

WebSphere Development Studio for iSeries

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IBM Advanced Technical Support (iSeries)

Rochester, MN

WDS

New World
New Servers
New Tools



Disclaimer



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, Linda Cole, Alison Butterill, David Slater*

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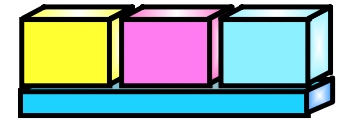
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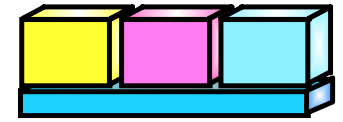
Photographs shown are of engineering prototypes. Changes may be incorporated in production models.

Strategy: What



▶ **iSeries AD Strategy:**

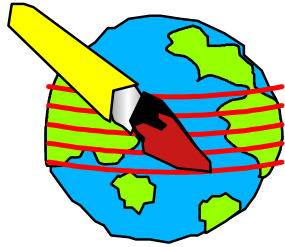
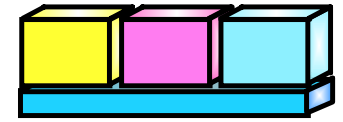
- **Increase number of eBusiness applications**
 - ✓ Build, convert, port
- **Increase usage of modern tools**
 - ✓ Modern applications need modern tools
- **Increase number of modern tools**
 - ✓ IBM can't build them all!
 - ✓ Prevent need for each vendor to build entire tool stack



▶ **How to Achieve Strategy:**

- **Remove barriers**
 - ✓ Cost to acquire tools and skills
 - ✓ Cost to pre-req or OEM tools and technology
 - ✓ Cost to build from scratch: iterate versus replace
- **Transition skill base**
 - ✓ To latest compilers
 - ✓ To latest technology
 - ✓ To latest tools
- **Transition code base**
 - ✓ Multiple options: go fast or go slow
- **Build ubiquitous tool base**
 - ✓ Repeat success of PDM in new generation of tools
- **Build excitement!**
 - ✓ Best eBusiness platform. Best eBusiness tools.

In A NutShell



CHANGE THE WORLD!

! Dramatic increase in eBusiness apps



TOOL THE WORLD!

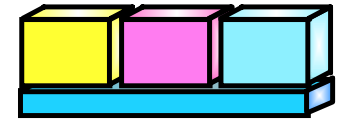
! All tools available to all programmers



TRAIN THE WORLD!

! Train Business Partners on tech'g, tools

Key Messages



Development (Build) & Deployment (Run) Platforms

- Open standards
- Tools that use standards
- Develop with GUI tools for programmer productivity
- Test & Deploy on secure, reliable, scalable iSeries

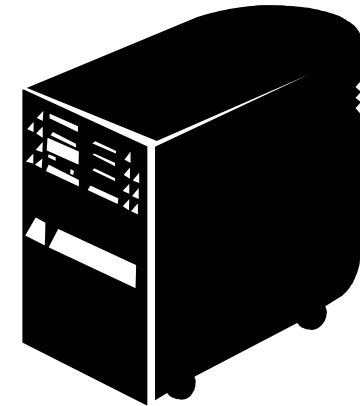
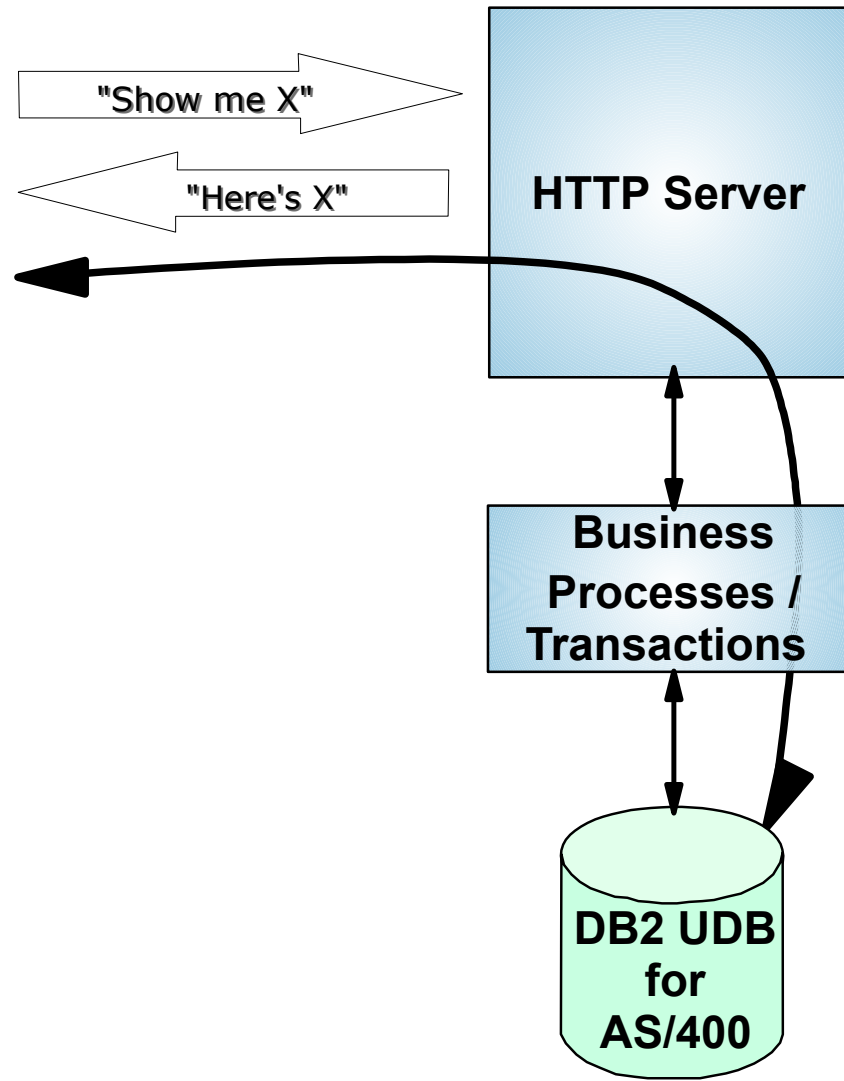
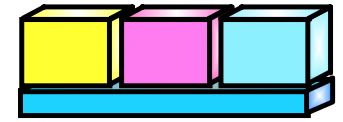
Integration Options With Core Applications & Data

- Java & WebSphere --- RPG, COBOL, C, C++
- Drive existing applications
- Modify and extend existing applications

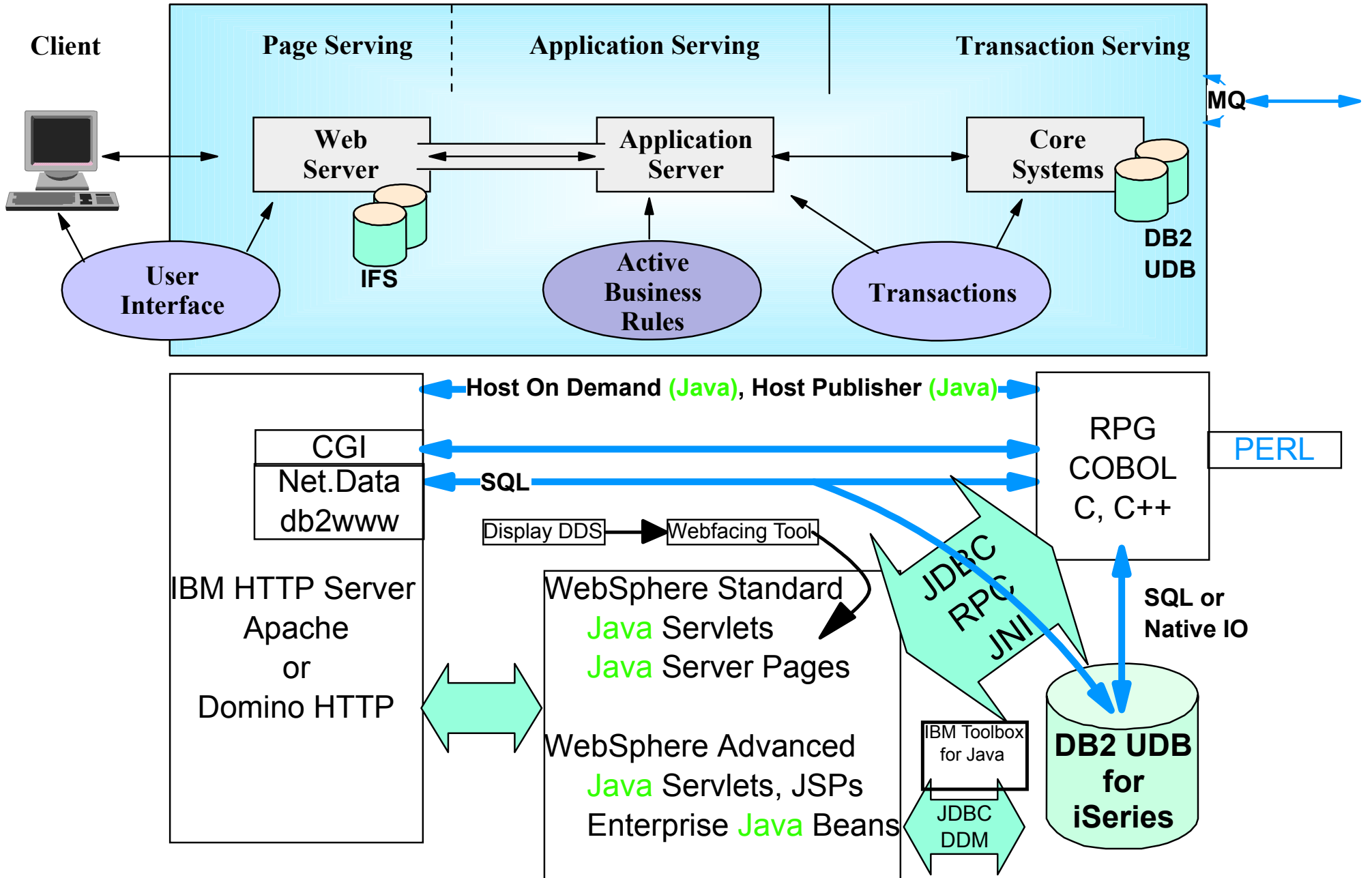
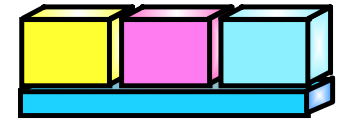
GUI Development & Administration, e.g.,

- WebSphere Development Studio

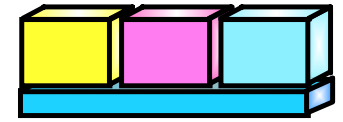
e-business Infrastructure - Simplified



Common Options - Application Server & Integration



The Challenge - How embedded is presentation layer?

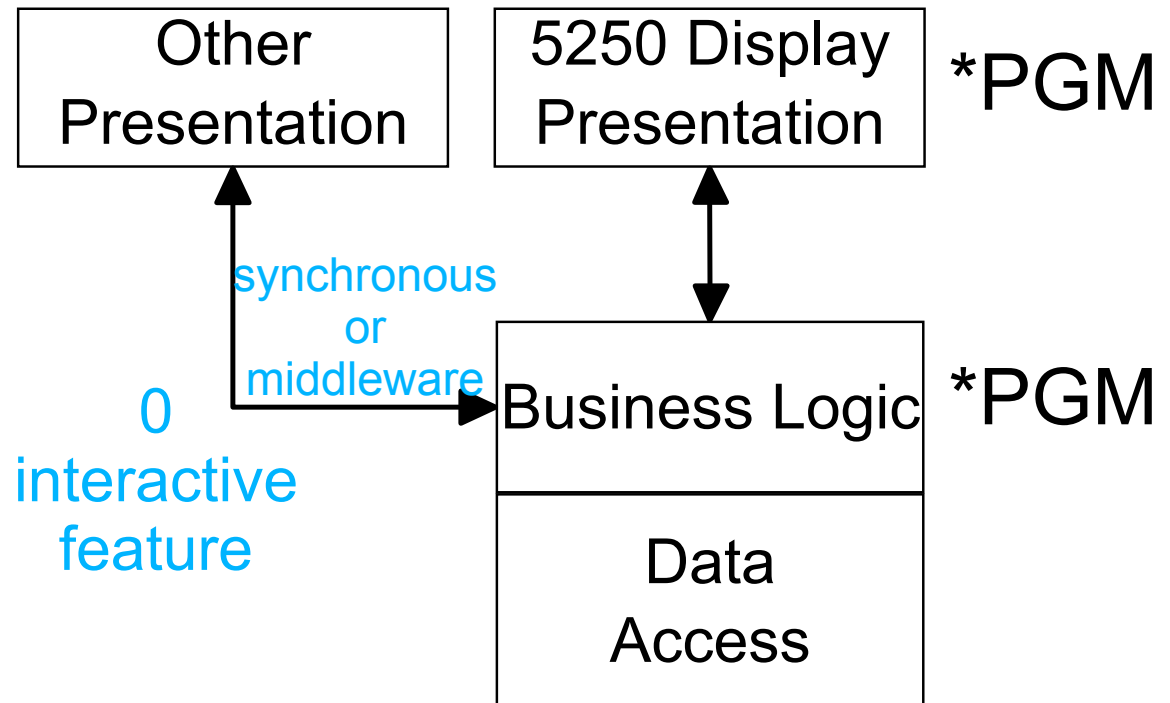
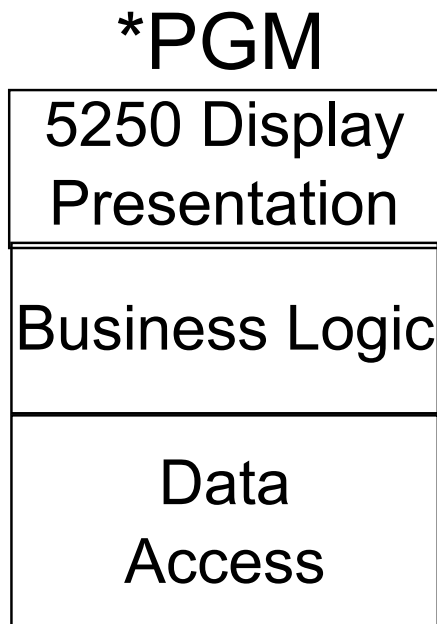


Monolithic Program Design, 5250 cannot be EASILY bypassed

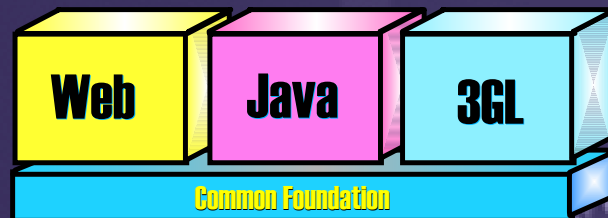
- 5250 datastream capture
- WebFacing

Modular Program Design, can either use or bypass 5250

- 5250 datastream capture
- WebFacing
- CGI (non-Java)
- Net.Data (non-Java)
- New Java logic can "call" existing business functions



Announcing: WebSphere Development Studio for iSeries

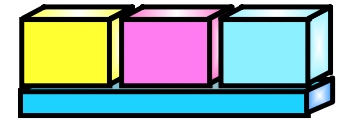


www.ibm.com/software/ad/wds400

5722-WDS (V5R1)

5769-WDS (V4R5)

WDS in V5R1



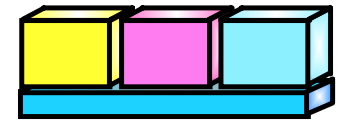
▶ **ONE PRODUCT: ALL TOOLS**

- All host compilers and tools
 - ✓ RPG, COBOL, C, C++
 - ✓ ADTS (PDM, SEU, SDA, RLU, DFU, AFP)
- All client tools
 - ✓ Unlimited WebSphere Development Tools
 - ✓ Containing key IBM AD products in single installable Windows offering:
 - CODE/400
 - VisualAge for RPG
 - VisualAge for Java Professional plus ET/400
 - WebSphere Studio Pro plus iSeries extensions
 - WebFacing **it's new!**

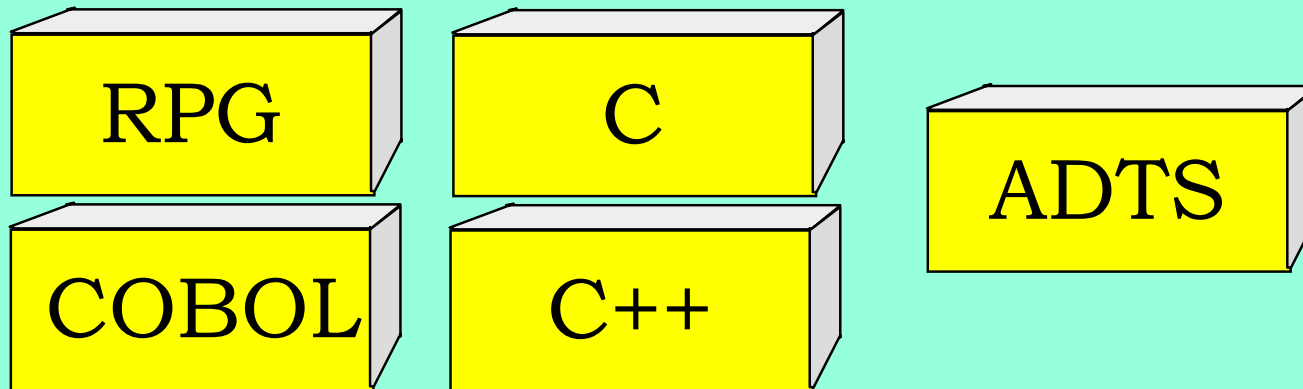
**New
Releases**

**New
Releases**

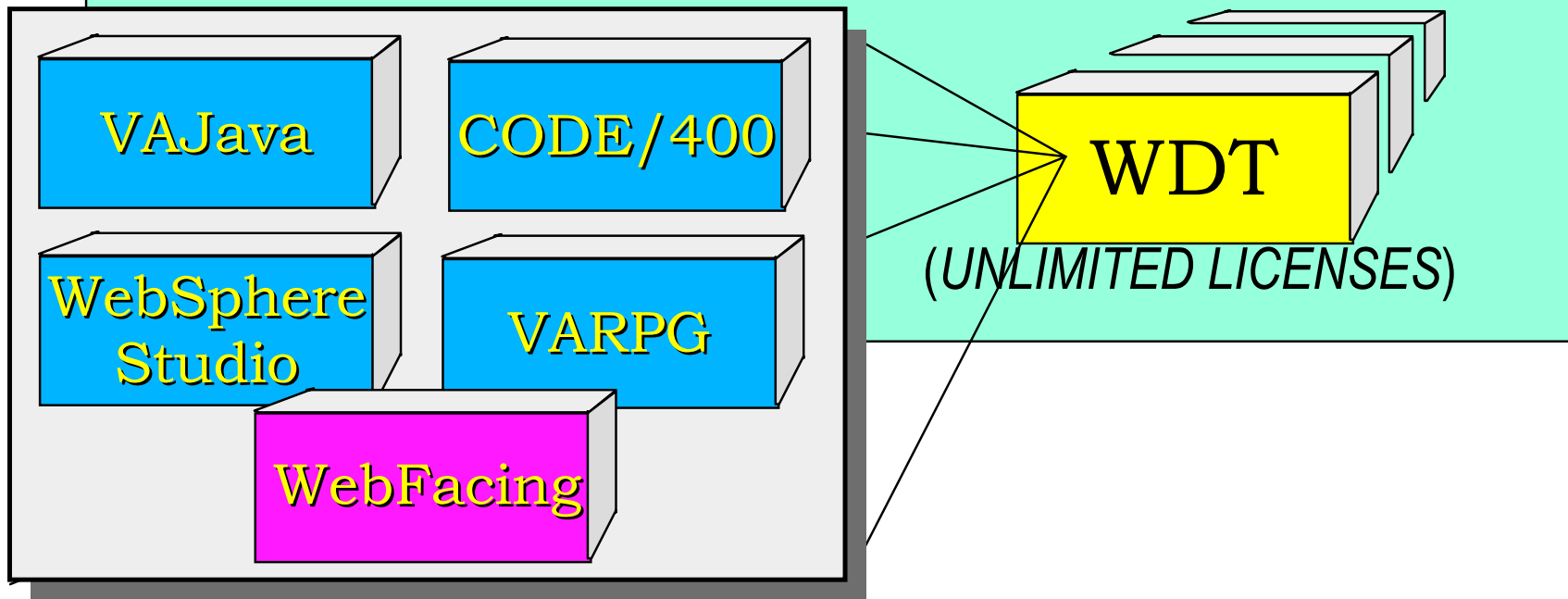
V5R1 WDS Packaging



WebSphere Development Studio for iSeries

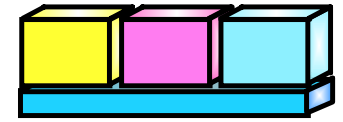


Host



Client

What Happens To ...



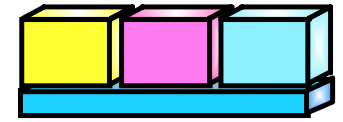
▶ **WHAT HAPPENS TO RPG?**

- You can't buy it anymore!
 - ✓ Or COBOL, C, C++, ADTS
- You can only buy WDS!
 - ✓ BPs can assume everyone has it
 - So go ahead and pre-req any piece of it

▶ **SAME FOR V4R5 (5769-WDS):**

- Same re-packaging at same time for V4R5 release:
 - ✓ Same client tools as in V5R1
 - ✓ But V4R5 versions of host compilers/tools

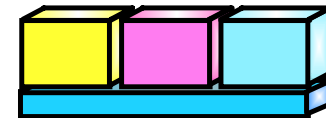
How Much?



- ▶ **With Software Subscription:**
 - Zero in all currencies
 - ✓ if you have RPG, COBOL, C or C++ today

- ▶ **Without Software Subscription:**
 - × N/A: You can't upgrade without SS

- ▶ **For new licenses:**
 - Cost of RPG plus ADTS plus 50%
 - ✓ Significantly less than constituent prices



▶ **HOST PRODUCTS IN V5R1**

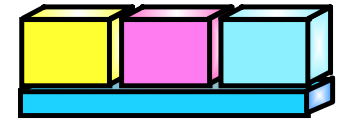
- COBOL:
 - ✓ Numerous enhancements
- RPG:
 - ✓ Massive enhancements
- C and C++:
 - ✓ Totally new compilers! Latest ANSI, more!
 - ✓ Latest version of IBM Open Class
 - ✓ Watch for GNU Tools PRPQ from Roch
- ADTS:
 - ✓ Keeps up with compiler, system changes
 - ✓ Some small enhancements

Awesome

**Your
Welcome**

Stable

WDS Client: WDT

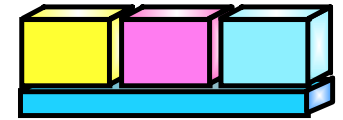


▶ **CLIENT PRODUCTS IN V4R5/V5R1**

- WebSphere Development Tools
 - ✓ Next release of WDT from Oct 2000
 - ✓ Now a Windows-orderable product
 - Freelance consultants can buy it without requiring an iSeries or WDS
 - Reasonable price (< \$1000)
 - ✓ Unlimited free licenses for WDS customers
 - Will get one copy of media, but no limit to installs
 - ✓ Renamed to "for iSeries" from "for AS/400"

**Your
Welcome**

WDS Client: WDT

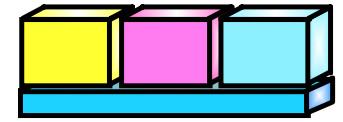


▶ **WDT for iSeries:**

- Install is faster, easier, better
 - ✓ Windows98/NT/2000
 - Windows/ME will work too... in most cases
 - We no longer support Windows95!
- Install from:
 - ✓ Windows CDs
 - ✓ Windows DVD (new!)
 - ✓ LAN or iSeries
 - Have to copy it there first from CDs/DVD
- Service from:
 - ✓ iSeries (PTFs), LAN/Web (Service Packs)

**IBM
First!**

WDS Client: WDT

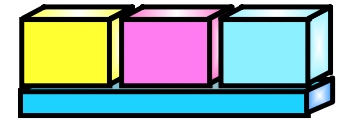


► **WDT for iSeries Contains:**

1. CODE/400 and Distributed Debug
 - ✓ Supports new RPG IV, COBOL, C, C++
 - Some RPG IV new support to be PTF'd into Debug
 - ✓ Quality improvements, misc enhancements
2. VisualAge for RPG
 - ✓ Miscellaneous enhancements
3. VisualAge for Java
 - ✓ 3.5.3 release. Supports 3.5.4 WAS
4. WebSphere Studio for iSeries
 - ✓ 3.5.3 release. Supports 3.5.4 WAS
5. WebFacing: **an entirely new tool!**

Its Hot!

Tooling For All!



- **RPG/COBOL/C/C++/CL/DDS**

- ✓ Interactive or Batch
- ✓ Server-side or client/server (VARPG)

Design

- **Java**

- ✓ Server-side logic or client/server GUI
- ✓ Beans, Applets, Servlets
- ✓ Enterprise Java Beans (have to buy VAJava EE)

Edit

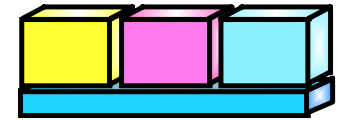
Compile

- **Web**

- ✓ Web pages and Web sites
- ✓ Internet, Intranet, Extranet
- ✓ Servlets, JavaServer Pages, HTML, GIFs, ...
- ✓ Special Macromedia sampler CD included

Debug

Run



▶ Next Generation of ADTS:

▶ CODE Editor

- ▶ Language aware editing for RPG, COBOL, CL, C, C++, DDS, Java, VARPG
- ▶ Program Verifiers for RPG, COBOL, DDS
 - ▶ Guaranteed clean compile, first time
- ▶ Language Reference manuals online, F1 enabled

▶ CODE Remote Compile

- ▶ Remote Compile with Error Feedback
- ▶ GUI Compile Options Dialogs

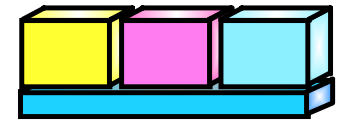
▶ CODE Designer

- ▶ WYSIWYG design of DSPFs, PRTFs, PFs

▶ CODE Distributed Debugger

- ▶ Remotely debug RPG, COBOL, CL, C, C++, Java

CODE/400 Picture

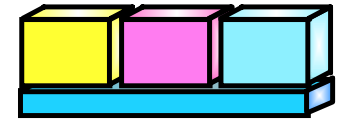


The screenshot displays the IBM Code/400 environment. The background window is titled "CODE - E:\ADTSWIN\SAMPLE.RPG" and shows a program listing with columns for Row, Column, and Replacement. The program code includes instructions like "H", "FQSYSPRT", "I", "IDS", "I I", "C", "MOVE", "RESETOK", "Z-ADD", and "SETON".

An "Error List" dialog box is overlaid on the editor, listing the following errors:

- GRP2318I Overflow indicator OA is assigned to PRINTER file QSYSPRT.
- GRP7031I The name or indicator DS is not referenced.
- GRP7030E The name or indicator is not defined.** (This error is highlighted with a dashed blue box)
- GRP7044E The field BADVAR on the C specification is not numeric; the s

The error list dialog also shows a summary for the selected error: "GRP7030 - Severity: Error Line: 10".



▶ **VARPG: Client and GUI RPG!**

▶ **VARPG Compiler and Runtime**

- ▶ In synch with V4R4 RPG IV and up
- ▶ Compile and run on Windows or
- ▶ Compile and run as Java (run anywhere!)

▶ **VARPG Debugger**

▶ **VARPG GUI Builder**

- ▶ Visually layout Graphical User Interface
- ▶ Program event logic ... in RPG

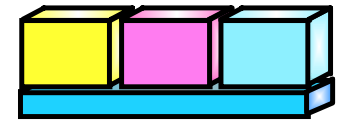
▶ **CODE Editor**

- ▶ Shared with CODE/400

▶ **Non-Visual projects supported too**

- ▶ Possible to write %100 portable business logic in RPG!

VisualAge RPG Picture



Parts Palette

Tree View

Drag and drop parts

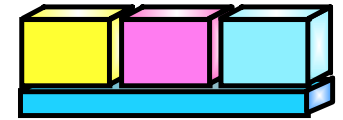
GUI Designer

AAA Video Store - Cashier(Update Order)

Order

Title	Type

Sub -Total: Tax:



▶ **VAJava Pro: Full IDE for Java**

▶ **Repository / Workbench**

- ▶ Supports version control

▶ **Incremental, automatic compilation**

▶ **Built-in functionality:**

- ▶ Editor, debugger, JDK, WebSphere Application Server (Standard), HTTP Server, ...

▶ **Visual Composition Editor**

- ▶ Visually layout and "wire" GUI and non-GUI

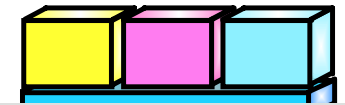
▶ **Support for Java**

- ▶ Classes, Beans, Applications, Servlets
- ▶ EJBs if Enterprise Edition purchased separately

▶ **Support for 3rd party SCM tools**

- ▶ SourceSafe, ClearCase, PVCS, Aldon Affinity, ...

VisualAge For Java Pic



C ToDoList(9/13/98 9:21:21 PM) in ToDo [Administrator]

File Bean Edit Tools Workspace Window Help

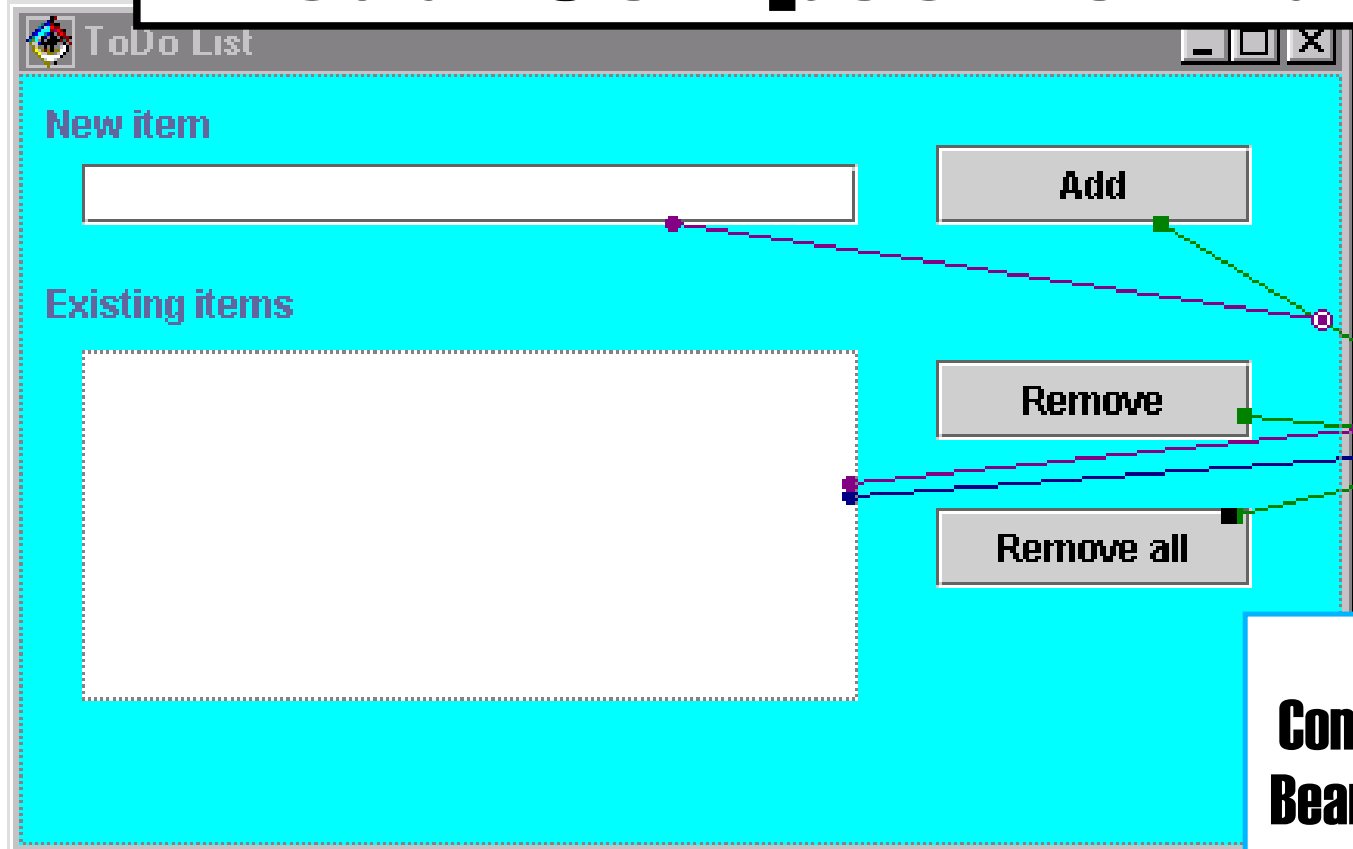


Methods Hierarchy Editions Visual Composition BeanInfo

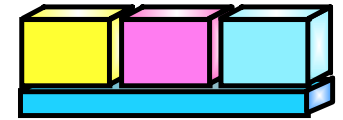
C Composition Editor

Visual Composition Editor

Swing



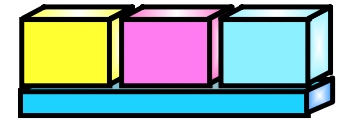
Connect Java Beans visually



▶ Enterprise Toolkit For iSeries

- ▶ **IBM Toolbox for Java built-in**
- ▶ **Remote Export/Compile/Run/Debug**
- ▶ **DSPF-to-Swing Import Tool**
- ▶ **Program-Call SmartGuide**
 - ▶ Generates Java Bean for calling *PGM object from GUI
- ▶ **DSPF-like Formatting Beans**
 - ▶ Entry field, label, comboBox and JTable column
 - ▶ iSeries attributes such as edit-codes, error checking
- ▶ **DFU-like Beans**
 - ▶ Beans for accessing DB2 UDB for iSeries via direct record access classes in Toolbox. Connect to Servlets for Web or JTable for GUI output
 - ▶ Replaces SubFile SmartGuide
- ▶ **PDM-like Beans**
 - ▶ Beans for retrieving lists of iSeries object information, supporting PDM's subsetting capabilities, IFS info




VAJava ET/400 Picture



JFormatted beans

Account Number (e.g. AA/999-9999): AA/999-9999

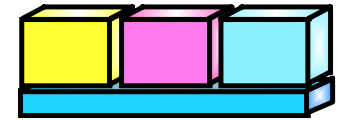
Select items to purchase

Item	Shipping Date	Price	Quantity	Amount
	9/06/1999	\$979.00	2	\$1,958.00
	9/06/1999	\$100.00	10	\$1,000.00
	9/06/1999	\$1.00	14	\$14.00

Total Amount: \$6,309.60

Debit amount from Bank Account: 401-827-4905

- JFormattedTextField
- JFormattedLabel
- JFormattedComboBox
- AS400FieldModel



▶ WebSphere Studio

● Create and manage Web Projects

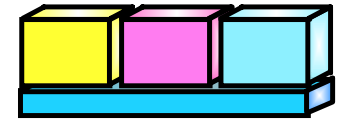
- ▶ Group all files related to the Website
- ▶ Check-in and Check-out files
- ▶ Publish project to web server
- ▶ Register any tool for any file type
- ▶ **Page Designer**: WYSIWYG editing of HTML, JSPs
- ▶ Wizards for creating:
 - ▶ **SQL statements**
 - ▶ **JSPs and servlet from SQL statements**
 - ▶ **JSPs and servlet from Java Beans**

▶ Integration with VAJava

- ▶ Read classes, beans, servlets from VAJava
- ▶ Write classes, beans, servlets to VAJava
- ▶ Publish website to VAJava for testing purposes

**Targets
WAS**

WebSphere Studio



WebSphere Studio - [Bean1HTMLInput.html - Untitled *]

File Edit View Insert Project Tools Window Help

Normal HTML Source Preview Standard P

Customer Central

Customer Id:

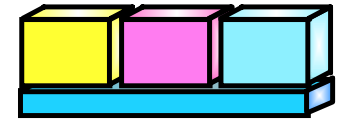
Submit Reset

Stage: VJava

PDM for Web Sites

SDA for Web Pages

WebSphere Studio 3.5



▶ iSeries-Unique Support

▶ DSPF-like Palette Parts in Page Designer

- ▶ Smart entry fields, labels, buttons, subfile, etc

▶ Program-call Wizard

- ▶ For putting Web UI onto existing iSeries *PGM/*SRVPGMs

- ▶ **Must be non-interactive programs**

- ▶ Describe *PGM/*SRVPGM inputs and outputs

- ▶ Generate output:

- ▶ **HTML Form prompting for input**

- ▶ **JSP to display output**

- ▶ **Java Bean to call *PGM or *SRVPGM (using Common Connector Framework, the new standard for Java-to-existing connections)**

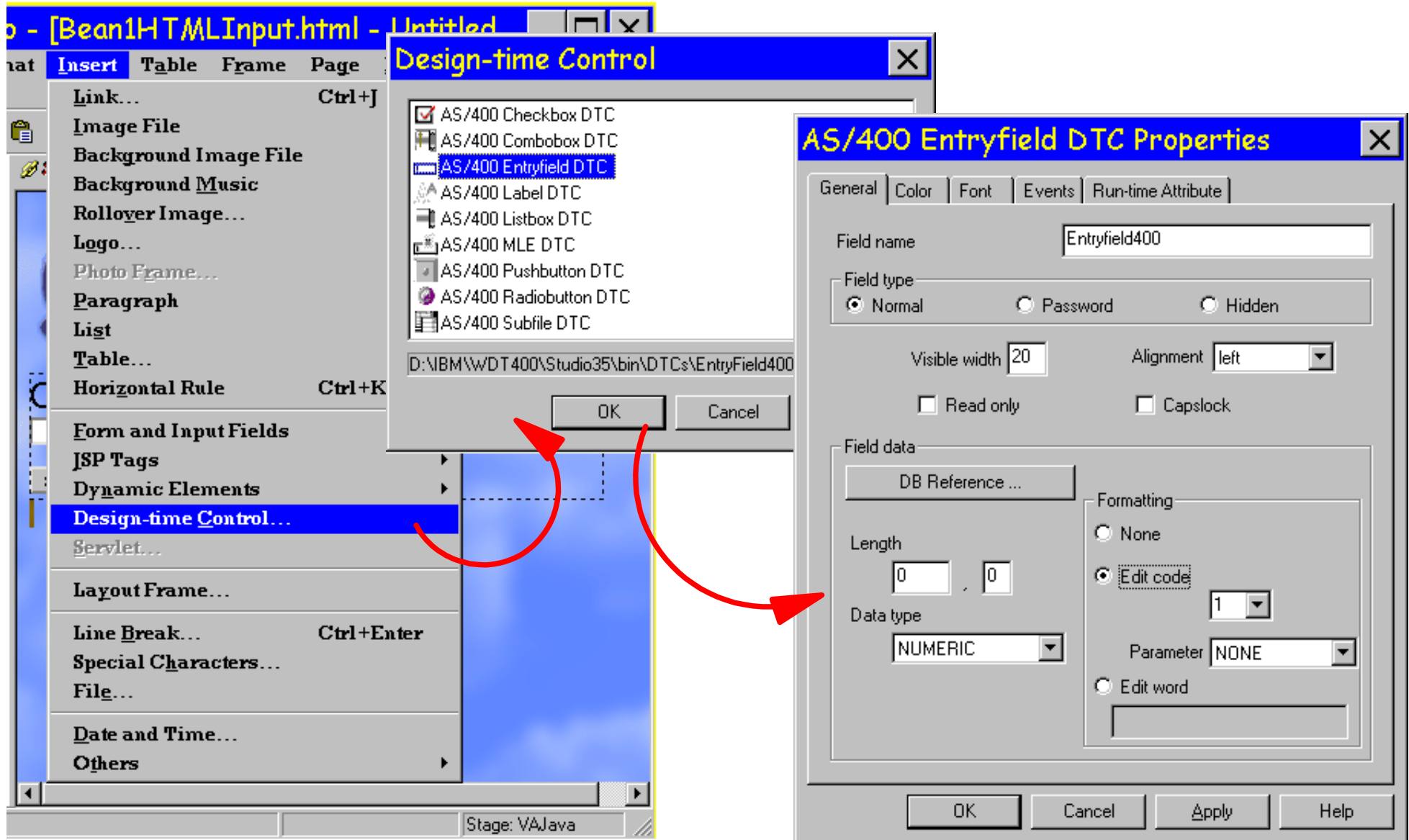
- ▶ **Servlet to glue it all together**

- ▶ Use PageDesigner to iterate generated output

▶ WAS Configuration Wizard

- ▶ Configures your application on iSeries WAS

iSeries Palette Parts



WebSphere Studio iSeries Palette Parts

IBM @server. For the next generation of e-business.

WebSphere Studio Wizards

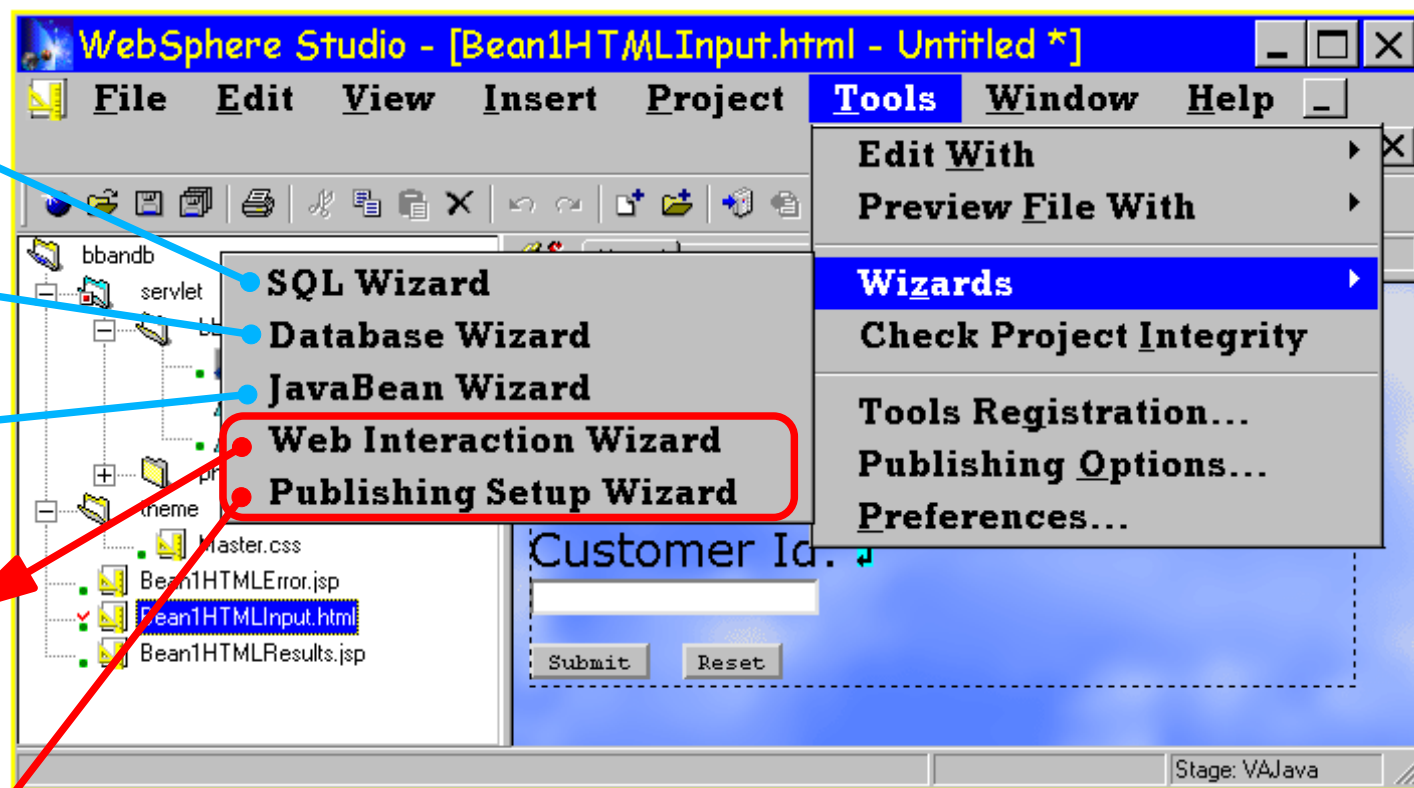
Web	Java	RPG CBL
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Wizards:

▶ SQL Statement

▶ DB Access Web Pages

▶ Bean Access Web Pages



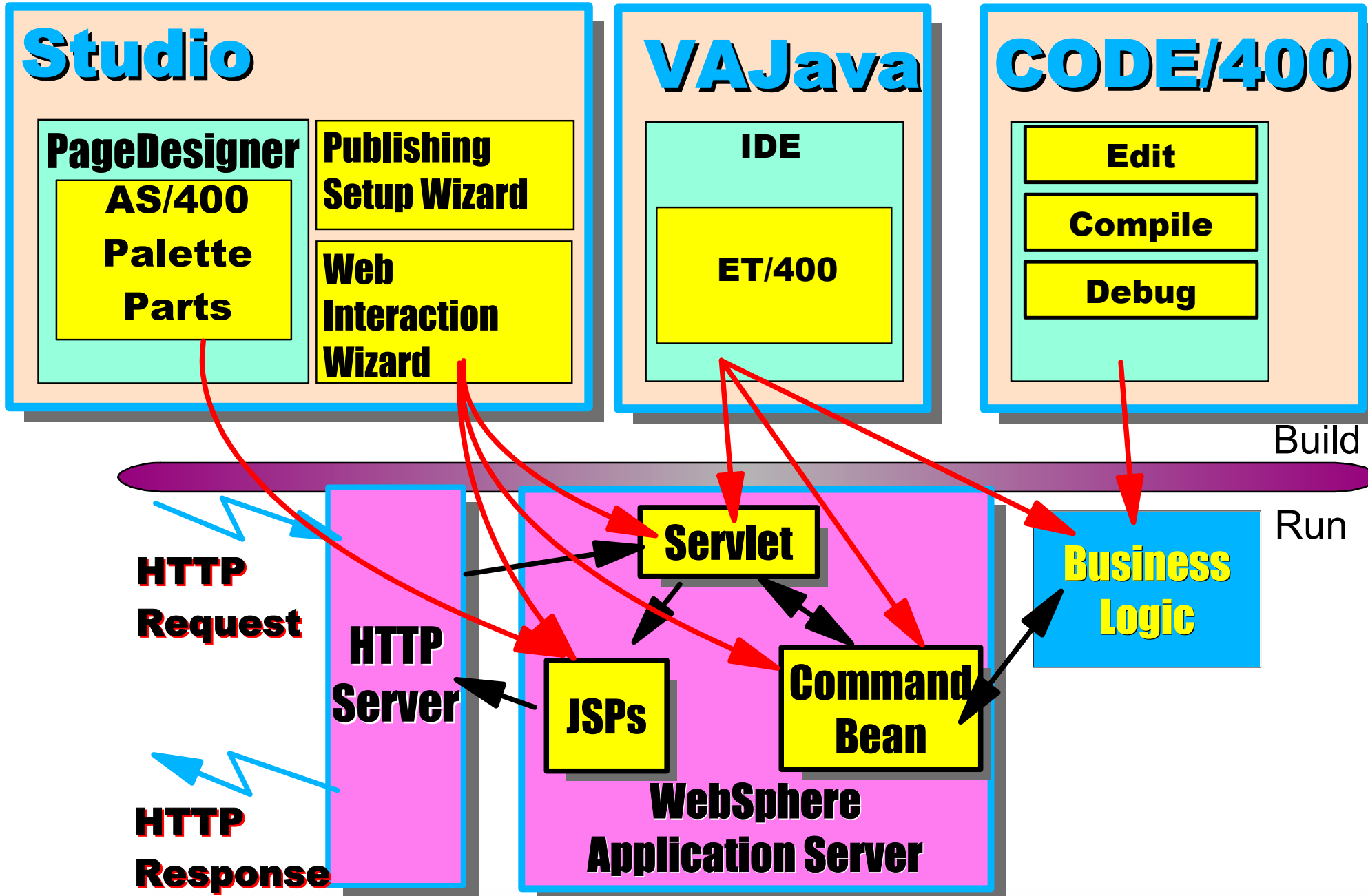
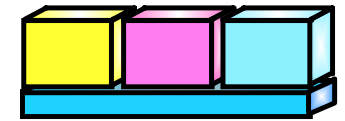
▶ **iSeries Web Interaction Wizard:**

✓ *PGM or *SRVPGM access Web Pages

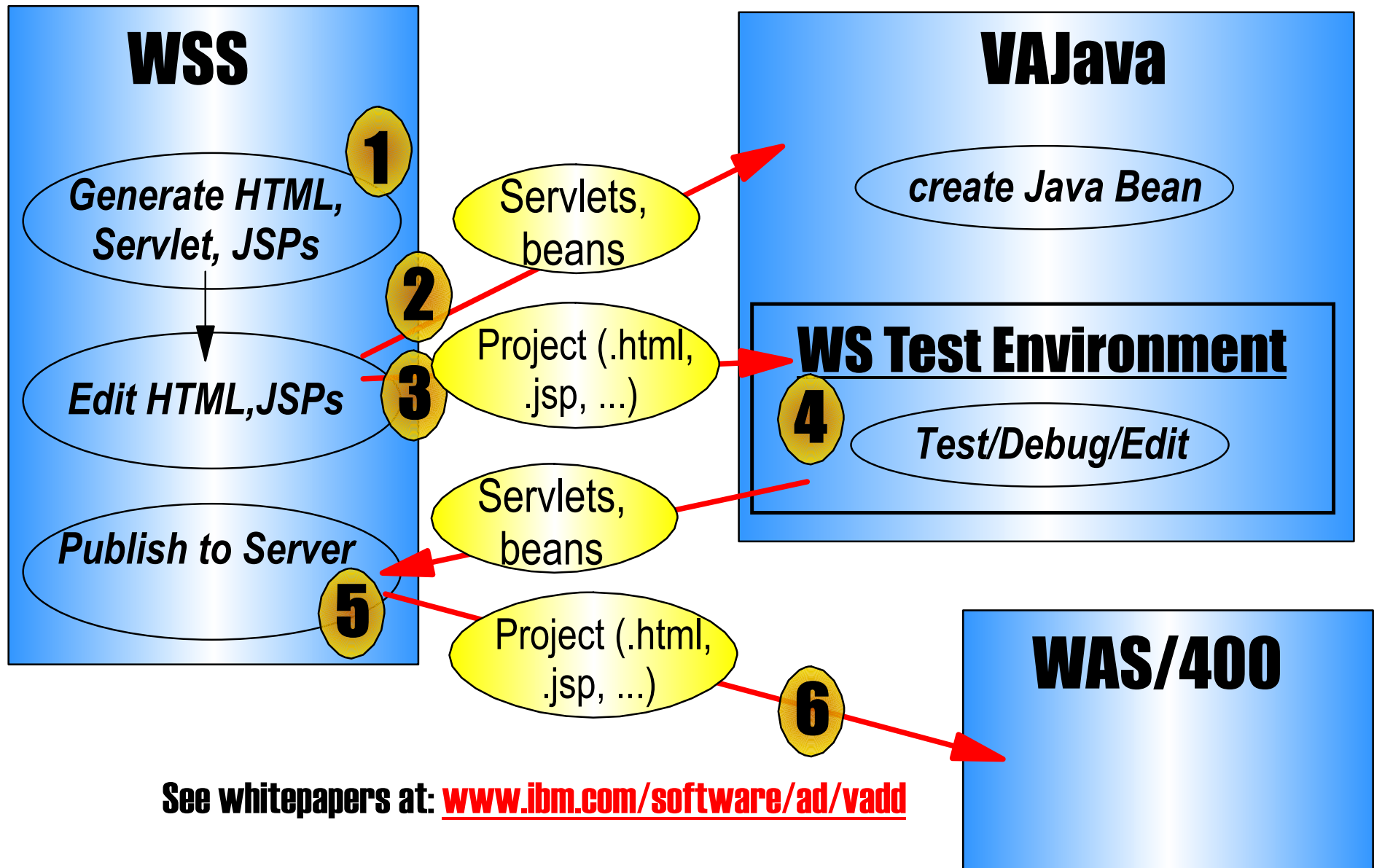
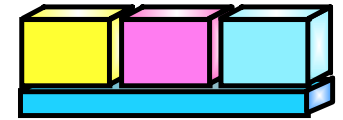
▶ **iSeries Publishing Setup Wizard**

✓ Set target information to make for easy publishing to WAS on iSeries

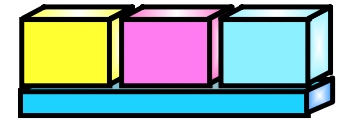
WDT Tooling



Using Studio and VAJava



WebFacing



▶ **WebFacing is technology to run green-screen applications on the Web**

- Part 1: A DSPF DDS to JSP conversion
- Part 2: A runtime intercept

▶ **Goals of WebFacing:**

- Quickly web-enable many applications
- Allow iterative optimization for the Web
- Introduce no new costs to application stack price

WebFace Before

E:\v4r5m1\dsu\win\calcfm.dspf - CODE Designer

File Edit View Insert Selected Tools Help



- E:\v4r5m1\dsu\win\calcfm.dspf
- SCREEN1
 - REC01
 - Record Keywords
 - 'System: '
 - *SYSTEM
 - 'An Exp...ulator'
 - *DATE
 - 'User...'
 - *USER
 - *TIME
 - 'Factor 1 '
 - FAC1
 - 'Factor 2'
 - FAC2
 - OP
 - '+, -, *, /'
 - 'Result'
 - RESULT
 - 'Can no...e by 0'
 - 'F3=Exi...efresh'
 - REPL

Details SCREEN1 Source Listing

```
REC01 'System: ' 8
All indicators are off 0
1 System: SSSSSSSS An Expensive Calculator HH/DD/YYYY
2 User..: UUUUUUUUU HH:MM:SS
3
4 Factor 1 333333
5
6 Factor 2 333333 I +, -, *, /
7
8 Result 6,666.66
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23 F3=Exit F5=Refresh
24
```

Selected DDS Comments Error list

```

A DSPSIZ(24 80 *
A CF03(03 'Get I
A CF05(05 'CF5')
A VLDCMDKEY(99)
R REC01
A CF12(03)
```

WebFace After: HoneyBee Style

Calculate On Me!

System: SSSSSSSS

An Expensive Calculator

MM/DD/YYYY

User.: UUUUUUUUUU

HH:MM:SS

Calculate

Help Me

Factor 1

Factor 2

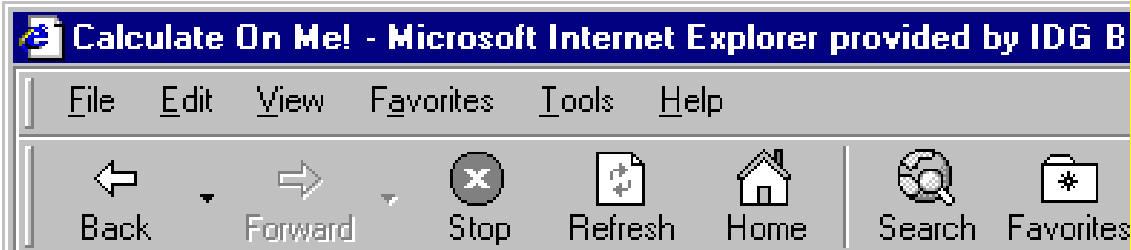
+, -, *, /

Result

666666

F3=Exit F5=Refresh

WebFace After: Star Trek Style



Calculate On Me!

System: SSSSSSSS

An Expensive Calculator

MM/DD/YYYY

User...: UUUUUUUUUU

HH:MM:SS

Enter

Factor 1

CF03

Factor 2

+,-,*,/

CF05

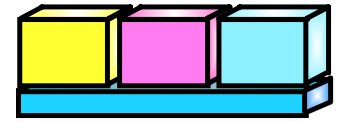
Result

666666

CF12

F3=Exit F5=Refresh

WebFacing Vs 5250 Tools



▶ **5250-intercept products are good when:**

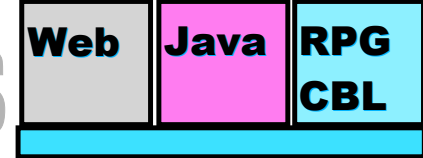
- Application is stable
- Zero change to application is desired
- Preference is to enhance runtime output versus development time source

▶ **WebFacing is good when:**

- Application still in active development
- Willing to change code base if required, to improve Web rendering
- Preference is to enhance source vs 5250

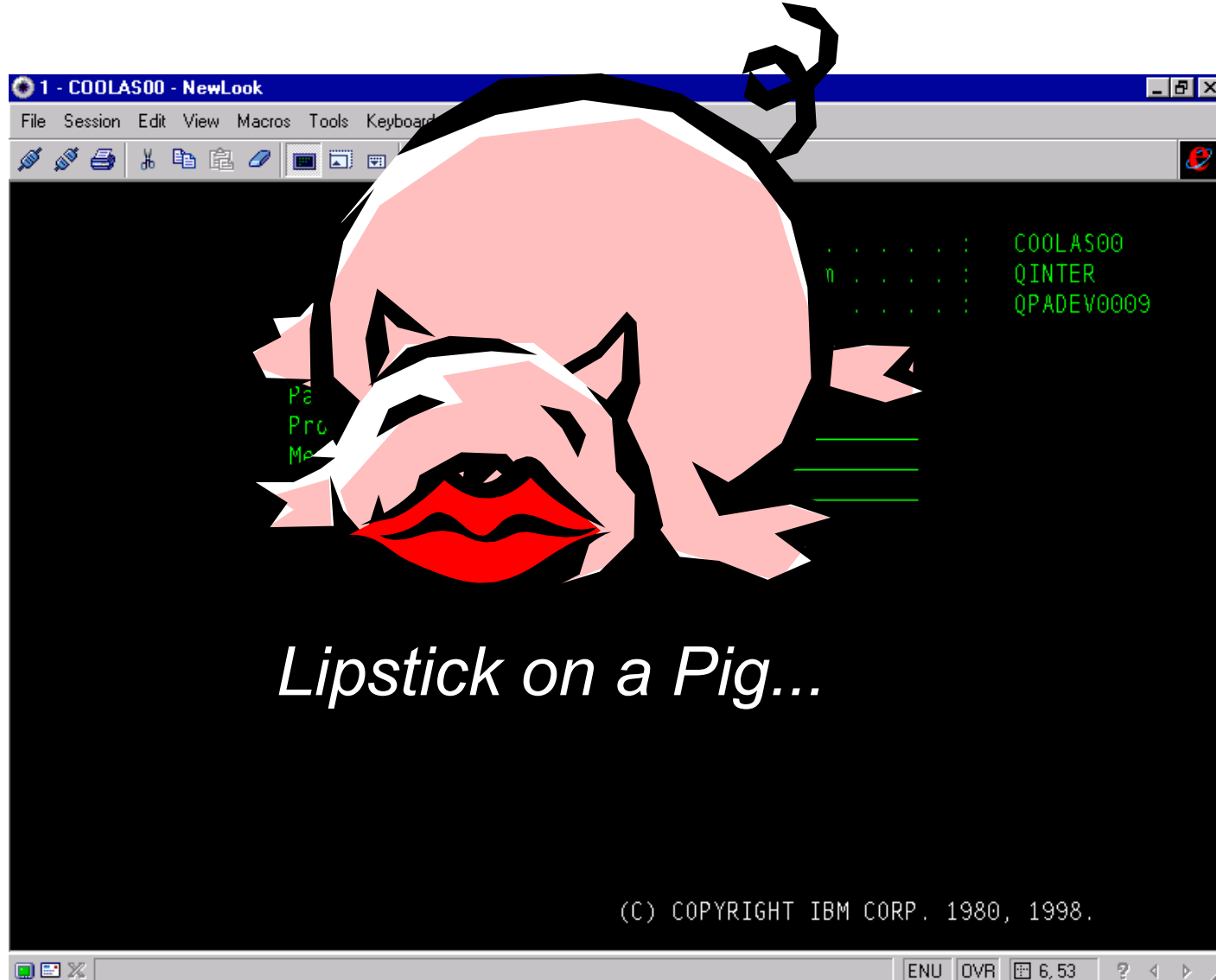
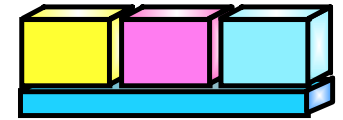
5250-intercept Products

Not part of WDS

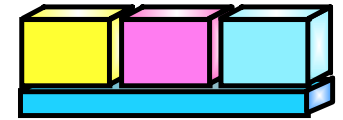


- ▶ No change needed for existing applications, either
- ▶ Capture 5250 datastreams and transform
 - HTML, XML, Java applets, other forms
 - Mimic and extend existing functions and workflow
 - Accept an order, request information
- ▶ Examples
 - IBM Host on Demand
 - IBM Host Publisher
 - Access to DB2 UDB
 - Access to 5250, 3270 (mainframe) applications and DBs
 - Merge various sources into single web page
 - 3rd Party products

Look Familiar??



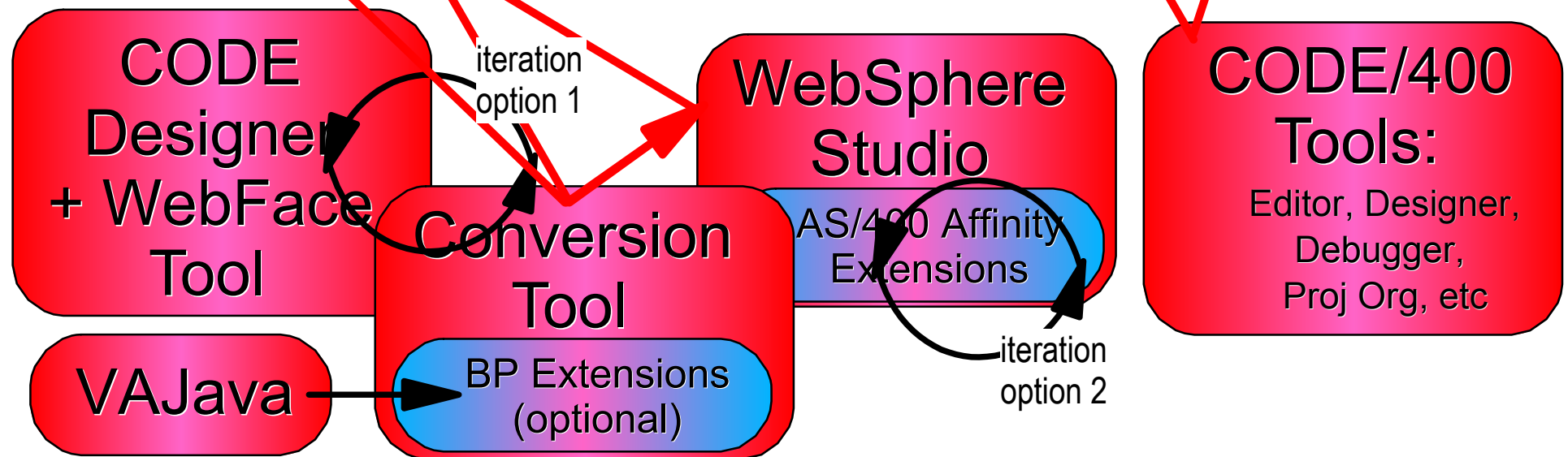
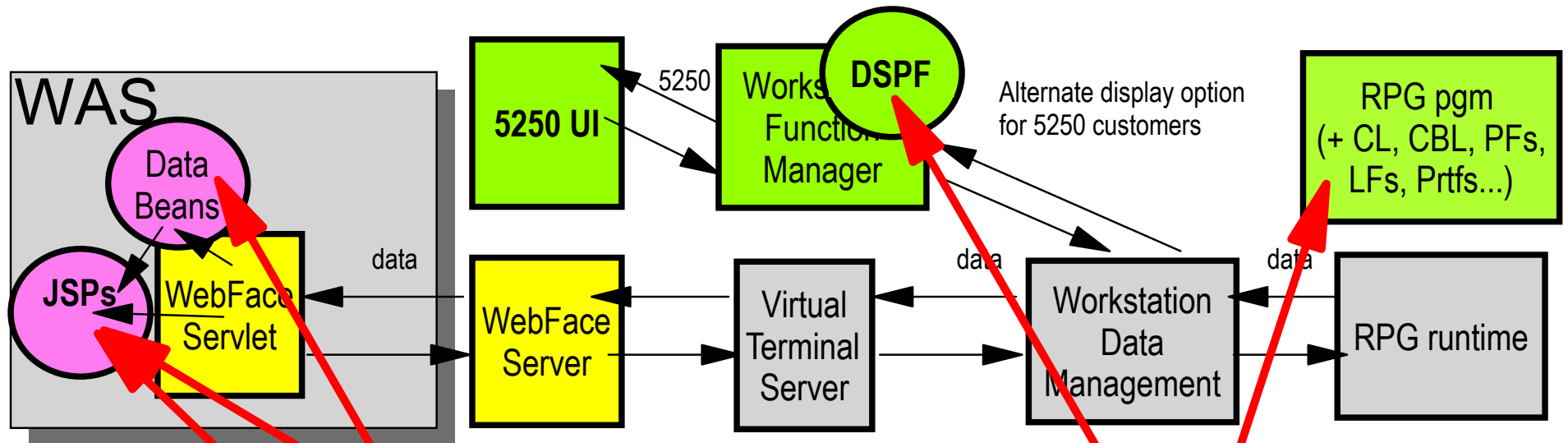
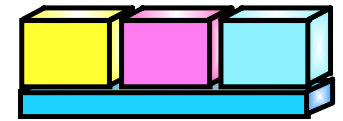
WebFacing Conversion



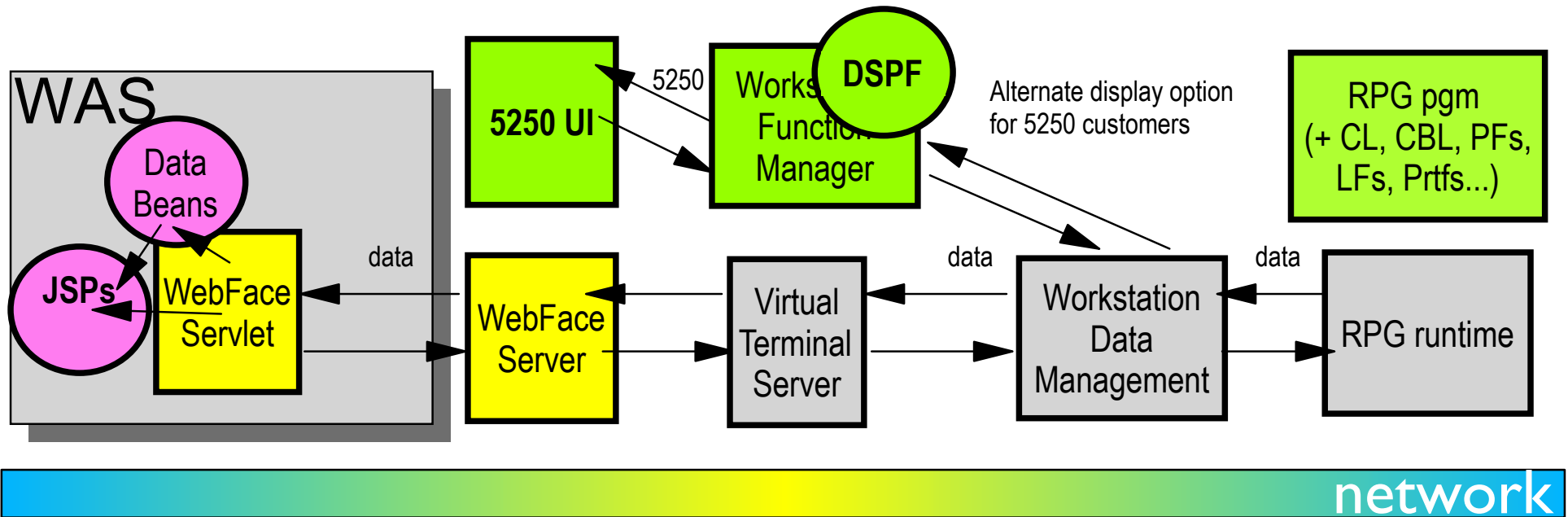
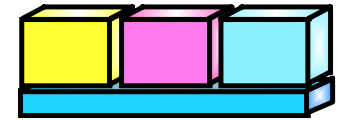
▶ WebFacing SmartGuide:

- Converts DDS to JSPs:
 - ▶ Select one or more members to convert
 - ▶ Creates one JavaBean and JavaServer Page per record format:
 - ▶ Bean holds data for record format
 - ▶ JSP display/prompts data
 - ▶ Select from various look-and-feels
- Creates an "invocation page" per conversion:
 - ▶ 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 Dev't Time



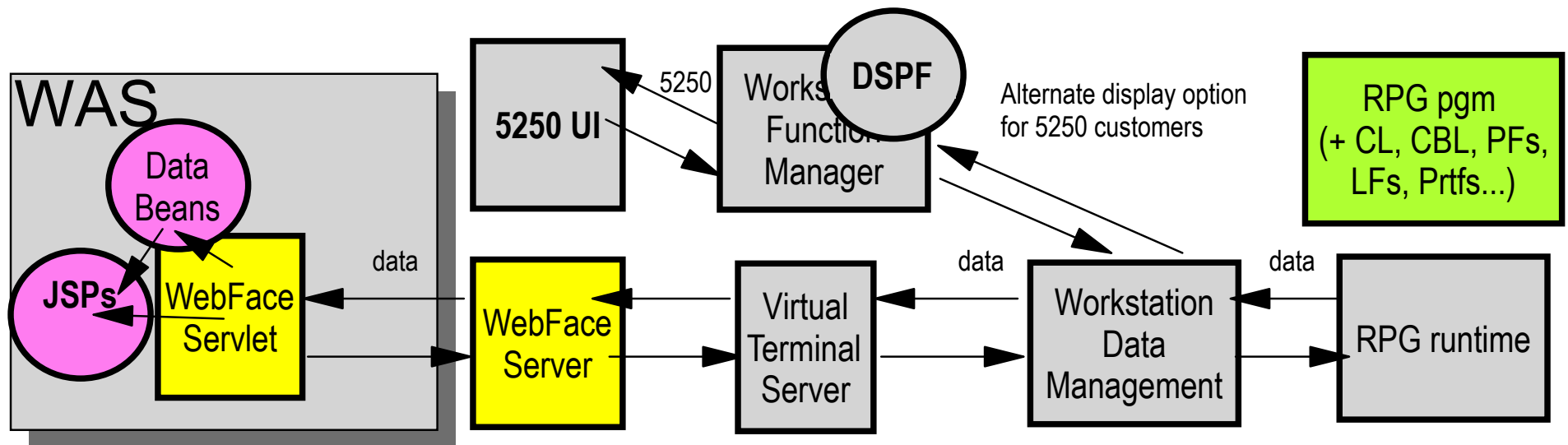
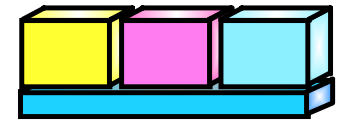
WebFacing Devt Time



Customize steps (Option 1)

1. Batch convert DDS to JSPs and Data Beans
2. Result is WebFacing Project. Use WFP to deploy, test, debug
3. Identify screens needing work, or not successfully convt'd
4. Use CODE Designer to change DDS to improve conversion, add limited Web functionality (links, GIFs, HTML templates, etc)
5. If necessary use CODE Tools to edit RPG or other source
6. If really desired, write unique extension to conversion tool

WebFacing Devt Time



network

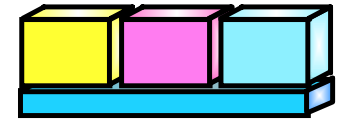
Customize steps (Option 2, when willing to diverge DSPF and JSP source)...

1. For selected JSPs, use Page Designer to enhance

▶ Future batch conversions will backup diverged DDS screens prior to convert

2. Use WebFacing Tool to re-deploy and re-test/debug/run

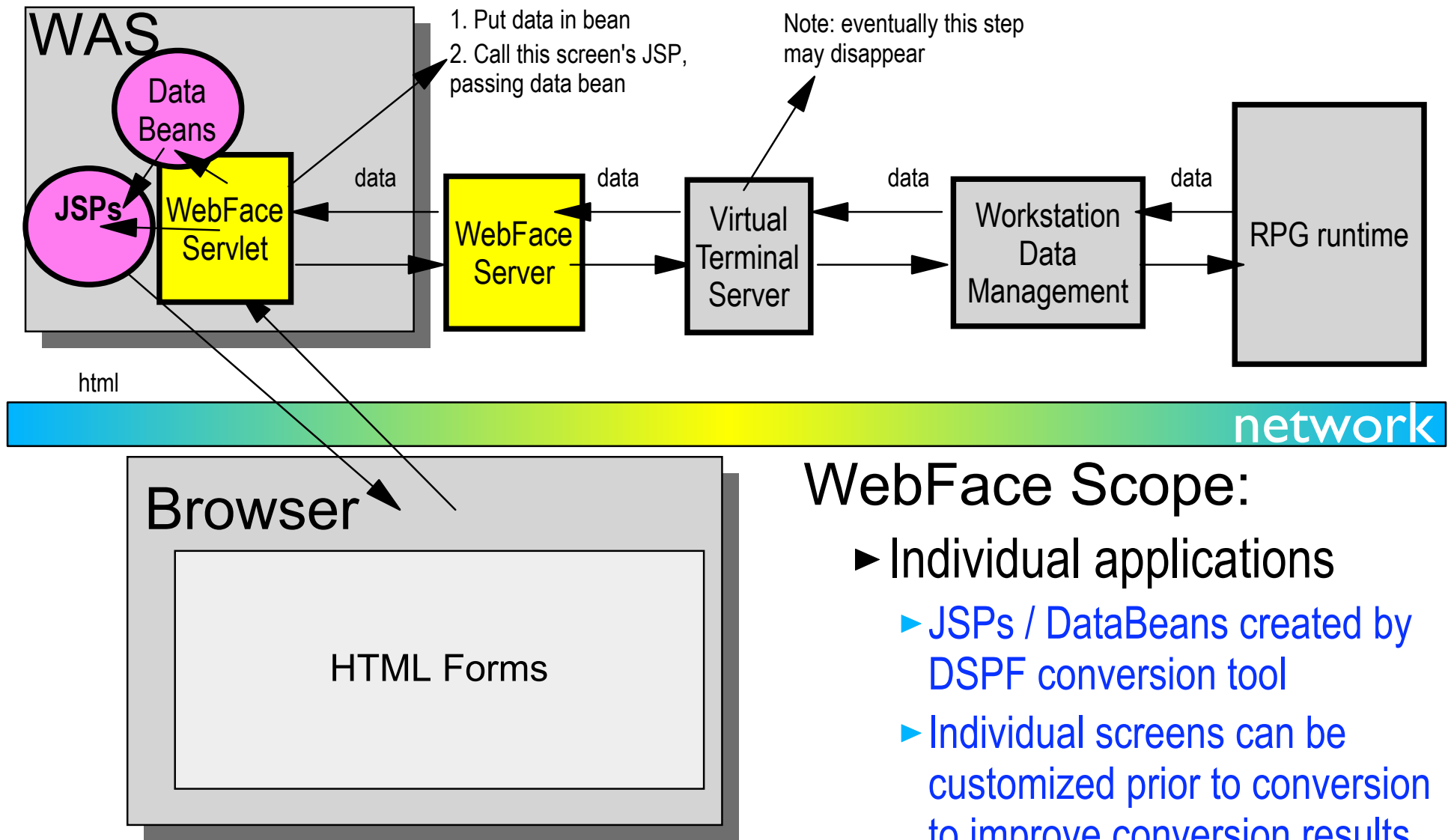
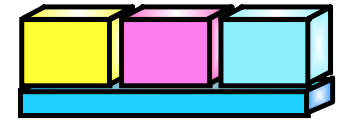
3. If field buffer changed, use CODE tools (launched from project) to edit/compile/debug RPG code to match change (read/write new/changed fields)



▶ WebFacing RunTime

- When interactive *PGM invoked via generated HTML link:
 - ▶ New servlet runtime gets control
 - ▶ Intercepts WRITES, READs to DSPFs
 - ▶ Converts to WRITES, READs to JSPs
 - ▶ *PGM need not know the difference
- Little change required to *PGM object
 - ▶ Except if some DDS keyword not supported which impacts program
 - ▶ Except if decision is made to optimize flow for the Web

WebFacing RunTime

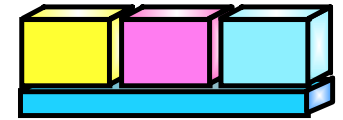


Release 1.0

WebFace Scope:

- ▶ Individual applications
 - ▶ JSPs / DataBeans created by DSPF conversion tool
 - ▶ Individual screens can be customized prior to conversion to improve conversion results

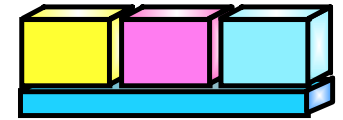
WebFacing Customization



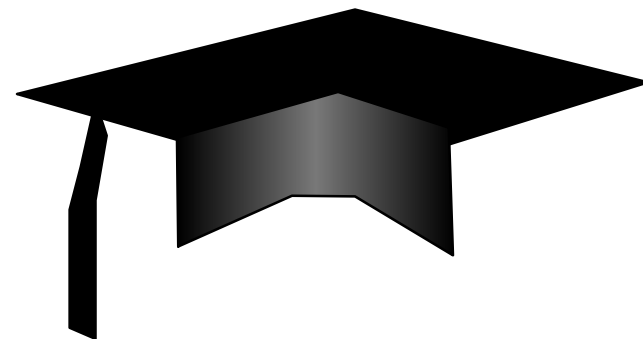
▶ Two options for customizing result:

- 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!
- Use Page Designer after to edit JSP
 - ▶ But changes to application area lost on next conversion
 - ▶ Conversion will be backup input, so you can manually merge if you desire

Education Plans

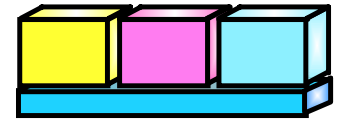


- ▶ **BP/SP/ISV channel is primary *route to market* for iSeries AD**
- **Challenge:** enable/energize BPs/SPs/ISVs to use/sell/support new iSeries AD offering:
 - ▶ Provide cost-effective education on new products and new technologies
 - ▶ Leverage iSeries PartnerWorld for Developers





Course Offerings



▶ Courses list:

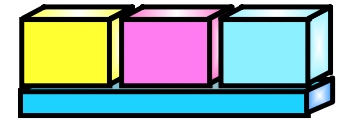
- ▶ Java for RPG Programmers
- ▶ Java for COBOL Programmers
- ▶ VisualAge for Java for AS/400 Programmers
- ▶ WebSphere Application Server for AS/400 Programmers
- ▶ WebSphere Studio for AS/400 Programmers
- ▶ CODE/400
- ▶ VisualAge RPG
- ▶ OO Design/Programming
- ▶ WebFacing Tool

● For information, watch:

- ▶ www.ibm.com/software/ad/wdt400

More to
come!

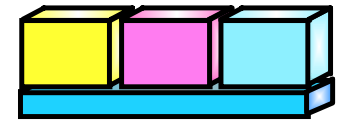
SUMMARY



▶ **Application Development on iSeries is changing**

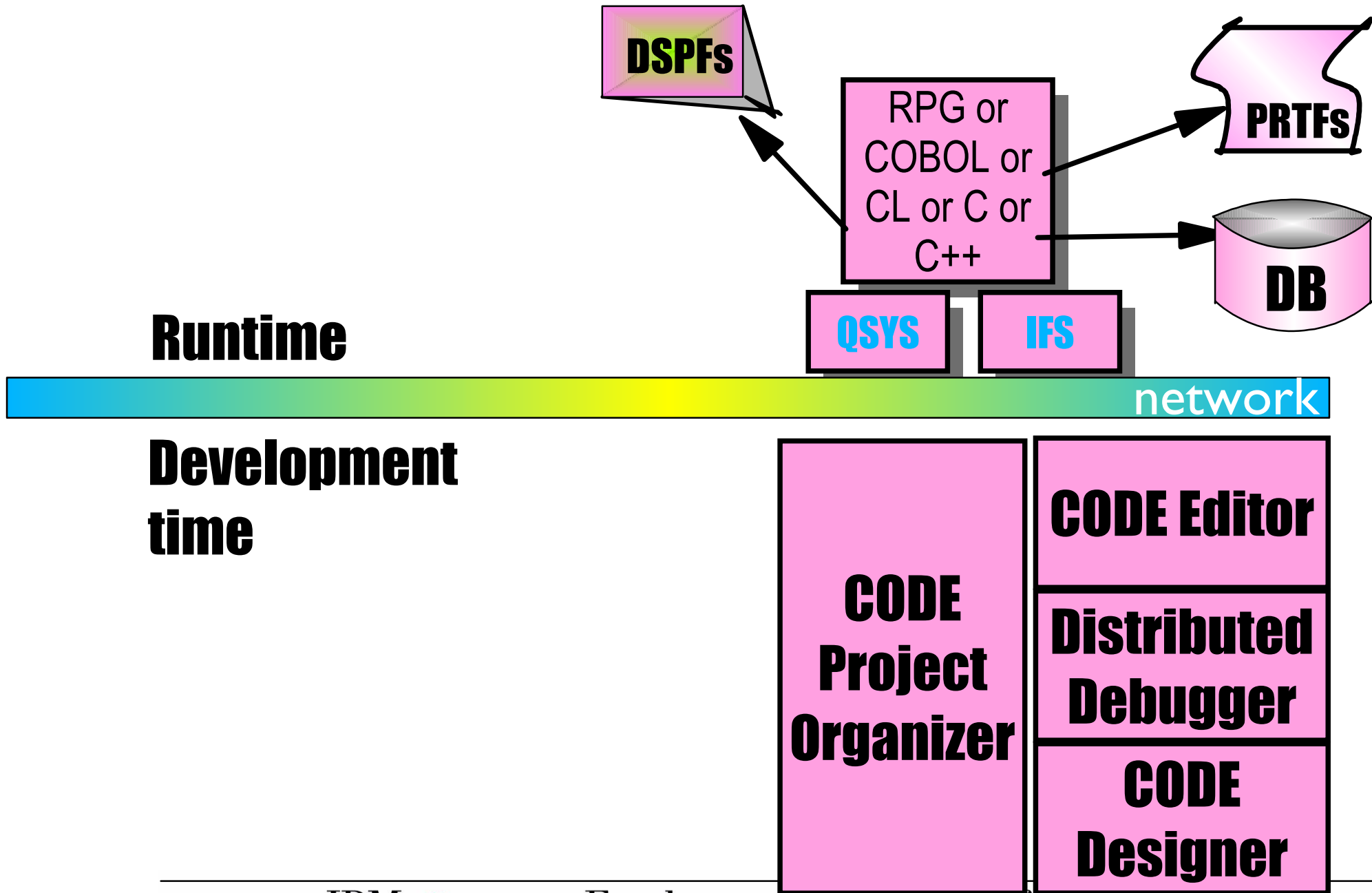
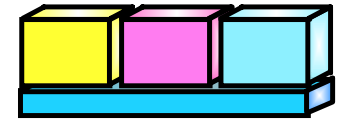
- **Solution Providers can provide e-business versions of their solutions**
 - ✓ Easily and cost effectively
 - ✓ Participating in expanding B2B marketplace
- **IBM has leveraged iSeries strengths**
 - ✓ Protecting and leveraging solution investments
 - ✓ Providing an integrated packaged offering
 - ✓ Making your system easy to use and maintain
 - ✓ Leveraging a secure, reliable, and scalable system

Sample Scenarios

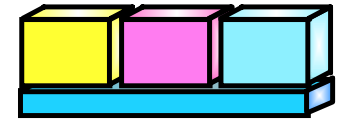


▶ Reference Information

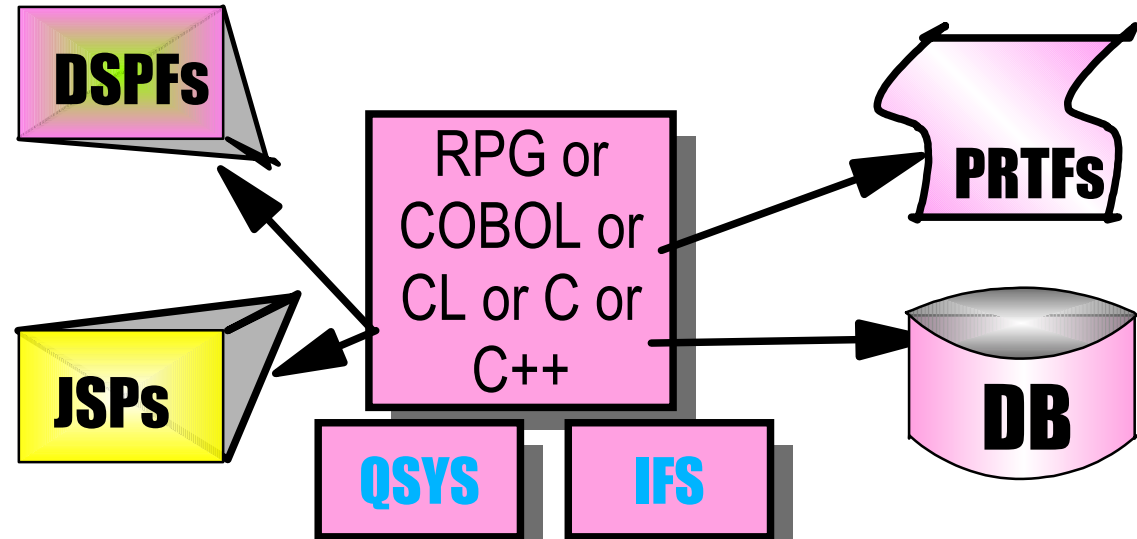
App'n Model 1



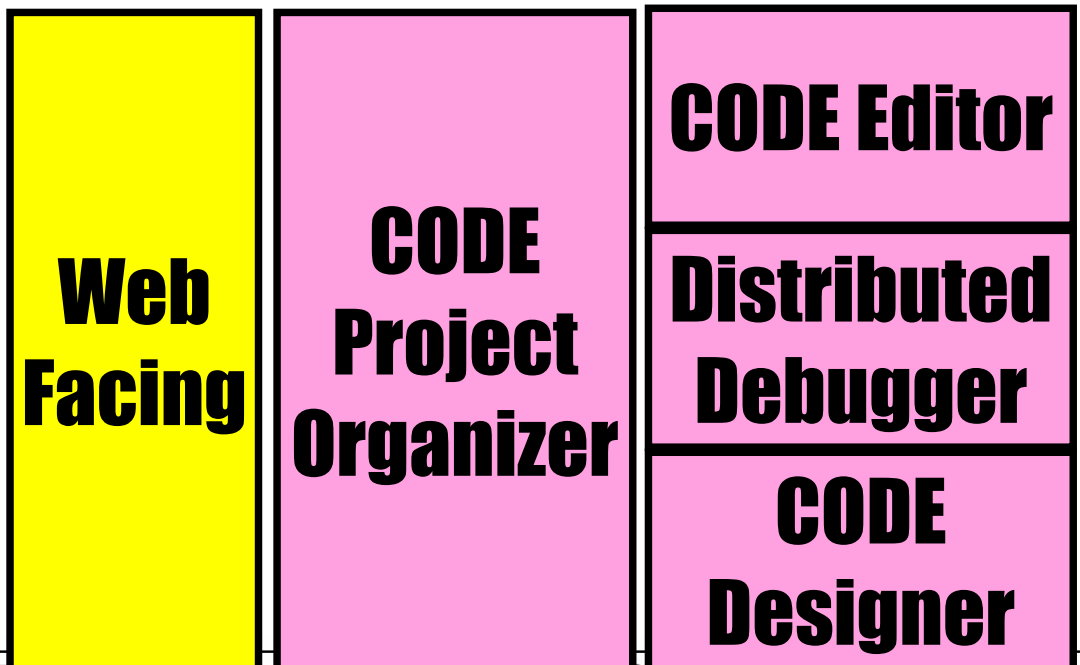
App'n Model 2



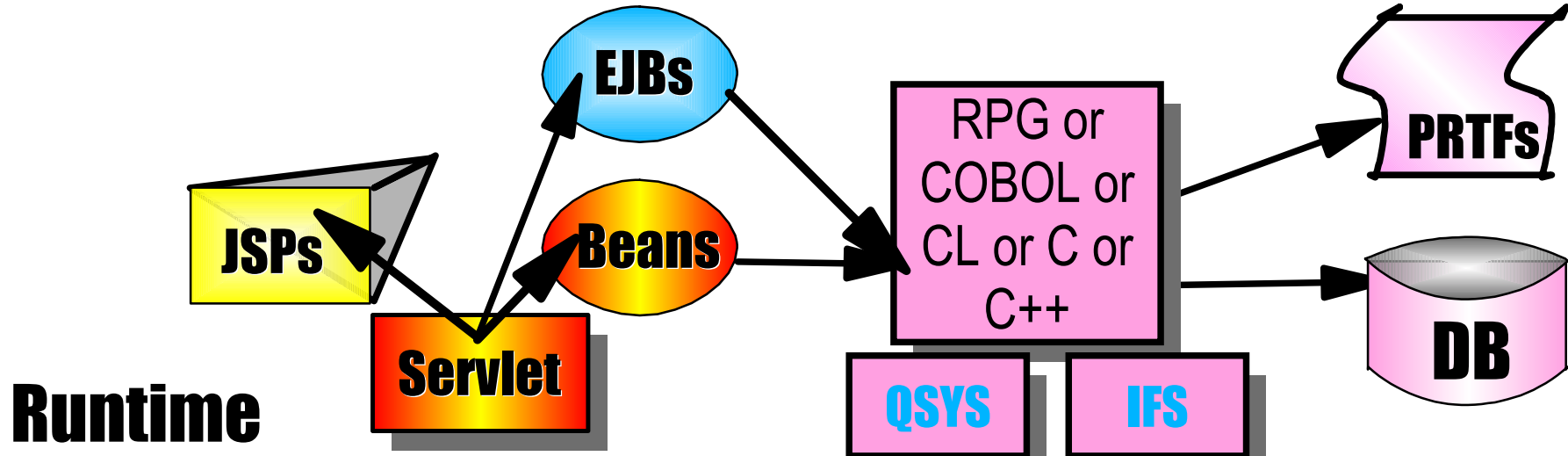
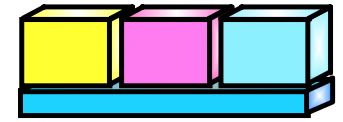
Runtime



**Development
time**



App'n Model 3



**Develop-
ment
time**

**Web
Sphere
Studio**
AS/400
Affinity

VAJava
EE
ET/400

**CODE
Project
Organizer**

CODE Editor
**Distributed
Debugger**
**CODE
Designer**

App'n Model 4

