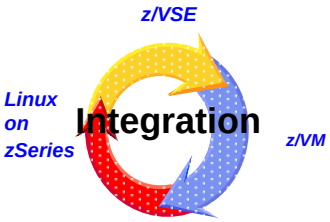
IBM Systems & Technology Group

Development possibilities for z/VSE



IBM zSeries and System z

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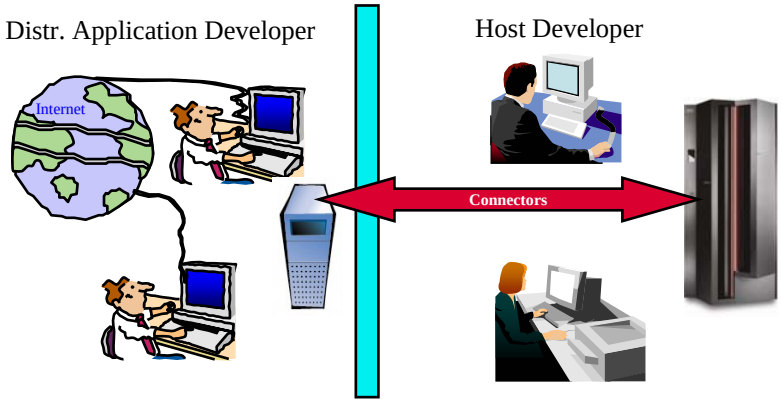
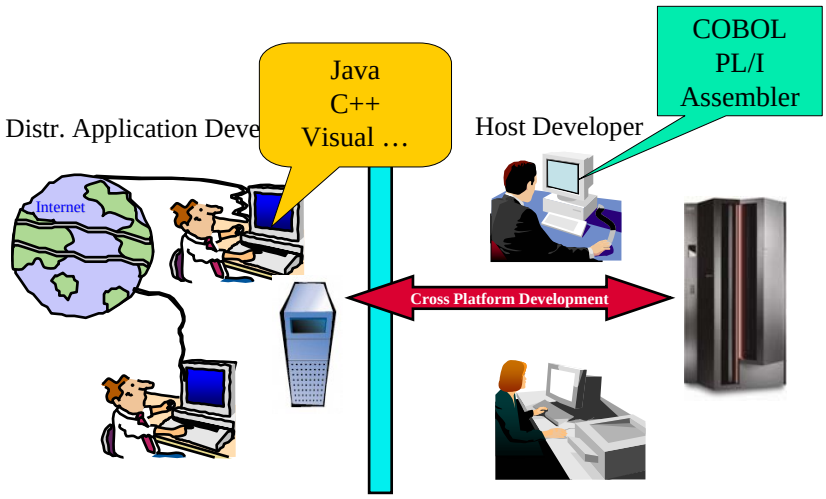
IT environments and their challenge

- Two IT worlds want a common solution

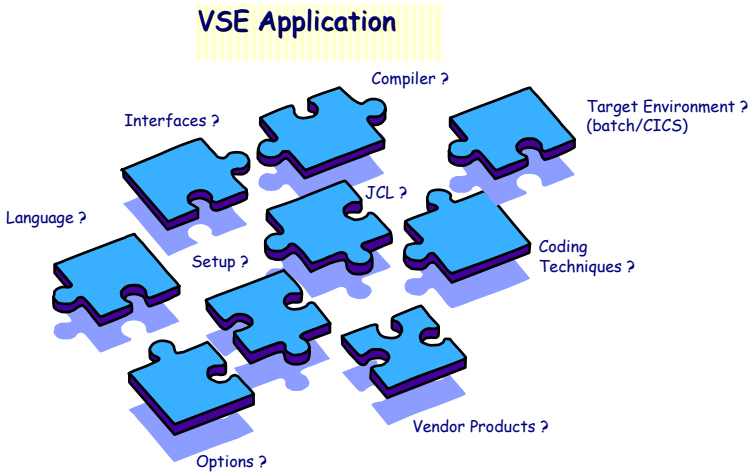


'Distributed' Development Landscape…



Native VSE Application

- **Typical interdependencies ...**

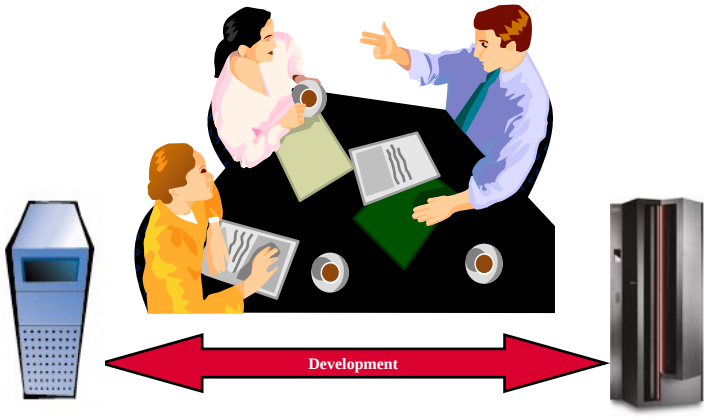


Goals of today's IT

- **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)

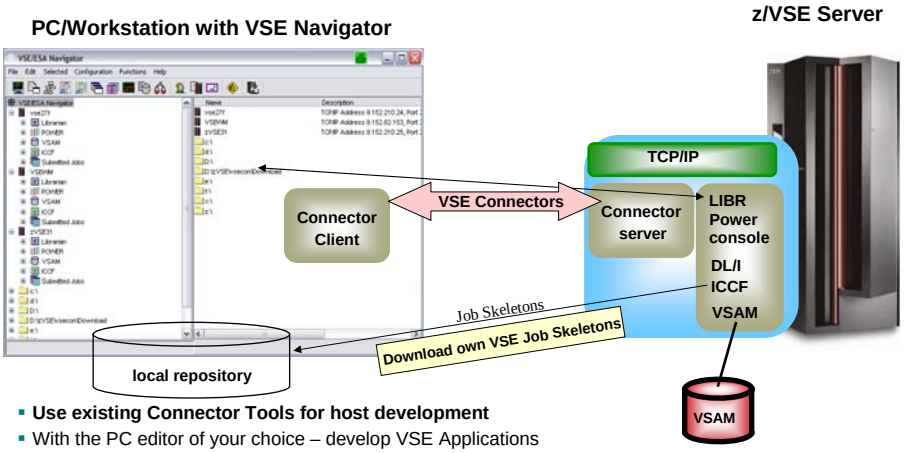
2) Cross-Platform solution development environments (i.e. 4GL Methods)

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

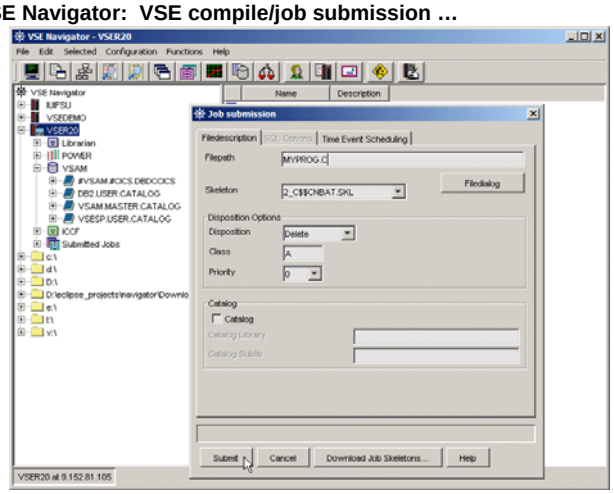
(1) Use of existing modern tools for z/VSE development



- **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 ...**



IBM eServer zSeries

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

z/VSE Home➔ Downloads ➔ Tools

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

JCalc_LEVSE Tool (Part 1)

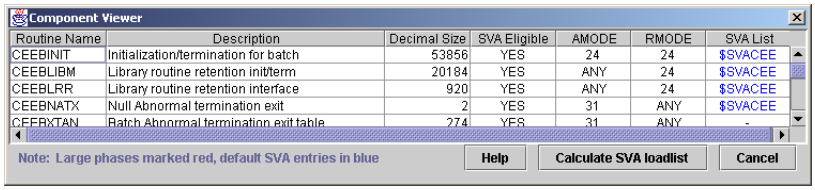
- **Calculator for LE/VSE load in the Shared Virtual Area**
  - Java GUI interface to choose one or more LE/VSE component(s)

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

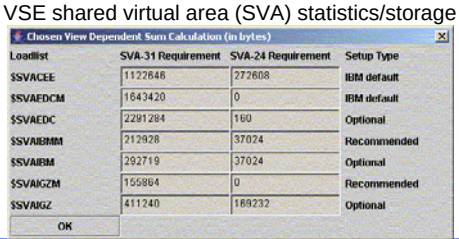
```
M E M B E R      CREATION   LAST      BYTES     LIBR CONT SVA  A- R-
 NAME     TYPE     DATE      UPDATE    RECORDS    BLKS STOR ELIG MODE
 ------------------------------------------------------------------------
 CEEFMON  PHASE    01-10-29 03-01-08      20 B        1 YES YES  31 ANY
 CEEFMTM  PHASE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



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



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 C/VSE 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)

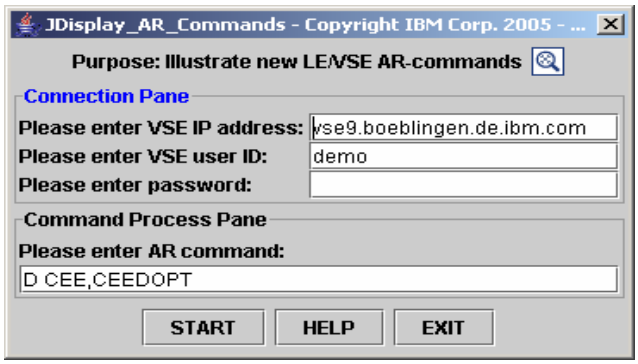
Linkage editor - Unresolved Reference events

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**

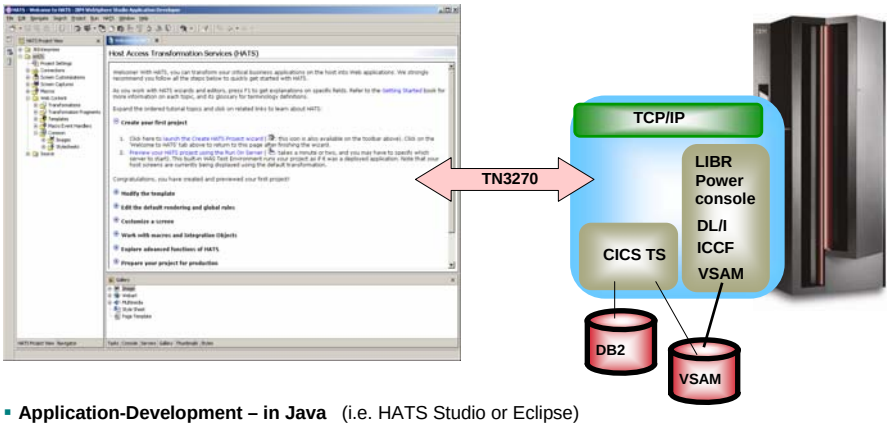


IBM eServer zSeries

Existing Applications
(2) Modernize – Develop graphical interfaces – in Java

PC/Workstation Front-End Development

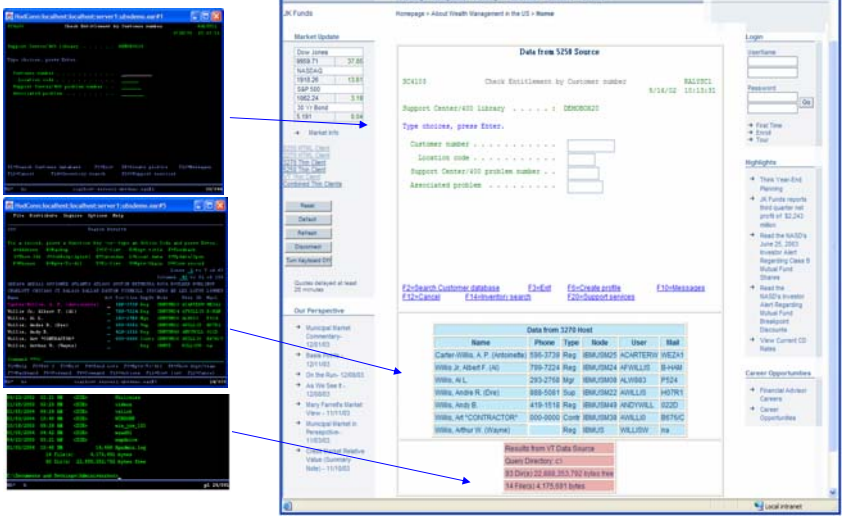
z/VSE Server



- **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:

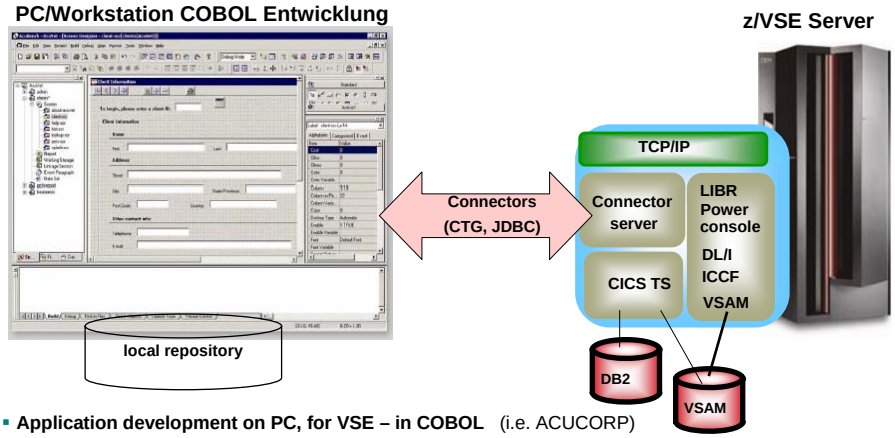
- Combine / Integrate



Existing Applications

(2) Modernize – Develop graphical interfaces – in Java

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



- **Application development on PC, for VSE – in COBOL** (i.e. ACUCORP)
- 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

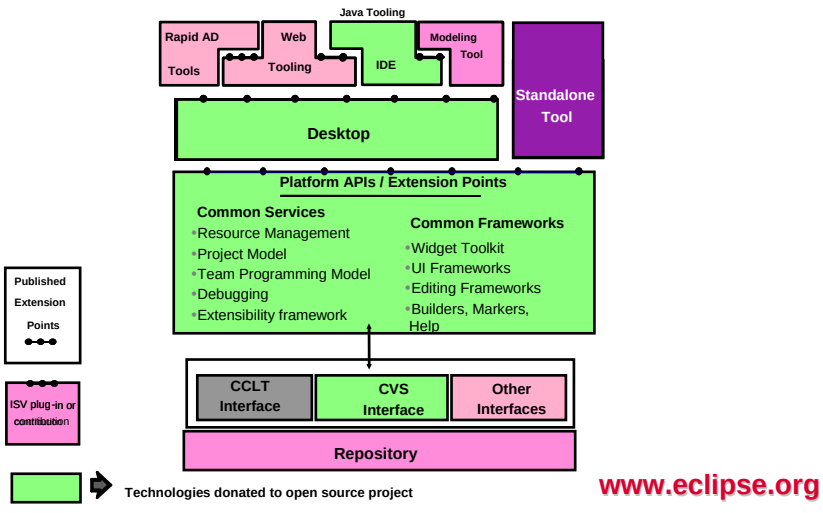
- **Core applications can be developed, maintained with modernized methods**
- **Existing development expertise is used**
- **increased effectiveness**
- **modern versioning software can be used**

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)

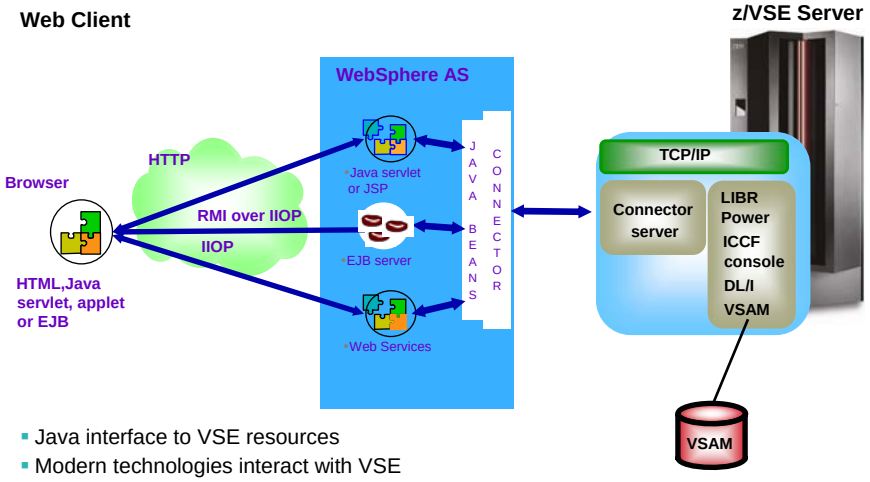
- **New Application for VSE**
  1) Use of modern development environments (i.e. Eclipse based)
  2) Cross-Platform solution development environments (i.e. 4GL Methods)

New applications for VSE
(1) Use of modern development environment !



www.eclipse.org

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

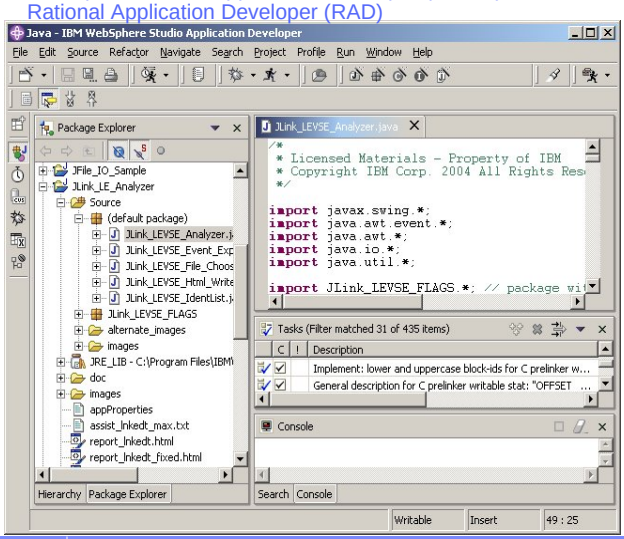


- Java interface to VSE resources
- Modern technologies interact with VSE

New applications for VSE

(1) Use of modern development environment !

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



Based on the eclipse platform

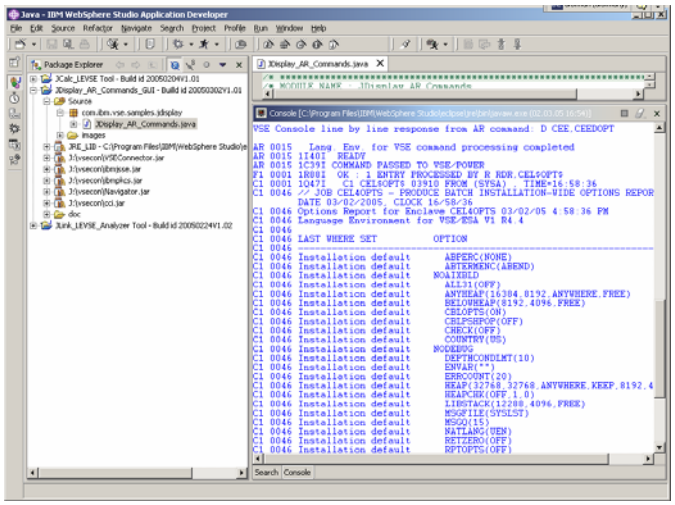
http://www.eclipse.org

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**



(2)Cross Plattform Solution development
Approach with VisualAge Generator

Rapid Development

Generation

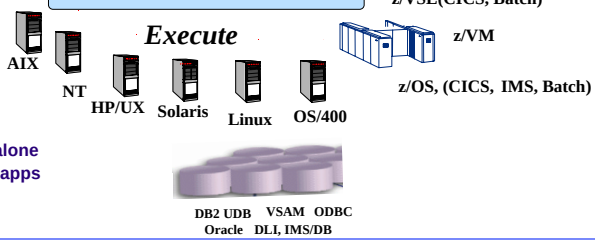
Execution

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

Generate

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

Execute



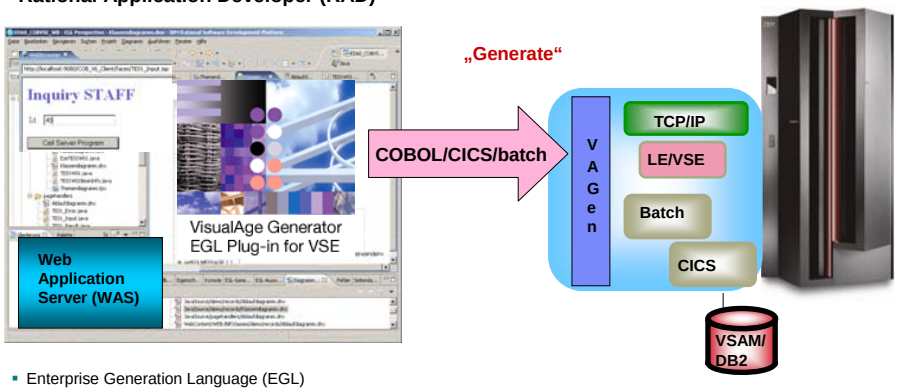
- Multiple platforms
- Client /Server Applications
- Java applets/servlets or standalone
- Multiple database/file support apps

(2)Cross Plattform Solution development
Approach with VisualAge Generator

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

Rational Application Developer (RAD)

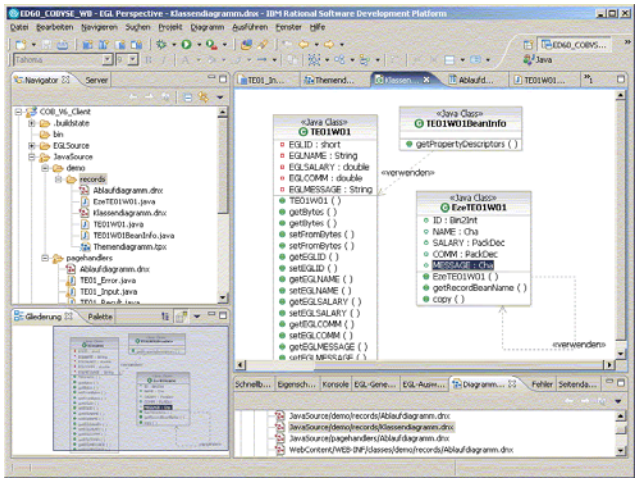
z/VSE Server



- Enterprise Generation Language (EGL)
- 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)

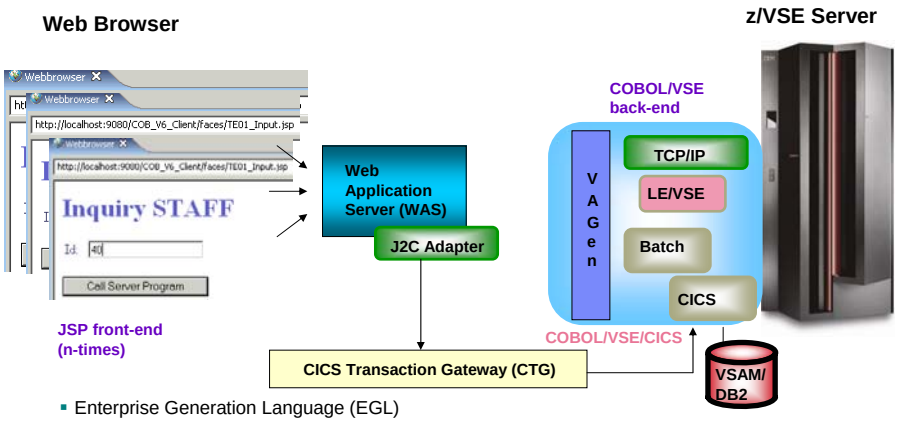


Functionality for Enterprise Development

- **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



- 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 prooven 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/

Redbooks

- 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