

System z Expo

October 13 – 17, 2008 – Las Vegas, Nevada



An Eclipse based Development Environment for z/VSE

zEO04

Wilhelm Mild

Authorized

IBM | **Training**

23-Sep-08

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		z/VM
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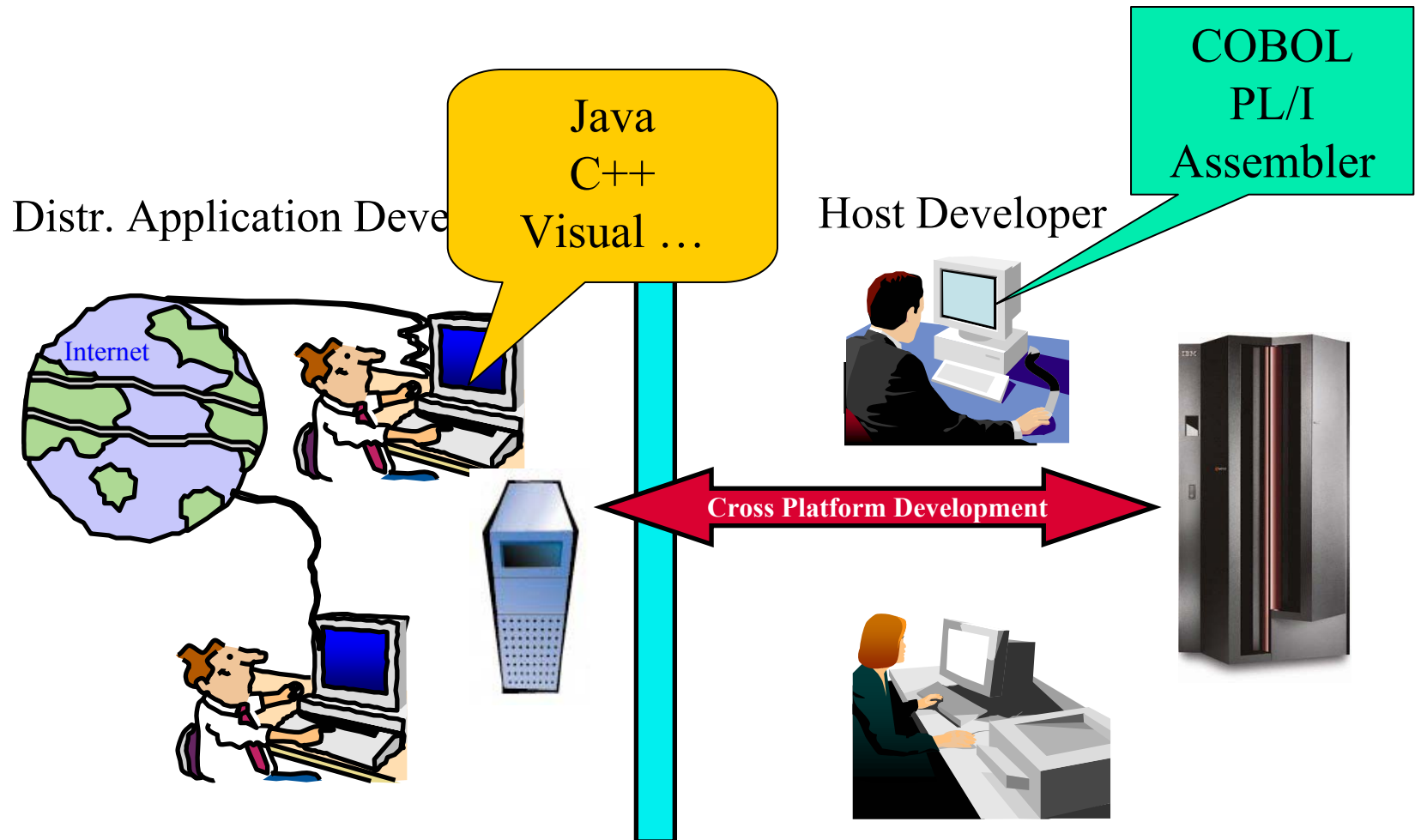
Development objectives !!!

- Tools for managing existing z/VSE source code and changes
 - COBOL, ASM, PL/I, C
 - increased productivity for changes and new development
 - flexibility in versioning
 - effective group development control

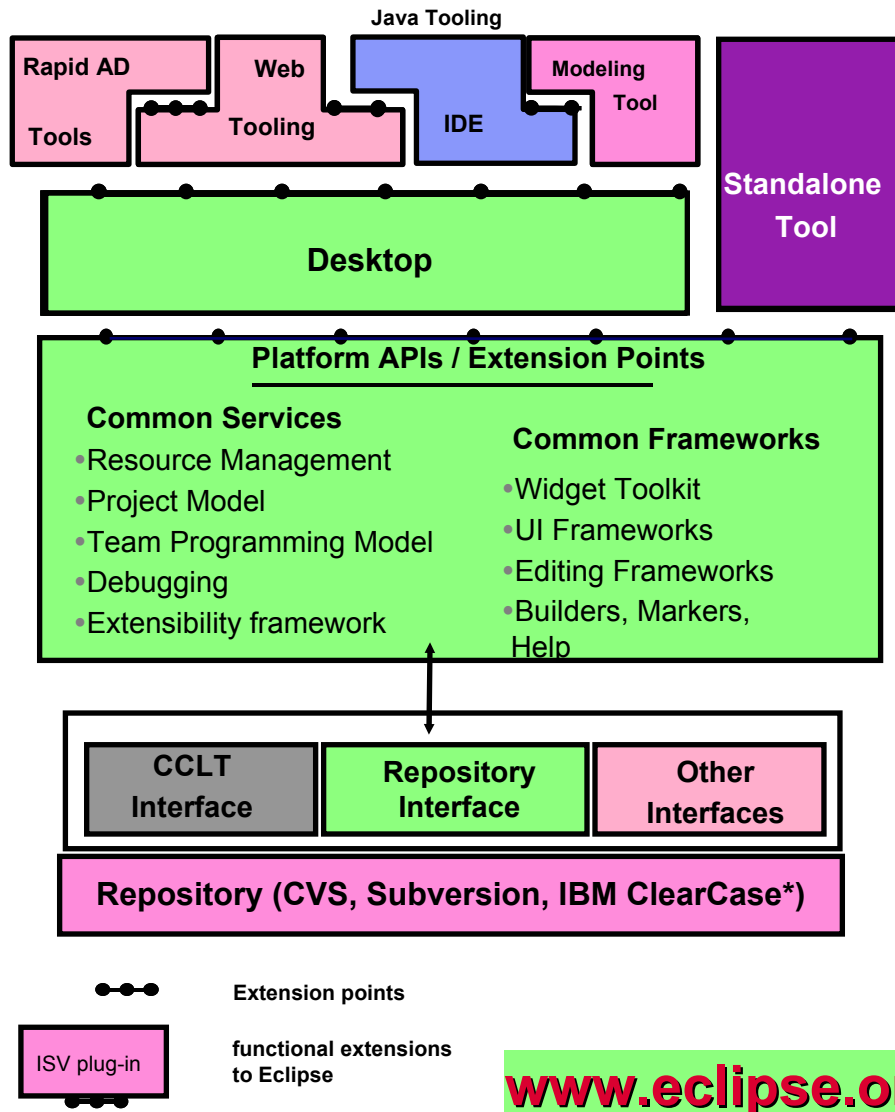
- Develop for multiple platforms
 - common framework for the enterprise instead of multiple unique platform dependent tools
 - same basic tool set for open systems and mainframe

- Open source based technology
 - tools that students know from school and university communities
 - help new developers adapt to the mainframe

'Distributed' Development Landscape...



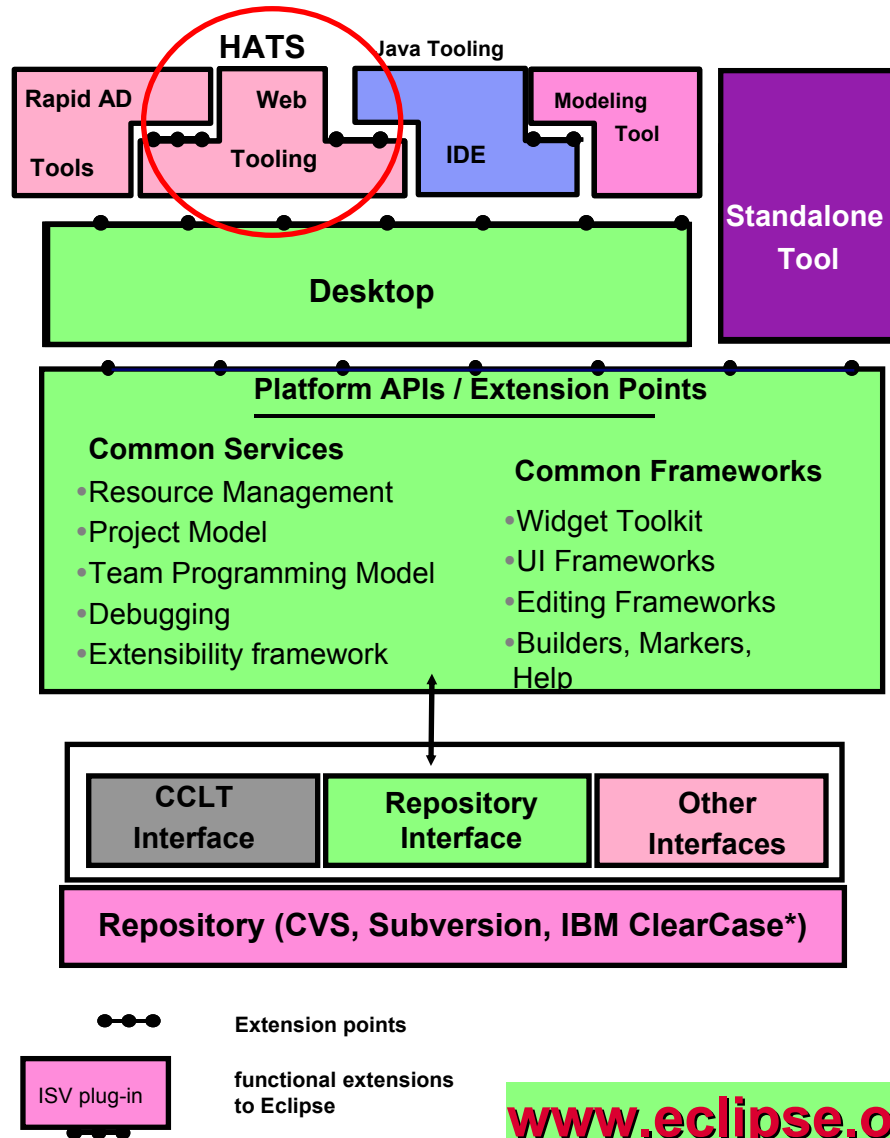
Eclipse – the open Standard for application development



What is Eclipse about:

- Open source development framework
 - with modern Editors
 - syntax help & check
 - semantic check
- Centralized source code maintenance
 - entire source code in central Repository
 - cross platform project administration
- Versioning software interface
 - CVS, Subversion, or IBM ClearCase
 - automatic Workgroup-control
 - i.e. development groups, system group
- Open for ISVs development Plug-Ins
 - Integrated Development Environments (IDE)
 - for System z (WDz, RDz)
 - for Java, COBOL, PL/I, ASM,C
 - Application analysis and optimization
 - Analyze the applications and workflows with graphical correlations
 - **IBM HATS Development Plug-In**
 - develop new front-ends to 3270 apps.
 - **IBM EGL development Plug-In for z/VSE**
 - follow-on to Visual Age Generator

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www.eclipse.org

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Host Access Transformation Server (HATS)

- A Web-to-host integrator, HTML emulator ...
- rules-based transformation engine, application integration ...
- converts green screens to graphical user interfaces in web applications
- improves ease-of-use of host applications.



The image illustrates the transformation of a green screen application into a web interface. On the left, a terminal window displays a 'Display Report' for 'JK Enterprises' with columns for Part Number, Part Name, and Stock. On the right, a web browser window shows the same data rendered as a modern web application with a navigation menu, a title 'JK Enterprises - Your Sports Supplier Depot', and a 'Delivery Schedule' calendar.

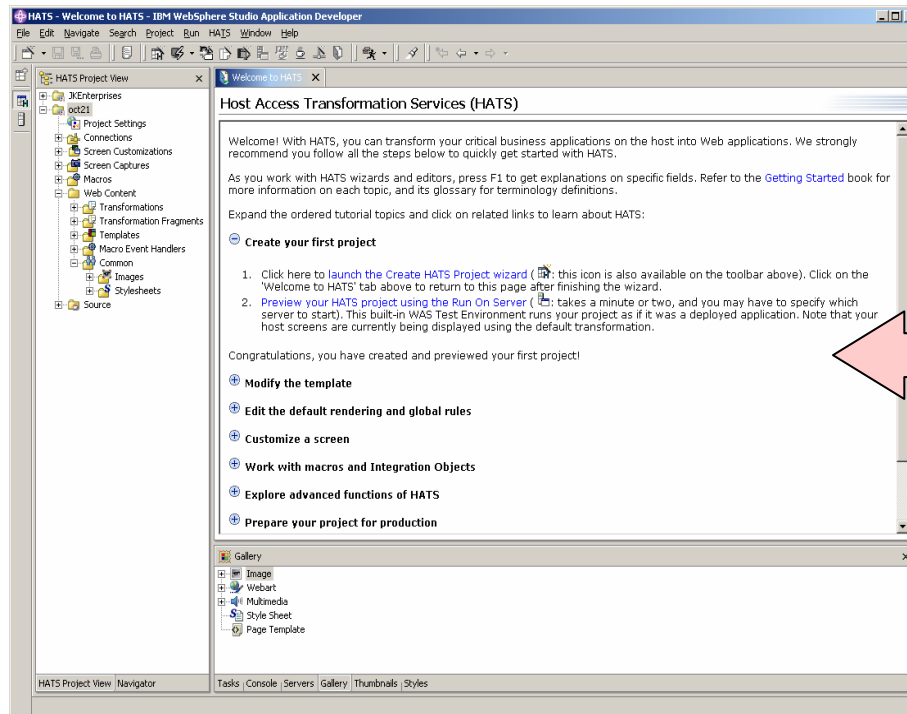
Part Number	Part Name	Stock
000001	Baseball glove	35
000002	Catcher's mit	20
000003	Baseball bat - 1 doz.	40
000004	Football	45
000005	Basketball	25
000006	Tennis balls - 1 doz.	41
000007	Golf balls - 1 doz.	27
000008	Ice Skates	17

Benefit: Easily extend existing applications to the web

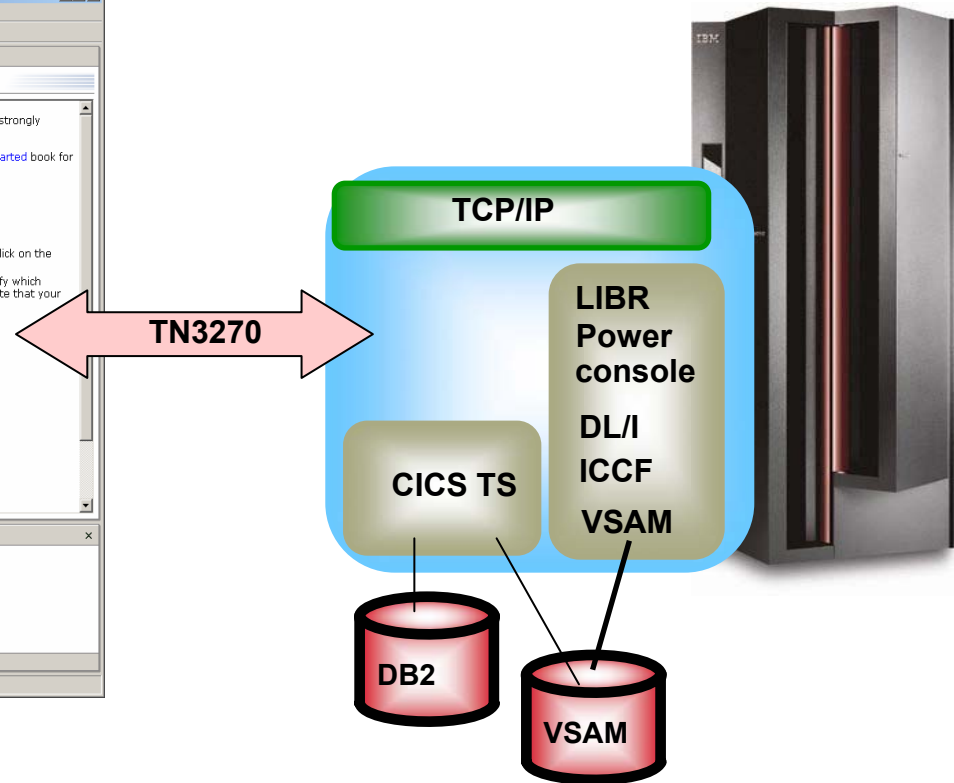
Modernize Existing Applications with HATS

(2) Integrate existing applications in Web applications – in Java

Rational Application Development + HATS Plug-In



z/VSE Server



- **Application-Development – in Java** (i.e. HATS Studio or Eclipse)
- The new application accesses unchanged VSE application and data
- the new application is a web application using internet technologies

Web application for z/VSE applications with 3270 interface

HATS Advantages:

- Combine / Integrate

Market Update

Dow Jones	9959.71	37.85
NASDAQ	1918.26	13.61
S&P 500	1062.24	3.19
30 Yr Bond	5.191	0.04

Data from 5250 Source

SC4103 Check Entitlement by Customer number RALYSC1
5/16/02 10:13:31

Support Center/400 library DEMOBOX20

Type choices, press Enter.

Customer number

Location code

Support Center/400 problem number

Associated problem

Data from 3270 Host

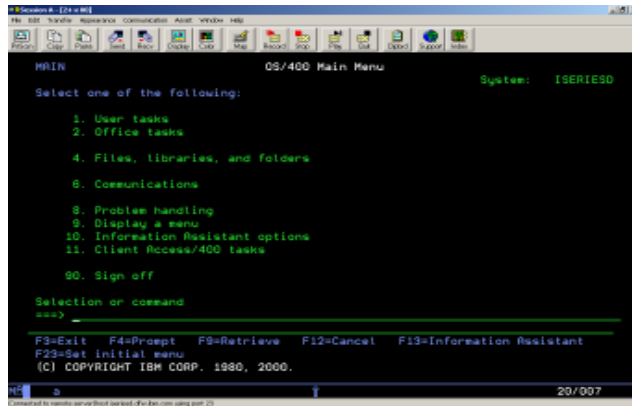
Name	Phone	Type	Node	User	Mail
Carter-Willis, A. P. (Antoinette)	596-3739	Reg	IBMUSM25	ACARTERW	WEZA1
Willis Jr, Albert F. (Al)	799-7224	Reg	IBMUSM24	AFWILLIS	B-HAM
Willis, Al L.	293-2768	Mgr	IBMUSM08	ALW883	P524
Willis, Andre R. (Dre)	888-5081	Sup	IBMUSM22	AWILLIS	H07R1
Willis, Andy B.	419-1518	Reg	IBMUSM49	ANDYWILL	022D
Willis, Art *CONTRACTOR*	000-0000	Contr	IBMUSM38	AWILLIO	B676/C
Willis, Arthur W. (Wayne)		Reg	IBMUS	WILLISW	na

Results from VT Data Source

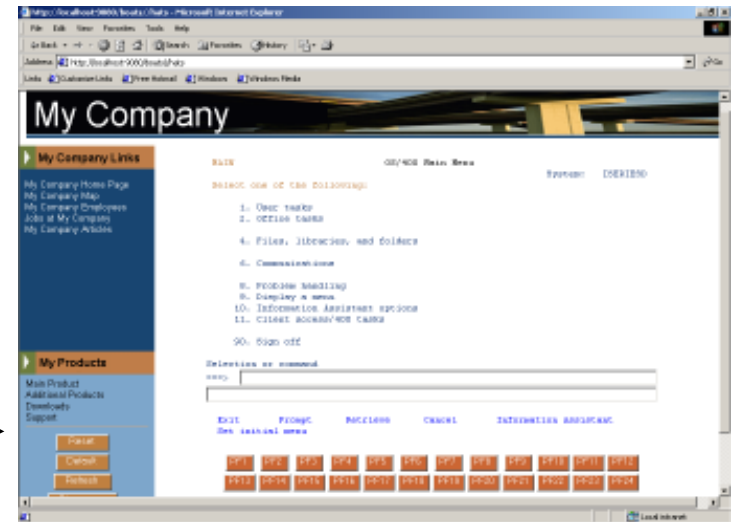
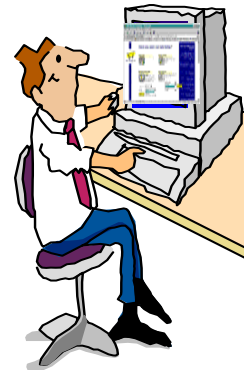
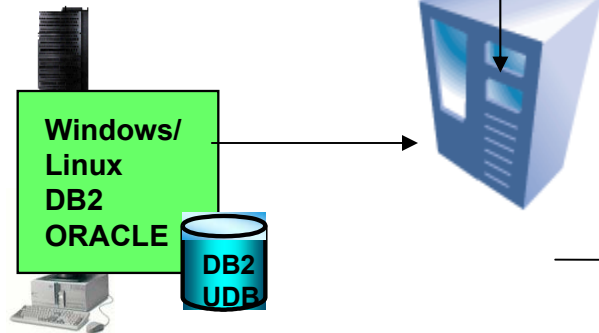
Query Directory: c:\
93 Dir(s) 22,888,353,792 bytes free
14 File(s) 4,175,691 bytes

Application Integration with Host Access Transformation Services

- Not invasive
- No software download to the client
- Web Services on the fly
- Integration with distributed applications



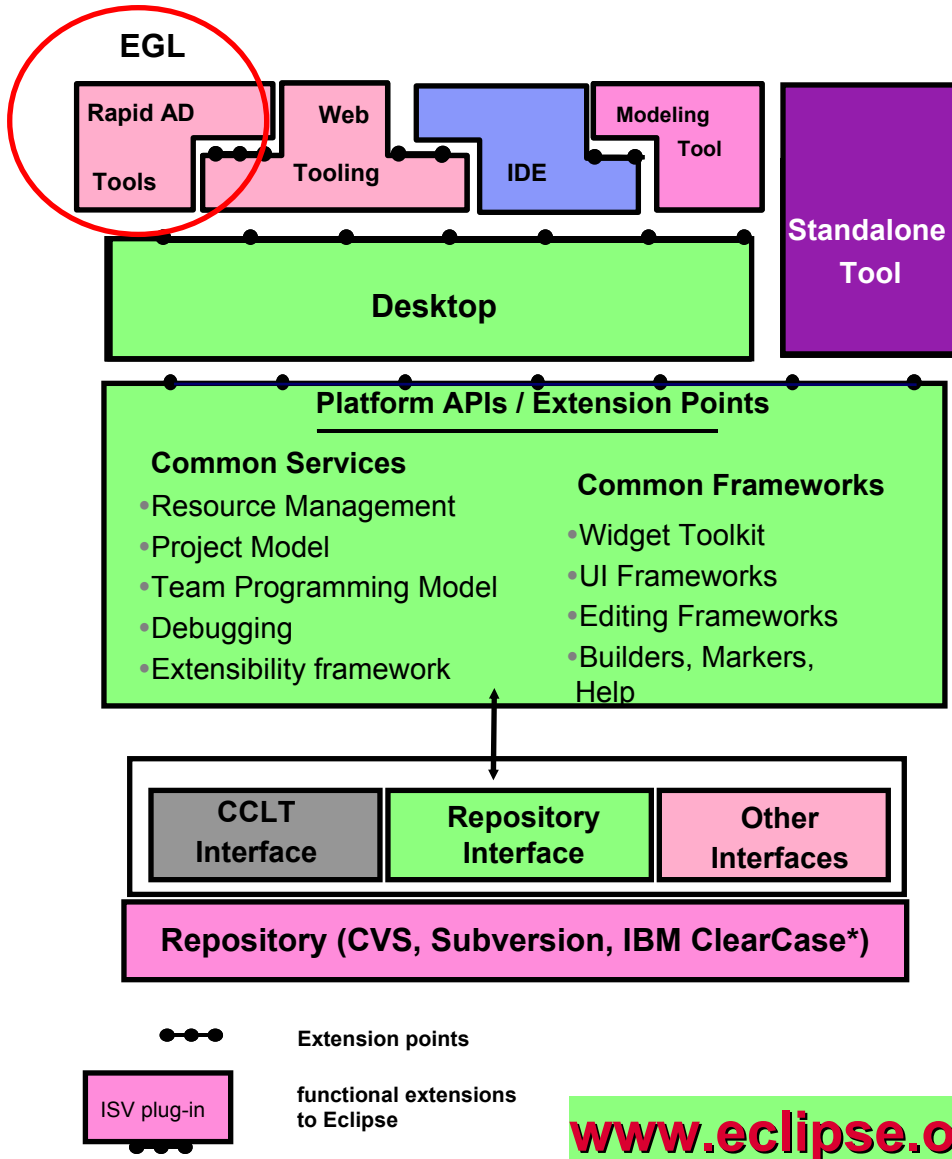
3270 or 5250 data stream



HTML in a Browser

Screen transformation rules running on WebSphere Application Server

Eclipse – the open Standard for application development

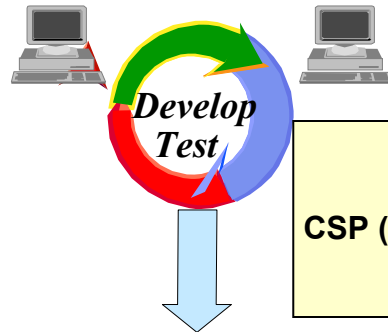


www.eclipse.org

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(2) Cross Platform Solution development Approach with VisualAge Generator

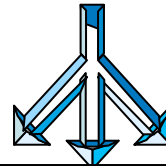
**Rapid
Development**



IBM 4GL history:
CSP (~1981) -> VAGen (~ 1994) -> EGL/ WSED (~2003)
Migration-Options available ...

Generation

Generate



GUI, Java, HTML, C++, COBOL, PL/I

Execution

Execute



AIX



NT



HP/UX



Solaris



Linux



OS/400

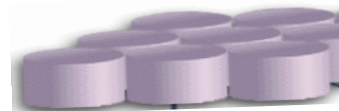


z/VM

z/VSE(CICS, Batch)

z/OS, (CICS, IMS, Batch)

- Multiple platforms
- Client /Server Applications
- Java applets/servlets or standalone
- Multiple database/file support apps



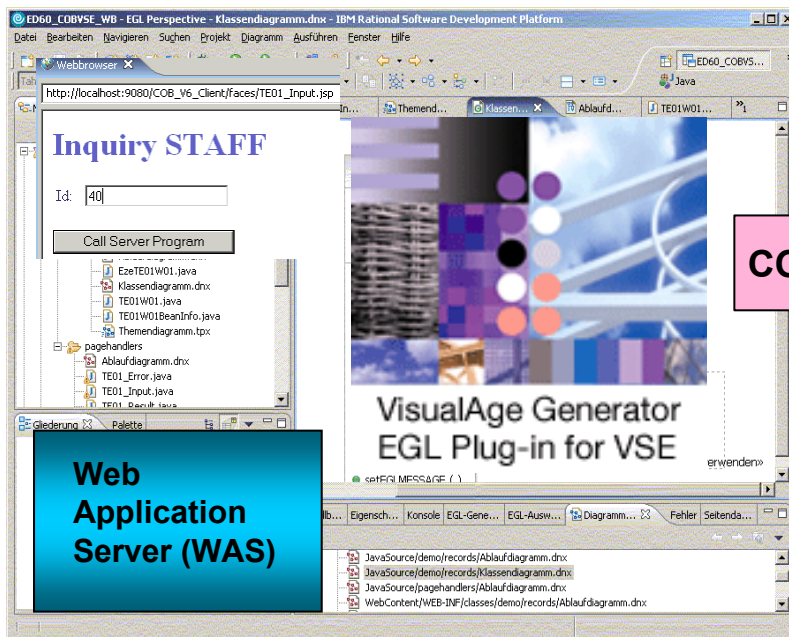
DB2 UDB VSAM ODBC
Oracle DLI, IMS/DB

(2) Cross Plattform Solution development Approach with VisualAge Generator

* **New:** VisualAge Generator EGL Plug-in for VSE *

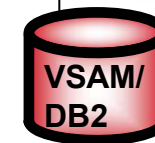
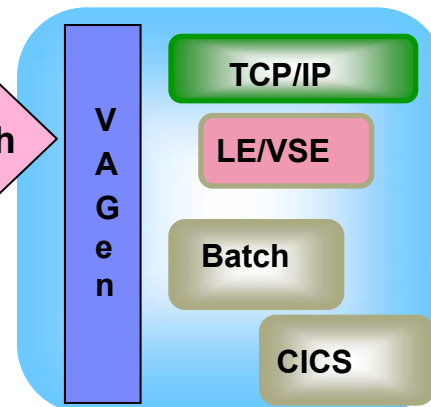
Rational Application Developer (RAD)

z/VSE Server



„Generate“

COBOL/CICS/batch

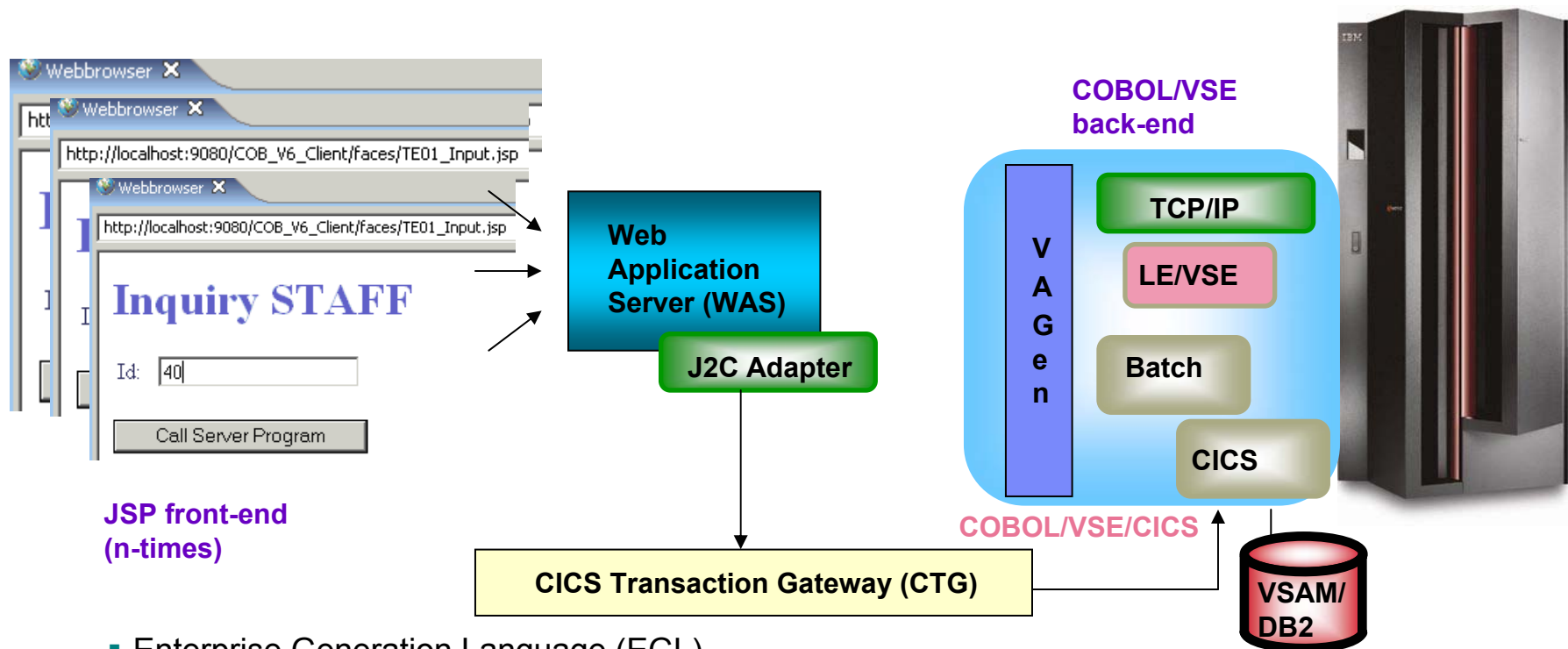


- Enterprise Generation Language (EGL), Visual Age Generator
- Java™ 2 Platform, Enterprise Edition (J2EE) connection Architecture (J2C/JCA)
- Java Server Pages (JSP), dynamic result page known by the Web Application Server (WAS)

Components for the 4GL runtime

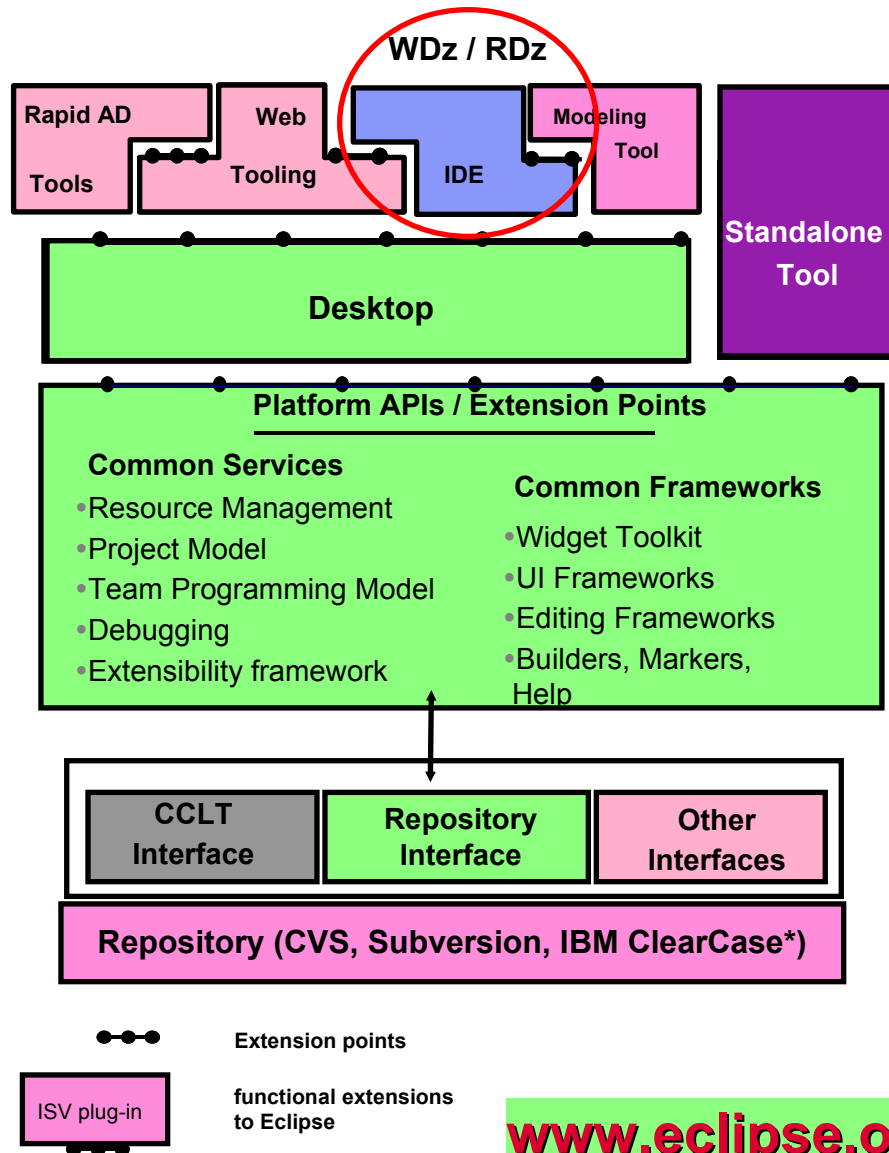
Web Browser

z/VSE Server



- Enterprise Generation Language (EGL)
- Java™ 2 Platform, Enterprise Edition (J2EE) connection Architecture (J2C/JCA)
- Java Server Pages (JSP), dynamic result pages in Web Application Server (WAS)

Eclipse – the open Standard for application development

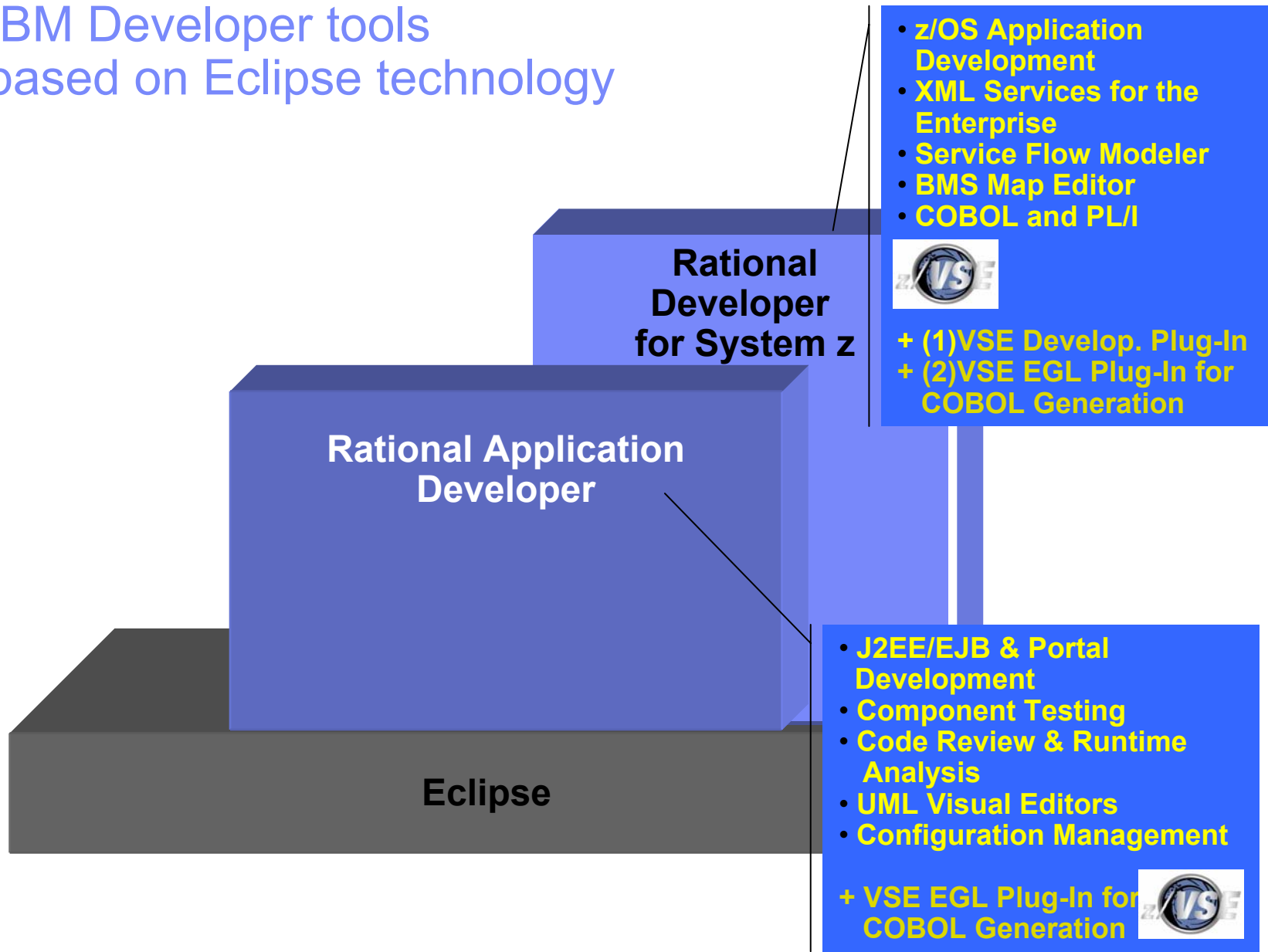


www.eclipse.org

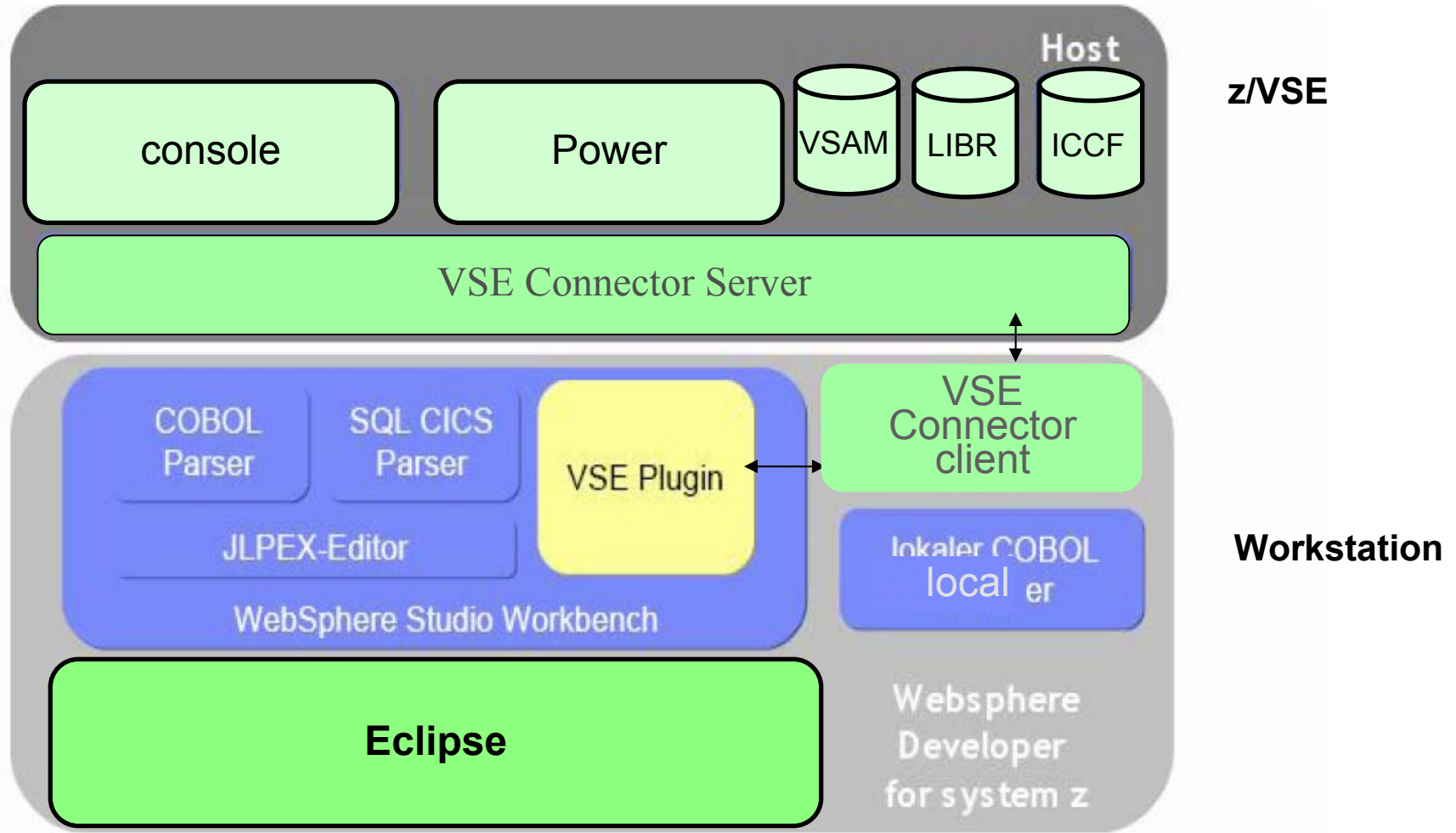
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IBM Developer tools based on Eclipse technology



The IBM Development environment for the enterprise
 WebSphere Developer for System z (WDz)
 Rational Developer for System z (RDZ)
 with z/VSE Development Plug-in

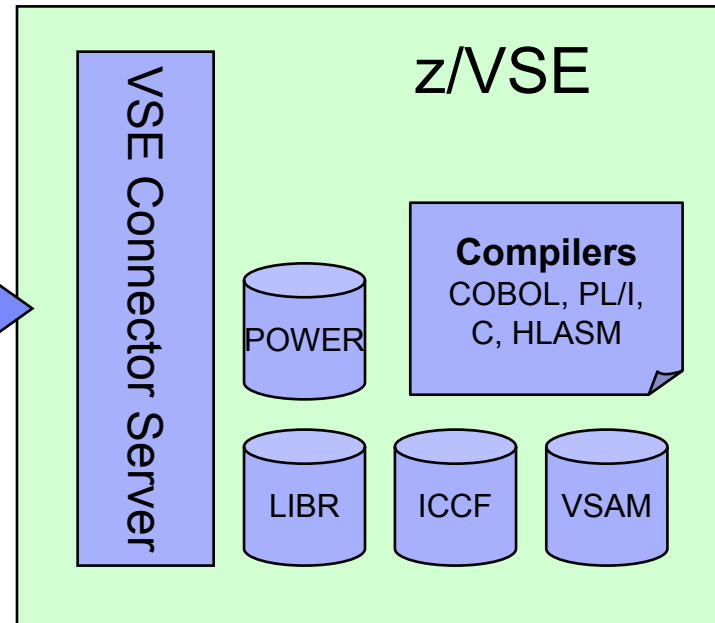
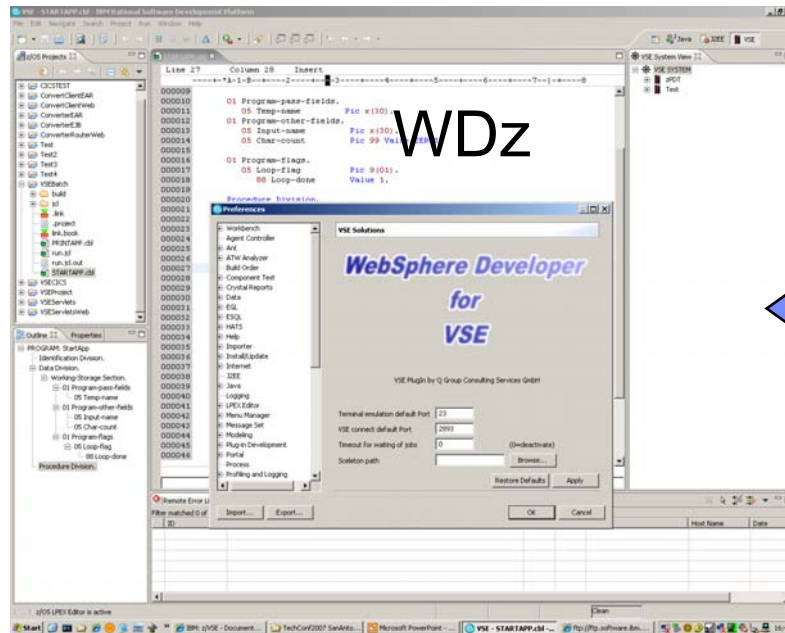


WDz functions for z/VSE and z/OS development

- Enhanced Eclipse tools with mainframe development functions
 - special editor functions for mainframe languages
 - local COBOL compiler
 - support for COBOL, ASM, PL/I, C
 - editor for CICS BMS maps
 - support for SQL generation
 - functions for remote processing and mainframe deployment

- Integrated test environment
 - full functional test within the development environment
 - debug possibility via z/VSE emulation window

(1) Development of COBOL applications in WDz



- Development of COBOL
 - batch and CICS application
 - Source code editing/checking
 - Access to z/VSE within the tool (console and 3270 access)
 - Compile, Link and error feedback from z/VSE
- Additional supported languages: PL/I, ASM, C, BSM Maps

WebSphere Developer (WDz) in z/VSE perspective

The screenshot displays the IBM Rational Software Development Platform interface for z/VSE development. The main editor window shows the source code for a program named PRINTAPP. The code is organized into sections: Identification Division, Data Division, Working-Storage Section, Linkage Section, and Procedure Division. Annotations 1 through 6 highlight specific components of the interface:

- 1. Perspective:** Points to the top menu bar and toolbar.
- 2. View:** Points to the VSE System View tree on the right side of the editor.
- 3. Projects:** Points to the Project Explorer on the left side of the editor.
- 4. Editor:** Points to the central source code editor window.
- 5. Outline View:** Points to the Outline view at the bottom left of the editor.
- 6. VSE Console:** Points to the VSE Mainframe console window at the bottom of the IDE.

The VSE Console window displays a table of system resources:

MAP	AR	0015	SPACE	AREA	V-SIZE	GETVIS	V-ADDR	UNUSED	NAME
	AR	0015	S	SUP	716K		0		\$\$A\$SUPI
	AR	0015	S	SVA-24	1888K	1748K	B3000	768K	
	AR	0015	0	B5 V	1280K	4864K	500000	45056K	
	AR	0015	1	F1 V	1024K	4096K	500000	0K	POWSTART
	AR	0015	2	F2 V	2048K	49152K	500000	0K	CICSICCF
	AR	0015	3	F3 V	600K	14760K	500000	0K	VTAMSTRT
	AR	0015	4	F4 V	2048K	18432K	500000	0K	
	AR	0015	5	F5 V	768K	256K	500000	0K	
	AR	0015	6	F6 V	256K	256K	500000	0K	
	AR	0015	7	F7 V	1024K	19456K	500000	0K	TCPIP00
	AR	0015	8	F8 V	2048K	49152K	500000	0K	
	AR	0015	9	F9 V	256K	256K	500000	0K	
	AR	0015	A	FA V	256K	256K	500000	0K	
	AR	0015	B	FB V	256K	256K	500000	0K	SECSERV
	AR	0015	S	SVA-31	7588K	6748K	3700000		

WebSphere Developer (WDz) in z/VSE perspective

1. Perspective

2. View

3. Projects

7. VSE Terminal

5. Outline View

6. VSE Console

The screenshot displays the IBM Rational Software Development Platform interface. The central window shows a VSE terminal session with the following text:

```

    IESADMS01          VSE/ESA ONLINE
    5609-zV4 and Other Materials (C) Copyright IBM Corp. 2005 and other dates

    ++          ++          VV          VV          88888          EEEEEEE
    ++          ++          VV          VV          8888888          EEEEEEE
    zzzzzz      ++          VV          VV          88          EE
    zzzzzz      ++          VV          VV          888888          EEEEEEE
    zz          ++          VV          VV          888888          EEEEEEE
    zzzzzz      ++          VV          VV          88          EE
    zzzzzz      ++          VVV          888888          EEEEEEE
    zzzzzz      ++          VVV          88888          EEEEEEE

    Your terminal is A002 and its name in the network is D3800001
    Today is 11/09/2007 To sign on to DBDCCIC8 -- enter your:

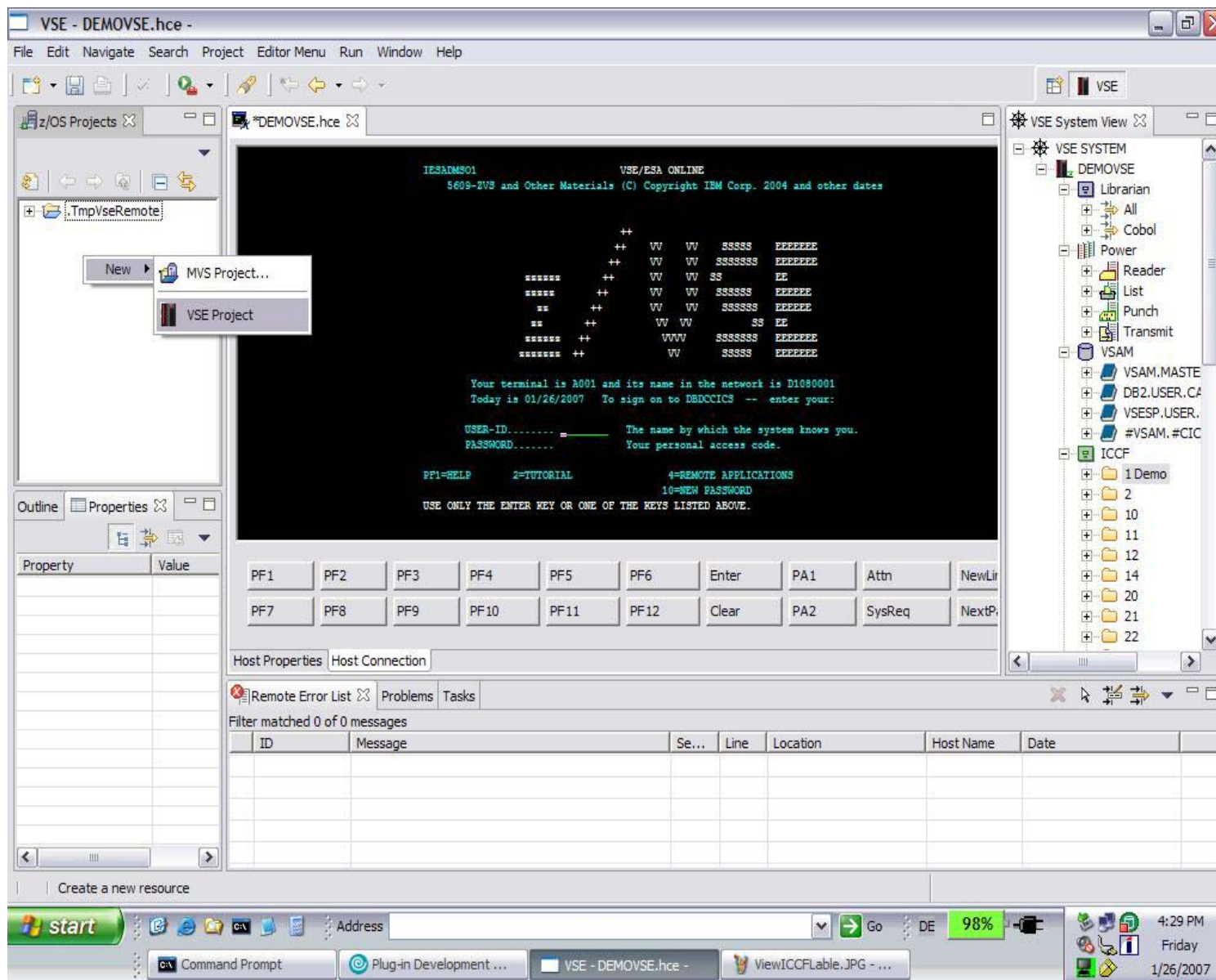
    USER-ID..... The name by which the system knows you.
    PASSWORD..... Your personal access code.

    PF1=HELP      2=TUTORIAL  3=TO VM      4=REMOTE APPLICATIONS
    PF7=          PF8=          PF9=          PF10=     10=NEW PASSWORD
    
```

The VSE Console window at the bottom shows a table of resources:

MAP	AR 0015	SPACE	AREA	V-SIZE	GETVIS	V-ADDR	UNUSED	NAME
	S	SUP		716K		0		\$\$\$SUPI
	S	SVA-24		1888K	1748K	B3000	768K	
	0	BG V		1280K	4864K	500000	45056K	
	1	F1 V		1024K	4096K	500000	0K	POWSTART
	2	F2 V		2048K	49152K	500000	0K	CICSICCF
	3	F3 V		600K	14760K	500000	0K	VTAMSTRI
	4	F4 V		2048K	18432K	500000	0K	
	5	F5 V		768K	256K	500000	0K	
	6	F6 V		256K	256K	500000	0K	
	7	F7 V		1024K	19456K	500000	0K	TCPIP00
	8	F8 V		2048K	49152K	500000	0K	
	9	F9 V		256K	256K	500000	0K	
	A	FA V		256K	256K	500000	0K	
	B	FB V		256K	256K	500000	0K	SECSEVR
	S	SVA-31		7588K	6748K	3700000		

■ Develop a z/VSE project



■ COBOL Syntax checking and highlighting

The screenshot displays the VSE editor interface for the file IGZTMATH.cbl. The main window shows COBOL code with several lines highlighted in red, indicating syntax errors. The error list at the bottom of the editor shows three messages:

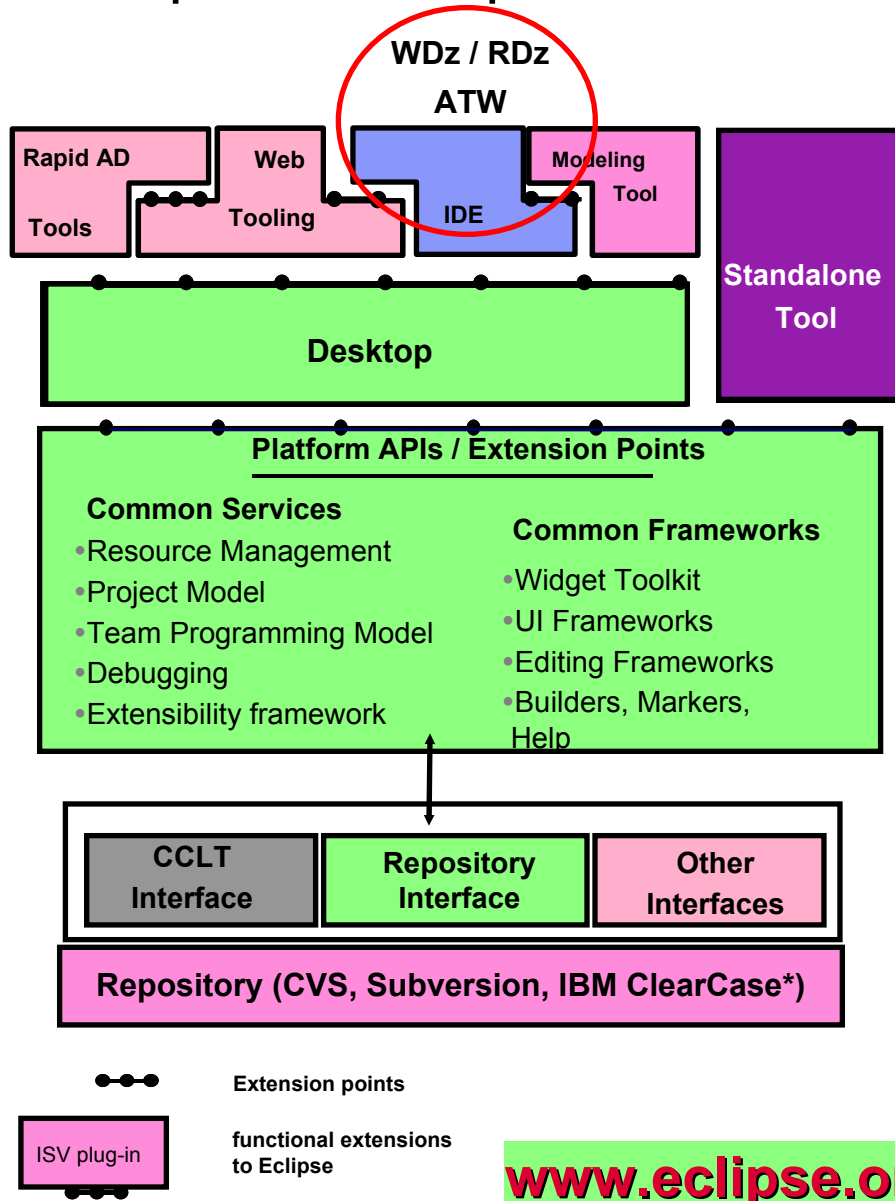
ID	Message	Se...	Line	Location	Host Name	Date
IGYP2106	IGYP2106-S "DIVI" was found in the "VALUE" stat...	2	40	/DEMOVSE/IGZTMATH...	Local	Jan 26, 2007 4:39:27 PM
IGYOS4027	THE SYSTEM OPTION "SYM" IS INTERPRETED AS "...	0	-1	IGZTMATH.C	DEMOVSE	Jan 26, 2007 4:41:09 PM
IGYP2106	"DIVI" WAS FOUND IN THE "VALUE" STATEMENT. ...	2	40	IGZTMATH.C	DEMOVSE	Jan 26, 2007 4:41:09 PM

■ z/VSE local and remote Compile

The screenshot displays the IBM z/VSE development environment. The main window shows a COBOL program named IGTZMATH.CBL. A context menu is open over the file 'IGZT' in the project tree, with the 'VSE' option selected. A sub-menu is visible, showing 'RemoteCompile' as the active option. The editor window shows COBOL code with a syntax error at line 40, column 81, where the word 'DIVISION' is misspelled as 'DIVISION' (with a typo in the original image, likely intended to be 'DIVISION'). The error message reads: 'S2106-S "DIVI" was found in the "VALUE" stat...'. The 'Problems' table at the bottom shows the error details.

Page	Se...	Line	Location	Host Name	Date	
1		2	40	/DEMOVSE/IGZTMATH...	Local	Jan 26, 2007 4:39:27 PM

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(2) Analysis of applications and workflow

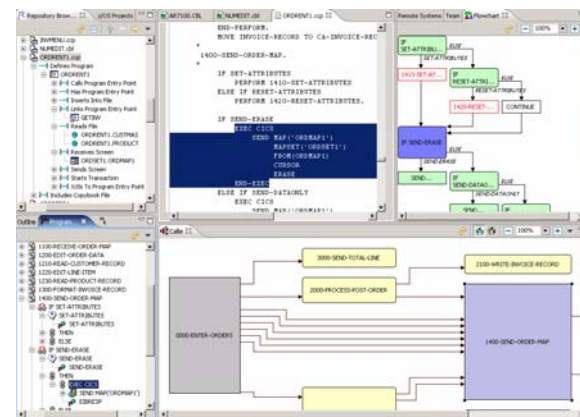
(ATW) Asset Transformation Workbench Analyzer for Eclipse

- Program analysis
 - Program understanding: structure, relationships, logic flow
 - Data impact analysis: within and between programs

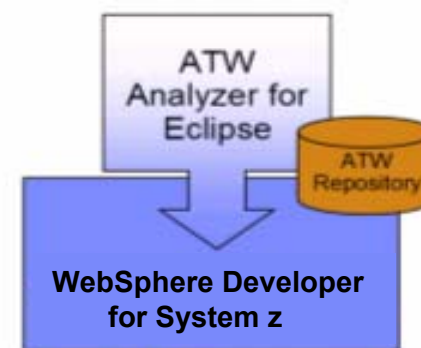
- Find code patterns and anti-patterns
 - Measure complexity
 - uses the source code in the central repository

- Integrated with WebSphere Developer for System z (WDz)
 - Adds ATW perspective to WDz
 - Synchronized with the LPEX editor in WDz

- Built on the technology of Asset Transformation Workbench
 - A core set of developer-oriented analysis tools
 - Can populate, share, or use an existing ATW repository



Multiple synchronized views of the program helps developers to zero in on the code that matters



ATW Analyzer for Eclipse adds five analysis views to WebSphere Developer for System z

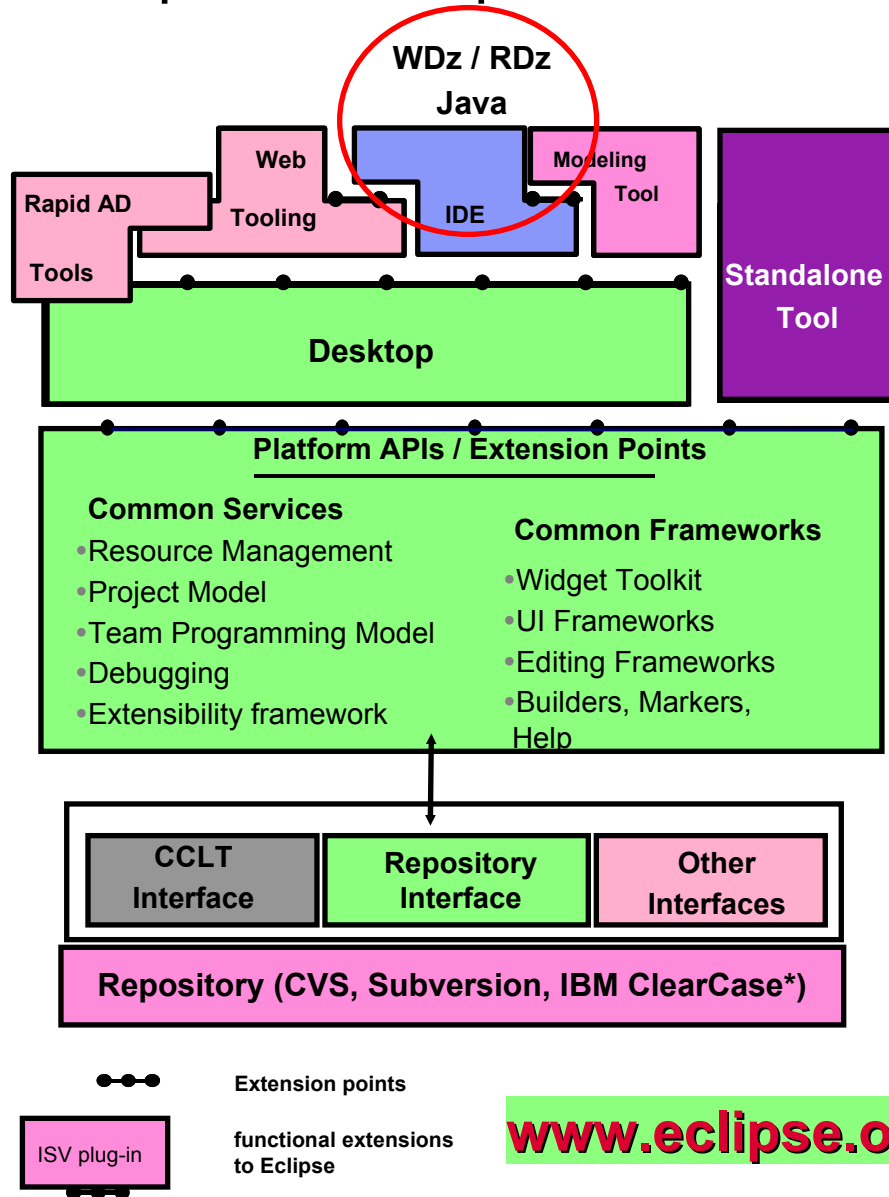
(2) Analysis of applications and workflow (sample)

Asset Transformation Workbench Analyzer for Eclipse

The screenshot displays the Asset Transformation Workbench Analyzer for Eclipse interface, which is used for analyzing and transforming application assets. The interface is divided into several panes:

- Repository Browser (Top Left):** Shows a hierarchical view of the project structure, including files like `INVMENU.ccp`, `NUMEDIT.cbl`, and `ORDRENT1.ccp`. The `ORDRENT1` program is expanded to show its internal structure.
- Code Editor (Top Middle):** Displays the source code for the `ORDRENT1` program. The code includes sections for `END-PERFORM.`, `MOVE INVOICE-RECORD TO CA-INVOICE-REC`, and a main loop starting with `1400-SEND-ORDER-MAP.`. A blue highlight is placed over the `EXEC CICS` block that contains `SEND MAP('ORDMAP1')` and related statements.
- Flowchart (Top Right):** A graphical representation of the code logic. It shows decision points like `IF SET-ATTRIBU...` and `IF RESET-ATTRI...`, leading to actions such as `1410-SET-AT...`, `1420-RESET...`, and `CONTINUE`. A blue box highlights the `IF SEND-ERASE` decision point.
- Outline (Bottom Left):** Provides a detailed view of the program's structure, listing various procedures and their internal components. The `EXEC CICS` block is highlighted in blue.
- Call Graph (Bottom Right):** A Callie diagram showing the relationships between different procedures. A large grey box labeled `0000-ENTER-ORDERS` is shown on the left, with arrows pointing to several yellow boxes representing sub-procedures: `3000-SEND-TOTAL-LINE`, `2000-PROCESS-POST-ORDER`, and `2100-WRITE-INVOICE-RECORD`. A large blue box labeled `1400-SEND-ORDER-MAP` is shown on the right, which is the target of the analysis.

Eclipse – the open Standard for application development

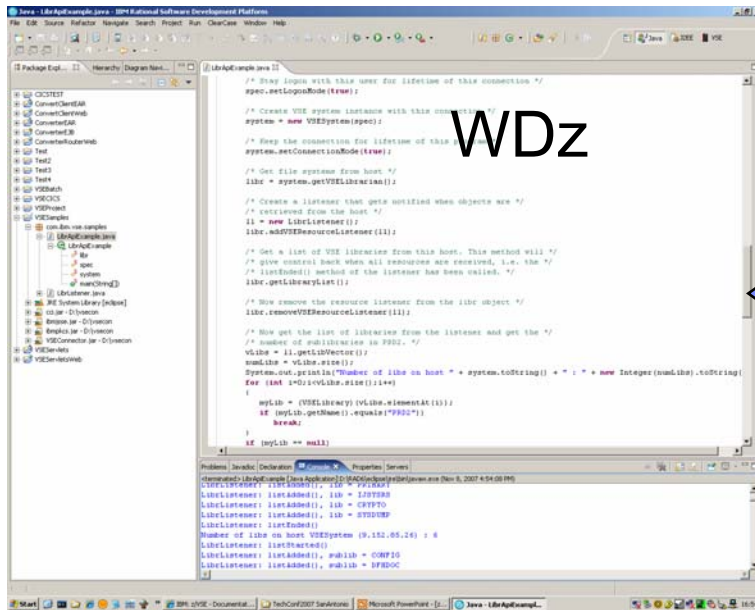


www.eclipse.org

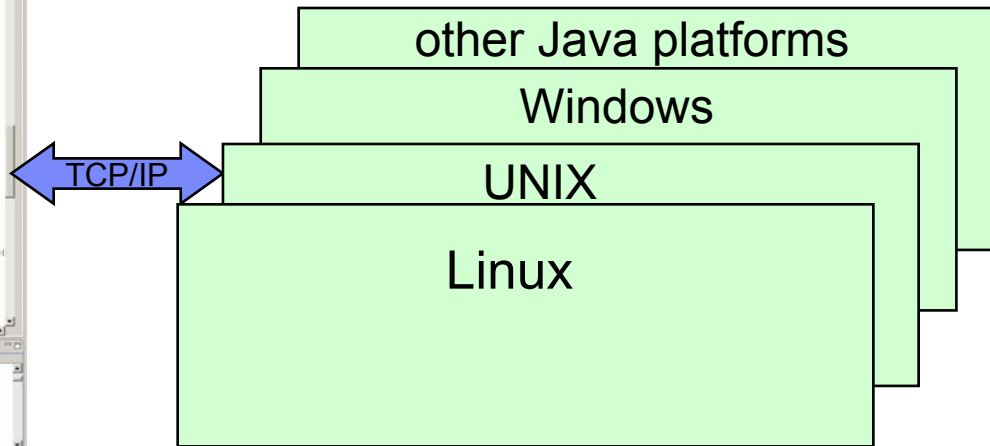
What is Eclipse about:

- Open source development framework
 - with modern Editors
 - syntax help & check
 - semantic check
- Centralized source code maintenance
 - entire source code in central Repository
 - cross platform project administration
- Versioning software interface
 - CVS, Subversion, or IBM ClearCase
 - automatic Workgroup-control
 - i.e. development groups, system group
- Open for ISVs development Plug-Ins
 - Integrated Development Environments (IDE)
 - for System z (WDz, RDz)
 - for Java, COBOL, PL/I, ASM,C
 - Application analysis and optimization
 - Analyze the applications and workflows with graphical correlations
 - **IBM HATS Development Plug-In**
 - develop new front-ends to 3270 apps.
 - **IBM EGL development Plug-In for z/VSE**
 - follow-on to Visual Age Generator

(3) Development of Java applications in WDz



WDz



- Development of native Java applications
 - for systems like UNIX, Linux, Windows or other Java platforms
 - Edit, compile and Build
 - Test the Java application in the integrated WebSphere test environment and access z/VSE resources
 - additional supported languages are C, C++, REXX
- Development of Java applications to access z/VSE resources
 - use of z/VSE Java-Based Connectors
 - develop SOA components to access z/VSE services

Conclusion: Development for all platforms with one tool set

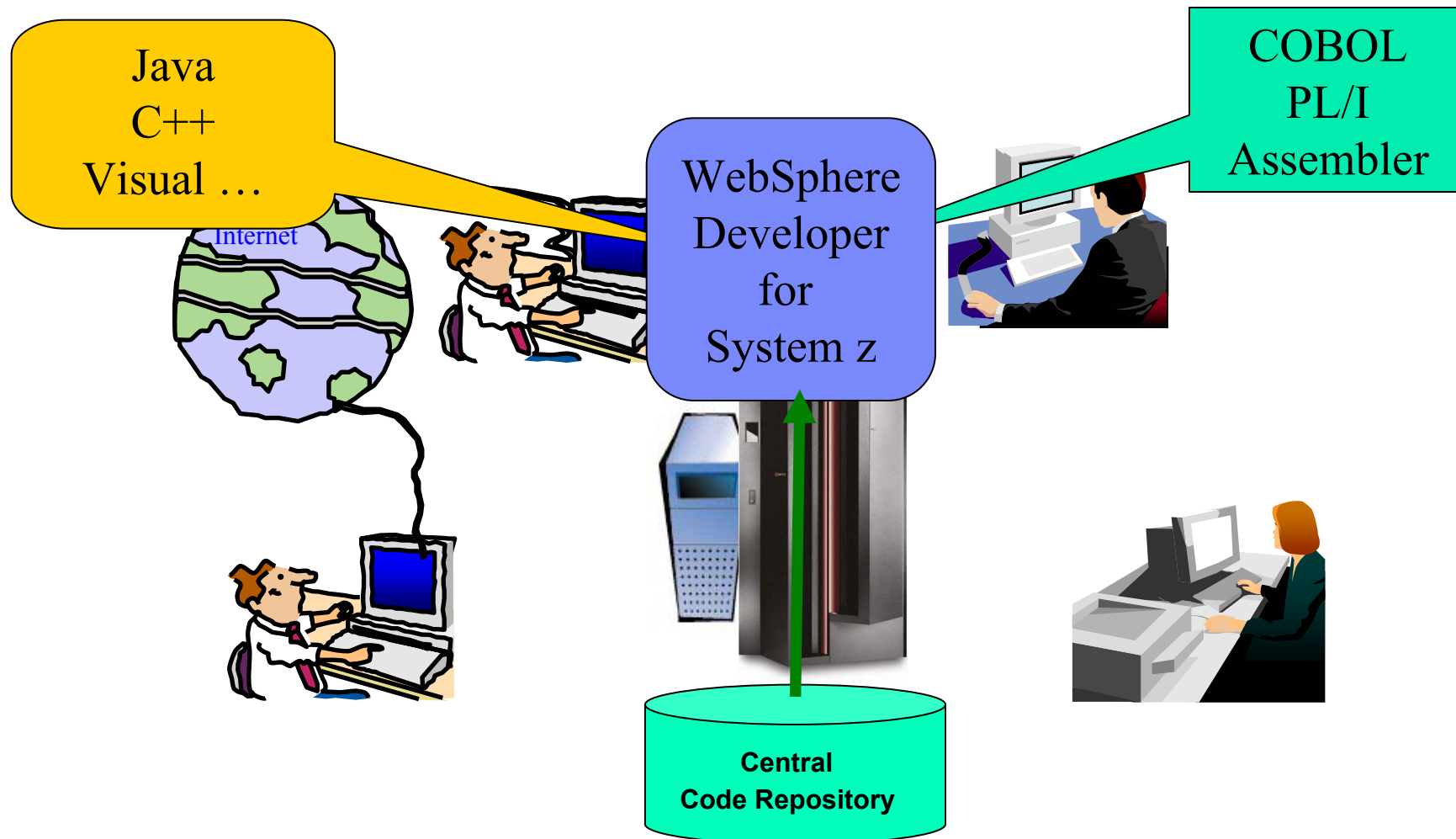
- A modern tool set to support z/VSE development and maintenance
 - modern editor for enhanced productivity
 - tools to analyse and optimize existent applications and workflow

- Common framework for enterprise development
 - standard for all developers
 - example: z/VSE with COBOL, Linux on System z with Java
 - easy skill transfer

- Open source framework
 - commonly thought in schools and universities
 - smooth introduction of new developers to the mainframe

Summary

Eclipse – an open Integrated Development Environment for the enterprise



z/VSE Additional Information

- z/VSE Home Page
<http://www.ibm.com/servers/eserver/zseries/zvse/>
- z/VSE Solutions and Utilities
<http://www-1.ibm.com/servers/eserver/zseries/zvse/solutions/>
- WDz
<http://www.ibm.com/software/awdtools/wdzseries/>
- WDz Plug-In for VSE
<http://www.qgrp.de/index.php?show=produkte&id=1&detail=wdz>



- e-business Solutions for VSE/ESA SG24-5662
- e-business Connectivity for VSE/ESA SG24-5950
- CICS Transaction Server for VSE/ESA
CICS Web Support SG24-5997
- Handbook For WebSphere (Connectors to z/OS and VSE) SG24-7042

We appreciate your comments on z/VSE: zvse@de.ibm.com