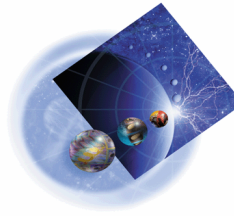


# Introducing WebSphere Development Tools for OS/400



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IBM AS/400e @business servers. Technology. Innovation. Magic.

## *Acknowledgement and Disclaimer*

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### Acknowledgement:

Many people contributed to this presentation. In particular, thanks goes to Phil Coulthard - IBM Corporation.

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## *Agenda*

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- Where Are We Today?
- Where Do We Want To Go?
- How Are We Going to Get There?
- WebSphere Development Tools/400
  - Phase 1 - WDT/400 Client
  - Phase 2 - WDT/400 All tools - new IDE
  - Phase 3 - WDT/400 IDE
  - Webfacing
- WebSphere Application Server
  - Runtime
  - testing
- Futures

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## *Where Are We Today?*

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### IBM AS/400 AD Tools Inventory:

- Individual compilers
  - RPG, COBOL, C and C++
- AS/400 Tools for traditional applications
  - Application Development ToolSet (ADTS)
- Windows Tools for traditional applications
  - CoOperative Development Environment (CODE/400)
- Windows Tools for client GUI
  - VisualAge RPG
- Windows Tools for Java and Web
  - VisualAge for Java and WebSphere Studio
- Windows Tools for 4GL
  - VisualAge Generator
- Tooling For Individual Products
  - WS Commerce, Host On Demand, Host Publisher

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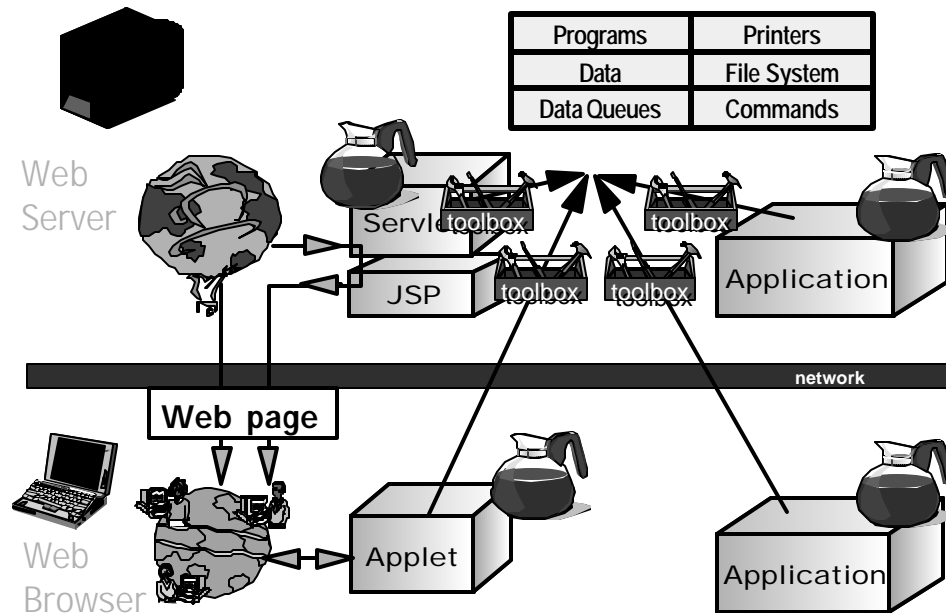
## Where Do We Want To Go?

We want to make it easy to:

- Web-enable existing apps
- to create eBusiness apps
- to port eBusiness apps
- to get eBusiness tools
- for Solution Providers to pre-req eBusiness Tools for customization

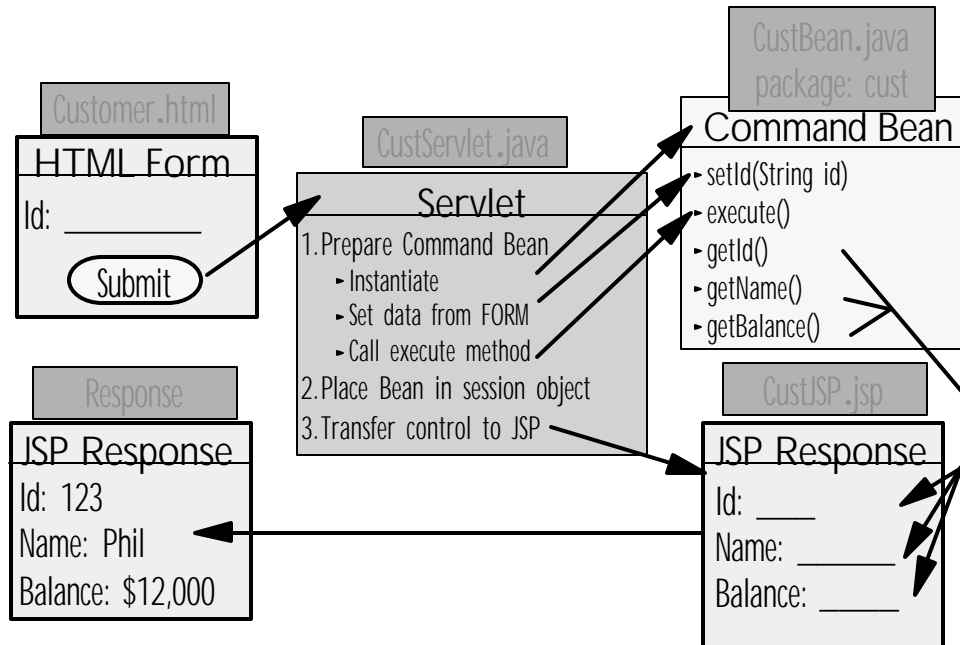
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## Where Do We Want to Go?



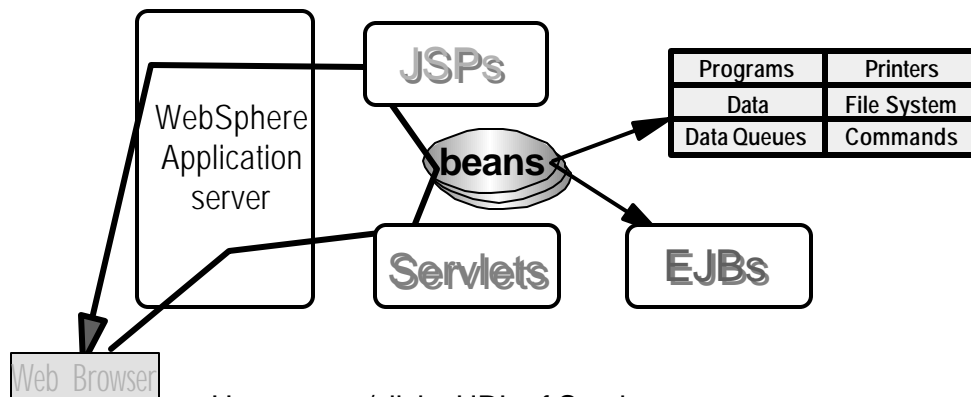
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## Sample of eBusiness Architecture



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## Java



- User enters/clicks URL of Servlet
- Servlet creates Java Bean to get required data
- Java Bean accesses DB2 or calls RPG/CBL program or EJB to get data
- Servlet decides on which JSP, calls it passing Bean as parameter
- JSP merges constant HTML with data from Bean to produce final page
- HTTP Server sends new page to user

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# WebSphere Development Tools

for OS/400

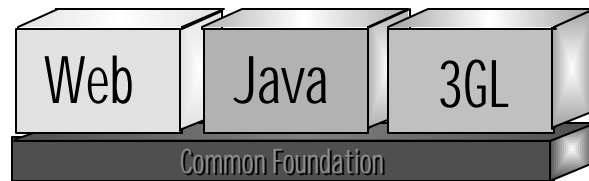
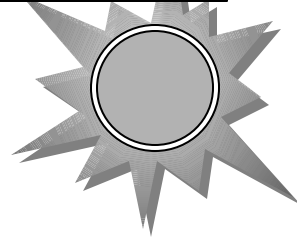
## Integrated Tool Offering

- tools to support all application models
- phased implementation

Phase 1 - Available October 20, 2000

Phase 2 - 2001

Phase 3 - ????



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## WebSphere Development Tools

### • Client Tools Together

- CODE/400
- VisualAge RPG
- VisualAge for Java Professional + ET/400
- WebSphere Studio + AS/400 "Affinity"

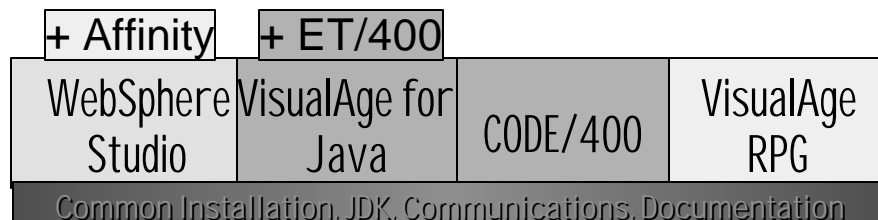
Oct 20,  
2000

Optionally purchase  
VAJava EE for EJB  
Tooling

### • Add Additional Functionality

- Business Partner "Early Adopter" DSPF to Web conversion (WebFacing) program

4Q,  
2000



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## Websphere Development Studio (Phase 2)

Statement  
of Direction

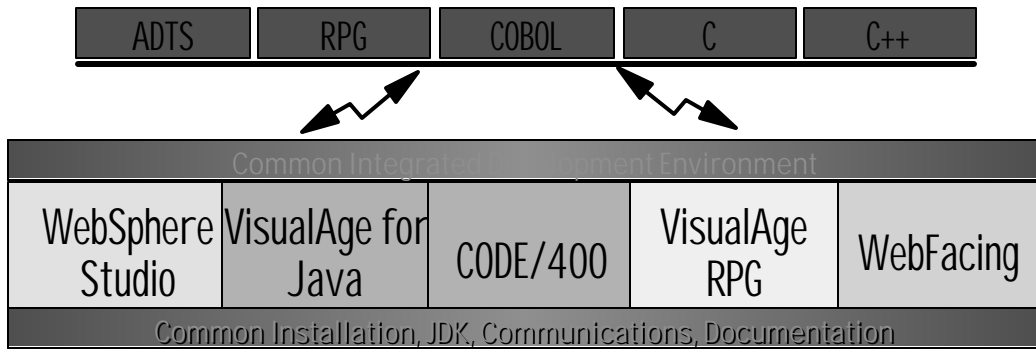
- All Tools Together

- Client Tools (including GA of WebFacing)
- ADTS (PDM, SEU, SDA, RLU, DFU, AFP, CGU)
- RPG and COBOL
- C and C++

2001

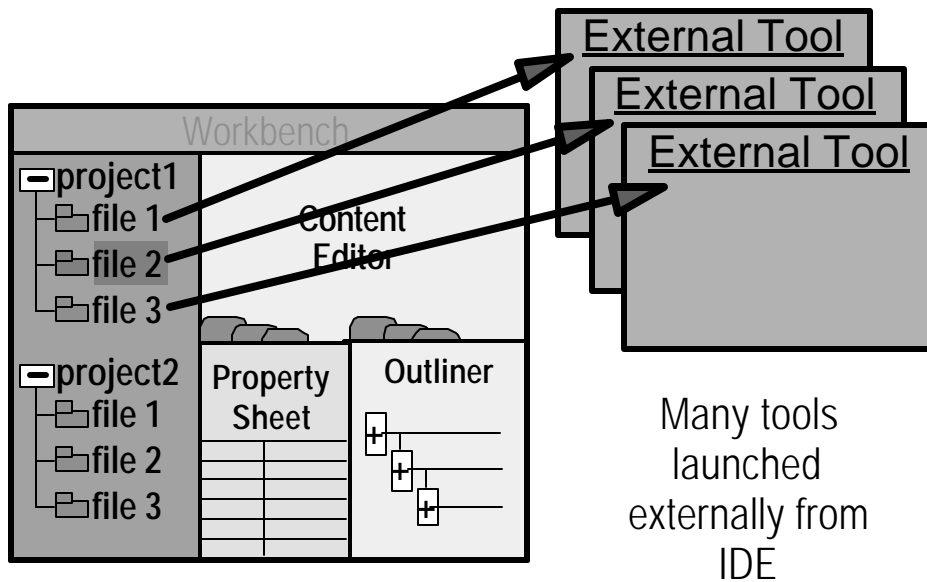
- Add "Open" IDE (**Workbench**)

- Common launch pad for all tools, any tool
- Common project definition and maintenance



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## Phase 2 IDE



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## Phase 3 IDE - All Powerful IDE

# FUTURE

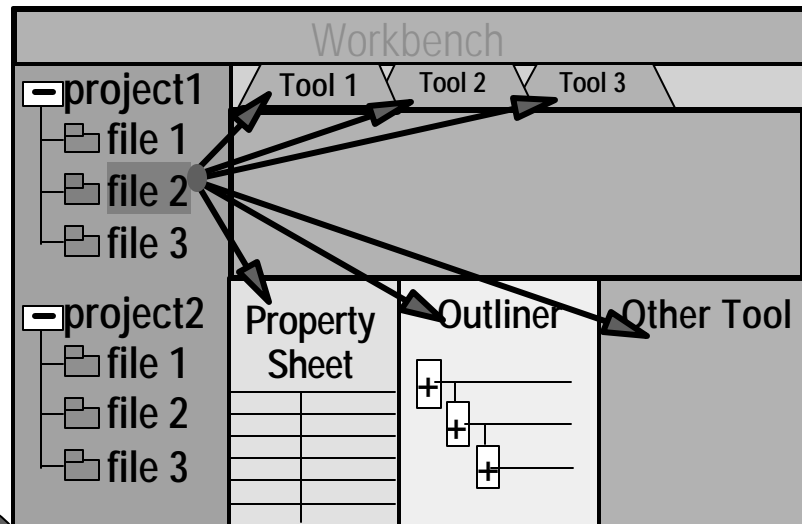
- Evolve all IBM client products into panes within the IDE
- Become "built-in" Workbench tools, versus separately launched products
- Steadily increase IDE tool portfolio
- IBM common tool components
  - 3rd party tool components
  - Customer authored tools

Statement of Direction!  
▸ *Subject to change*

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## Phase 3 IDE

# FUTURE



Statement of Direction!  
▸ *Subject to change*

✓ All tools internal to IDE

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# More Details

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## *Phase 1: WebSphere Development Tools*

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- Client Based Tools
  - = CODE/400
  - VisualAge RPG
  - = VisualAge for Java for AS/400 - Professional
    - Enterprise Toolkit/400
  - WebSphere Studio for AS/400 - Standard
    - AS/400 affinity
- Common installation
  - Onto AS/400
  - Onto PC from AS/400, CD, DVD or LAN

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## Phase 1: WebSphere Development Tools

Design

Edit

Compile

Debug

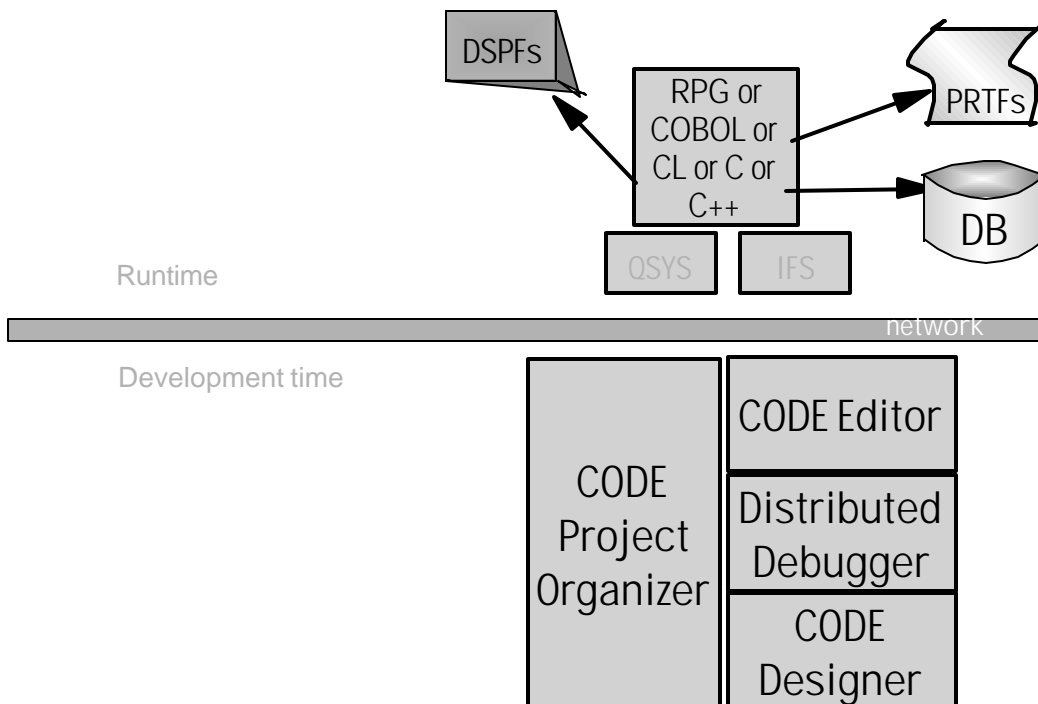
Run

### • Client Tooling To Address:

- RPG/COBOL/C/C++/CL/DDS
  - Interactive
  - Batch
  - VisualAge RPG client/server
- Java
  - Server applications
  - Client applications
  - Beans
  - Applets
  - Servlets
  - Enterprise Java Beans (with Enterprise VAJ)
  - Connectors to Existing
- Web
  - Artifacts: Servlets, JSPs, HTML, GIFs, etc
  - Managing, deploying

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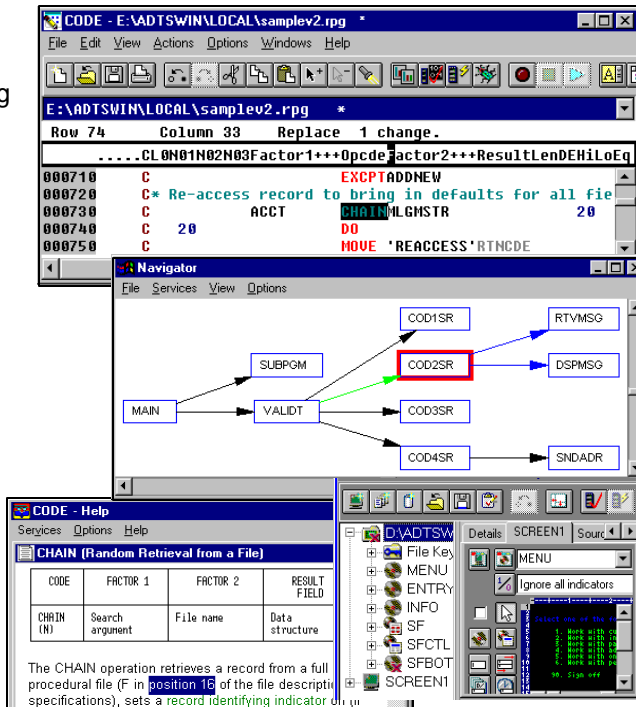
## App'n Model - AS/400 Native



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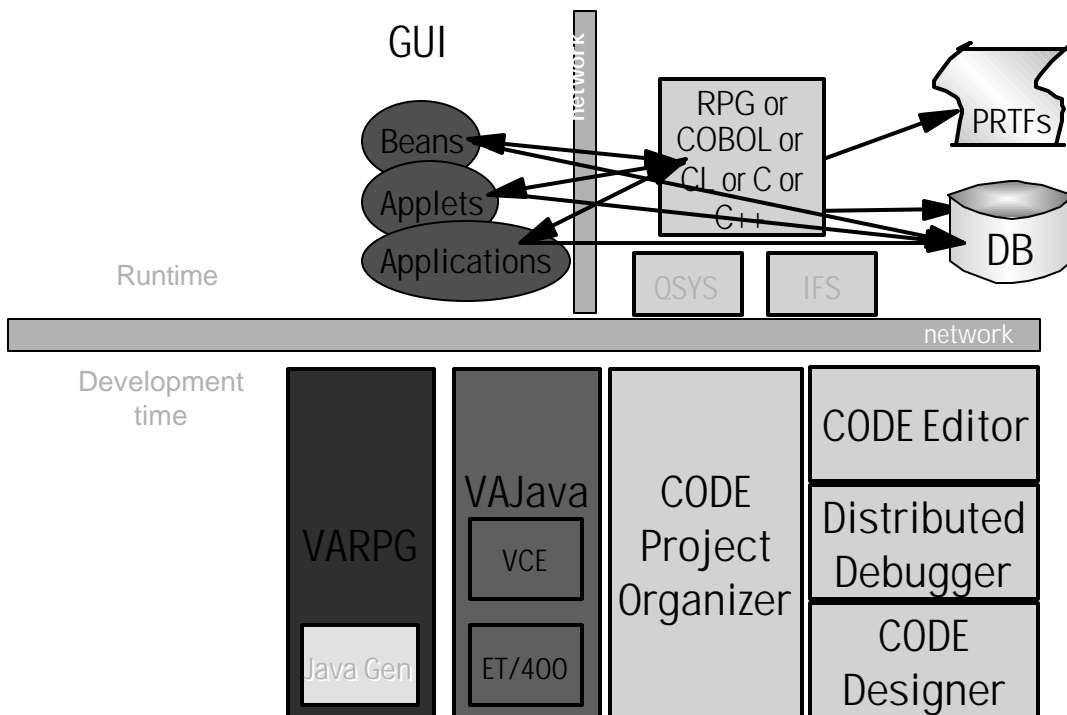
# CODE/400

- AS/400-aware tool suite:
  - CODE Editor
    - Language aware editing for RPG, COBOL, CL, C,C++, DDS, Java, VARPG
    - Program Verifiers for RPG, COBOL, DDS
    - 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



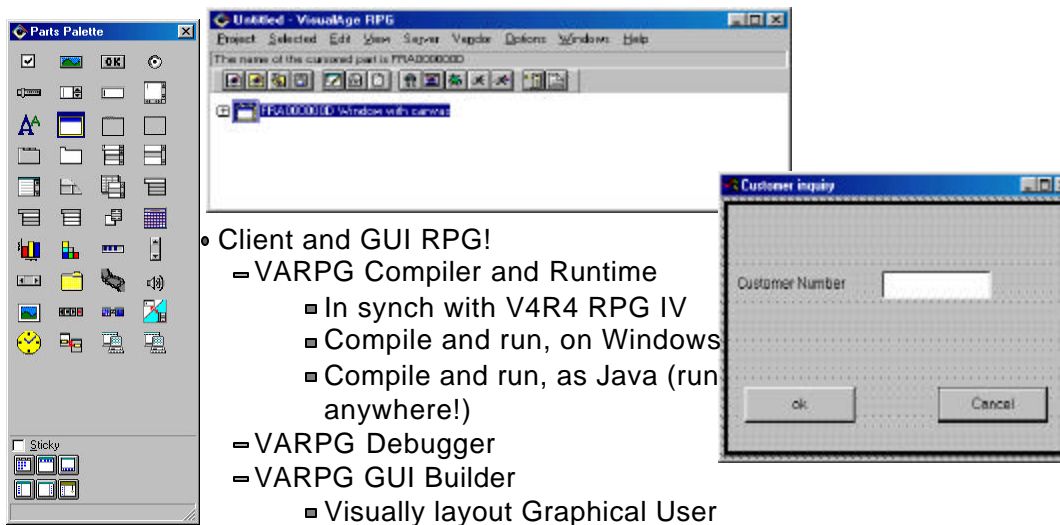
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# App'n Model - GUI



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## VisualAge RPG

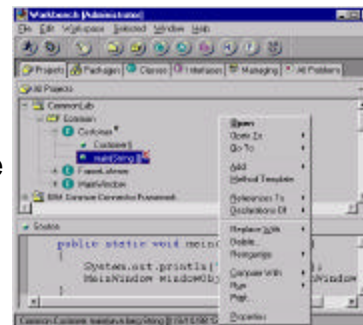


- Client and GUI RPG!
  - VARPG Compiler and Runtime
    - In synch with V4R4 RPG IV
    - Compile and run, on Windows
    - Compile and run, as Java (run anywhere!)
  - VARPG Debugger
  - VARPG GUI Builder
    - Visually layout Graphical User Interface
    - Program event logic ... in RPG
  - CODE Editor
    - Shared with CODE/400
  - Non-Visual projects supported too
    - Possible to write %100 portable business logic in RPG!

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## VisualAge For Java - Professional

- 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, TeamConnection, ClearCase, PVCS, Aldon Affinity, ...



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## Enterprise ToolKit/400

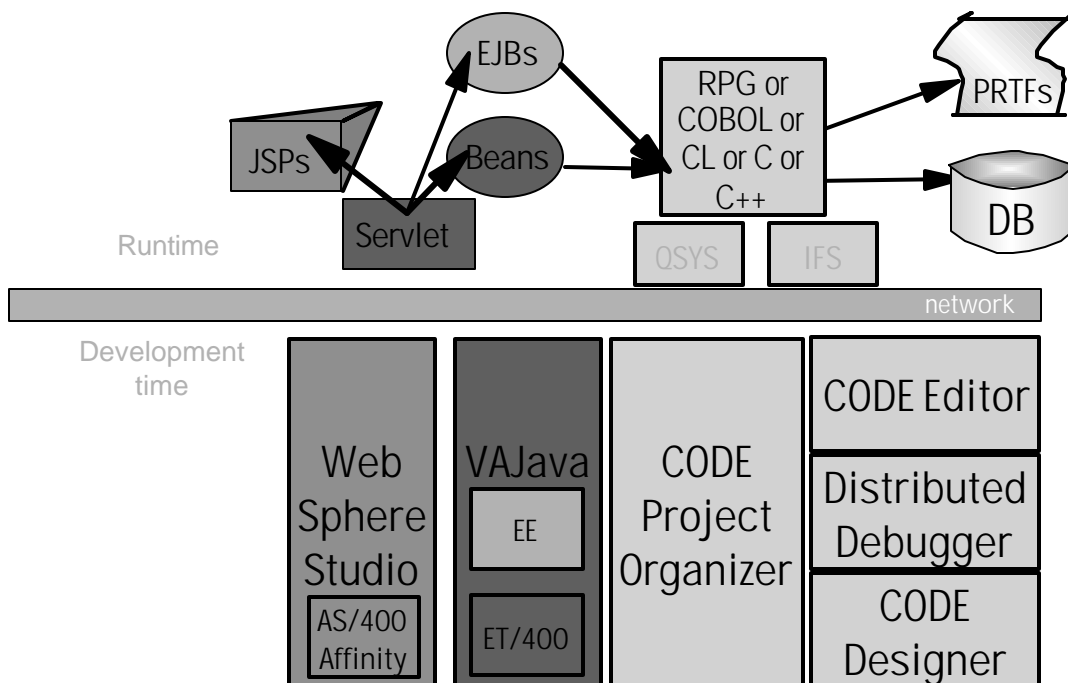
- AS/400 Toolbox for Java built-in
- Remote Export/Compile/Run/Debug
- DSPF-to-Swing Import Tool
- Program-Call SmartGuide
  - Generates Java Bean for calling \*PGM object from GUI
- DSPF-like Formatting Beans
  - Entry field, label, comboBox and JTable column
  - AS/400 attributes such as edit-codes, error checking
- DFU-like Beans
  - Beans with SmartGuides for accessing DB2/400 via direct record access classes in Toolbox. Connect to **Servlets** for HTML output, or to Java's **JTable** GUI widget for GUI output
  - Replaces SubFile SmartGuide
- PDM-like Beans
  - Beans for retrieving lists of AS/400 object information, supporting PDM's subsetting capabilities, IFS info

New

New

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## App'n Model - Servlets/JSPs/Beans/EJB



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## WebSphere Studio - Standard Edition

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Targets  
WebSphere  
Application  
Server

- WebSphere Studio
  - Full IDE for Web
    - 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

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## WebSphere Studio with Affinity/400

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New!

- AS/400-Unique Support in Studio
  - DSPF-like Palette Parts in Page Designer
    - ✓ HTML+JavaScript controls
    - ✓ Smart entry fields, labels, buttons, subfile, etc
    - ✓ SmartGuides to generate JSP code to set attributes
  - Program-call SmartGuide Framework
    - ✓ For putting batch \*PGM/\*SRVPGM APIs on the Web
  - Easy steps to the Web:
    - ✓ 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

---

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## WebSphere Studio with Affinity/400

- AS/400-Unique Support in Studio

- Simple AS/400 Deployment

- SmartGuide to easily publish WebSite to AS/400

- Auto-configuration of WebSphere App Server

- Documentation/testing

- Lots of AS/400 specific documentation and testing to ensure Studio and WebSphere Application Server together make the AS/400 the easiest choice and the best choice for AS/400 customer going to the Web

- Remember:

- "Web User Interfaces" can and will be used for in-house applications too!

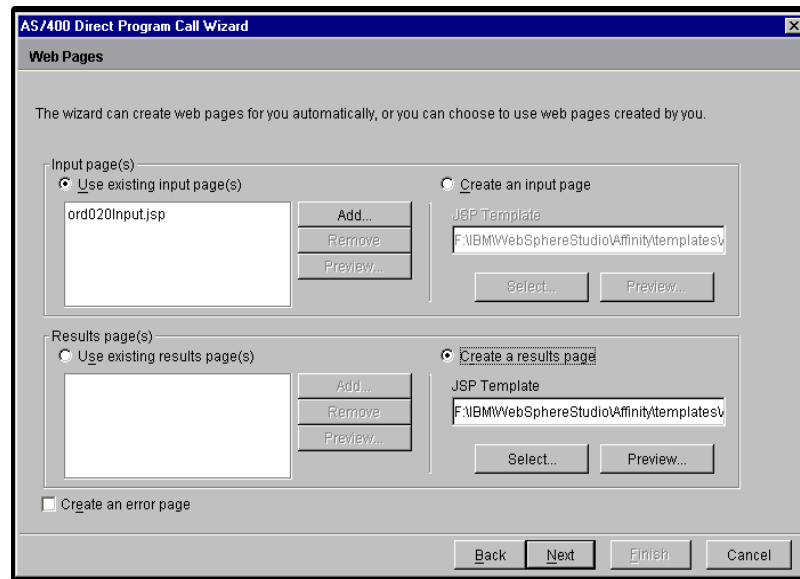
- That means...

- ✓ Studio's Page Designer is the new SDA for AS/400

Cont'd

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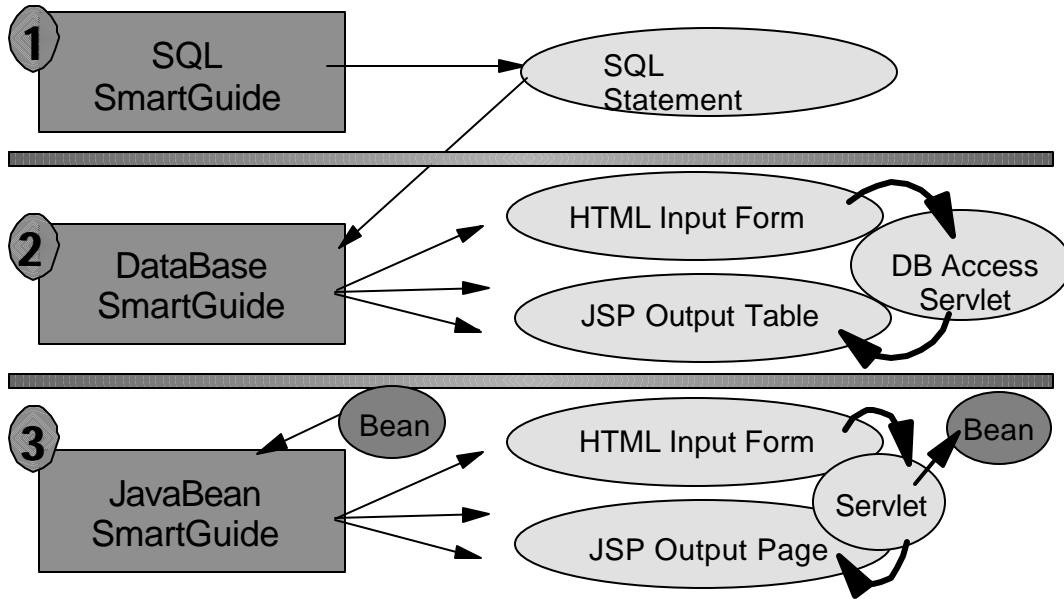
## Sample Page



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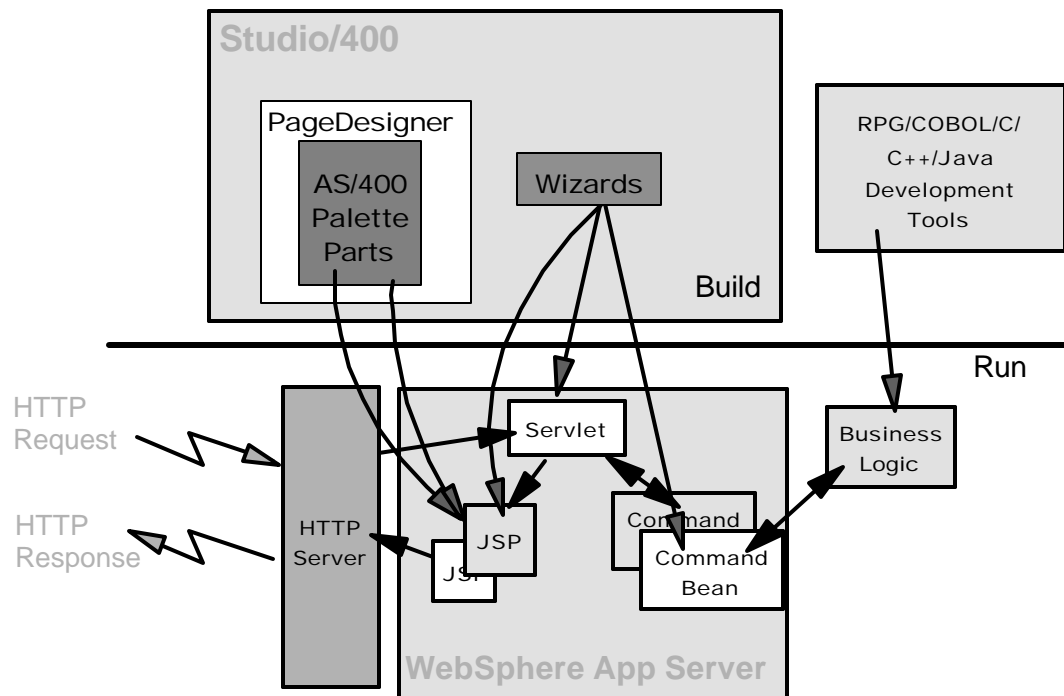
## WebSphere Studio Wizards

3 Wizards available today



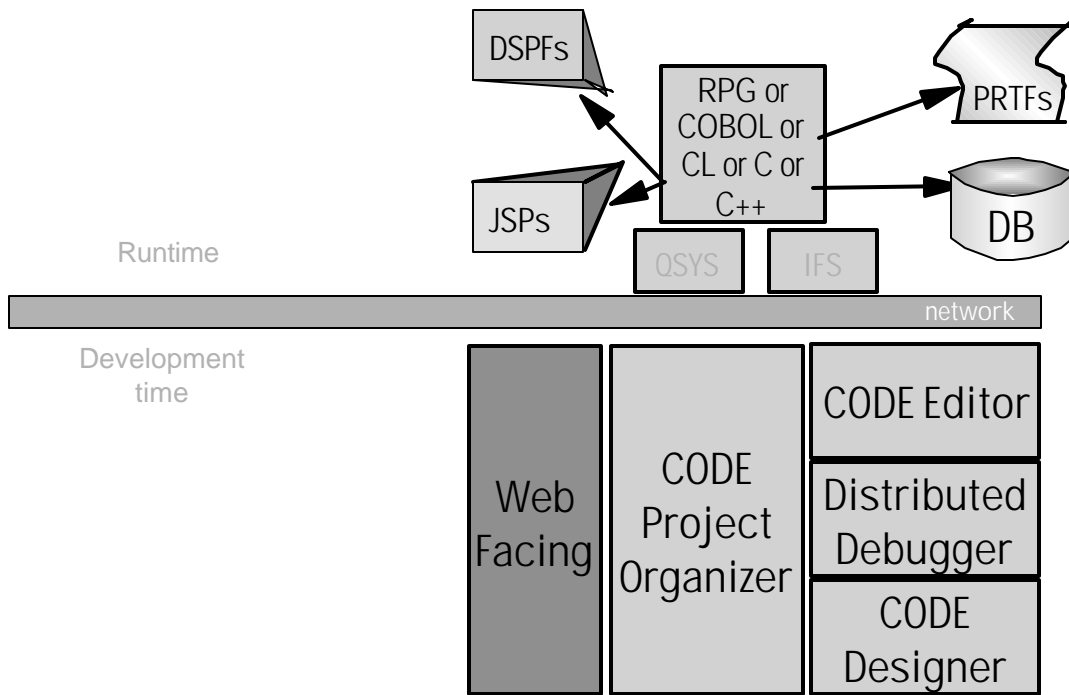
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## Tooling for Studio/400



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## App'n Model - Web Facing



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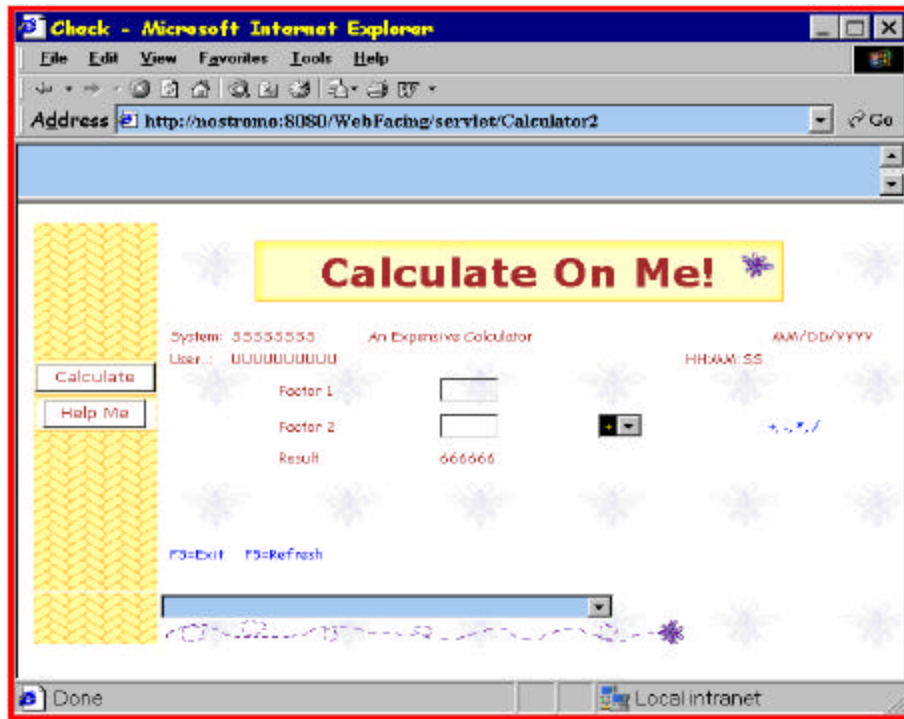
## WebFacing

- Technology Preview 4Q of 2000
  - Early Adopter program for selected Business Partners
    - Web registration, T&Cs
    - Early access to functionality
    - Agree to be reference account
- But ... what is WebFacing?
  - Something cool! . . .

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## After WebFacing



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## 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

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## *WebFacing Conversion*

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- Customization Options:
  - Can choose one of the default style sheets for layout of converted screens
    - or can create your own
  - Can tailor screen before conversion using CODE/400 (or SDA if you must!!)
    - add images, links, etc
    - saves information in comments
  - Use Page Designer from WebSphere Studio to tailor
    - remember changes will be lost on next conversion
      - ✓ conversion will backup, so can manually merge
  - Can write your own extensions to the conversion tool

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## *WebFacing RunTime*

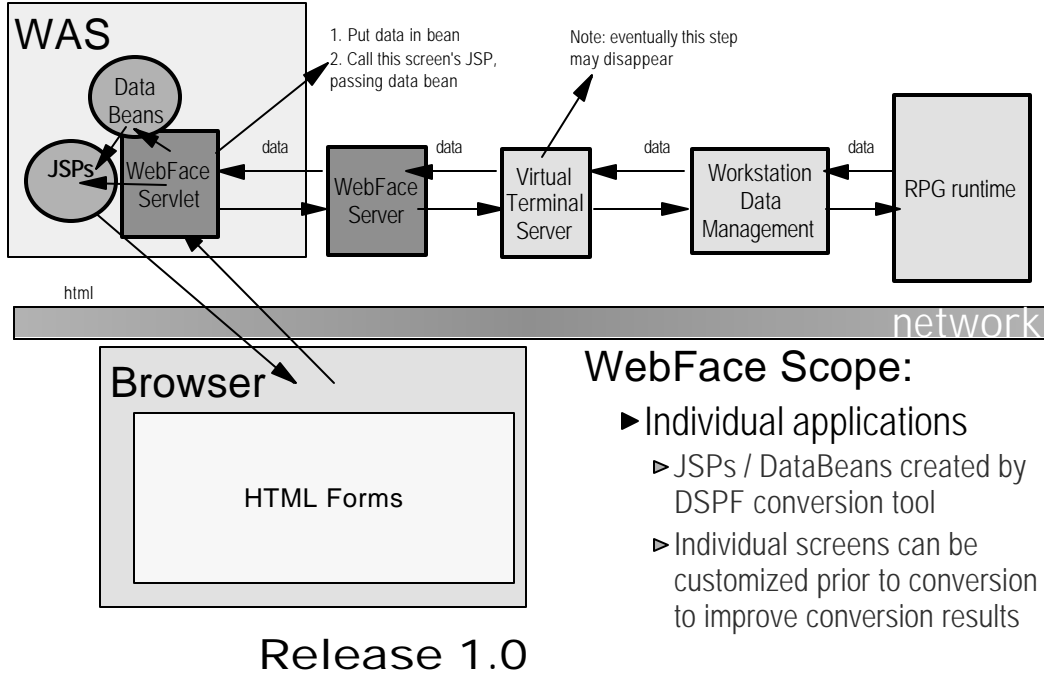
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- WebFacing RunTime
  - When interactive \*PGM invoked via generated HTML link:
    - New servlet runtime gets control
    - Intercepts WRITES, READs to DSPFs
    - Converts to WRITES, READs to JSPs
    - \*PGM need not know the difference
  - Little 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

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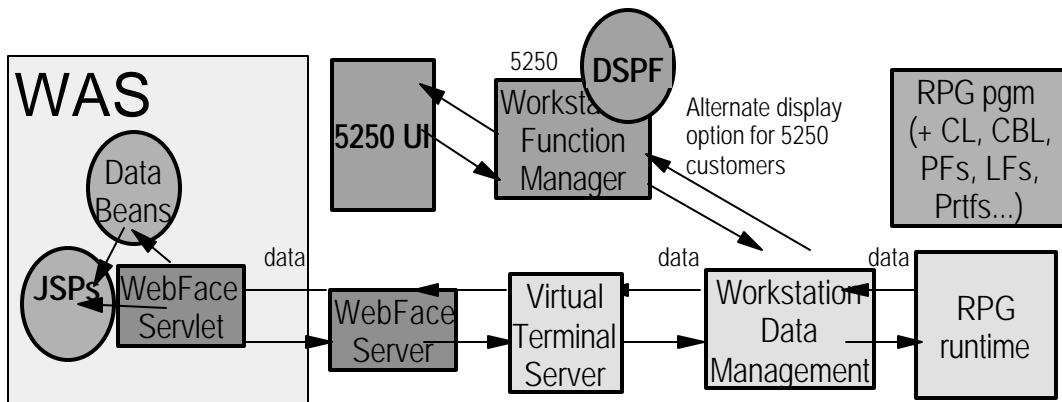
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## WebFacing RunTime



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## WebFacing Devt Time



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## WebFacing Vs 5250 Tools

5250-intercept products are good when:

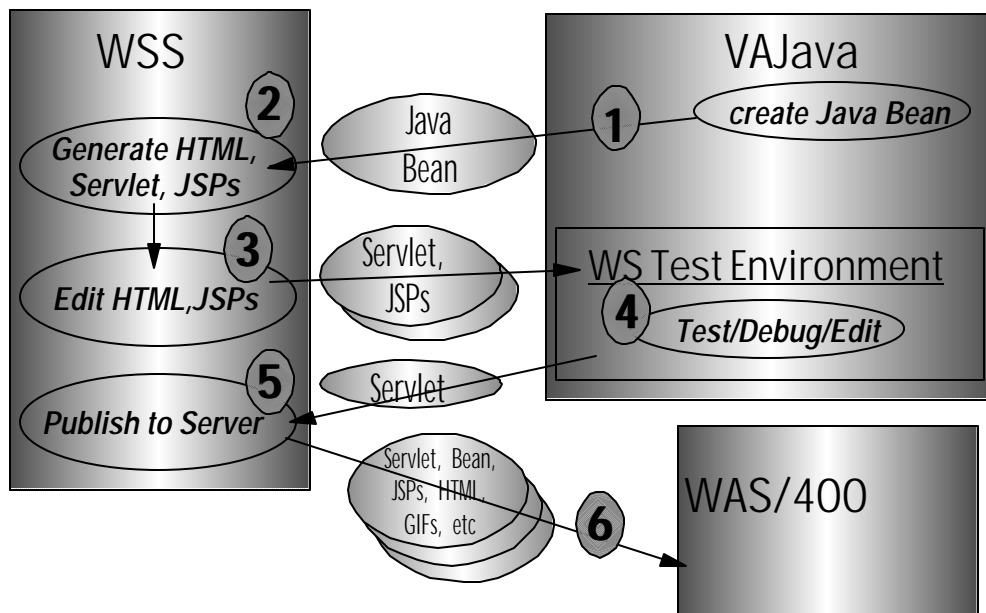
- Application is stable
- Zero change to application is desired
- Preference is to enhance runtime output versus development time source

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

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## Other Features



See whitepapers at: [www.ibm.com/software/ad/vadd](http://www.ibm.com/software/ad/vadd)

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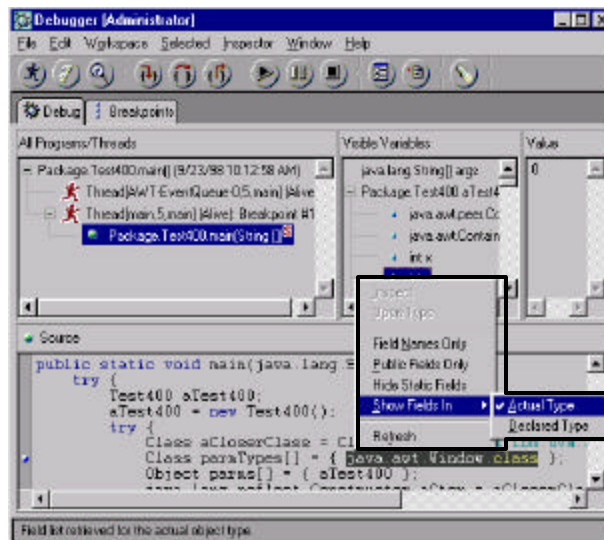
## WebSphere Test Environment

- VisualAge For Java Includes Full WebSphere R/T
  - Professional includes WAS Standard
    - For running/debugging Servlets and JSPs
  - Enterprise includes WAS Advanced
    - For running/debugging Enterprise Java Beans
- VisualAge for Java Includes Studio Integration
  - Daemon for exporting Servlets/EJBs to Studio, Importing Servlets/EJBs from Studio
- VisualAge for Java Includes JSP Execution Monitor
  - Watch JSPs execute:
    - Step through JSP source
    - See generated Servlet source
    - See generated HTML output

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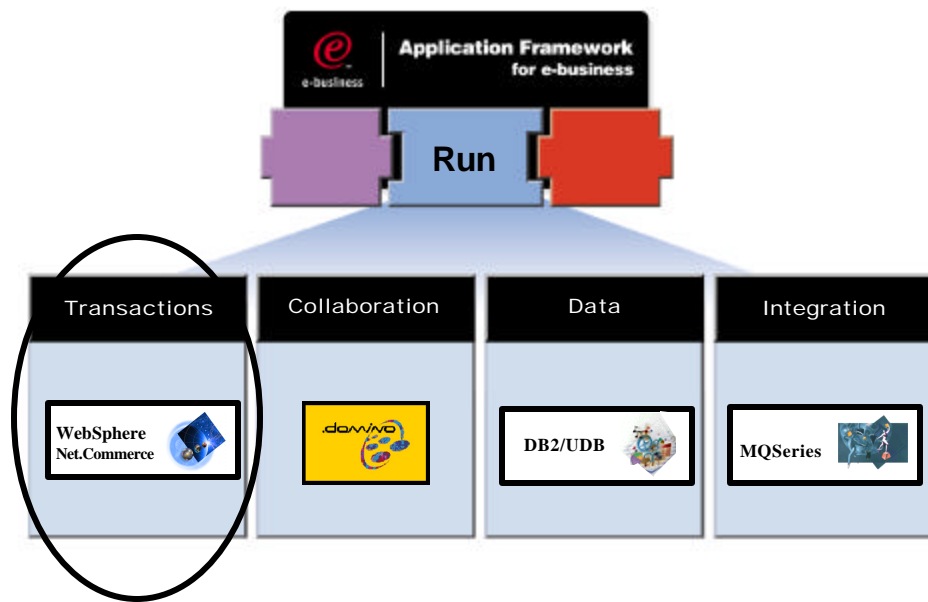
## Debugging

- To debug Servlets, JSPs and EJBs
  - Use VAJava's WebSphere Test Environment
  - Debugging happens locally within VAJava
- To debug deployed Servlets, JSPs and EJBs remotely on AS/400:
  - Wait for VAJava 3.5
    - Use AS/400 Distributed Debugger plus Object Level Trace
    - Will require AS/400 PTFs to enable
  - Or... use CODE/400 today
    - V3R2M3 (April 2000) release required
    - Contains same debugger as VAJava, but later release
    - Requires AS/400 PTFs and WAS 3.02



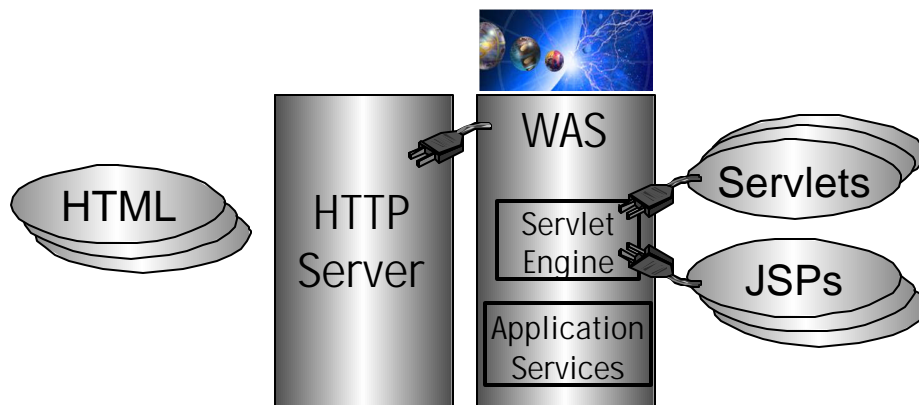
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## The Runtime Environment for eBusiness Applications



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## WebSphere Application Server



- Standard Edition:
  - V1: Available V4R3, V4R4 as part of HTTP Server
  - V2: Available V4R4 as free product
    - ▶ (5769-AS1)
  - V3.02: Avail V4R5 as free PRPQ
    - ▶ (5769-AS2 or 5769-AS3) (Int'l, US)
- Advanced Edition:
  - V3.02: Available as purchasable product on V4R4
    - ▶ (5733-WA2 or 5733-WA3) (Int'l, US)
- HTML, Servlets, JSPs and all Java files exist in the Integrated File System (IFS)
- Use AS/400 Toolbox for Java to access DB2/400, RPG/COBOL, Data Queues, etc

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## Summary

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- Application Development on AS/400 is changing
  - Solution Providers can provide e-business versions of their solutions
    - Easily and cost effectively
    - Participating in expanding B2B marketplace
  - IBM has leveraged AS/400 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
  - AS/400 realizes its potential as a premier e-business server
    - AS/400 traditional strengths
    - e-Business strengths
    - AD strengths
- More Information
  - [www.ibm.com/software/ad/as400](http://www.ibm.com/software/ad/as400)
  - [www.ibm.com/software/ad/wdt400](http://www.ibm.com/software/ad/wdt400)

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