



IBM System z Technical Conference Dresden – Germany – May 5-9



Integrated Application Development for z/VSE based on Eclipse

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		z/VM
		zSeries
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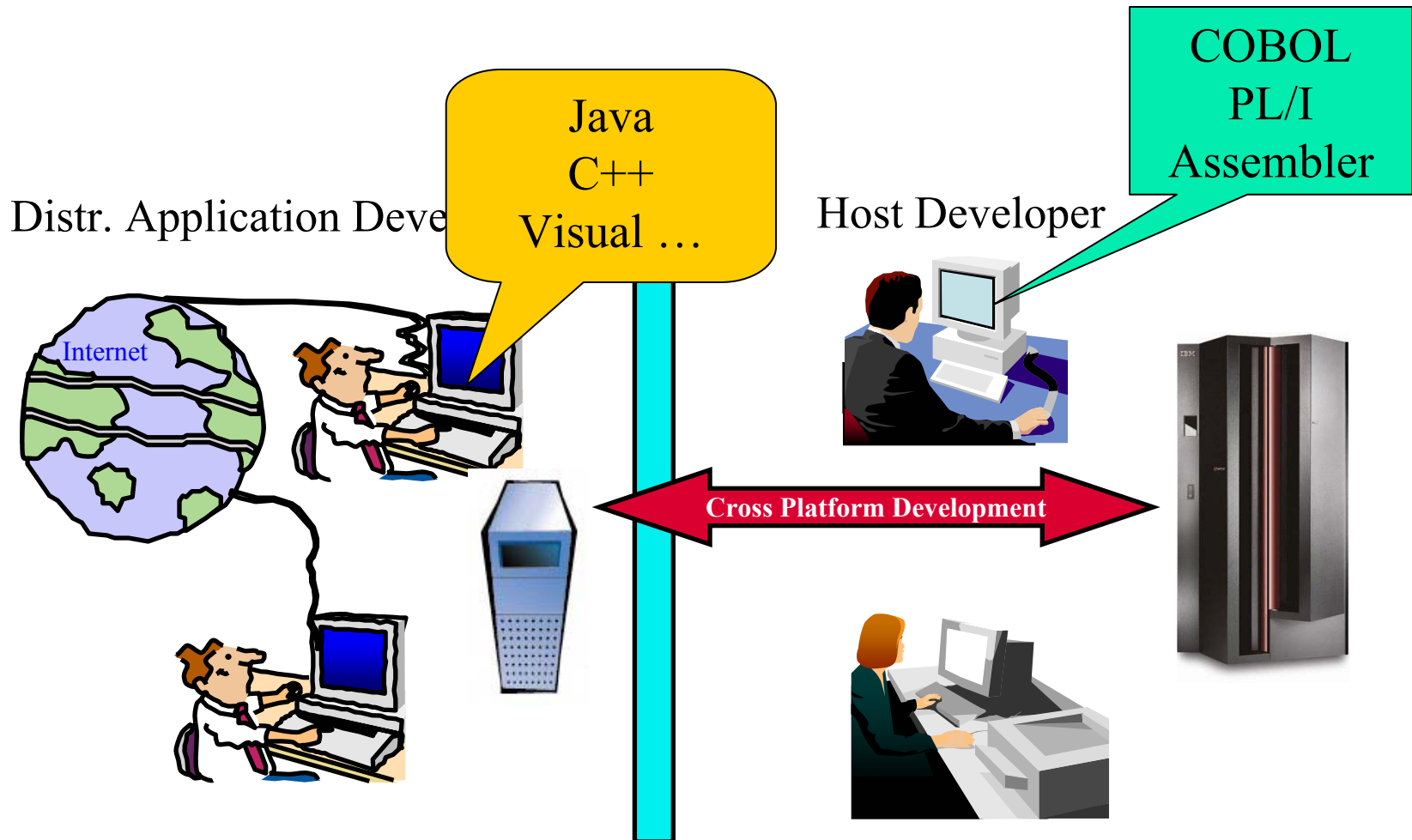
Development objectives !!!

- 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

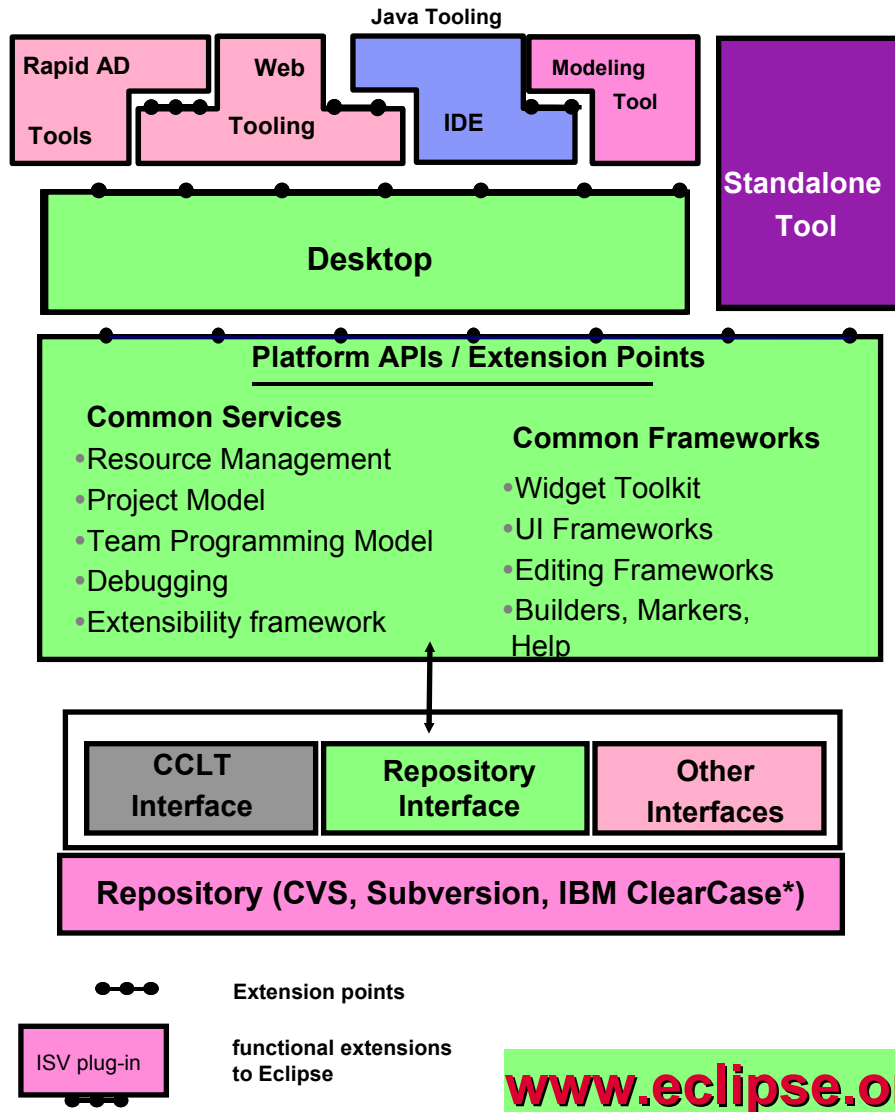
- Develop for multiple platforms
 - common framework for the enterprise instead of multiple unique platform dependent tools
 - same basic tool set for open systems and mainframe

- 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

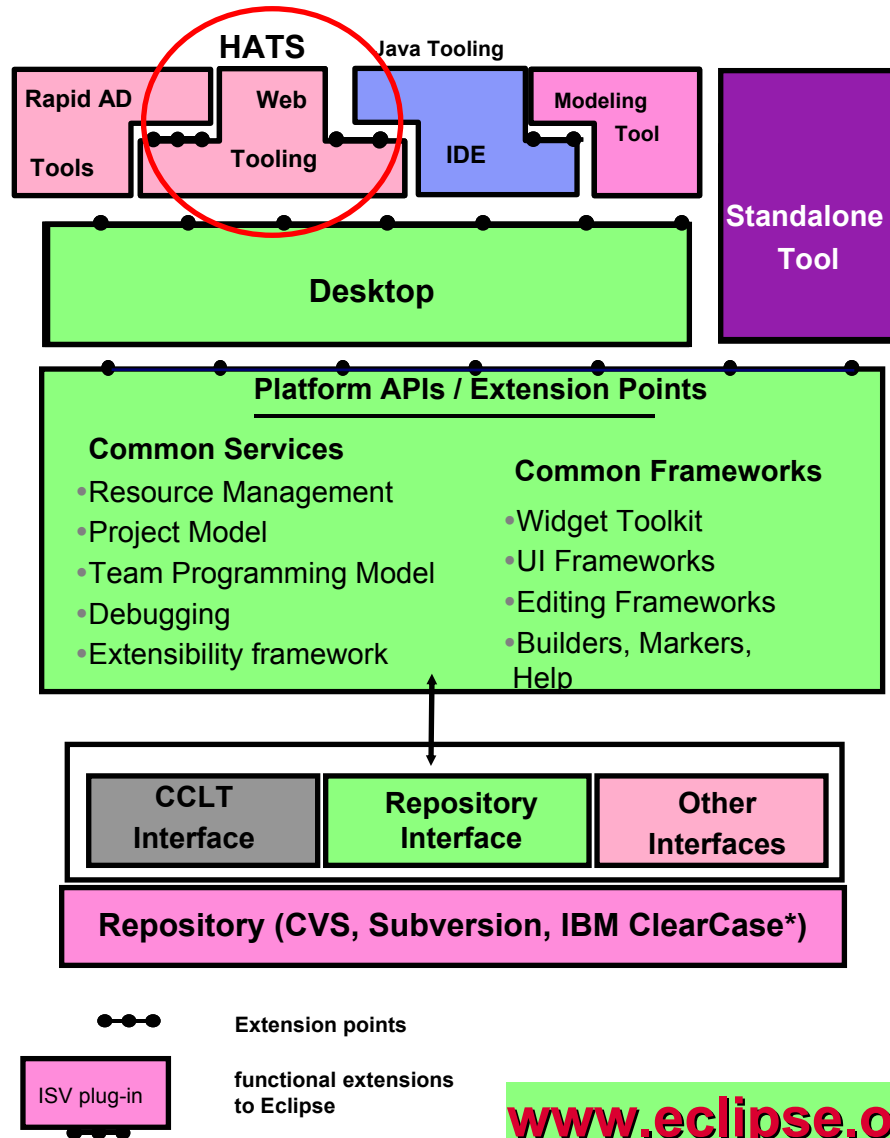


www.eclipse.org

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

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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.



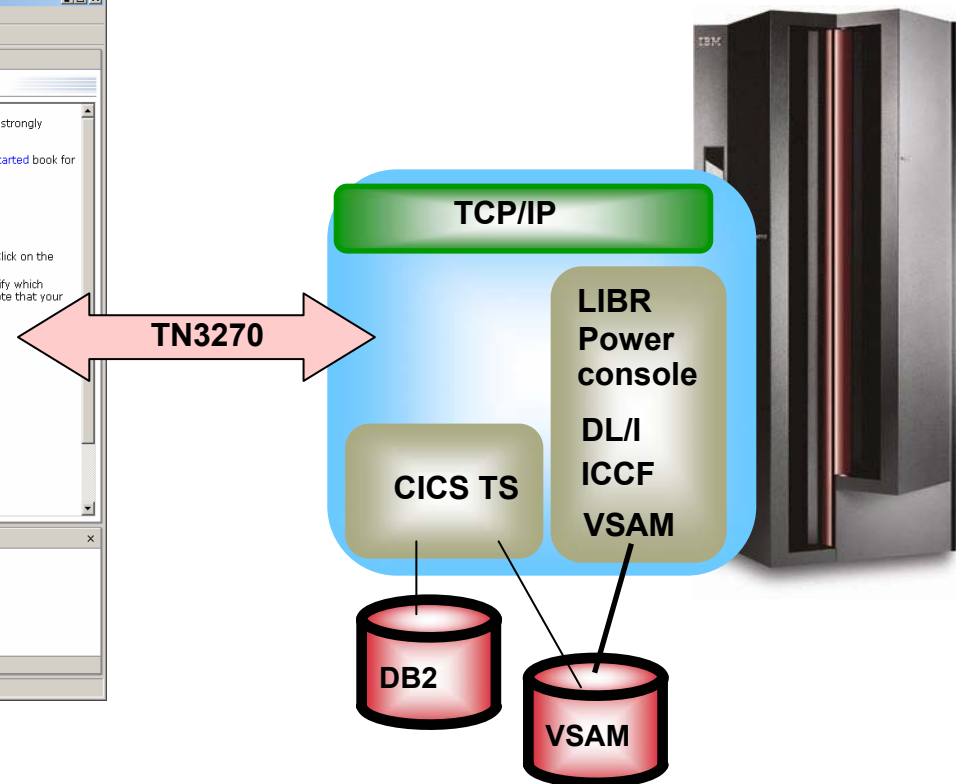
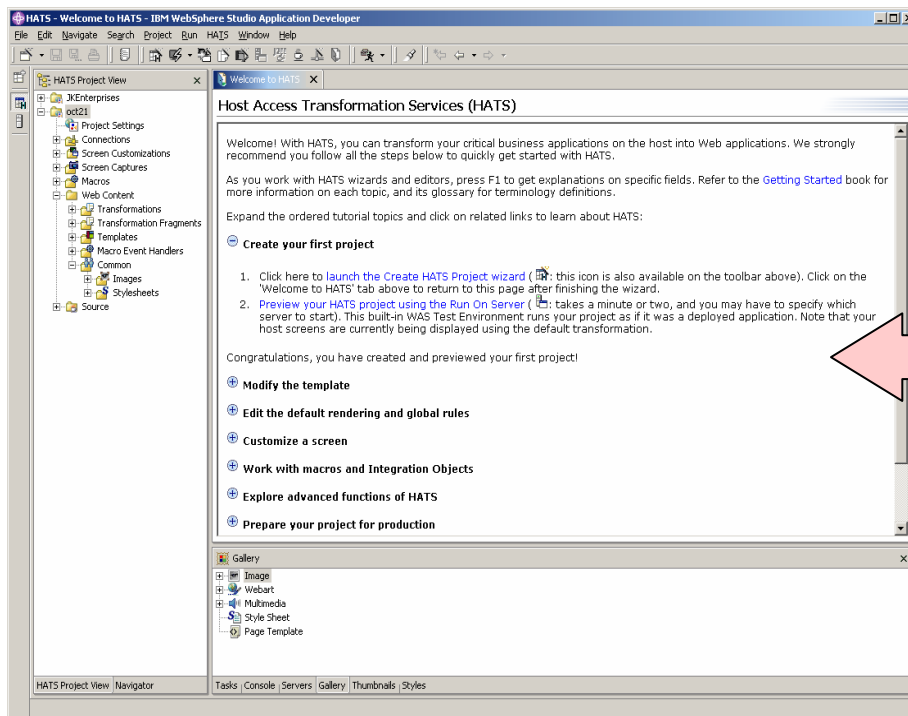
Benefit: Easily extend existing applications to the web

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

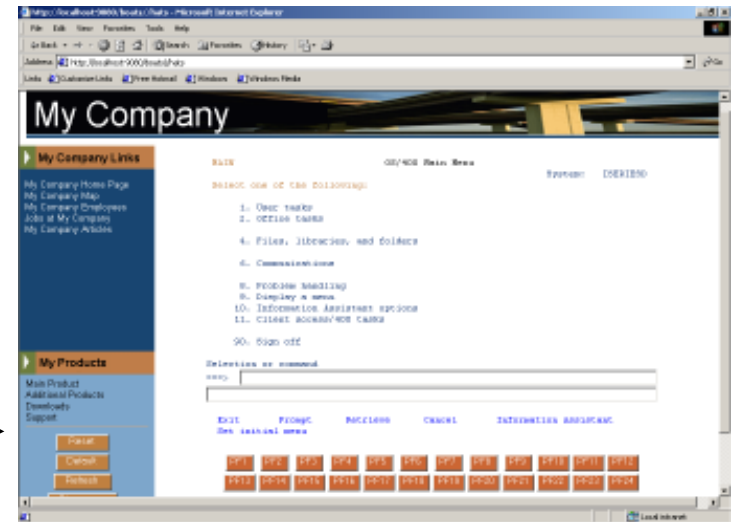
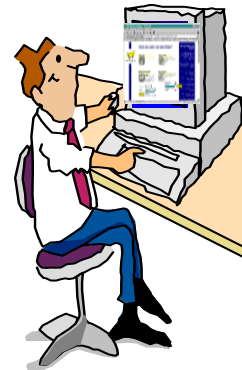
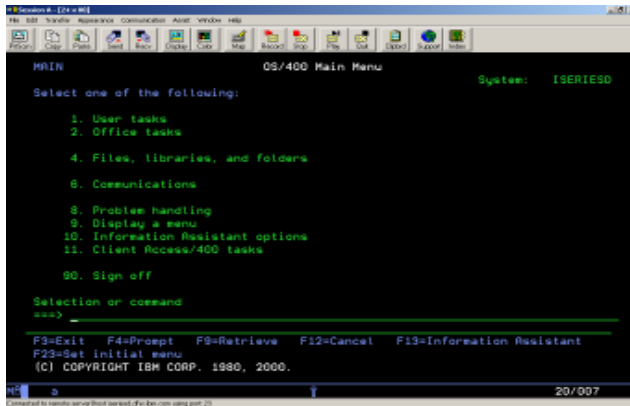
Query Directory: c:\

93 Dir(s) 22,888,353,792 bytes free

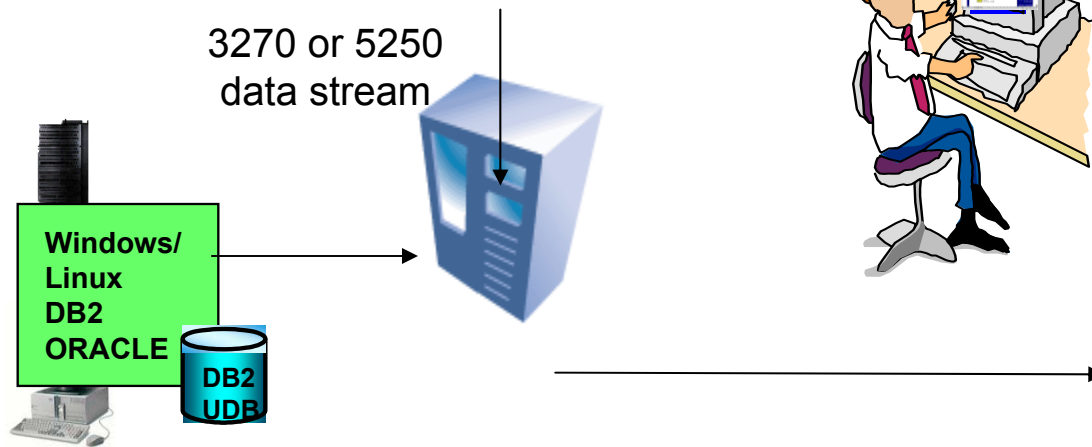
14 File(s) 4,175,691 bytes

Application Integration with Host Access Transformation Services

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

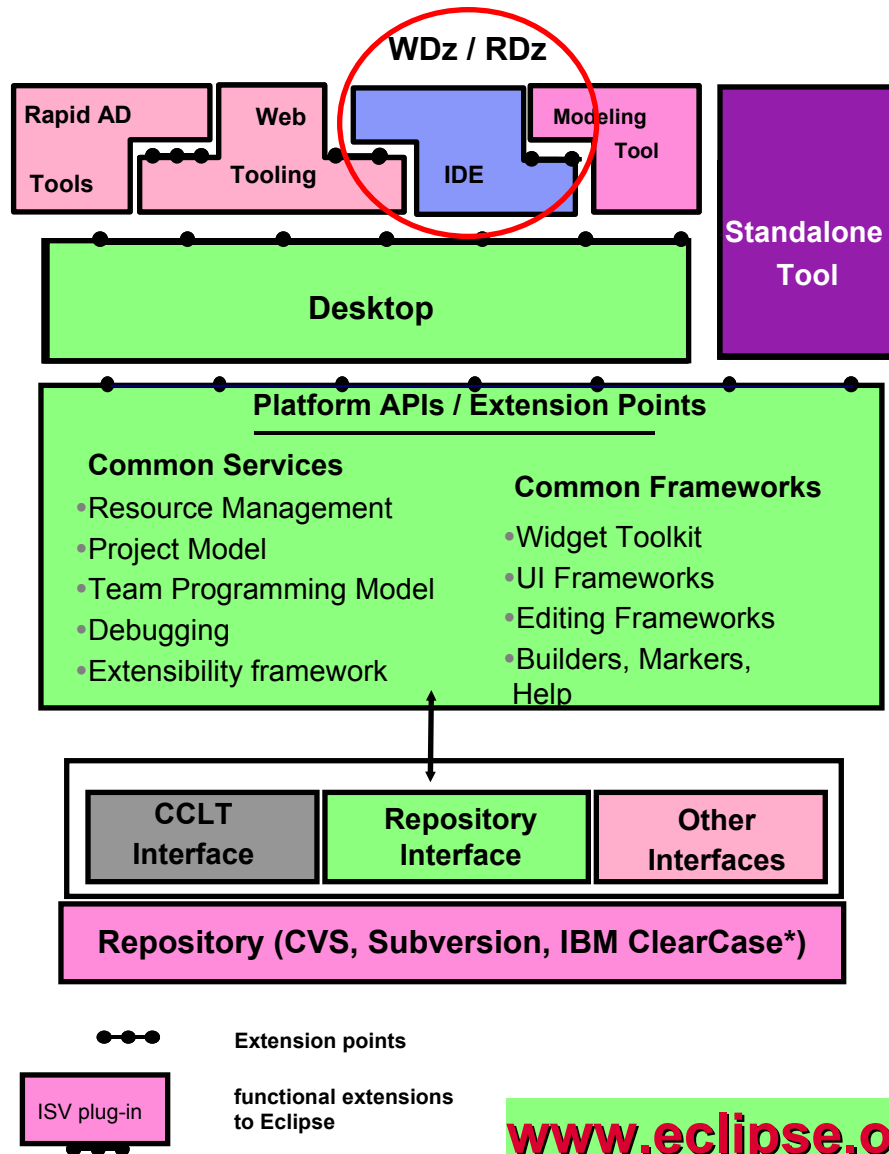


HTML in a Browser



Screen transformation rules running on WebSphere Application Server

Eclipse – the open Standard for application development

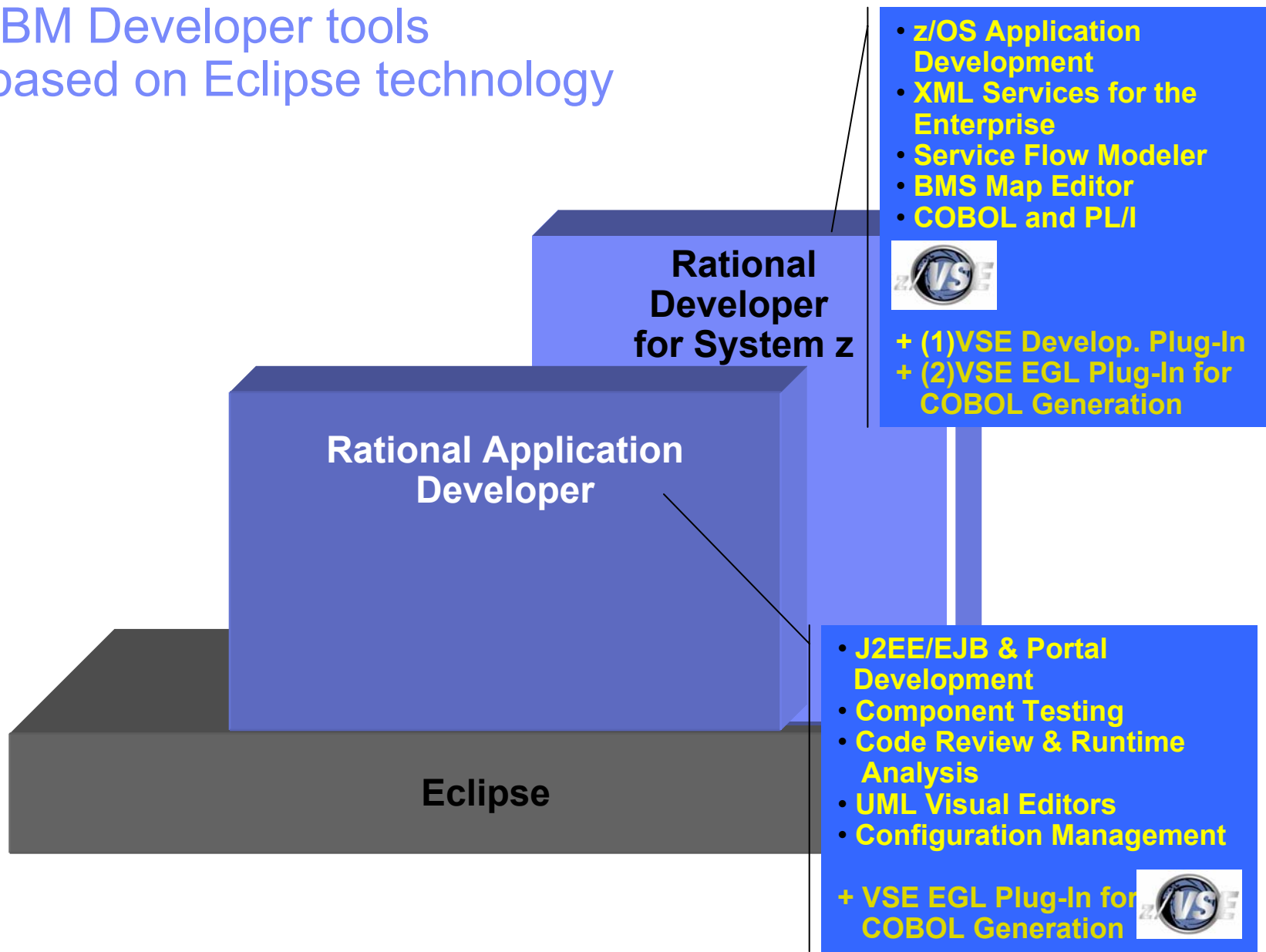


www.eclipse.org

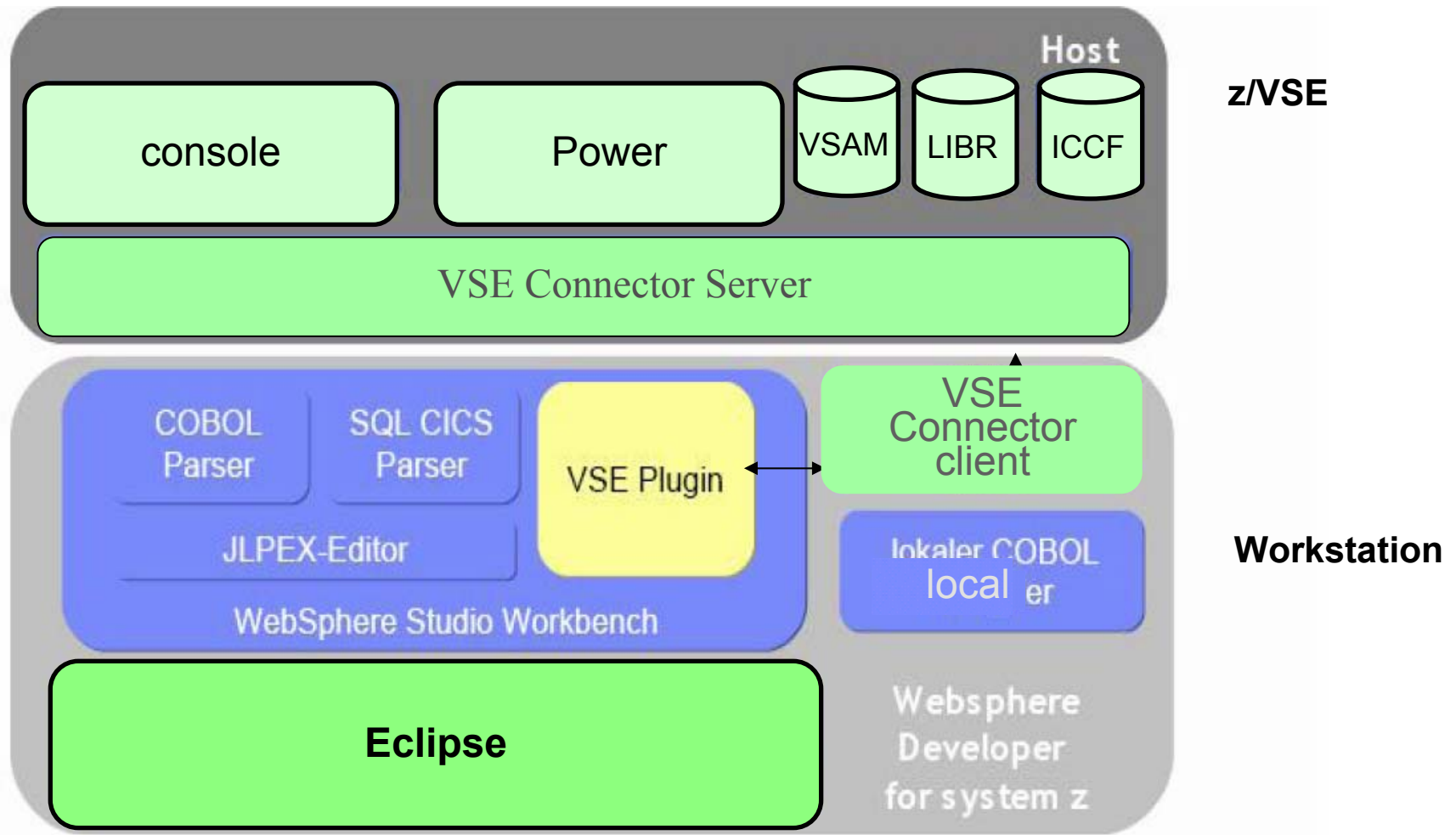
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IBM Developer tools based on Eclipse technology



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

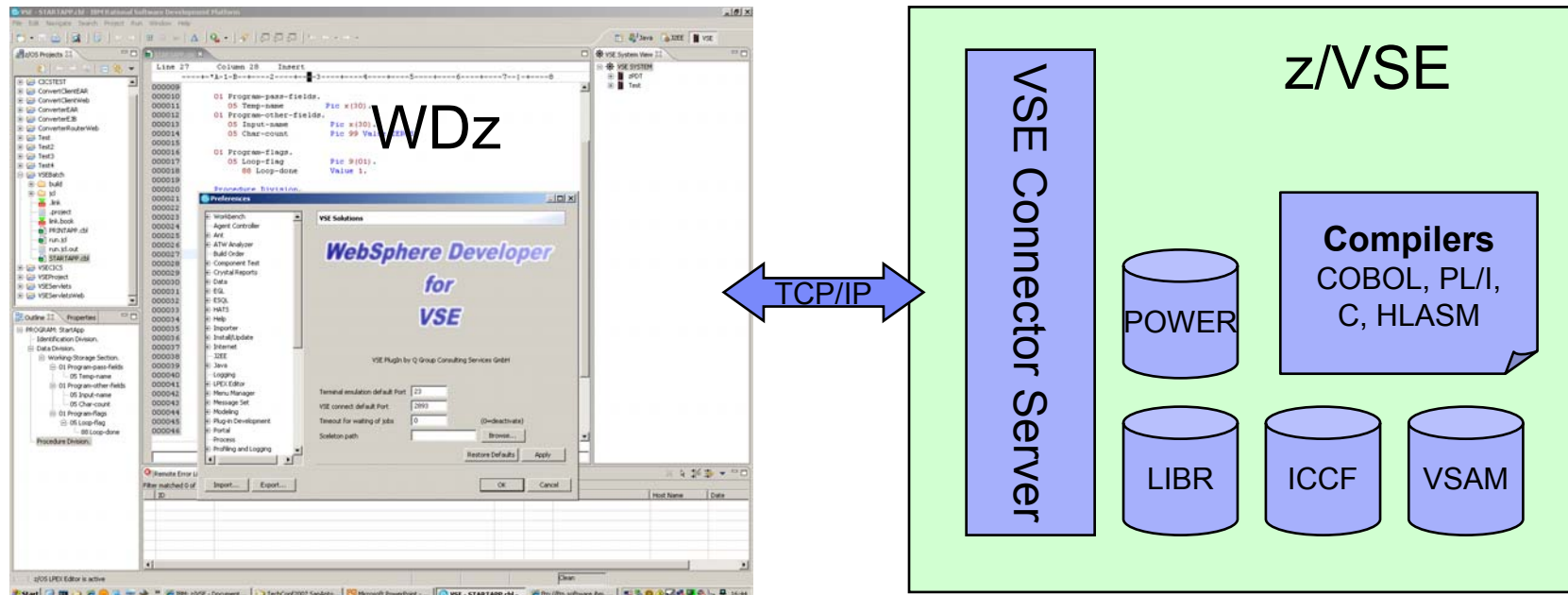


WDz functions for z/VSE and z/OS development

- 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 VSE development. The main editor window shows the source code for 'PRINTAPP.cbl' with annotations 1 through 6 highlighting key components: 1. Perspective (the overall IDE window), 2. View (the VSE System View tree on the right), 3. Projects (the z/OS Projects tree on the left), 4. Editor (the central code editor), 5. Outline View (the Outline and Properties panels at the bottom left), and 6. VSE Console (the VSE Mainframe console window at the bottom right).

1. Perspective

2. View

3. Projects

4. Editor

5. Outline View

6. VSE Console

The VSE Console window displays the following table:

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		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

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

```

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

      ++      VV      VV      88888      EEEEEEE
      ++      VV      VV      8888888      EEEEEEE
      ++      VV      VV      88      EE
zzzzzz      ++      VV      VV      888888      EEEEEEE
zz      ++      VV      VV      888888      EEEEEEE
zz      ++      VV      VV      88      EE
zzzzzz      ++      VVVV      8888888      EEEEEEE
zzzzzzzz      ++      VV      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
                10=NEW PASSWORD
    
```

Annotations on the screenshot include:

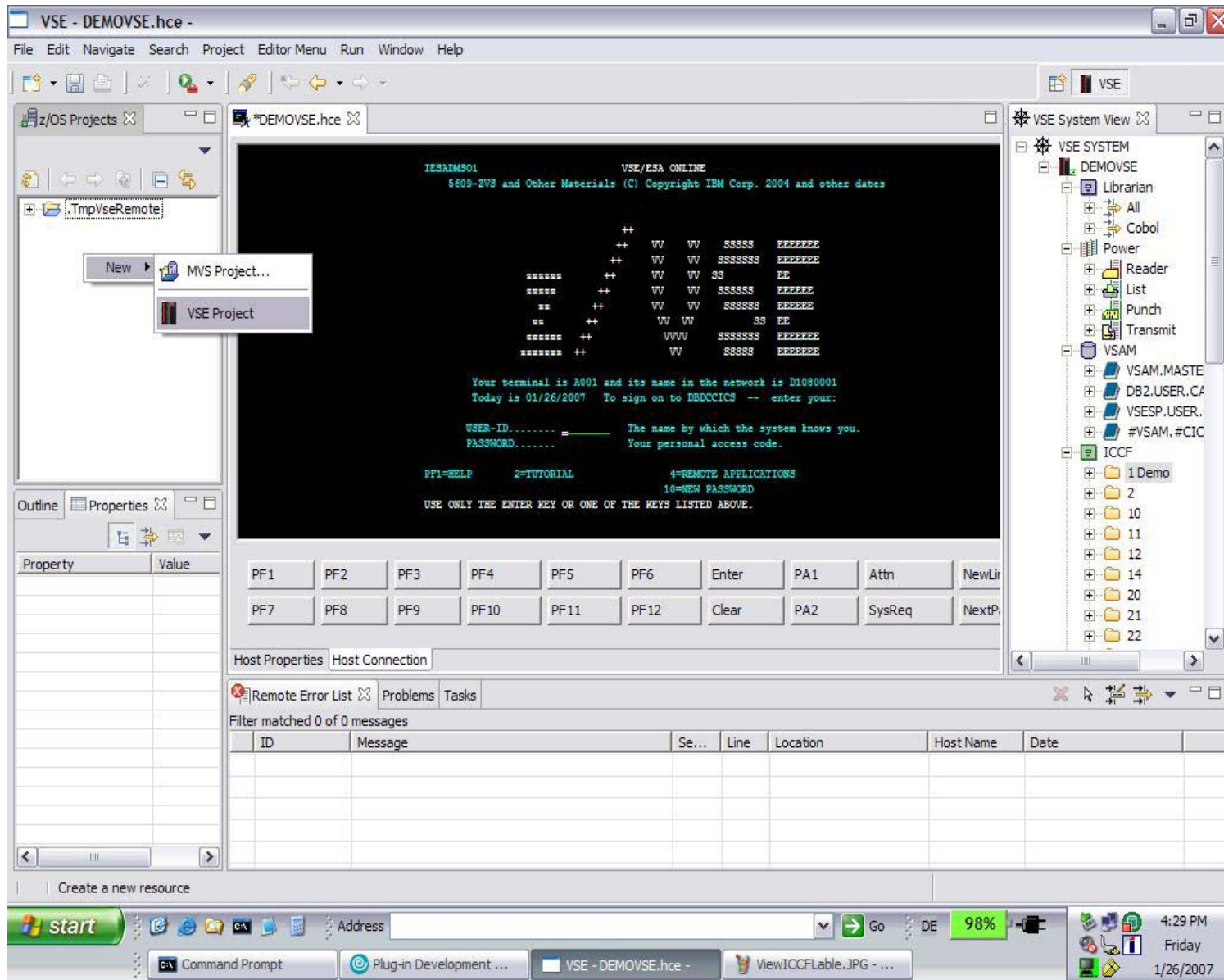
- 1. Perspective**: Points to the top menu bar.
- 2. View**: Points to the VSE System View tree on the right.
- 3. Projects**: Points to the z/OS Projects tree on the left.
- 4. VSE Terminal**: Points to the main terminal window.
- 5. Outline View**: Points to the Outline and Properties panels at the bottom left.
- 6. VSE Console**: Points to the VSE Console window at the bottom.
- 7. VSE Terminal**: Points to the terminal window (repeated).

The VSE Console window shows a table of resources:

MAP	AR	0015	SPACE	AREA	V-SIZE	GETVIS	V-ADDR	UNUSED	NAME
	AR	0015	S	SUP	716K		0		\$\$\$SUPI
	AR	0015	S	SVA-24	1888K	1748K	B3000	768K	
	AR	0015	0	BG 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	VTAMSTRI
	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		

17 For a live demo of these functions, join the next LVC on March 27, 2008

■ **Develop a z/VSE project**



■ **COBOL Syntax checking and highlighting**

The screenshot shows the VSE editor interface with the following components:

- Editor Window:** Displays COBOL code for 'IGZTMATH.cbl'. A syntax error is highlighted in red at line 40, column 81, indicating an 'Insert' operation. The code includes:


```

                02 Condition-Token-Value.          00027000
                COPY CEEIGZCT.                    00028000
                03 Case-1-Condition-ID.           00029000
                   04 Severity PIC S9(4) BINARY. 00030000
                   04 Msg-No PIC S9(4) BINARY.   00031000
                03 Case-2-Condition-ID           00032000
                   REDEFINES Case-1-Condition-ID.
                   04 Class-Code PIC S9(4) BINARY. 00034000
                   04 Cause-Code PIC S9(4) BINARY. 00035000
                03 Case-Sev-Ctl PIC X.           00036000
                03 Facility-ID PIC XXX.          00037000
                02 I-S-Info PIC S9(9) BINARY.    00038000
                00039000
                PROCEDURE DIVISION.             00040000
                00041000
                PARA-MTHSLOG.                   00042000
                MOVE 5.65 TO ARG1RS.             00043000
                CALL 'CEE5SLOG' USING ARG1RS, FC, RESLTRS. 00044000
                *****                          00045000
                *****                          00046000
            
```
- Project Explorer:** Shows the project structure including 'DEMOVSE' and its subfolders like 'build', 'BuildOutput', and 'jd'.
- Remote Error List:** Filtered to show 3 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 VSE IDE interface. The main window shows a COBOL program named IGZTMATH.cbl. A context menu is open over the file 'IGZTMATH.cbl' in the project tree. The menu options include 'New', 'Go Into', 'Go To', 'Open', 'Open With', 'Refresh', 'Expand', 'Collapse', 'Rename...', 'Copy', 'Move...', 'Delete...', 'Search...', 'Run', 'Debug', 'Team', 'Compare With', 'Replace With', 'VSE', 'Host Connection Emulator Support', 'Local Syntax Check', 'Nominate as Entry Point(B)', and 'Open Welcome Page(Q)'. The 'VSE' option is expanded to show 'RemoteCompile', 'Info', and 'Upload'. The code editor shows the following code snippet:

```

Line 40      Column 81      Insert
--*A-1-B--+-----2-----+3-----+4-----+5-----+6-----+7-----+8
02 Condition-Token-Value.
COPY CEEIGZCT.
03 Case-1-Condition-ID.
04 Severity      PIC S9(4) BINARY.
04 Msg-No       PIC S9(4) BINARY.
03 Case-2-Condition-ID
   REDEFINES Case-1-Condition-ID.
04 Class-Code   PIC S9(4) BINARY.
04 Cause-Code   PIC S9(4) BINARY.
Case-Sev-Ctl   PIC X.
Facility-ID    PIC XXX.
Info          PIC S9(9) BINARY.

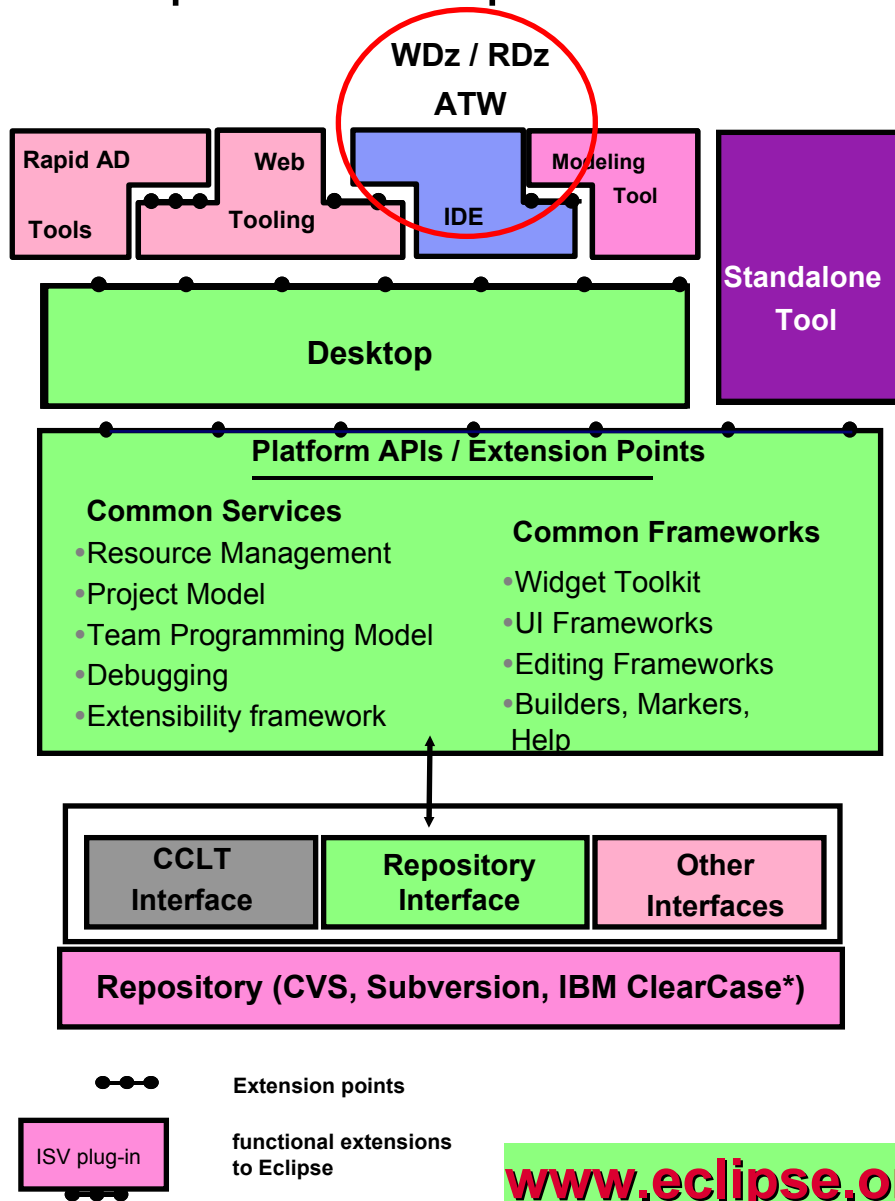
```

The 'Problems' window at the bottom shows the following error:

Page	Se...	Line	Location	Host Name	Date
1	S2106-S	2	'DIVI' was found in the 'VALUE' stat...	Local	Jan 26, 2007 4:39:27 PM

The system tray at the bottom right shows the date as Friday, 1/26/2007, and the battery level as 98%.

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(2) Analysis of applications and workflow

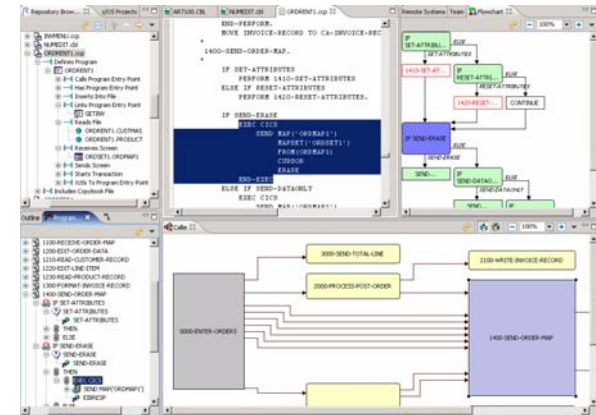
(ATW) Asset Transformation Workbench Analyzer for Eclipse

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

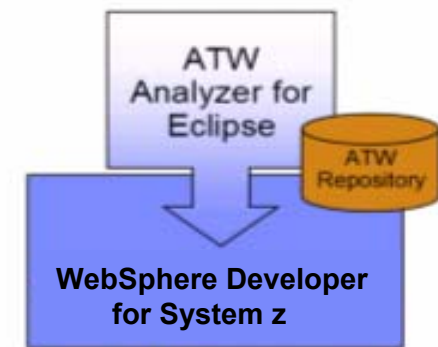
- Find code patterns and anti-patterns
 - Measure complexity
 - uses the source code in the central repository

- 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

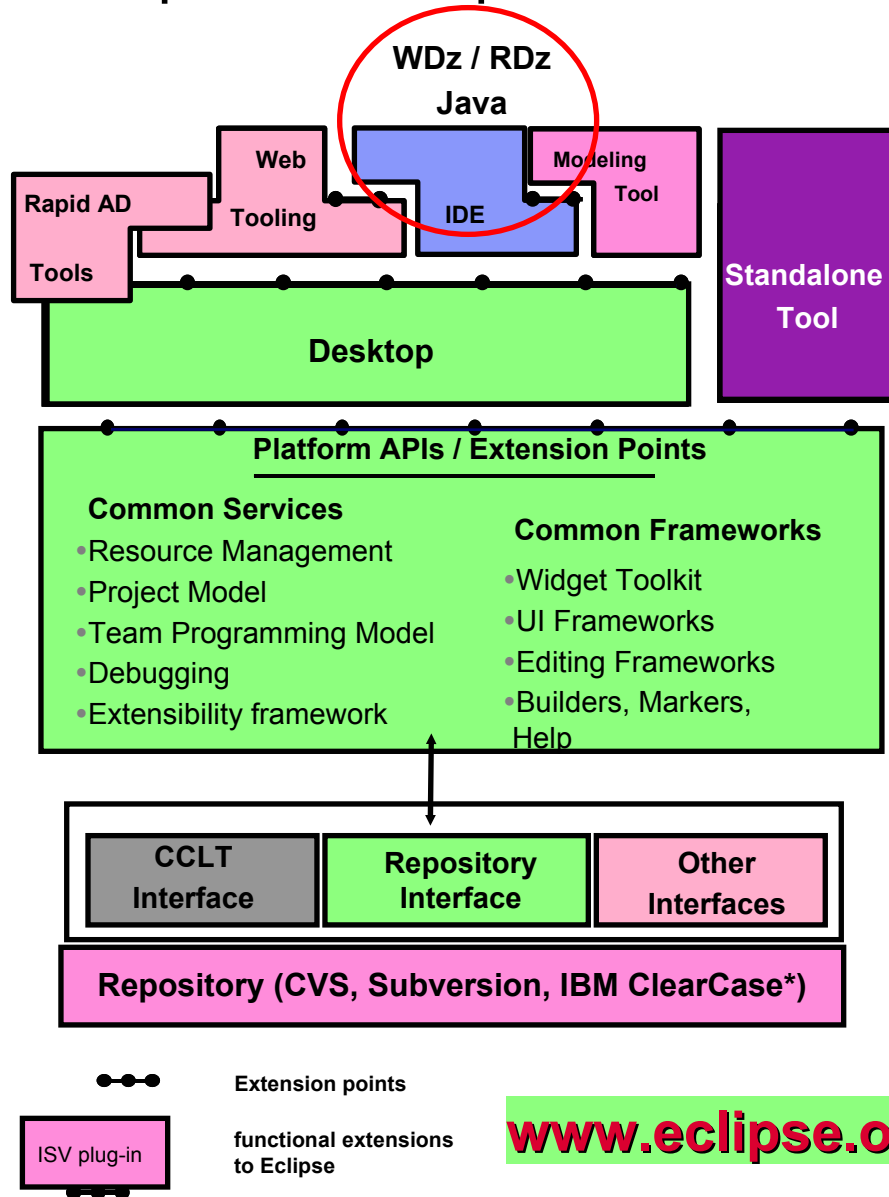
(2) Analysis of applications and workflow (sample)

Asset Transformation Workbench Analyzer for Eclipse

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

- Repository Browser (Left):** Shows a tree view of project files, including INVMENU.ccp, NUMEDIT.cbl, and ORDRENT1.ccp. The ORDRENT1.ccp file is expanded to show its internal structure, including a 'Defines Program' section for ORDRENT1.
- Code Editor (Top Center):** Displays the source code for ORDRENT1.cbl. The code includes sections for 'END-PERFORM', '1400-SEND-ORDER-MAP', and conditional logic for 'IF SET-ATTRIBUTES', 'IF RESET-ATTRIBUTES', and 'IF SEND-ERASE'. A blue highlight is placed over the 'EXEC CICS' block within the 'IF SEND-ERASE' section.
- Flowchart (Top Right):** A graphical representation of the code logic. It shows decision diamonds for 'IF SET-ATTRIBU...', 'IF RESET-ATTRI...', and 'IF SEND-ERASE'. The flowchart uses color-coded boxes: green for 'IF' and 'SEND...' blocks, red for '1410-SET-AT...' and '1420-RESET-...' blocks, and blue for the 'IF SEND-ERASE' block. Arrows indicate the flow of execution between these blocks.
- Outline (Bottom Left):** A detailed view of the program's structure, listing various modules and their internal components. The '1400-SEND-ORDER-MAP' module is expanded to show its internal logic, including 'IF SET-ATTRIBUTES', 'SEND-ERASE', and 'EXEC CICS' blocks.
- Callie (Bottom Right):** A Callie diagram showing the relationships between different modules. A large grey box labeled '0000-ENTER-ORDERS' has multiple arrows pointing to several yellow boxes: '3000-SEND-TOTAL-LINE', '2000-PROCESS-POST-ORDER', and '2100-WRITE-INVOICE-RECORD'. A large blue box labeled '1400-SEND-ORDER-MAP' is also shown, with arrows indicating its interactions with other modules.

Eclipse – the open Standard for application development

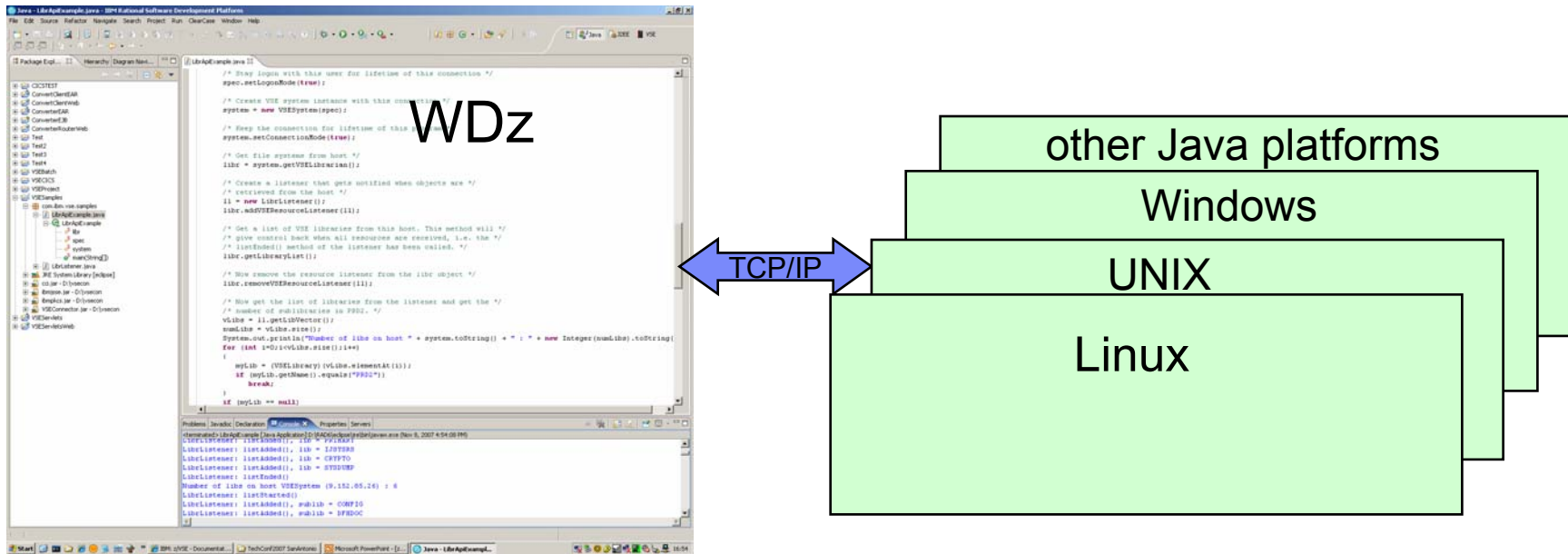


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(3) Development of Java applications in WDz



- 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

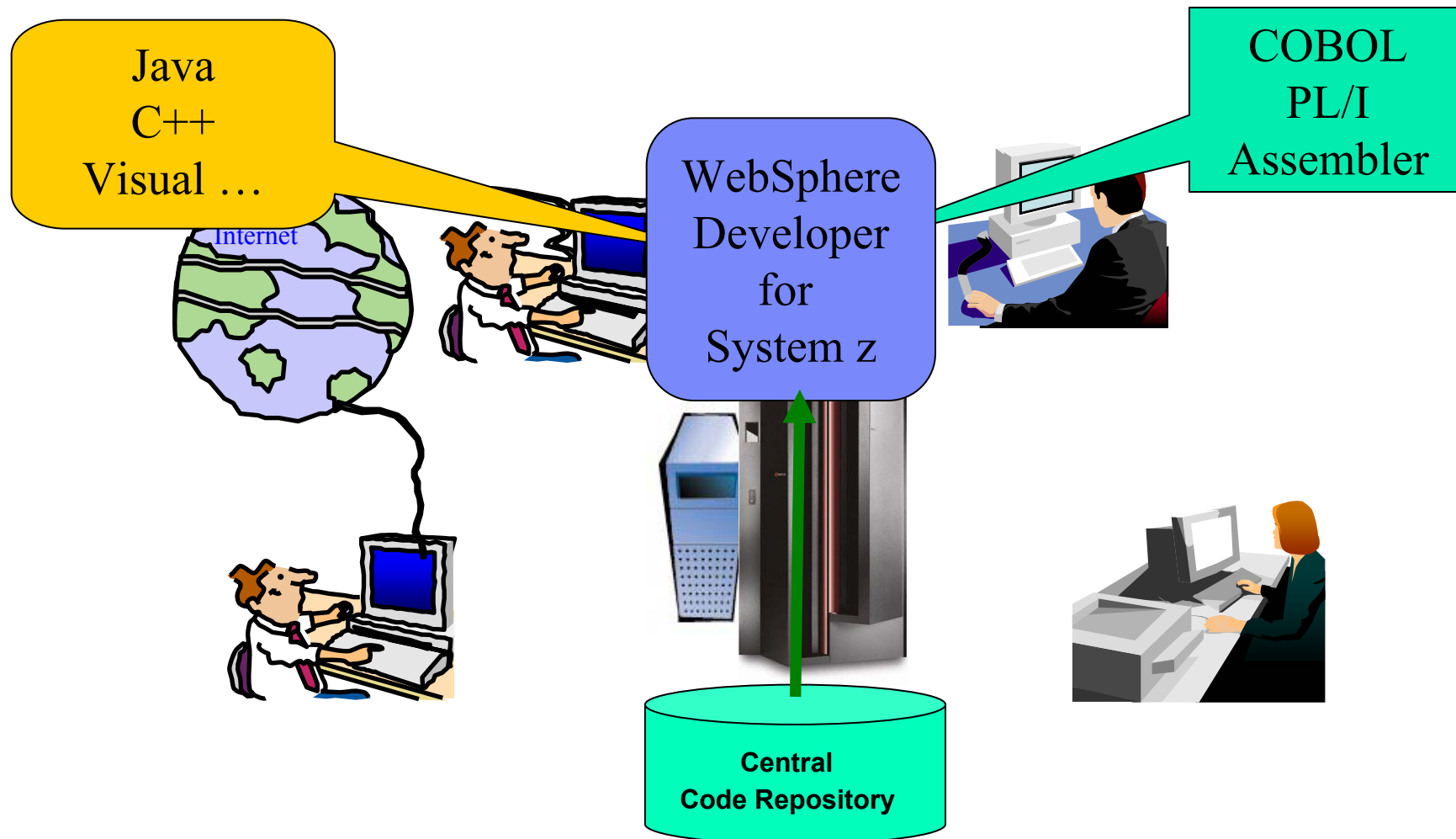
- A modern tool set to support z/VSE development and maintenance
 - modern editor for enhanced productivity
 - tools to analyse and optimize existent applications and workflow

- 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