WebFacing 5250 Applications with WebSphere Development Studio Client Version 5.0

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ITSO

► This presentation reviews the components of a Web application, the WebFacing Tool and how it is packaged, how the WebFacing Tool development time and runtime works and the steps to Web-enable a 5250 application using the WebFacing Tool.

Disclaimer

Acknowledgment:

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

  ► *Phil Coulthard, George Farr, Satish Gungabeesoon, John Steinbacher, Claus Weiss*

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WebFacing Before and After
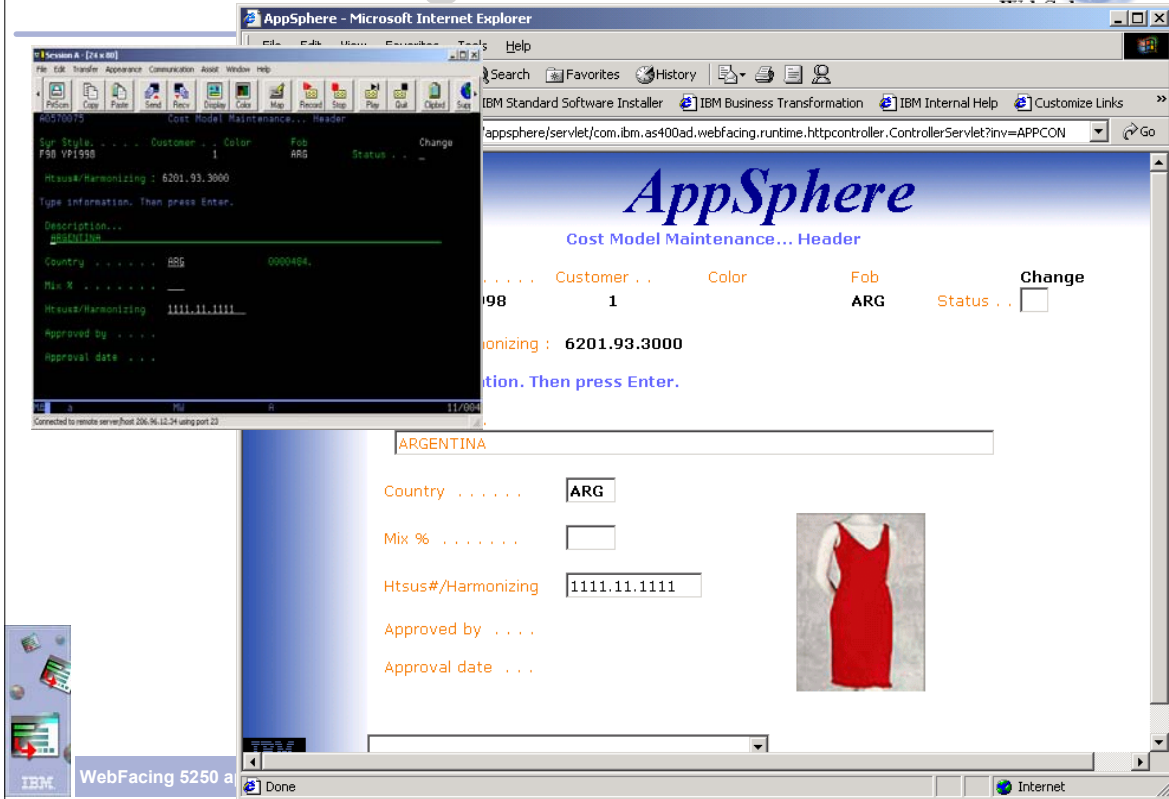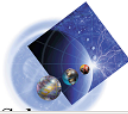
▶ This slide shows the before and after screens of Web-enabling a application.
▶ This example shows an application WebFaced using one of the pre-defined styles
▶ An image has been added using the WebSettings feature of CODE Designer
▶ WebSettings are set using CODE Designer prior to performing DDS conversion
▶ WebSettings are stored in the DDS as comments

AGENDA

- **Webucation**

- **Introduction to WebFacing**
- **How WebFacing Works**
- **Development Time Tooling**
- **Sample Applications**

- **Demo**

AGENDA

Webucation

► Static Web

► Dynamic Web

► Application servers, servlets, JSPs, ...

► WebSphere Platform

In the beginning ...

WebSphere Development Studio for iSeries

Static Web

➡ No interaction with Web pages
➡ Web pages were pre-constructed

HTML & images

HTTP server

Open connection, request page (URL)

Send page, close connection

Web browser

TCP/IP
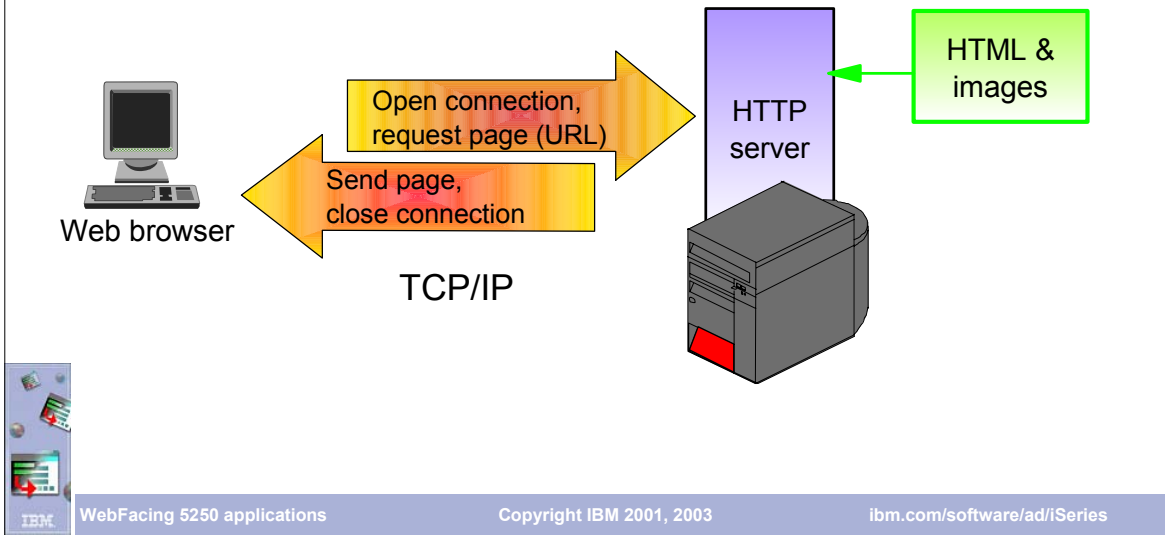
► Web pages contained static content in the beginning and that typically there was no user interaction with the Web page; it was for display only.

Dynamic Web...CGI Bin

WebSphere Development Studio iSeries

Web browser	
Open connection, send request w/ parms	→ HTTP server ← HTML & images
Send page with parms, close connection	←
TCP/IP	HTTP server ↔ CGI-Bin programs
	Net.Data
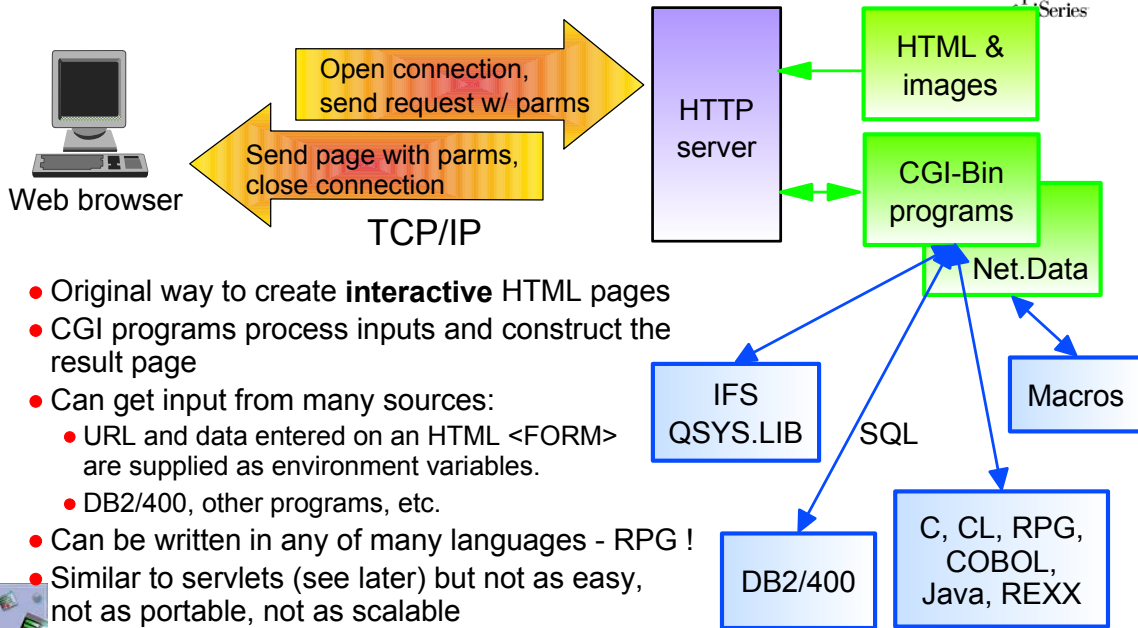
- Original way to create **interactive** HTML pages
- CGI programs process inputs and construct the result page
- Can get input from many sources:
  - URL and data entered on an HTML <FORM> are supplied as environment variables.
  - DB2/400, other programs, etc.
- Can be written in any of many languages - RPG !
- Similar to servlets (see later) but not as easy, not as portable, not as scalable
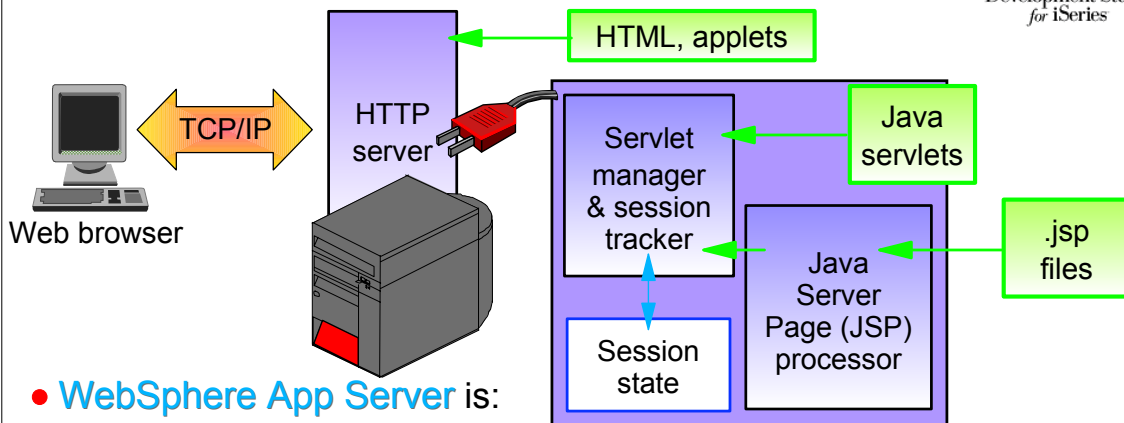
Boxes connected to CGI-Bin programs:
- IFS QSYS.LIB
- SQL
- Macros
- DB2/400
- C, CL, RPG, COBOL, Java, REXX

- This slide shows the dynamic Web and the use of CGI.
- iSeries advantages:
- iSeries keeps a pool of CGI processes active
- Improves CGI performance
- Pool size can be configured
- iSeries Activation Groups can be used to eliminate program start-up costs
- iSeries also supports persistent CGI which allows program state to be maintained between requests
- Can use AS/400 user profiles.
- Default is all CGI programs run under Internet user profile QTMHHTTP1.
- Server can be configured to run CGI under AS/400 profile associated with sign on.
- Server can also be configured to run under a specific user profile.

WebSphere App Server

WebSphere Development Studio for iSeries

Web browser ←→ TCP/IP ←→ HTTP server

HTML, applets

Servlet manager & session tracker

Java servlets

Session state

Java Server Page (JSP) processor

.jsp files

- **WebSphere App Server** is:
  - A plug-in to the HTTP server for running Java servlets
  - Available on many platforms - OS/400, OS/390, NT, AIX, ...
- Version 3.5
  - Standard Edition - Servlets and JSPs ← **FREE on OS/400 !**
- Version 4.0
  - Advanced Single Server Edition
  - Advanced Server Edition

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

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► This slide shows the role of the WebSphere Application Server.
► The WebSphere application server is a plugin to the HTTP server - Original or Apache
► Provides containers for JSP, HTML and servlets
► The Session manager stores information between interactions
► Web content can be dynamic

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.

JSP Programming model

- Use WebSphere Studio or any editor to create an HTML file with imbedded Java code

- Store this file on the iSeries with a file extension of .jsp

- Access the file from your browser as you would any .html file

- The JSP processor will 'page compile' the .jsp file into a servlet that generates HTML. That servlet is then executed.

- Subsequent references to the .jsp file will automatically execute the servlet

- If the .jsp file is modified in any way, the JSP Page Compiler will be run again the next time it is accessed.

Sample .jsp file:

```
<html>
<head>
<title>My First Title</title>
</head>
<body>
<h1>My First Web Page</h1>
<ul>
<java>
for (int i = 0; i < 5; i++)
out.println ("<li>" + i);
</java>
</ul>
</body>
</html>
```

Web App Architecture

WebSphere Development Studio for iSeries

HTTP Server

Application Server

Servlet

Web browser

Internet

JSPs

Java Beans

Enterprise System

Tier 1   Tier 2   Tier 3
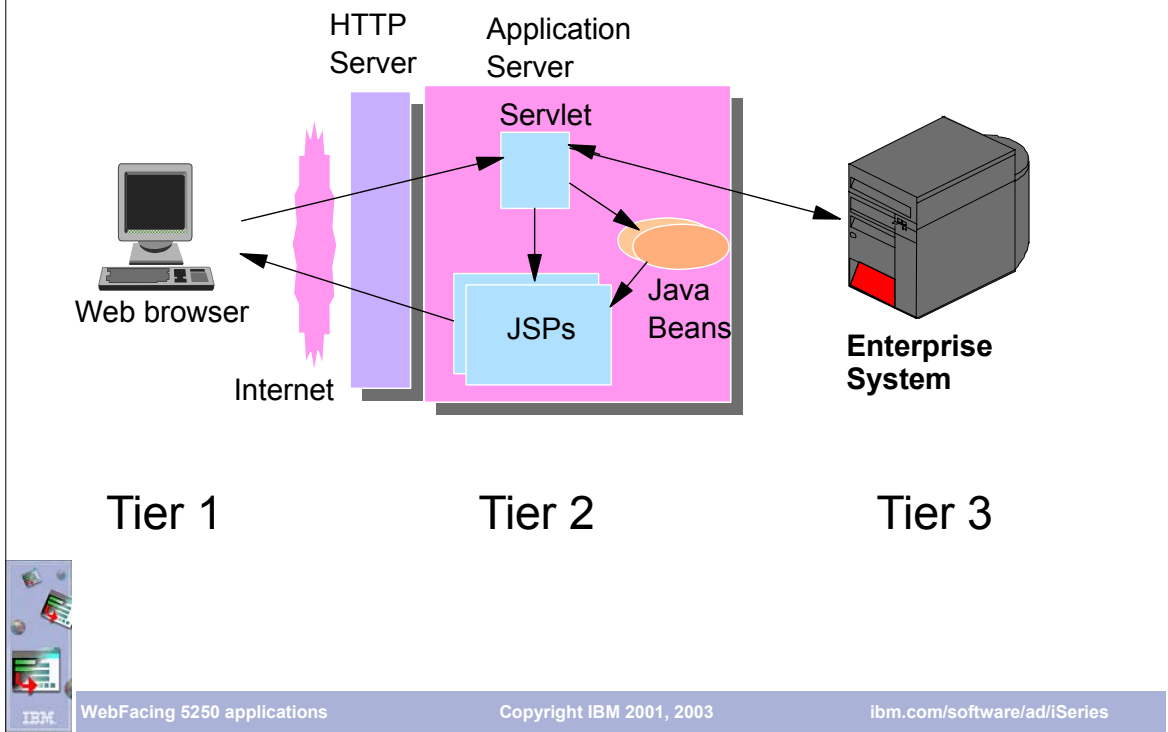
▶ The Application server and HTTP server can be on a different system than the system with the application

AGENDA

Introduction to WebFacing

- ►What is WebFacing ?
- ►A quick example
- ►How do I get it ?
- ►What do I need ?
- ►Goals of WebFacing

What is WebFacing ?
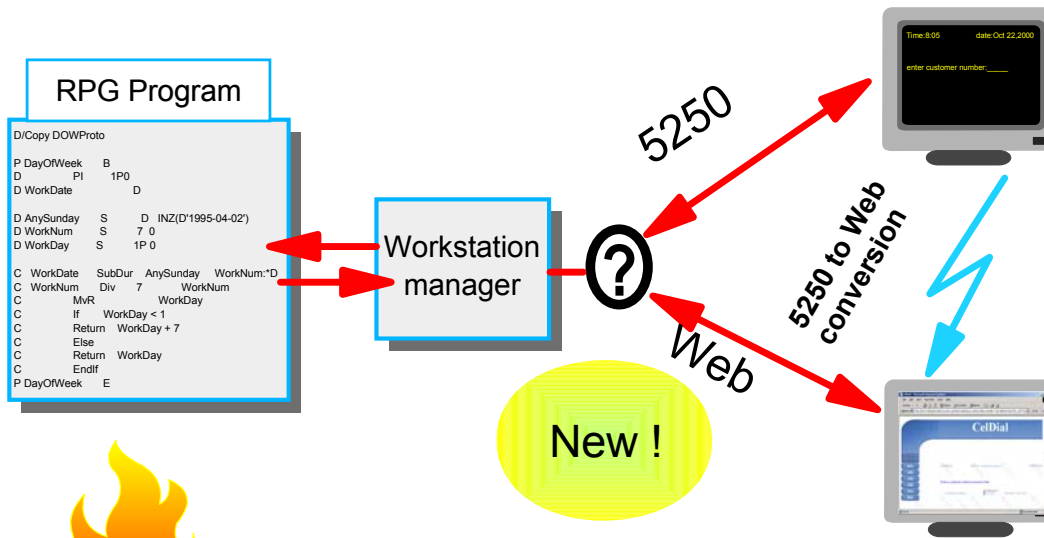
- ▸ This slide shows what WebFacing is all about.
- ▸ A WebFaced application can still be run on a 'green screen'
- ▸ It is not a screen scraper - no data stream is constructed
- ▸ Typically no changes are required to the program
- ▸ The conversion process converts record formats to JSPs and Java beans
- ▸ Program READ/WRITE is intercepted by WebFacing run-time
- ▸ WebFace run-time merges data passed by the program with the JSPs then sends the JSPs to the browser

WebFacing Before and After

WebFacing 5250 application
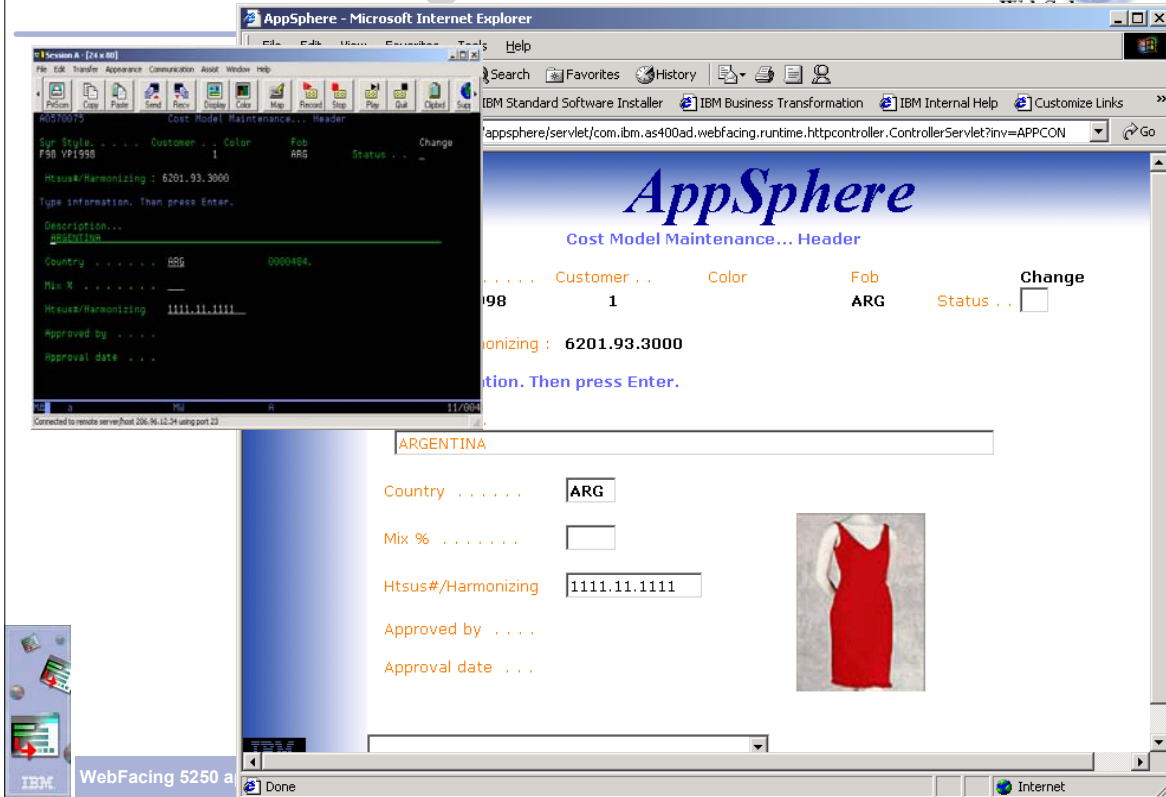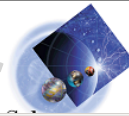
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- ▸ WebSettings are stored in the DDS as comments

How Do I Get It ?
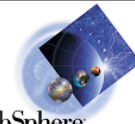
ONE PRODUCT: ALL TOOLS

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

► All client tools - unlimited

Announcing ➡ WebSphere Development Studio

Client **Version 5**　　**New**

- ✓ **WebSphere Studio Site Developer**
  - ● **Remote System Explorer**
  - ● **iSeries extensions**
  - ● **WebFacing**
- ✓ **Classic tools**
  - ● CODE/400
  - ● VisualAge for RPG

WebSphere Development Studio for iSeries

● 5722-WDS: V5R1/R2

refresh code FC 5903

ibm.com/software/ad/iSeries

WebFacing 5250 applications　　Copyright IBM 2001, 2003　　ibm.com/software/ad/iSeries

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- ‣ This slide overviews the WebSphere Development Studio Client product.
- ‣ It includes all host compilers (RPG etc) as well as tools including PDM, SEU etc.
- ‣ It comes with an unlimited license for client tool - WebSphere Development Studio Client for iSeries
- ‣ Development Studio Client is based on WSSDa (WebSphere Site Developer Advanced) and includes iSeries plugins
- ‣ The Remote System Explorer (RSE) is an iSeries plugin
- ‣ Filters can be configured to give a graphical view of system objects such as source members
- ‣ Options such as Edit, Compile are available from pop-up menus for each object
- ‣ The iSeries Project perspective downloads members to the work station so you can edit disconnected
- ‣ WebFacing is fully integrated in the IDE; has a 'perspective' in Development Studio Client
- ‣ Development Studio Client has a built-in WAS server so WebFaced applications. can be tested before deploying
- ‣ It includes the 'classic' tools CODE/400 and VisualAge RPG - launched as separate programs (not in the IDE)

WebSphere Development Studio Client 5.0

WebSphere Development Studio

| RPG | COBOL | C | C++ | ADTS |

Host

WebSphere Development Studio Client

WebSphere Studio Site Developer + iSeries Tools

Client

WebSphere Application Server Test Environment

| Team Projects | Plugin Tools | Java Tools | Web Tools | Struts Tools | AppSrvr Tools | WebSvc Tools | XML Tools | DB Tools |
| UI F/W | | | | | | | | |

iSeries Projects

iSeries Extns

iSeries Extns

iSeries Extns

Remote System Explorer

WebFacing Tool

CODE

VisualAge RPG

- ► The next generation of workstation development tools to create iSeries e-business applications that leverage the iSeries and the power of WebSphere Application Server
- ► Inherits and extends the WebSphere Studio Site Developer's robust, easy-to-use development environment for creating, building, and maintaining dynamic Web sites, or developing Java, Web and Web services applications. It also includes a robust, easy-to-use development environment for creating, building and maintaining iSeries RPG, COBOL, C, C++ applications, and Web-enabled applications using the IBM WebFacing Tool. The Remote Systems Explorer also makes it easy to access UNIX, Windows, and Linux application resources.

WDSc Advanced 5.0

WebSphere Development Studio for iSeries

WebSphere Development Studio Advanced Edition

RPG | COBOL | C | C++ | ADTS

Host

WDSc Advanced

WebSphere Studio Application Developer + iSeries Tools

Client

WebSphere Application Server Test Environment

Team											
Projects	Plugin Tools	Java Tools	Web Tools	Struts Tools	EJB Tools	AppSrvr Tools	WebSvc Tools	XML Tools	DB Tools	Profiling Tools	Tracing Tools
UI F/W											

iSeries Projects

iSeries Extns

iSeries Extns

iSeries Extns

Remote System Explorer

WebFacing Tool
Struts compliant runtime

CODE

VARPG

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

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▸ The next generation of advanced workstation development tools to create iSeries e-business applications that leverage the execution capabilities of WebSphere Application Server

▸ Inherits and extends the application development environment for the creation and maintenance of J2EE and Web services applications from WebSphere Studio Application Developer V5.0. It also includes a robust, easy-to-use development for creating, building, and maintaining iSeries RPG, COBOL, C, C++ applications, and Web-enabled applications using the IBM WebFacing Tool. The Remote Systems Explorer also makes it easy to access UNIX, Windows, and Linux application resources.

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**

✓ **Introduce <u>no</u> new costs to application stack price**

✓ **To change the face of the iSeries**

- Get your RPG/COBOL programs running on the Web in a short time
- Conversion is straight forward. After creating a project and specifying the DDS to convert, just choose Convert from the pop-up menu
- Typically no change required by the host program
- After initial conversion, new style can be applied to give the application a new look
- With knowledge of JSPs and Cascading Style sheets (CSS), users can modify shipped styles to create their own
- Does not require other skills such as Java to WebFace an application
- No additional costs from previous version

WebFacing tool

✓ **V5R1: "First Edition"**
- ► Base function
- ► Many improvements thru SP's

✓ **Version 4**
- ► Support for UIM help
- ► Improved Style support
- ► Improved authentication support
- ► Function key support
- ► Improved performance (smaller footprint)
- ► Better runtime support ....

✓ **Version 5**
- ► Better runtime performance
- ► Scalability enhancements
- ► Struts support
- ► Work SpoolFile support
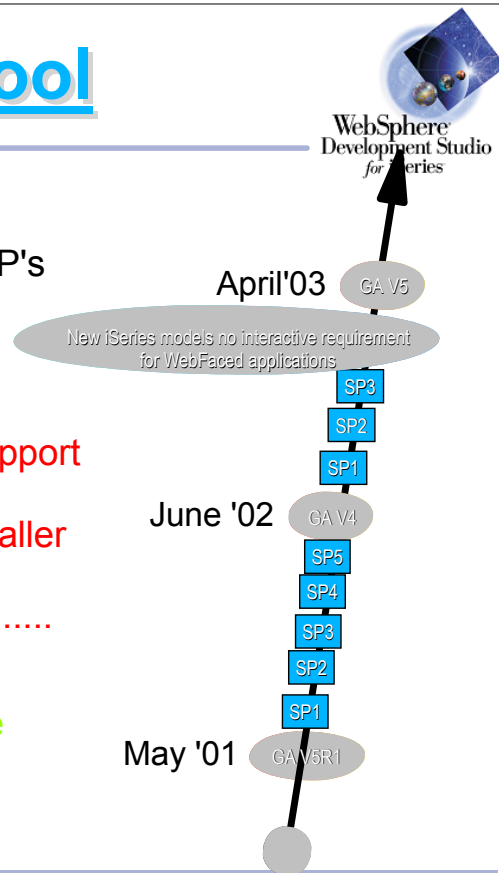
April'03   GA V5

New iSeries models no interactive requirement for WebFaced applications

SP3
SP2
SP1

June '02   GA V4

SP5
SP4
SP3
SP2
SP1

May '01   GA V5R1

WebSphere Development Studio for iSeries

► This slide shows the WebFacing Tool plans.
► Version 4:
► Testing WebFaced applications is much easier due to a built-in WebSphere Test Environment
► Support for User Interface Manager (UIM) help includes support for PNLGRP keywords
► Generated Cascaded Style Sheets are now much cleaner. Includes better documentation on how user can modify
► Logon page is now customizable (previously the basic authentication dialog was shown)
► Support for Command keys
► Version 5:
► IBM has provided an option during the code generation phase to output Struts-compliant Web application infrastructure that can be easily enhanced. The Struts-compliant runtime can now leverage the Struts tools to provide more customization capability.
► Conversion-time extension points allow developers to replace the default HTML
► IBM and user-defined custom tags enhance customization
► Can override command-key actions to invoke user-defined functions
► Support for displaying and printing iSeries spool files from inside your Web-enabled applications generated using the IBM WebFacing Tool

AGENDA

How WebFacing Works

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

WebSphere
Development Studio
for iSeries

Interactive *PGM Model

WebSphere Development Studio *for iSeries*

*PGM

Business Logic

UI Processing

DB Access

Display File Records

Data Buffer

Workstation Manager

5250 datastream

Time:8:05   date:Oct 22,2000

enter customer number:_____

Enter

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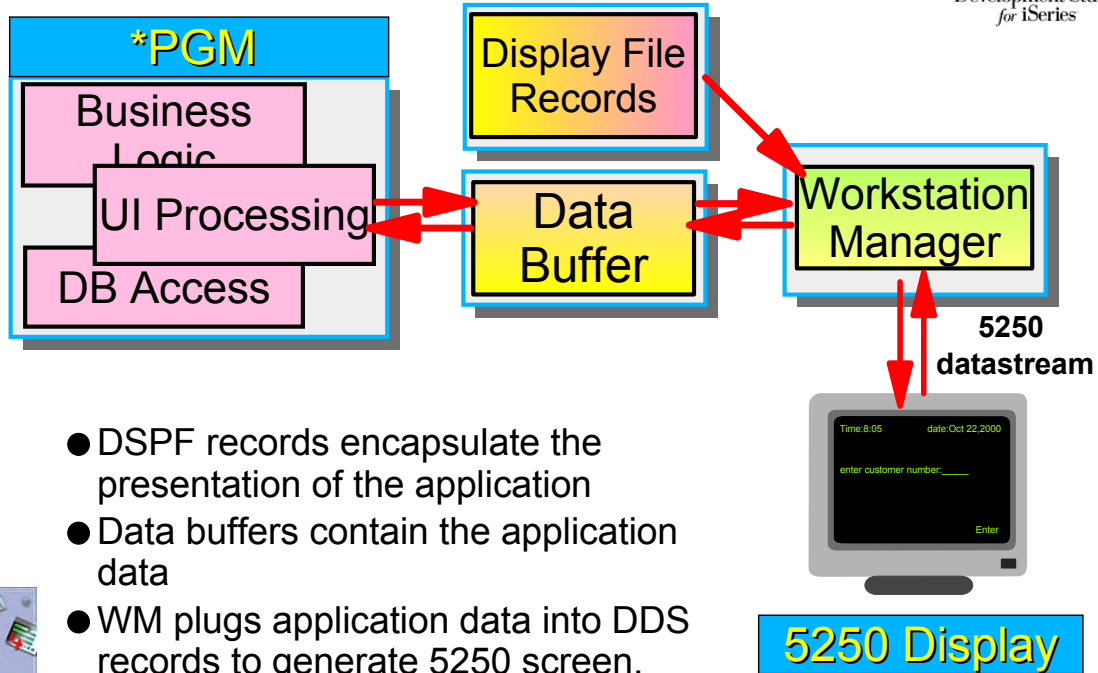
- DSPF records encapsulate the presentation of the application
- Data buffers contain the application data
- WM plugs application data into DDS records to generate 5250 screen.

WebFacing 5250 applications   **Copyright IBM 2001, 2003**   **ibm.com/software/ad/iSeries**

▸ This is the interactive programming model:
▸ In the green screen environment, the application performs READs and WRITEs to the workstation
▸ The application data is sent to workstation data management (WSDM)
▸ WSDM merges application data with the display file
▸ WSDM generates a 5250 datastream that is sent to the display

WebFacing Model

WebSphere Development Studio for iSeries

*PGM

Business Logic

UI Processing

DB Access

Data Buffer

Workstation Manager

I/O redirected

WebFacing Server

CustInterI...

Normal | HTML Source | Preview
Done

Welcome to ABC!!

Please complete this form

Customer Number

0010100

Submit | Reset

Form data

HTML

Browser

WebSphere Application Server

JSPs + JavaBeans

WebFacing Runtime

Servlet

- This is the WebFacing Tool Model:
- First the application is converted
- This creates JSPs for each record format as well as Java beans
- When the program performs a READ on a record format, control as well as the application data is sent to the workstation manager
- Because the job was started by the WebFacing server, workstation manager knows this is a WebFacing request and passes the data and control to the WebFacing server which runs on the iSeries
- Control returns to the Webfacing runtime servlet that runs in WAS
- The WebFacing servlet locates the appropriate JSPs and Java beans
- The WebFacing servlet tells WAS to return the JSP back to the browser
- The JSP is compiled and the resutant HTML is returned to the browser
- Note that no 5250 datastream is generated in this flow

Convert DDS to JSPs & Beans

WebSphere Development Studio for iSeries

► Development time wizard:
- Converts DDS to JSPs:
  - ►Select DDS members to convert
  - ►Creates Java server page and XML descriptions per record format:
    - ✓XML describes 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 project: (index.html)
  - ►Web page with links
  - ►Each link results in starting a job, running a user-supplied CL command which starts the application
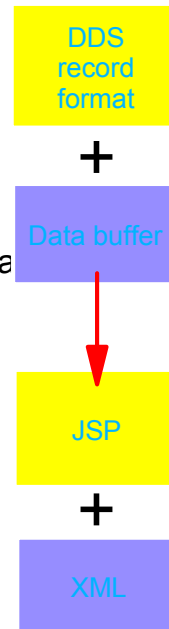
DDS record format

+

Data buffer

JSP

+

XML

► This slide explains how DDS is converted to JSPs and Beans:
► At development time, the DDS members that are part of the application are selected and converted
► During conversion one of the pre-defined styles can be selected
► Conversion creates 2 JSPs and 3 Java beans for each record format.
► One JSP contains JavaScript functions the other defines the layout of the page
► The beans will contain the application data as well as information on how the data is to be displayed and feedback information
► When the JSP is sent back to the browser, data from the data bean is merged with the JSP

WebFacing Runtime

WebSphere Development Studio *for iSeries*

- **WebFacing Servlet Runtime**
  - ► Called by generated Invocation Web Page
  - ► Starts iSeries 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

- The WebFacing run-time servlet resides on the application server (which may be diferent than the server with the program to be invoked)
- The generated index.html page has a link to the WebFacing run-time servlet and passes to it the .invocation file which contains the name of the iSeries, the invocation command and, if specified, the userid and password
- The run-time servlet passes control to the WebFacing server on the iSeries which creates an interactive job and invokes the program. It also sets a flag to indicate to workstation data management that this is a WebFaced application
- Application READs and WRITEs are re-directed to the WebFacing server along with the application data
- WRITEs are queued up until a READ is performed
- At that time the run-time servlet requests that PageBuilder.jsp to WAS
- PageBuilder.jsp merges all the JSPs that were queued up
- Resulting HTML is sent to the browser

How does it all work?

Tier 1

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

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

Tier 2

Servlet

JSPs

Beans

WebFacing
Runtime

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

App writes,
reads data

Tier 3

5250
Host
app
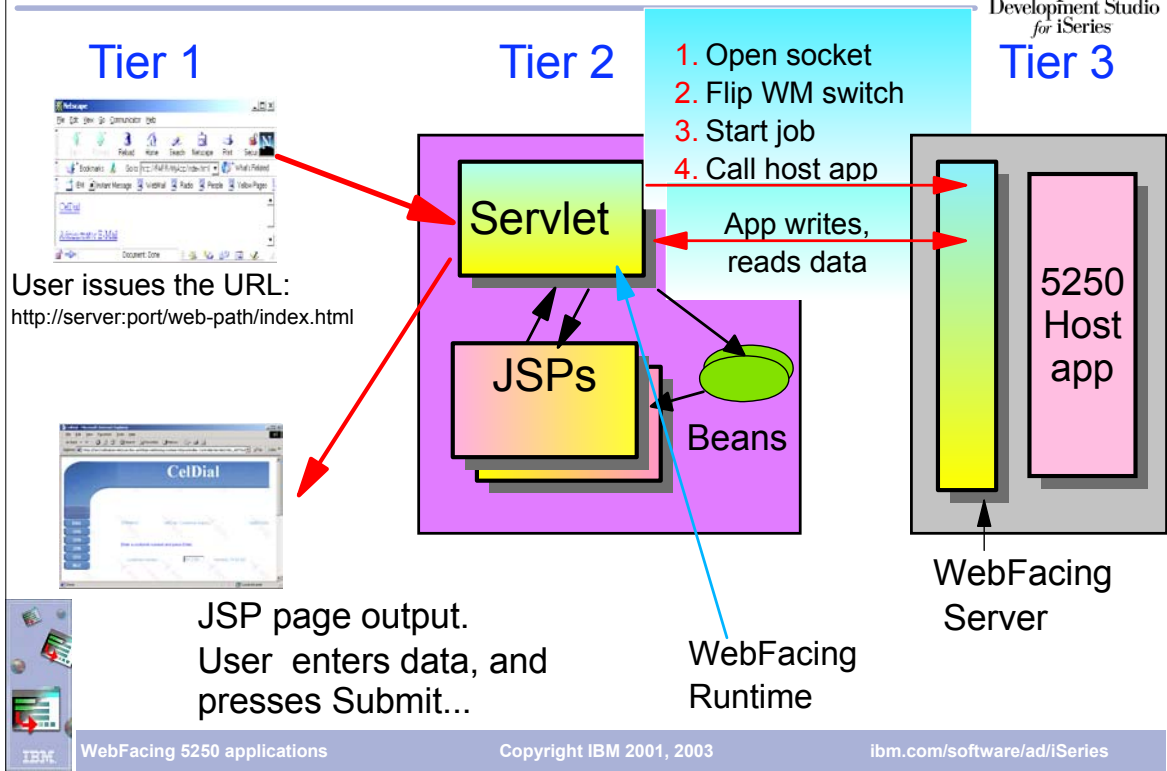
WebFacing
Server

- This slide shows how it all works together:
- The user selects the invocation link on the index.html page
- This passes control to the WebFacing run-time servlet passing the .invocation file that contains the iSeries name and the name of the command to call
- The WebFacing run-time servlet opens a port (default 4004) on the specified iSeries to the WebFacing server to validate the userid and password.
- If necessary, the user is prompted for a user id and password
- An interactive job is created on the iSeries and a flag is set to indicate to workstation data mangement that this is a WebFaced application
- Application WRITEs are queued up until a READ is performed, and the beans are populated with the data.
- When the application performs a READ the WebFacing run-time servlet requests that WAS serves page PageBuilder.jsp. This JSP has logic that will include all of the JSPs corresponding to the queued up WRITEs
- The application server compiles, the first time, the JSP and sends the resulting HTML back to the browser

AGENDA

Development Time Tooling

► Create WebFacing Project wizard

► Publishing information

► Deployment to WebSphere Application Server

► Test it out !
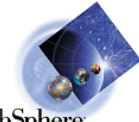
What are the steps?.......

WebSphere Development Studio *for iSeries*

- Start the WDSc workbench
- Open WebFacing perspective
- Run the Create WebFacing Project wizard
  - Select DDS Source on server
  - Specify the CL command used to start the app and the text for the Web page link
  - Select style
- Convert DDS to JSPs, XML

What are the steps?

- Run on server in workbench test environment
- Invoke the first page - Invocation page = index.html
- Test the WebFaced application
- Iteratively improve the look ...
- Test on remote server
- Move to production server

WebFacing perspective

Fully integrated into WDSc workbench

- ▶ WDSc has perspectives to work with projects. For example there is a Java perspective to work on Java projects
- ▶ WebFacing has it's own perspective
- ▶ Each perspective can have multiple views open
- ▶ WDSc has perspectives to work with projects. For example there is a Java perspective to work on Java projects
- ▶ WebFacing has it's own perspective
- ▶ Each perspective can have multiple views open

Create a New Project !

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

- ► To begin, create a new project. If WebFacing doesn't appear in the menu choose other and choose WebFacing from the next dialog
- ► On the next dialog we give the project a name and specify were the files are to be stored. The default is to store them in the workspace directory
- ► Web applications (which WebFacing is based on) are part of an EAR (Enterprise Archive) file, so we need to specify the EAR file name
- ► The Context root is what the user would specify as part of the URL in the browser to invoke the application

Select DDS source

- Select server
- Sign on
- Select DDS source
  - all members
    or
  - selected members

- ▸ On this dialog we choose which connection (iSeries) our DDS is on.
- ▸ The member types allows to choose DSPF and/or MNUDDS (for menus - WebFacing supports menus)
- ▸ Clicking the Refresh list will retrieve the library list, after we have signed on
- ▸ From the library list we drill down to find the DDS source members we want to convert
- ▸ Clicking the push button moves the selected members to the list of members to be converted
- ▸ Clicking on the folder moves all members at once. No need to select each member

Select UIM help source

Select UIM source members to convert

Select "Refresh list" to refresh the library items displayed in the tree. Select members from the tree and add them to the table for conversion.

Project name: mywebapp

- **Select UIM help source**
  - all members or
  - selected members

▸ On this dialog we select the UIM help members to be converted by again drilling down to locate those members

Command to Call App

WebFacing Project

Specify CL commands

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

Project name: wflabaa

WebFacing generates hypertext links that you can use to launch your application from the web. In order to do this, it 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.

If your program requires interactive parameters you should also enter them in the command line. For example: to invoke program MYPGM with a part number parameter, you would enter CALL MYPGM PARM('&part') as the CL command. The variable "&part" will be replaced when you click on the invocation link. For details, refer to the generated index.html file.

CL command: Call Ordentr
Command label: Order Entry Application
○ Prompt for signon
● Sign on with specified values
User ID weiss
Password ****** Confirm password ******

CL Command	Command Label	User ID
CALL ORDENTR	Order Entry Applica...	WEISS

Add / Modify / Delete / Move Up / Move Down

< Back / Next > / Finish / Cancel

CL command

Text for web page link
Authentication
    always prompt
    or
        use predefined
userid/Password

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

- ▶ The Command label text is the text that will appear on the generated Index.html page to launch the application.
- ▶ The CL command is an iSeries command to start the program. Typically we just do a CALL to the program. If the program has parameters we specify them here. Specifying parameters results in input fields being generated on the index.html page were the user would enter their value
- ▶ If Prompt for sign-on is selected, an authentication dialog (login.jsp) is displayed before the application is launched
- ▶ Alternatively we can specify a user id and password to be passed to the WebFacing server before the program is started
- ▶ Either way, the user id and password is used to start an interactive job on the iSeries and invoke the specified command

Select Presentation Style

WebFacing Project

Choose a Web style
Select a "Look and Feel" style to use for the project.

Select a predefined or previously customized style:
- avenue
- corporate1
- fun
- gradient
- sage
- sage1
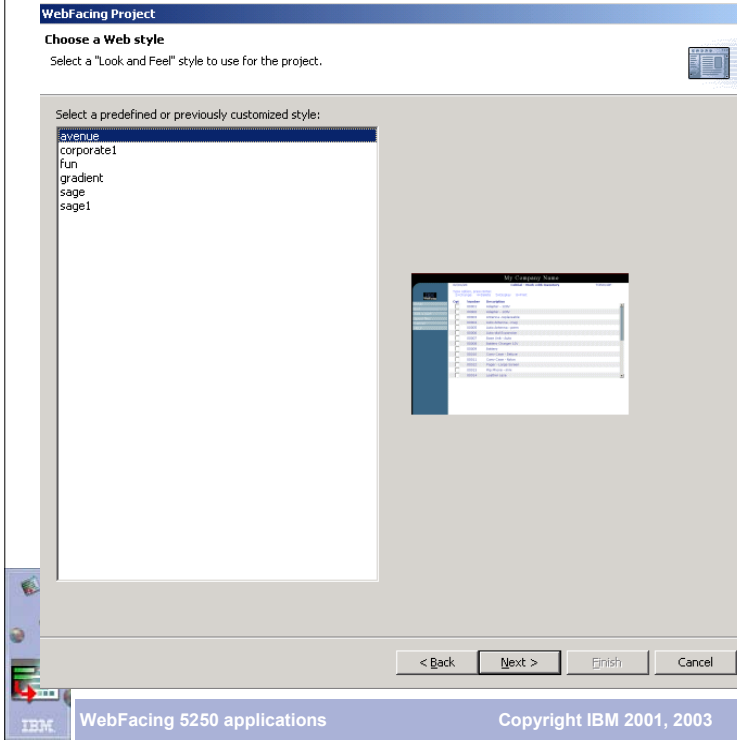
- Cascading style sheets
- Sample styles that you can modify !

< Back   Next >   Finish   Cancel

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

WebSphere Development Studio *for iSeries*

▶ On this page we choose the style for our application
▶ After the project has been created another style can be applied without performing conversion
▶ After conversion the WebFacing Style propertiesdialog allows the user to customize one of the pre-defined styles and save it as a new style that can then be used by other projects

Done!

WebFacing Project

Complete WebFacing project
You have indicated the specifications for your new WebFacing project. To continue, click Finish.

You are about to create a WebFacing project.
Do you also want to convert the selected display files?

○ Yes. I want to create the project and proceed with conversion now.

● No. I only want to create the project now.

Create project

[< Back] [Next >] [Finish] [Cancel]

WebSphere Development Studio for iSeries

- ► On this dialog we can choose just to create the project and perform conversion at a later time, or create the project and perform conversion when Finish is pressed.
- ► Press Finish to complete the wizard

Convert DDS to JSPs
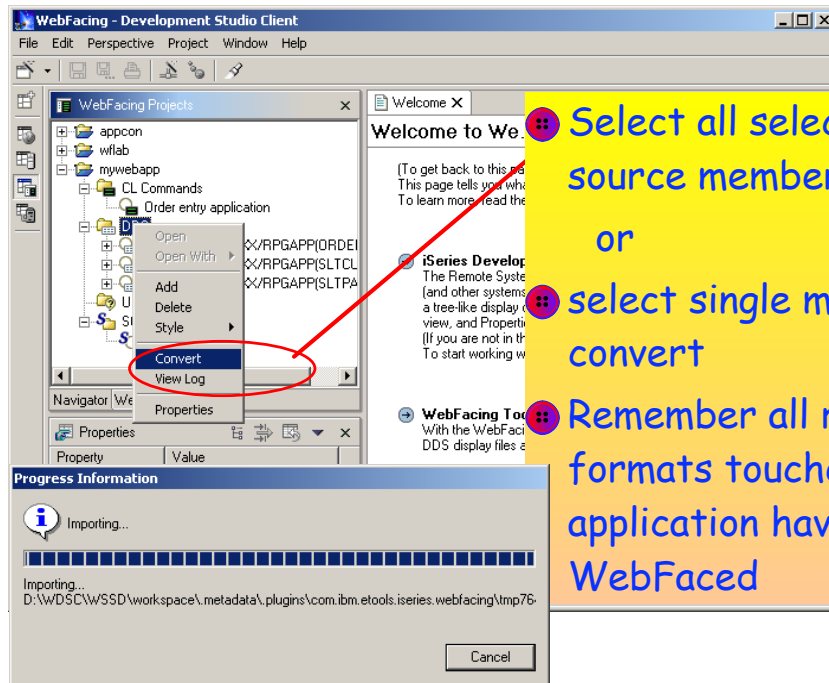
Select all selected DDS source members

or

select single members to convert

Remember all record formats touched in the application have to be WebFaced

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▶ Right click on the DDS folder and choose convert. This will convert all members in this folder.

▶ If we made changes to a single member, we could just select that member to convert

▶ Note that the source remains on the iSeries. The conversion process reads the DDS members and performs conversion in memory

▶ Conversion creates 2 JSPs and 3 Java beans for each record format

▶ It is important to convert all DDS members that are part of the application. If a member is not converted you will get a 'class not found' message at run-time.

Conversion Log

Report of problems during conversion

- Once conversion is complete, the conversion log is displayed in its own view
- Note the tabs at the bottom of the log view to see different parts of the conversion log
- Review the conversion log to be sure all members were converted
- A red X symbol indicates conversion failed for that member. No JSPs or beans were created
- See the Message Text to determine the cause of the failure and fix as necessary

Conversion Log

Referenced keywords list
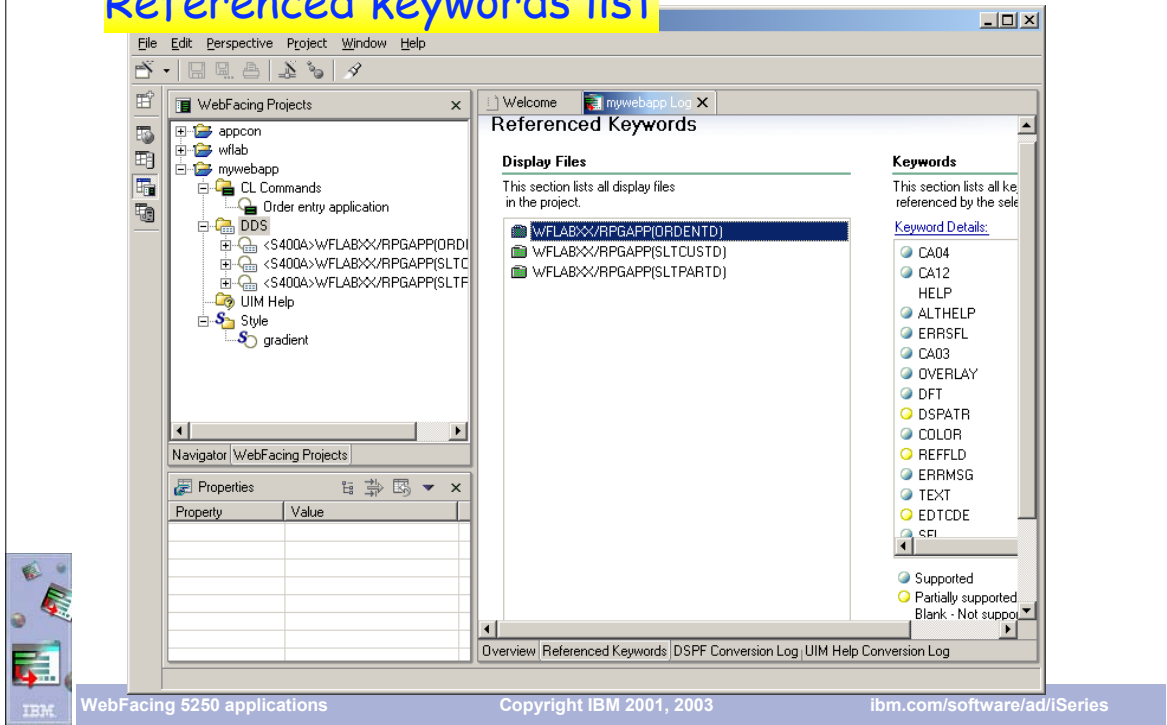
▸ Click on the Referenced Keywords tab in the log view to see the keywords that were found during conversion

▸ Icons next to the keyword indicate if conversion was successful. For partially converted members see the message text to determine the reason

Generated Output

- ▸ By switching to the Navigator view of the project we can see the directory structure of the project after conversion
- ▸ Note that there are 2 JSP files created for each record format
- ▸ To see the generated JSP, double-click it to open it in Page Designer

Update Server Information

- ▸ To make changes to the project right-mouse click the project and choose Properties to get the properties dialog
- ▸ The Host Port number is the port number the WebFacing run-time uses to invoke the program on the host.
- ▸ 4004 is the default and can be changed on the host with the WRKSVRTBLE command. If you change it on the host be sure to change it here also
- ▸ You can indicate that the user will be prompted to sign-on to the application or sign will occur using the user id and password specified here
- ▸ By checking Retain user ID and password, the user will not be prompted to sign-on for subsequent calls to the program in the same session. If this is left unchecked, the user will be prompted each time they invoke the program
- ▸ The JSP level indicates the amount of tracing detail to put in the log file. 3 outputs the most detail. The log is used by developers for debugging

Ready to run

> Once the application has been converted it can be tested in the internal WebSphere Application Server (WAS)
> Locate the index.html page and choose Run on server
> If not yet started, the WAS server will start.
> The index page will appear in the internal browser view

The Invocation Page

Links for Program : "CALL ORDENTR"

Oder Entry Application - Launch in main browser window
Oder Entry Application - Launch in a new browser window

- Test invocation page (index.html) is generated automatically during conversion
- Invocation page URL is used when Run on Server is selected
- Click on a CL command link to start application

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► This is the index.html page that was generated based on your choices during conversion or by settings in the properties dialog
► Clicking on a link will invoke the WebFacing run-time servlet (in WFRun.jar)
► Passed as a parameter is the .invocation file that contains the system name and the name of the program to call
► To see how WebFacing is invoked choose View/Source from the browser window

Run the App !

▸ In this case, the DDS used the WINDOW keyword
▸ In that case windows are created that can be moved around the browser
▸ Notice that subfiles are fully supported
▸ Clicking on the up/down arrows in the subfile scroll bar will navigate the subfile

Deploy to remote Server

File → Export

Ready to run !

EAR WAR or other file formats

Use WAS ADMIN console to create application

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► Once the applcation has been tested and is running properly it is deployed to the production WAS
► Choose File Export and specify the EAR file name you specified when you created the project
► Once the EAR file has been deployed, use the WAS admin. console to install the applcation in WAS

Customizing Your Results

Three 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 your own !
3. Use Page Designer in Studio *after* to edit JSPs
   - ✓ But changes to application area lost on next conversion
   - ✓ Conversion will backup previous JSPs, so you can manually merge if you desire

- ► There are 3 ways to customize WebFace screens:
- ► Use the WebSettings feature of CODE designer
- ► This is done before conversion is performed
- ► WebSettings are stored as comments in the DDS
- ► With WebSettings you had certain fields that may not be relevant on the web
- ► You can specify that a field contains an image name, and an <IMG> tag should be created for that field
- ► You can specify that a field is a hyper-link. Clicking on the link at run-time will launch the URL specifed in WebSettings
- ► After conversion, WebFacing copies the Cascading Style Sheet (CSS) to the project
- ► With some knowledge of CSS you can modify it to customize your pages
- ► You can use Page Designer to edit the created JSPs
- ► Note, conversion will overwrite customized JSPs

Web Settings

✓ **Customizing at pre-conversion**
  ● **Web Settings saved as DDS comments**

- To open the member in CODE Designer, right-mouse click on the member and choose Open with/CODE Designer
- Note the new tab, WebSettings
- Selecting an element in the design window will show the current web settings for that element
- WebSettings are saved as comments in the DDS
- In this example the Customer field will become a hyperlink on the browser. When the link is selected, the value '1' will be placed in the OPT field and a submit will automatically be issued
- Other WebSettings let you insert an image, hide a field

Change Styles

Chrome area change with Style sheet tools

Application area properties change with WebFacing tool

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▸ The Chrome area is that area that surrounds the application area; i..e the header (My Company Logo) and side bar
▸ This area is defined by a separate style sheet that is store in it's own folder (chrome)
▸ Use the built-in CSS editor to modify
▸ The application area can be modified opening the Properties dialog for the project

Style properties

- New style properties allow you to customize individual elements of your pages
- DDS Color keyword can be assigned to a specific color
- Default font can be changed
- Appearance of push buttons can be customized
- Various elements of windows can be changed including foreground and background color as well as font
- Elements of a the subfile can be changed including color of the slider alternate row coloring
- Many more options . . .
- After you've customized a style you do a Save as so it can be applied to other projects

WebSphere Development Studio client
for iSeries

WebSphere Development Studio Series

V4

Web - Development Studio Client

File Edit Perspective Project Toolbar Page Tools Window Help

Navigator

myfirst.jsp | Web Browser | *myfirst.jsp

myfirst.jsp - Customer inquiry *

- appcon
- cc
- labxx
  - source
  - webApplication
    - WEB-INF
    - a034ani.gif
    - blue6b.gif
    - custinquiryResults.js
    - error.jsp
    - labxx.pcml
    - logo1.jpg
    - logo2.jpg
    - myfirst.jsp
    - setdebug.jsp

GUI PDM for all your files

SDA for Web Pages

Customer inquiry

Enter customer number
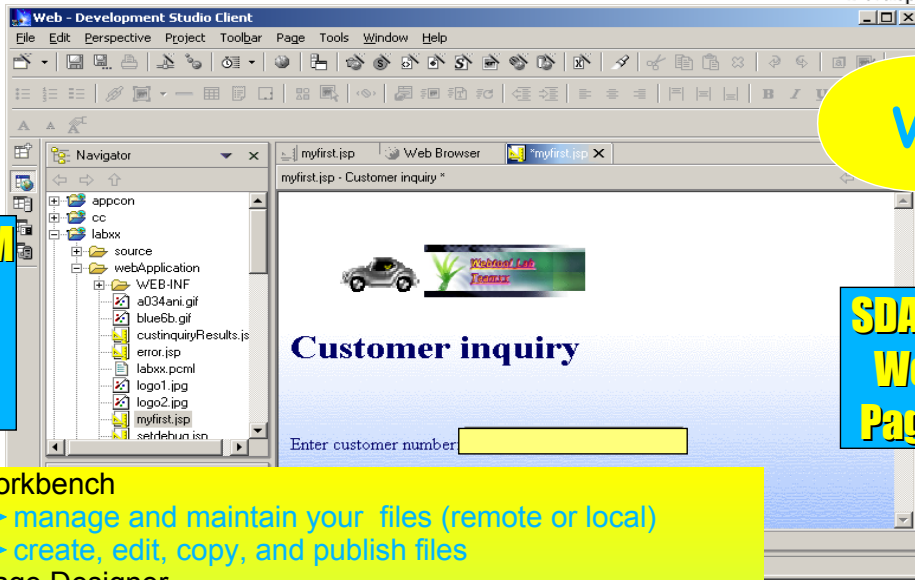
- ● workbench
  - ► manage and maintain your files (remote or local)
  - ► create, edit, copy, and publish files
- ● Page Designer
  - ► a WYSIWYG HTML editor
  - ► a WYSIWYG JSP editor
- ● Many perspectives, views, wizards and numerous little editors

- ▸ All the tools necessary to work with their project in one IDE.
- ▸ WDSC is based on Websphere Site Developer Advanced (WSSDa) which is based on Eclipse
- ▸ IDE offers all common options including edit, rename, delete, copy etc.
- ▸ Double clicking on a file will bring up the appropriate editor in another view
- ▸ In this example, Page Designer was opened to work with a JSP
- ▸ WYSIWYG tool for working with HTML, JSP pages
- ▸ Also has a source view for working directly with the source
- ▸ Perspectives for different project types such as Java and WebFacing
- ▸ Multiple views can be opened at once within the same perspective
- ▸ Perspective and views are customizable

WebFacing Examples
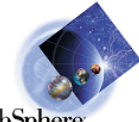
✓ **Customers/Business partners**

- **Basic conversion, minimal customization**
  - ► **Gulistan Carpet**
    - ✓ Sales management application
  - ► **Astech**
    - ✓ Typical Work-With application
  - ► **GUS**
    - ✓ Charisma ERP application
- **Conversion with added customization**
  - ► **APPCON**
    - ✓ AppSphere ERP application
- **Conversion customization tools**
  - ► **ebt-now**
    - ✓ Built additional tools to analyze application
    - ✓ Conversion results modified to achieve custom results

WebSphere Development Studio for iSeries

Gulistan Green Screen

Initial screen

Gulistan

Current announcements listed here

Courtesy: Gulistan Carpet Inc.
www.gulistan.com

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

▶ 'Before' screen of Gulistan initial screen

Gulistan Web Page

Initial screen

Courtesy: Gulistan Carpet Inc.
www.gulistan.com

▶ WebFaced version of Gulistan initial page using one of the supplied styles

▶ Note they've customized the header by adding their own graphic

Gulistan Green Screen

Sales summary screen

```
Session A - [24 x 80]
File  Edit  Transfer  Appearance  Communication  Assist  Window  Help

    4/30/02                    Sales Summary by Salesman              11:06:09 SLF100
  NORTH CENTRAL
  JOSEPH H. FORTE

                               MAR 02  TO  MAR 02      NOV 01  TO  MAR 02
     Style Description        Mtd Yards Mtd Dollars    Ytd Yards  Ytd Dollars
  _  44600 NORTHFIELD SD-26       411      2,699         9,500      60,523
  _  47650 TOP AUTHORITY          402      7,701         1,181      20,512
  _  42270 FIDDLER                  0        686-        2,398      19,433
  _  49130 WORKPLACE 26           119        988         2,656      18,611
  _  45280 PERMAPOINT             598      6,568         1,747      17,532
  _  41210 CIMARON                867      9,510         1,195      14,440
  _  39000 SPECIAL 3900             0          0         1,180      13,491
  _  44620 NORTHFIELD SD-28       248      1,627         1,899      12,261
  _  45680 PRECISION                0          0           877       9,372
  _  42040 DATAWEAVE             104      1,165           640       6,434
  _  49030 WORKPLACE               0          0           748       4,600
  _  40920 CROSSCURRENT            0          0           271       4,249
  _  44630 NORTHFIELD SD-28 UN     0          0           618       4,113
  _  86510 AROUND THE BLOCK       22        376           211       3,331
  _  41590 DURAPOINT SUPREME       0          0           245       3,098   +


  MA    a                               ⇧                          07/002
```

Courtesy: Gulistan Carpet Inc.
www.gulistan.com

▶ Gulistan typical Work with Green screen

Gulistan Web Page

Sales summary screen
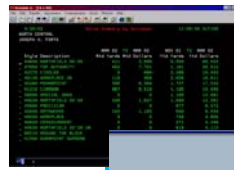
04/30/02	Sales Summary by Salesman	14:37:10 SLP100
NORTH CENTRAL		
JOSEPH M. FORTE		

| | | MAR 02 TO MAR 02 | | NOV 01 TO MAR 02 | |
Style	Description	Mtd Yards	Mtd Dollars	Ytd Yards	Ytd Dollars
44600	NORTHFIELD SD-26	411	2,699	9,500	60,523
47650	TOP AUTHORITY	402	7,701	1,181	20,512
42270	FIDDLER	0	686-	2,398	19,433
49130	WORKPLACE 26	119	988	2,656	18,611
45280	PERMAPOINT	598	6,568	1,747	17,532
41210	CIMARON	867	9,510	1,195	14,440
39000	SPECIAL 3900	0	0	1,180	13,491
44620	NORTHFIELD SD-28	248	1,627	1,899	12,261
45680	PRECISION	0	0	877	9,372
42040	DATAWEAVE	104	1,165	640	6,434
49030	WORKPLACE	0	0	748	4,600
40920	CROSSCURRENT	0	0	271	4,249
44630	NORTHFIELD SD-28 UN	0	0	618	4,113
86510	AROUND THE BLOCK	22	376	211	3,331
41590	DURAPOINT SUPREME	0	0	245	3,098

- Enter
- Log Off
- Back

Courtesy: Gulistan Carpet Inc.
www.gulistan.com

▶ WebFaced version of Work With Green screen
▶ Note subfile has a slider; user clicks on up/down arrows to navigate the subfile

ASTECH Green Screen
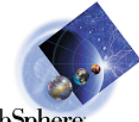
Inventory WorkWith

ASTECH
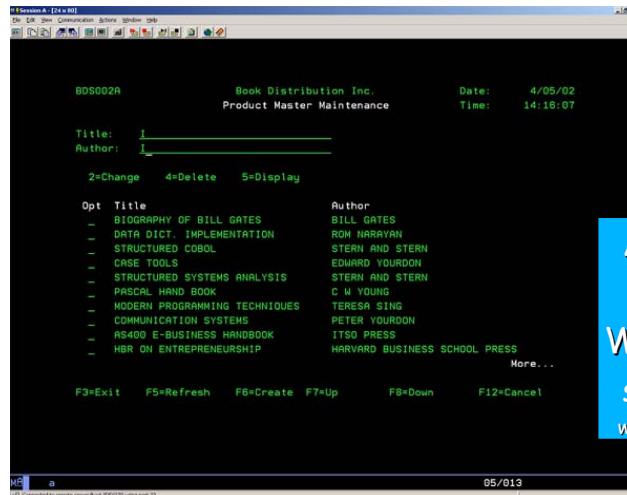
ASTECH offers WebFacing services!
www.astech.com

Courtesy: ASTECH Solutions Inc
www.astech.com

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

▶ Astech Work with Inventory green screen
▶ Astech will provide WebFacing services to customers

Astech Web Page

Inventory WorkWith
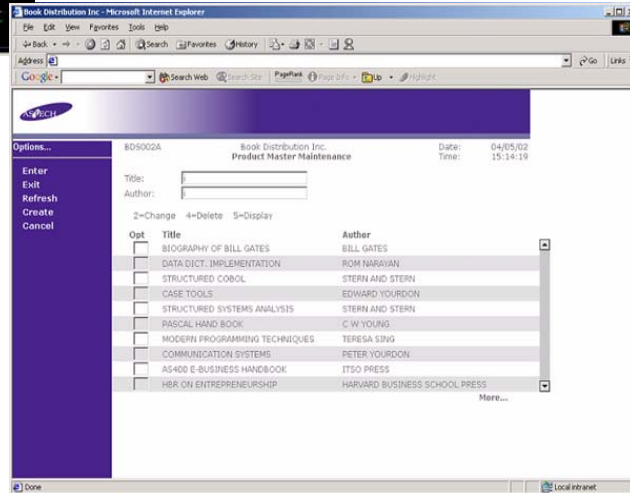
Courtesy: ASTECH Solutions Inc
www.astech.com

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

- ► WebFaced version of Astech's Work with green screen
- ► Note the style is not one shipped with WDSC. This customer has created their own style

GUS Green Screen
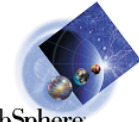
Sign in screen

GUS
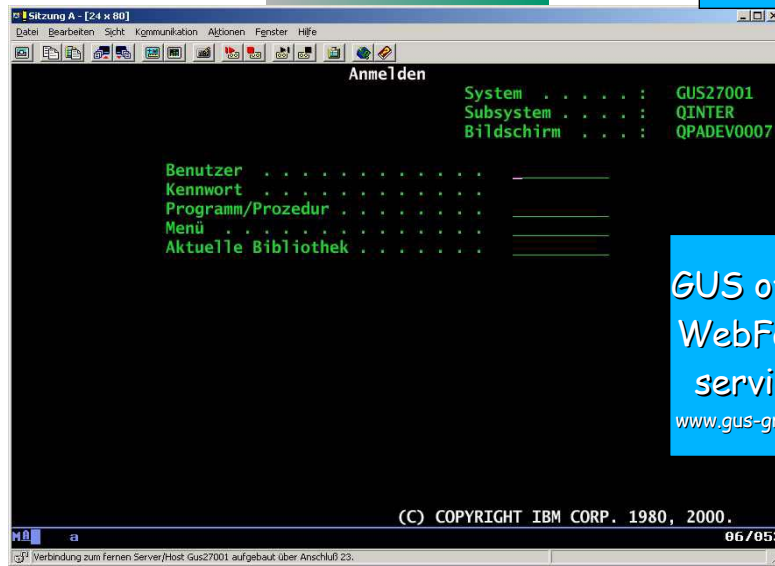
GUS offers WebFacing services!
www.gus-group.com

```
Anmelden
                              System . . . . . :    GUS27001
                              Subsystem . . . . :    QINTER
                              Bildschirm . . . :    QPADEV0007

        Benutzer  . . . . . . . . . . . . .      _____
        Kennwort  . . . . . . . . . . . . .
        Programm/Prozedur . . . . . . . . .      _____
        Menü  . . . . . . . . . . . . . . .      _____
        Aktuelle Bibliothek . . . . . . .        _____




                            (C) COPYRIGHT IBM CORP. 1980, 2000.
```

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com
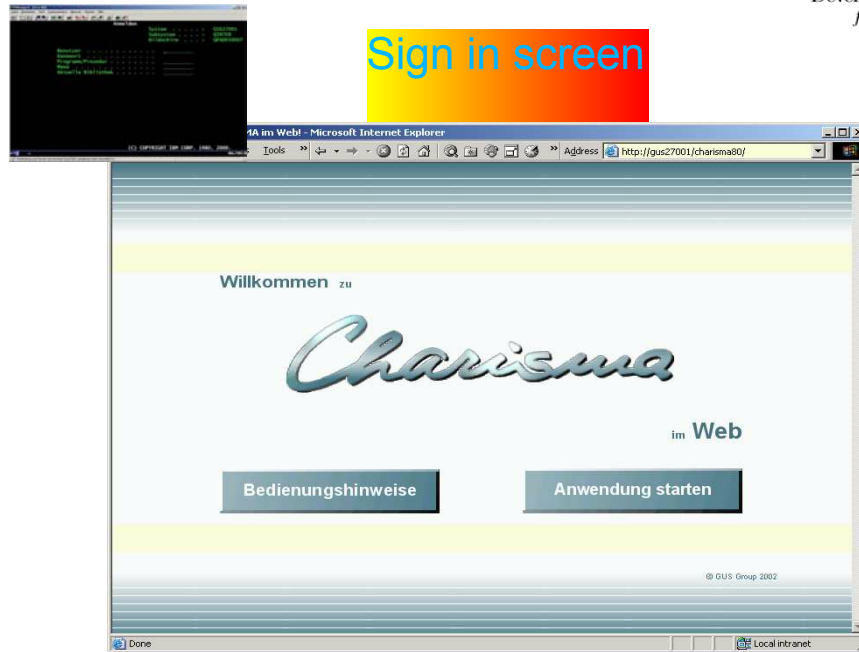
▸ The user has customized the index.html page generated by the WebFacing Tool
▸ The button on the left displays help written in HTML
▸ The other button invokes the WebFaced application which will result in a sign-on dialog

GUS Green Screen

Main menu

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

▶ Menu screen from GUS

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

▶ WebFaced version of GUS menu screen
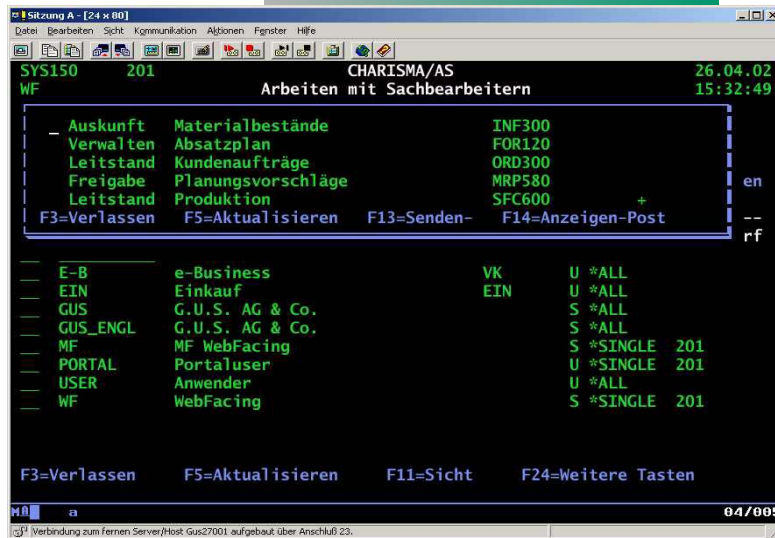
Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

► Example of green screen using the WINDOW keyword to display a pop-up window

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

▶ The converted screen includes a window that can be moved around the screen
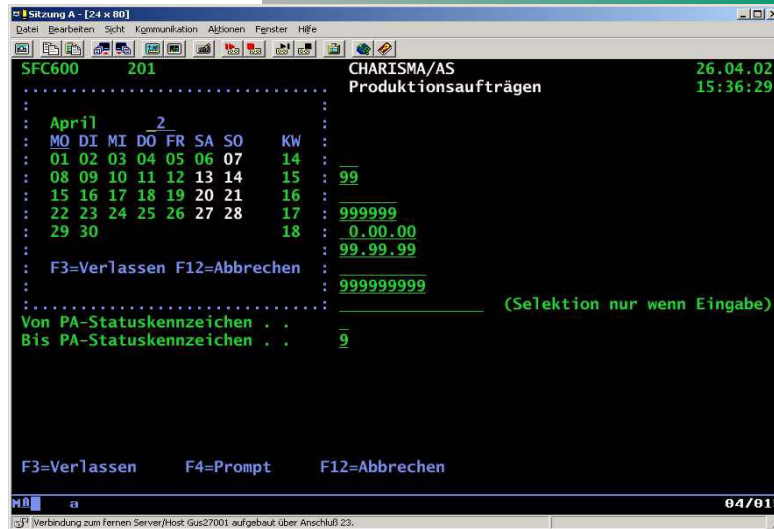
Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

▶ Another example of a window in a green screen showing a calendar in a window

Courtesy: GUS Anwendungssysteme & Softwareentwicklung GmbH
www.gus-group.com

► WebFaced version of screen has a window that can be moved about the screen

Courtesy: APPCON

- ▸ Example of green screen from AppCon
- ▸ AppCon proves software for the apparel industry
- ▸ Is an early adopter of WebFacing
- ▸ Also provides WebFacing services
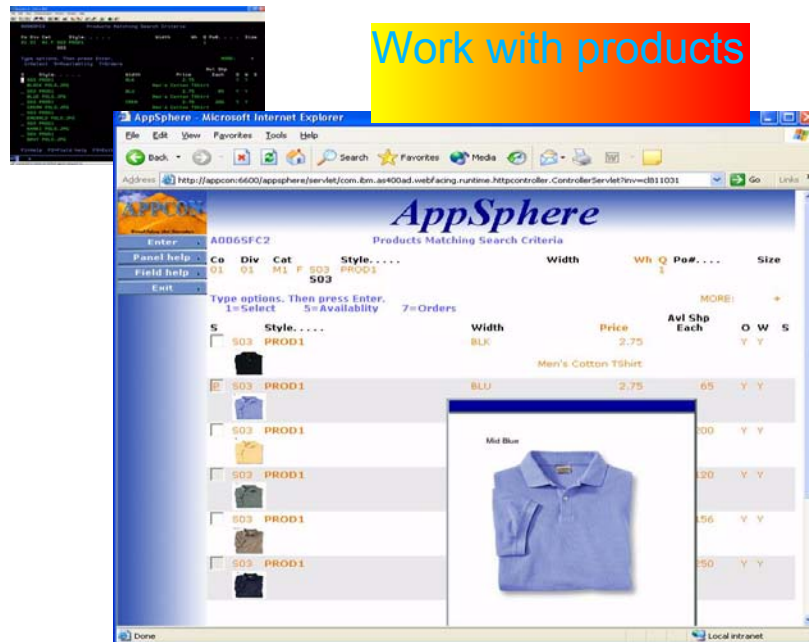
Courtesy: APPCON

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

- ► WebFaced version of AppCons green screen
- ► Note that the subfile shows a small image of the item
- ► The image was created by setting WebSettings in the DDS before conversion
- ► The pop-up window with the larger image was generated using the Web Interaction Wizard - another component of WDSC

Courtesy: APPCON

▶ Another green screen from AppCon showing details on an item

Courtesy: APPCON

- ▶ WebFaced version of the detail screenA
- ▶ Again, the image was generated by using the WebSettings features
- ▶ In WebSettings you can indicate that a field contains an image name
- ▶ During conversion the correct <IMG> tag is created
- ▶ During runtime, the field value is added to the <IMG> tag and the image is displayed

APPCON Green Screen

Bill of material detail

Courtesy: APPCON

► Another screen from AppCon showing the bill of material for an item

Courtesy: APPCON

- ► WebFaced version of Bill of Material screen
- ► Again, WebSettings were used to create the image
- ► Note the pop up window with the radio buttons
- ► This popup was generated because the option field had the VALUES keyword
- ► When the user hovers the mouse over the option field the pop up is displayed
- ► User then clicks on the option and the correct value is inserted in the option field
- ► User can still enter directly into the option field

ebt-now Green Screen

Contract inquiry

ebt-now

ebt-now offers WebFacing services!
www.ebt-now.com

Courtesy: ebt-now
www.ebt-now.com

▸ Example of a green screen from ebt-now
▸ ebt-now also offers WebFacing services

ebt-now Web Page

Contract inquiry

Courtesy: ebt-now
www.ebt-now.com

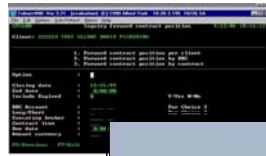WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

▶ WebFaced version of ebt-now screen using one of the supplied styles

ebt-now Web Page

Contract inquiry

ebt-now Services - WebFace

CFC600   Inquiry forward contract position   11/06/01

Client: 222224 TEST CLIENT DAVID PICKERING

- Enter
- Previous
- Inquiry item
- Exit
- Inquiry contract
- More cmds
- HELP

----
                      1. Forward contract position per client
                      2. Forward contract position by BBC
                      3. Forward contract position by contract
----
Option   :   [▼]

Closing date   :   12/31/99
End date   :   0/00/00   X
Include Expired :   N ▼   Y=Yes N=No

BBC Account   :   [   ]   [ ]   For Choice 2
Long/Short   :   [ ]   For Choice 3
Executing broker :   [   ]   [ ]
Contract item   :   [ ]
Due date   :   0/00/00
Amount currency :   [ ]

F3=Previous F7=Exit   F24=More keys
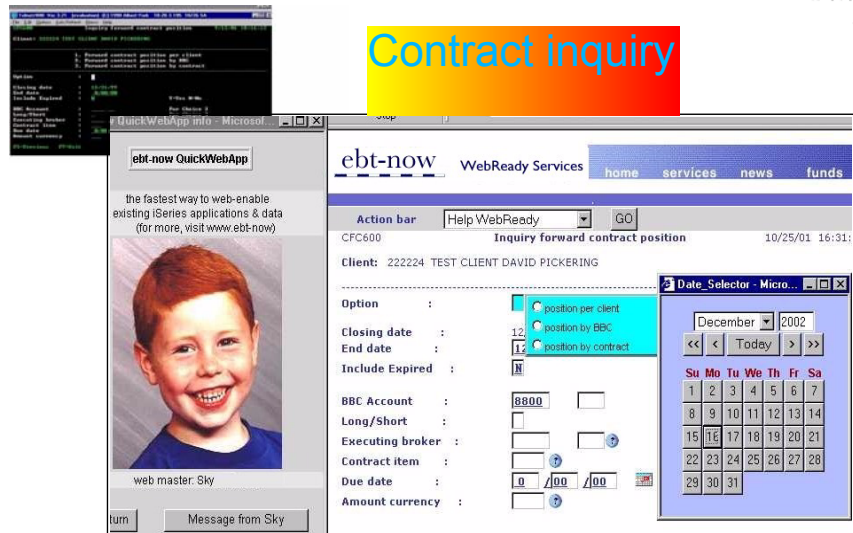
Courtesy: ebt-now
www.ebt-now.com

Courtesy: ebt-now
www.ebt-now.com

▸ Customized version of ebt-now panel
▸ Note the small calendar icon they have inserted next to the date fields
▸ Clicking an icon causes the JavaScript calendar window to appear
▸ Clicking a date push-button on the calendar inserts the selected date in the date field
▸ JavaScript calendar was developed by ebt-now

ebt-now Web Page

Contract inquiry

Courtesy: ebt-now
www.ebt-now.com

WebFacing 5250 applications   Copyright IBM 2001, 2003   ibm.com/software/ad/iSeries

▸ Another example of a customized WebFaced screen from ebt-now
▸ Note that the command keys have been replaced by a drop-down selection box at the top of the window
▸ They have added extra links (home, services etc) to display other web pages
▸ Note the WebFaced application is displayed in a frame. The picture to the left is displayed in another frame

WebFacing Pros and Cons

WebSphere
Development Studio
for iSeries

- Pros:
  - ► 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 is part of OS/400. Tooling part of WDSc
- Cons:
  - ► Must have access to DDS source
  - ► Non-DDS screens cannot be converted
    - ▪ No current support for UIM or system screens or 3270 or ...

URLs

WebSphere Development Studio

- **ibm.com/software/ad/iSeries**
  - ► **WebSphere Development Studio for iSeries**
  - **WebSphere Development Studio Client**
    - 💡 **WebFacing**
- **ibm.com/software/awdtools**
  - ► **WebSphere Studio Site Developer**
  - ► **WebSphere Studio Application Developer**