



IBM System *i*™

Introduction to WebSphere Development Studio for i5/OS

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*i want stress-free IT.
i want control.
i want an *i*.*

Simplify IT

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IBM System *i*



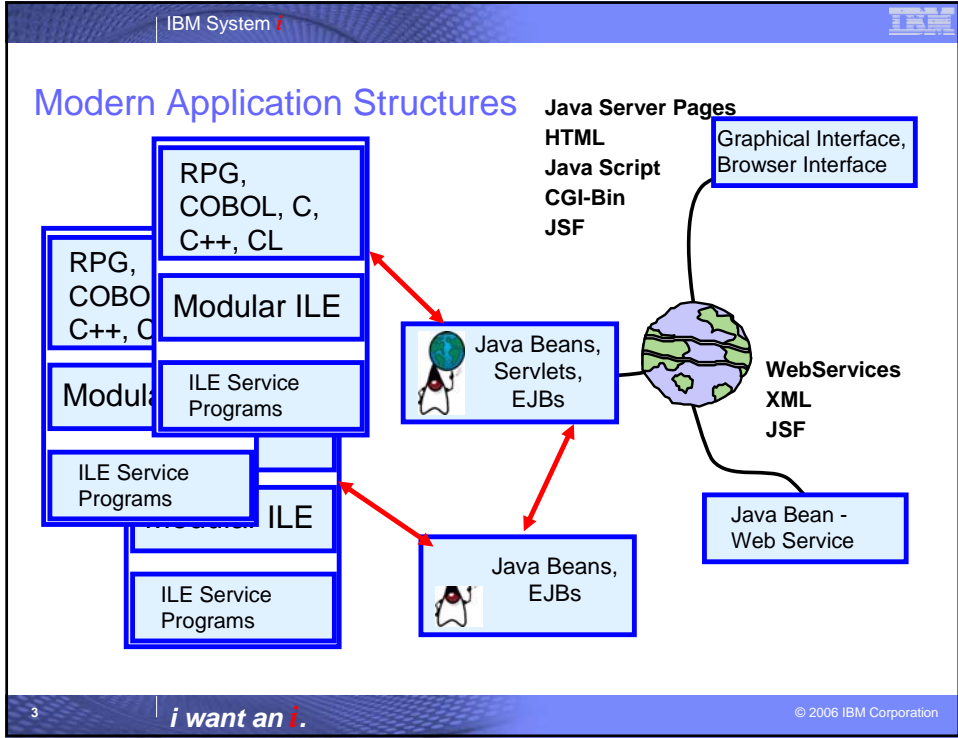
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2. Rational Development Tools
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Has the Tooling Kept Pace?

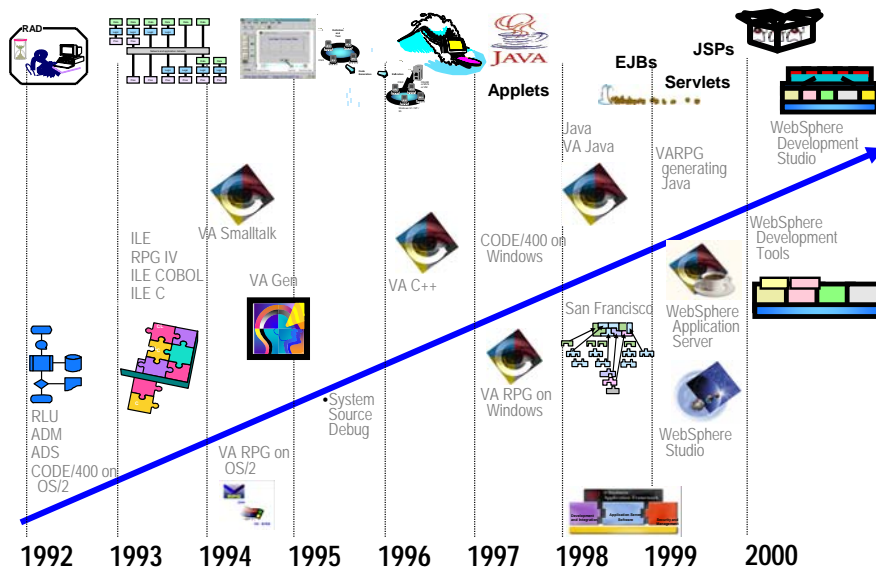
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1988 to 2000

In the beginning there was...

- RPG/400, COBOL/400, Control Language (CL), Data Description Specifications (DDS)
- Programming Utilities
 - PDM - Program Development Manager
 - SEU - Source Entry Utility
 - SDA - Screen Design Aid
 - DFU - Data File Utility
 - System Debugger

Over the Years ...



Developing Modern Applications

Independent tools and poorly connected islands of development

WebSphere Studio

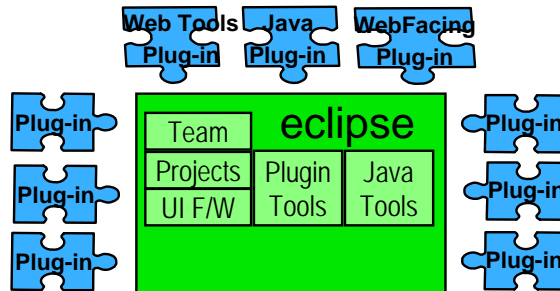


Best-of-breed tools and teams working together in an integrated environment

Eclipse Technology



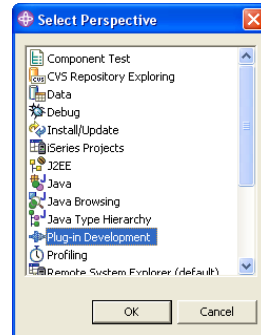
- eclipse powers IBM's new IDE technology engine
 - fully open-source @ www.eclipse.org
 - huge interest: > 500,000 downloads
 - written in Java
 - easily extended by plugins
- Great industry feedback
 - buy in from many industry tool vendors



Eclipse Perspectives

- **Users work with perspectives**
 - Collection of views and editors
 - Tools for a particular task
 - Allows for role-based development
 - Many perspectives are pre-supplied for specific tasks like Java, Web, XML, RPG/CBL
 - Users can create their own perspectives

- **The user interface is very “Windows-like”**
 - Build from a Java wrapper of OS widgets
 - Behaves and feels like any other native application
 - Views can be re-sized and re-positioned through drag ‘n drop



One Development Environment

Many perspectives

Java

Remote System Explorer

Web

Eclipse – Java Toolset

- **The base Integrated Development Environment (IDE)**
 - Comes with built-in rich Java tools
 - Extensible via plug-ins
- **Used as basis of products**
 - Product = Eclipse + plug-ins
- **Open source**
 - Contributed by IBM, managed by consortium
- **Popular!**
 - Millions of user downloads
 - 35+ products offerings powered by Eclipse
 - 25+ companies in consortium
 - 175+ companies writing plug-ins

Plug-in Writers:

A collage of logos for various Eclipse plug-in writers. The logos are arranged in several rows. The first row includes ALDON, IBM, ASC (Advanced System Concepts), and SoftLanding. The second row features Instantiations, Borland, catalist (Systems Corporation), and redhat. The third row shows ETRI, FLASHLINE, FUJITSU (with the tagline 'THE POSSIBILITIES ARE INFINITE'), and SAP. The fourth row contains AltoWeb, slickedit, Scapa Technologies, and mks (with the tagline 'Build Better Software™'). The fifth row includes HITACHI (with the tagline 'Inspire the Next'), teamstudio (with the tagline 'Strengthening the platform business to build on'), MERANT, and Telelogic. The sixth row features hp invent, MONTAVISTA SOFTWARE, TRANS-ENTERPRISE, and serena (with the tagline 'Automating Change to Enterprise Code and Content'). The seventh row shows SuSE, TogetherSoft, and SYBASE.

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Tool Vendor Integration and Perspectives

ASC - Abstract

MKS - Implementor

SoftLanding Systems - Turnover

Aldon - CMS

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IBM Rational Web Developer

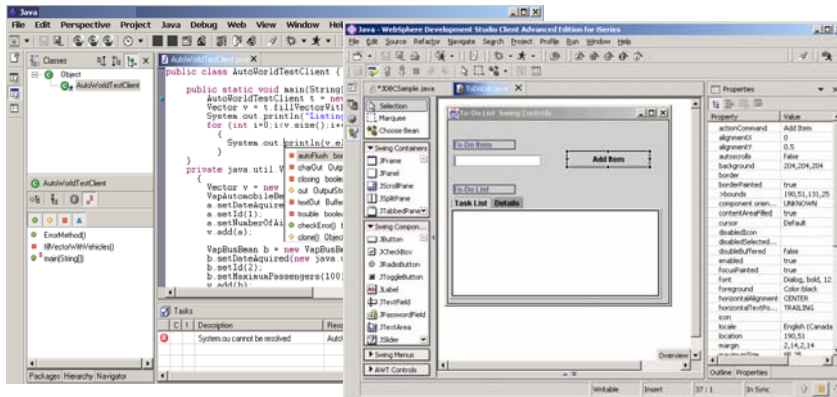
WebSphere Studio Site Developer (WSSD) + Rational Web Developer (RWD) =

- Web Services Tools
- Web UI construction
- Rich Client UI construction
- Enterprise Generation Language
- XML Tools
- Eclipse Java Development Tools

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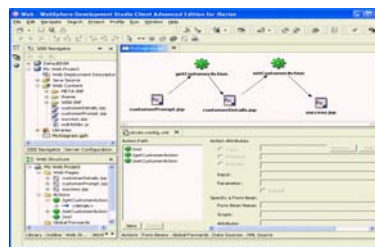
Java Development Perspective

- Built on top of eclipse Java development environment
 - Additional wizards and smartguides
- Visual Construction Environment



Web Development Perspective

- **J2EE defined folder structure Superset of the Java projects**
 - inherits Java tools capabilities
- **Automatic creation/maintenance of web.xml files**
- **Editor support**
 - Create/edit/validate/debug JSP/HTML files
 - Images and animation
 - Cascading Style Sheets
- **Import/Export form/to a variety of sources**
 - HTTP/FTP/WAR/EAR
- **Link viewing and management**
- **Wizards**
 - Java bean wizard
 - Data bean wizard
- **Struts Support**

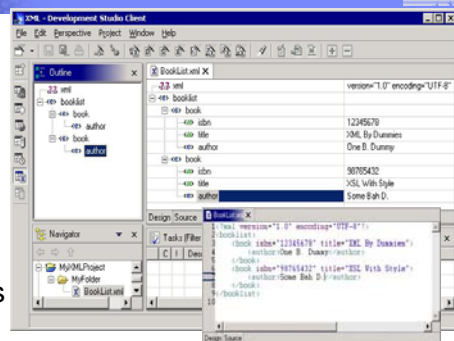


Web Service Tools

- Consume/Construct Web services:
 - Discover
 - Browse UDDI registry to locate existing services
 - Generate Java Bean Proxy for existing services
 - Create/Transform
 - Create new Web services from Java Beans, databases
 - ✓ Including Java Beans output from System i ProgramCall wizard
 - Deploy
 - Deploy Web service to WebSphere or Tomcat for testing
 - Test
 - Built-in test client allows for immediate testing of local/remote Web services
 - Publish
 - Publish Web services to UDDI registry

XML Tools

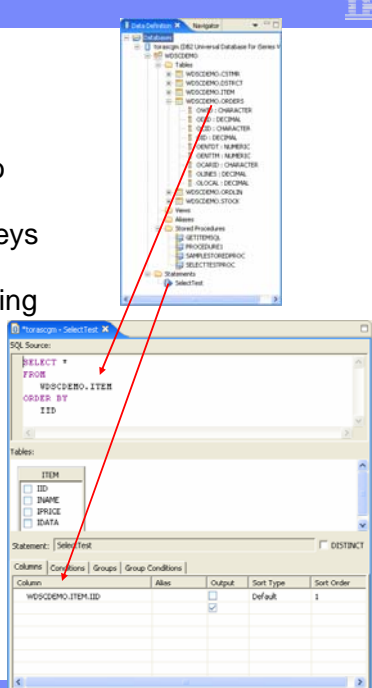
- XML Editor
 - For creating and viewing XML files
- DTD Editor
 - For creating/viewing Document Type Definitions
- XML Schema Editor
 - For creating, viewing and editing XML Schemas
- XML to XML Mapping Editor
 - To map one+ source XML files to a target XML file
- XSL Trace Editor
 - To visually step through an XSL transform
- XML and SQL Query Wizard
 - To create an XML file from an SQL query
- RDB to XML Mapping Editor
 - To map one+ relational tables to a target XML file



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Database Tools

- Relational Schema Center
 - Provides views geared for DBAs to
 - Create Databases
 - Create Tables/Views/Indexes/Keys
 - Generate DDL
 - Online and offline support for working with databases
 - Metadata generated as XMI
- SQL Query Builder
 - Visually construct SQL statements
 - Insert, update, delete, select supported
 - Metadata generated as XMI
- SQL/XML mapping

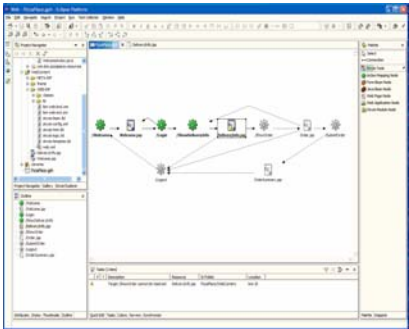


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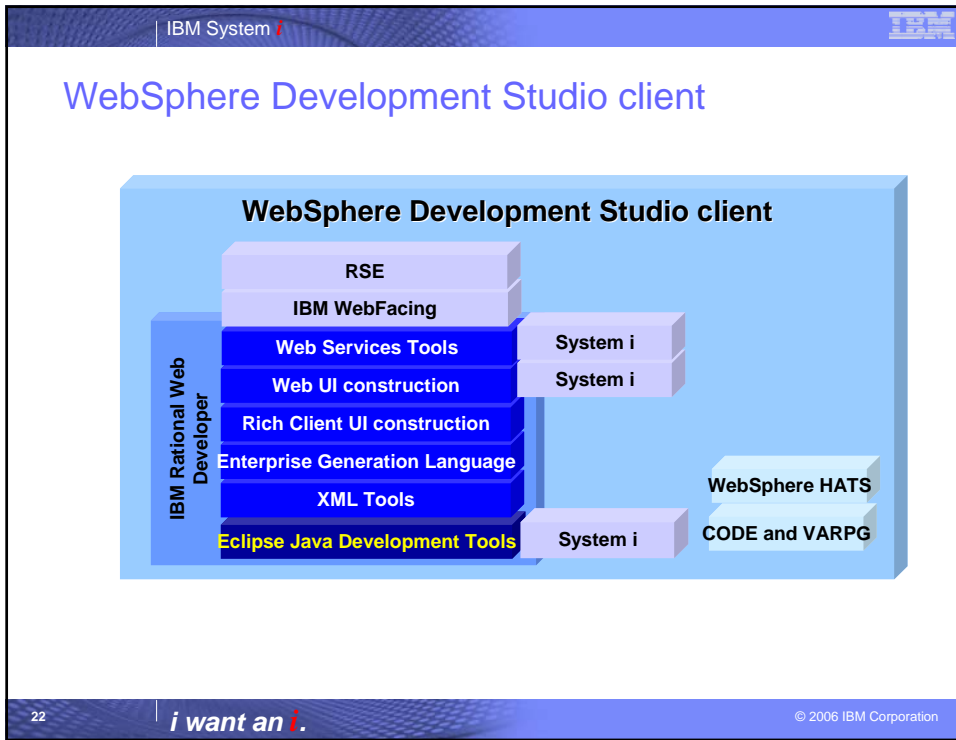
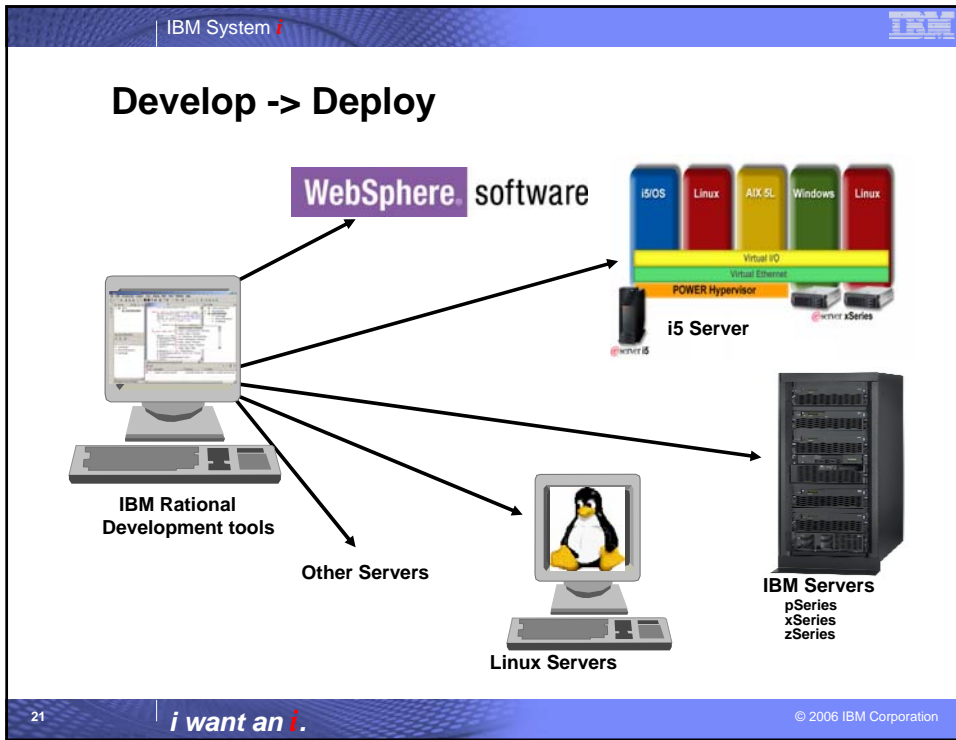
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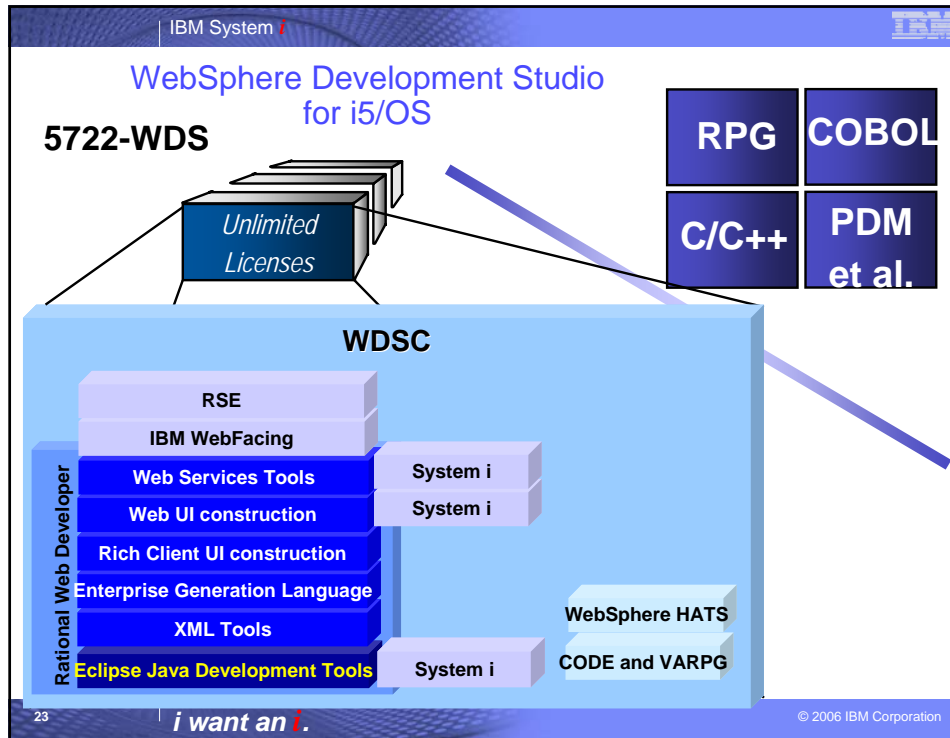
eGL

- Enterprise Generation Language
 - 4GL procedural language
 - Generates Java code
 - User interface based on Java Server Faces (JSF)
- Easy transition for developers with
 - SQL, COBOL, RPG
 - Informix 4GL skills
- Allows these developers to build J2EE applications without having to know Java or object oriented programming concepts
- Single source used for J2EE applications, regardless of target platform



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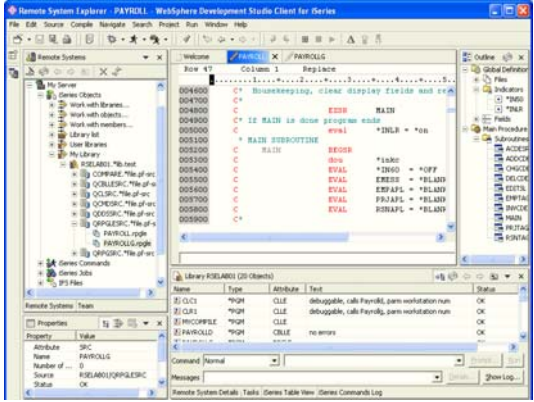




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Remote System Explorer (RSE)

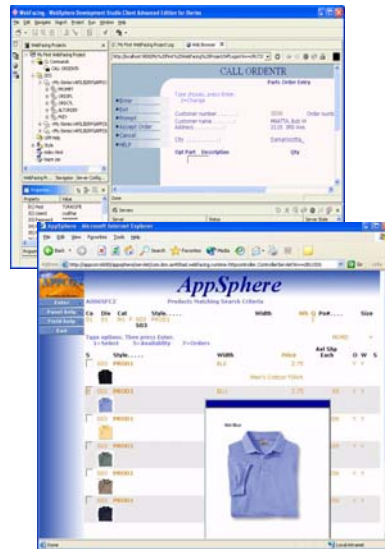
- **Perspective for access to remote systems**
 - Linux, Unix, Windows
 - System i
- **Reusable actions, dialogs, widgets, APIs**
- **Editor for traditional System i application code**
 - RPG, COBOL, C, C++, Java & DDS
- **WYSIWYG Designer**
 - DSPF
 - PRTF
 - PF
- **Debugger**
 - Multi-language



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The IBM WebFacing Tool

- **Quick conversion at development time**
- **Creates JSPs and Servlet from Display File DDS source**
- **Targets WebSphere Application Server – Express**
 - now included with i5/OS
- **Two components**
 - development environment
 - part of WDS
 - runtime intercept
 - part of OS/400 and i5/OS



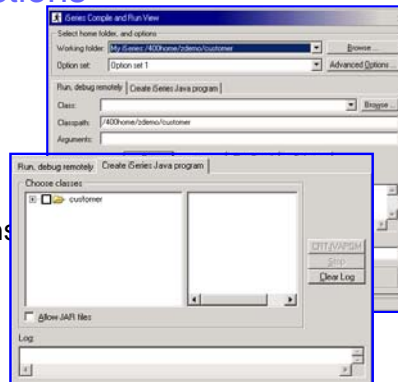
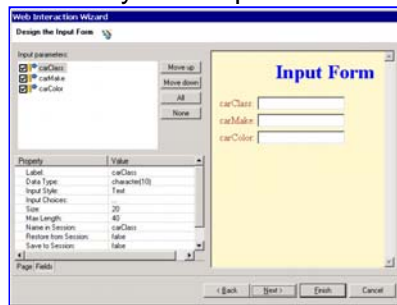
WebSphere Host Access Transformation Services

- **A datastream-to-HTML translator**
 - 5250 or 3270 datastream
- **Rules based transformation engine**
- **Converts green-screen to Graphical User Interface (GUI) in real time**
- **Improves usability and effectiveness of existing applications**
- **Customization options**
- **Plugs-In to IBM Rational Tools**
- **Integrated with Portal**
- **Requires WebSphere Application Server (or Express)**



Other System i Specific Functions

- **Java Tools Extensions**
 - Import/export
 - Remote compile/run/debug
 - Program call wizard
 - Toolbox for Java built in
 - Additional supplied Java beans for System i specific function



- **Web Tools Extensions**
 - Web Interaction Wizard
 - Host Information Wizard
 - Web GUI Widgets

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Web Services Tools in WDSi

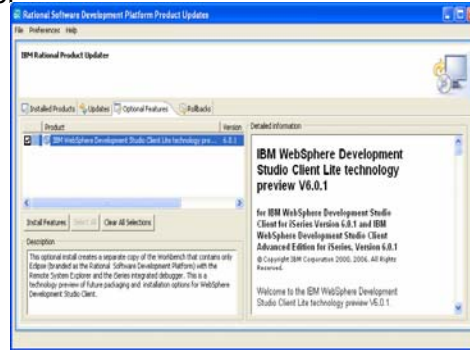
- **Program Call Wizard**
 - Generates a remote interface to a native *PGM or *SRVPGM in the form of a JavaBean
 - Input: System i *PGM/*SRVPGM interface info or PCML
 - Output: JavaBean proxy
 - PCML: Program Call Meta Language
 - holds all interface info required by Program Call Wizard
 - V5R2+ language compilers can generate PCML file
 - System i *PGM/*SRVPGM can now be used remotely within the scope of a Java or Web application via the new JavaBean proxy



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WDSc Lite – Technology Preview

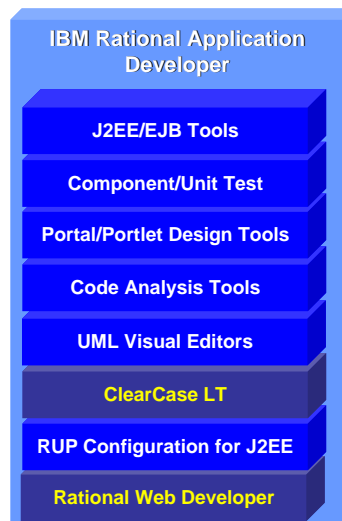
- **WDSc Lite is a slimmed down workbench with only the:**
 - Eclipse workbench
 - Remote System Explorer
 - System i Projects
 - System i Integrated Debugger
- **Requires only 256 MB RAM !!!**
- **Optional installation feature**
 - Must already have full WDSc 6.0.1 installed
 - Creates a second copy of the workbench
- **Fully supported technology preview**
 - Preview of future packaging directions ☺



IBM Rational Application Developer (RAD)

WebSphere Studio Application Developer (WSAD)
+
Rational Application Developer (RAD)

=



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Enterprise Java Bean Tools

- **Support for Enterprise Java Beans 2.0**
 - Require J2EE 1.3
- **EJB 2.0 specific tools include**
 - Message Driven beans
 - Container Managed Persistence 2.0 (CMP 2.0)
 - Mapping tooling
 - EJB Query Language (EJB QL)
 - Similar to SQL language
 - EJB unit test environment
 - Profiling tools (for EJB 1.1 or 2.0)

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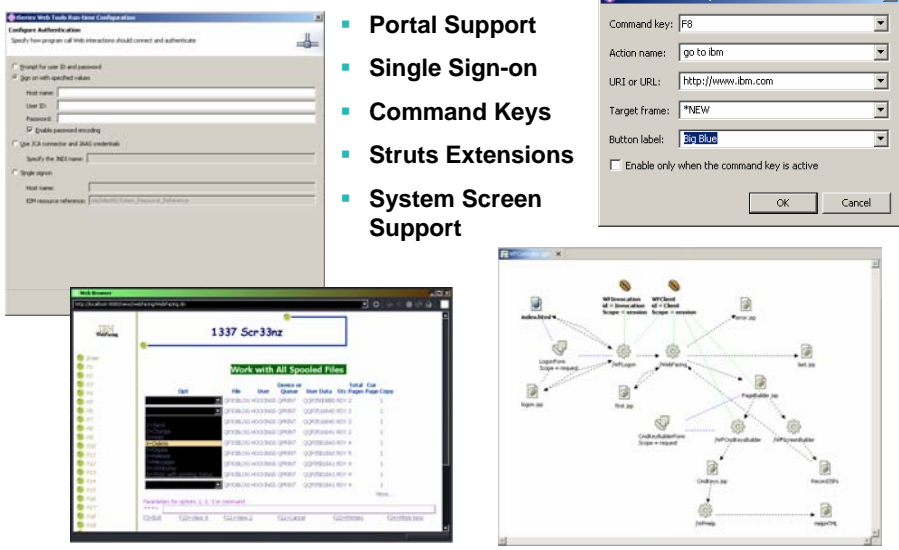
WebSphere Development Studio Client - Advanced Edition

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Advanced WebFacing Functions

- Portal Support
- Single Sign-on
- Command Keys
- Struts Extensions
- System Screen Support



The screenshots show the 'Configure Web Tools from Host Configuration' dialog for 'Configure Authentication', the 'Add Command Key Action' dialog with fields for Command key (F8), Action name (go to ibm), URI or URL (http://www.ibm.com), Target frame (*NEW), and Button label (Go Blue), and a screenshot of a system screen displaying a file list.

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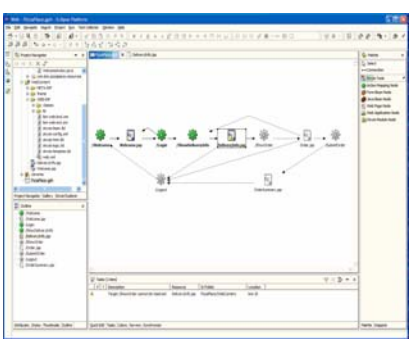
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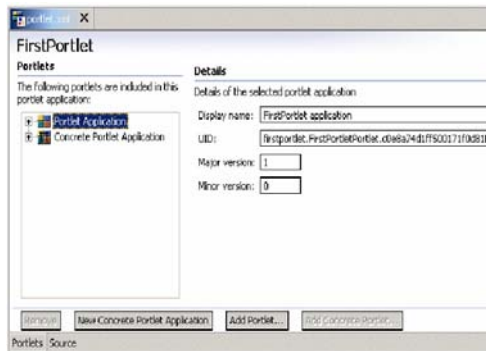


The screenshot shows the eGL development environment with a project structure on the left and a diagram in the center.

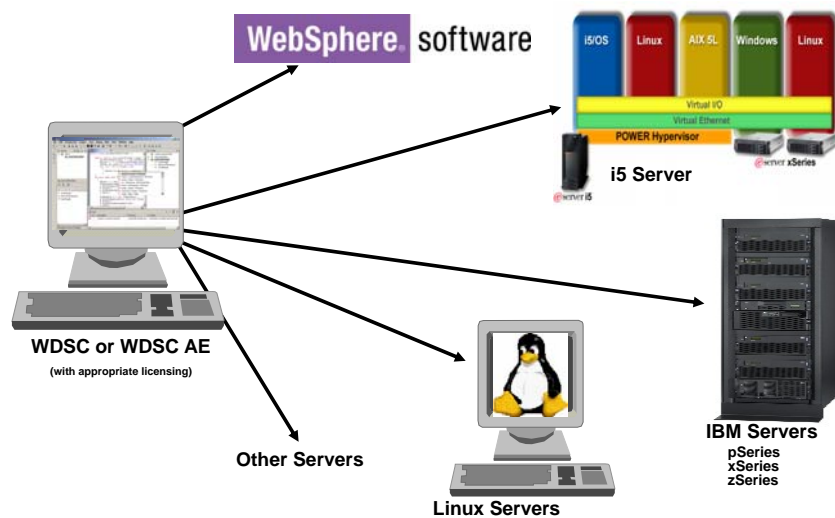
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WebSphere Portal ToolKit

- **Portlet creation and customization**
 - IBM portlet API and JSR 168 portlet API support.
- **Portlet Wizard supports**
 - action handling
 - message handling
 - using Portlet Data
 - single signon function
 - cooperative portlets
 - multi-portlet applications



Develop -> Deploy



Modern Application Structures

