjectMapping.properties
 - tracing.properties
 - WFAPP.properties

Properties

Property	Value
name	WebFacing Lab
path	/WebFacing Lab

Wizard

File system

Export resources to the local file system.

What resources do you want to export?

Container: /WebFacing Lab Browse...

All types

Specific types: Edit...

Details... All file resources matching this criteria

Where do you want to export resources to?

Directory: H:\UserData\WebASAdv\default\hosts\default_host\WebFac Browse...

Options:

- Overwrite existing files without warning
- Create directory structure
- Create directories for selected containers

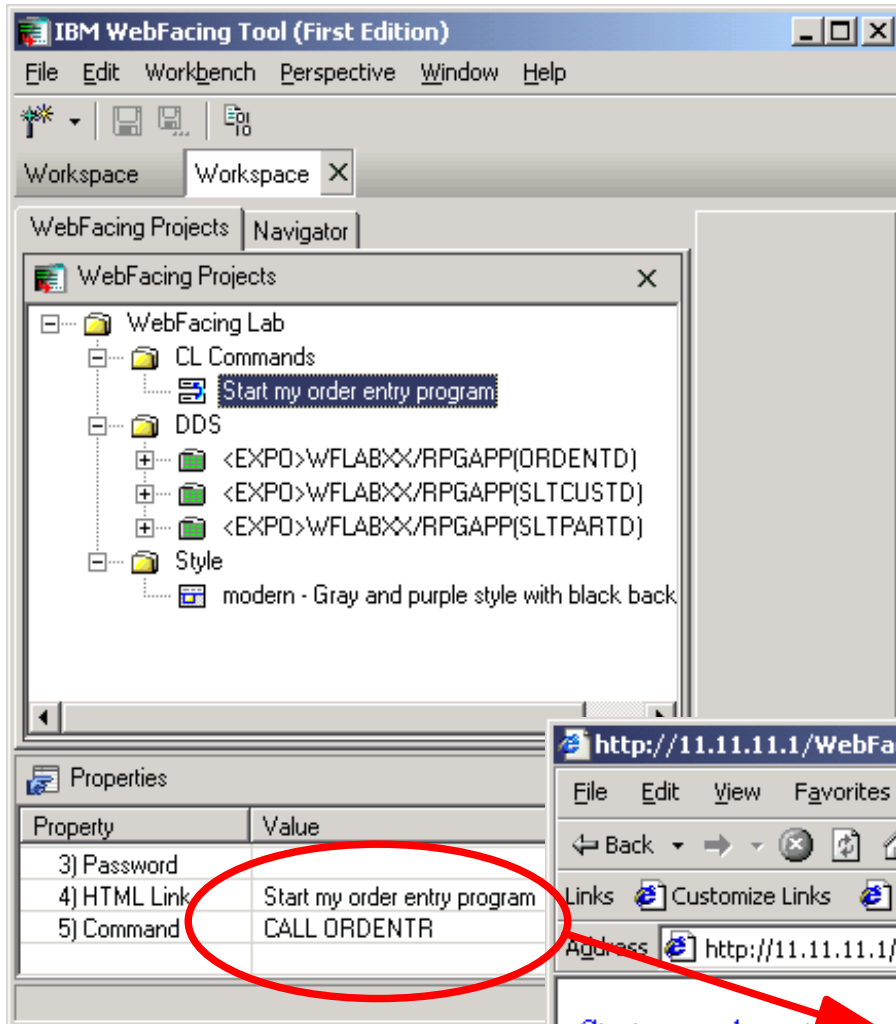
Ready to run!

< Back Next > Finish Cancel

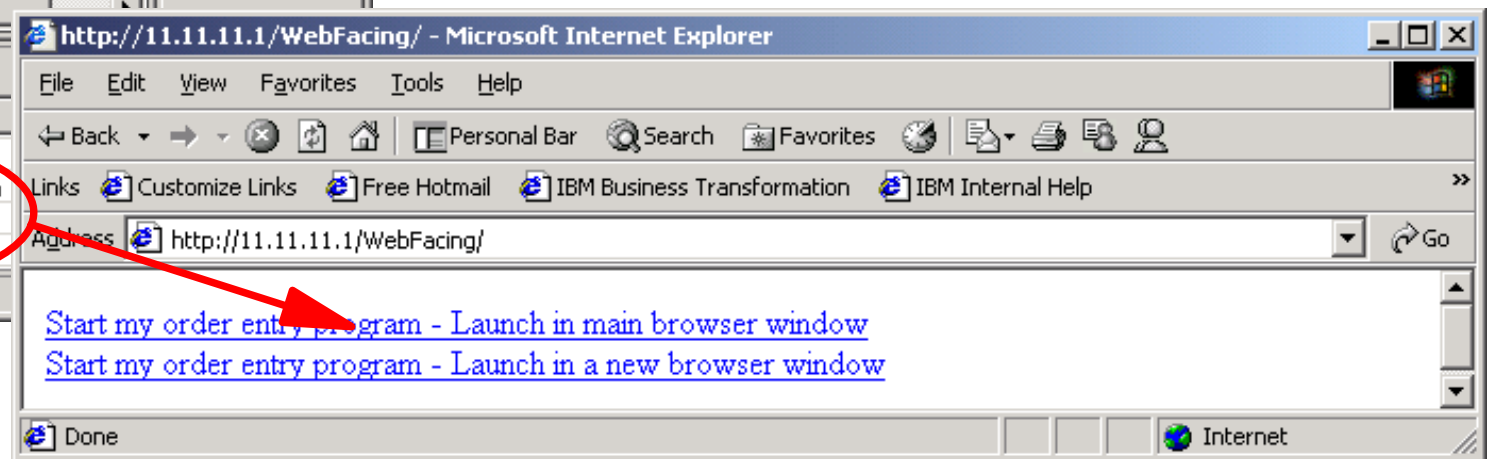
< Back Next > Finish Cancel



The Invocation Page



- Test invocation page is generated automatically
- Type invocation page URL
- Click on a CL command link



Run the App !



Start my order entry program - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History

Links IBM Standard Software IBM Standard Software Installer IBM Business Transformation IBM Internal Help Customize Links

Address http://s105bm4m/WebFacing/servlet/com.ibm.as400ad.webfacing.runtime.httpcontroller.ControllerServlet?inv=c1507247

Start my order entry program

Parts Order Entry

Enter
Cancel
HELP

Type choices, press Enter.
2=Change

Customer number
Customer name
Address
City

Opt Part [000001] WEBSR
[2] F4=Prompt F12=Cancel

Select Part

Type choices, press Enter.
1=Select

Opt Part	Description	Qty
<input type="checkbox"/>	000081 Cross_Country_Ski_Set	65
<input type="checkbox"/>	000082 Magical_Mystery_Maze	88
<input type="checkbox"/>	000083 Fireplace_Tools	90
<input type="checkbox"/>	000084 VCR_Road_Warrior_Game	75
<input type="checkbox"/>	000085 While_You_Were_Gone_Memo	71
<input type="checkbox"/>	000086 Pebble_Beach_Poster	87
<input type="checkbox"/>	000087 32_Gal._Keg_Beer	96
<input type="checkbox"/>	000088 Doll_House_Furniture	87
<input type="checkbox"/>	000089 VCR_Road_Warrior_Game	51
<input type="checkbox"/>	000090 8_Foot_Plant_Pole	97

F12=Cancel

F4=Prompt F6=Accept Order F12=Cancel

Done Local intranet

Windows !



Customizing Your Results

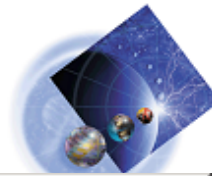


3 options for customizing results:

1. Use CODE Designer *before* conversion to add links or images, or hide/change fields
 - ✓ Saves information in comments, used by conversion
 - ✓ You can also extend our conversion code with your own!
2. Change the cascading style sheets
 - ✓ Or build you own !
3. Use Page Designer in WebSphere Studio *after* to edit JSPs
 - ✓ But changes to application area lost on next conversion
 - ✓ Conversion will be backup input, so you can manually merge if you desire



CODE Designer



<EXPO>WFLABXX/RPGAPP(ORDENTD) - CODE Designer

File Edit View Insert Selected Tools Help

Details SCREEN2 SCREEN1 Source Listing

ORDSFL PARTNBR_O 6 I O B

Ignore all indicators

10	City	:	00000000000000000000	00	0000000000
11					
12	Opt Part	Description			Qty
13	888888	000000000000000000000000			99999
14	9 00000	000000000000000000000000			66,666
15	9 00000	000000000000000000000000			66,666
16	9 00000	000000000000000000000000			66,666
17	9 00000	000000000000000000000000			66,666
18	9 00000	000000000000000000000000			66,666

Selected DDS Web Settings Comments Error list

Visibility Location

Program defined HTML User defined HTML

Appearance and Text Insert HTML

Create graphic Create hyperlink

Create hyperlink

Specify URL Set field value and submit

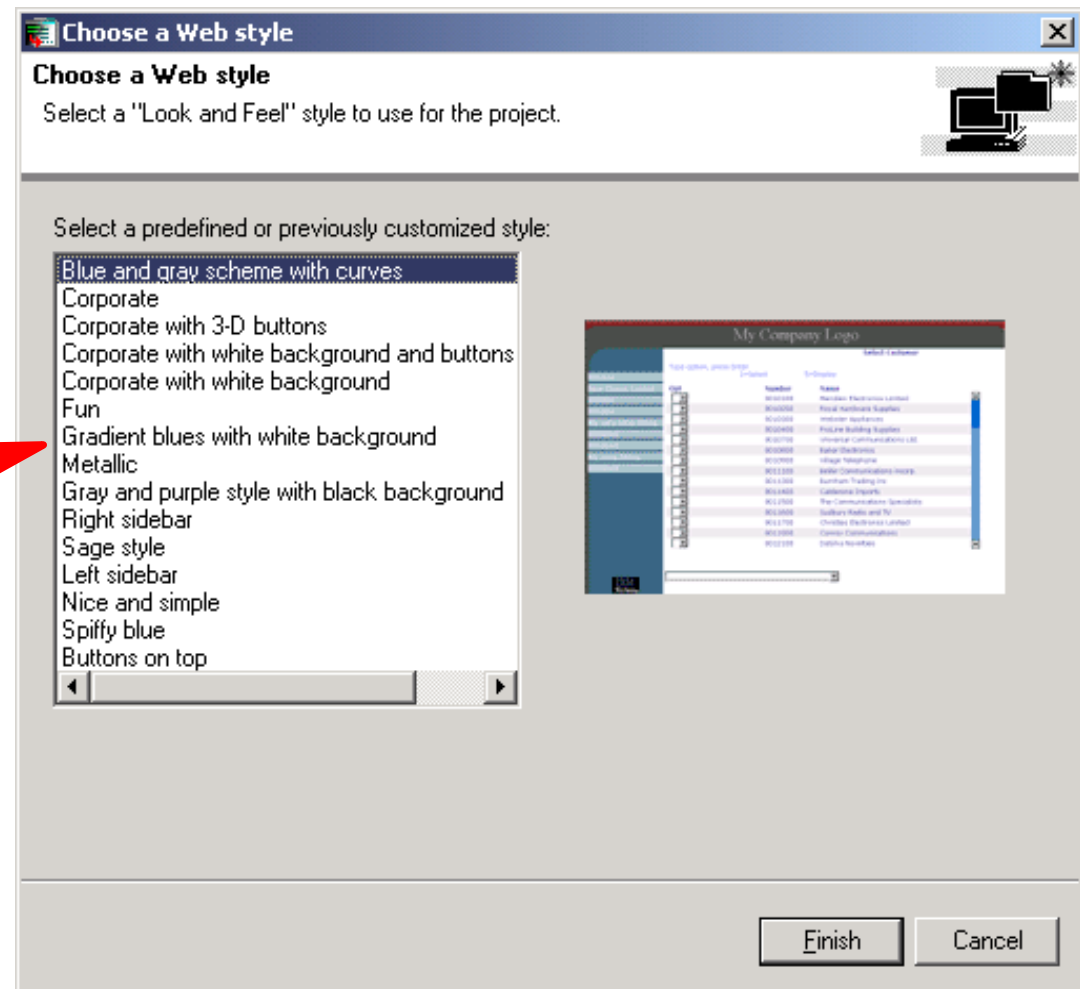
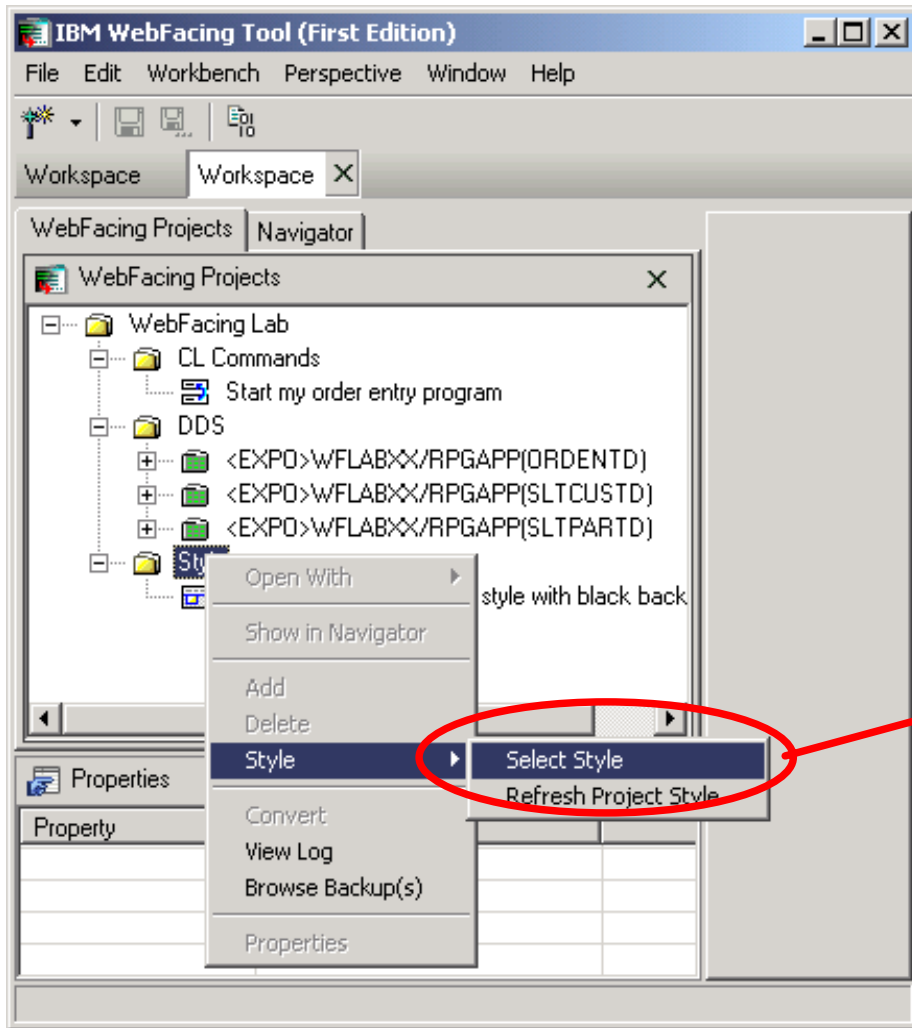
URL: www.ibm.com/partno

Choose a field: &{PARTNBR_O}, &{OPT}, &{PARTDSC_O}, &{PARTQTY_O}, &{ITEMPRICE}

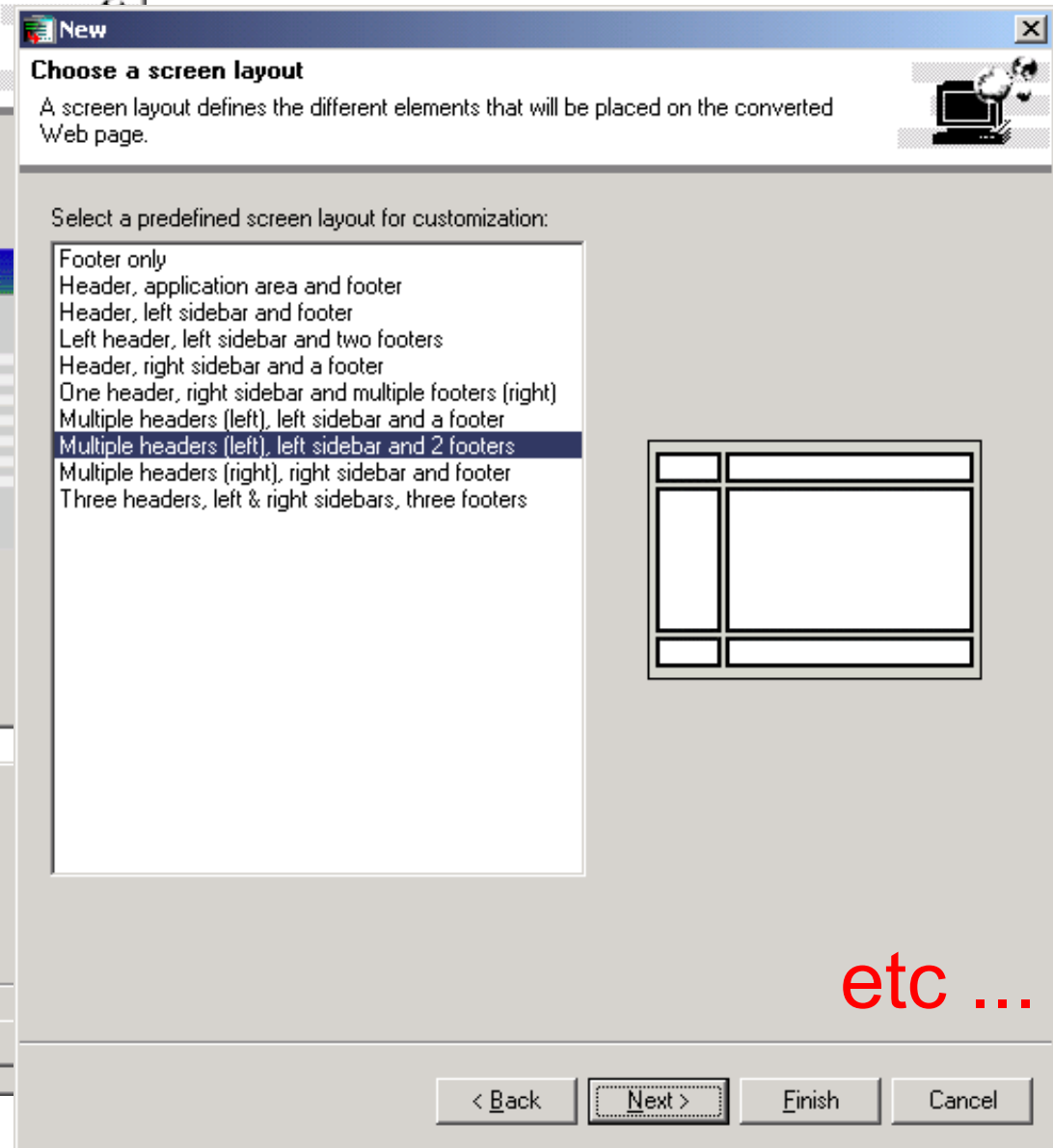
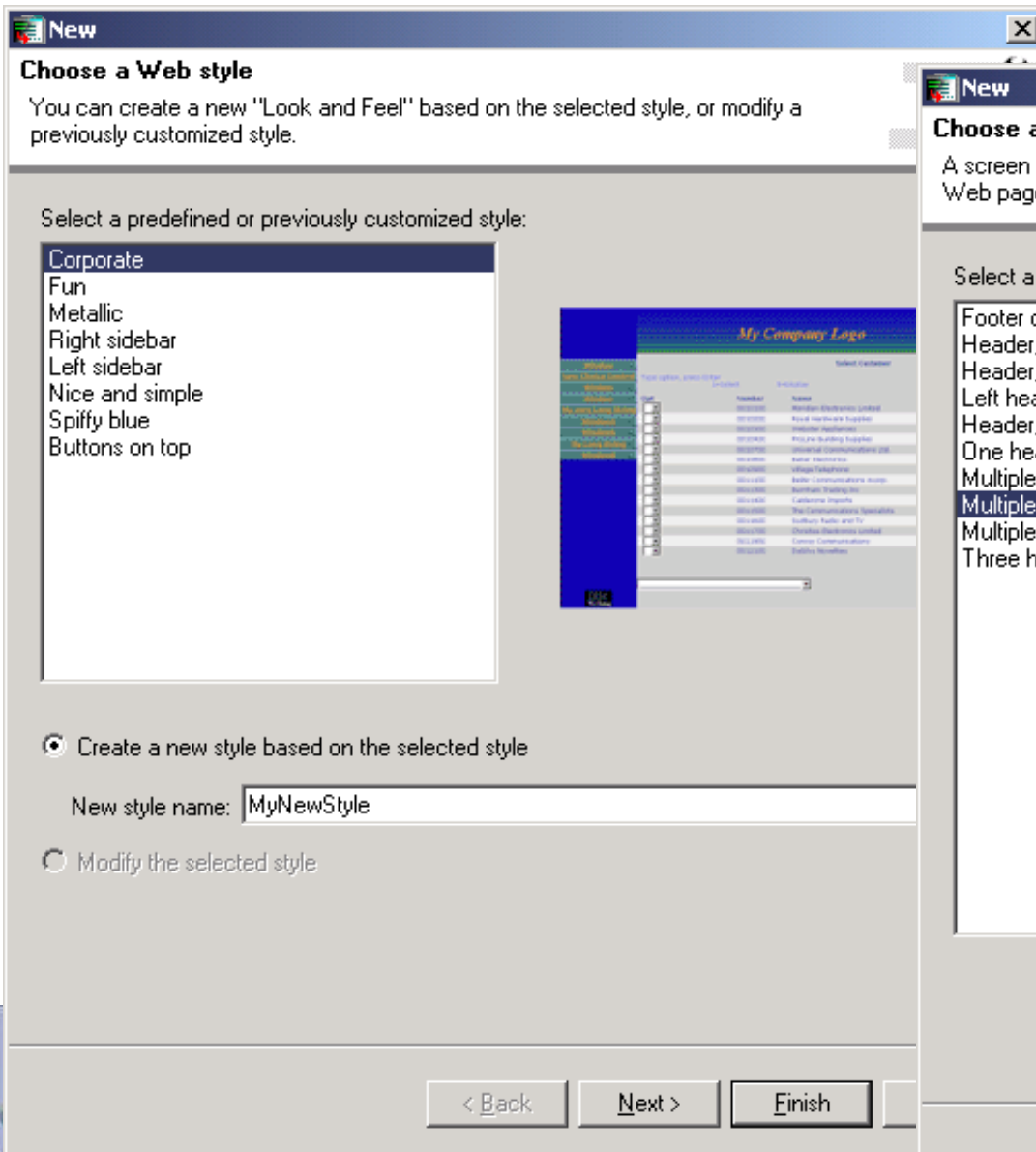
Change to/insert field value



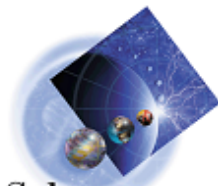
Change Styles



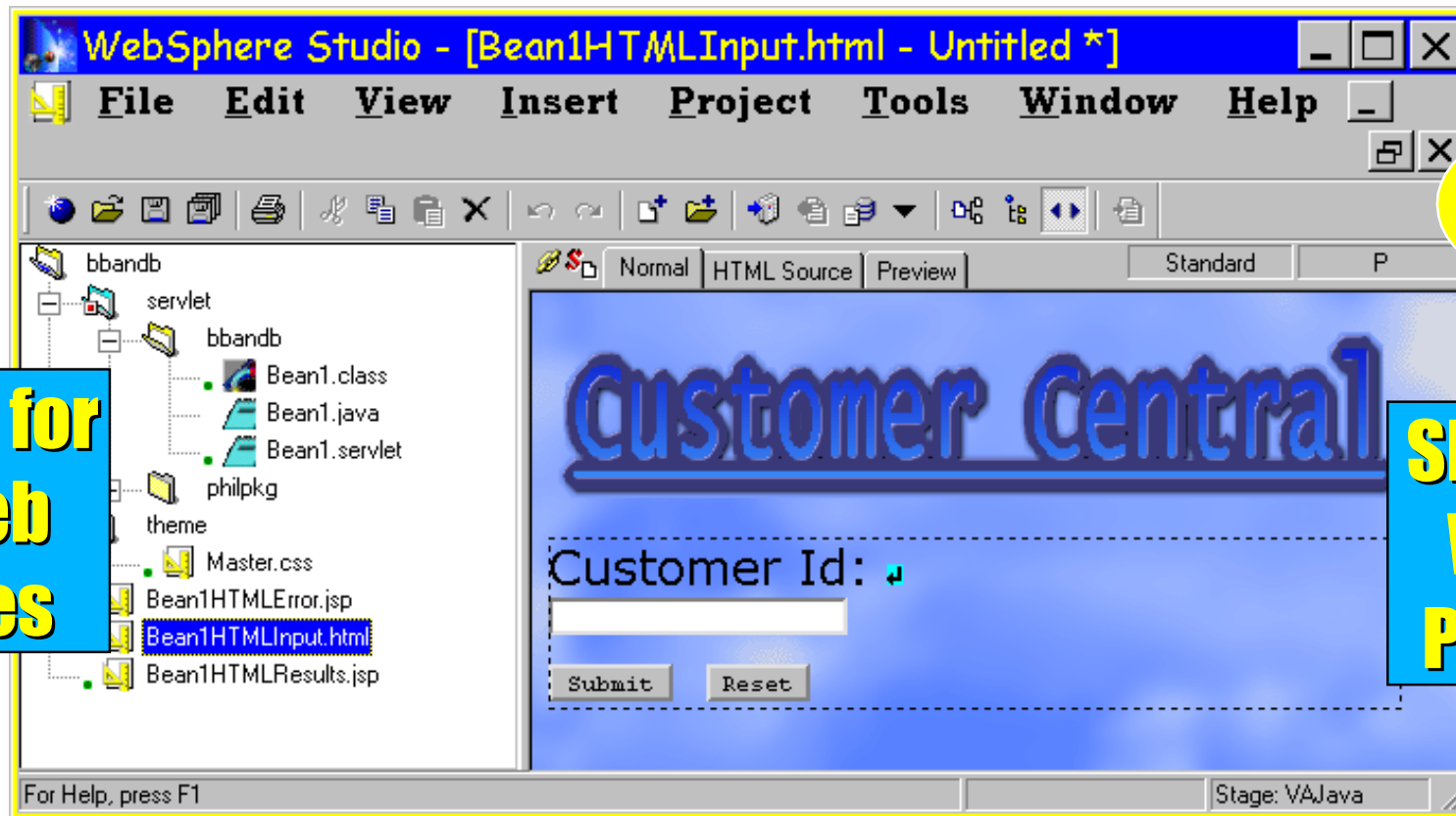
Or Build Your Own Style ...



WebSphere Studio for iSeries



WebSphere
Development Studio
for iSeries



v3.5

**PDM for
Web
Files**

**SDA for
Web
Pages**

- Studio "workbench"
 - ▶ manage and maintain your site's files
 - ▶ create, edit, copy, share, and publish files
- WebSphere Page Designer
 - ▶ a WYSIWYG HTML editor
 - ▶ a WYSIWYG JSP editor
- Studio wizards and numerous little editors



Some Final Comments

- ▶ Pros and cons
- ▶ Current status



WebFacing Considerations



- ▶ Interactive *PGM can run either 5250 or WebFaced UI
 - Hopefully only minor changes needed to program and DDS
- ▶ Conversion done at development time
 - So runtime is fast and efficient
 - No 5250 datastream is ever created
 - It means generated JSP output can be enhanced ... before deploying into production
- ▶ Runtime part of OS/400. Tooling part of WDT/400
- ▶ Must have access to DDS source
- ▶ Non-DDS screens cannot be converted
 - No current support for UIM or system screens or 3270 or ...
- ▶ Some non-supported DDS keywords



💧 ibm.com/software/ad/wds400

- ▶ WebSphere Development Studio for iSeries

💧 ibm.com/software/ad/wdt400

- ▶ WebSphere Development Tools for iSeries

💧 ibm.com/software/ad/wdt400/webfacing

- ▶ WebFacing





💧 **ITSO Redpiece www.redbooks.ibm.com**

- ▶ WebSphere Development Tools for iSeries
Generating Web Front Ends to Existing
Applications

💧 **"Getting Started" manual and lab exercises**

- ▶ Getting Started with WebSphere™ Development
Tools for iSeries SC09-2625-05

