



z/VSE Modernization

Modernize your VSE environment with z/VSE V4.1 and IBM System z9

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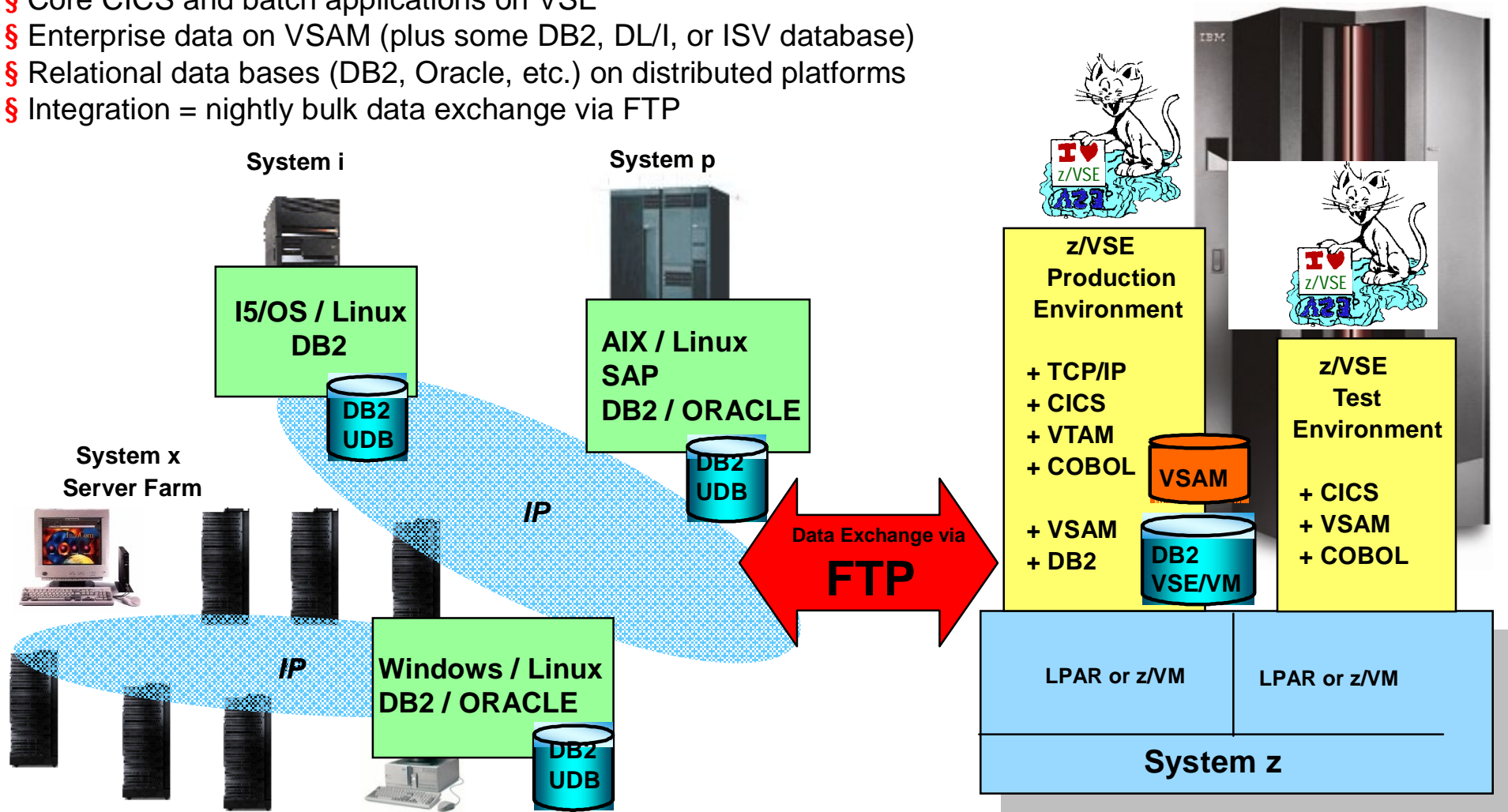
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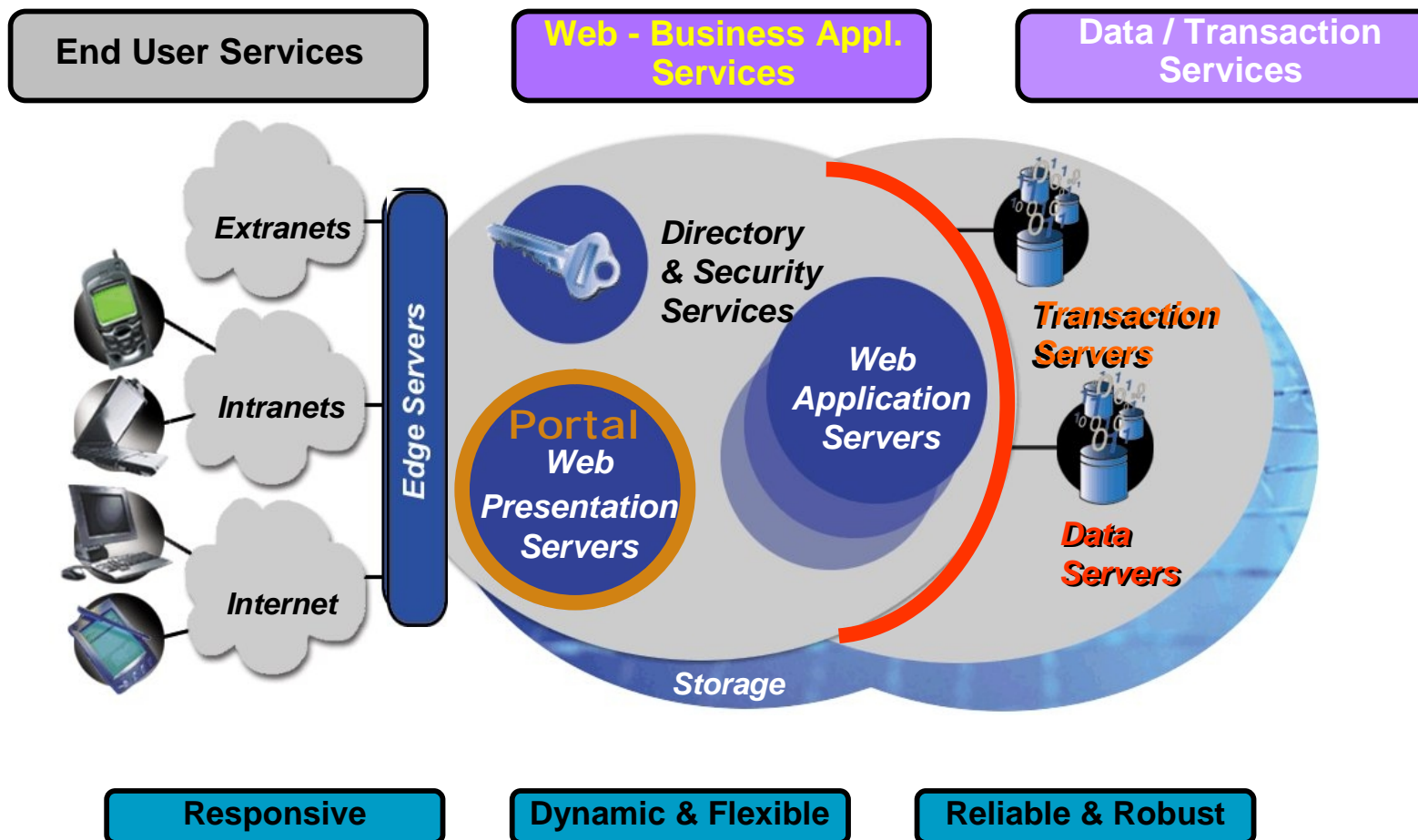
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VSE Customer Environment

- § Multiple server platforms (System z, System p, System x, System i, and competitive)
- § Core CICS and batch applications on VSE
- § Enterprise data on VSAM (plus some DB2, DL/I, or ISV database)
- § Relational data bases (DB2, Oracle, etc.) on distributed platforms
- § Integration = nightly bulk data exchange via FTP



Infrastructure





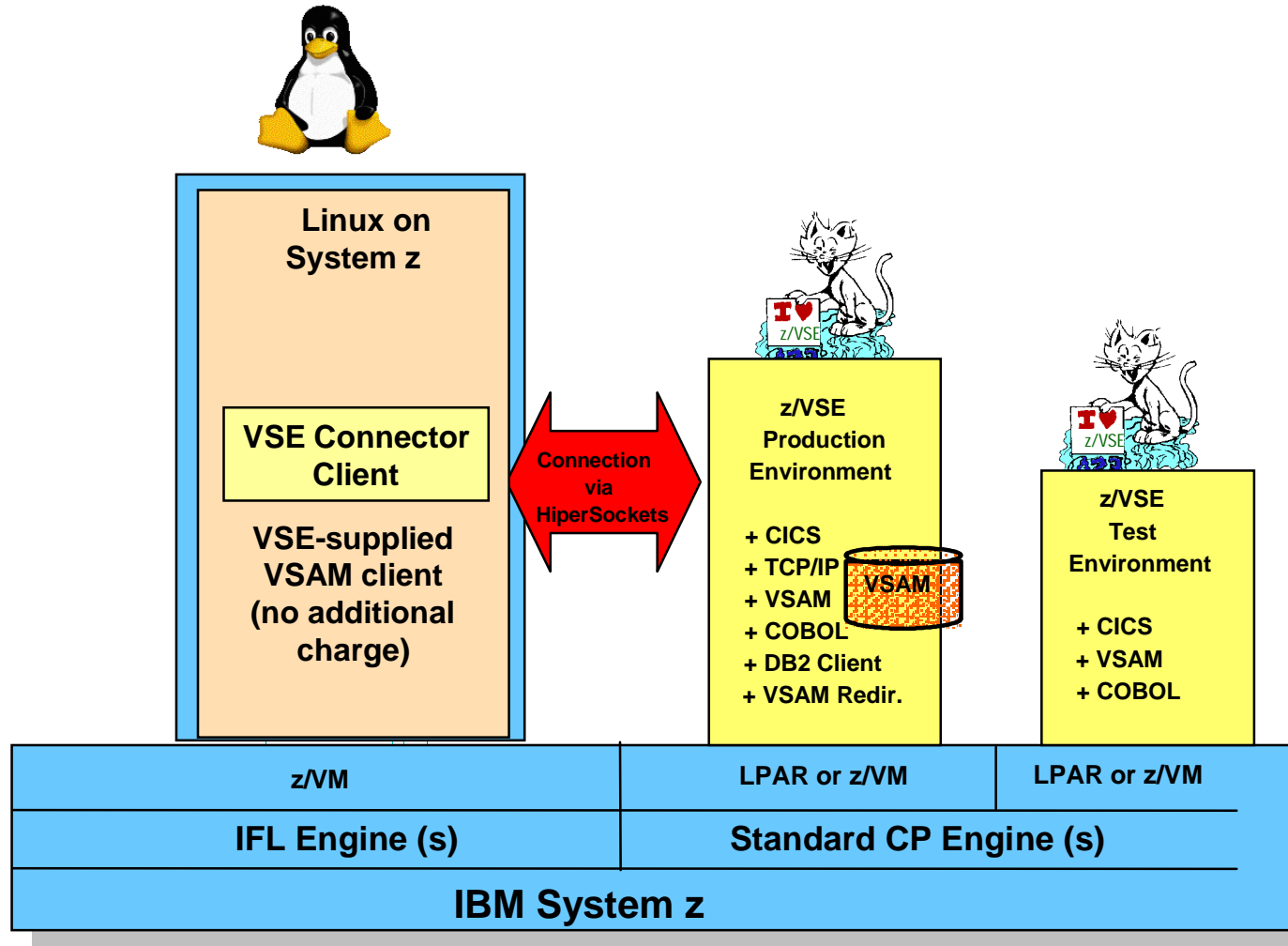
Workshop Part 1

Access to z/VSE resources from remote

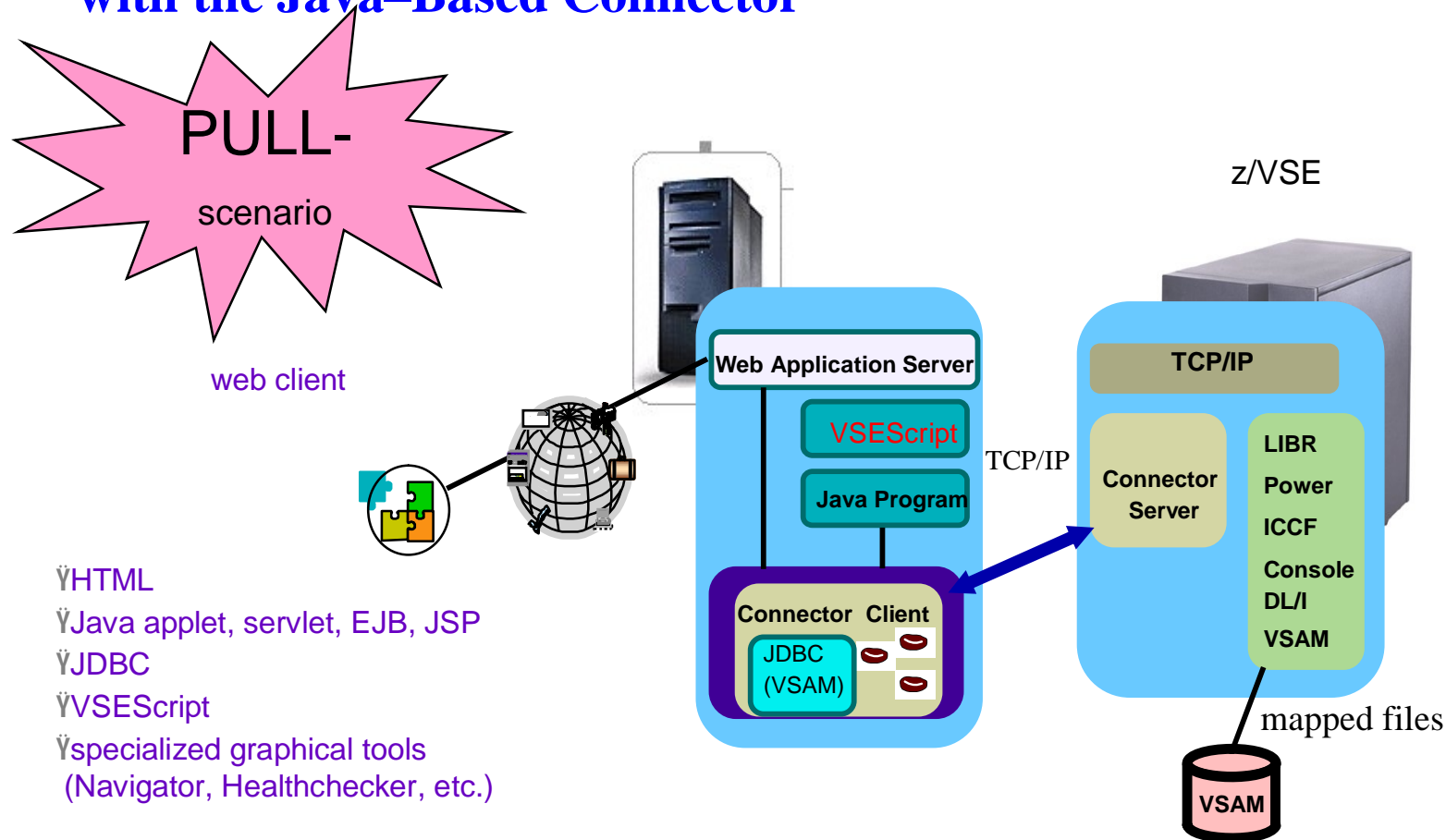


Scenario : Leverage z/VSE data and resources

Leverage VSE/VSAM data using VSAM Connectors on Linux on System z



(1) PULL scenario: Real time access to z/VSE Resources with the Java-Based Connector



• HTML

• Java applet, servlet, EJB, JSP

• JDBC

• VSEScript

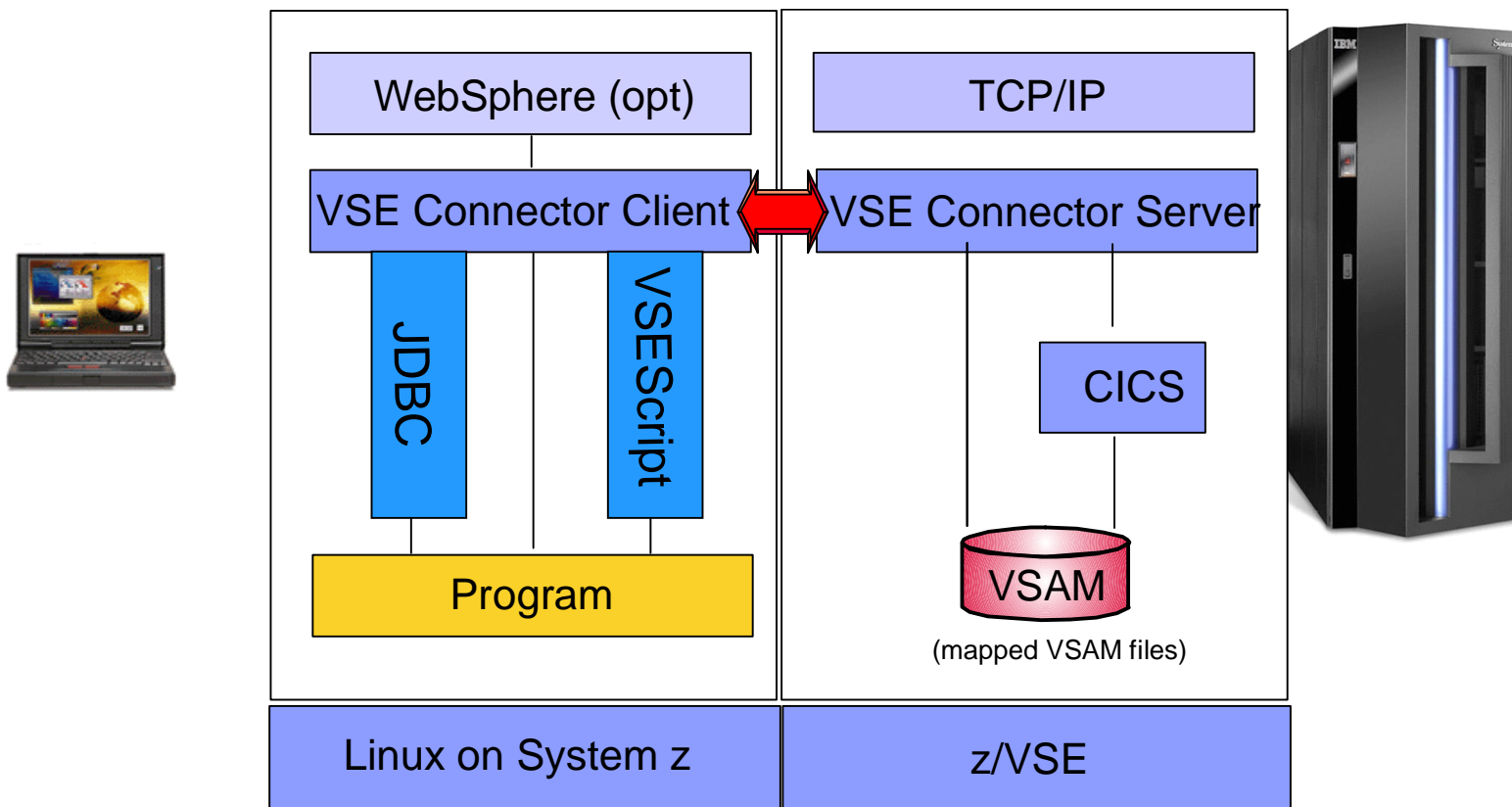
• specialized graphical tools
(Navigator, Healthchecker, etc.)

f real time access to VSE resources from remote systems ,

f real time access to VSAM data, Librarian

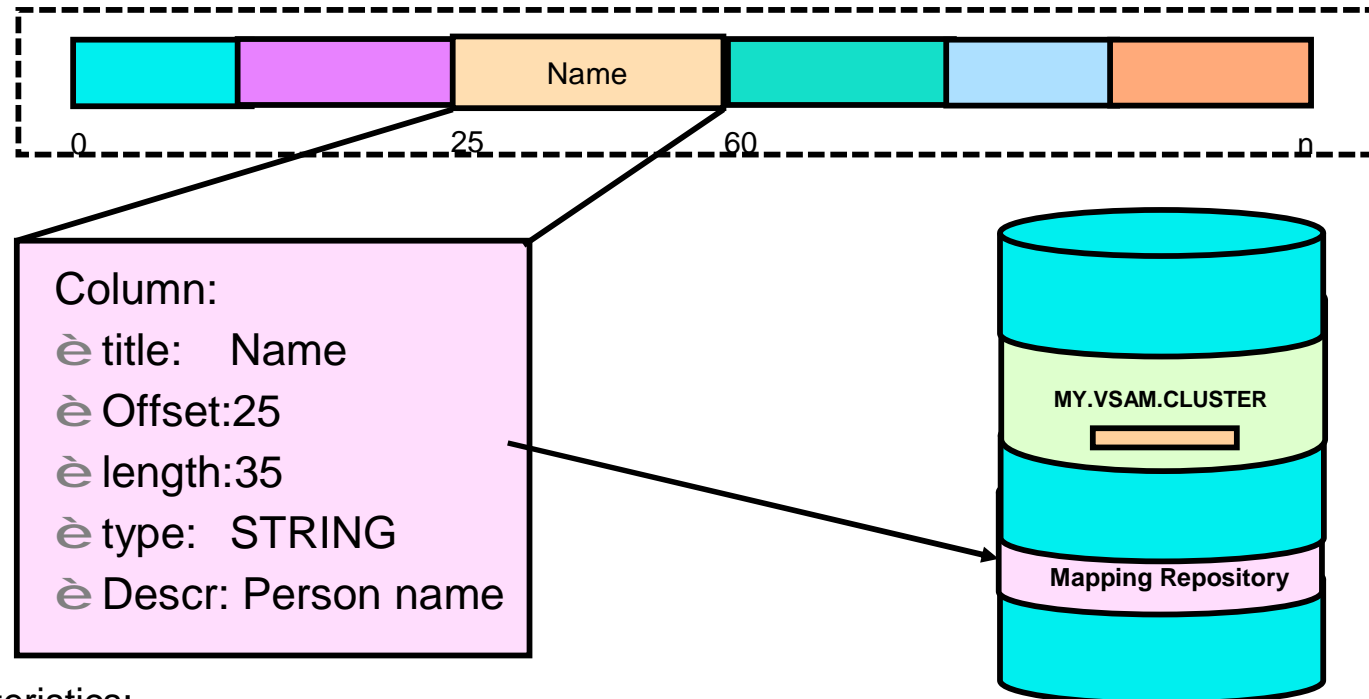
f monitoring and analyzing possibilities using console or statistic values

VSAM Connector



VSAM Record Mapping

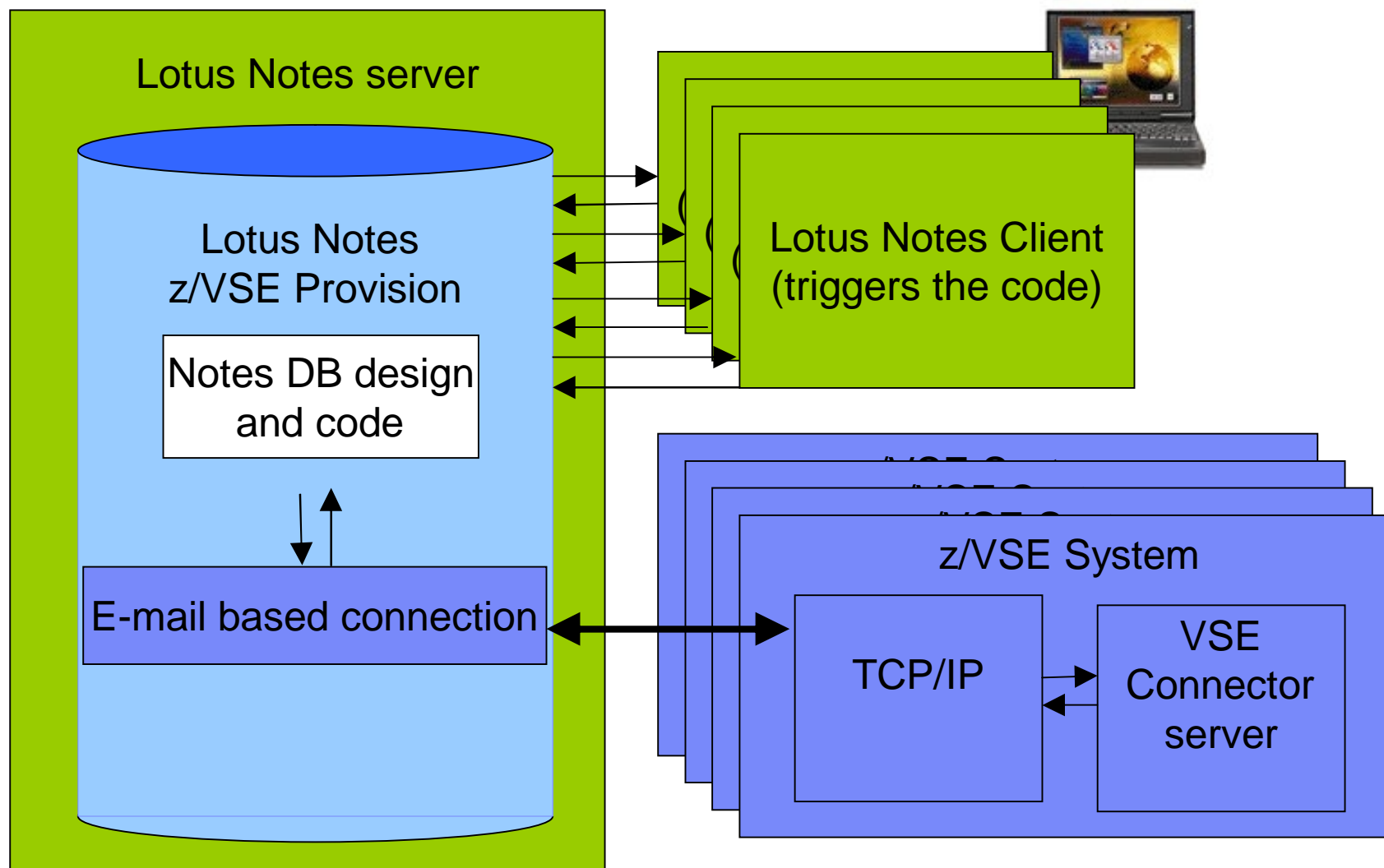
VSE/VSAM Record structure from EMPPROG.COBOL



Mapping characteristics:

- f* No changes to VSAM data
- f* Mapping information stored in a repository in VSAM (VSE.VSAM.MAPPING.DEFS)
- f* Possible data types: STRING, binary, signed number, unsigned number, packed data
- f* Multiple maps and views (subset of map fields) supported
- f* Tools available to import copy books and generate MAP (MapTool, Navigator, IDCAMS RECMAP)

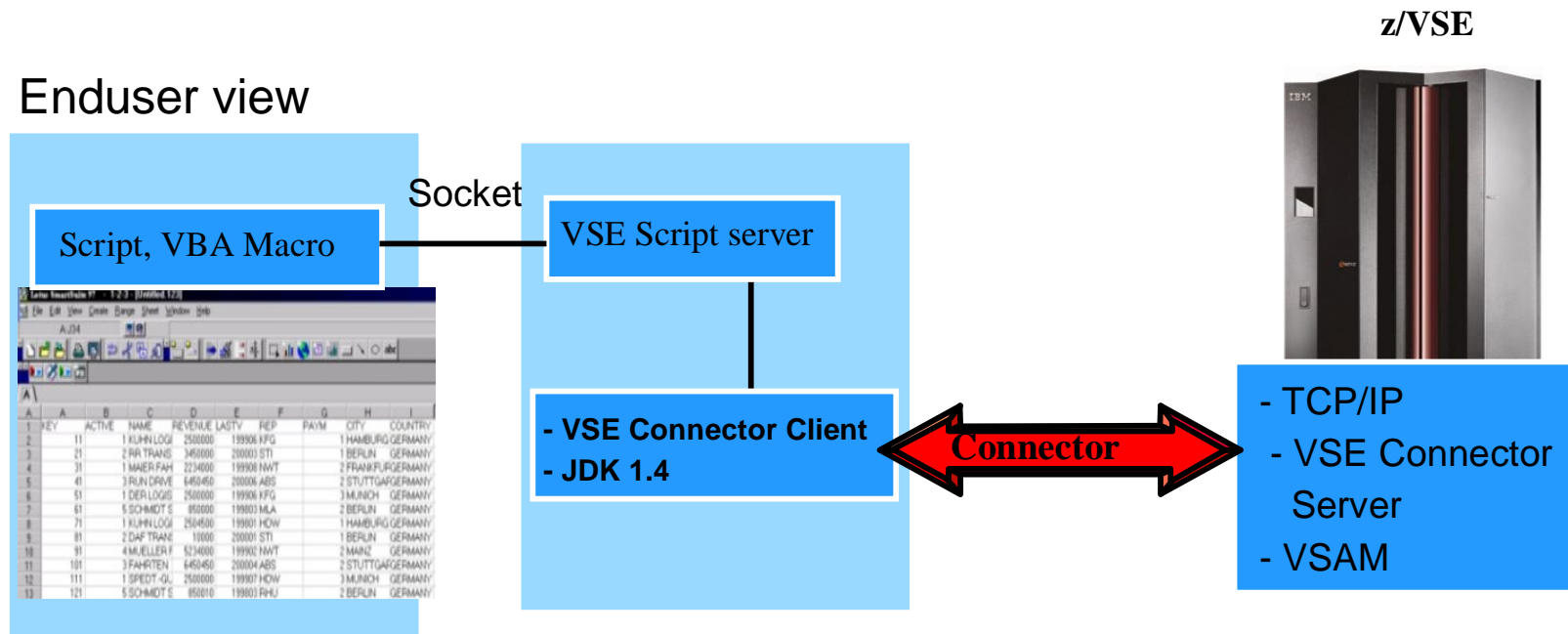
Lotus Notes and z/VSE interaction



Accessing VSAM data from remote systems

using non-Java methods, scripts

Enduser view



Advantages:

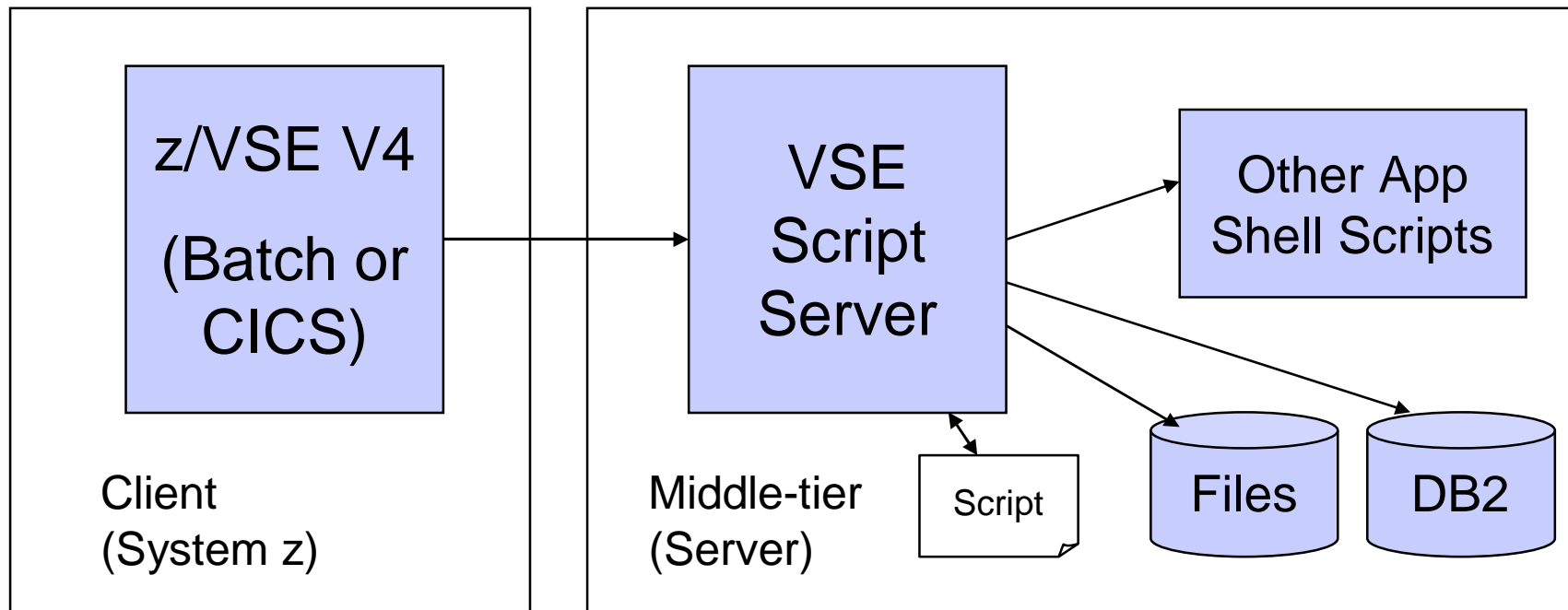
- f* Individual requests (Statistics)
 - f* Security: Userid/Password for VSE
- f* Centralization, using macros from server
- f* Automation (automatically create Office files/reports)

New with z/VSE V4 – remote script invocation from VSE



§ With z/VSE V4 we provide a Script client that runs on VSE

- Allows to start scripts on remote system



z/VSE web site

IBM: z/VSE - Downloads - Connectors - Mozilla Firefox: IBM Edition

http://www-03.ibm.com/servers/eserver/zseries/zvse/downloads/

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- ↓ VSE Script Server
- ↓ TCP/IP Configuration Dialog
- ↓ VSE Health Checker
- ↓ CICS2WS Toolkit
- ↓ VSAM Redirector Server
- ↓ VSE Navigator
- ↓ VSEPrint utility
- ↓ VSE System class library
- ↓ VSE Virtual Tape Server
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- ↓ Keyman/VSE
- ↓ WebSphere MQ Client for VSE

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VSE Connector Client	VSAM Redirector Server
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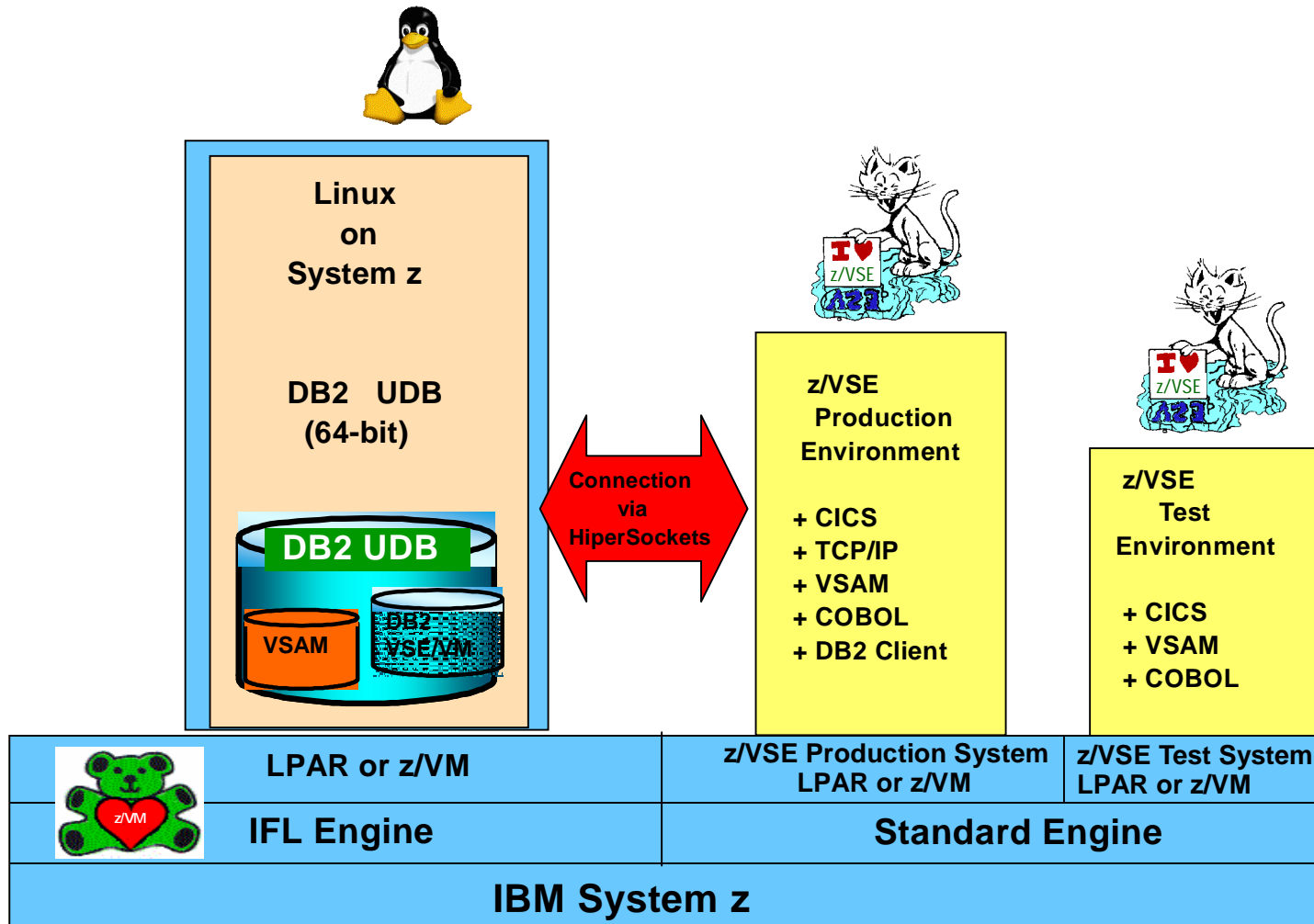
Workshop Part 2

Transparent access to remote data

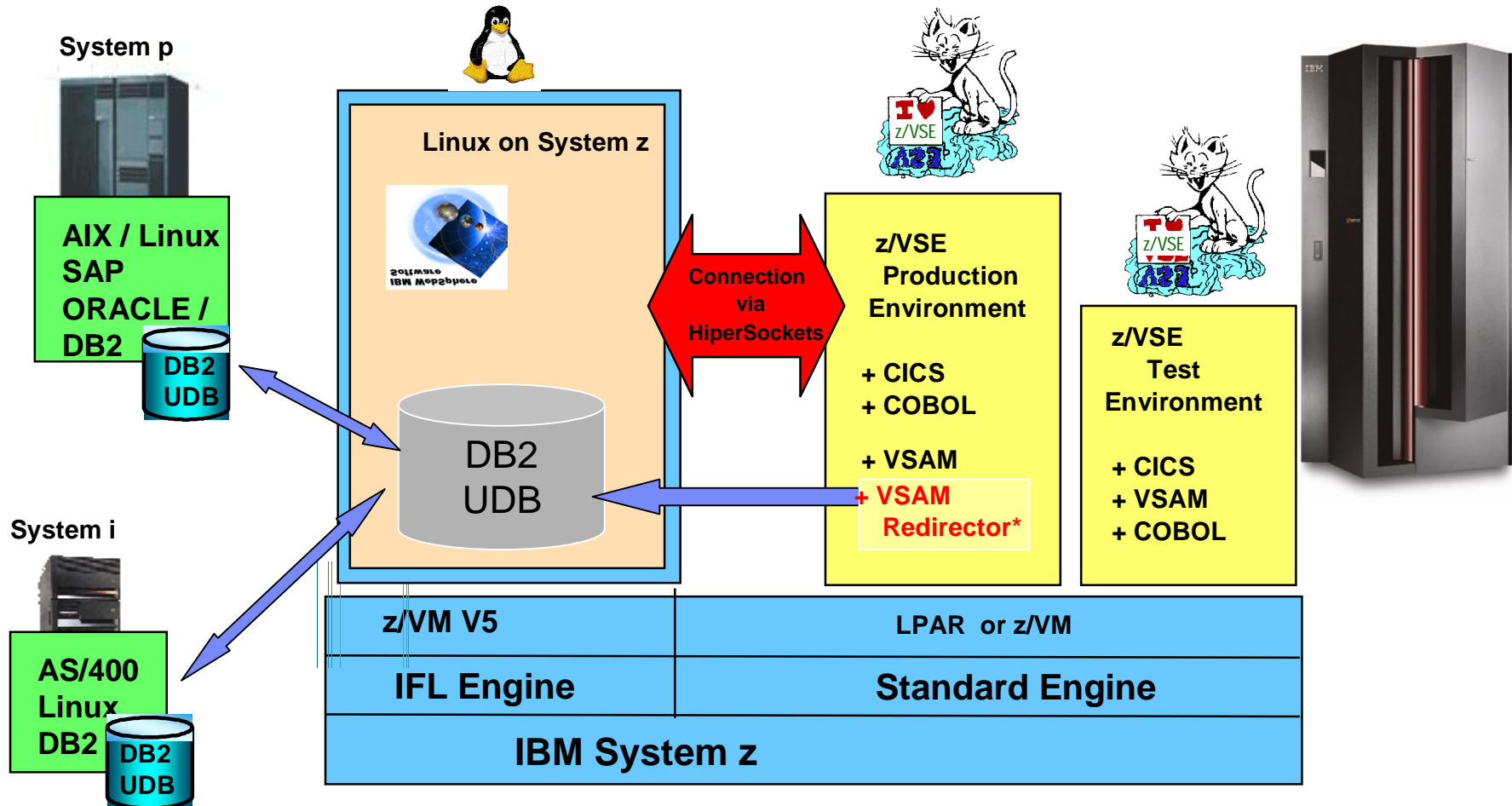


Scenario 2: Common data Store

Leverage VSE/VSAM or DB2 data using shared DB2 UDB on Linux on System z



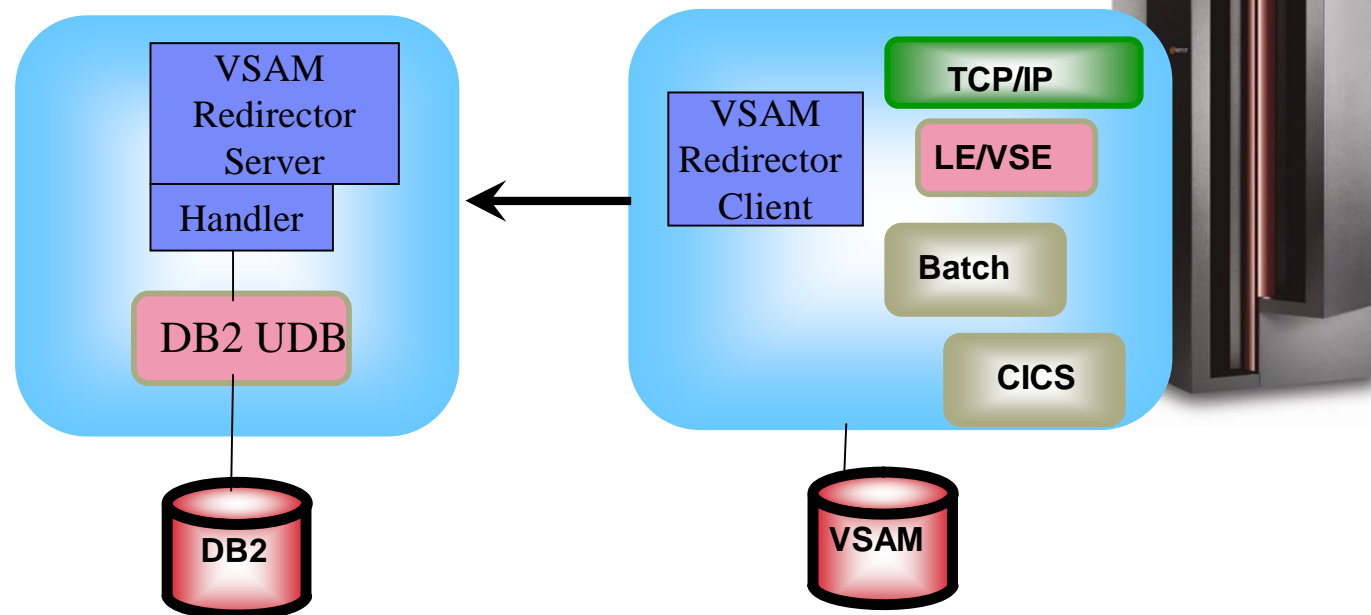
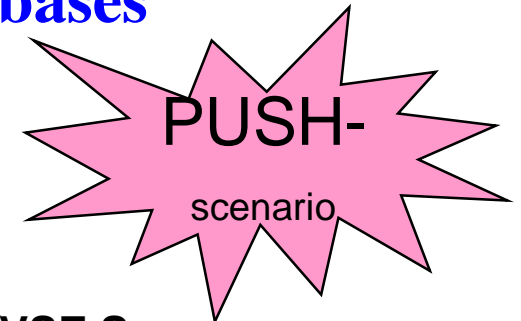
Transparent Work of VSAM Programs with DB2 UDB on Linux on System z



(*) VSAM Redirector – Common data store solution – with DB2 on Linux on zSeries Solutions without changes to VSAM programs

(2) PUSH scenario: VSE/VSAM applications, access remote relational databases

- (1) Real time access VSAM to relational databases
 - a) synchronization (two phase commit of VSAM and DB2)
 - b) Real time access to DB2 (no VSAM access anymore)
- (2) VSE local data collection for VSAM
 - a) Capture Exit and Incremental FTP, processing
 - b) MQ Exit and MQ Series solutions

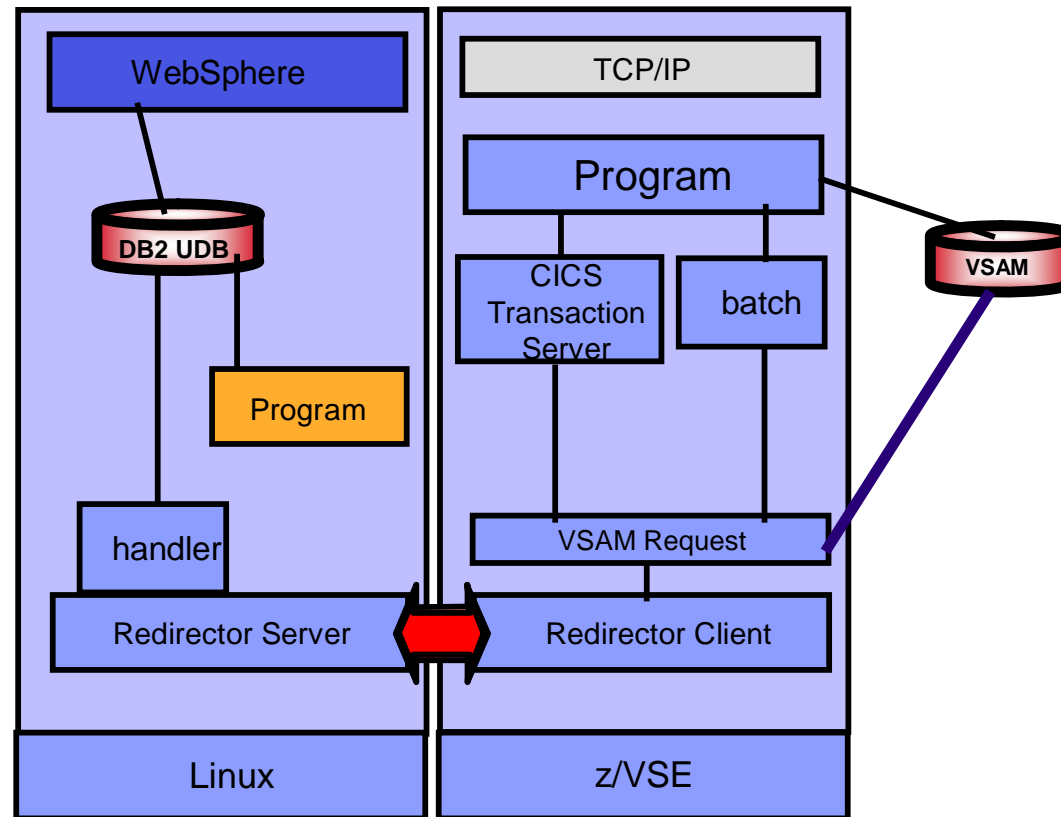


Data propagation / synchronization from VSE

VSE/VSAM Redirector

f Existing applications transparently access remote data

f No changes to the existing VSE applications

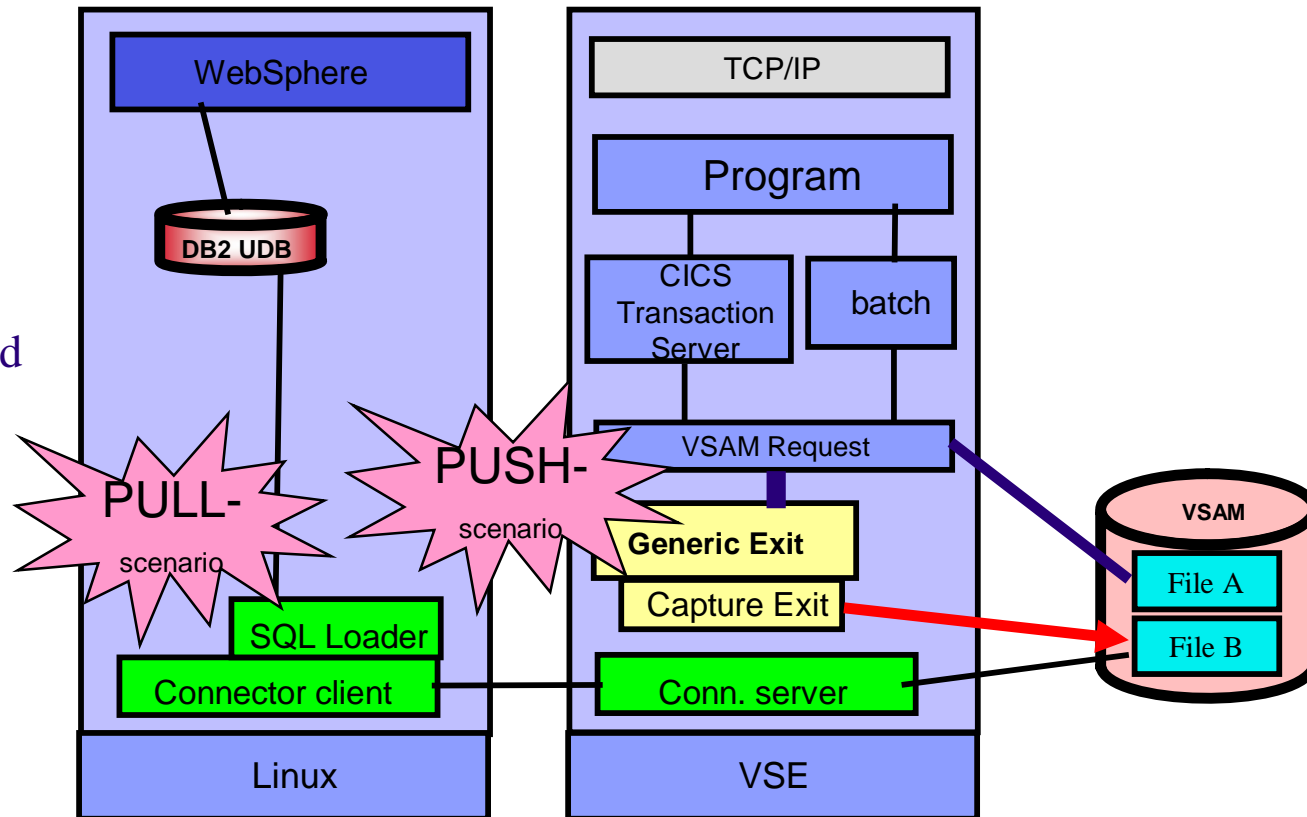


f Synchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
(VSAM Redirector is part of z/VSE)

Solution for FTP Replacement: Incremental, Linux driven updates

f With VSAM Capture – the performance of the VSE production system protected

f The changes are processed asynchronously and not influencing the production system



f Collect the changed records in a separate VSAM file

f Possibility of cleansing

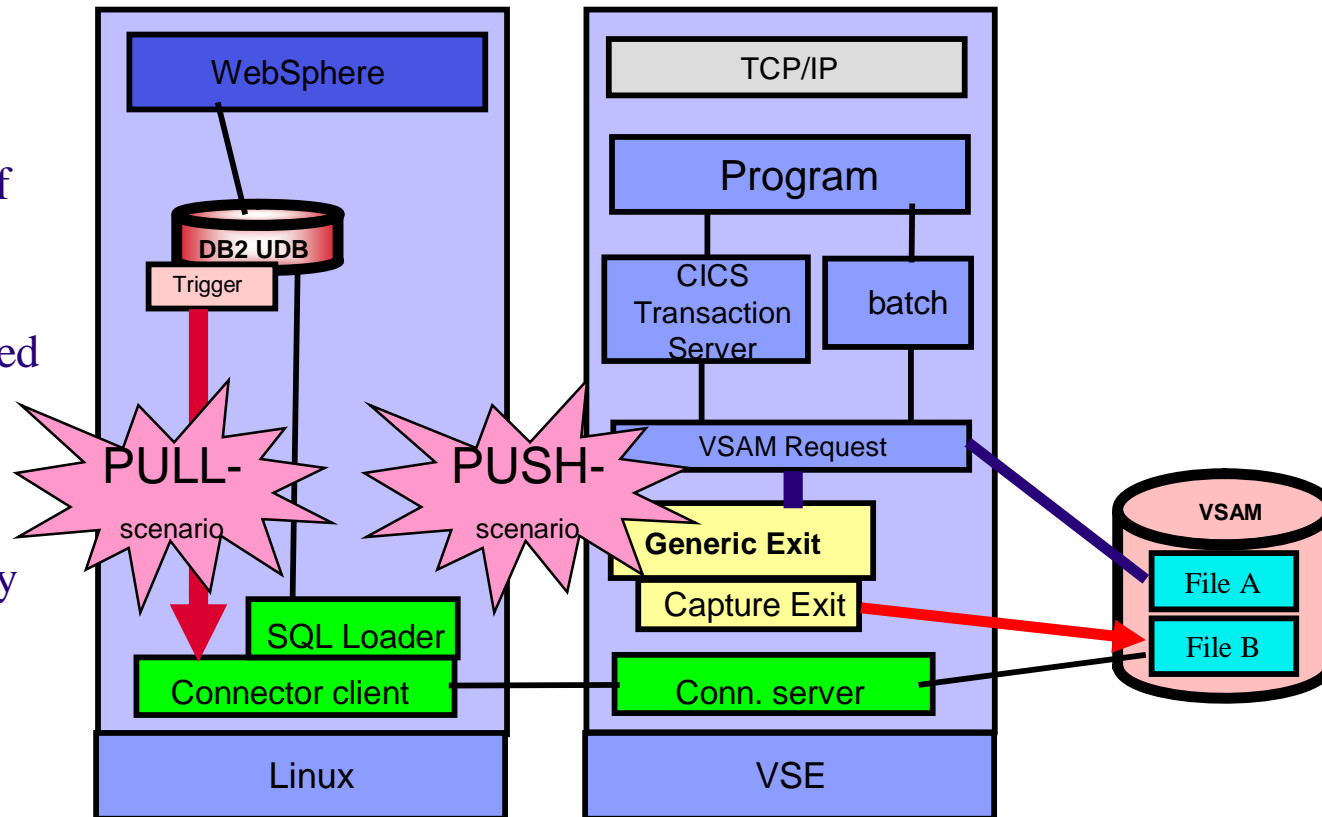
f Process them – with the VSE Connectors

Solution for FTP Replacement:

Bidirectional updates with VSE connectors

f With VSAM Capture – the performance of the VSE production system protected

f The changes are processed asynchronously and not influencing the production system



f Collect the changed records in a separate VSAM file

f Possibility of cleansing

f Process them – with the VSE Connectors

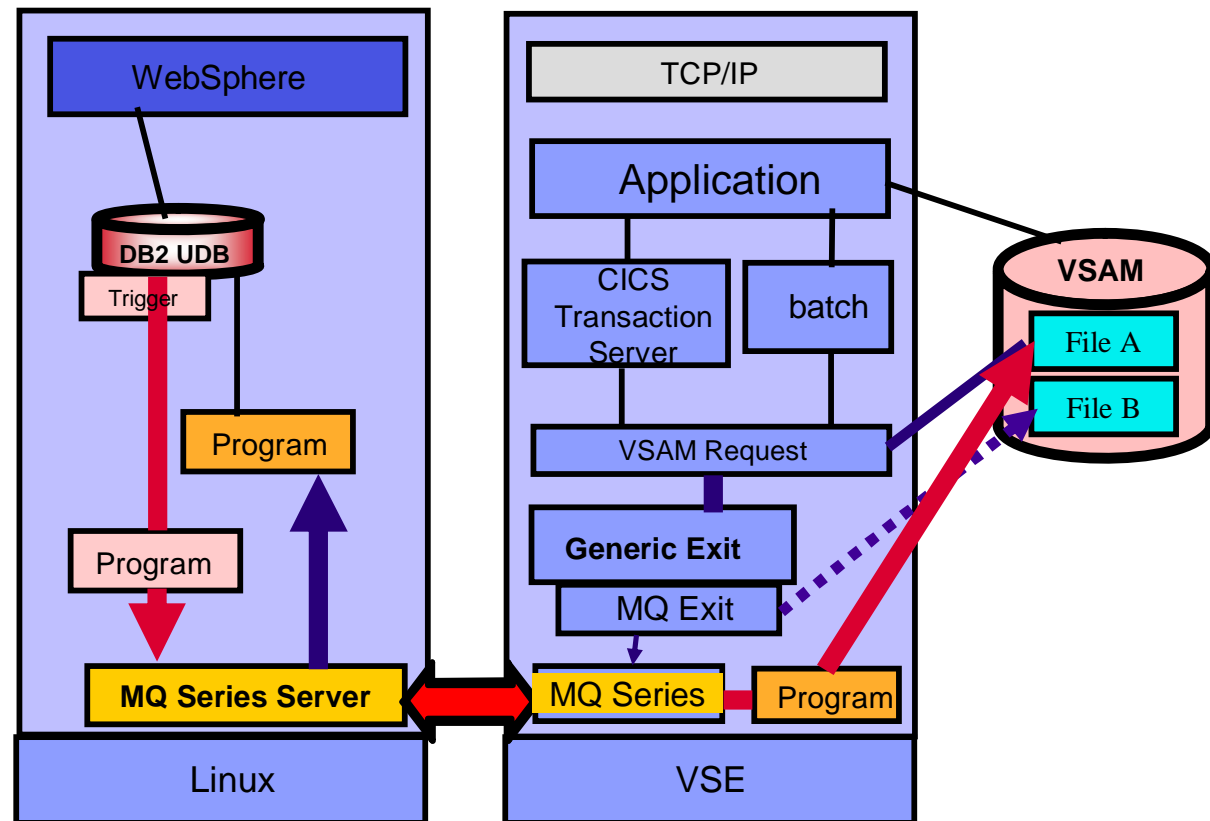
MQ Exit

Integration of VSE Application with MQ Series

f enablement for MQ Series w/o changing existing applications.

f Bidirectional processing

f Guaranteed processing using asynchronous data transfer method MQ

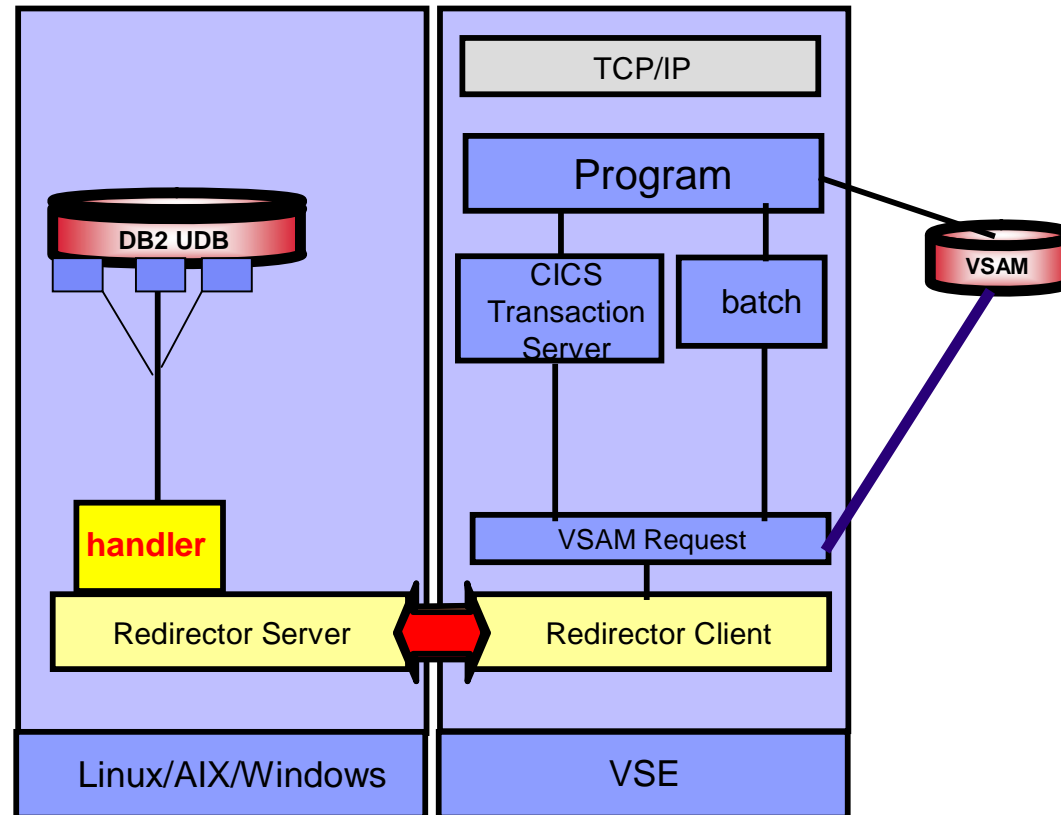


Data synchronization – Normalization

VSE/VSAM Redirector can store VSAM data normalized

*f*No changes to the existing VSE applications

*f***The new Redirector Handler in z/VSE 4.1 can store 'VSAM' data in multiple DB Tables .**



f Applications on VSE should be able to access DB2 data on Linux

f Population of DB2 UDB on Linux with VSAM using VSAM Redirector.
(VSAM Redirector is part of VSE)

z/VSE web site

IBM: z/VSE - Downloads - Connectors - Mozilla Firefox: IBM Edition

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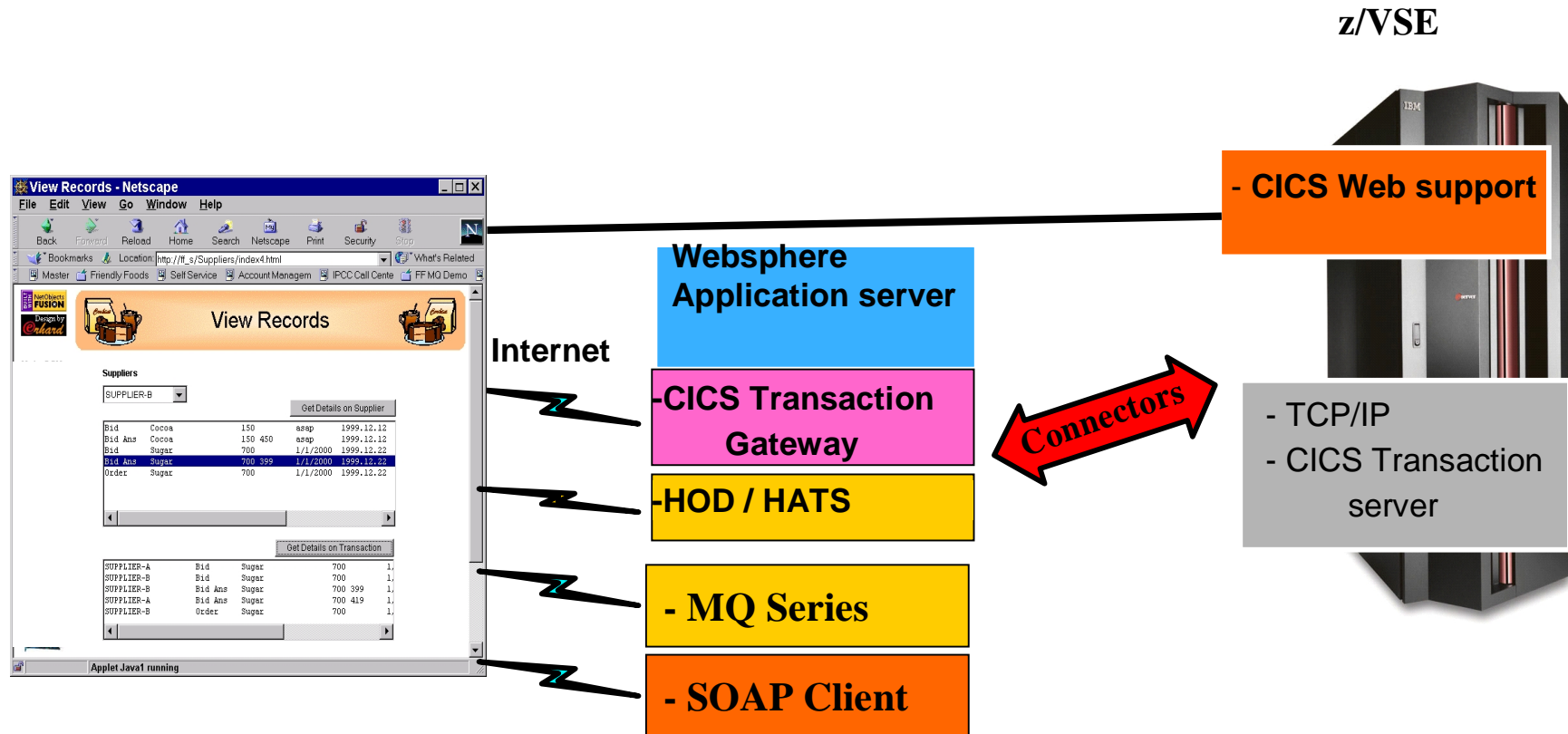
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Workshop Part 3 Access CICS and SOA with z/VSE



(3) Access VSE applications from the Web



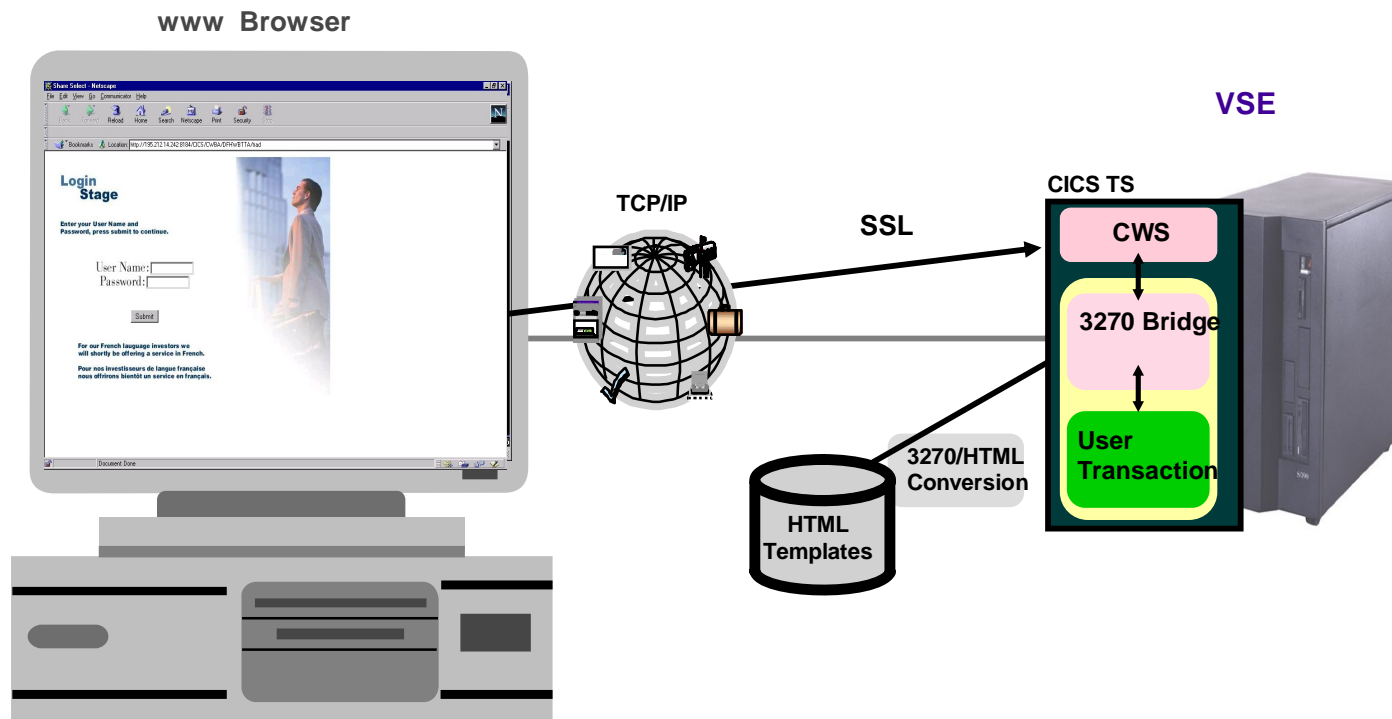
f Enable the access to core applications with web technologies

f No change to the core applications

f Consistent development interfaces (Java based)

Direct access to VSE transactions via browser

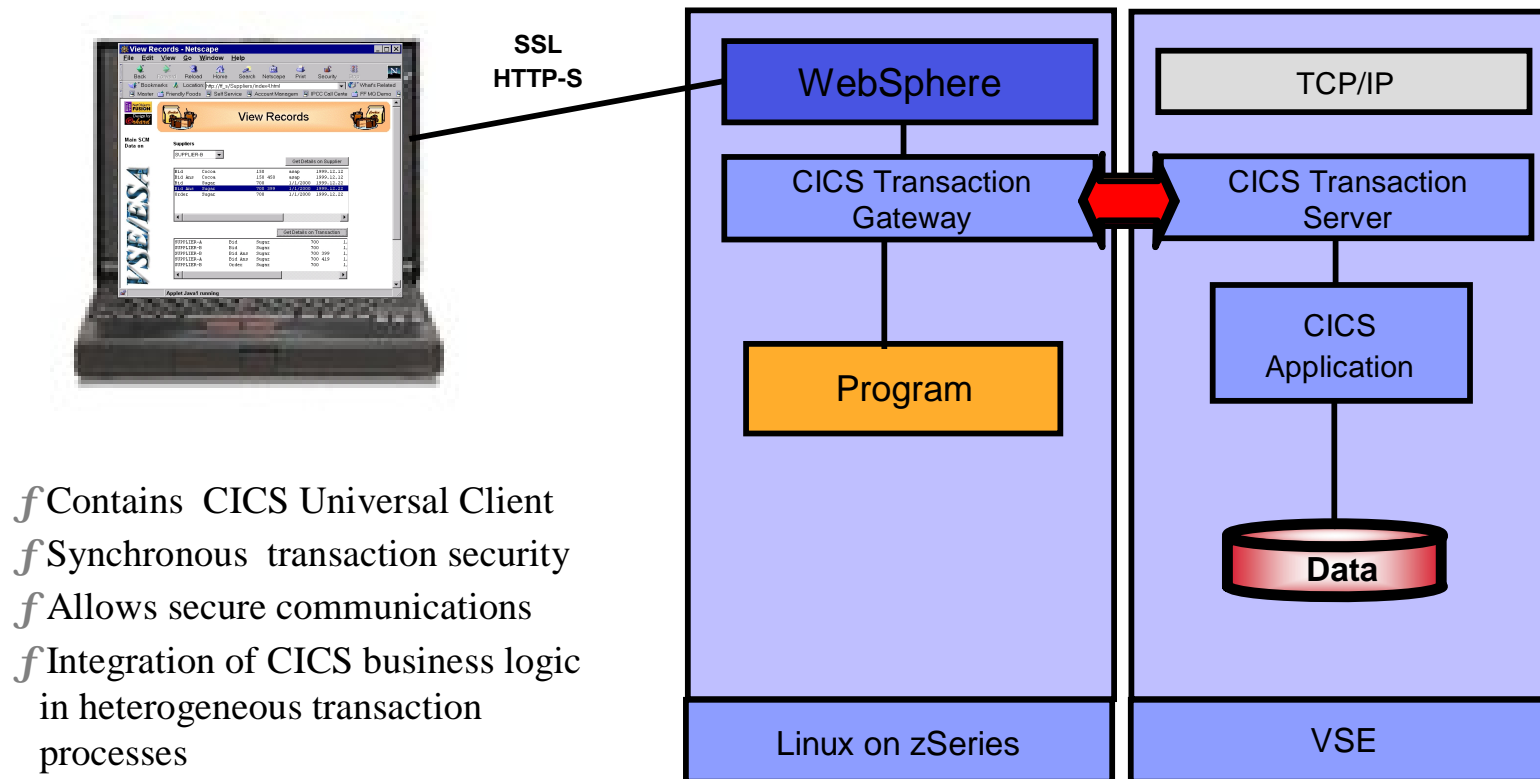
IBM CICS Web Support - Components



f direct access to VSE transactions via web Browser
f Without the need of a web server on VSE

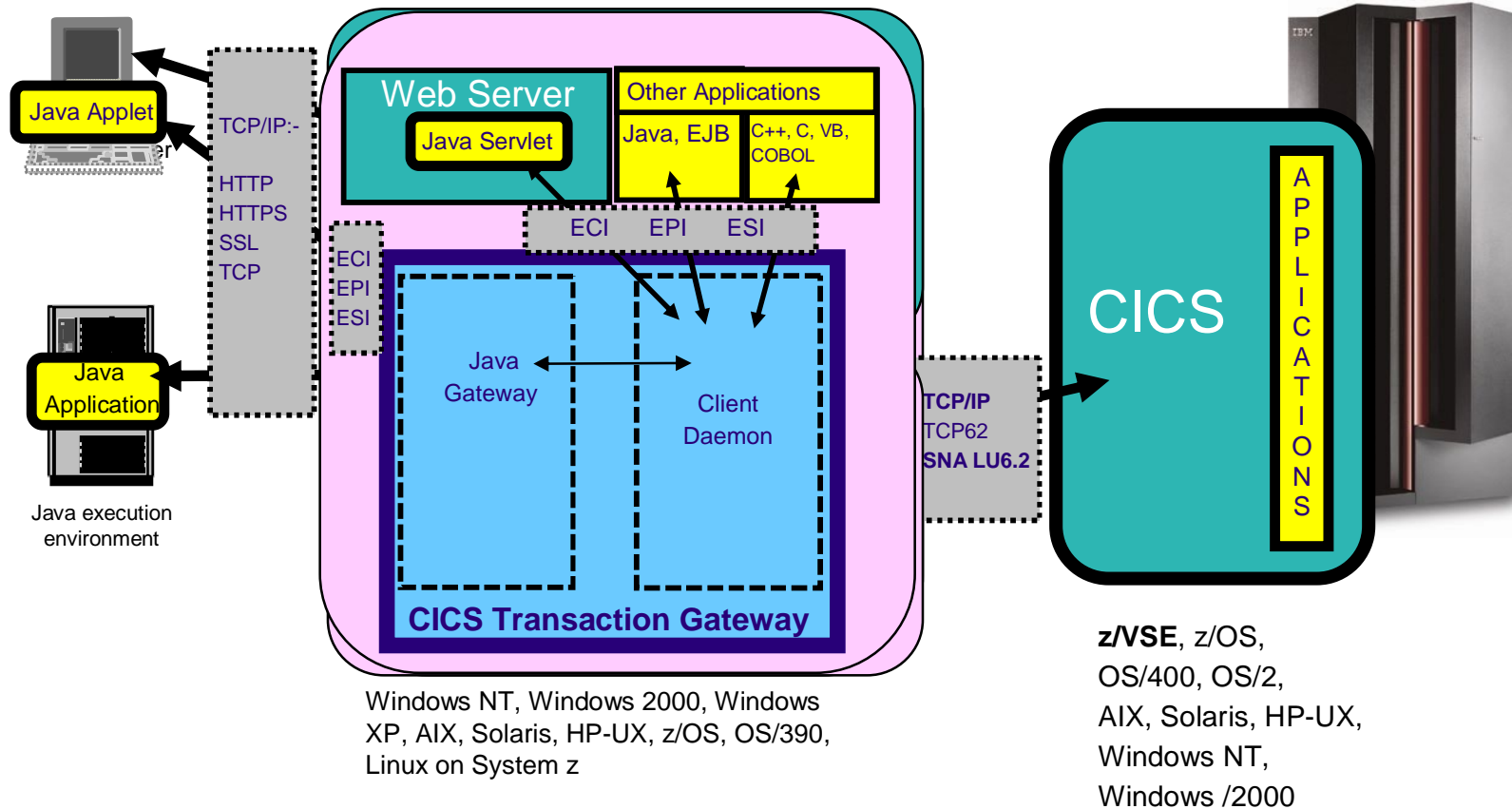
Integration of VSE transaction processes

IBM CICS Transaction Gateway

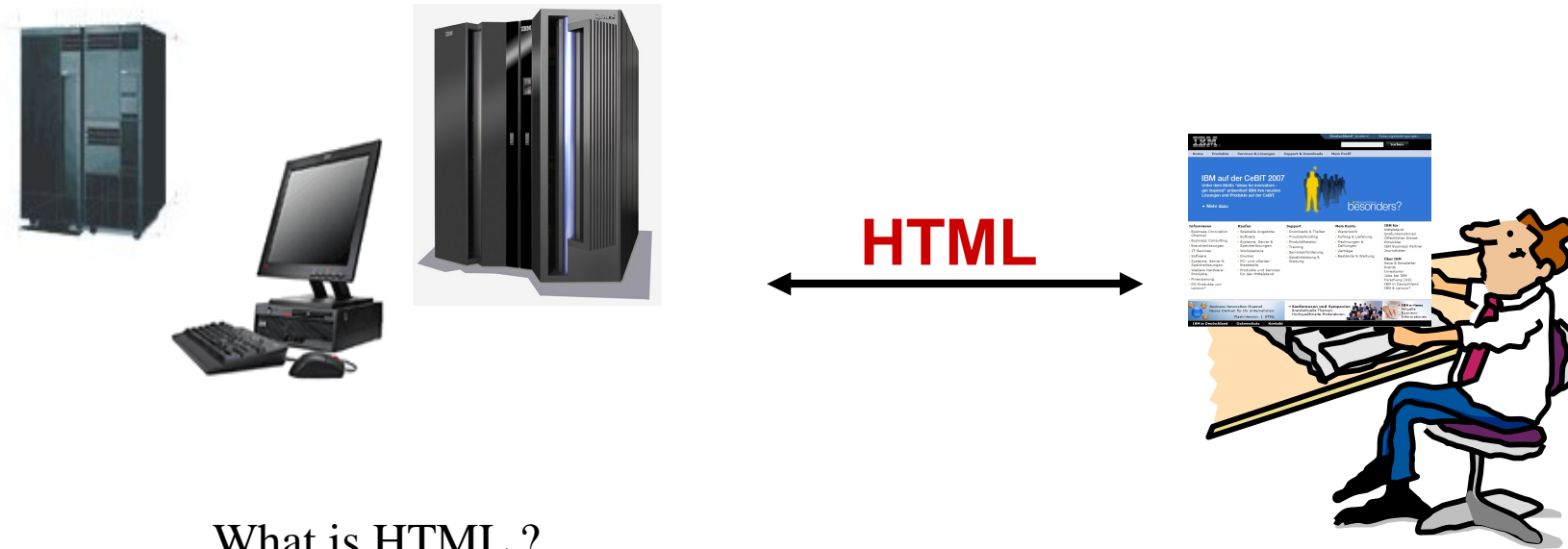


CICS Transaction Gateway (CTG)

Integration of VSE Transactions and Processes



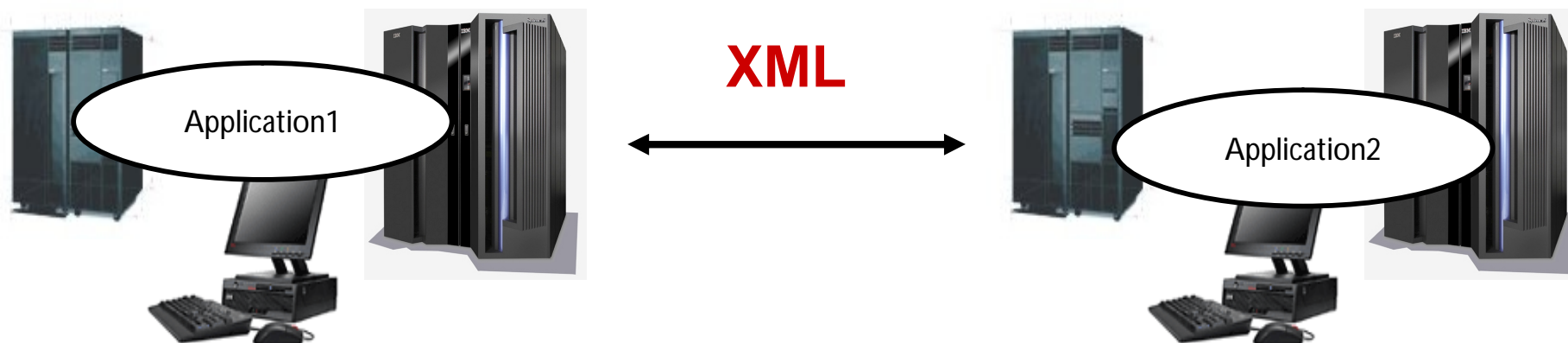
HTML - Traditional Internet Technology



What is HTML ?

- Ø the most successful markup language ever
- Ø with the used tags, an HTML document can be seen on all platforms from Palmtops to mainframe
- Ø extension interfaces like CGI (Common Gateway Interface) and Java (applets, servlets, EJB) allow access to backend systems
- Ø **HTML was designed with humans in mind**

XML - was designed for program communication



Today's Requirements for flexible solutions:

- Ø Enterprise wide integration of:
 - Ø information
 - Ø processes
- Ø Reduction of Data Redundancy and complexity
- Ø Standard Internet protocols,
- Ø Application integration
 - Ø Programming Language independent,
 - Ø Platform independent,
 - Ø Architecture independent,

What is Service-Oriented Architecture (SOA)?

§ SOA is an IT architectural style

- supports **integrating your business** as linked services that can be accessed when needed over a network, enabling your business to adapt to changing conditions and requirements
- These services are **self-contained** and have **well-defined interfaces** to let the users of those services -- called clients or consumers -- know how to interact with them

§ SOA results in "**loosely coupled**" application components

- The code is not necessarily tied to a particular database, or even a particular infrastructure.

§ It is this loose coupling that enables the combination of services into diverse applications.

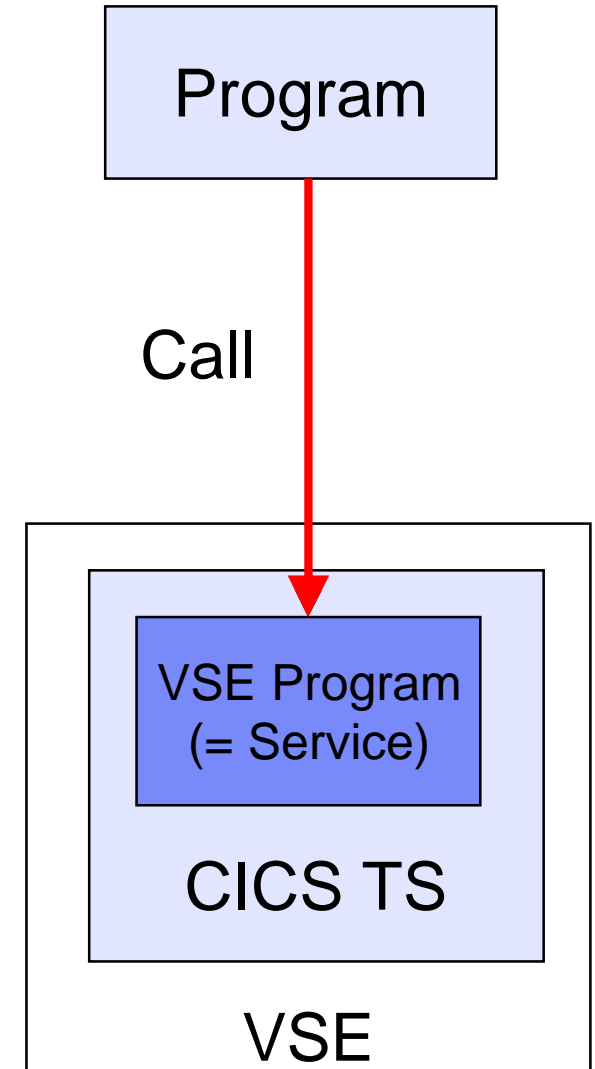
- It also enables much greater **code reuse**, cutting your workload at the same time that it increases your capabilities.

§ Because a service and the client accessing that service are not tied to each other

- a service used to process an order could be completely replaced, and the client-services placing orders would never know.

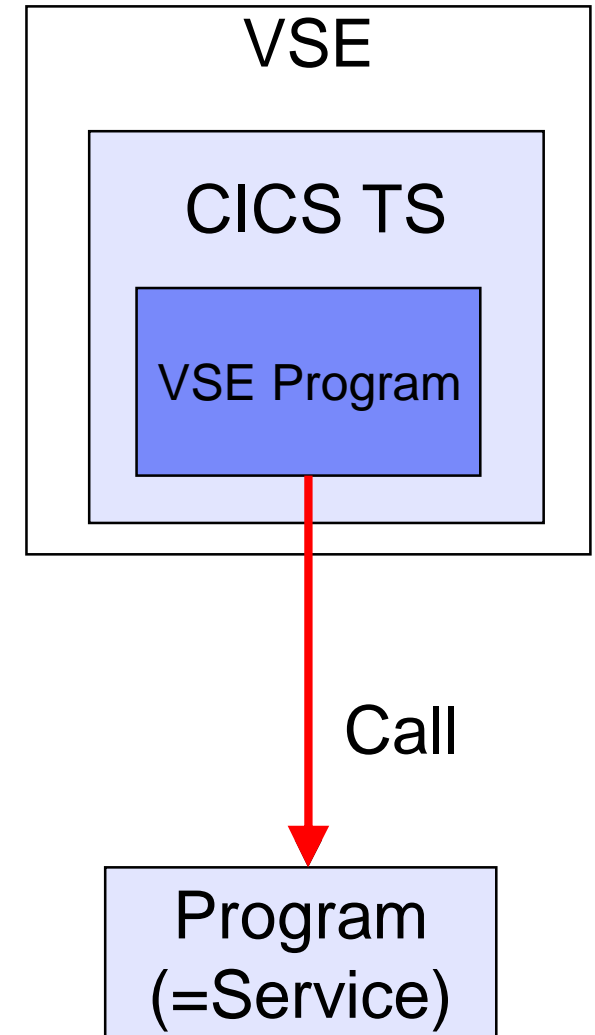
What is a Web Service?

- § Assume **you have a VSE program** that implements some kind of important business logic
- § Someone else (outside VSE) wants to use this program
 - 1. Possibility: Rewrite the same logic
 - May need access to VSE data
 - Changes/Fixes in VSE code needs to be re-done in new code also
 - 2. Possibility: Call the VSE program from remote
 - VSE program can be treated as a **Web Service**
 - VSE is the Web Service provider



What is a Web Service?

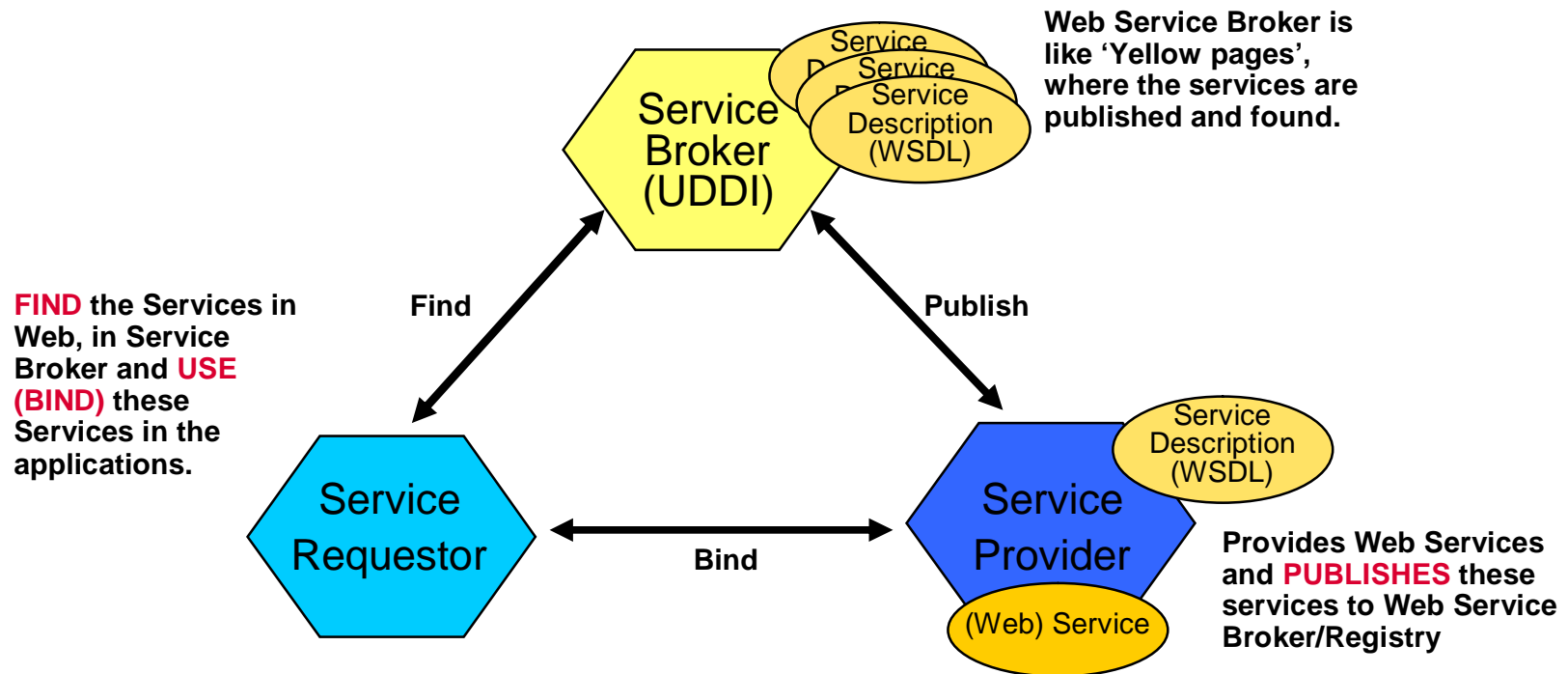
- § Assume **someone has a program** that implements some kind of important business logic
- § You want to use this program inside a VSE application
 - 1. Possibility: Rewrite the same logic
 - May need access to the remote data
 - Changes/Fixes in code needs to be re-done in VSE code also
 - 2. Possibility: Call the external program from VSE
 - External program can be treated as a **Web Service**
 - VSE is the Web Service Requestor



What are Web Services ?

„WebServices are self-contained, modular applications that can be described, published, located, and invoked over a network, generally, the World Wide Web.“ **IBM**

“A WebService is programmable application logic, accessible using standard Internet protocols“ **Microsoft**



Why would a VSE customer do SOA ?

§ SOA is modern (hype) and strategic

- The management says: We also have to do SOA

§ Easy integration of existing VSE programs into the modern world

- Reducing the interface complexity
- Reuse of existing applications as services
- Use of standard protocols (XML, SOAP, HTTP)

§ Encapsulation of VSE programs

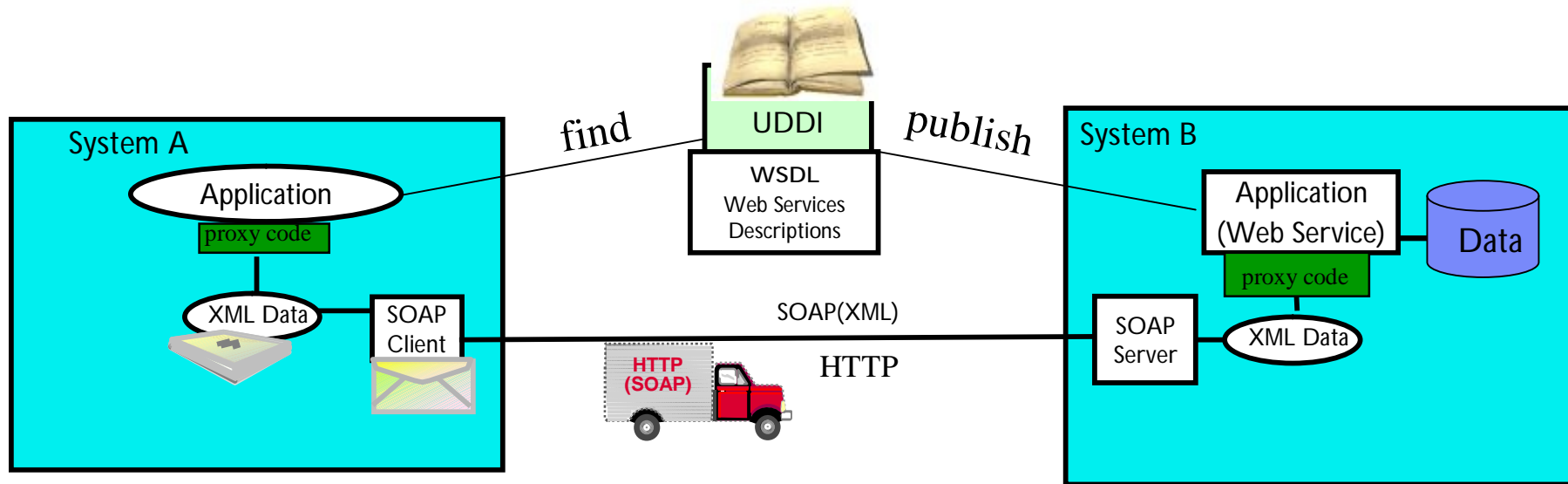
- Disconnecting business and display logic

§ Integration of VSE into a Microsoft .Net environment

- You do not want to use Java
- You already have a Microsoft environment

Web Services in action

XML Document + SOAP Protocol = Web Services

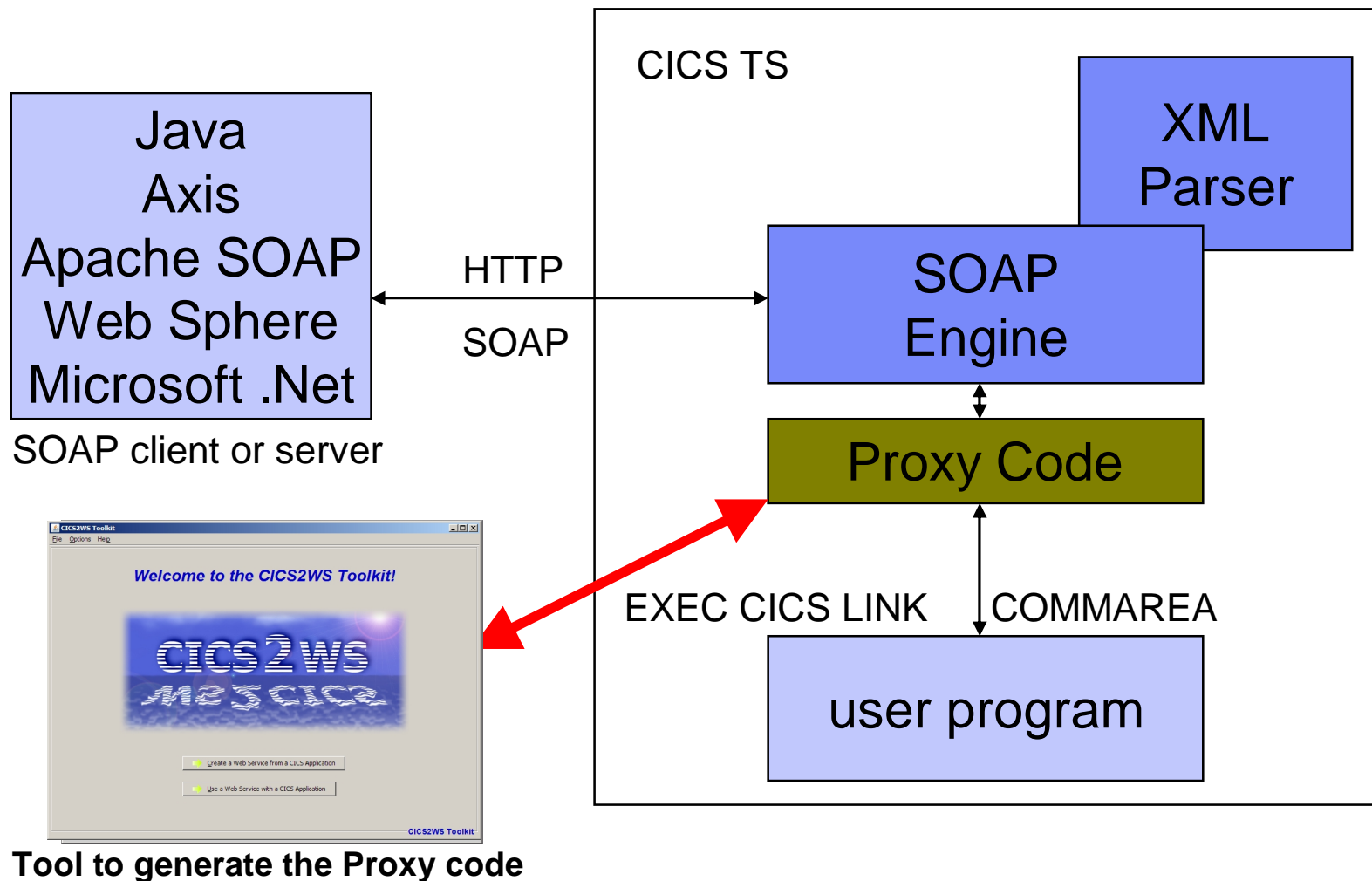


XML	-	
SOAP	-	
HTTP	-	Carrier
TCP/IP	-	Street
UDDI	-	Yellow pages

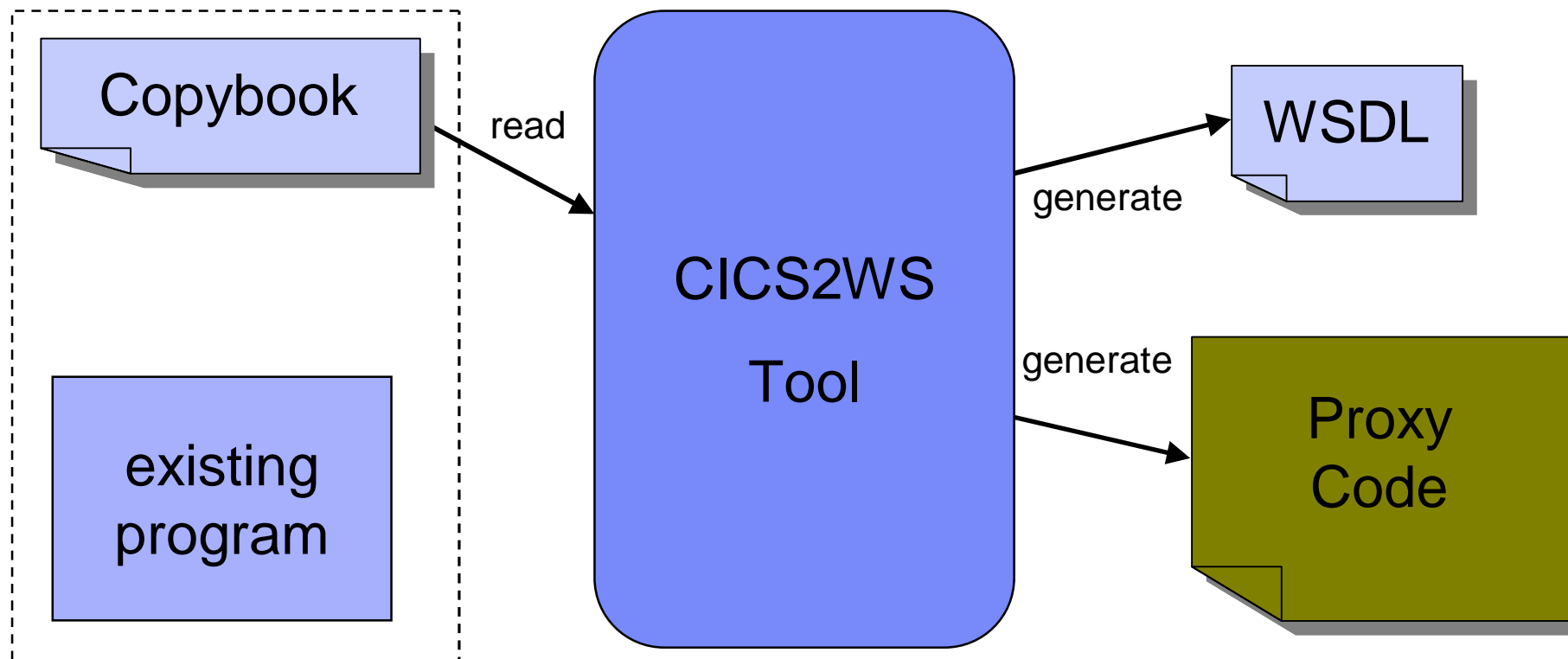
A web service

- It is intended for application communication
- It implements a business logic, application or system functionality
- It is useable in internet, intranet, extranet
- It is useable for browser-based solutions up to the integration between companies
- It uses only standard internet technologies

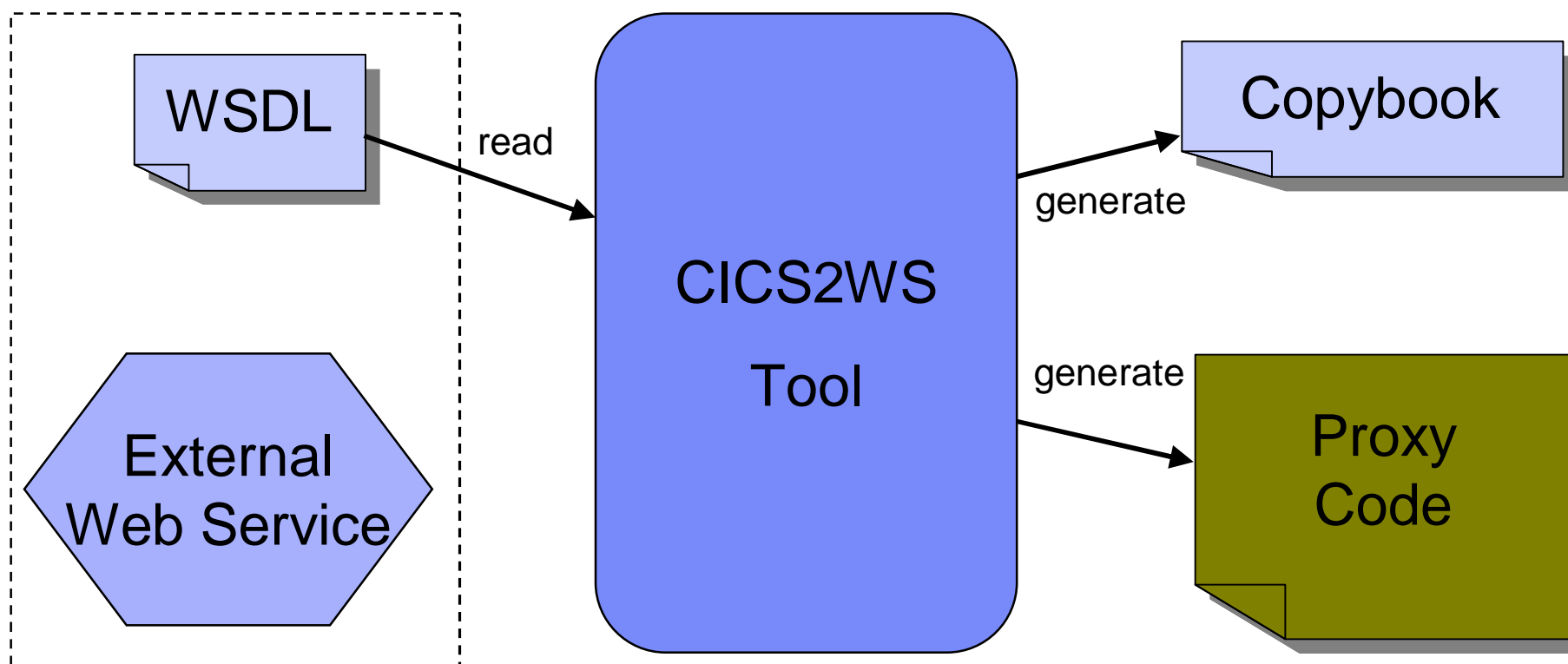
Web Services in and with VSE



VSE as a SOAP server (service provider)



VSE as a SOAP client (service requestor)



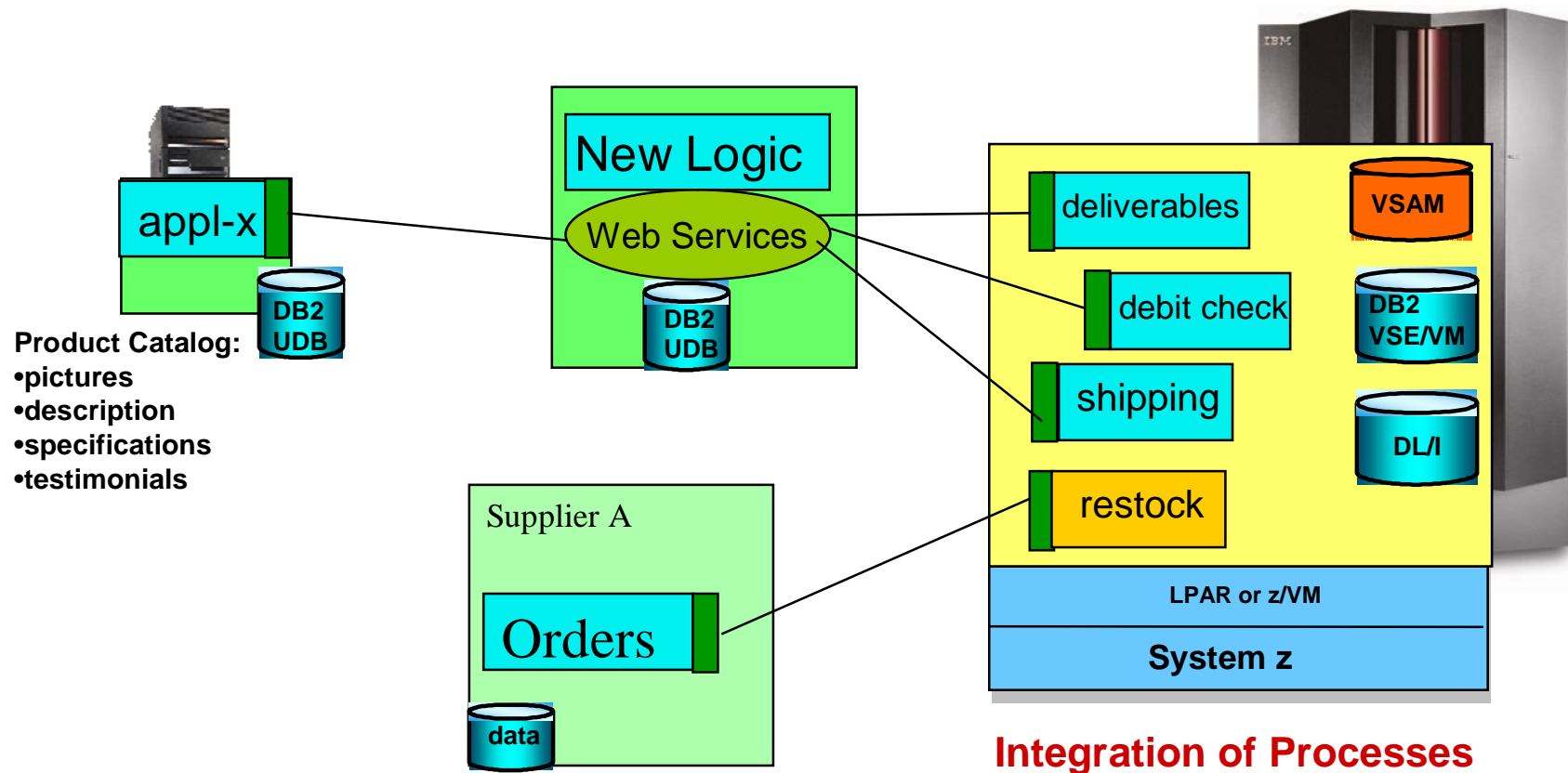
SOA – the way to New applications and processes

§ Applications look the same for all users

§ Core applications can be enhanced (independent of their language, COBOL, ASM, PL/I)

§ New business logic can be built

Increases business for the Company



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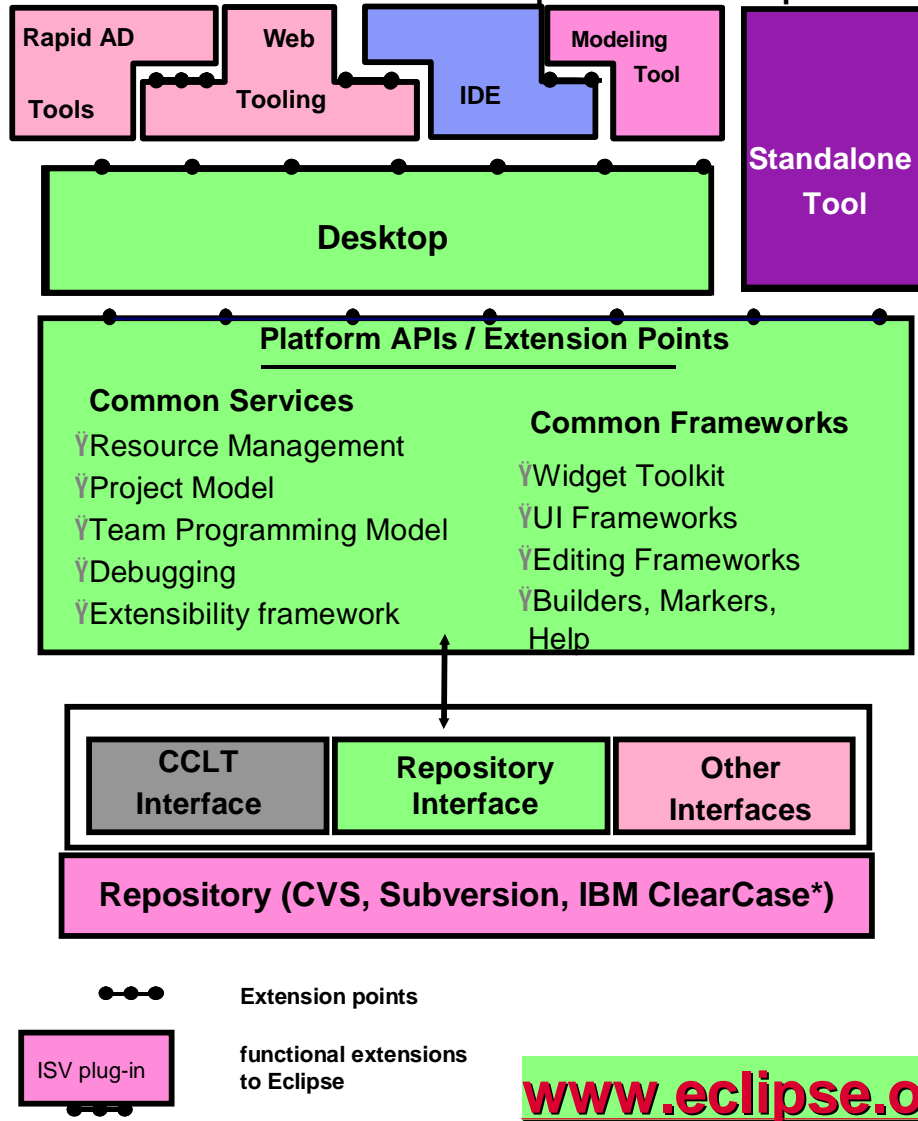
Workshop Part 4

Modern Application Development for z/VSE



Scenario 6: Application development for z/VSE

Eclipse – the open Standard for application development

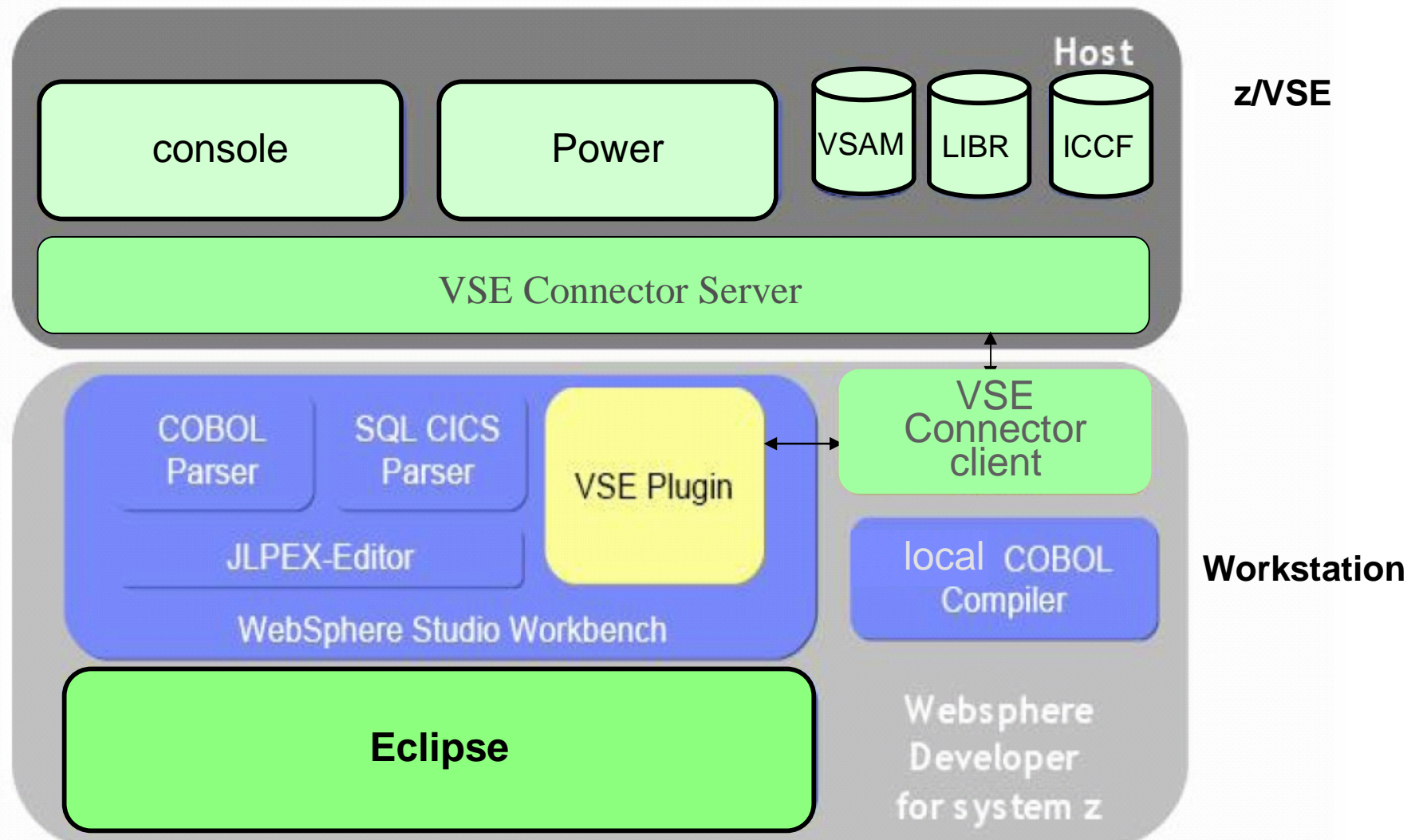


www.eclipse.org

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 appls.
 - **IBM EGL development Plug-In for z/VSE**
 - follow-on to Visual Age Generator

IBM WebSphere Developer for System z (WDz) with z/VSE Development Plug-in



IBM WebSphere Developer (WDz) in z/VSE perspective

The screenshot displays the IBM Rational Software Development Platform (WDz) interface for z/VSE development. The main editor window shows the source code for a program named PRINTAPP.cbl. The code is organized into sections: Identification Division, Data Division, Working-Storage Section, Linkage Section, and Procedure Division. The Procedure Division contains logic for moving data from input to output, including calculations for character counts and string lengths.

Annotations on the screenshot identify key components:

- 1. Perspective:** The overall IDE window.
- 2. View:** The VSE System View on the right, showing a hierarchical tree of system components like VSE Lab, VSE Workshop, and various datasets.
- 3. Projects:** The z/OS Projects view on the left, showing a tree of project files and folders.
- 4. Editor:** The central text editor displaying the source code.
- 5. Outline View:** The Outline view at the bottom left, providing a structured overview of the code's sections and paragraphs.
- 6. VSE Console:** The VSE Mainframe console at the bottom, displaying a memory map (MAP) with columns for address, space, area, size, and name.

The VSE Console output shows the following memory map:

MAP	AR	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	BC 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	600K	14760K	500000		OK	VTANSTRT
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	SECSEVR
AR 0015	S	SVA-31	7588K	6748K	370000			

WebSphere Developer (WDz) in z/VSE perspective

1. Perspective

2. View

3. Projects

4. Outline View

5. VSE Terminal

6. VSE Console

7. VSE Terminal

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

```

VSE/ESA ONLINE
5609-2V4 and Other Materials (C) Copyright IBM Corp. 2005 and other dates

      ++      VV      VV      SSSSS      EEEEEEE
      ++      VV      VV      SSSSSSS      EEEEEEE
      ++      VV      VV      SSSSS      EE
      ++      VV      VV      SSSSS      EEEEEEE
      ++      VV      VV      SSSSS      EE
      ++      VV      VV      SSSSS      EEEEEEE
      ++      VV      VV      SSSSS      EEEEEEE
      ++      VV      VV      SSSSS      EEEEEEE
      ++      VV      VV      SSSSS      EEEEEEE

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

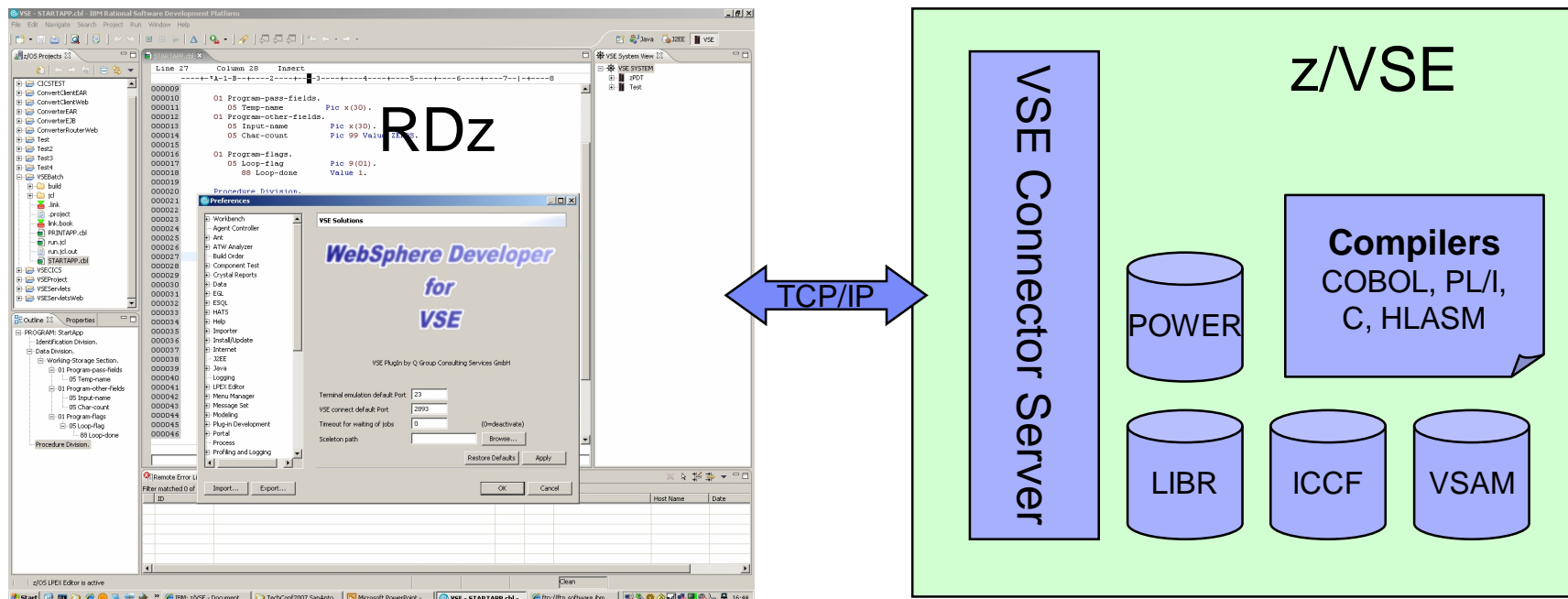
USER-ID..... The name by which the system knows you.
PASSWORD..... Your personal access code.

PF1=HELP      2=TUTORIAL      3=TO VM      4=REMOTE APPLICATIONS
              10=NEW PASSWORD
  
```

The VSE Console window shows the following table:

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

(1) Development of COBOL applications in WDz



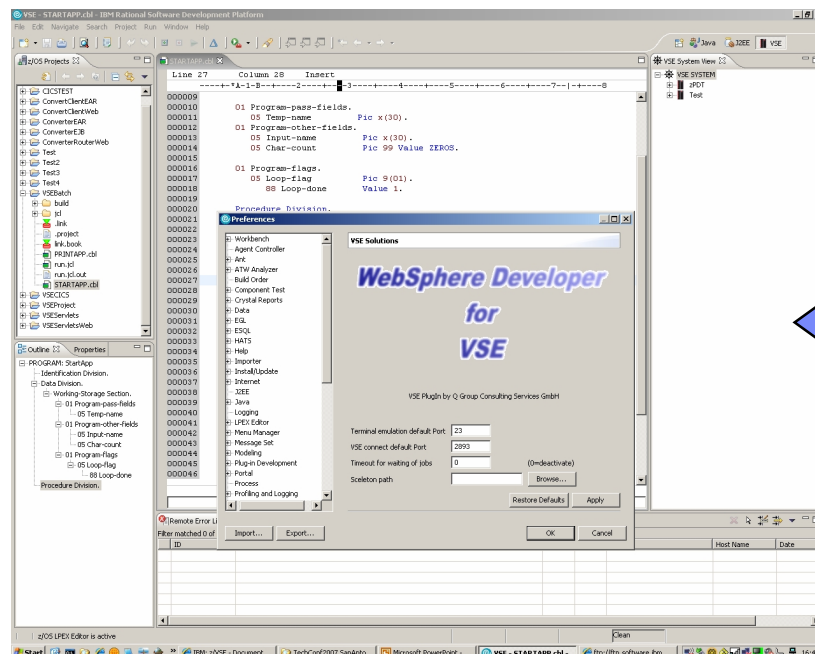
§ Development of COBOL

- batch and CICS application

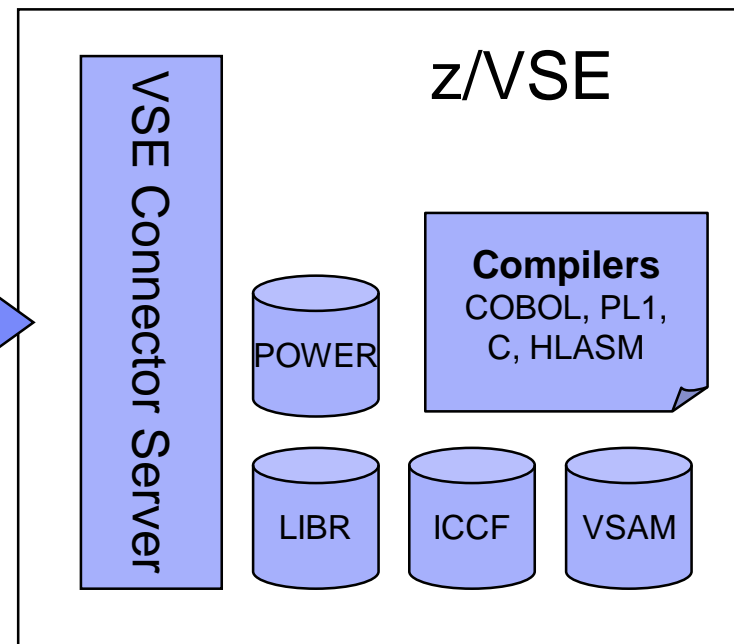
- Source code editing/checking
- Access to z/VSE within the tool (console and 3270 access)
- Compile, Link and error feedback from z/VSE

§ Additional supported languages: PL/I, ASM, C, BSM Maps

Part 1 – Development of COBOL applications in WDz



← TCP/IP →



§ Development of COBOL batch and CICS application

- Create a VSE project
- Import source code from VSE Library
- Edit, Compile and Link
- Run the COBOL application

Part 2 – Development of Java applications in WDz

```

// Stay login with this user for lifetime of this connection */
spec.setLoginCode(true);

// Create VSE system instance with this connection */
system = new VSESystem(spec);

// Keep the connection for lifetime of this program */
system.setConnectionMode(true);

// Get file system from host */
libr = system.getVSELibrarian();

// Create a listener that gets notified when objects are */
// retrieved from the host */
ll = new LibListener();
libr.addVSEResourceListener(ll);

// Get a list of VSE libraries from this host. This method will */
// give control back when all resources are received, i.e. the */
// listEnded() method of the listener has been called. */
libr.getListLibraries();

// Now remove the resource listener from the libr object */
libr.removeVSEResourceListener(ll);

// Now get the list of libraries from the listener and get the */
// number of sublibraries in PRD2. */
vlibs = ll.getLibraries();
numLibs = vlibs.size();
System.out.println("Number of libs on host " + system.toString() + " : " + numLibs);
for (int i=0;i<numLibs;i++)
{
    myLib = (VSELibrary) vlibs.elementAt(i);
    if (myLib.getname().equals("PRD2"))
        break;
}
if (myLib == null)

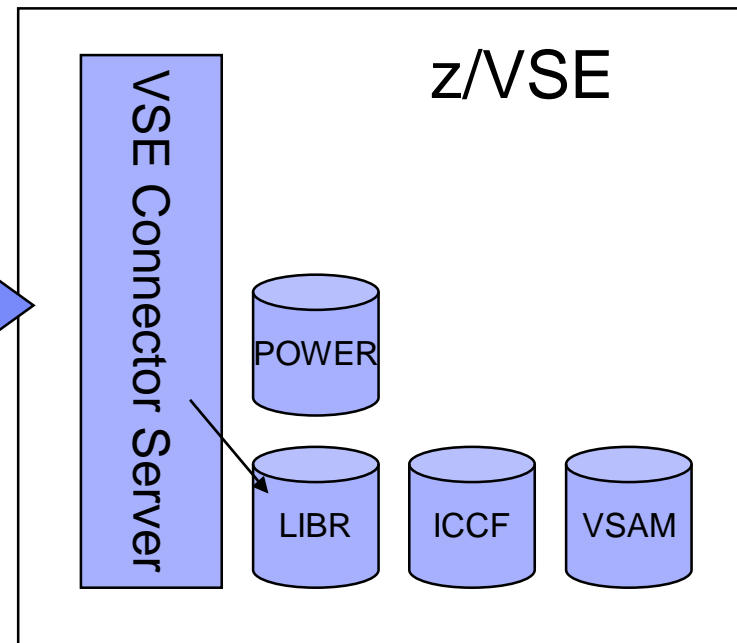
```

```

Number of libs on host VSESystem (9.152.05.26) : 6
LibListener: listStarted()
sublib = CONF10
LibListener: listAdded()
sublib = DF800C
LibListener: listEnded()
Number of libs on host VSESystem (9.152.05.26) : 6
LibListener: listStarted()
sublib = SYSDUMP
LibListener: listAdded()
sublib = SYSVTO
LibListener: listAdded()
sublib = SYS3RS
LibListener: listEnded()

```

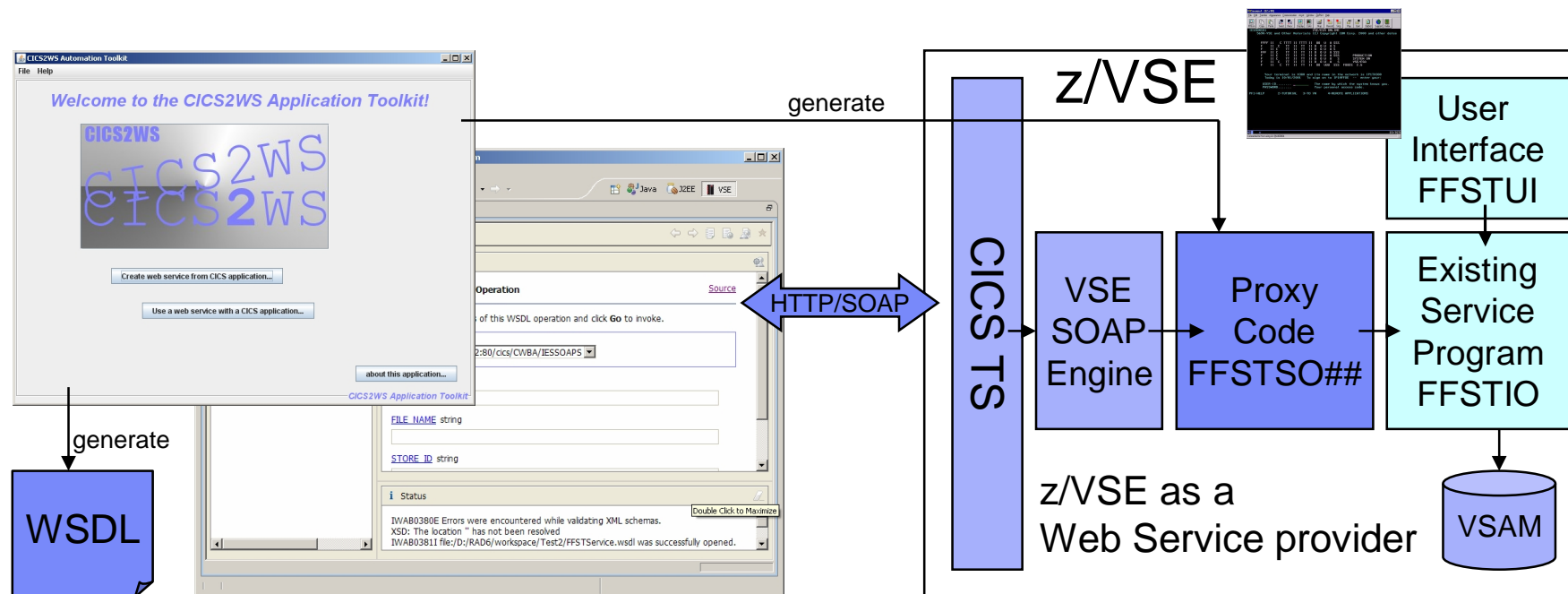
TCP/IP



§ Development of Java application that access VSE resources via VSE Connector Client

- Create a Java project
- Import source code from the VSE Connector Client samples
- Edit and Build
- Run the Java application with access to VSE

Part 3 – Development of SOA applications in WDz



§ Service enabling of an existing CICS application

- Generate the proxy code with CICS2WS Tool
- Import generated proxy code into WDz
- Edit, Compile and Link of proxy code
- Run the Web Service using Web Service Explorer

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 analyze and optimize existent applications and workflow

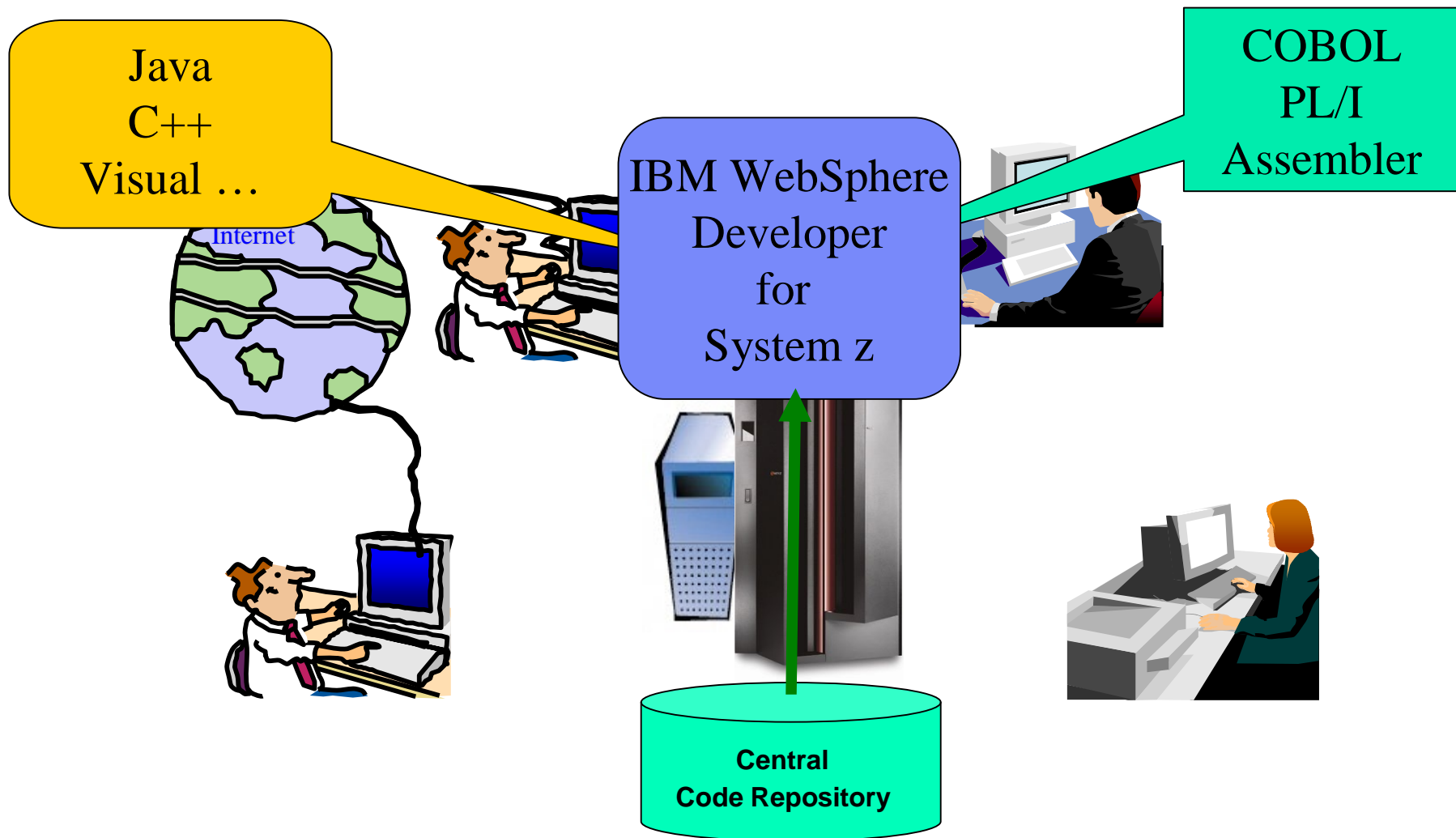
§ **Common framework for enterprise development**

- 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

Eclipse – an open Integrated Development Environment for the enterprise



z/VSE web site

The screenshot shows a web browser window with the address bar displaying <http://www-03.ibm.com/servers/eserver/zseries/zvse/downloads/>. The page content includes:

- Navigation:** Home, Business solutions, IT services, Products, Support & downloads, My IBM.
- Header:** IBM logo, Country/region [select], Search.
- Left Sidebar:** z/VSE, About VSE, How to buy, News & announcements, Events, Solutions, Products & components, Documentation, Service & support, Downloads, Education, Partners, FAQ, Contact VSE.
- Main Content:**
 - Downloads:** Connectors, Tools, Samples.
 - Connectors: VSE Connector Client, VSE Script Server, TCP/IP Configuration Dialog, VSE Health Checker, CICS2WS Toolkit.
 - Tools: VSAM Redirector Server, VSE Navigator, VSEPrint utility, VSE System class library.
 - Samples: VSE Virtual Tape Server, VSAM Maptool, Keyman/VSE, WebSphere MQ Client for VSE.
 - Recent additions and updates:**
 - VSE Connector components (updated 03/2007 for z/VSE V4.1)
 - Keyman/VSE (updated 03/2007)
 - VSE Health Checker (updated 02/2007)
 - VSE System class library (updated 02/2007)
 - VSAM Maptool (updated 03/2007)
 - Product Cards:**
 - VSE Connector Client** (Updated: 03/2007) with links to Detailed Description, Documentation, Latest APARs and PTFs, Frequently asked questions, and Installation.
 - VSAM Redirector Server** (Updated: 03/2007) with links to Detailed Description, Documentation, Latest APARs and PTFs, Frequently asked questions, and Installation.
- Right Sidebar:** We're here to help (E-mail us), Downloads (Get Java from IBM developerworks, Order PTFs), Acrobat (Get Adobe Reader).

The Windows taskbar at the bottom shows the Start button, several open applications (AT&T Network Client, IBM: z/VSE - Downloa..., Microsoft PowerPoint), system tray icons (97% battery, network, volume), and the time 10:46 AM.

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

