



IBM STG Technical Conference

IBM Systems and Technology Group Technical Conference

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E71

Approaches to Application Development for z/VSE

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z/VSE Solution Architect

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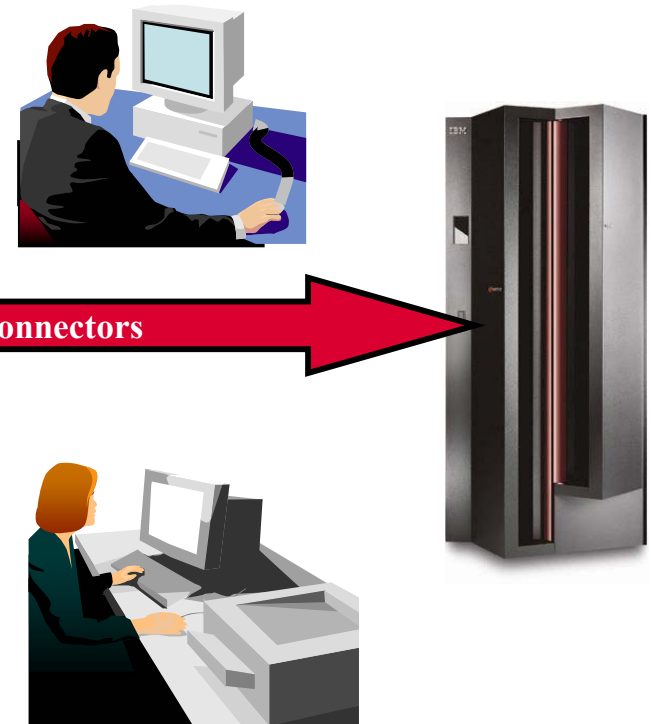
IT environments and their challenge

- ▶ Two IT worlds want a common solution

Distr. Application Developer

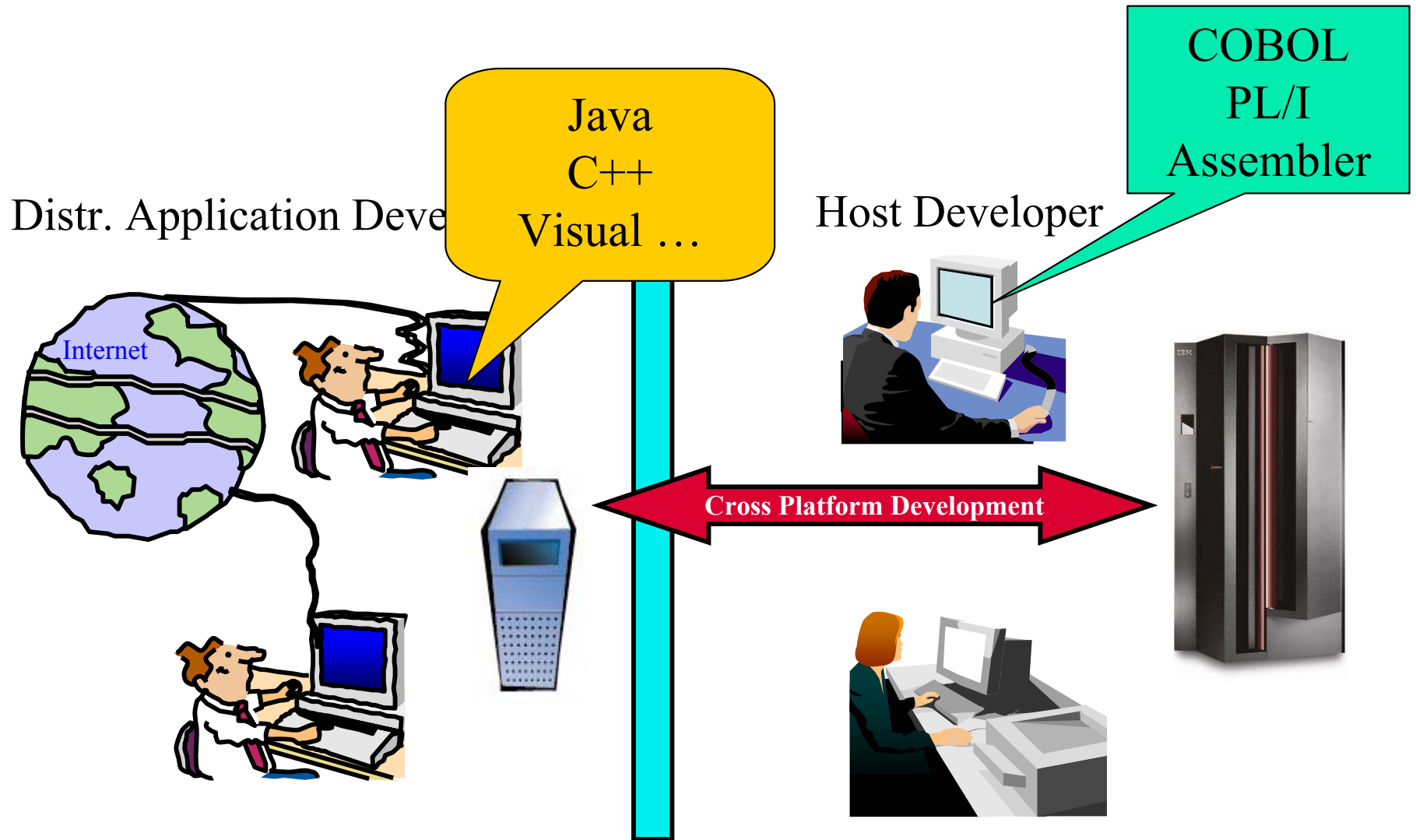


Host Developer



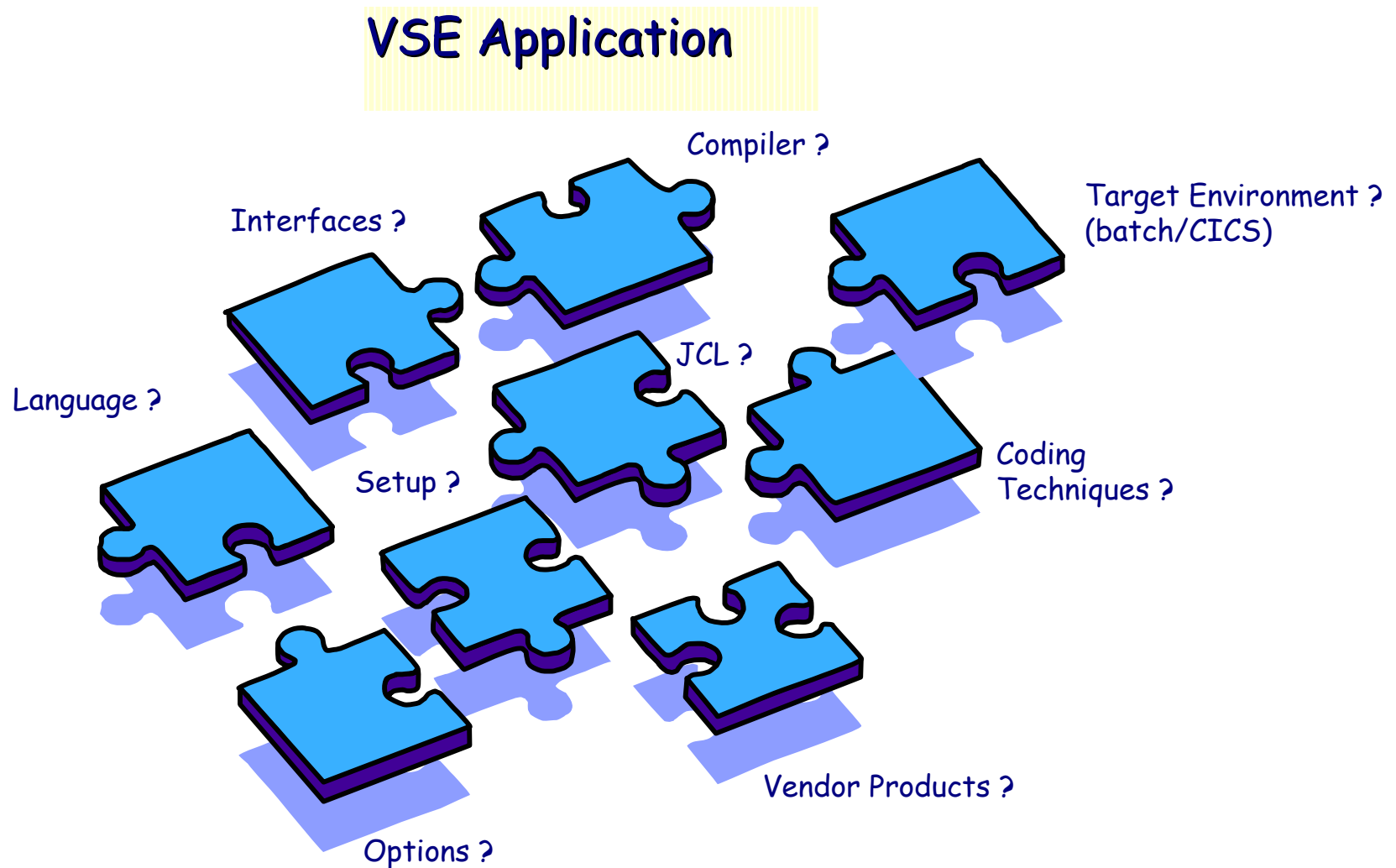
Connectors

'Distributed' Development Landscape...



Native VSE Application

- Typical interdependencies ...

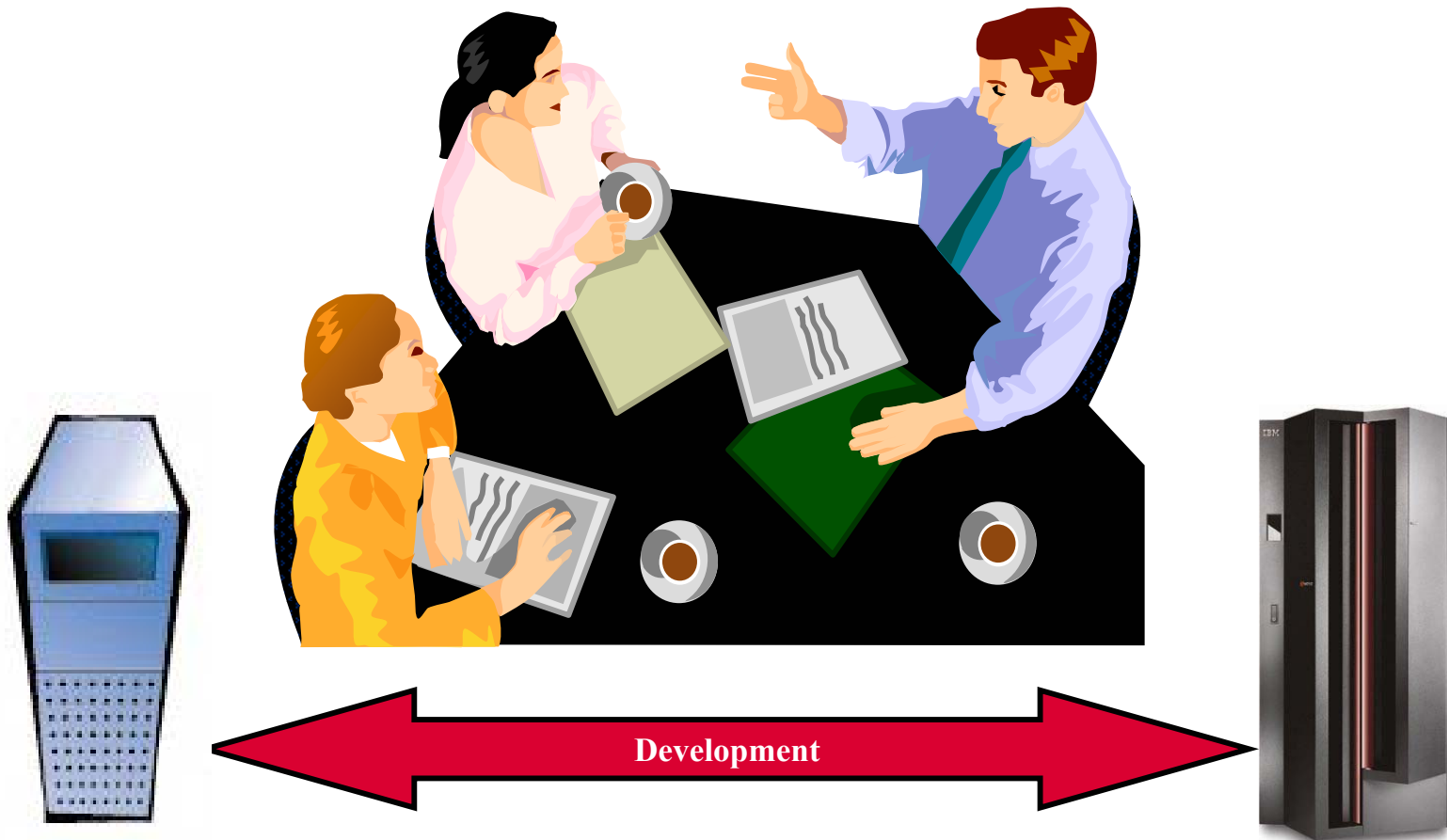


Goals of today's IT

- **Optimization of Development**
 - performant, less resources
- **Omit redundancies**
 - optimize processes
- **Reduce IT complexity**
 - efficient data flows and data stores

IT challenges

- ▶ **Key success factor - Effective Communication**
- ▶ **integrate all developer participating in the solution**



VSE Development options

■ Existing applications

- 1) Use of modern tools for development (i.e. PC tools instead of ICCF)
- 2) Modernize – develop graphical interfaces (in Java or COBOL)

■ New Applications for VSE

- 1) Use of modern development environments (i.e. Eclipse based)
- 2) Cross-Platform solution development environments (i.e. 4GL Methods)

VSE existing application considerations

- **Interactive Interface Support to build your applications**
 - Primary Library, OPTION 8, in order to build your applications

- **JCL Skeletons for various application languages and call structures**
 - Batch main/subroutines, CICS or DB2 target environments etc.
 - Considerations for suitable translate and compile steps
 - Language independent stubs such as CICS DFHELII ...
 - Appropriate compile and pre-processor options etc.

- **Security Issues**
 - Every CICS TS transaction needs to be "security-enabled" prior to first execution
 - The IUI provides associated support via selection path "Resource Definition" --> "Define Transaction Security"

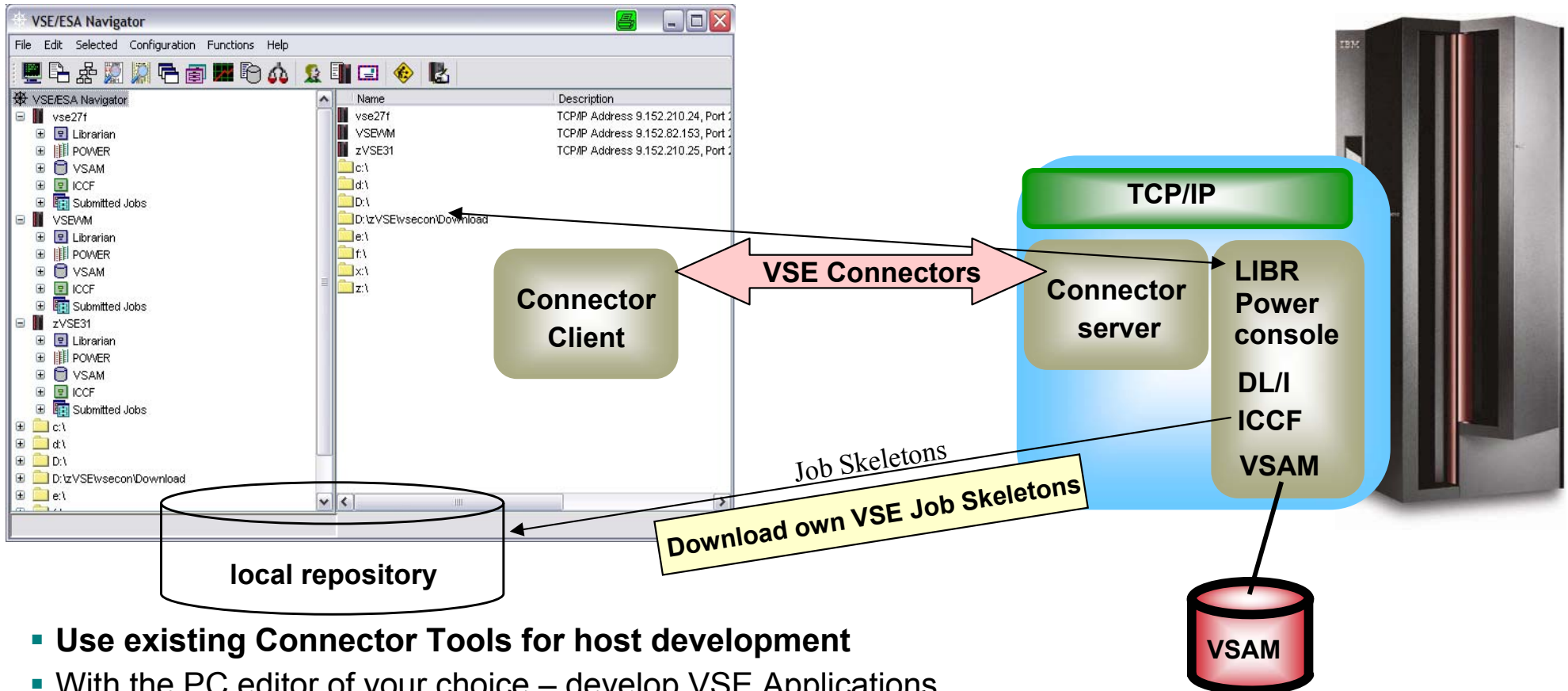
- **Program Maintenance from outside-VSE environment**
 - needs to ensure use of current compile skeletons, related options, stubs etc.

Existing Applications

(1) Use of existing modern tools for z/VSE development

PC/Workstation with VSE Navigator

z/VSE Server

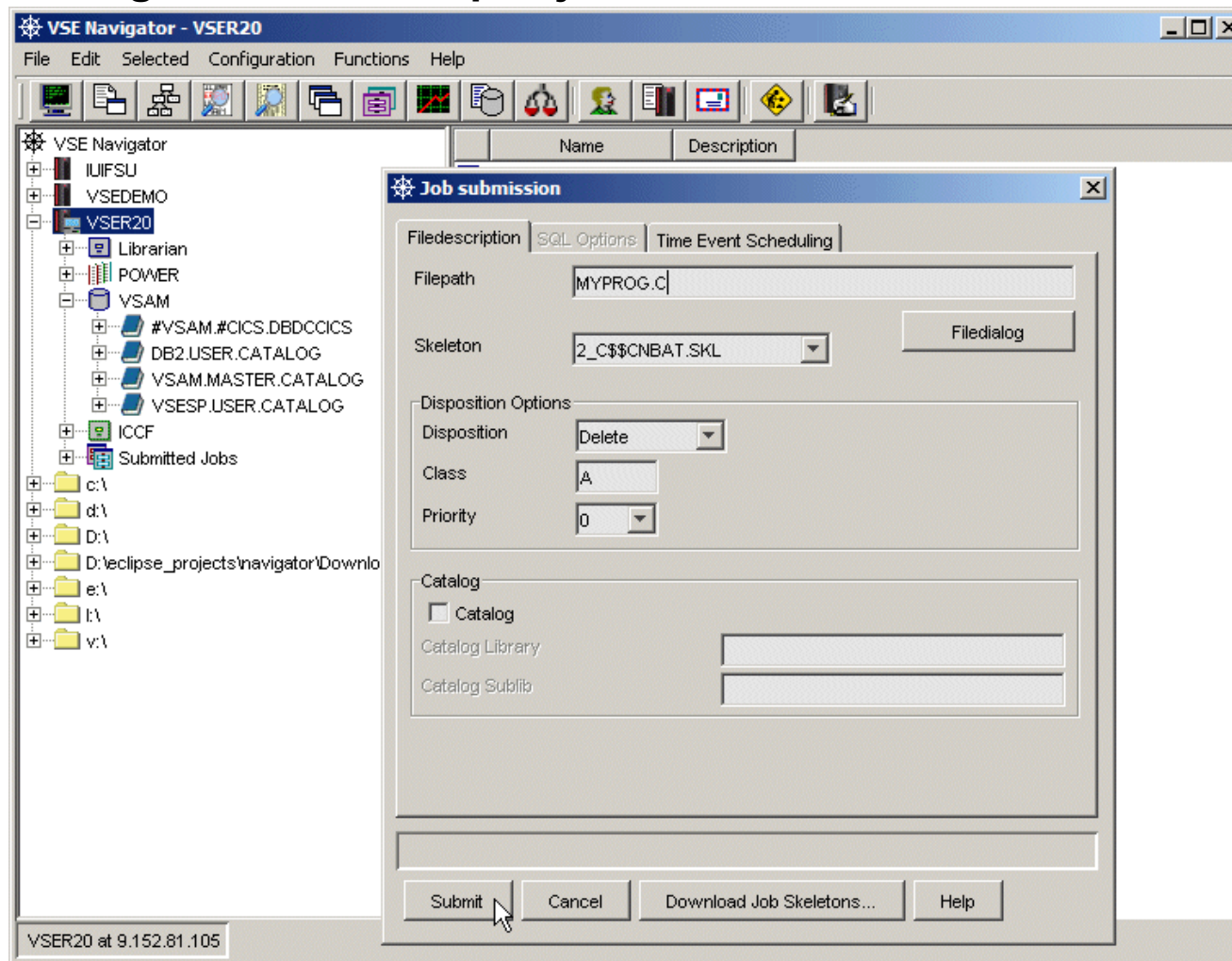


- Use existing Connector Tools for host development
- With the PC editor of your choice – develop VSE Applications
- Use Helper plugins for PC – VSE process preparation (Compile, Analysis)

Existing Applications

(1) Use of existing modern tools for z/VSE development Helper plugins

- VSE Navigator: VSE compile/job submission ...



Existing Applications

(1) Use of existing modern tools for z/VSE development Helper plugins

■ JCalc_LEVSE Tool

- SVA related Phase allocations – report, downloaded to PC ...

<http://www.ibm.com/servers/eserver/zseries/zvse/downloads/tools.html>

■ JLink_LEVSE Tool

- Analyze lists + generate report in Browser

<http://www.ibm.com/servers/eserver/zseries/zvse/downloads/tools.html>

■ JDisplay_AR_Commands

- Java front-end in WebSphere environment, connecting to z/VSE server, exploiting VSE Connector API for console communication ...

<http://www.ibm.com/servers/eserver/zseries/zvse/products/connectors.html>

Existing Applications

(1) Use of existing modern tools for z/VSE development Helper plugins

JCalc_LEVSE Tool (Part 1)

- ❑ **Calculator for LE/VSE load in the Shared Virtual Area**
 - Java GUI interface to choose one or more LE/VSE component(s)



- ❑ **Excerpt of downloaded VSE LIBR input data, to analyze**

M E M B E R	CREATION	LAST	BYTES	LIBR CONT	SVA	A-	R-	
NAME	TYPE	DATE	UPDATE	RECORDS	BLKS	STOR	ELIG	MODE
CEEFMON	PHASE	01-10-29	03-01-08	20 B	1	YES	YES	31 ANY
CEEFMTM	PHASE	01-10-29	03-01-08	20 B	1	YES	YES	31 ANY

JCalc_LEVSE Tool (Part 2)

□ The basic functionality

- Allocate descriptions to modules identified (focus on SVA eligible routines)
- Prepare a JTable overall view (with option to calculate a storage summary)

Routine Name	Description	Decimal Size	SVA Eligible	AMODE	RMODE	SVA List
CEEBINIT	Initialization/termination for batch	53856	YES	24	24	\$SVACEE
CEEBLIBM	Library routine retention init/term	20184	YES	ANY	24	\$SVACEE
CEEBLRR	Library routine retention interface	920	YES	ANY	24	\$SVACEE
CEEBNATX	Null Abnormal termination exit	2	YES	31	ANY	\$SVACEE
CEFRXTAN	Batch Abnormal termination exit table	274	YES	31	ANY	-

Note: Large phases marked red, default SVA entries in blue

Buttons: Help, Calculate SVA loadlist, Cancel

- Generate VSE shared virtual area (SVA) statistics/storage report

Loadlist	SVA-31 Requirement	SVA-24 Requirement	Setup Type
\$SVACEE	1122646	272608	IBM default
\$SVAEDCM	1643420	0	IBM default
\$SVAEDC	2291284	160	Optional
\$SVAIBMM	212928	37024	Recommended
\$SVAIBM	292719	37024	Optional
\$SVAIGZM	155864	0	Recommended
\$SVAIGZ	411240	169232	Optional

OK

Existing Applications

(1) Use of existing modern tools for z/VSE development Helper plugins

JLink_LEVSE_Analyzer Tool (Part 1)

Cross-check VSE Compile/link Lists

- GUI application front-end (3 step user-interaction: file chooser, build, show report)
- VSE application summary overview (e.g. resources involved, coding techniques ...)
- Event/context specific summaries & explanation (e.g. compile- options/messages ...)
- Specific warnings ... (e.g. indicators for improper stub usage etc.)



JLink_LEVSE_Analyzer Tool (Part 2)

❑ Sample report generated (web browser view)

C Prelinker - Object Resolution events

CEESETL	Unresolved prelink module reference. Also check linkage editor resolution
WARNING EDC4015:	Unresolved references are detected. Verify if the reference(s) given in this section are later resolved by the linkage editor

C Prelinker - Writable Static events

INFORMATIONAL EDC4013:	No map contents displayed as no writable static was found
-------------------------------	---

Linkage editor - Autolink events

CEESG003	Signature module for CVSE has been linked into application phase	Library reference not visible in link list (typical for C)
CEESTART	Compiler generated default entry point available	Library reference not visible in link list (typical for C)
EDCINPL	LE/C initialization triggered (might involve an assembler program with EDCPRLG and EDCEPIL macros coded)	Library reference not visible in link list (typical for C)
PRINTF	C Run-Time library function - printf (Format and Write Data)	Library reference not visible in link list (typical for C)

Linkage editor - Unresolved Reference events

EXTRN CE\$SETL	Do not code the CEESETL callable service. For C routines the setlocale() function should be used instead
WXTRN @@DLL	Internal LE/C reference, fine to be present

Existing Applications

(1) Use of existing modern tools for z/VSE development

Helper plugins

JDisplay_AR_Commands (Part 1)

❑ GUI Communication with VSE Console

JDisplay_AR_Commands - Copyright IBM Corp. 2005 - ...

Purpose: Illustrate new LE/VSE AR-commands

Connection Pane

Please enter VSE IP address: vse9.boeblingen.de.ibm.com

Please enter VSE user ID: demo

Please enter password:

Command Process Pane

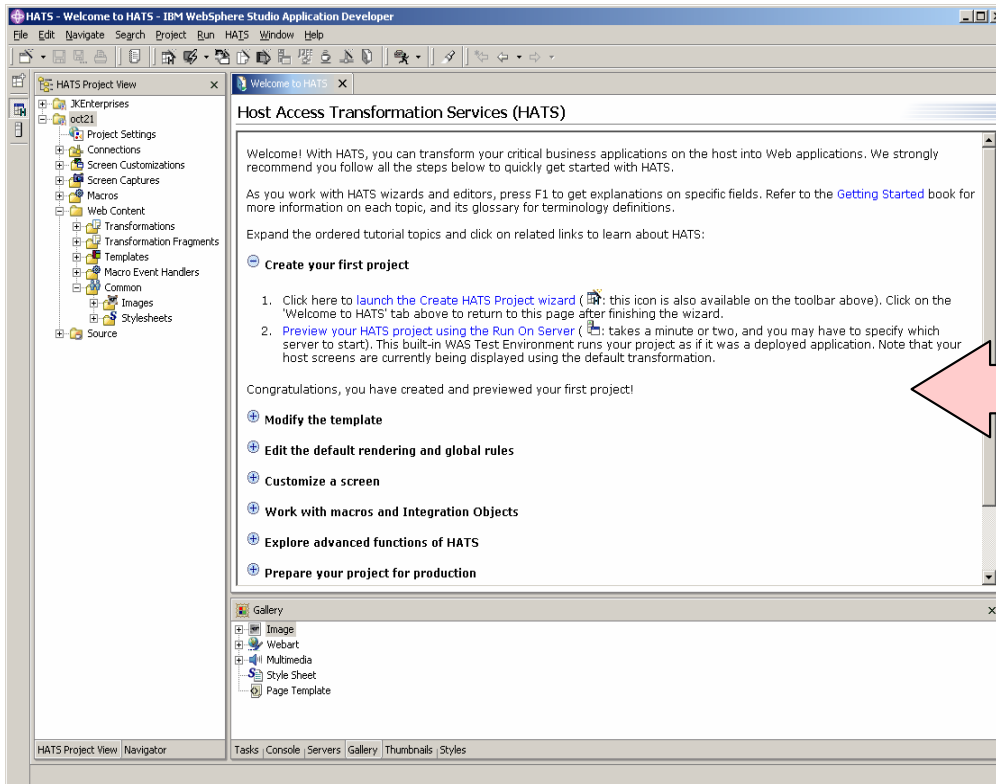
Please enter AR command: D CEE,CEEDOPT

START HELP EXIT

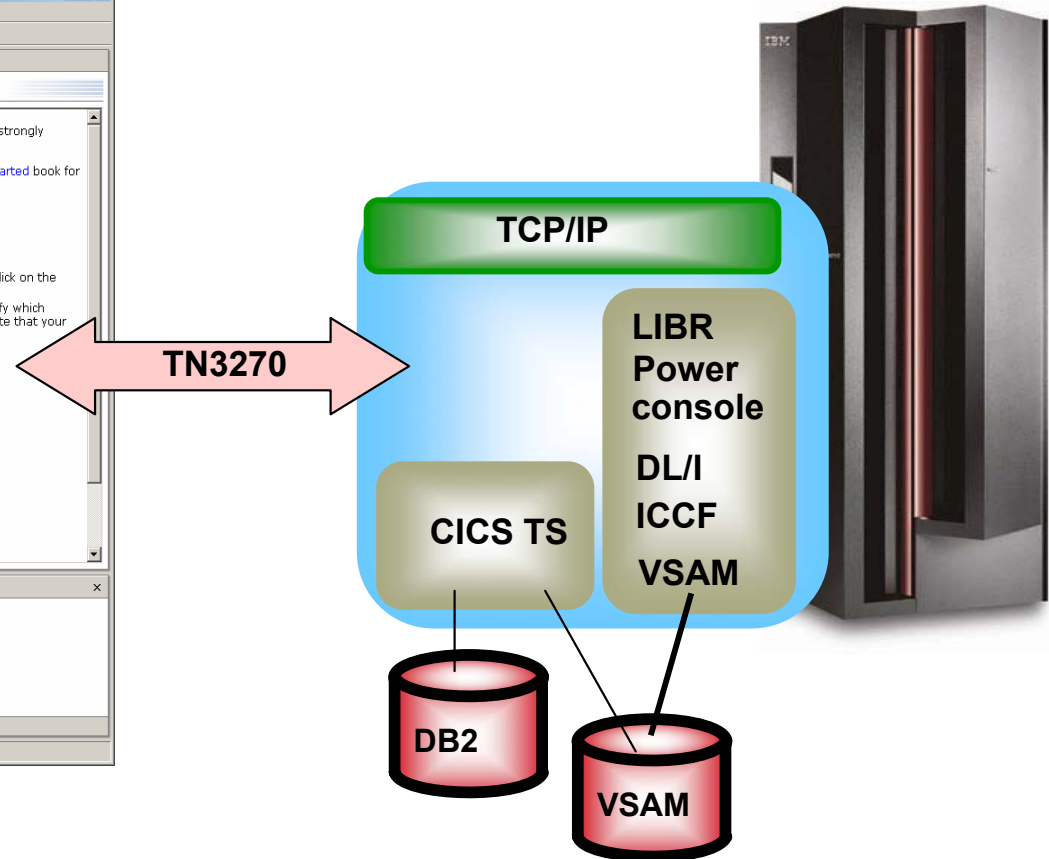
Existing Applications

(2) Modernize – Develop graphical interfaces – in Java

PC/Workstation Front-End Development



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

HATS Advantages:

Combine / Integrate

```

HodConn:localhost:localhost:server1:ubsdemo.ear#1
SC4100      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 . . . . .

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
File Distribute Inquire Options Help

200      Search Results

For a record, press a function key "F" type an Action Code and press Enter.
A=Address  B=Backup  C=C-list  E=Dept title  F=Feedback
I=Show Ids  J=JobResp(Ipers)  K=Calendar  L=Local data  O=Update/Open
P=Phones  R=Resp-To=All  T=T-to-list  U=Resp-Chain  V=View record

Lines 1 to 7 of 63
Column 42 to 81 of 208
Name      Act Tie-line EmpSt Mode  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 AWILLIS B676/C
Willis, Arthur W. (Wayne)  - Reg  IBMUS WILLISW na

Command ==>
F1=Help  F2=Get 2  F3=Exit  F4=Send note  F5=Resp-To=All  F6=Show dept/team
F7=Backward  F8=Forward  F9=Command  F10=Actions  F11=Dist list  F12=Cancel
  
```

```

09/22/2002 02:21 PM <DIR>      Utilities
11/28/2003 02:33 PM <DIR>      widens
01/05/2004 09:34 PM <DIR>      wilcib
01/02/2004 10:40 PM <DIR>      WINDONS
10/16/2003 09:26 PM <DIR>      win_jre_131
01/05/2004 04:42 PM <DIR>      woad51
04/22/2003 05:21 PM <DIR>      wspdrive
01/02/2004 10:40 PM      14,496 Xpadmin.log
      14 File(s)      4,175,691 bytes
      93 Dir(s)      22,888,353,792 bytes free

C:\Documents and Settings\Administrator_
  
```

JK Funds
Homepage > About Wealth Management in the US > Home

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

→ Market Info

5250 HTML Client
3270 HTML Client
3270 Thin Client
5250 Thin Client
VT Thin Client
Combined Thin Clients

Reset
Default
Refresh
Disconnect
Turn Keyboard Off

Quotes delayed at least 20 minutes

Our Perspective

- Municipal Market Commentary- 12/01/03
- Basis Points - 12/11/03
- On the Run- 12/08/03
- As We See It - 12/08/03
- Mary Farrell's Market View - 11/11/03
- Municipal Market in Perspective- 11/03/03
- Credit Market Relative Value (Summary Note) - 11/10/03

Data from 5250 Source

SC4100 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

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

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	AWILLIS	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

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

Local intranet

Existing Applications

(2) Modernize – Develop graphical interfaces – in Java

The screenshot displays a legacy application interface. On the left, an 'iseriesd Terminal' window shows a text-based menu for 'JK Enterprises' with options like 'Home Page', 'SiteMap', 'Employees', 'Jobs at JK Enterprises', 'Press Articles', and 'Support'. The terminal also shows a list of items with IDs (000001-000009) and a status of '***** **'. On the right, a Microsoft Internet Explorer browser window displays the 'JK Enterprises' website. The website features a navigation bar, a main menu, and a central 'Inventory Table' section. The inventory table includes a bar chart showing the number in stock for various items. To the right of the inventory table is a 'Delivery Schedule' calendar for August 2002, and a 'Current Order' table listing items like 'Catcher's mit', 'Baseball bat', 'Football', and 'Basketball' with their quantities and photo links.

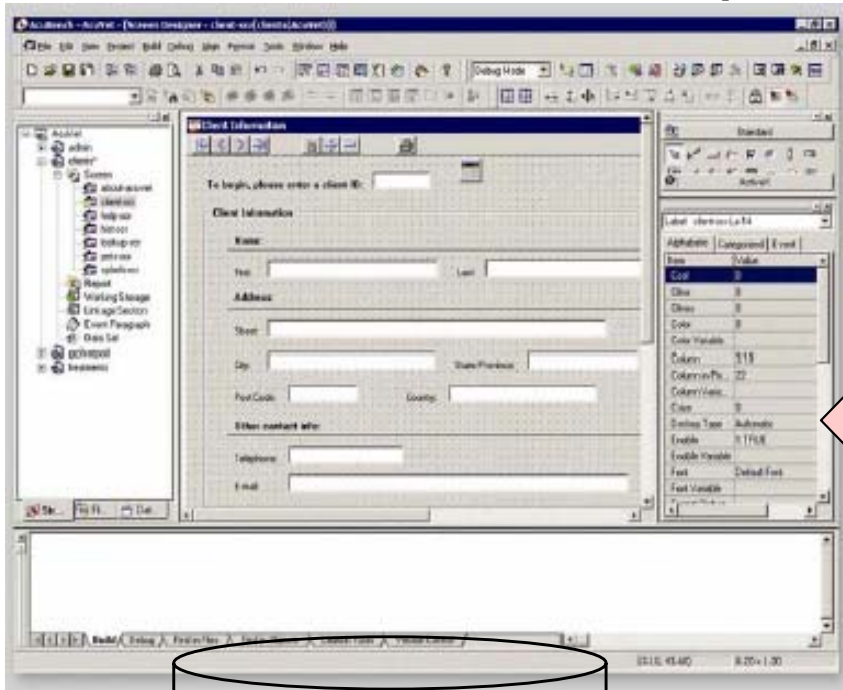
Inventory Table	Inventory Graph	Part Number
Description		
Baseball glove	35	
Catcher's mit	20	
Baseballs - 1 doz.	40	
Baseball bat	46	
Football	33	
Basketball	25	
Tennis balls - 1 doz.	41	
Golf balls - 1 doz.	27	
Ice Skates	17	
	Number in Stock	

Current Order	Quantity	Image
Catcher's mit	10	Photo
Baseball bat	20	Photo
Football	10	Photo
Basketball	10	Photo

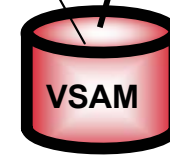
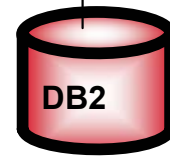
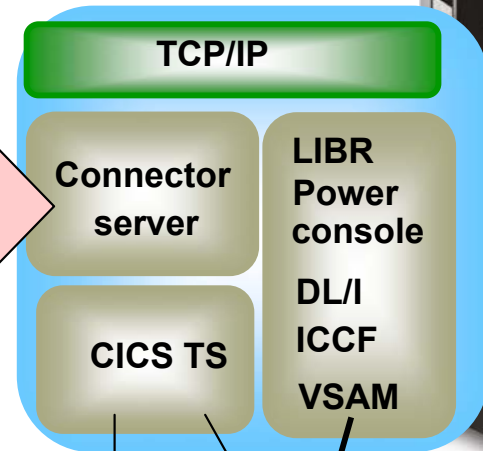
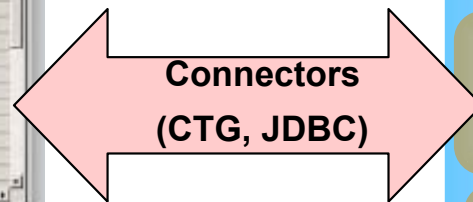
Existing and new Applications

(2) Modernize / new – Develop graphical interfaces – in Cobol

PC/Workstation COBOL Development



z/VSE Server



- Application development on PC, for VSE – in COBOL (i.e. WDz)
- Use existing COBOL expertise
- COBOL Compiler and Runtime (COBOL Virtual Machine) on PC
- New application in COBOL – access to existing data and applications via Connectors (CTG, JDBC)

Existing Applications

(1) Use of existing modern tools for z/VSE development

Conclusion

- **Core applications can be developed, maintained with modernized methods**
- **Existing development expertise is used**
- **increased effectiveness**
- **modern versioning software can be used**

VSE Development options

■ Existing applications

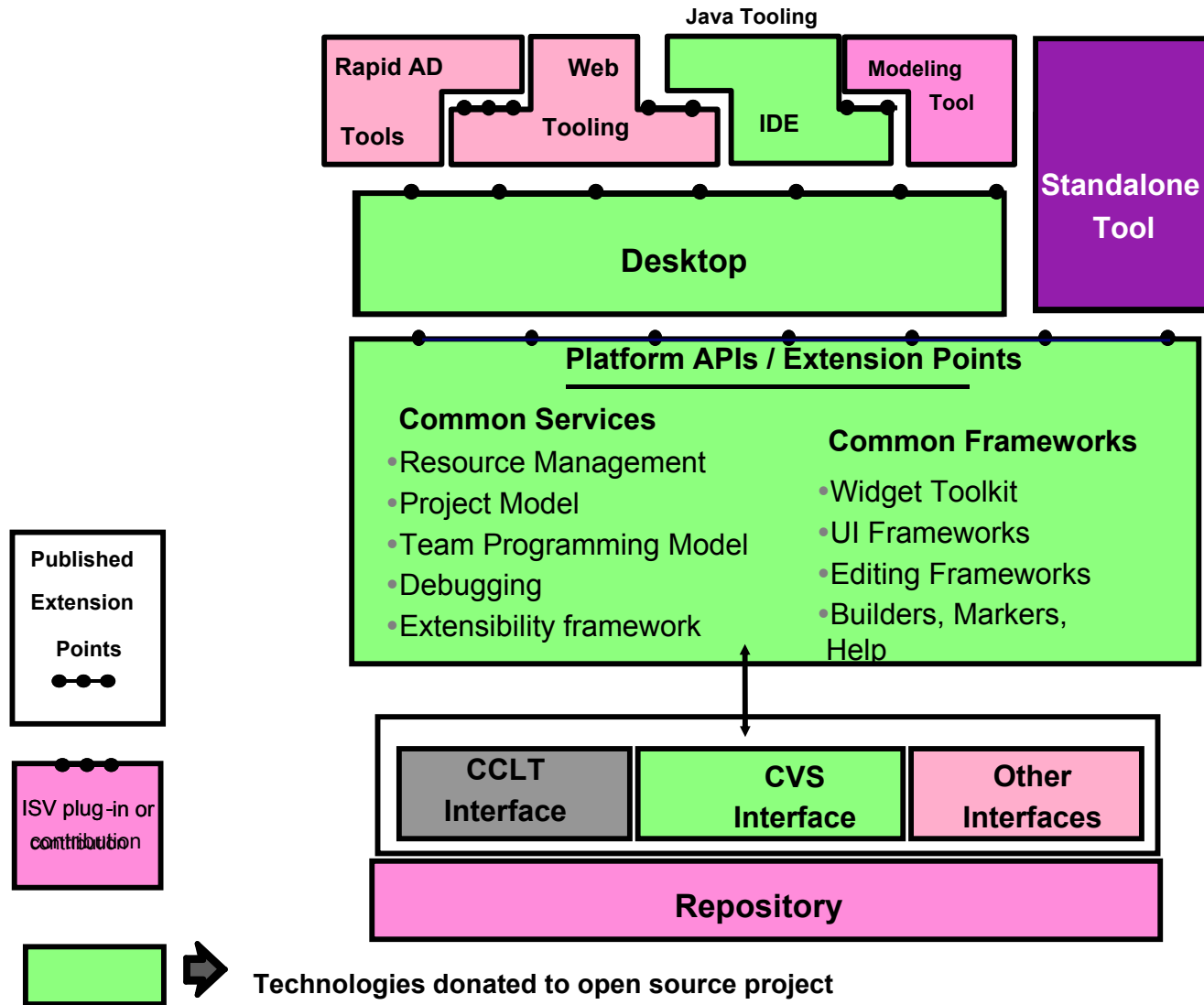
- 1) Use of modern tools for development (i.e. PC tools instead of ICCF)
- 2) Modernize – develop graphical interfaces (in Java or COBOL)

■ New Application for VSE

- 1) Use of modern development environments (i.e. Eclipse based)
- 2) Cross-Platform solution development environments (i.e. 4GL Methods)

New applications for VSE

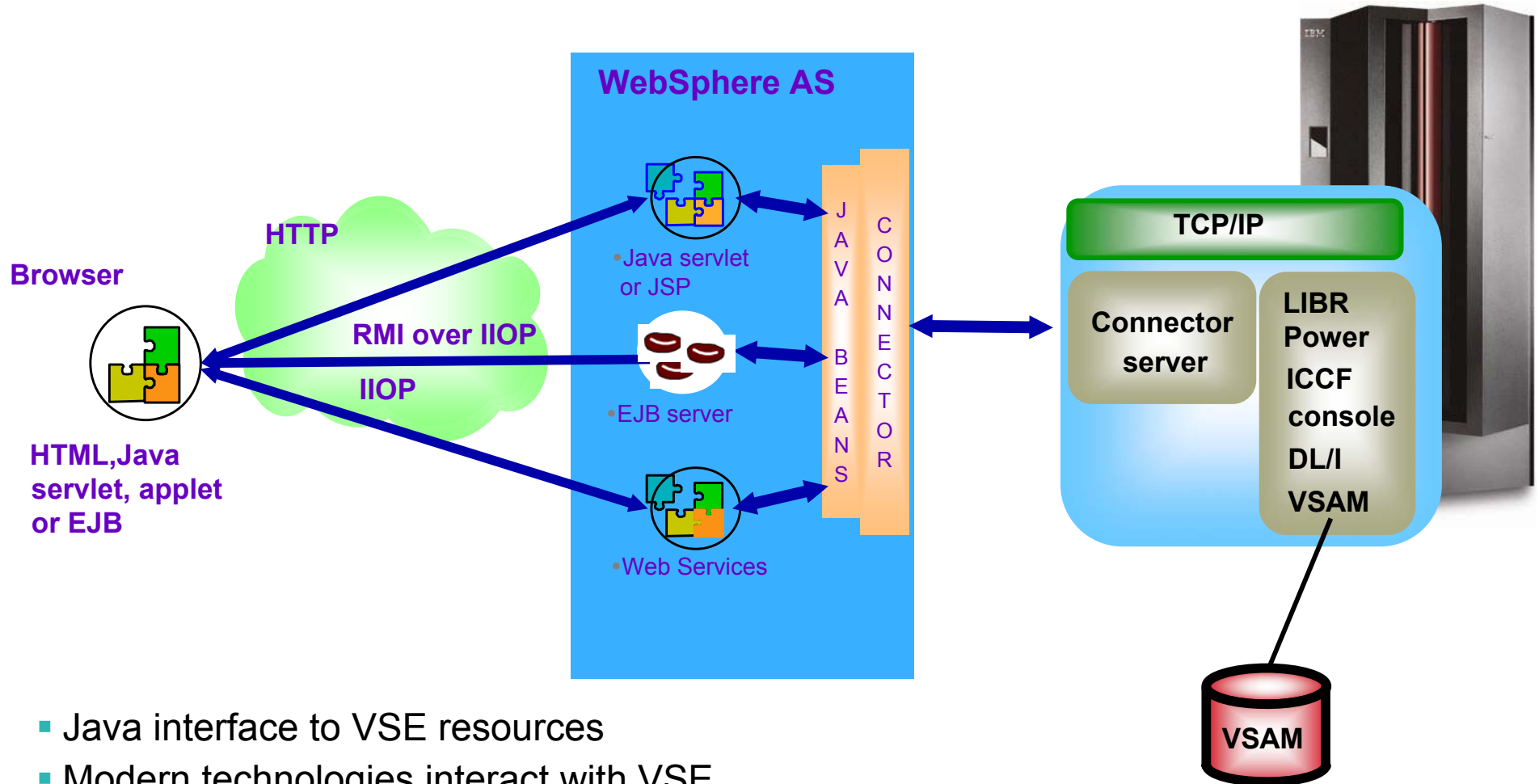
(1) Use of modern development environment !



Real time access to VSE data and subsystems with Java-Based Connector

Web Client

z/VSE Server

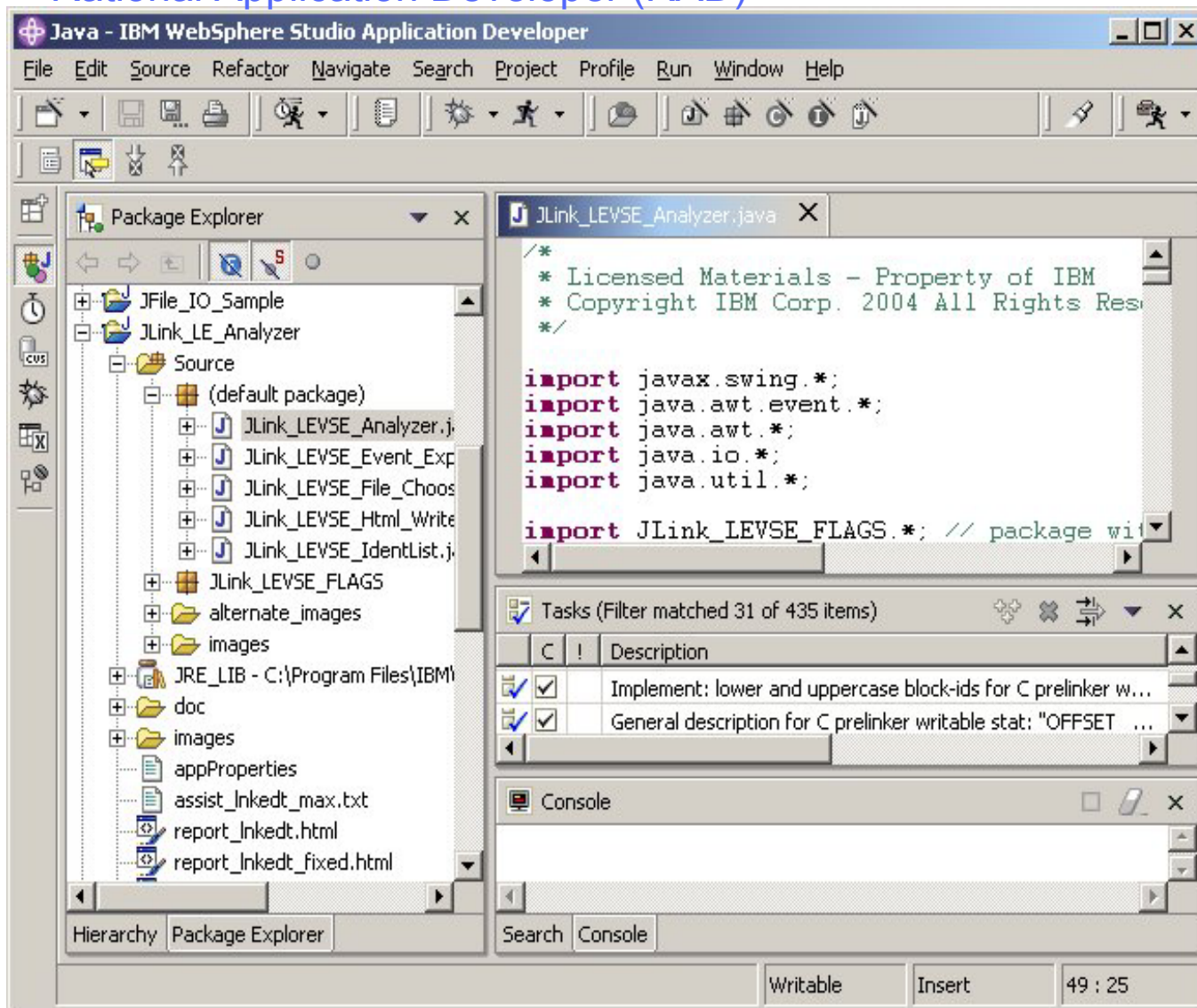
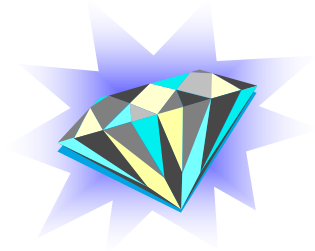


- Java interface to VSE resources
- Modern technologies interact with VSE

New applications for VSE

(1) Use of modern development environment !

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



Based on the eclipse platform

<http://www.eclipse.org>

Open architecture for integrated
Web- & application development.
Supports the plug-in model

- **Different Perspectives**
Java-, Profiling-, Debugging-,
CVS Repository-, J2EE-, XML ...
- **Basic Functions** like:
Project-, class-, interface-
generation, code-formatting
- **Control Windows**
Source code, tasks, console-
messages, package explorer ...
- **Developer Tools** like:
Profile-agents for analysis,
javadoc generator
- **Tools for execution, test**

JDisplay_AR_Commands tool

❑ VSE Console Messages in WebSphere Development Environment

The screenshot displays the IBM WebSphere Studio Application Developer interface. The Package Explorer on the left shows the project structure for 'JDisplay_AR_Commands_GUI'. The main editor window shows the source code for 'JDisplay_AR_Commands.java'. The Console window at the bottom right displays the output of the VSE command 'D CEE,CEEDOPT', showing a detailed options report for the Enclave CEL4OPTS.

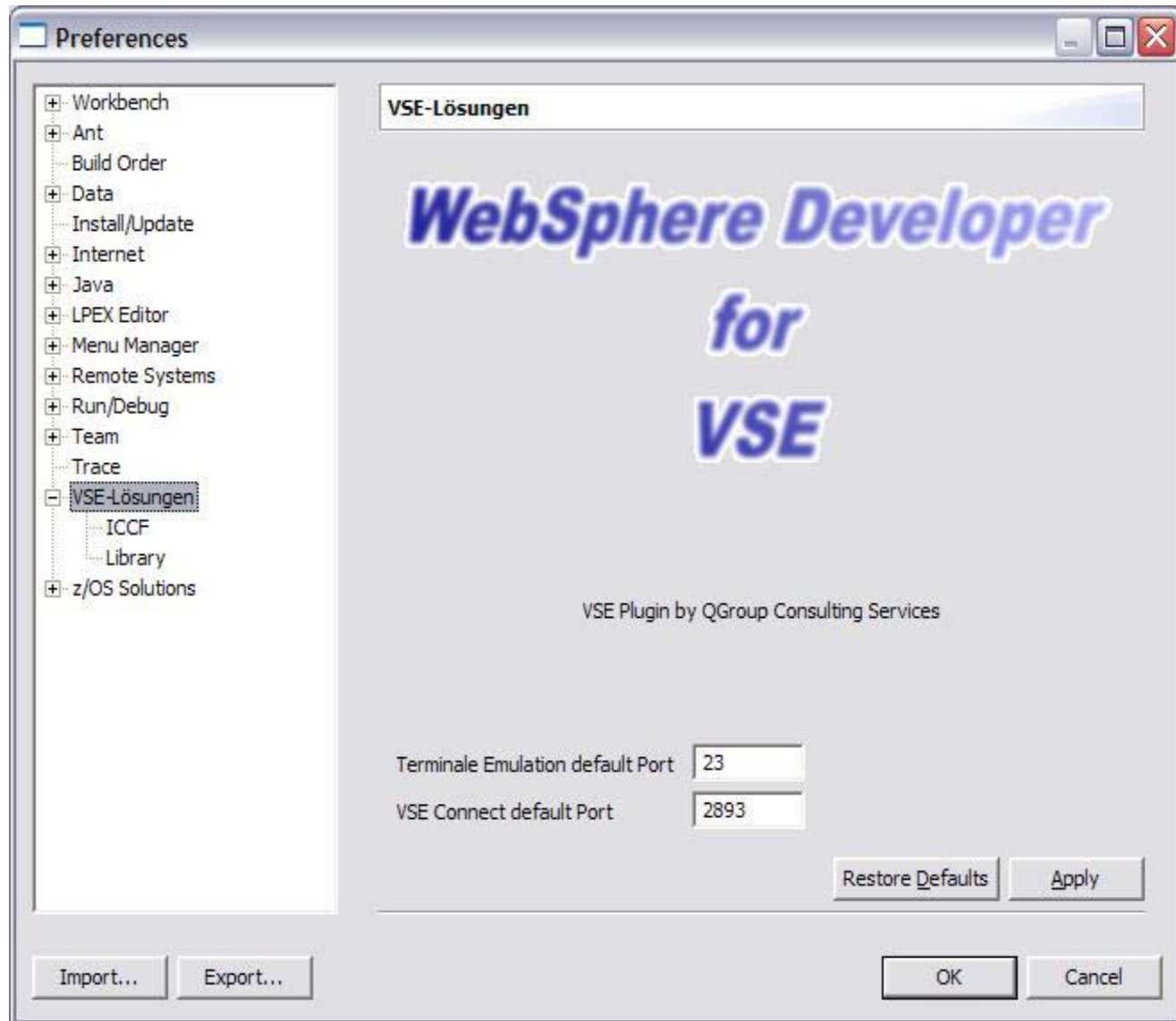
```

VSE Console line by line response from AR command: D CEE,CEEDOPT
AR 0015 Lang. Env. for VSE command processing completed
AR 0015 1140I READY
AR 0015 1C39I COMMAND PASSED TO VSE/POWER
F1 0001 1R881 OK : 1 ENTRY PROCESSED BY R RDR,CEL$OPT$
C1 0001 1Q47I C1 CEL$OPT$ 03910 FROM (SYSA) , TIME=16:58:36
C1 0046 // JOB CEL4OPTS - PRODUCE BATCH INSTALLATION-WIDE OPTIONS REPORT
DATE 03/02/2005, CLOCK 16/58/36
C1 0046 Options Report for Enclave CEL4OPTS 03/02/05 4:58:36 PM
C1 0046 Language Environment for VSE/ESA V1 R4.4
C1 0046
C1 0046 LAST WHERE SET OPTION
C1 0046
-----
C1 0046 Installation default ABPERC(NONE)
C1 0046 Installation default ABTERMENC(ABEND)
C1 0046 Installation default NOAIXBLD
C1 0046 Installation default ALL31(OFF)
C1 0046 Installation default ANYHEAP(16384,8192,ANYWHERE,FREE)
C1 0046 Installation default BELOWHEAP(8192,4096,FREE)
C1 0046 Installation default CBLOPTS(ON)
C1 0046 Installation default CBLPSHPOP(OFF)
C1 0046 Installation default CHECK(OFF)
C1 0046 Installation default COUNTRY(US)
C1 0046 Installation default NODEBUG
C1 0046 Installation default DEPTHCONDLMT(10)
C1 0046 Installation default ENVAR("")
C1 0046 Installation default ERRCOUNT(20)
C1 0046 Installation default HEAP(32768,32768,ANYWHERE,KEEP,8192,4)
C1 0046 Installation default HEAPCHK(OFF,1,0)
C1 0046 Installation default LIBSTACK(12288,4096,FREE)
C1 0046 Installation default MSGFILE(SYSLST)
C1 0046 Installation default MSGQ(15)
C1 0046 Installation default NATLANG(UEN)
C1 0046 Installation default RETZERO(OFF)
C1 0046 Installation default RPTOPTS(OFF)
  
```

(1+)Cross Plattform Integrated Development Environment

Approach with WDz - WebSphere Developer for System z (*)

(*) In development.



VSE - IGTZMATH.cbl -

File Edit Navigate Search Project Run Window Help

z/OS Projects DEMOVSE.hce IGTZMATH.cbl VSE System View

Line 40 Column 81 Insert

```

--*A-1-B-----2-----3-----4-----5-----6-----7---|-----8
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
Case-Sev-Ctl PIC X.                00036000
Facility-ID PIC XXX.               00037000
Info PIC S9(9) BINARY.             00038000
                                   00039000
VI SION.                           00040000
                                   00041000
.                                    00042000
                                   00043000
5 TO ARG1RS.                        00044000
ESSLOG' USING ARG1RS, FC, RESLTRS.  00045000
*****                              00046000

```

Outline: .TmpVseRemote, DEMOVSE, BuildOutput, .project, CEEIGZCT.cbl, IGTZ

Property: Info, derived, editable, last modified, linked, location, name, path, size

Context Menu: 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), Open Welcome Page(Q), Properties(Z)

VSE Sub-menu: RemoteCompile, Info, Upload

Problems Table:

Page	Se...	Line	Location	Host Name	Date		
S2106-S	"DIVI"	was found in the "VALUE" stat...	2	40	/DEMOVSE/IGZTMATH...	Local	Jan 26, 2007 4:39:27 PM

start | Go DE 98% | 4:40 PM Friday 1/26/2007

Taskbar: Plug-in Development..., VSE - IGTZMATH.cbl, localSyntaxcheckErro...

VSE - IGTZMATH.cbl -

File Edit Navigate Search Project Run Window Help

z/OS Projects

- .TmpVseRemote
 - DEMOVSE
 - build
 - BuildOutput
 - jd
 - .project
 - CEEIGZCT.cbl
 - IGZTMATH.cbl

Line 40 Column 81 Insert

```

--*A-1-B-----2-----3-----4-----5-----6-----7---|-----8
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
                                   00039000
PROCEDURE DIVISION.                00040000
                                   00041000
PARA-MTHSLOG.                       00042000
                                   00043000
   MOVE 5.65 TO ARG1RS.              00044000
   CALL 'CEESLOG' USING ARG1RS, FC,  00045000
   RESLTRS.                          00046000
   *****

```

Remote Error List

Filter matched 3 of 3 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

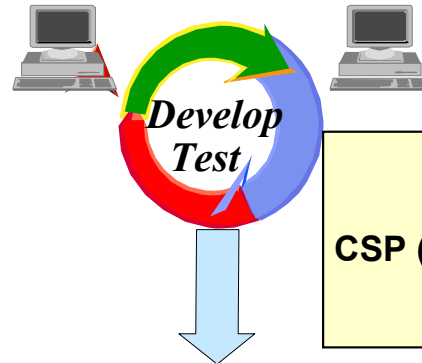
z/OS LPEX Editor is active

start | Address | Go | DE 98% | 4:44 PM Friday 1/26/2007

Command Prompt | Plug-in Development ... | VSE - IGTZMATH.cbl - | Paint

(2) Cross Platform Solution development Approach with VisualAge Generator

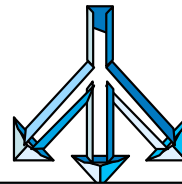
**Rapid
Development**



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

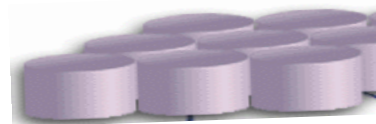


z/VM

z/VSE(CICS, Batch)

z/OS, (CICS, IMS, Batch)

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



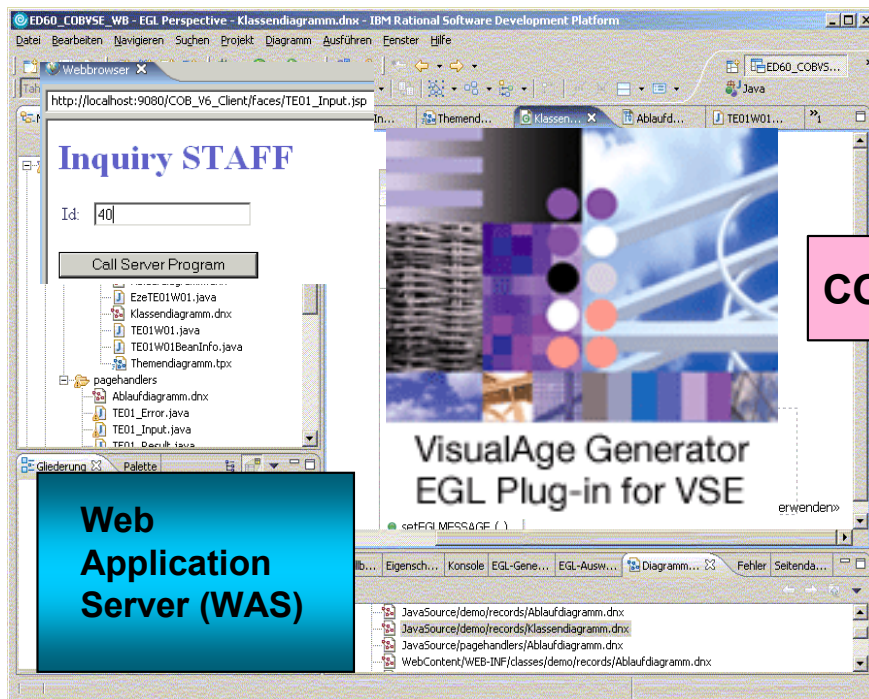
DB2 UDB VSAM ODBC
Oracle DLI, IMS/DB

(2) Cross Plattform Solution development Approach with VisualAge Generator

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

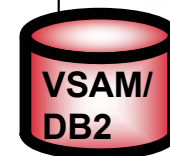
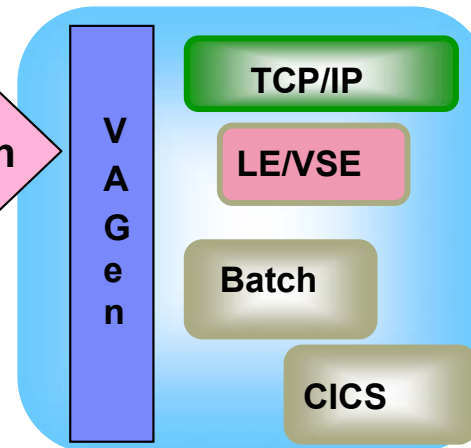
Rational Application Developer (RAD)

z/VSE Server



„Generate“

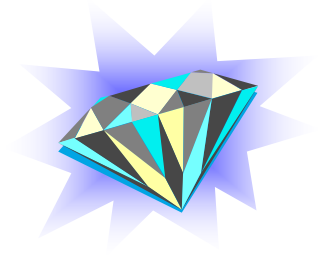
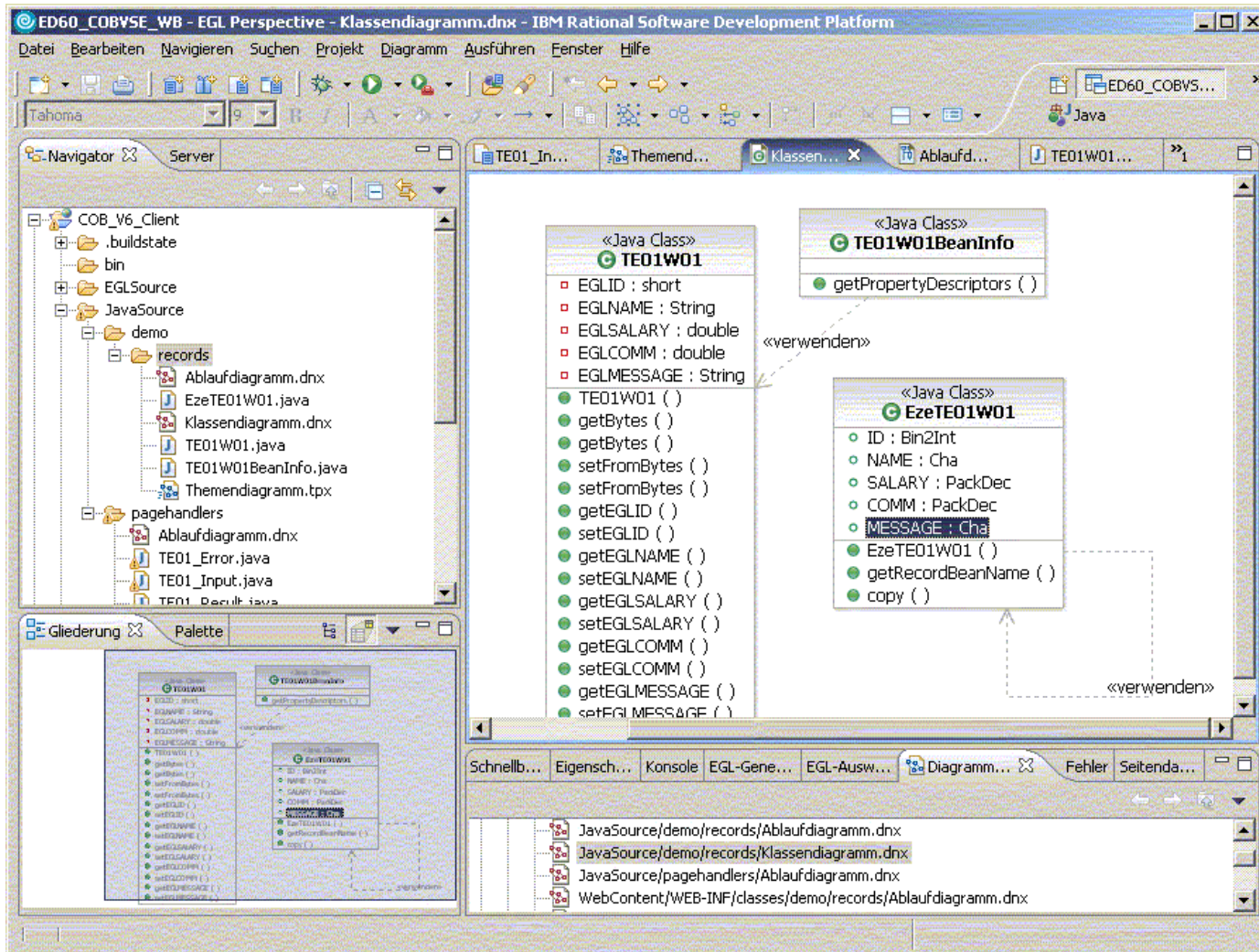
COBOL/CICS/batch



- 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)

Rational Application Developer (RAD)

Integrated Development Environment (IDE)



Functionality for Enterprise Development

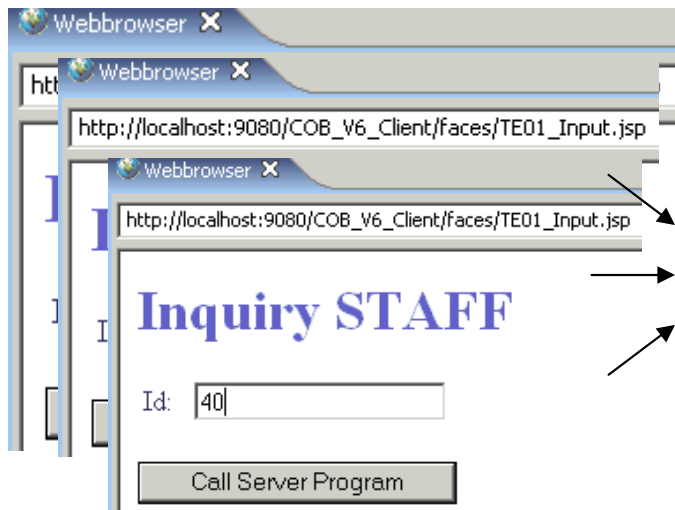
- **Additional perspectives**
EGL ...
- **Migration Assistance:**
EGL V6 Migration, VisualAge Generator Migration
- **Control Windows/Views**
EGL generation, SQL errors ...
- **Additional developer tools:**
e.g. page designer, web site designer, portal tools, service data objects, XML tools, UML Visual Editor etc.

Tech-article: **IBM Rational Developer: Powerful support for rapid Java and J2EE development**

<http://www.ibm.com/developerworks/rational/library/dec04/parkin/>

Components for the 4GL runtime

Web Browser

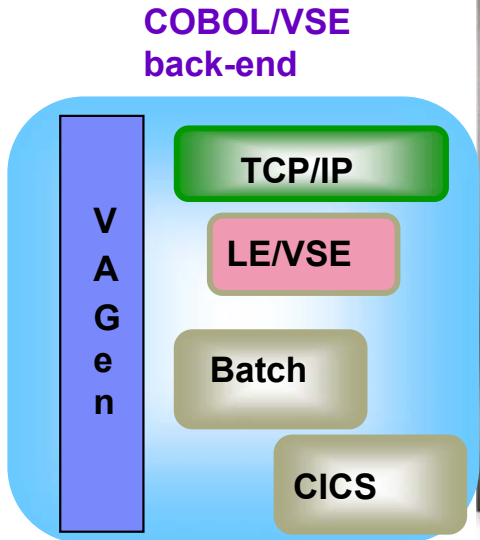


JSP front-end
(n-times)

Web
Application
Server (WAS)

J2C Adapter

CICS Transaction Gateway (CTG)



COBOL/VSE/CICS

VSAM/
DB2

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)

Types of generated Programs via EGL

➤ **VSE applications**

- CICS applications,

 - including the Compile/Link Jobs and CICS definitions

- batch applications

 - including Compile/Link Jobs

- **It's very easy to switch the data access method (i.e from VSAM to SQL)**

➤ **Web applications:**

- Standalone (without access to VSE)

- With access to Core applications (Core existing CICS, or EGL generated)

➤ **Distributed Applications**

- Mixed applications with a client part and a VSE part in COBOL

Program generation with 4GL

➤ **Who may consider exploring EGL solutions?**

- All developers with the need to implement „Business Logic“ and want to be platform independent
- Especially for: Databases, Java-, Host-, VisualAge Generator Developer

➤ **What are the changes in the development process**

- Specialized knowledge in Programming languages is obsolete (COBOL, Java ...)
- The focus is on the EGL-Language and build descriptors
- Coding and maintenance is done in EGL, not on the generated Programs !
- The data access method is defined in EGL and can be switched easily (i.e. „indexedRecord“ (VSAM KSDS), „sqlRecord“ for SQL)

A 'Common' Development environment !



Eclipse is the base !

Conclusion

- **Make use of the e-business infrastructure available in z/VSE for AD**
 - VSE Connectors, Solution Scenarios“ (→ z/VSE home) z/VSE Home → Downloads → Tools
- **Check the possibility and advantage of platform independent deployment (especially new applications ... i.e. with target environment: Linux)**
 - WSAD-/RAD-based development can be host-oriented and relieve it
 - EGL has different possibilities to generate server programs
 - Flexibility and a modern Solution Landscape is the result
- **Avoid unknown risks in ,total‘ migrations**
 - Avoid ‘big-switch‘ changes, from today's robust solutions, the result is often unpredictable
 - functionality in core applications is often undocumented and therefore hard to be recreated without the whole picture of dependencies
 - Modern solution can often be developed as enhancement to proven existing solutions, with affordable effort
 - The main business processes should be the main path for solution enhancements (rather than modern techniques only)
- **Where traditional development makes most sense it should be kept**
 - The host environment has special services (i.e. Assembler driver, macros, program-techniques), which might not be usable in other development environments – modern tools can help

Rational Application Developer (RAD)

- **Overview RAD for WebSphere Software**
<http://www.ibm.com/software/awdtools/developer/application/index.html>
- **Download RAD V6001**
<http://www.ibm.com/support/docview.wss?uid=swg24009346>
- <http://www.ibm.com/developerworks/downloads/r/rad>
- **Rational Software downloads**
- <http://www.ibm.com/developerworks/websphere/downloads/plugin/>
- **Rational Technical Library**
 - <http://www.ibm.com/developerworks/rational/library/>
- **Rational Technical Resources + Best Practices**
 - <http://www.ibm.com/developerworks/rational/>
- **IBM Software Products**
 - <http://www.ibm.com/software/sw-bycategory/subcategory/SW740.html>

Enterprise Generation Language (EGL)

- **Visual Age Generator**
<http://www.ibm.com/software/awdtools/visgen>
- **Program Directory (includes setup prerequisites ...)**
<http://www.ibm.com/software/awdtools/visgen/library/v45docs.html>
- **Overall EGL**
 - <http://www.ibm.com/developerworks/rational/products/egl/>
- **EGL Language Resources (check for latest references - V6 level)**
 - <http://www.ibm.com/developerworks/rational/library/egldoc.html>
- **Samples / Practice**
 - **EGL integration with Java using Rational Application Developer V6**
http://www.ibm.com/developerworks/rational/library/05/510_java/#download
 - **Generating COBOL using EGL and JSF with WebSphere Studio Enterprise Developer**
http://www.ibm.com/developerworks/websphere/library/techarticles/0502_barosa/0502_barosa.html
Note: target system in this sample is not z/VSE 3.1 but can be customized !
It is recommended to use RAD V6 instead WSED !
 - **Generating Java using EGL and JSF with WebSphere Studio Site Developer V5.1.2**
http://www.ibm.com/developerworks/websphere/library/techarticles/0408_barosa/0408_barosa.html

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/>



- 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

SG24-5997-00

- ***Handbook For WebSphere 5***
(Connectors to z/OS and VSE)

SG24-7042

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