



IBM System z Technical University



October 4–8, 2010 — Boston, MA

Session Title: Eclipse based Development for z/VSE

Session ID: zDO02

Speaker Name: Wilhelm Mild

Authorized

IBM. | **Training**

16-Sep-10

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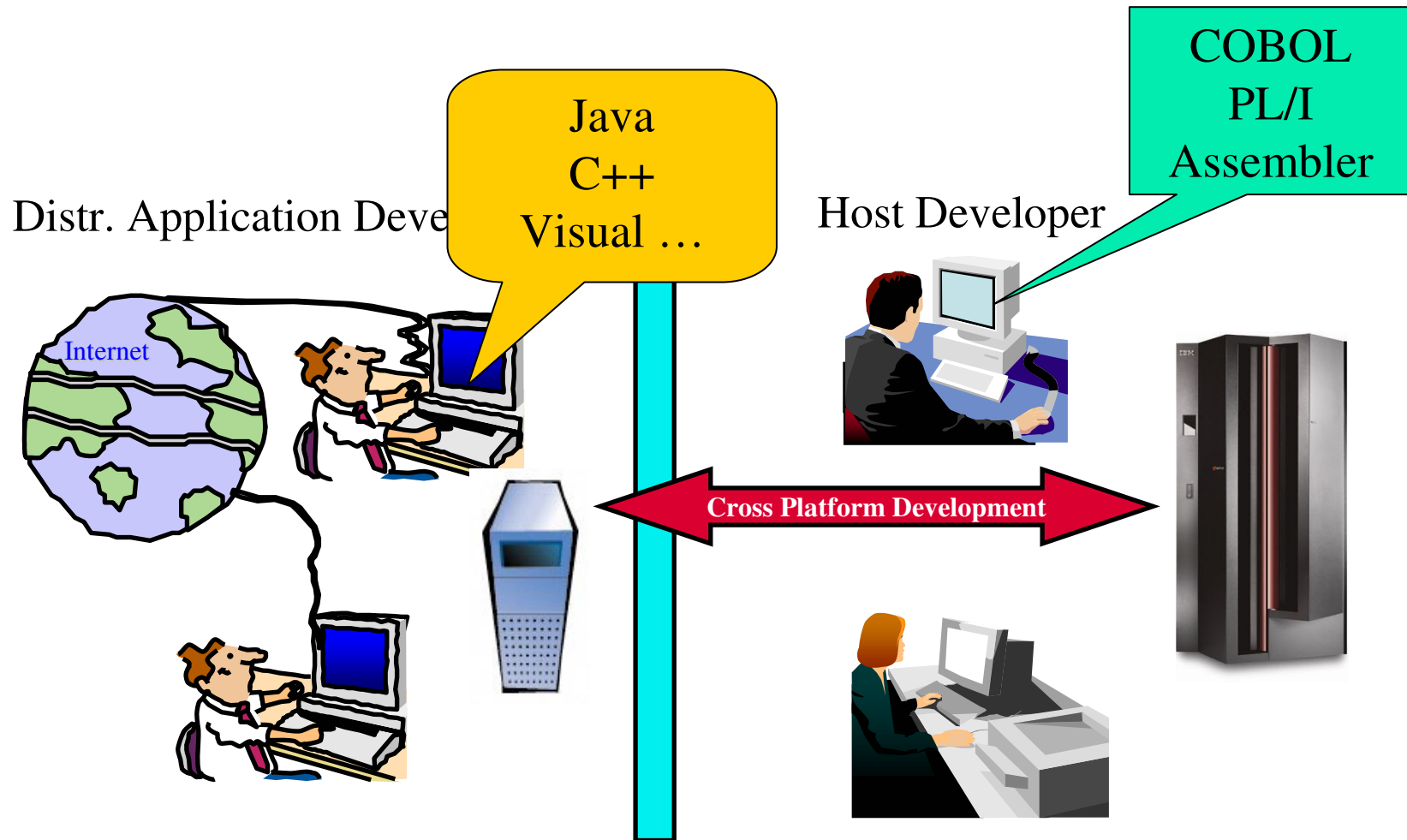
Development objectives !!!

- Tools for managing existing z/VSE source code and changes
 - COBOL, ASM, PL/I, C, 4GL Languages
 - increased productivity for changes and new development
 - flexibility in versioning
 - effective group development control

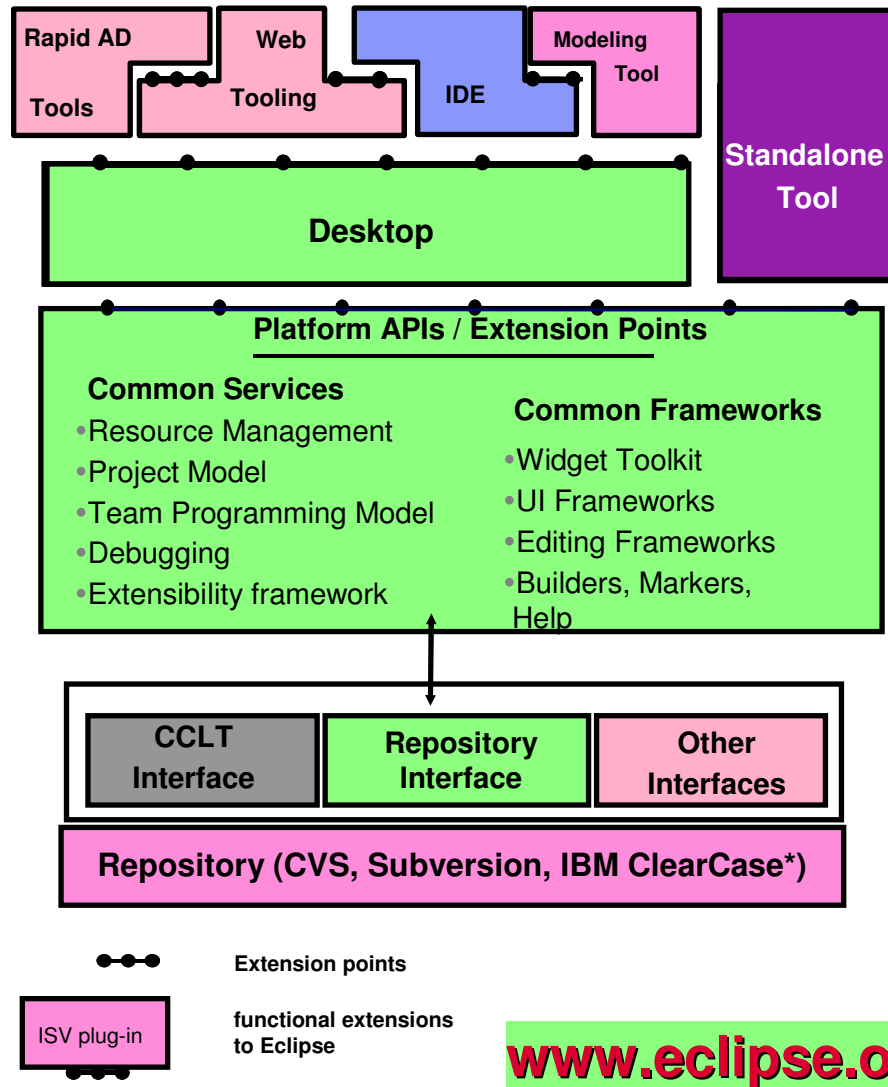
- Develop for multiple platforms
 - common framework for the enterprise instead of multiple unique platform dependent tools
 - same basic tool set for open systems and mainframe

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

'Distributed' Development Landscape...



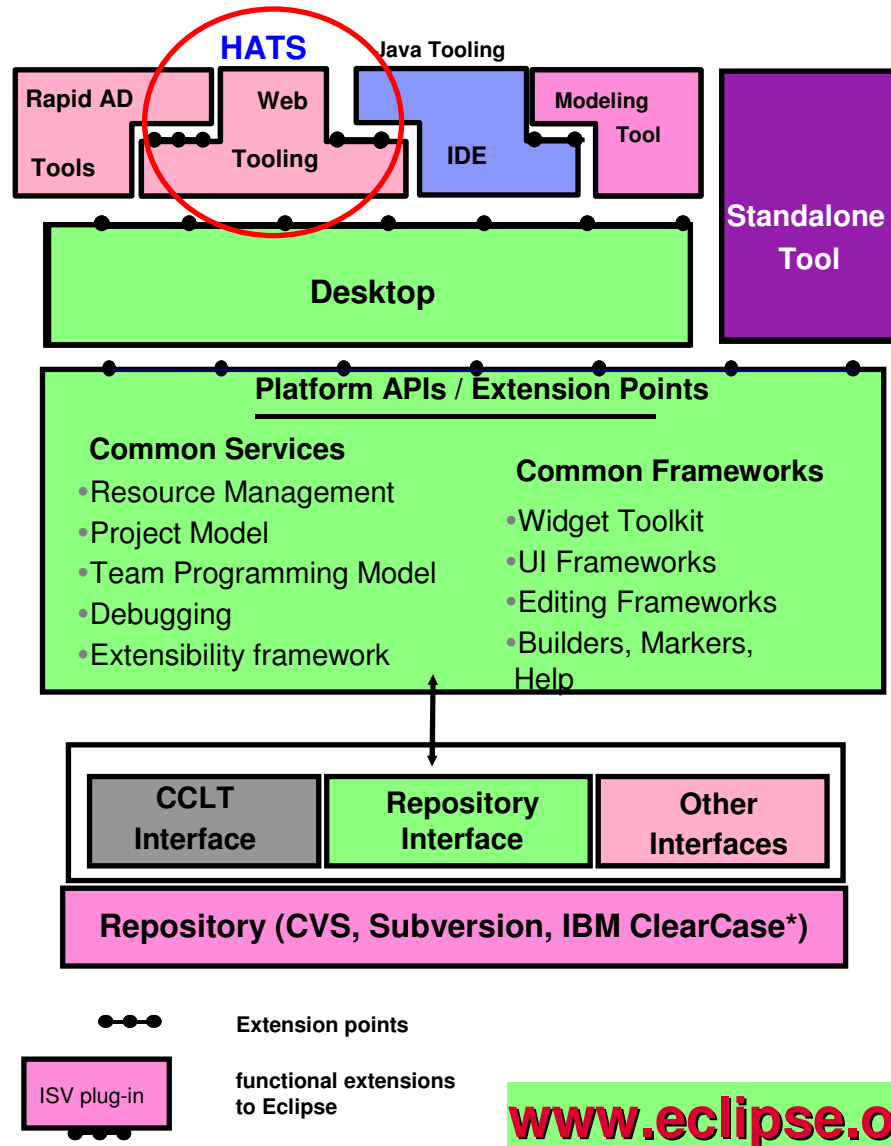
Eclipse – the open Standard for application development



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 (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 applications
 - IBM EGL development for z/VSE (RBD)
 - 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 Host Access Transformation Server (HATS) in action. It shows two windows side-by-side. The left window is a terminal window displaying a 'Display Report' for 'JK Enterprises'. The report lists various sports equipment items with their part numbers and names. The right window is a web browser window showing the transformed version of the same report. The web interface includes a navigation menu, a search bar, and a graphical inventory table with a bar chart showing stock levels for various sports equipment. The web interface also includes a 'Delivery Schedule' section with a calendar and a 'Submit Order' button.

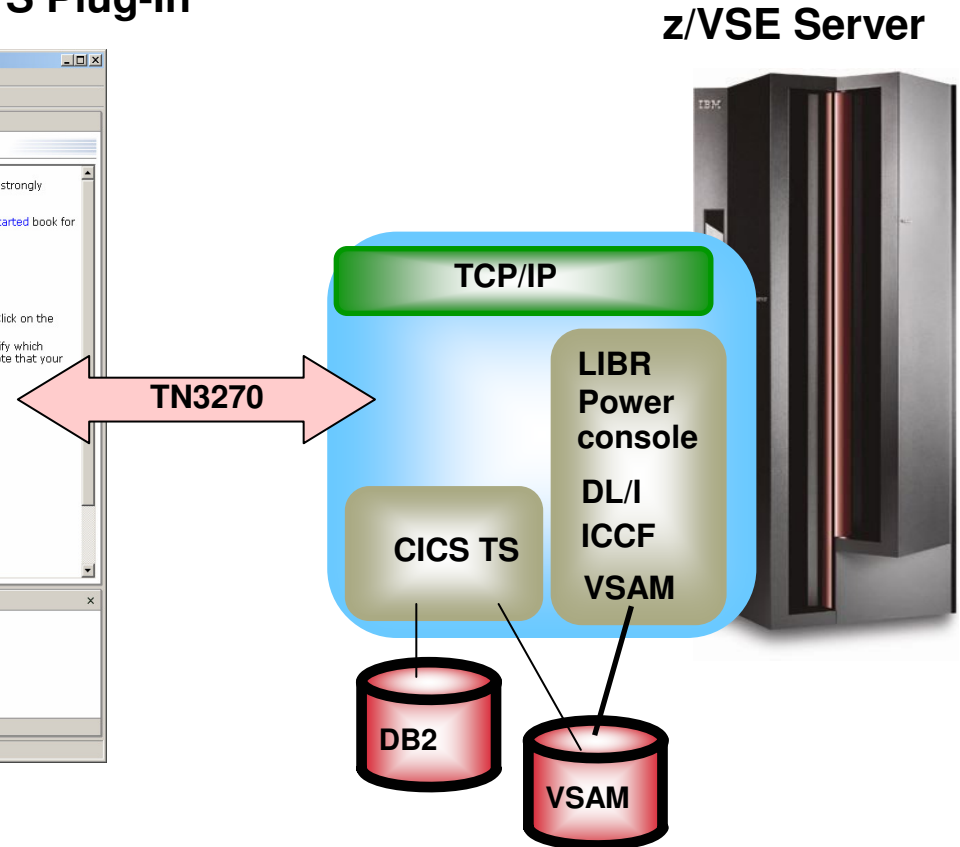
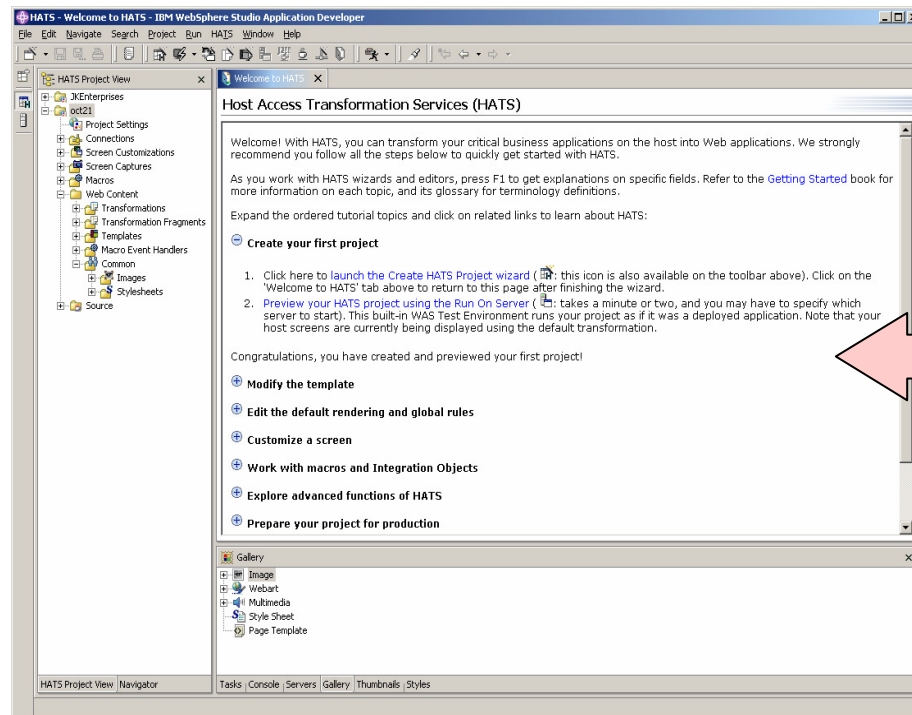
Part Number	Part Name	Quantity
000001	Baseball glove	35
000002	Catcher's mit	20
000003	Baseball - 1 doz.	40
000004	Baseball bat	46
000005	Football	33
000006	Basketball	25
000007	Tennis balls - 1 doz.	41
000008	Golf balls - 1 doz.	27
000009	Ice Skates	17

Benefit: Easily extend existing applications to the web

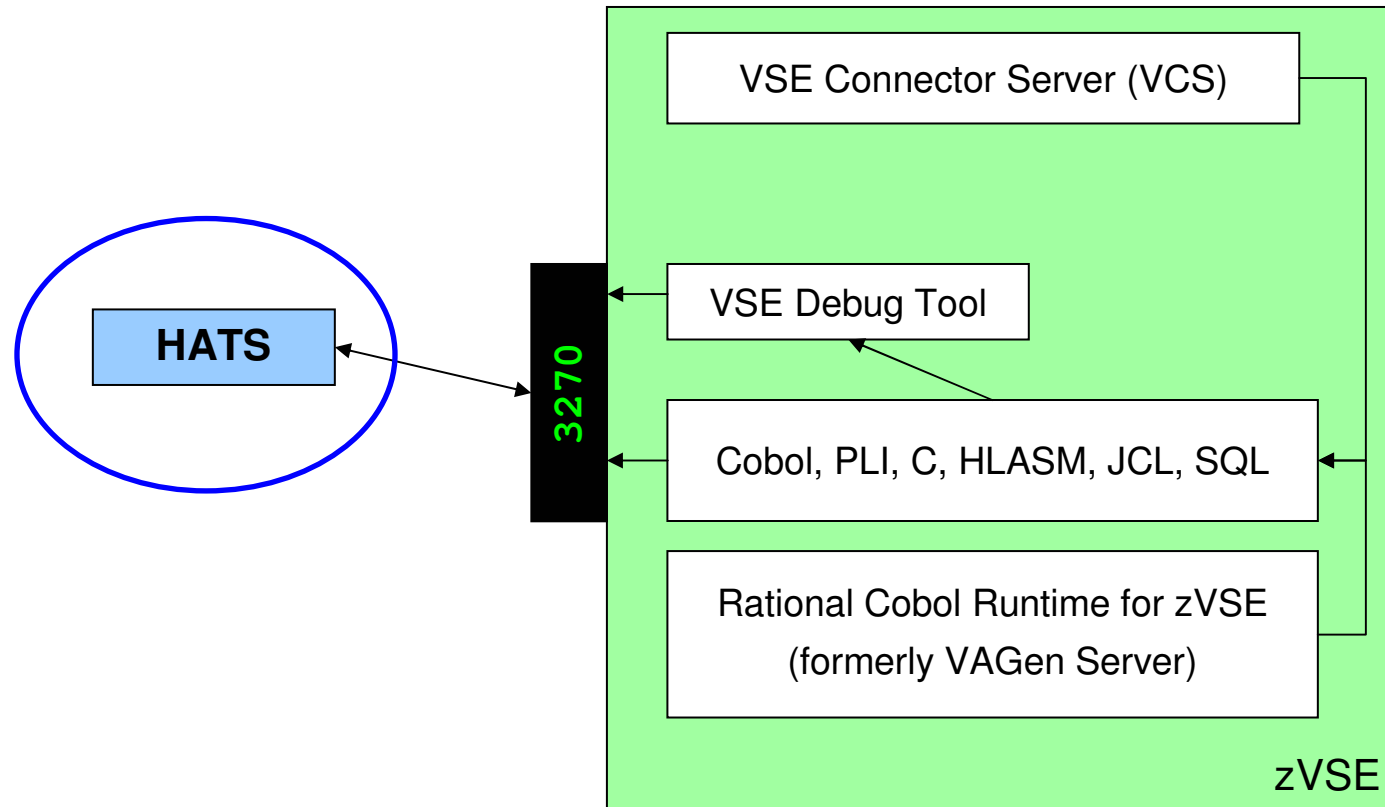
Modernize Existing Applications with HATS

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

Rational Application Development + HATS Plug-In



- **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

```

HodConn:localhost:localhost:server1:ubsdemo.ear#1
SC4103      Check Entitlement by Customer number
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 . . . . .

F2=Search Customer database   F3=Exit   F6=Create profile   F10=Messages
F12=Cancel                   F14=Inventory search  F20=Support services
  
```

```

HodConn:localhost:localhost:server1:ubsdemo.ear#5
200      Search Results

For a record, press a function key -or- type an Action Code and press Enter.
A=Address   B=Backup   C=C-list   D=Dept title   F=Feedback
I>Show Ids  O=ObjResp (press)  R=Calendar  L=Local data  O=Update/Open
P=Phone     R=Reps-To-All  T=Te-list  U=Pages-Chain  U=Low record

Columns: 42 to 61 of 69
Line# 1 to 7 of 69
AREA04 AREALL ASSIGNED ATLANTA ATLA00 AUSTIN BETHESDA BOCA BOULDER BURLINGOT
CHARLOTT CHICAGO CT DALA00 DALLAS DAYTON FISHKILL INSCA00 KP LEX LOTUS LOUW02
Name      Act  Tie-line EmpSt Node      User ID  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

Command ===>
FLM=help  F2=Set 2  F3=Exit  F4=Send note  F5=Reps-To-All  F6=Show dept/team
F7=Backward  F8=Forward  F9=Command  F10=Actions  F11=Dist list  F12=Cancel
  
```

```

09/23/2003 02:21 PM <DIR>  Wollitess
11/28/2003 02:23 PM <DIR>  videos
01/05/2004 09:24 AM <DIR>  vslick
01/09/2004 10:40 AM <DIR>  NINDONGS
10/16/2003 09:26 AM <DIR>  win_jce_121
01/05/2004 04:42 PM <DIR>  wad51
04/23/2003 05:21 AM <DIR>  wpxdrive
01/09/2004 10:40 PM      14,496 Mpamin.log
01/09/2004      14 File(s) 4,175,651 bytes
          93 Dir(s) 22,888,359,792 bytes free

C:\Documents and Settings\Administrator\
  
```

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 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

Login

UserName

Password

Go

→ First Time

→ Enroll

→ Tour

Highlights

- Think Year-End Planning
- JK Funds reports third quarter net profit of \$2.243 million
- Read the NASD's June 25, 2003 Investor Alert Regarding Class B Mutual Fund Shares
- Read the NASD's Investor Alert Regarding Mutual Fund Breakpoint Discounts
- View Current CD Rates

Career Opportunities

- Financial Advisor Careers
- Career Opportunities

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



MASTER INDEX INQUIRY

LAST NAME: smith?? MID: ?
 FIRST: John???????????????? MIDDLE: TITLE: ?
 AKA: ?
 AKA: NAME CNT:
 DATE OF BIRTH: SEX: TELEPHONE:
 ADDRESS: ADDR CNT:
 DATE OF DEATH:
 STATE ID: SSN:
 EMPLOYER NAME:
 COMMENTS:

RELATED CASE ID CASE TITLE NO. OF REL. CASES:

PA1 - PAGE FORWARD PF2 - RESTART INQUIRY PAGE: OF
 PA2 - PAGE BACKWARD PF3 - AKA SUMMARY OPID:
 PF4 - RETURN TO SUMMARY MOD DATE:
 JSH207 - MID RECORD DOES NOT EXISTS. TIME:
 JSH208 - SET ADDITIONAL SEARCH PARAMETERS.
 JSH209 - CANCEL TASK WITH CLEAR KEY.

JSHIM51



Hawai'i State Judiciary

Hawai'i State Judiciary's Public Access to Court Information

Search Option #1 - Enter the full case ID below.

Case ID

Search

Search Option #2 - Search on a person or business' name.

Last or Business Name

First Name

Search

Search Option #3 - Choose from the selections below and enter the case number as indicated. (Suffix is optional)

Circuit

Oahu

Case Type

Civil

Year

Century

2000's

Case Number

Suffix

01

Search

- Civil
- Circuit Court Criminal
- District Court Regular Civil Claim
- District Court Small Civil Claim
- District Court Temporary Restraining Order
- Equity
- Family Court Appeal
- Family Court Criminal
- Divorce
- Family Court Domestic Abuse
- Family Court Miscellaneous
- Guardianship
- Land (after 1997)
- LAW - initiated prior to statehood w/ activity after 1984
- Mechanic's and Materialman's Lien
- Probate
- Small Estate (before 1995)
- Small Guardianship (before 1995)
- Special Proceedings
- Special Prisoner Proceedings

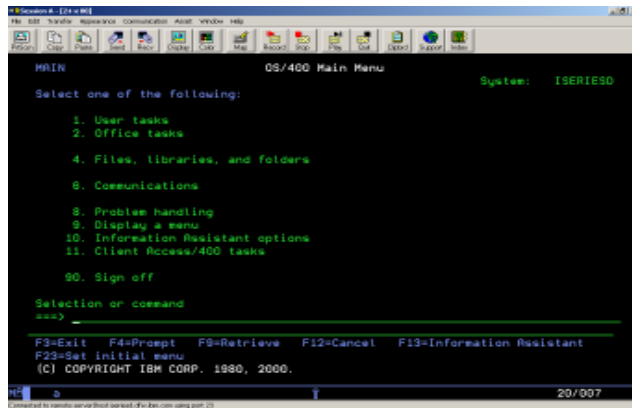
Print

Help

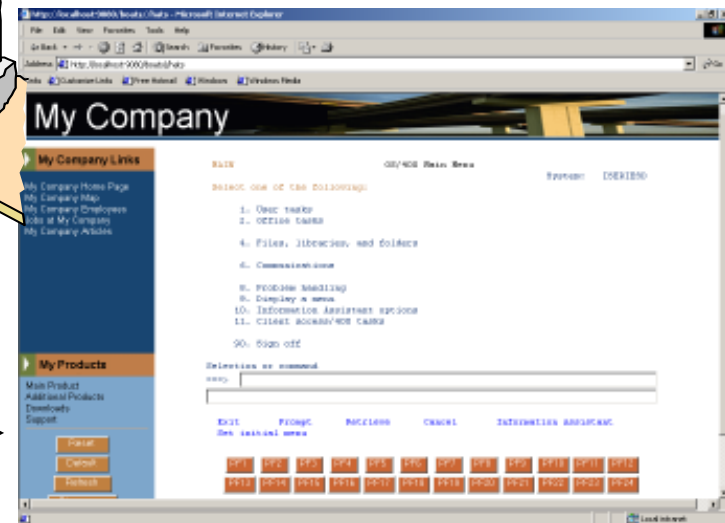
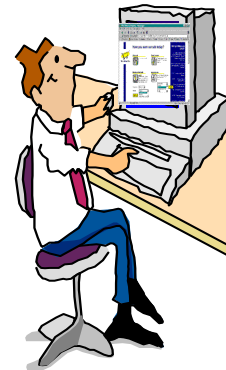
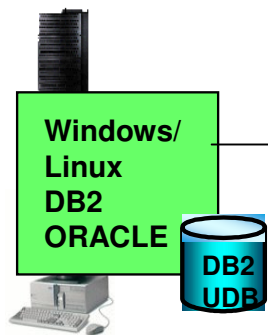
Exit

Application Integration with Host Access Transformation Services (HATS)

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



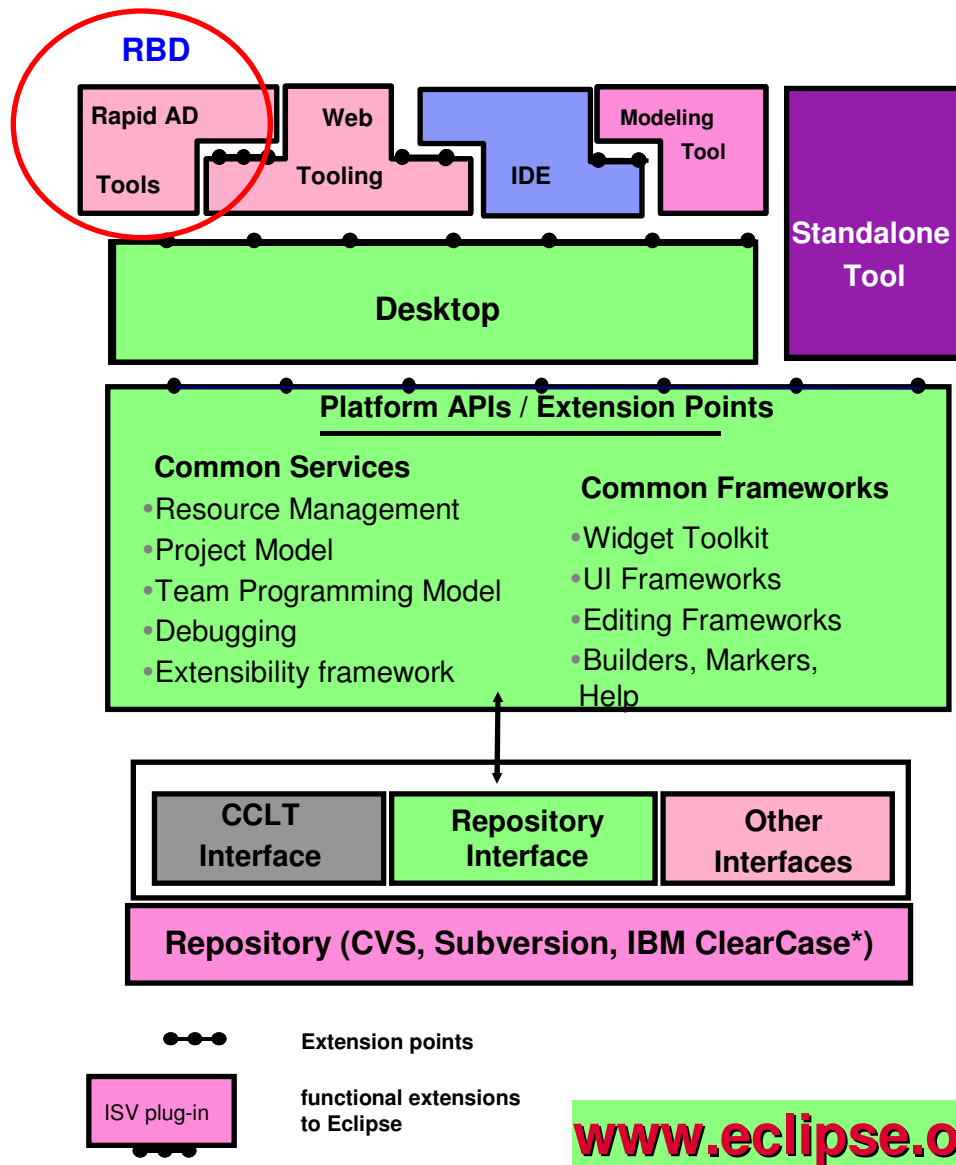
3270 or 5250 data stream



HTML in a Browser

Screen transformation rules running on WebSphere Application Server

Eclipse – the open Standard for application development



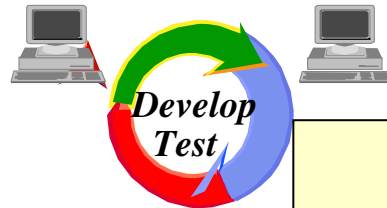
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 - **follow-on to Visual Age Generator**

(2) Cross Platform Solution development Approach with 4GL Language (EGL)

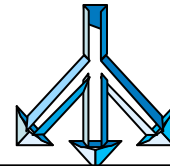
**Rapid
Development**



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

Generation

Generate



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

z/VSE(CICS, Batch)

Execution

Execute



AIX



Windows



HP/UX



Solaris



Linux

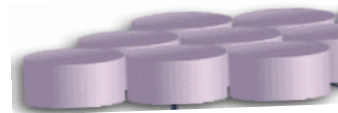


OS/400



z/OS, (CICS, IMS, Batch)

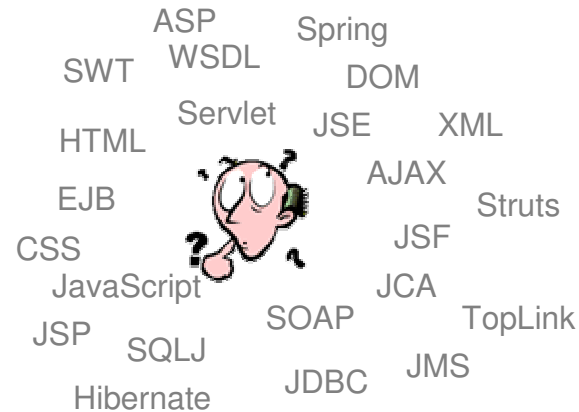
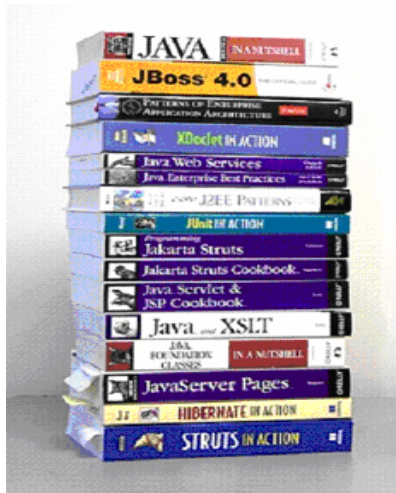
- Multiple platforms
- Client /Server Applications
- Java applets/servlets or standalone
- Multiple database/file support apps



DB2 UDB VSAM ODBC
Oracle DLI, IMS/DB

Why EGL?

Because building applications today is not easy



- Learn and master myriads of
 - programming languages and semantics
 - middleware interfaces
 - programming paradigms and styles
 - frameworks and libraries
- Constantly emerging new technologies
- Code at a more abstract and simpler level
- Easy to learn, modern and comprehensive language
- Keeps up with emerging technologies
- Inter-operates seamlessly with legacy

The power of the Language

Simple and familiar.... yet robust and complete



- Rich data types
 - Primitive
 - Simple (int, string, boolean, etc.)
 - Complex (any, arrays, dynamic arrays, dictionaries, array dictionaries, etc.)
 - User defined Data Parts
- Keywords
 - Case, if-then-else, while, for loop, for loop cycling through a database result set, etc.
- High power language capabilities
 - Automated Casting (e.g. using AS operator)
 - Mixing data types in assignments and expressions
 - Exception handling
- Rich libraries of built-in functions
 - Math, string, date/time, system, i5/OS objects APIs
- Robust integration with existing investment or access to low level APIs
 - Call RPG, COBOL, C, etc.
 - Full Java interoperability
 - Invoke Java from EGL (map Java classes with EGL External Types)
 - Invoke EGL from Java

```
hello.egl x
1 // Hello World basic program
2
3 program hello type BasicProgram
4
5 // Data Declarations
6 name string = "World";
7
8 function main()
9     writeStdOut("Hello " +name);
10 end
11
12 end
13
```

The power of Abstractions and Declarative



■ Data access:

- “Records” provide access to:
 - SQL, Indexed, Relative, Serial, DL/I, Service data, Message Queues
- Common Verbs for data access (**Get, Add, Replace, Delete**).
- Allows complete access to SQL statement if needed.
- Common Error Handling.

```
*sampleProgram.egl x
function allLoans()
  loans LoanRec[];
  get loans;
end
```

■ Remote Invocation

- Call COBOL, RPG, C, Java.
- Linkage information separated from code.
- Data mapping, protocol invocation all resolved at runtime, NO code necessary

```
*sampleProgram.egl x
function callHelloWorldOniSeries()
  salutation char(30);
  call helloworld salutation;
end
```

■ User Interface:

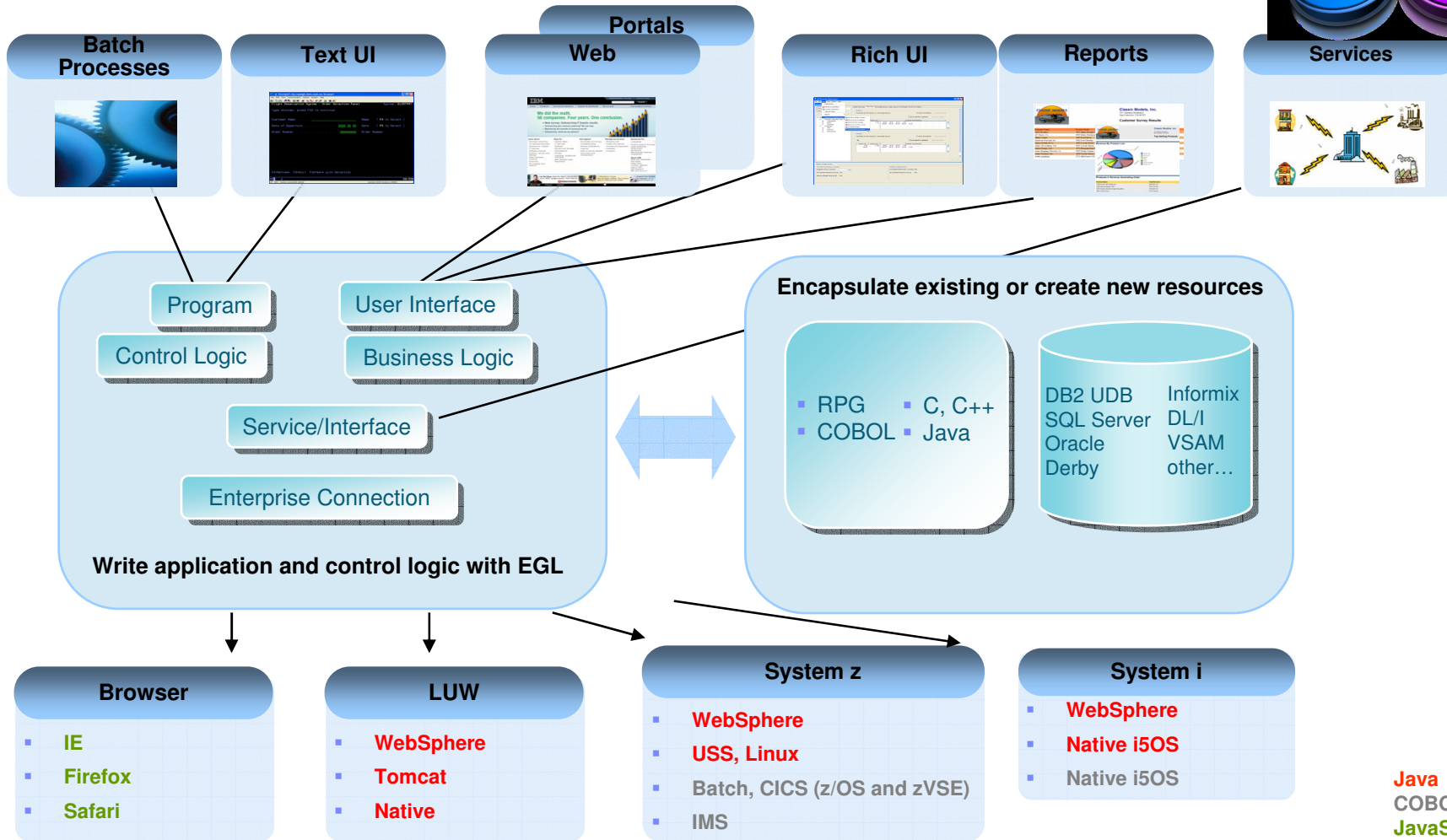
- EGL “handlers” hide complexities of
 - Web (JSF) UI
 - Reports (BIRT)
 - Portlets
 - Rich Web (Ajax)

```
*sampleProgram.egl x
DataItem SSN Password char(9) {
  validatorFunction = "ValidateSSN()",
  displayUse = secret,
  pattern = "XXX-XX-XXXX",
  displayName = "Social Security No",
  inputRequired = yes
end
```

Validation/Editing Rules:

- Via properties in “Data Items.
- Define formatting & validation rules in a common place.
- Reuse data items for Records, screens, web pages, reports.

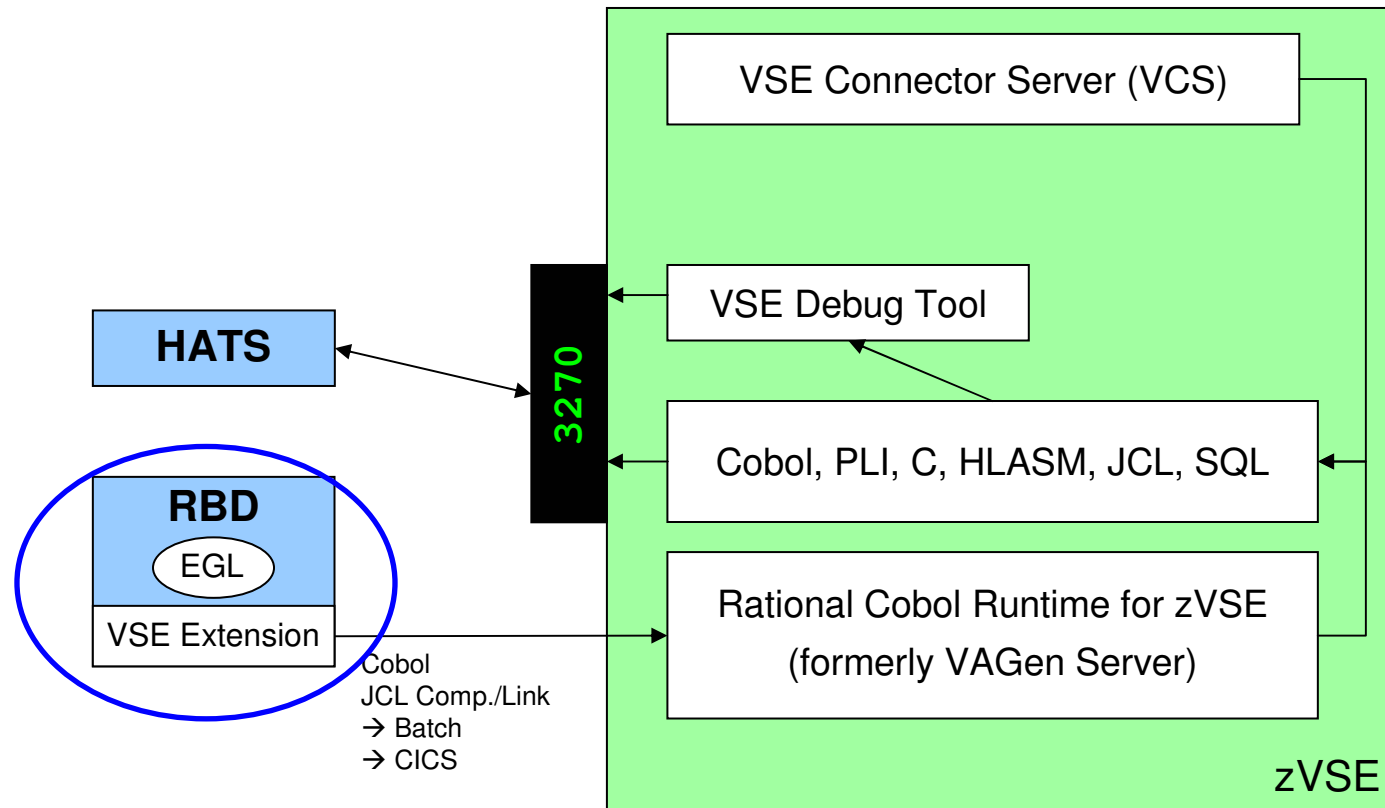
Respond to Broadest Application Needs



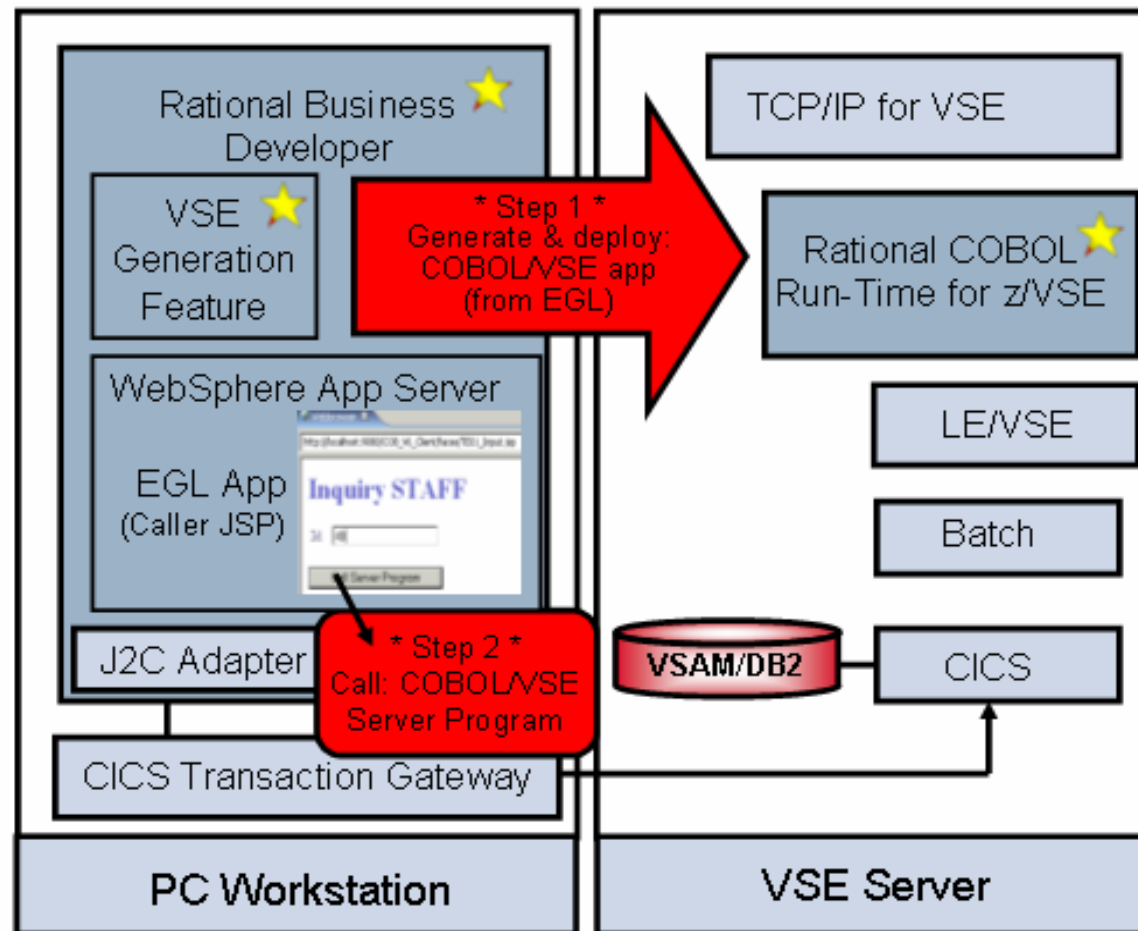
Java
 COBOL
 JavaScript

Modern development environment for z/VSE with RBD - IBM Rational Business Developer

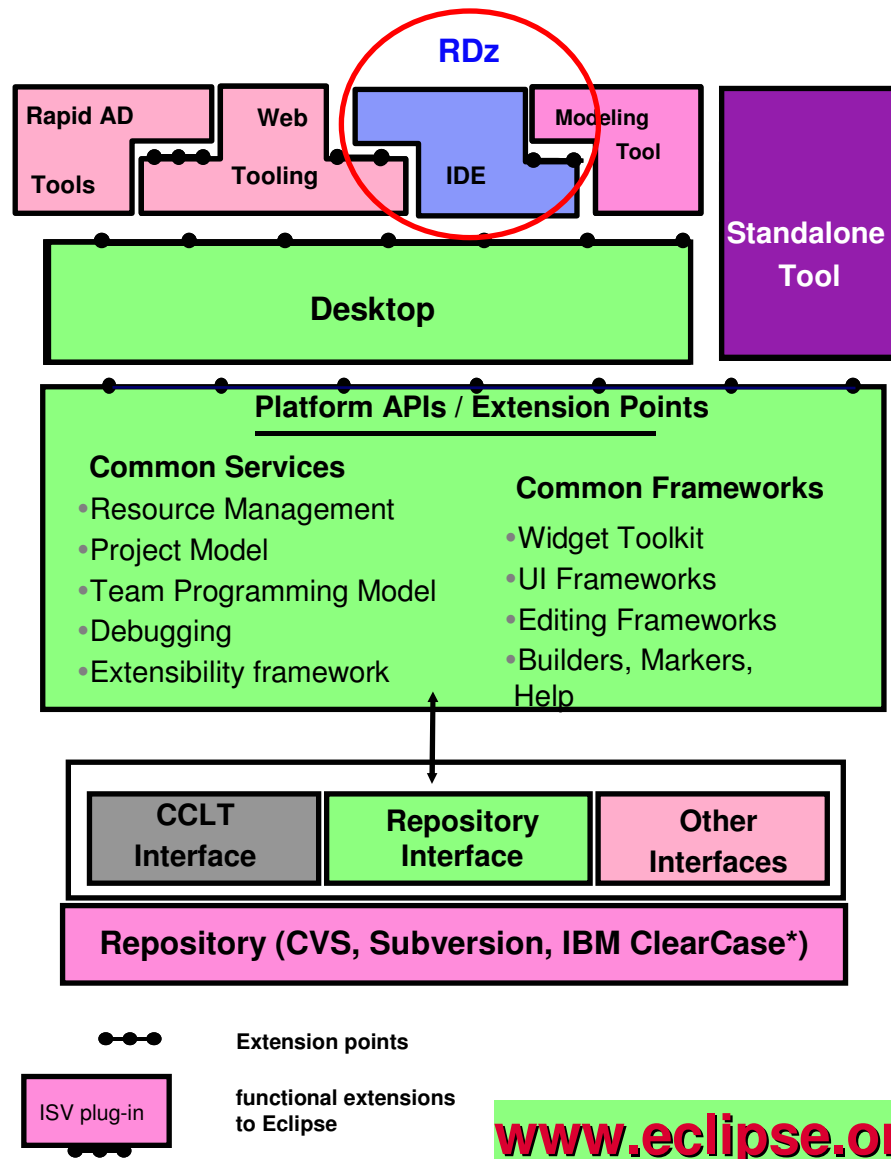
- Since December 2008, continued 4GL support for z/VSE is available:
 1. z/VSE host component **IBM Rational COBOL Runtime for z/VSE (V7.5)**
(replaces the Visual Age Generator Server for VSE)
 2. PC tool for development: **IBM Rational Business Developer (RBD V7.5.1)**
and the associated components
 - **IBM Rational Business Developer Extension for VSE V7.5.1**
 - COBOL Code generation for z/VSE
 - Generation for System z (z/OS)
- J2C-Tools (Java EE Connector)
- **IBM CICS Transaction Gateway (optional – for CICS access only)**



RBD – functional view (Generate COBOL applications on z/VSE using EGL)



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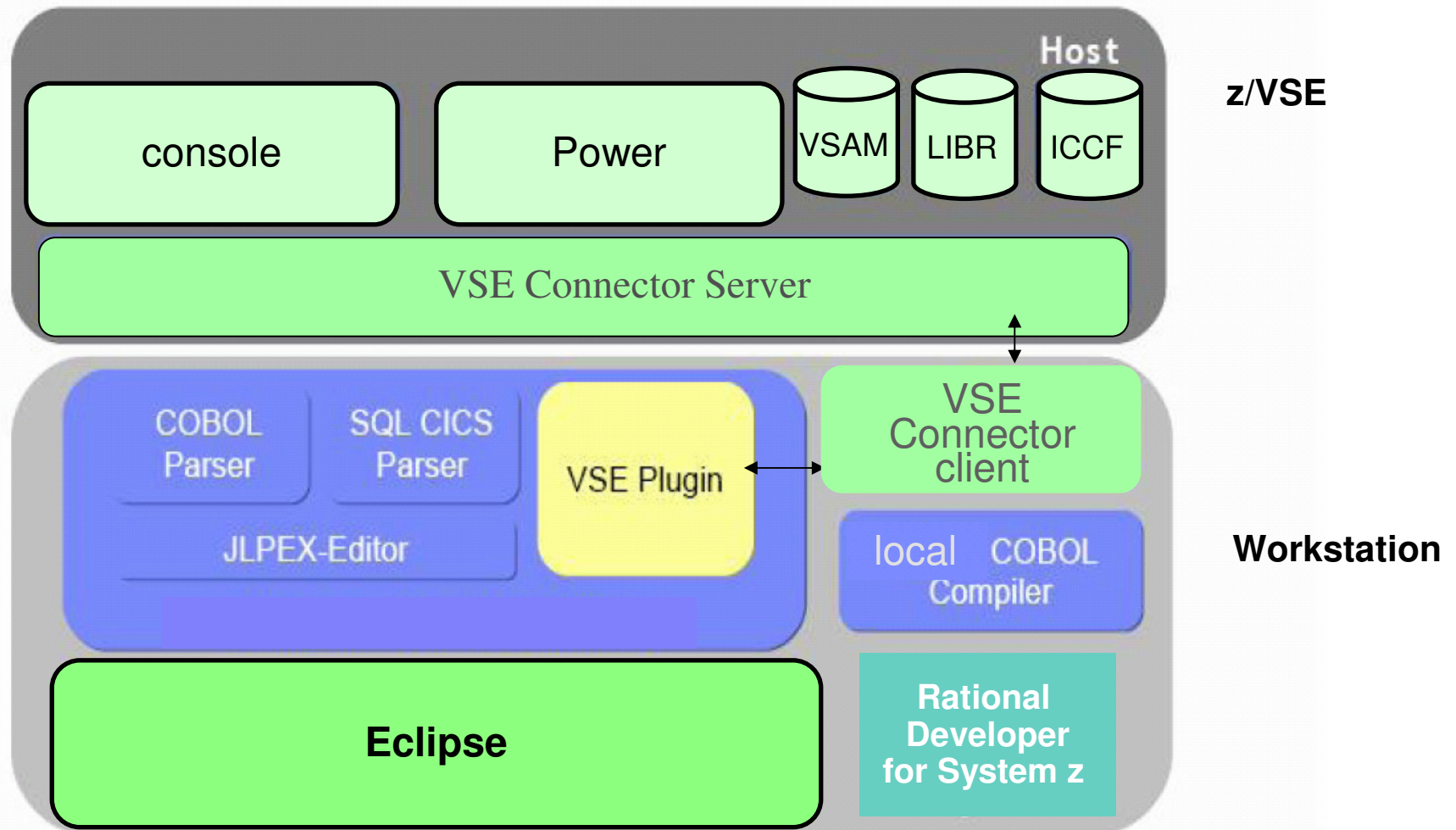


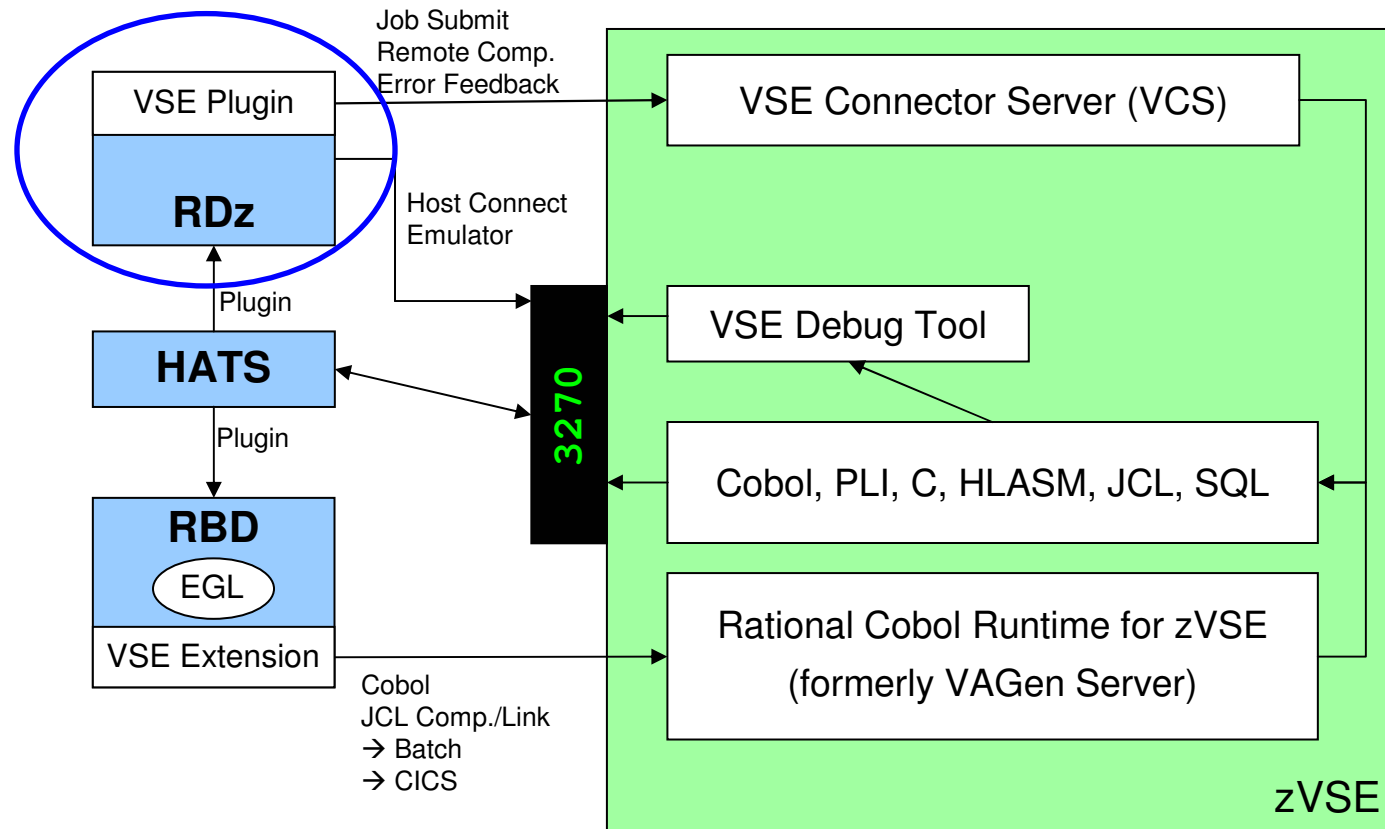
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 - RTW – Rational Trasformation Workbench
 - Analyze applications with graphical correlations
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The IBM Development environment for the enterprise
Rational Developer for System z (RDz 7.5)
 with z/VSE Development Plug-in for RDz 7.5





RDz 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

Rational Developer (RDz) in z/VSE perspective

1. Perspective

2. View

3. Projects

4. Editor

5. Outline View

6. VSE Console

```

Line 7      Column 1      Insert
-----
000001      Identification Division.
000002      Program-ID.  PRINTAPP.
000003
000004      Data Division.
000005      Working-Storage Section.
000006      01 Work-Parms.
000007      05 In-Len          PIC 99(4) BINARY.
000008      05 Char-count     Pic 99 Value ZEROS.
000009      05 Out-Name       PIC X(100).
000010
000011      Linkage Section.
000012      01 Recvd-Parms.
000013      05 In-name        Pic x(30).
000014
000015
000016      Procedure Division using Recvd-Parms.
000017      Move spaces to Out-Name.
000018
000019      Move 0 to Char-count
000020      Inspect Function Reverse(In-Name)
000021      Tallying Char-count For Leading Spaces
000022      Compute In-Len = 30 - Char-count
000023
000024      Move 'Thanks to ' to Out-Name (1:10).
000025      Move In-name(1:In-Len) to Out-Name(11:In-Len)
000026      Move ' for succeeding!' to Out-Name((11 + In-Len):16).
000027      Display Out-name.
000028      Goback.
000029
The quick mark was set at the cursor location.
  
```

MAP	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	BG V	1280K	4864K	500000	45056K	
AR 0015	1	F1 V	1024K	4096K	500000	OK	POWSTART
AR 0015	2	F2 V	2048K	49152K	500000	OK	CICSICCF
AR 0015	3	F3 V	608K	14768K	500000	OK	VTAMSTRI
AR 0015	4	F4 V	2048K	18432K	500000	OK	
AR 0015	5	F5 V	768K	256K	500000	OK	
AR 0015	6	F6 V	256K	256K	500000	OK	
AR 0015	7	F7 V	1024K	19456K	500000	OK	TCPIP00
AR 0015	8	F8 V	2048K	49152K	500000	OK	
AR 0015	9	F9 V	256K	256K	500000	OK	
AR 0015	A	FA V	256K	256K	500000	OK	
AR 0015	B	FB V	256K	256K	500000	OK	SECSERV
AR 0015	S	SVA-31	7588K	6748K	3700000		

RDz in Action : Sunday April 11, at 9:15 in Room U3,

Rational Developer (RDz) in z/VSE perspective

The screenshot shows the IBM Rational Developer (RDz) interface in z/VSE perspective. The main window displays a VSE terminal session with a login prompt and a system view on the right. Below the terminal is a VSE console window showing a memory map (MAP) with columns for AR, SPACE, AREA, V-SIZE, GETVIS, V-ADDR, UNUSED, and NAME. The interface includes a project browser on the left, an outline view at the bottom left, and a toolbar at the top.

1.Perspective (Callout pointing to the main window title bar)

2.View (Callout pointing to the VSE System View tree)

3.Projects (Callout pointing to the z/OS Projects tree)

4.Outline View (Callout pointing to the Outline view pane)

5.VSE Terminal (Callout pointing to the main terminal window)

6.VSE Console (Callout pointing to the VSE Console window)

7.VSE Terminal (Callout pointing to the terminal content)

VSE Console Output:

```

MAP
AR 0015 SPACE AREA      V-SIZE  GETVIS  V-ADDR  UNUSED  NAME
AR 0015 S  SUP          716K          0          $$$SUPI
AR 0015 S  SWA-24       1888K          1748K   B3000    768K
AR 0015 0  BG V         1280K          4864K   500000  45056K
AR 0015 1  F1 V         1024K          4096K   500000  0K
AR 0015 2  F2 V         2048K          49152K  500000  0K
AR 0015 3  F3 V           600K          14760K  500000  0K
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
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
AR 0015 S  SWA-31       7588K          6748K   3700000  0K
  
```


■ Develop a z/VSE project

The screenshot shows the VSE IDE interface. The main window displays a terminal session with the following text:

```

    IESADMS01          VSE/ESA ONLINE
    5609-ZVS and Other Materials (C) Copyright IBM Corp. 2004 and other dates

    ++              ++
    ++  WV  WV  SSSSS  EEEEEEE
    ++  WV  WV  SSSSSSS  EEEEEEE
    ***** ++  WV  WV  SS  EE
    ***** ++  WV  WV  SSSSSS  EEEEE
    **  ++  WV  WV  SSSSSS  EEEEE
    **  ++  WV  WV  SS  EE
    ***** ++  WVWV  SSSSSS  EEEEEEE
    ***** ++  WV  SSSSS  EEEEEEE

    Your terminal is A001 and its name in the network is D1080001
    Today is 01/26/2007 To sign on to DEBCCICS -- enter your:

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

    PF1=HELP      2=TUTORIAL      4=REMOTE APPLICATIONS
                                10=NEW PASSWORD
    USE ONLY THE ENTER KEY OR ONE OF THE KEYS LISTED ABOVE.
    
```

A context menu is open over the terminal, showing options: "New", "MVS Project...", and "VSE Project".

The interface also includes a "z/OS Projects" pane on the left, a "VSE System View" tree on the right, and a "Remote Error List" table at the bottom.

ID	Message	Se...	Line	Location	Host Name	Date

■ COBOL Syntax checking and highlighting

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

- File Explorer:** Shows a project structure with folders like .TmpVseRemote, DEMOVSE, build, BuildOutput, jcl, .project, and files CEEIGZCT.cbl and IGZTMATH.cbl.
- Code Editor:** Displays COBOL code for IGZTMATH.cbl. The code includes:

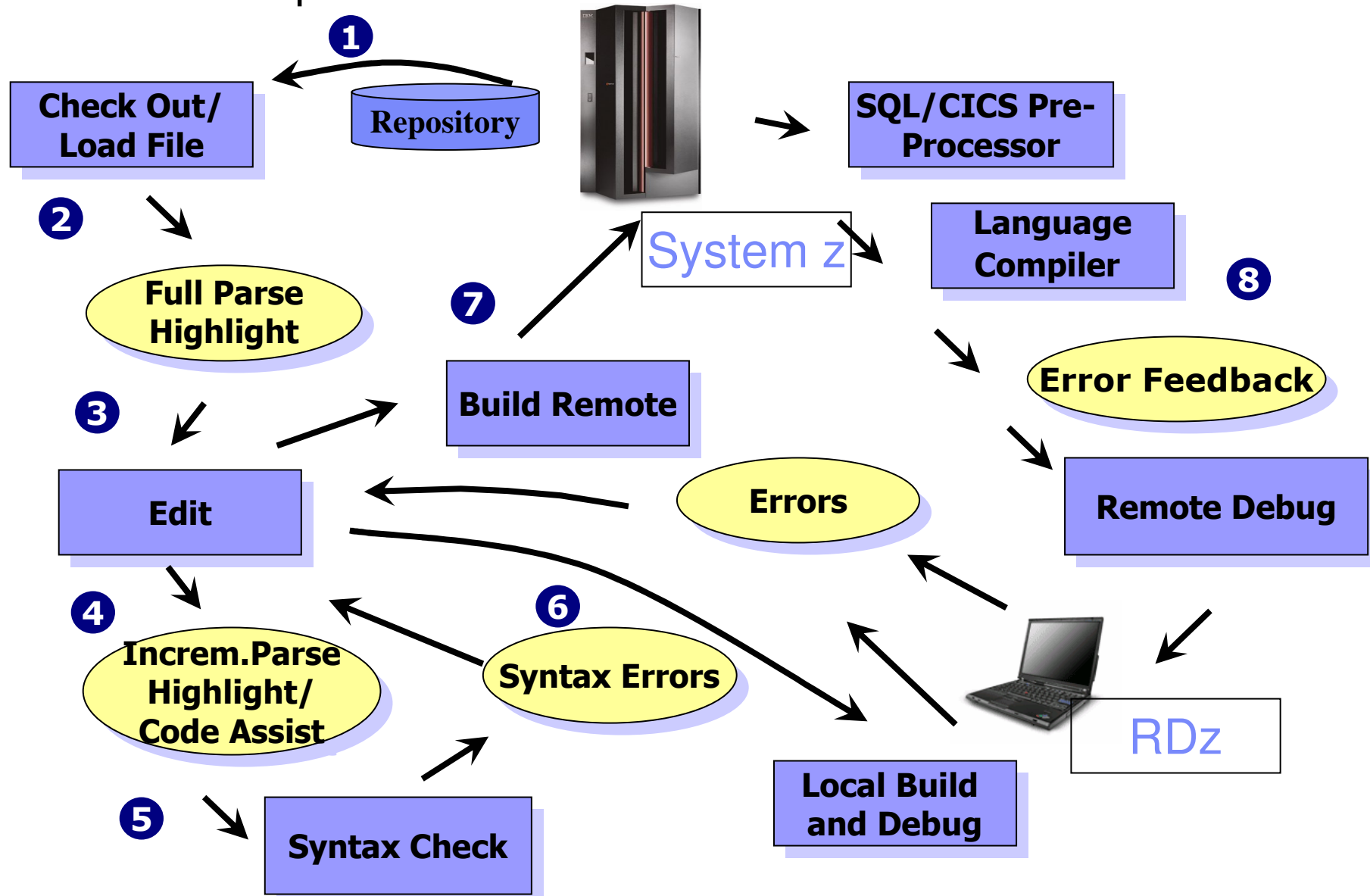

```

                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. 00033000
                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
            
```

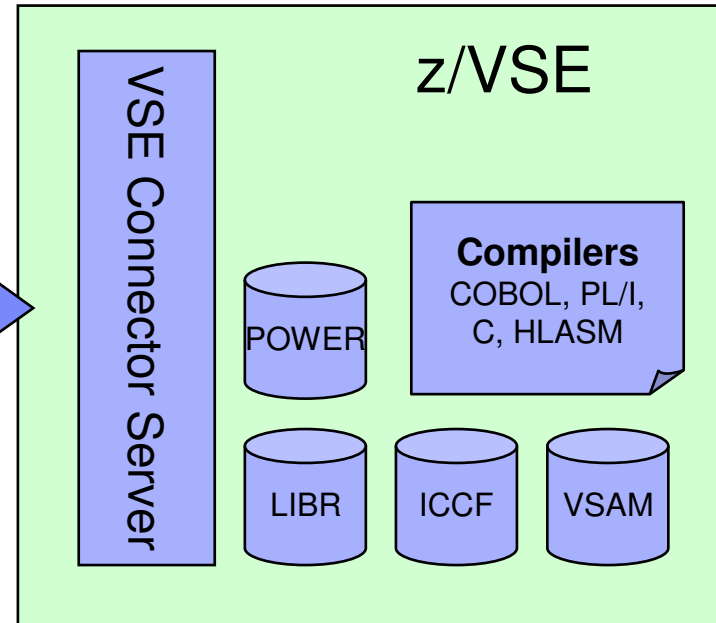
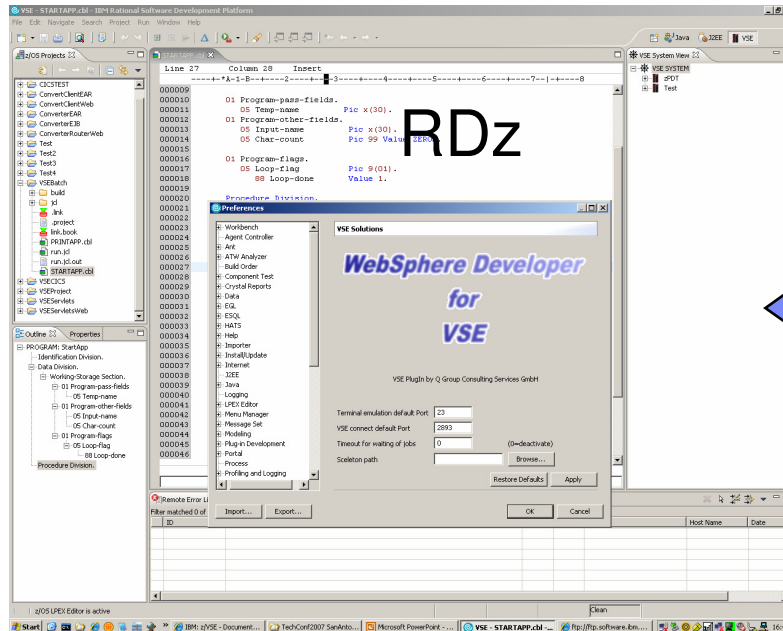
 The line "PROCEDURE DIVISION." is highlighted in red, indicating a syntax error.
- Remote Error List:** A table showing error messages:

ID	Message	Se...	Line	Location	Host Name	Date
IGYPS2106	IGYPS2106-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
IGYPS2106	"DIVI" WAS FOUND IN THE "VALUE" STATEMENT. ...	2	40	IGZTMATH.C	DEMOVSE	Jan 26, 2007 4:41:09 PM
- System Tray:** Shows the taskbar with applications like Command Prompt, Plug-in Development, VSE - IGZTMATH.cbl, and Paint. The system clock shows 4:44 PM on Friday, 1/26/2007.

RDz Development Process

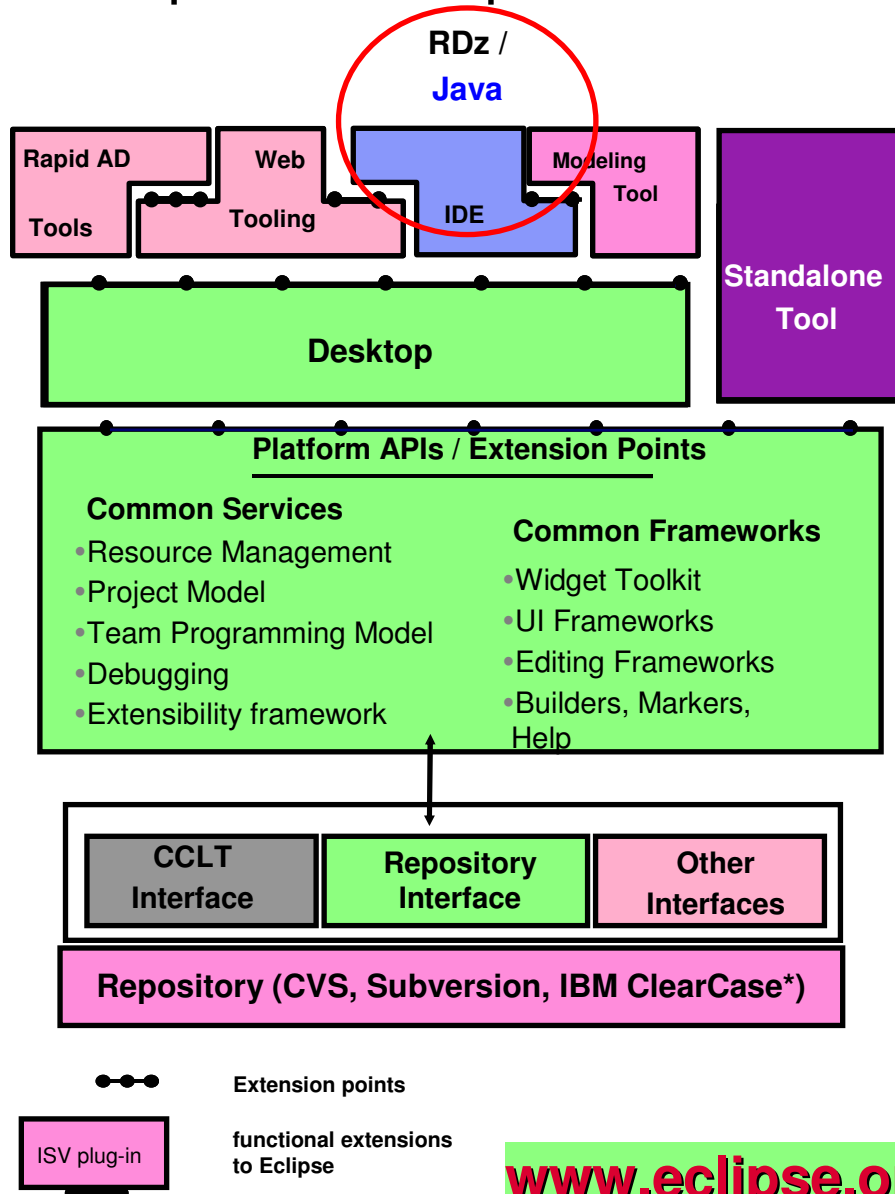


(1) Development of COBOL applications in RDz



- 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

Eclipse – the open Standard for application development

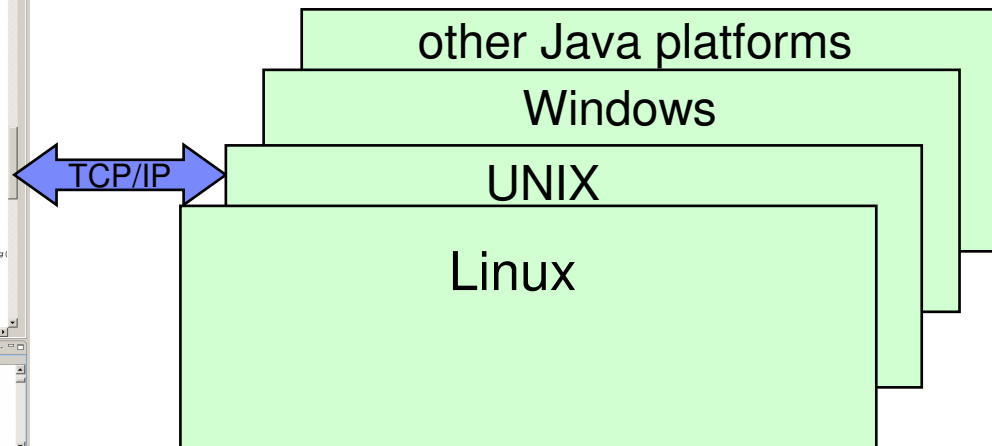
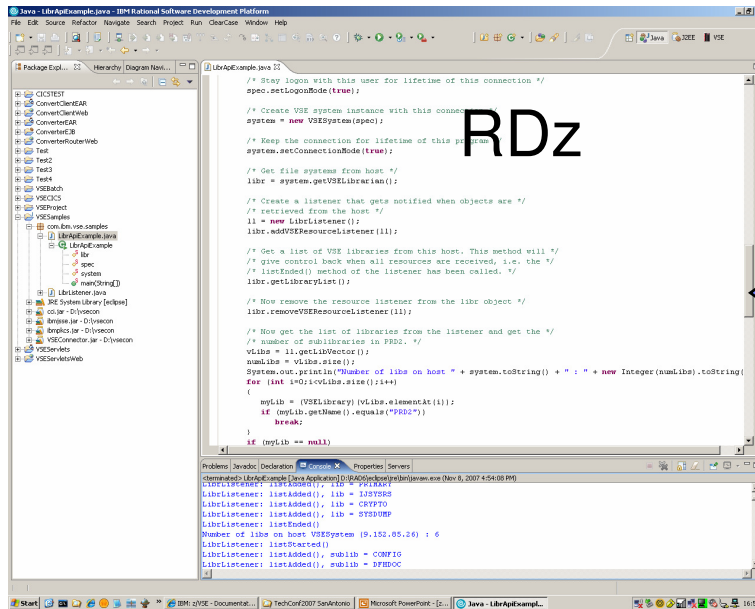


What is Eclipse about:

- **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

www.eclipse.org

(3) Development of Java applications in RDz

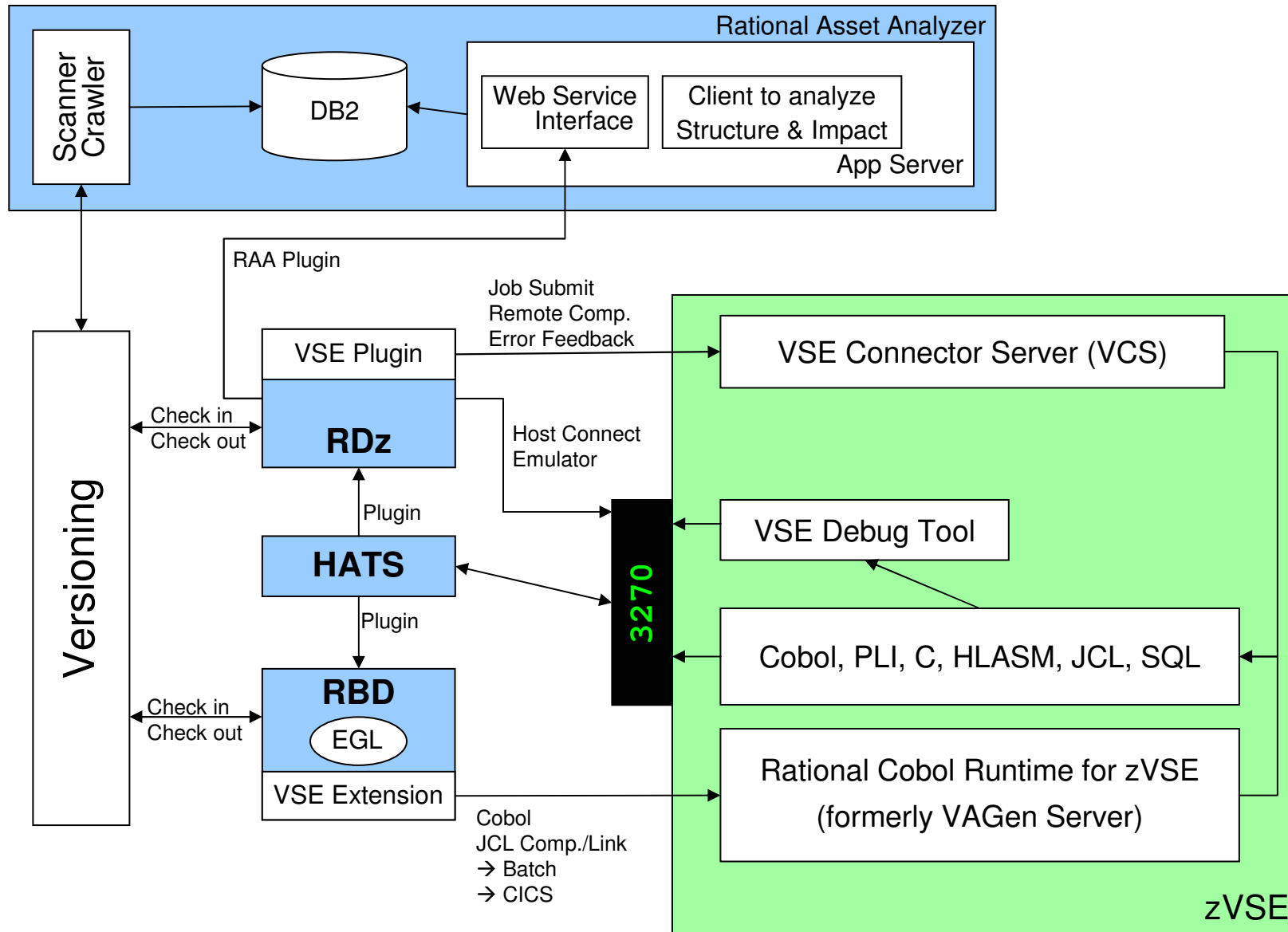


- Development of native Java applications
 - for systems like UNIX, Linux, Windows or other Java platforms
 - Edit, compile and Build
 - Test the Java application in the integrated WebSphere test environment and access z/VSE resources
 - **additional supported languages are C, C++, REXX**

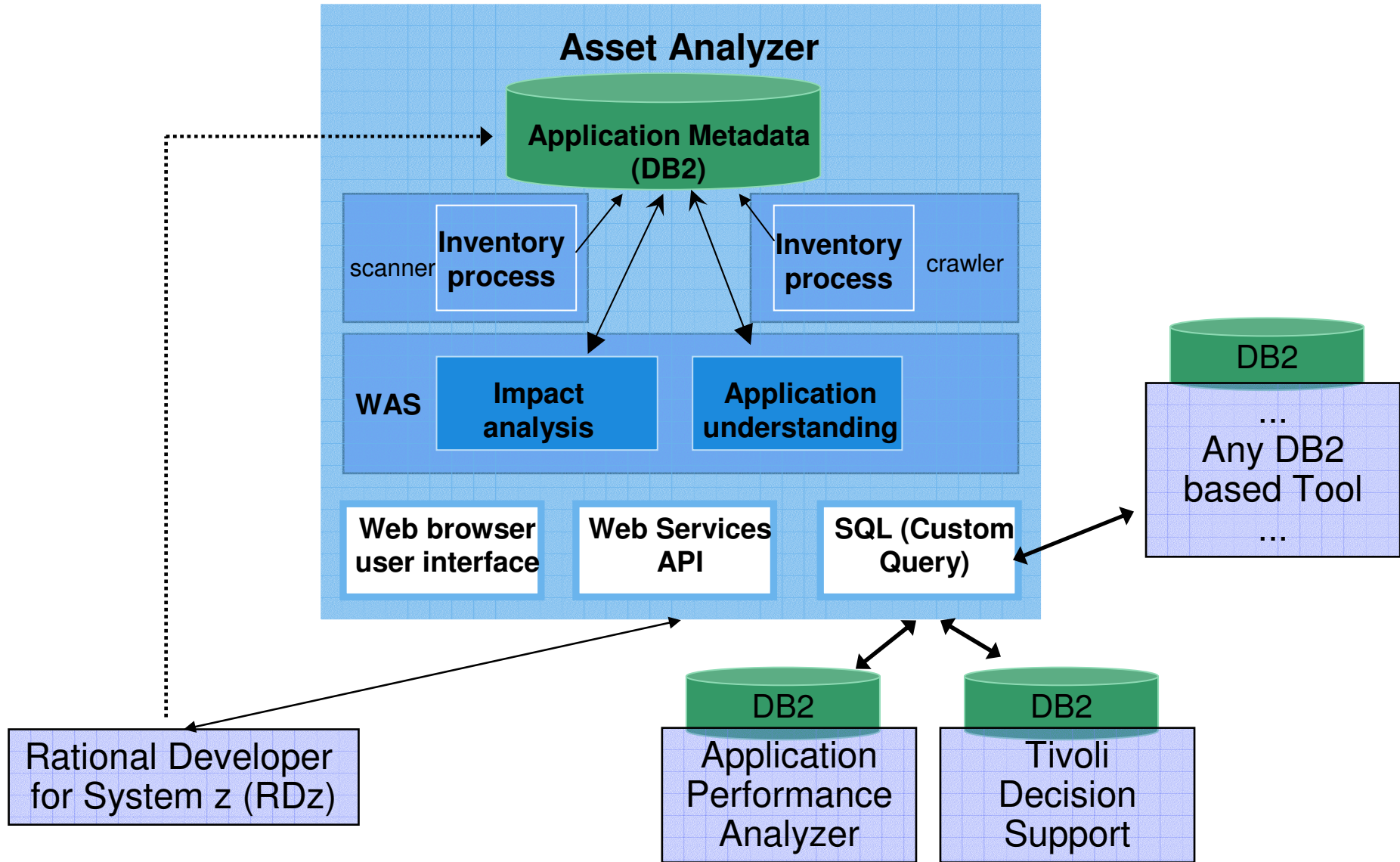
- Development of Java applications to access z/VSE resources
 - use of z/VSE Java-Based Connectors
 - develop SOA components to access z/VSE services

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

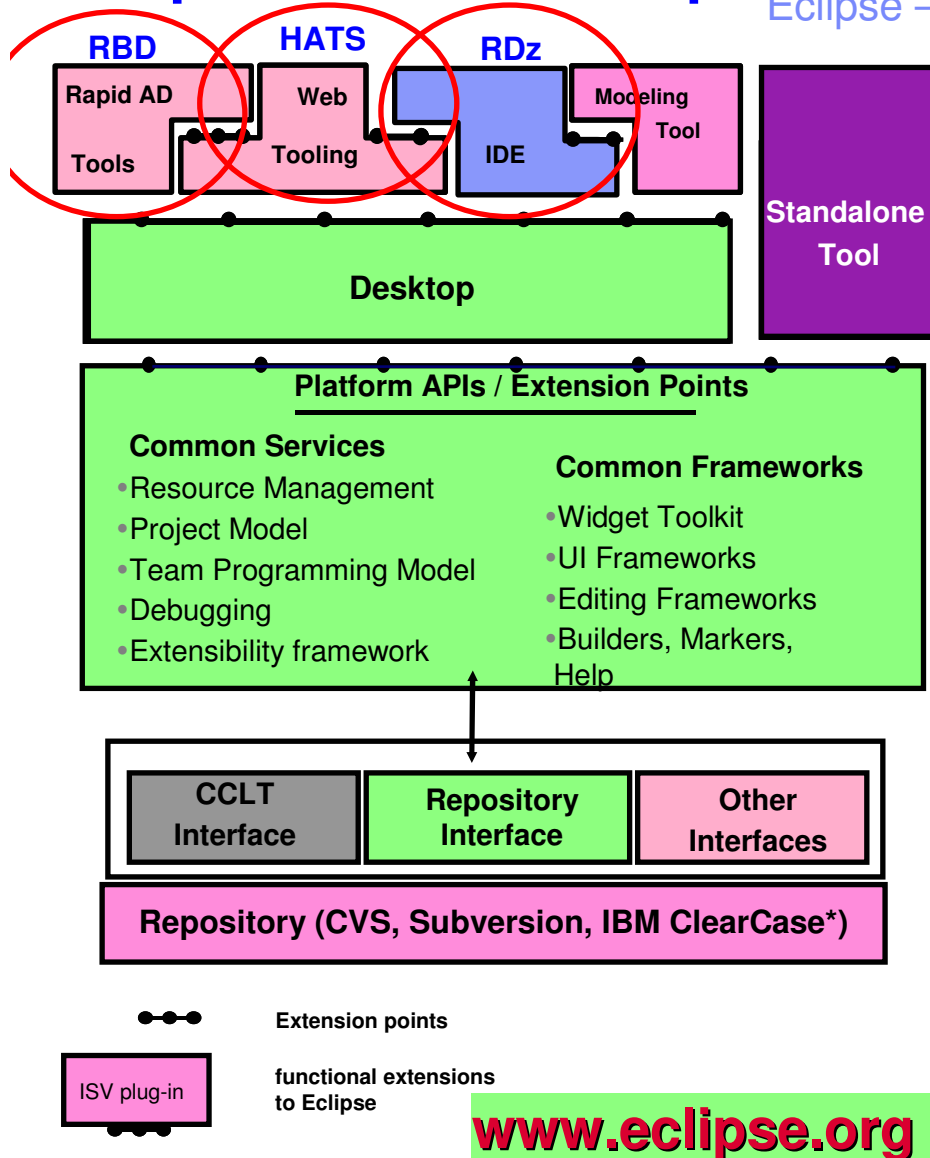


Asset Analyzer



Eclipse based Development Environments for z/VSE

Eclipse – the open Standard for application development

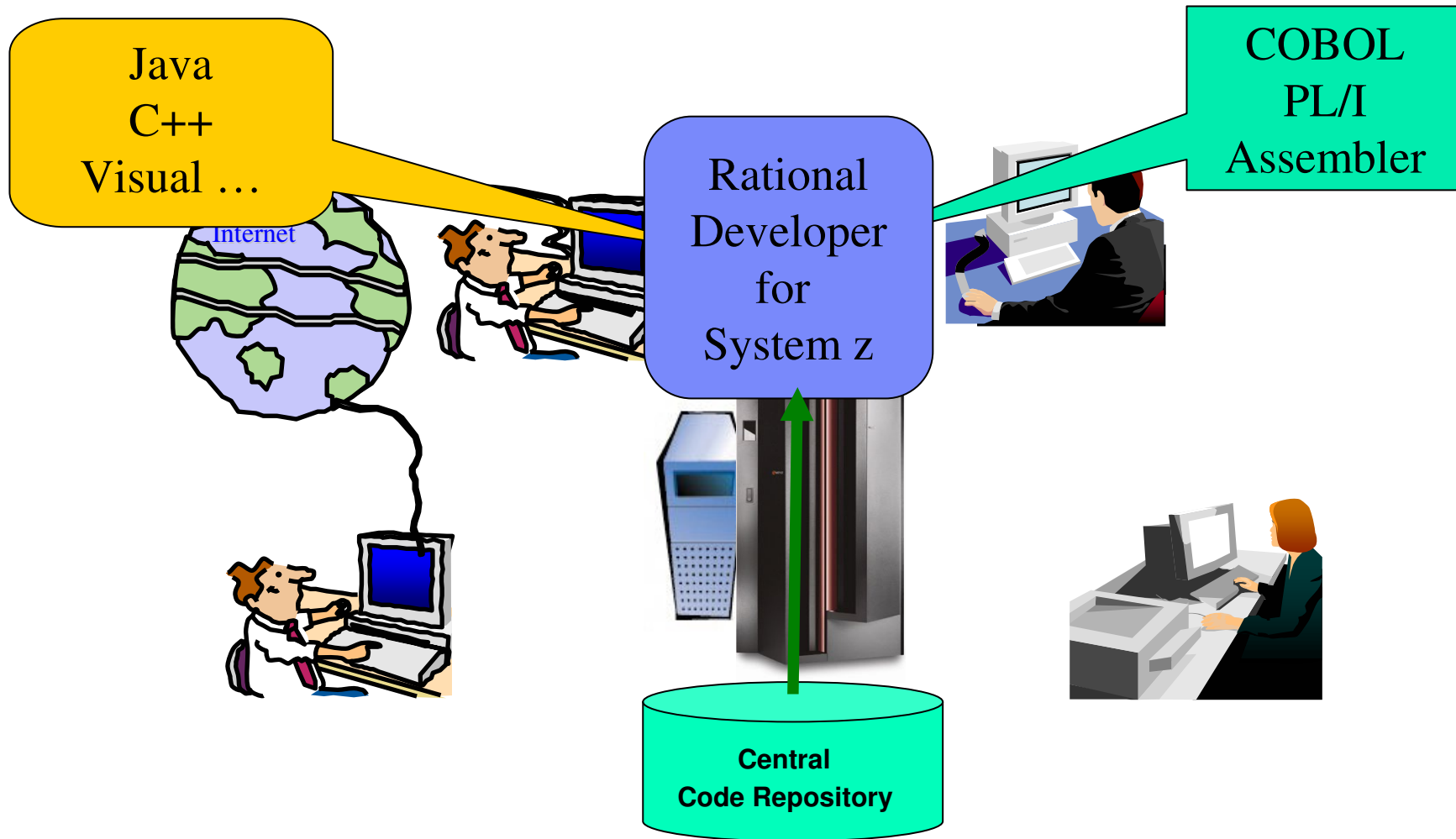


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 - 1) Integrated Development Environment (IDE)
 - Rational Developer for System z (RDz)
 - for Java, COBOL, PL/I, ASM,C
 - 2) IBM HATS Development Plug-In
 - develop new front-ends to 3270 applications
 - 3) IBM EGL development for z/VSE
 - Rational Business Developer (RBD)
 - EGL Plug-In for z/VSE
 - follow-on to Visual Age Generator

Summary

Eclipse – an open Integrated Development Environment for the enterprise



z/VSE Additional Information

- z/VSE Home Page
<http://www.ibm.com/zvse/>
- z/VSE Solutions and Utilities
<http://www-03.ibm.com/systems/z/os/zvse/solutions/>
- RDz
<http://www-01.ibm.com/software/awdtools/rdz/>
- RDz Plug-In for VSE
<http://www.qgrp.de/index.php?show=produkte&id=1&detail=wdz>
- Live Virtual Classes for RDz for VSE
<http://www-03.ibm.com/systems/z/os/zvse/education/index.html#completed>



- 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