IBM Systems & Technology Group

Modernization for VSE Customers

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IBM Dev. Lab Böblingen

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Agenda

- **IT Modernization for VSE Customers**

(1)VSE environment - Hardware and Data interchange

(2)Modern Data Management Solutions with zSeries

DB2 scenarios with MQSeries and VSAM Redirector

(3)IT Modernization with Enterprise Solutions and IBM Tools

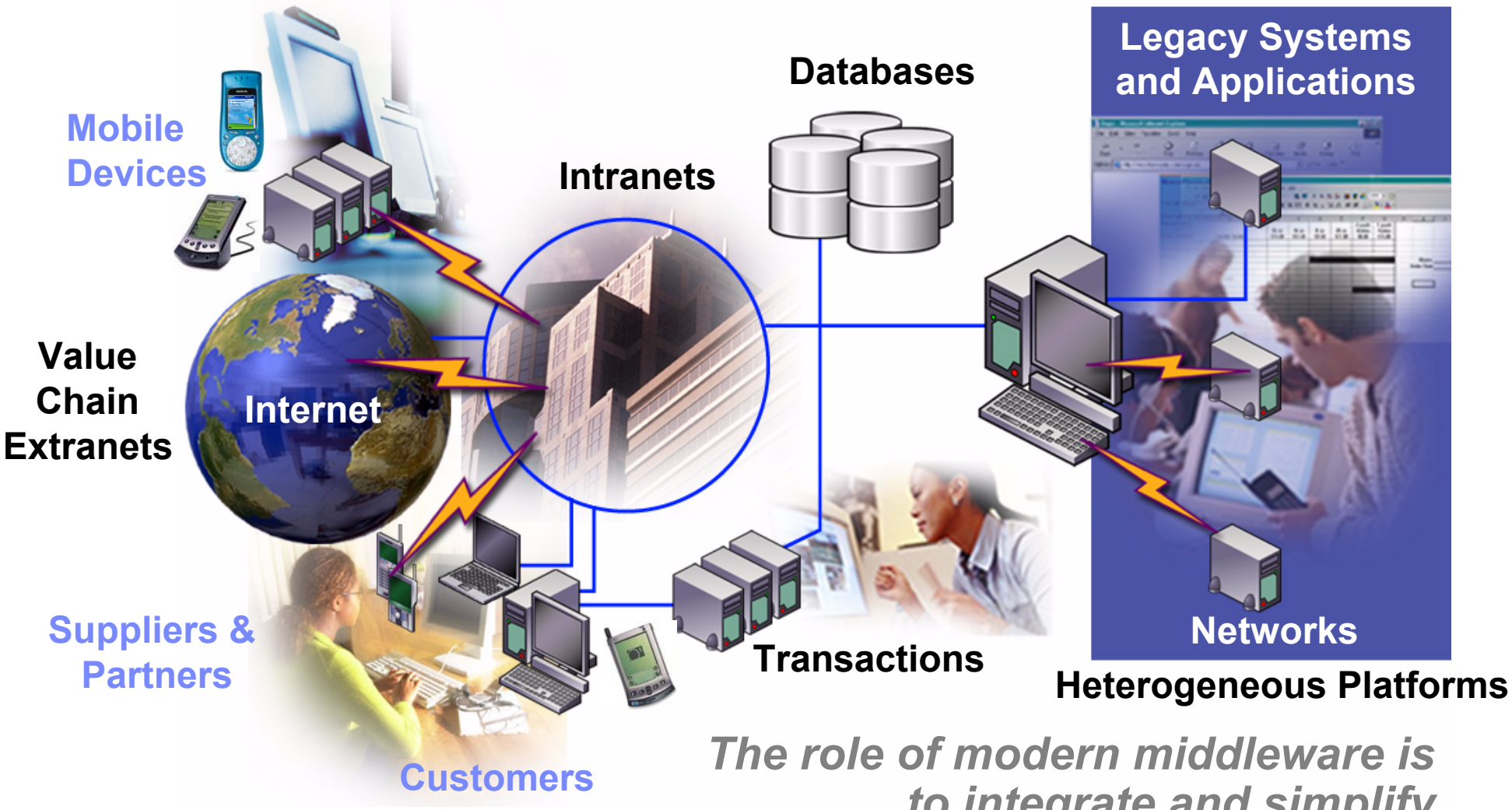
Linux, WAS, HATS, WSAD

(4)Building 24x7 Environments with Linux and Storage Solutions

Linux NCP replacements, Flashcopy, PPRC

Today's IT Environment

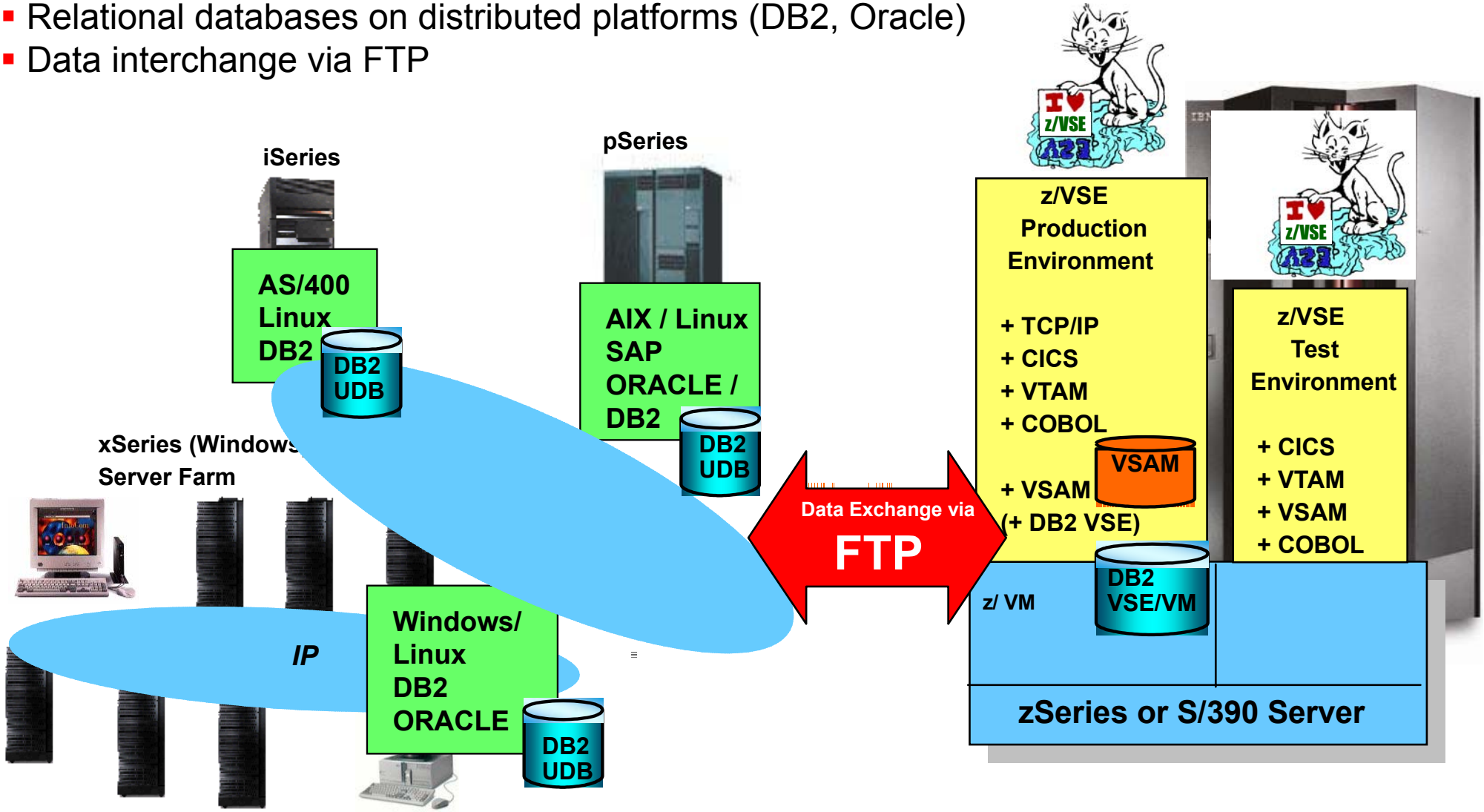
IT environments are increasingly heterogeneous and complex



The role of modern middleware is to integrate and simplify

Typical VSE Customer Environment Data interchange

- Various different servers (zSeries, pSeries, iSeries, xSeries, and competitive)
- VSAM data on VSE (few DB2 environments)
- Relational databases on distributed platforms (DB2, Oracle)
- Data interchange via FTP



VSE Customer Pain Points - Technical

- **Cross-Platform Common Data Store**

What's behind it?	How to address?
• DB2 on VSE limitations in functions, capabilities and capacity • MQ Series server to expensive on VSE	• DB2 UDB on Linux System z • HiperSockets connection to VSE data & appls • MQ Series client for z/VSE • Linux cloning for "a new server" request

- **Existing 3270 Interfaces**

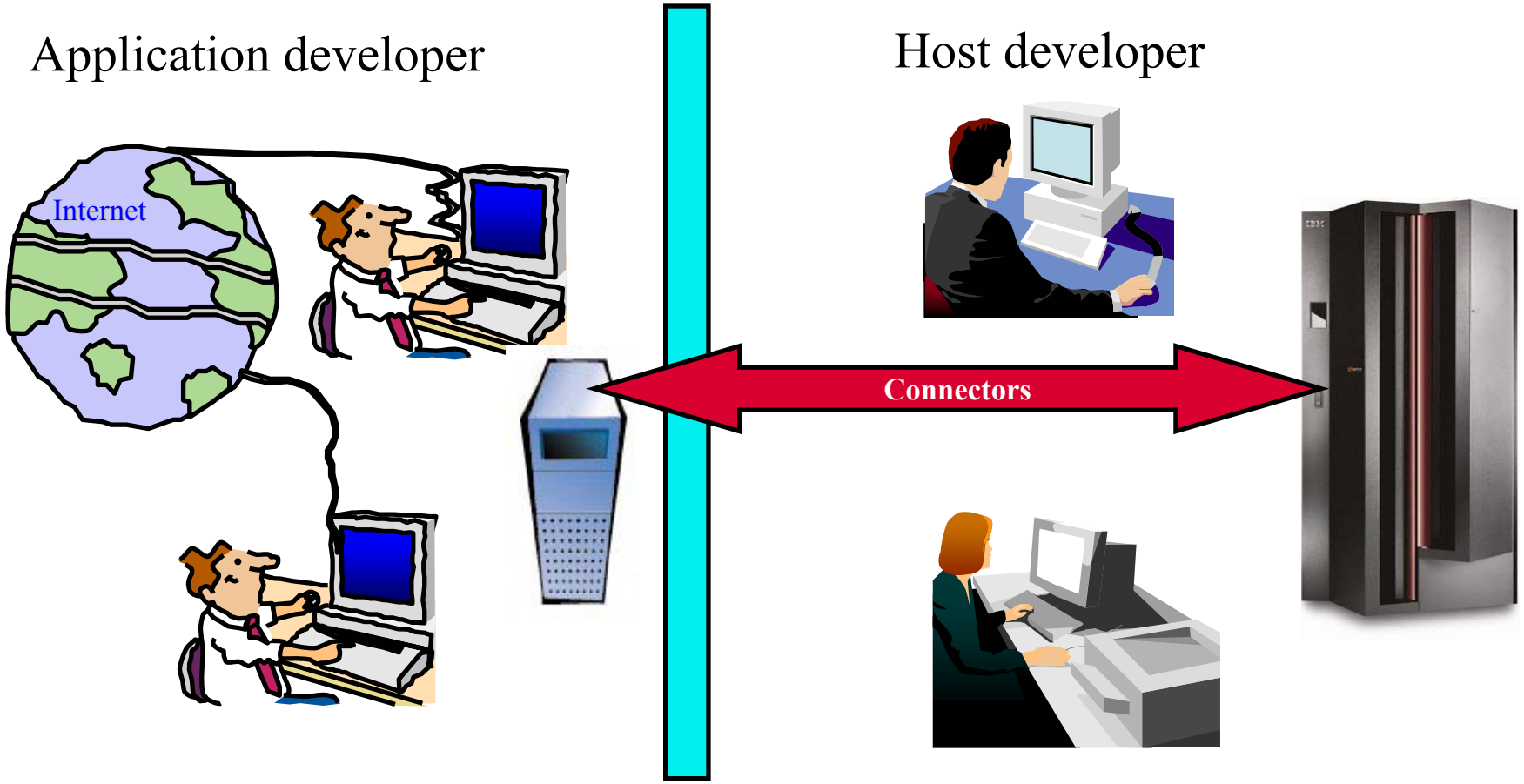
What's behind it?	How to address?
• Green screens are outdated and not fancy	• With: WAS, HATS, HoD, Portal on Linux on zSeries

- **Platform Integration and Server Consolidation**

What's behind it?	How to address?
• VSE CICS applications must be integrated in distributed environments • IT complexity, e.g. FTP jobs every night to distributed servers, must be reduced	• WSAD (RAD) and WAS for rapid appl dev based on Web Services • SOA and open & industry standards implementation for VSE with Linux on zSeries • Virtual Linux servers with VSE connectors can eliminate FTPs

Challenges in today's IT

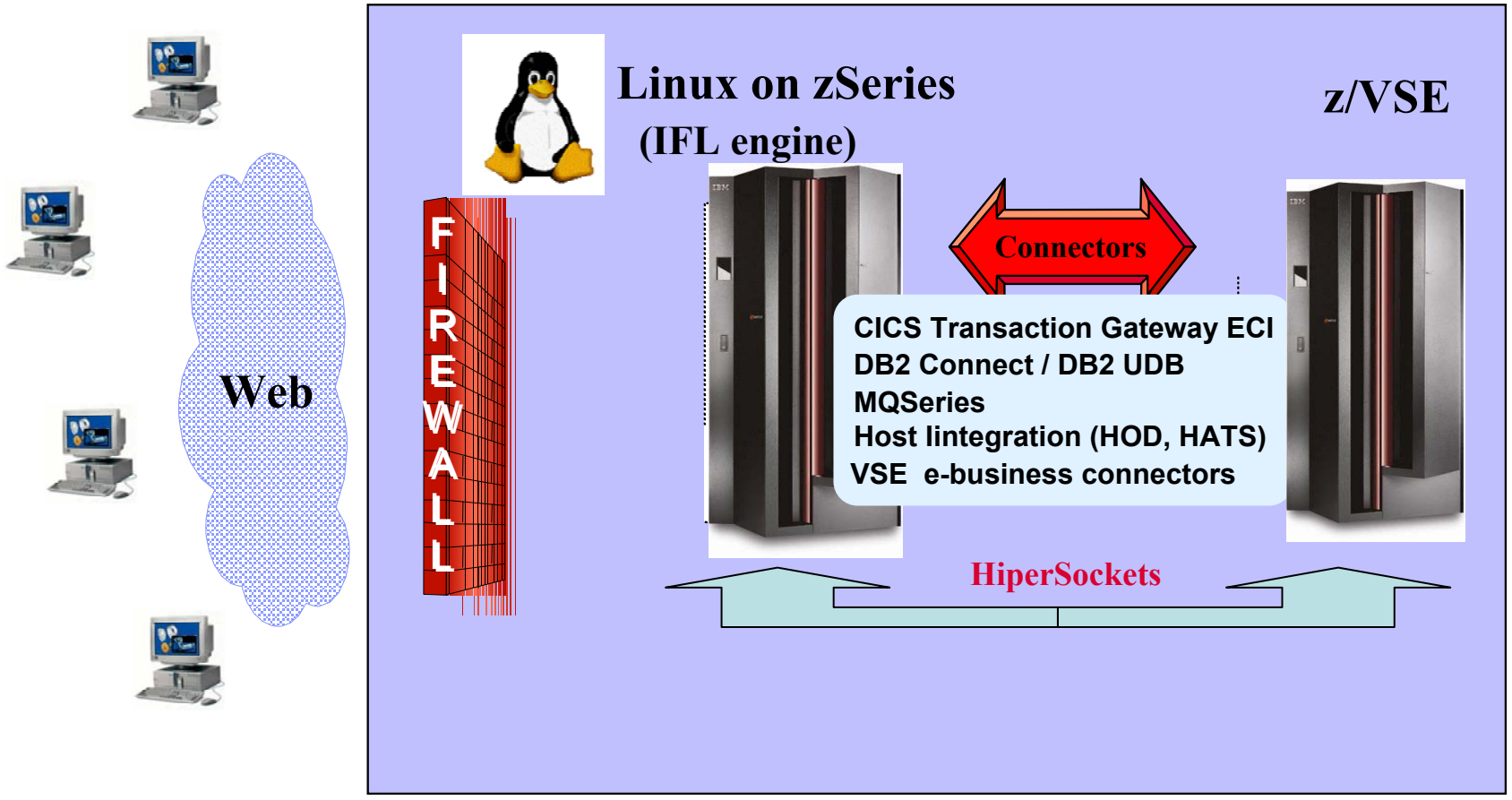
- **Two Architectures, two cultures one goal – universal solutions**



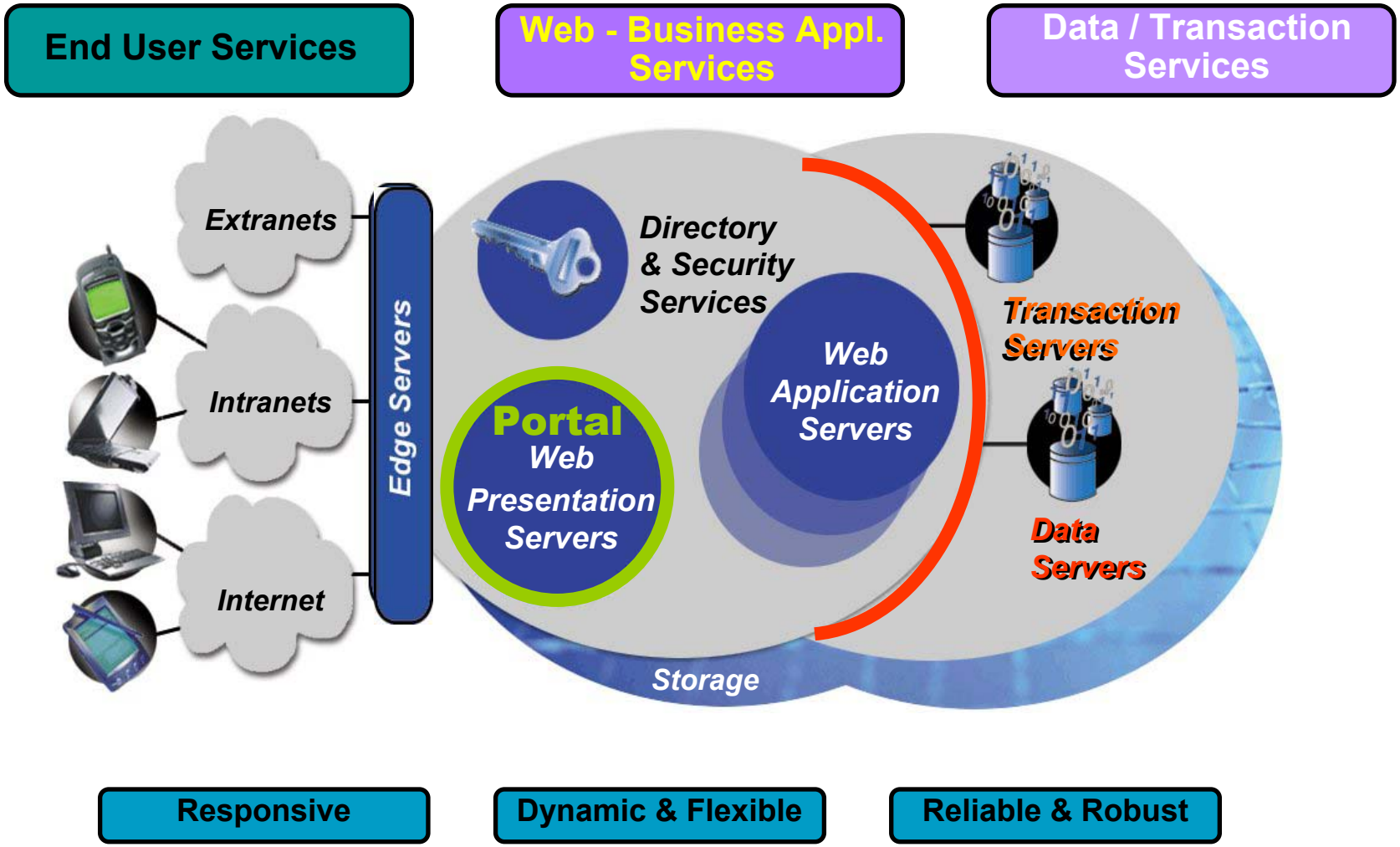
Solutions in distributed environments with VSE

Limitation	Description
Organizational inhibitors at customer site	▪organizational structures inhibit cross platform projects because of budget settings for each platform
The decision of solutions within the company is driven by personal interests	▪The need of cross platform solution meetings is highly recommended ▪Solutions must be accepted from all platforms involved
Solutions are complex and need to be prepared accordingly	▪Meetings and workshops are required to bring people from different platforms to work together and understand each other
Solution	▪Proposals of solutions have to be understood by all platforms involved ▪Decision maker and technical leader have to understand the benefit of the solution ▪Involvement of Boeblingen Lab. for Consultancy, PoC, Briefings

Integration of z/VSE with Linux on zSeries



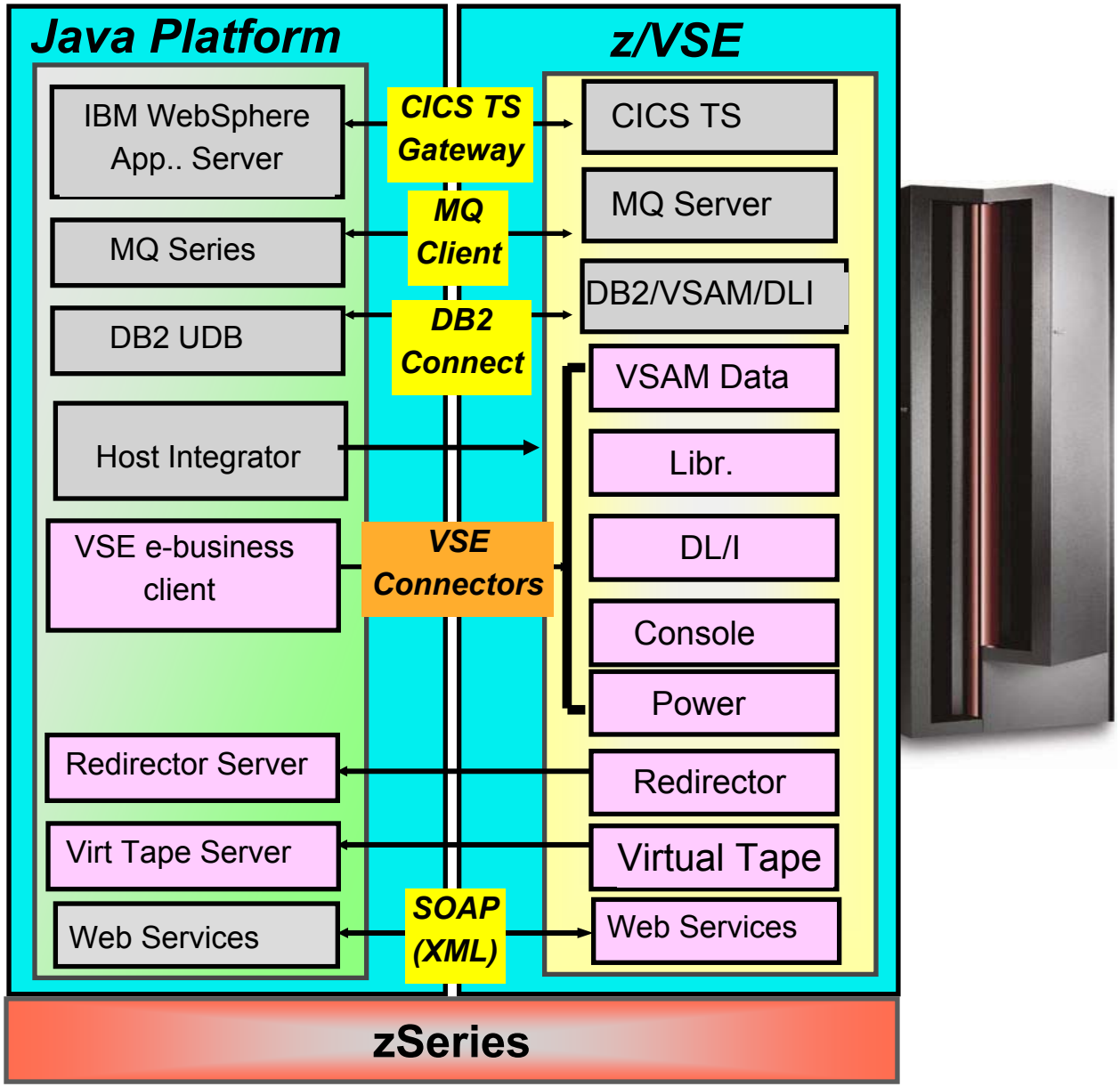
Infrastructure



Middleware Relations to z/VSE

- Modern Applications with Linux on zSeries
- Most modern Technologies interact with VSE Services
- Modernisation of IT Infrastructures using Real-time access to data

- part of VSE



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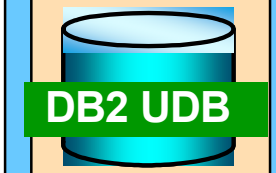
DB2 UDB (64-bit) for VSE Customers

Linux on zSeries

DB2 UDB V8.2 (64-bit)



Connection via HiperSockets

z/VSE V3.1 Production Environment

+ CICS
+ TCP/IP
+ VSAM
+ COBOL
+ DB2 VM / VSE

z/VSE V3.1 Test Environment

+ CICS
+ VSAM
+ COBOL

z/VM V5

z/VSE Production System LPAR

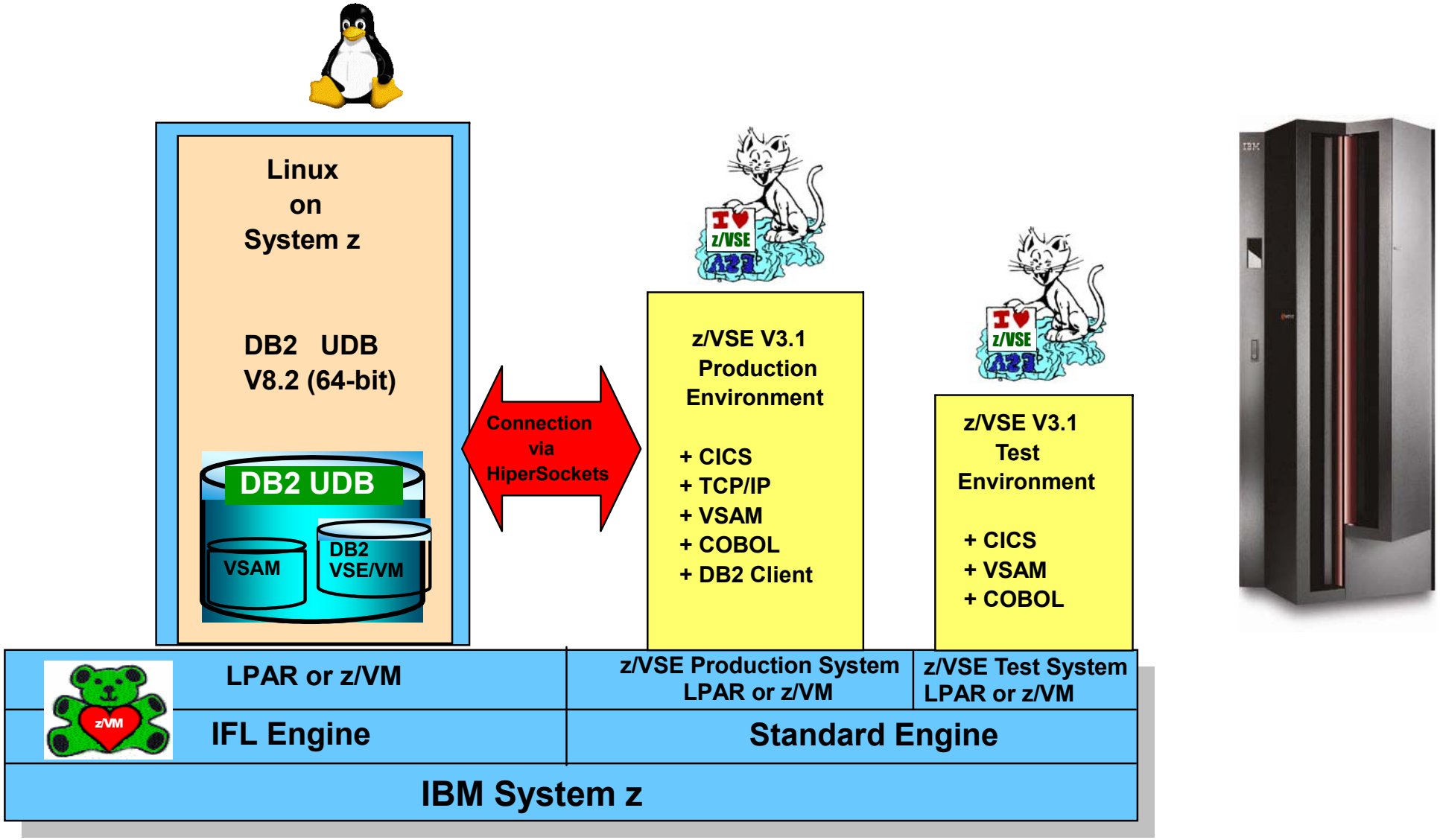
z/VSE Test System LPAR

IFL Engine

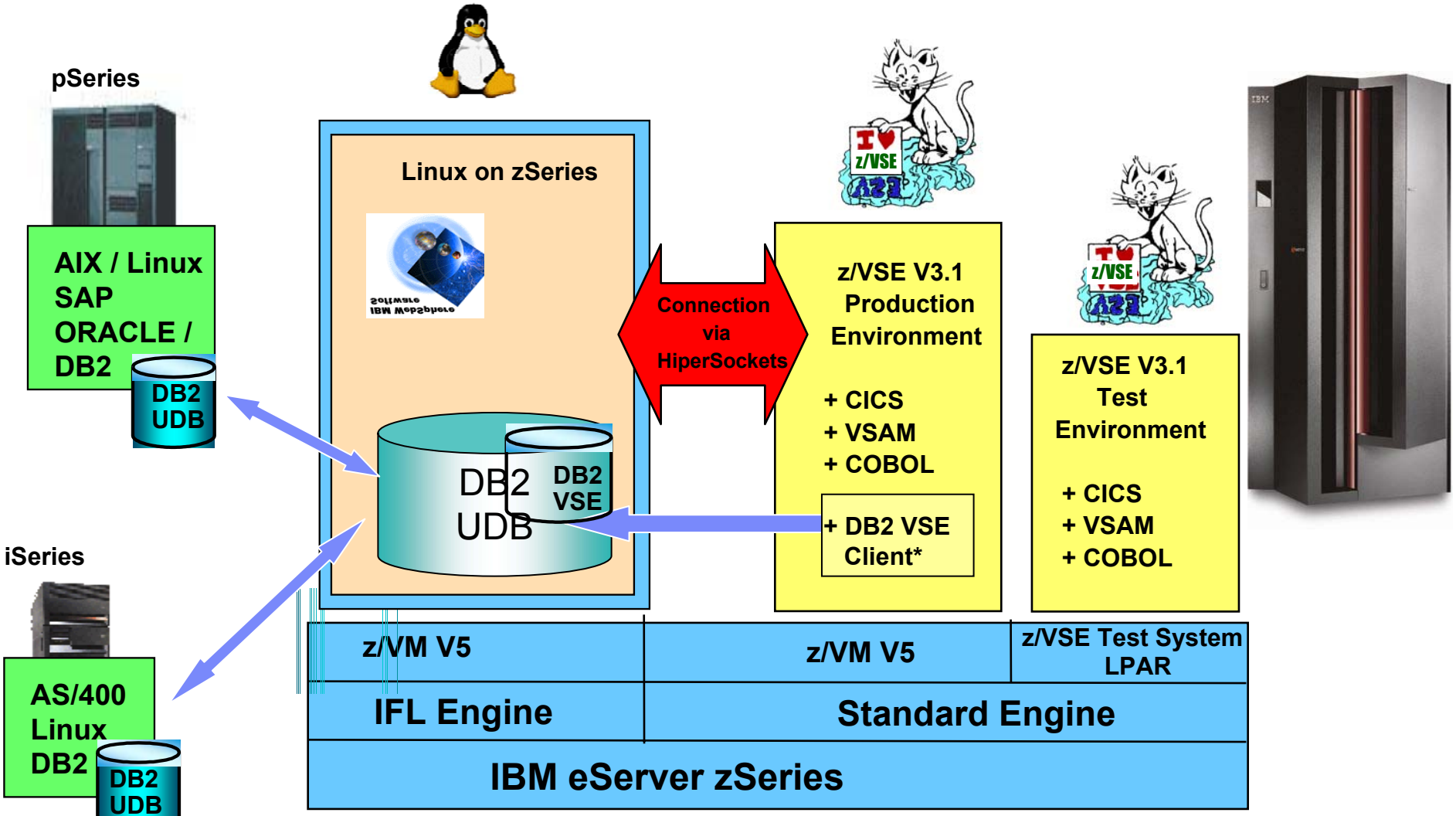
Standard Engine

IBM eServer zSeries

Common Data Store with DB2 UDB on Linux on System z



From DB2 VSE to – DB2 UDB using Linux on System z

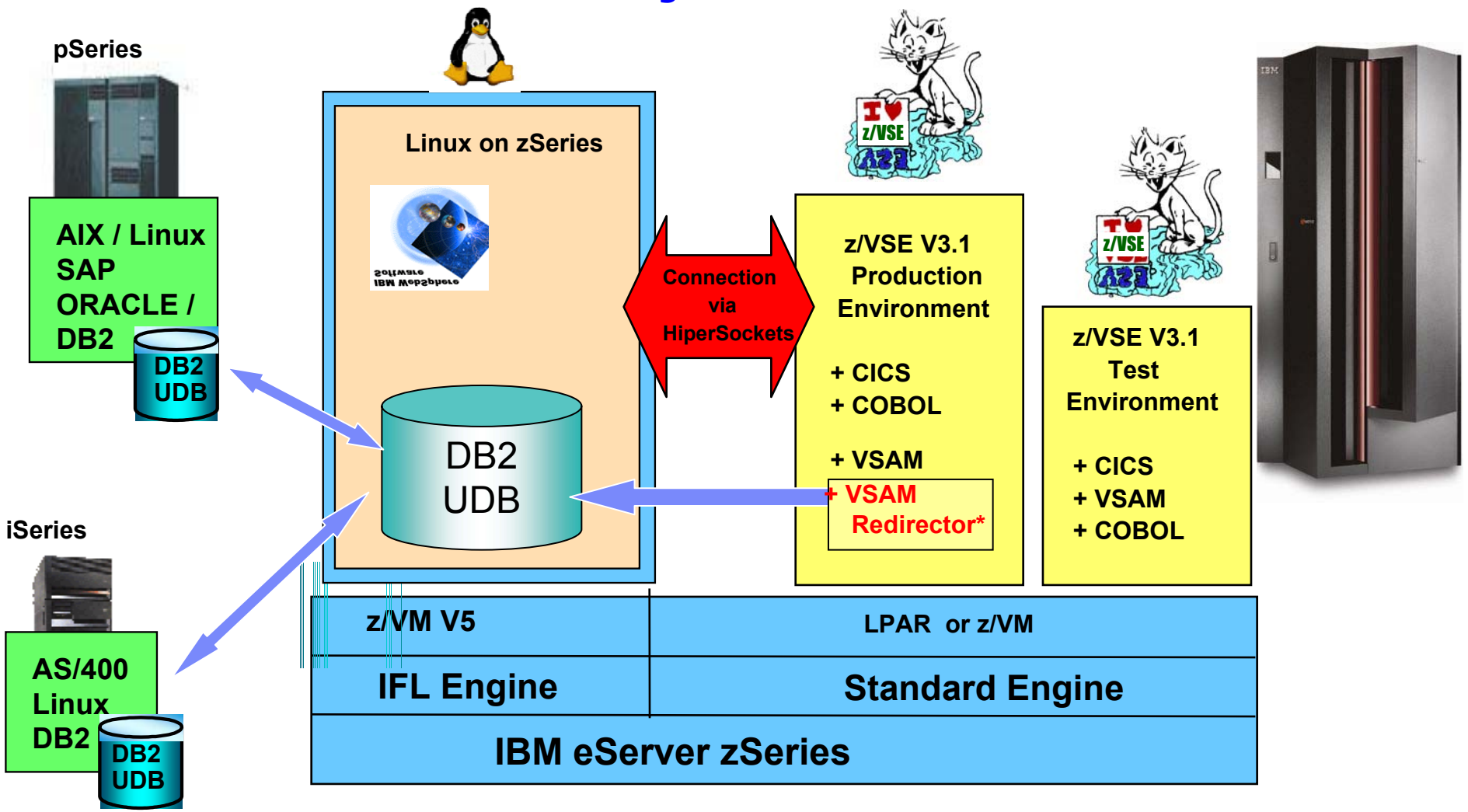


(*) DB2 VSE Client – the client functionality only, can be obtained with PRPQ P10154

DB2 UDB on Linux - To address DB2/VSE Limitations

Limitation	Description
Old SQL standard	Limited SQL query functionality
Lack of DB2 functionality	▪NO triggers, limited JOIN functionality ▪CAPTURE/APPLY function partially imlemented ▪NO XML-Extender, NO WEB Extender ▪No support for BIG data formats (BLOB, CLOB) ▪Naming conventions for the DB2 VM/VSE catalog different than DB2 UDB database catalog
Lack of DB2 VSE management possibilities	▪DB2 VSE can not be managed from a remote DB2 UDB ▪tools for management, performance and recovery ▪query analysis, optimization and space exploitation
Capacity	▪MAX Database Capacity 64 GB ▪No support for BIG data formats - BLOB (Binary large object blocks - CLOB (Character large object blocks)
Solution	▪IFL processor(s) and DB2 UDB on Linux on zSeries ▪DB2 VSE data to be moved to DB2 UDB on Linux ▪DB2 VSE Client PRPQ P10154

Common Data Store – Transparent Work of VSAM Programs with DB2 UDB on Linux on System z

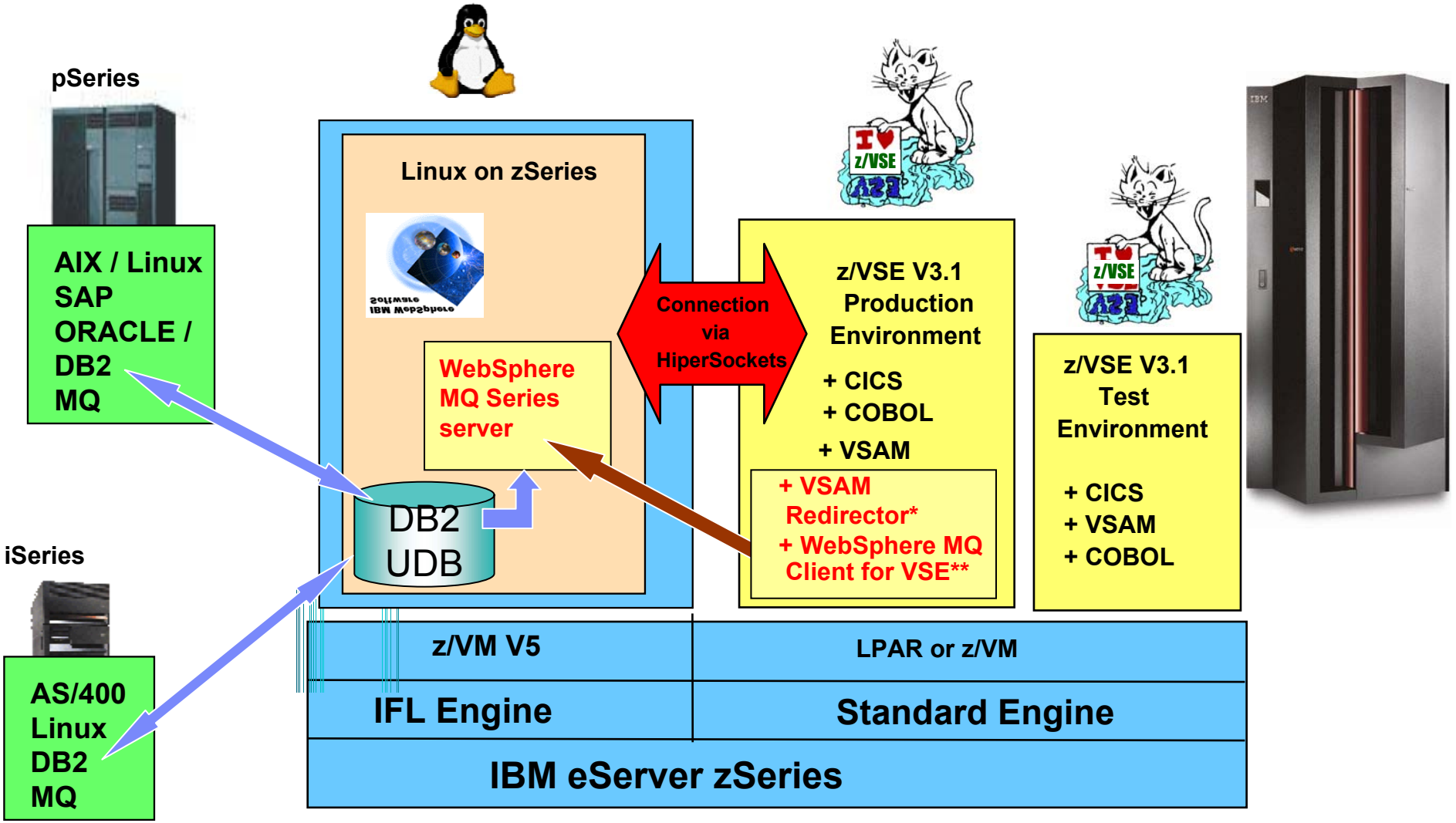


(*) VSAM Redirector – Common data store solution – with DB2 on Linux on zSeries Solutions without changes to VSAM programs

Common Data Store – From VSAM to DB2 UDB

Data Store	Description
VSAM	▪advantage ▪high performance ▪historically grown applications ▪core applications ▪disadvantage ▪no standard interface ▪VSAM doesn't know data structures ▪hard to integrate with open world
DB2 UDB via VSE VSAM Redirector	▪For batch and online (CICS) applications ▪no changes to the applications needed ▪two phase commit synchronization, VSAM with a remote database ▪real time synchronization of VSAM to DB2 UDB ▪FTP alternative with incremental work
Common data store solution	▪customers with VSAM data only can build modern solutions based on relational databases (i.e. DB2) ▪with DB2 UDB on Linux on zSeries – based on a very fast reliable network connection (HiperSockets) ▪IFL and Linux on zSeries needed

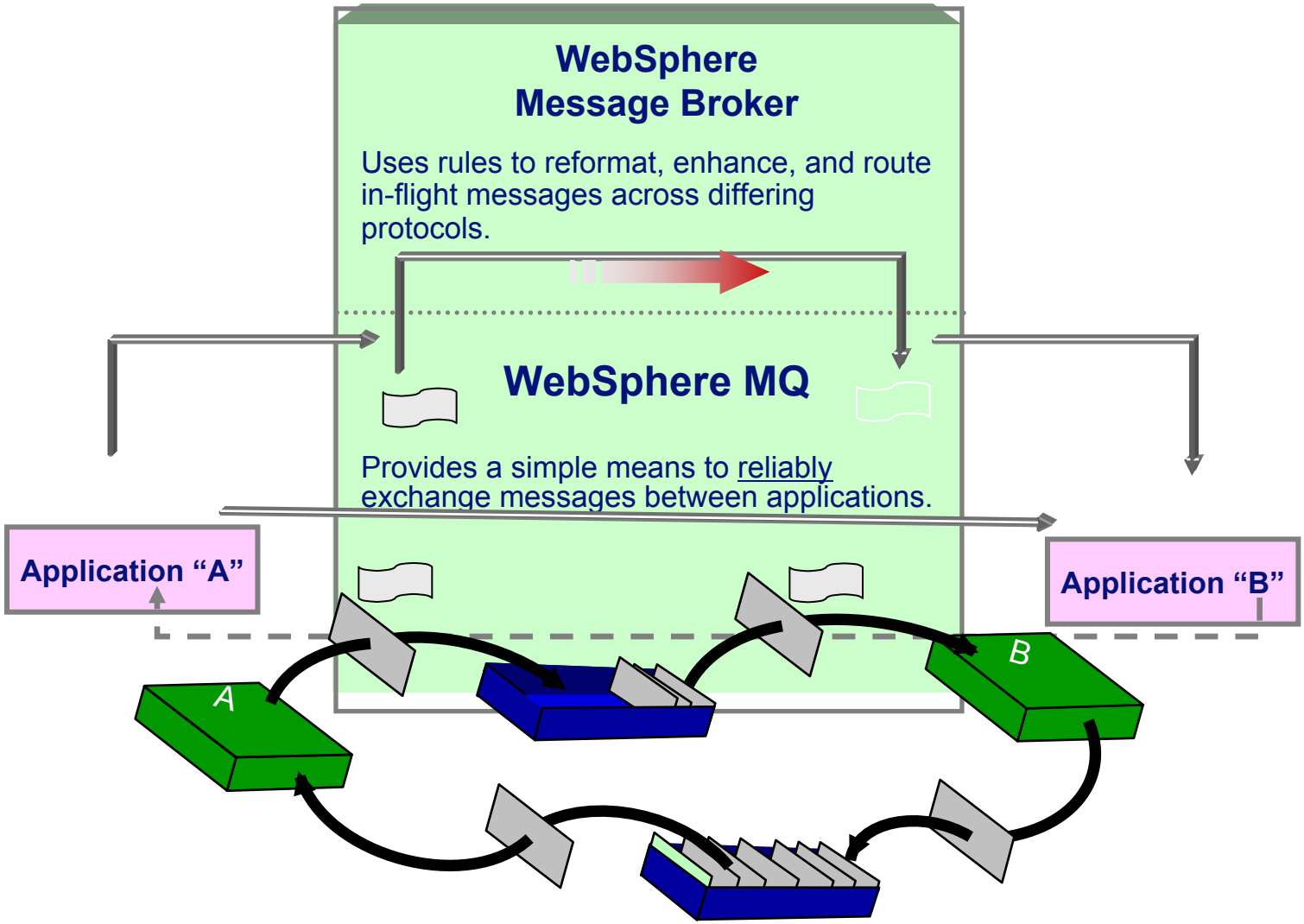
WebSphere MQ Series Solutions with z/VSE



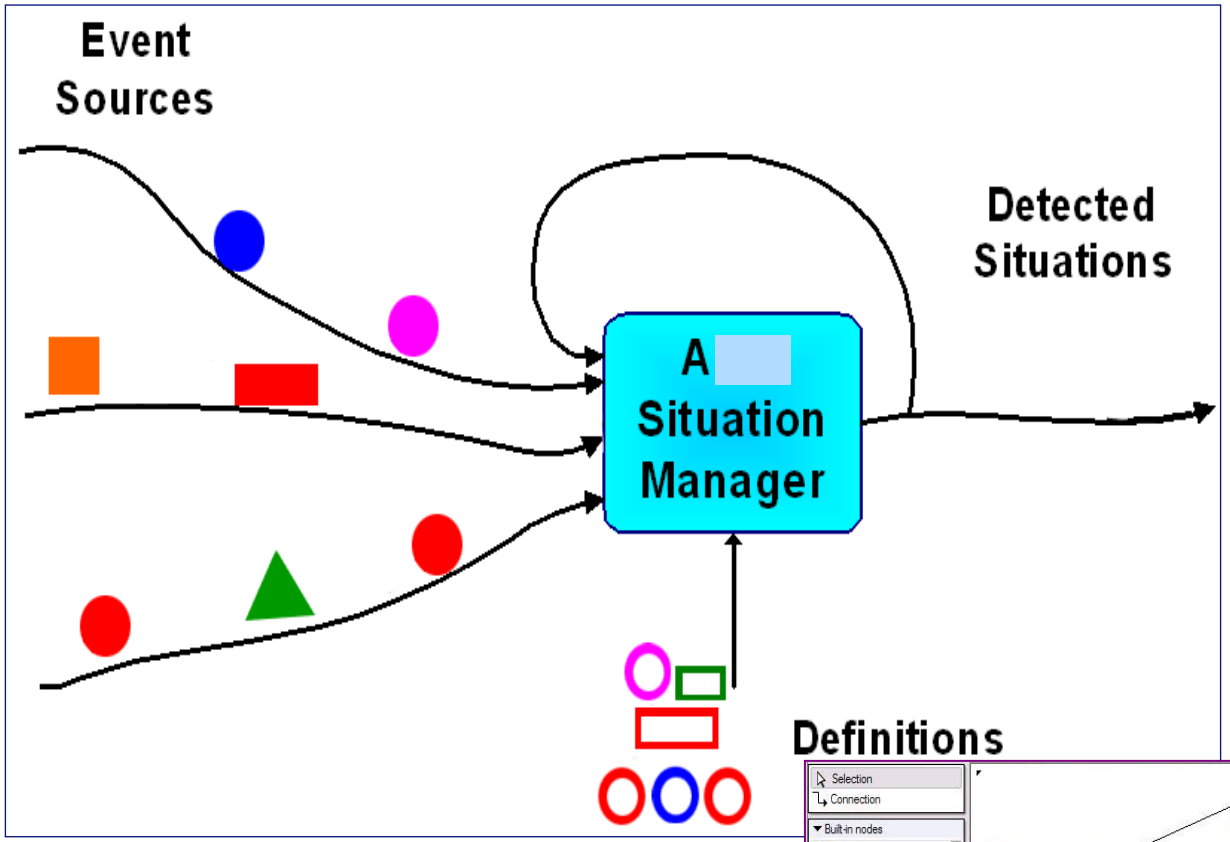
(*) **VSAM Redirector + Redirector MQ Exit** allows MQ Solutions without changes to VSAM programs
(**) **WebSphere MQ Client for VSE** is brand-new and free of charge

Messaging Overview

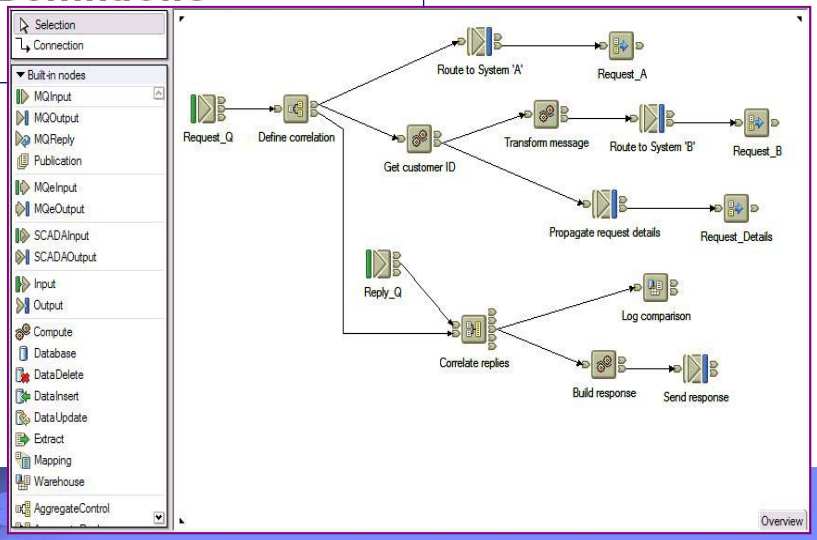
Event Notification (1 way communication), Request / Response (2 way communication)



What is WebSphere Message Broker?



1. **A framework for processing MQ messages**
2. **A robust hosting environment for:**
   - ✓ Transforming data
   - ✓ Enriching data
   - ✓ Interacting with databases
   - ✓ Routing messages based on content
   - ✓ Detecting complex combinations of messages
   - ✓ Interacting existing applications with Web Services



WebSphere MQ Series solutions with z/VSE

Data interchange	Description
FTP	▪Free available ▪One step in a data transfer (i.e. from VSAM to remote DB2) ▪(preparation, FTP, insert into a database) ▪insecure, not guaranteed delivery
MQ Series	▪A standard method of data transfer (secure, asynchronous) ▪MQ Series server, expensive on VSE ▪**WebSphere MQ Series Client for VSE** ▪**Requires MQ server on another platform (i.e. Linux on zSeries)** ▪Standard interface for > 30 Platforms and Java standard ▪Applications in VSE can work with MQ without changes (via VSAM Redirector and MQ Exit)
MQ Series solutions with z/VSE	▪Customers with VSAM data, can now build modern solutions based on relational databases and MQ ▪No changes to VSE/VSAM applications required ▪using VSE VSAM Redirector and MQ Exit ▪using WebSphere MQ Series Client for VSE ▪Asynchronous data transfer between different platforms ▪Integration with WebSphere technologies ▪IFL and Linux on zSeries needed

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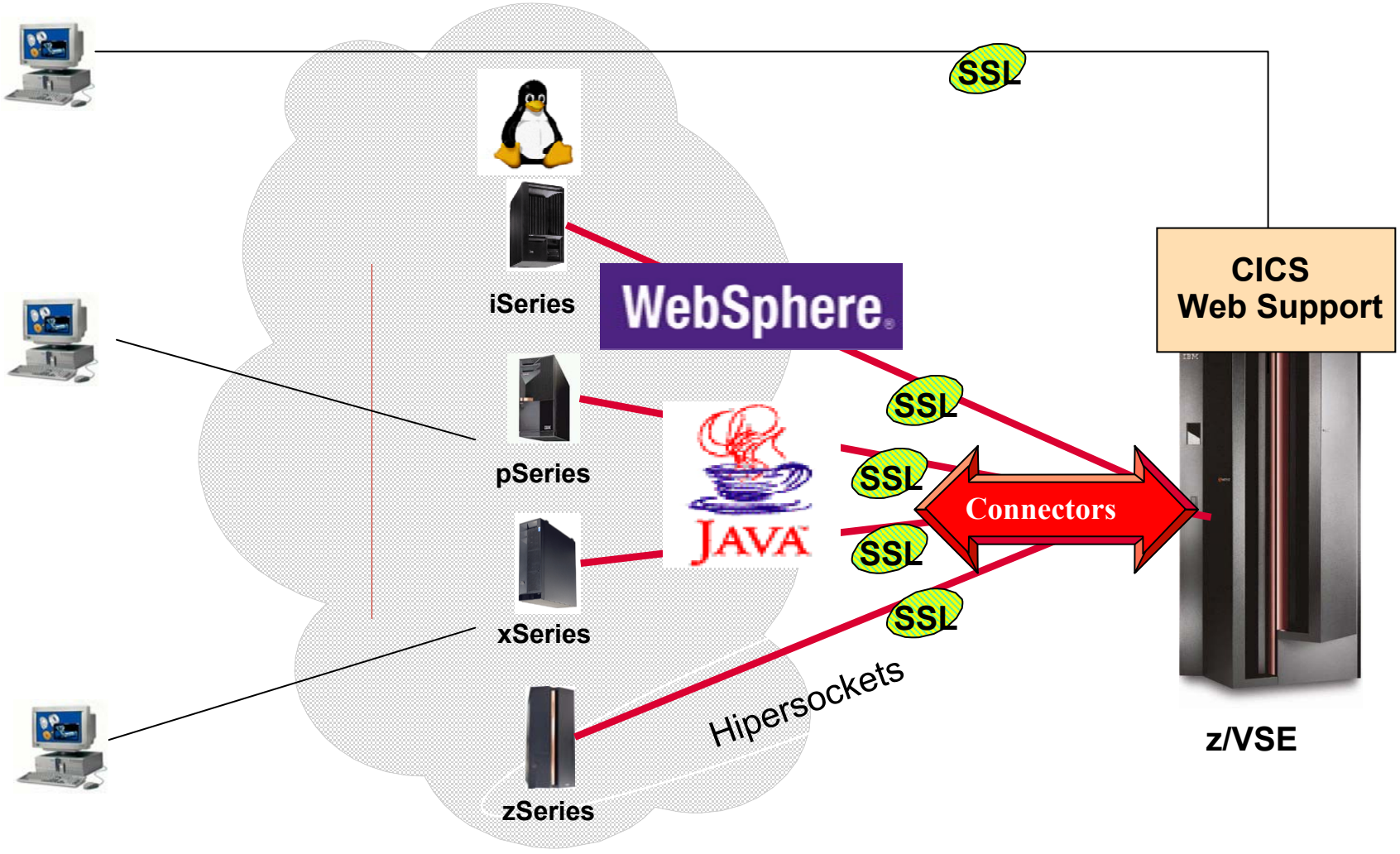
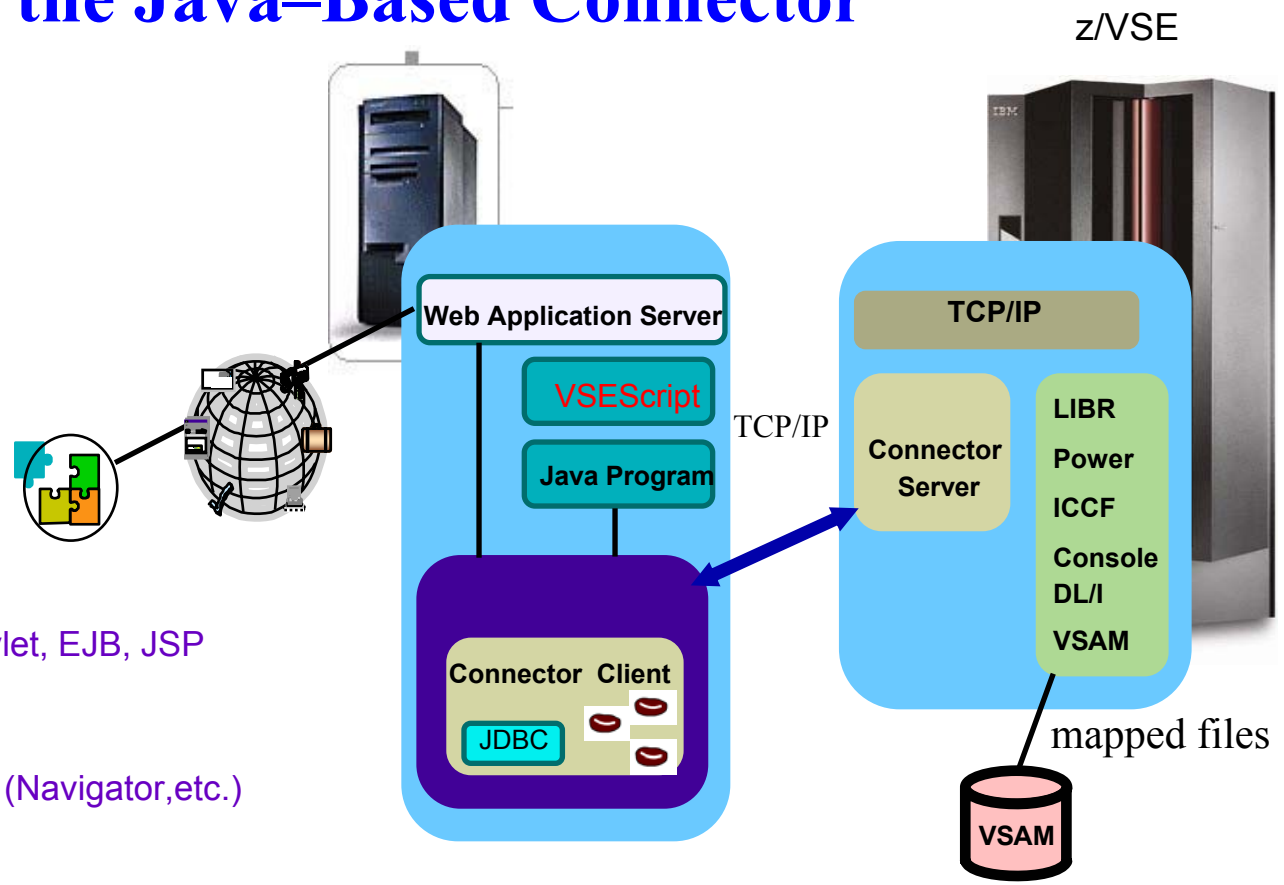
VSE Connectors – flexible and secure



Real time access to VSE resources using the Java–Based Connector

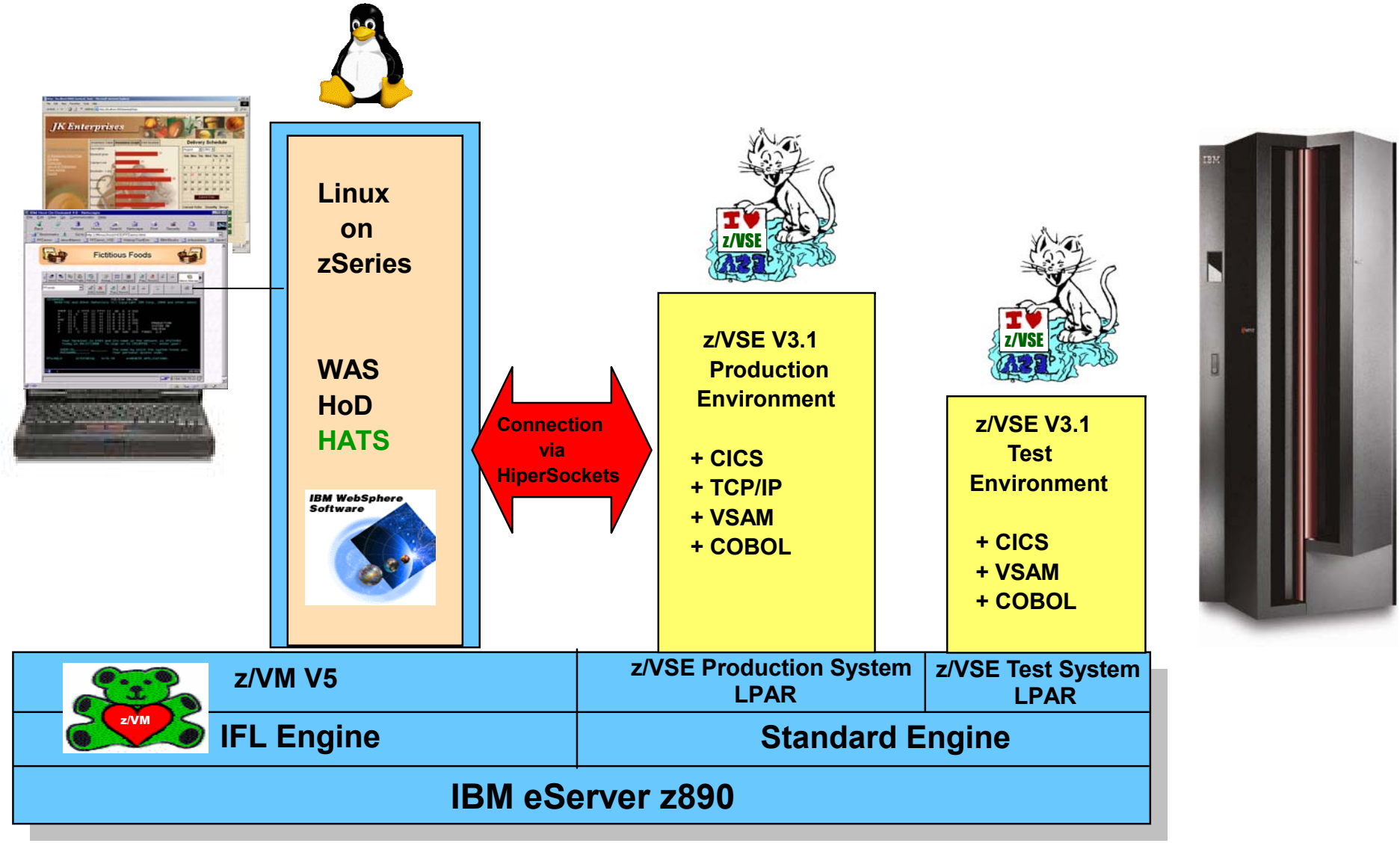


- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized tools (Navigator,etc.)

- real time access to VSE resources from remote systems
- new possibilities for leveraging the VSE investment

„Webification“ for VSE applications

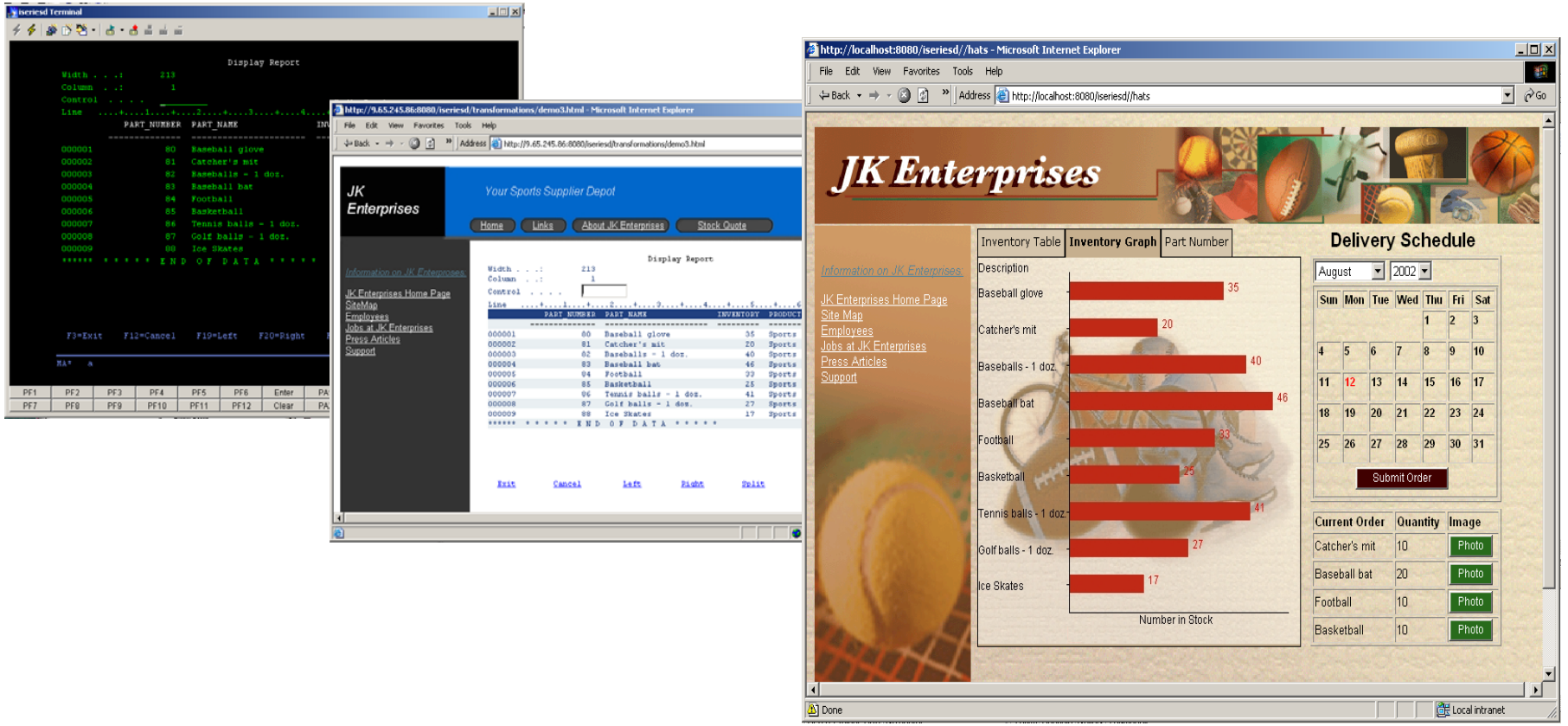
Web-enable existing applications through an Internet / Intranet Front-end



Host Access Transformation Server (HATS)

Develop

- A Web-to-host HTML emulator, with ...
- rules-based transformation engine, application integration hat...
- converts green screens to graphical user interfaces
- improves ease-of-use of host applications.

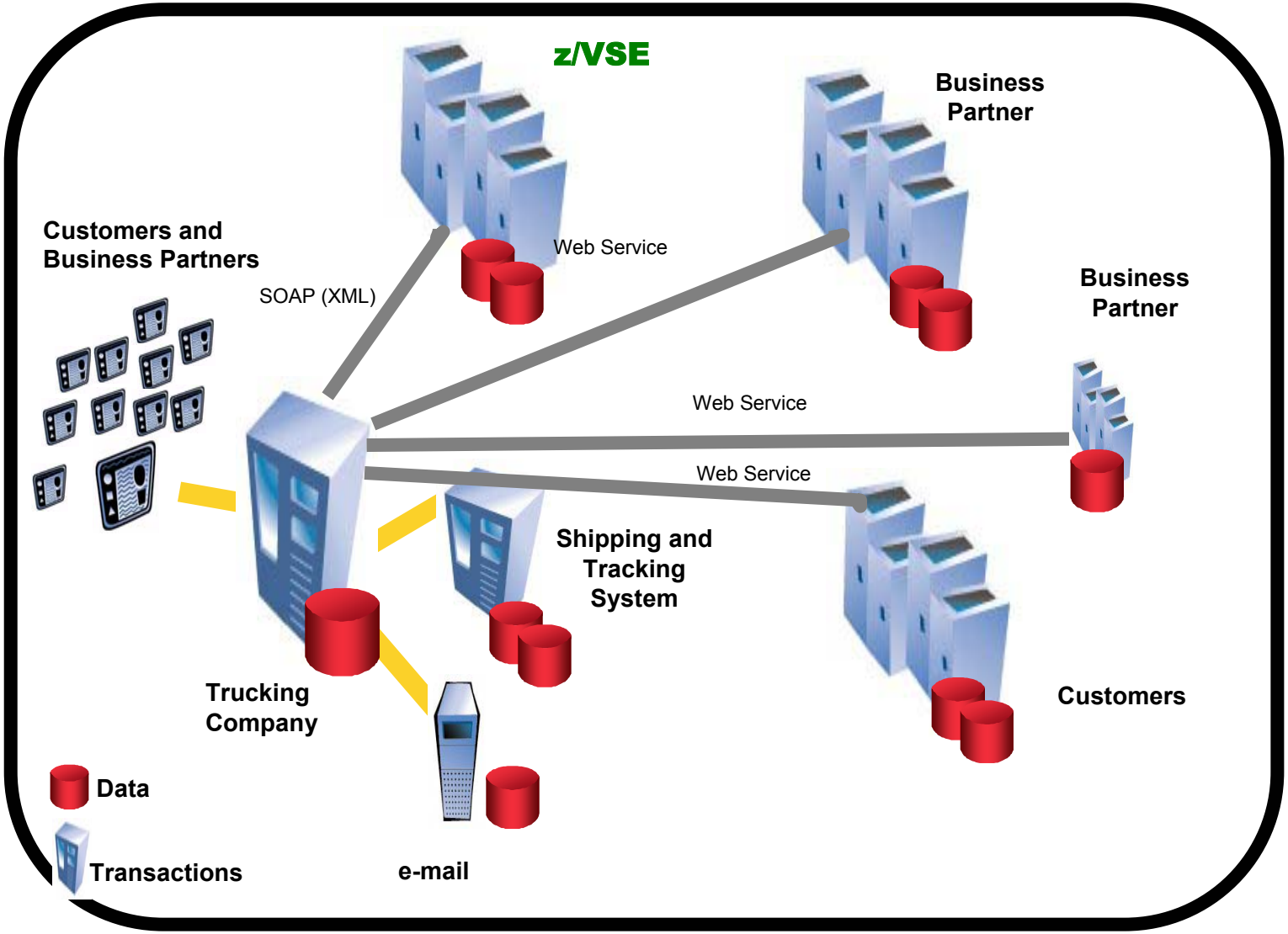


Benefit: Easily extend existing applications to the web

„Webification“ for VSE applications

Limitation	Description
3270 screens are out-dated	▪The VSE applications are well performing but their interface is out-dated and must be renewed ▪3270 one-to one “webification” may not work – the use of application integration logic is needed
Application integration with modern technologies wanted	▪Application need to be Web enabled for increased business ▪Application integration with distributed processes needed ▪Different existing applications have to be integrated in a distributed business logic – with other processes
Solution	▪Host Access transformation Server (HATS) Studio is designed for Application integration with the web ▪HATS Studio ease the development of a new web application that interacts with backend VSE applications ▪Without changes to existing applications – no matter what type of interaction they require (i.e. CICS Maps or 3270) ▪Integration with WebSphere technologies ▪IFL and Linux on zSeries

(4) Application integration SOA and Web Services with z/VSE



Customers & Analysts Agree:

SOA Enables Rapid & Incremental Change Leading to Innovation

Innovation That Matters *

*"The IBM and GenXus SOA-based solution has made our product **more innovative, expanded our market** and made us **more competitive** It will let us grow our business significantly in the years to come."*

MADDENCO INC.

*"SOA is the **heart of the next wave of innovation**. The leaders that do this well are able to **rapidly change** …"*

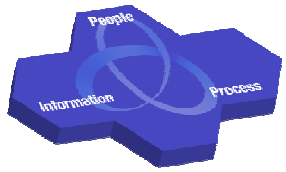
AMR

*"SOA is critical for … executing the on-demand vision and in preparing … for the **incremental changes** … over time. Companies … make better decisions."*

IDC

Reusing Services

Business Challenge: Leverage existing assets to improve business agility



Sysdat & Gautzsch

Reused existing RPG service based function to integrate with Amazon.de sales portal

Online in 3 weeks. ***ROI in < 3 months.***

WebSphere Business Integration Express, Partner Gateway

Acesita

Integrates mySAP and existing backend applications with **reusable service data**

Real-time views of critical cost and profit information for **better decisions**

IBM BCS, WebSphere MQ and Message Broker

Mainsoft and Comtec

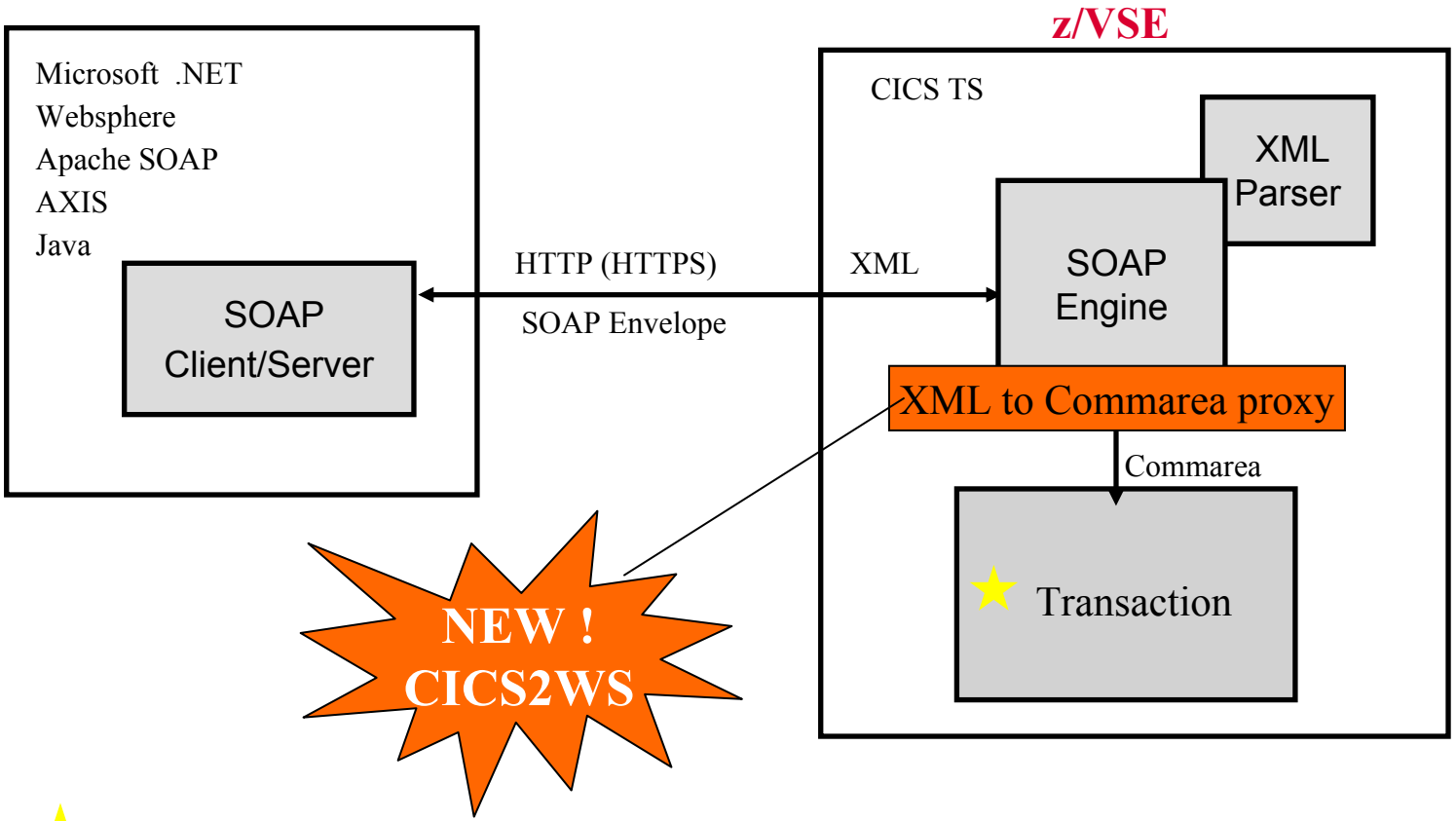
Reuse .NET applications in open standards-based SOA with IBM Business Partner Mainsoft Solutions

5x faster than rewriting the code from scratch

Mainsoft Visual MainWin, WebSphere Application Server

Web Services with z/VSE

XML data interchange with CICS transactions

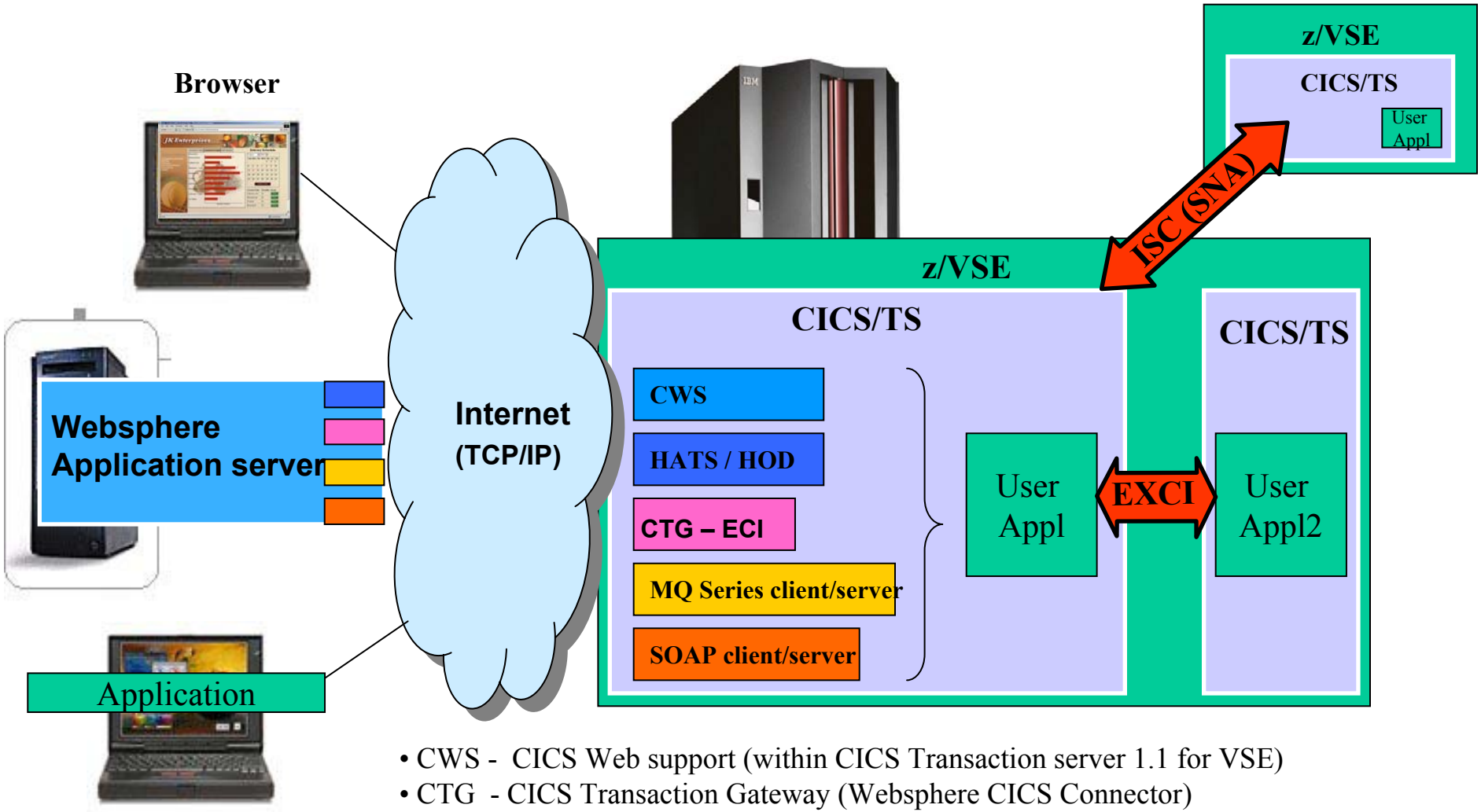


★ VSE Transactions as Web Service – generated with the tool CICS2WS

WebSphere Software solutions with z/VSE

Requirements	Description
VSE Application integration	▪Access to VSE data ▪VSE Applications to be integrated in distributed processes ▪VSE applications to be integrated with Web technologies
Service Oriented Architecture (SOA)	▪SOA is based on the platform independent programming language **Java** ▪SOA is based on the platform independent data representation - **XML** ▪**CICS2WS – CICS to Web Services generation tool – free for download**
Solution	▪WebSphere technologies can be used to modernize VSE environments ▪With free tools like **CICS2WS – core CICS applications can be transformed into web Services to be accessed from WebSphere and distributed environments** ▪IFL and Linux on zSeries

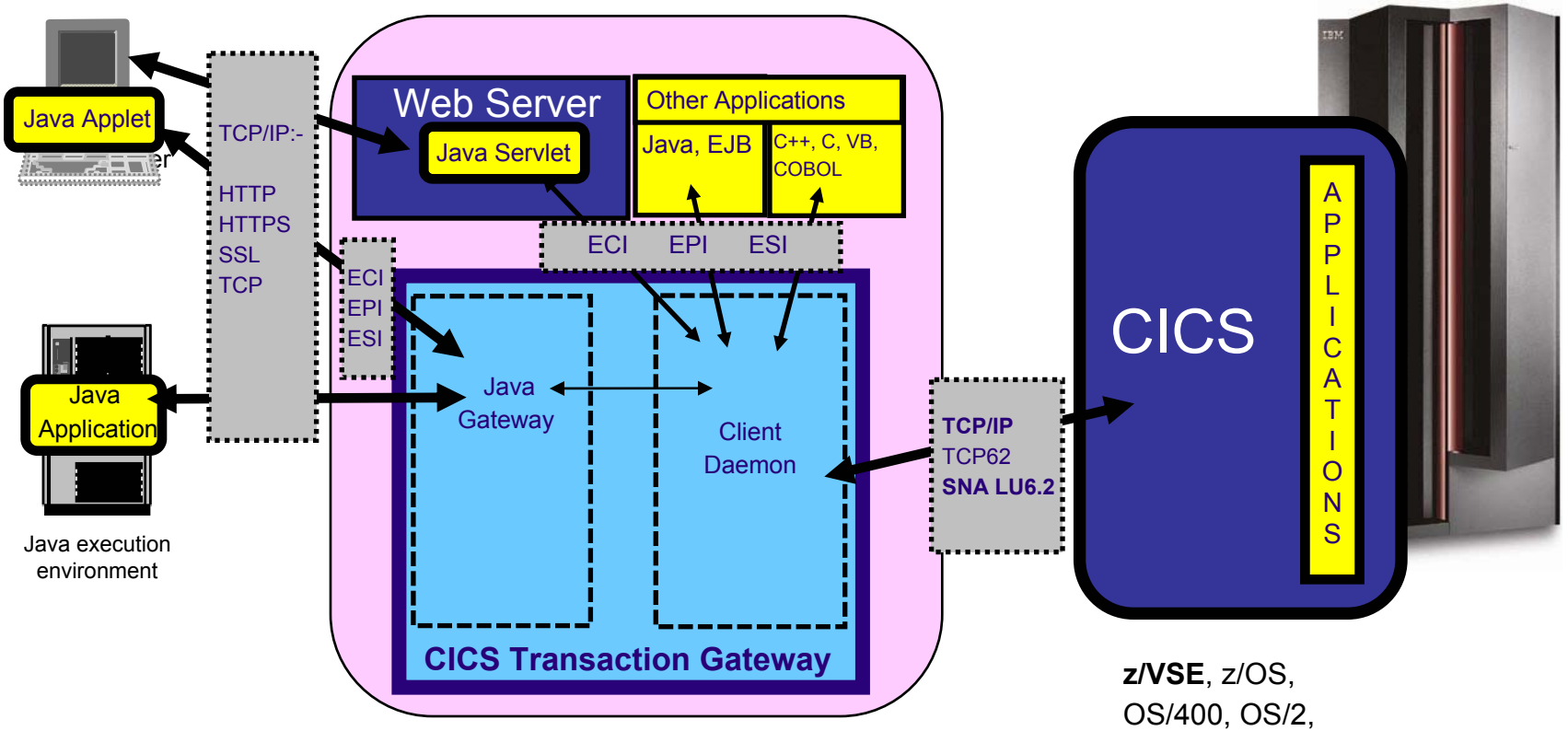
Inter-Communication with VSE Transactions



- CWS - CICS Web support (within CICS Transaction server 1.1 for VSE)
- CTG - CICS Transaction Gateway (Websphere CICS Connector)
- HATS – Host Access Transformation Server (no VSE software component required)
- HOD - Host OnDemand (Websphere Host Integrator)
- SOAP - Simple Object Access Protocol (Web Services based with XML data)

Integration of VSE transactions in distributed processes

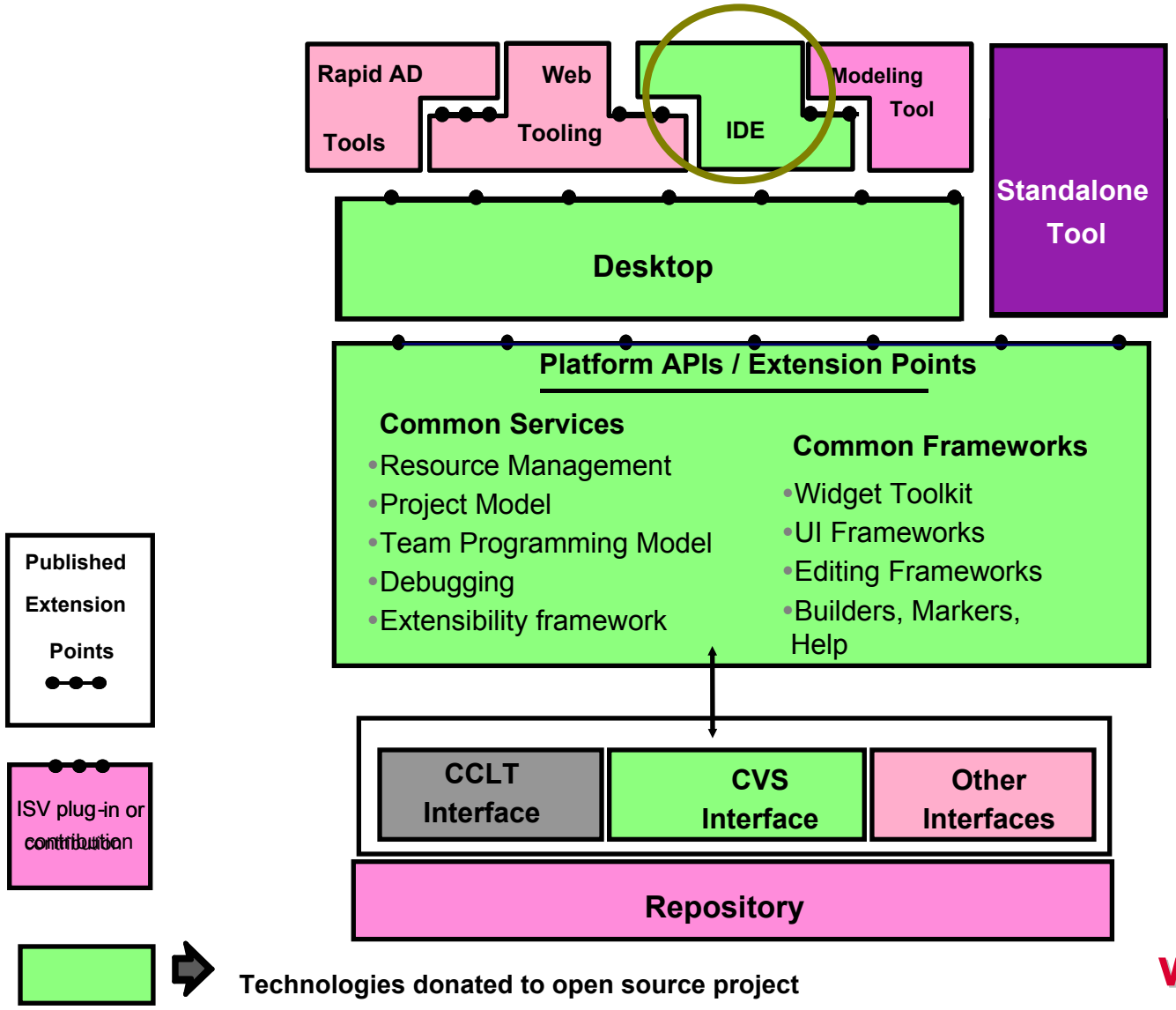
CICS Transaction Gateway (CTG) - Components



Transactional processing with CICS TS

Solution	Connector to use
Webify	▪CWS – CICS Web Support ▪HATS – Host Access Transformation server ▪HOD – Host on Demand server
CICS application access from remote	▪CTG – CICS Transaction Gateway ▪HATS – Host Access Transformation Server ▪MQ Series (Client or Server)
SOA - Flexible, platform independent, CICS application integration, the most advance Application-to-application communication Method	▪Web Services – using XML data and SOAP protocol

Application development for VSE
(1) Use of modern development environments !



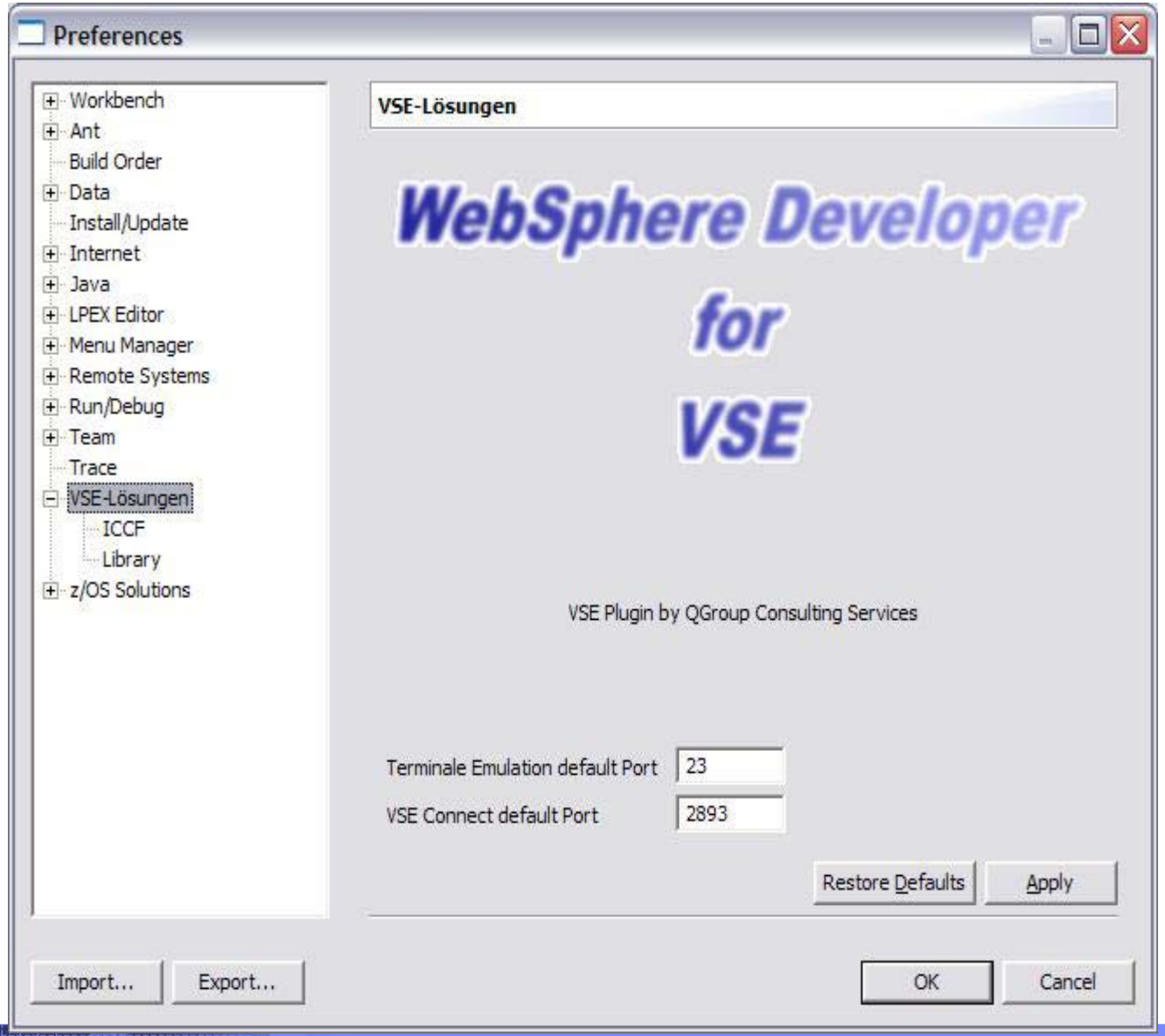
www.eclipse.org

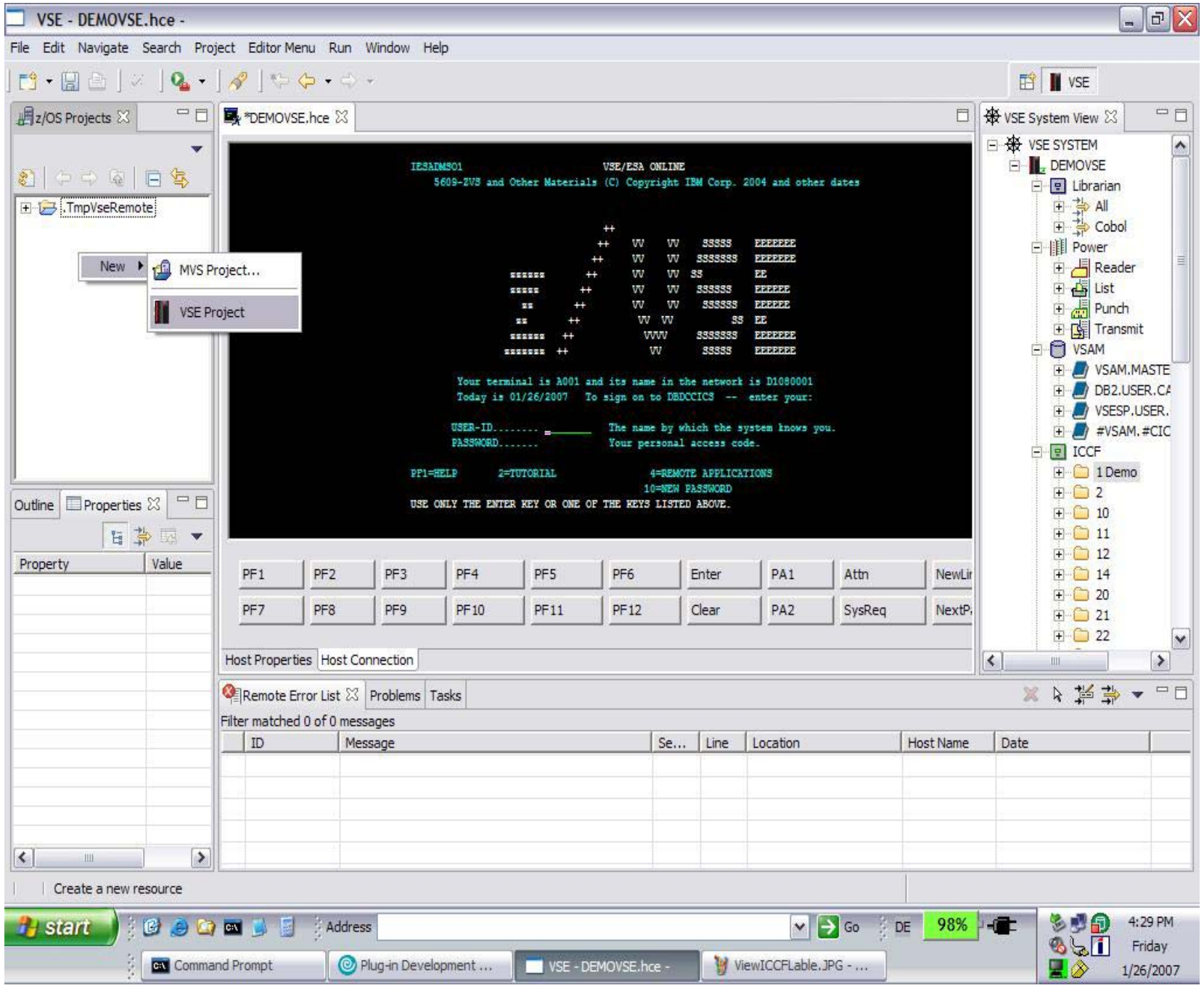
(1)Cross Plattform Integrated Development Environment

Approach with WebSphere Developer for System z (*)

(*) In development.

NEW !

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5609-ZV3 and Other Materials (C) Copyright IBM Corp. 2004 and other dates
Your terminal is A001 and its name in the network is D1080001
Today is 01/26/2007 To sign on to DBDCCICS -- 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.
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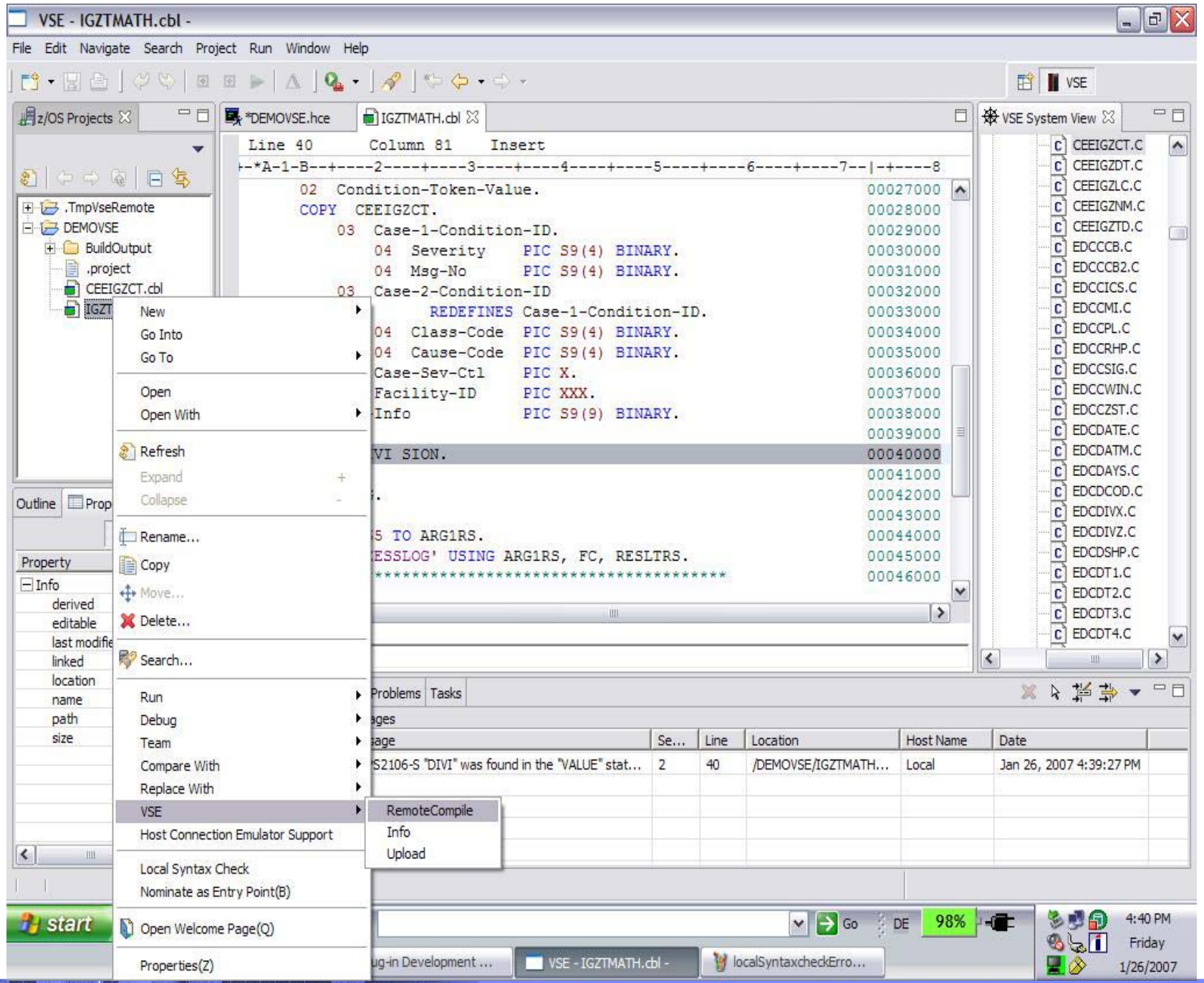
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04 Msg-No PIC S9(4) BINARY.
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.project
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Delete...
Search...
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Debug
Team
Compare With
Replace With
VSE
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Local Syntax Check
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Open Welcome Page(Q)
Properties(Z)
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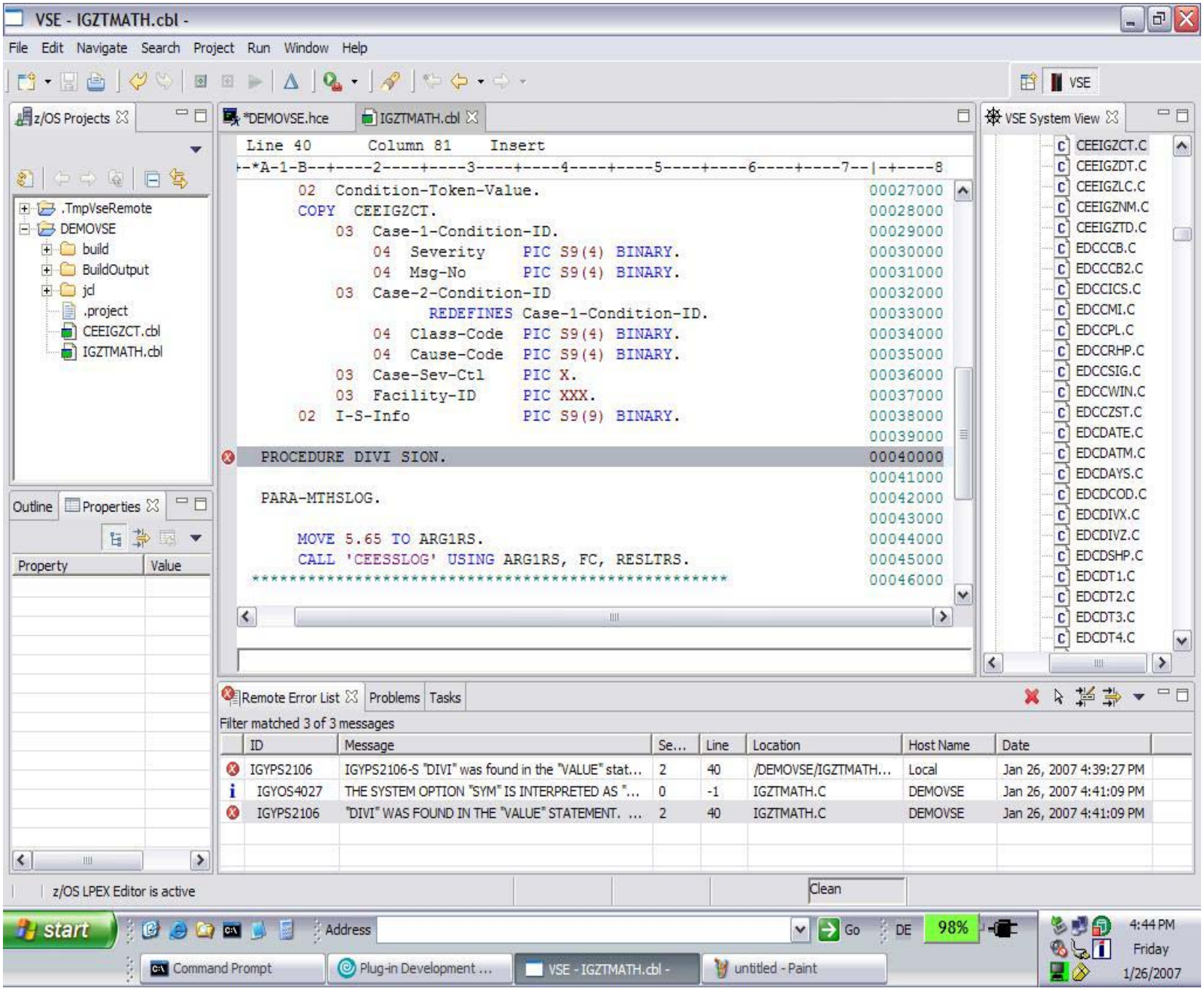
/DEMOVSE/IGZTMATH...
Local
Jan 26, 2007 4:39:27 PM
start
Go
DE
98%
VSE - IGZTMATH.cbl -
4:40 PM
Friday
1/26/2007

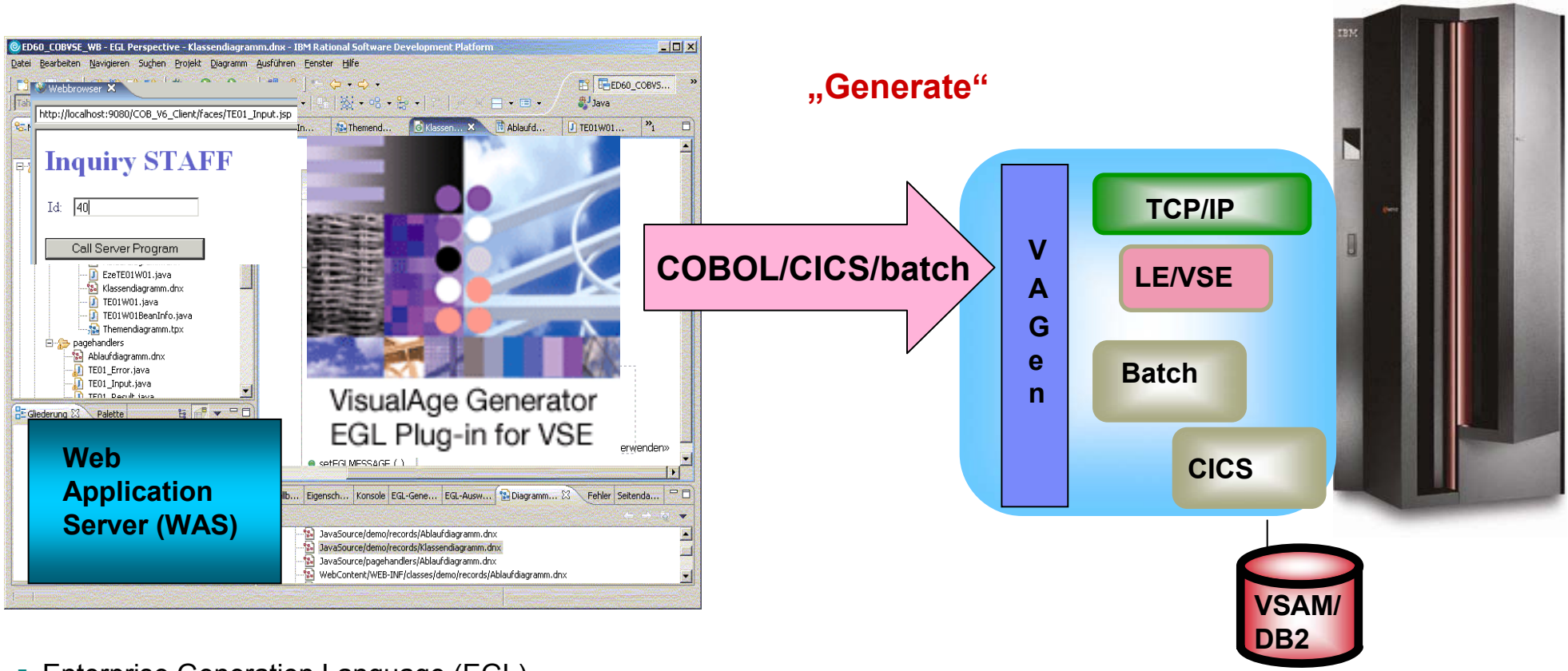

VSE - IGZTMATH.cbl -
File Edit Navigate Search Project Run Window Help
VSE
z/OS Projects
.TmpVseRemote
DEMOVSE
build
BuildOutput
jcl
.project
CEEIGZCT.cbl
IGZTMATH.cbl
*DEMOVSE.hce
IGZTMATH.cbl
Line 40 Column 81 Insert
02 Condition-Token-Value. 00027000
COPY CEEIGZCT. 00028000
03 Case-1-Condition-ID. 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 DIVI SION. 00040000
00041000
PARA-MTHSLOG. 00042000
00043000
MOVE 5.65 TO ARG1RS. 00044000
CALL 'CEESSLOG' USING ARG1RS, FC, RESLTRS. 00045000
00046000
VSE System View
CEEIGZCT.C
CEEIGZDT.C
CEEIGZLC.C
CEEIGZNM.C
CEEIGZTD.C
EDCCCB.C
EDCCCB2.C
EDCCICS.C
EDCCMI.C
EDCCPL.C
EDCCRHP.C
EDCCSIG.C
EDCCWIN.C
EDCCZST.C
EDCDATE.C
EDCDATM.C
EDCDAYS.C
EDCDCOD.C
EDCDIVX.C
EDCDIVZ.C
EDCDSHP.C
EDCDT1.C
EDCDT2.C
EDCDT3.C
EDCDT4.C
Outline
Properties
Property
Value
Remote Error List
Problems
Tasks
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
Clean
start
Address
Go
DE
98%
4:44 PM
Friday
1/26/2007
Command Prompt
Plug-in Development ...
VSE - IGZTMATH.cbl -
untitled - Paint

(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)

Application development for VSE Customers

Requirements	Description
Generation of Applications – based on Visual Age technology	▪Visual Age Generator Product Family was integrated into Eclipse development technologies – WSAD and RAD. ▪Follow-on product for Visual Age Generator for VSE, is the Rational Application Developer V6 + Visual Age Generator EGL Plug-in for VSE
Access to existing applications using modern distributed editors	▪With the VSE Connectors members of ICCF and VSE Libraries can be accessed and edited with an Editor on a distributed Platform. ▪VSE Navigator – free download tool, includes this functionality
Solution	▪Customers can develop applications based on the new 4GL Application development environment, with Rational Application Developer (RAD) V6 and the Visual Age Generator EGL Plug-in for VSE. - Generate CICS and batch applications - Generate entire client server applications (i.e. client in Java to work with VSE program in COBOL) ▪VSE Connectors allow access via Java to existing members (i.e. ICCF, VSE Library) with an editor on a distributed platform.

Agenda

- **IT Modernization for VSE Customers**

(1)VSE environment - Hardware and Data Management

(2)Modern Data Management Solutions with zSeries

DB2 scenarios with MQSeries and VSAM Redirector

(3)IT Modernization with Enterprise Solutions and IBM Tools

Linux, WAS, HATS, WSAD

(4)Building 24x7 Environments with Linux and Storage Solutions

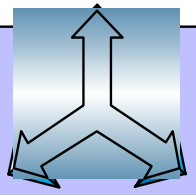
Linux NCP replacements, Flashcopy, PPRC

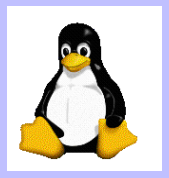
VSE's PIE Strategy with Linux on zSeries

Protect existing investments
Integrate with middleware using connectors
Extend with Linux on zSeries

VSE supports FCP (SCSI) connections to Storage devices

IBM TotalStorage



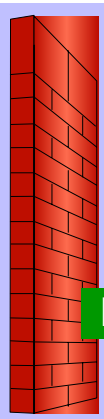


Linux on zSeries
(IFL engines)

z/VSE
(Standard engines)

HiperSockets

Connectors



CICS Transaction Gateway
DB2 Connect / DB2 UDB DRDA
WebSphere MQ
VSE e-business connectors
VSE Web services

Web

z/VM

LPAR or z/VM

IBM eServer z890

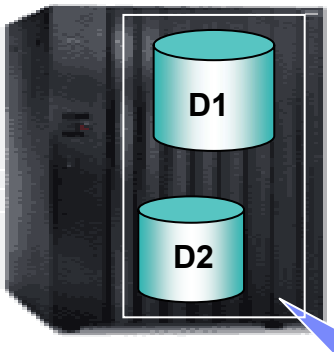
Clients

Business Services

Tran/Data Services

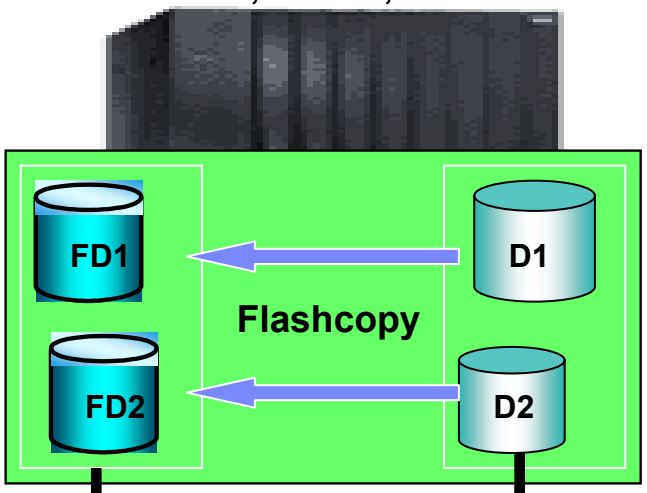
IT Environment Needs for 24x7 Availability

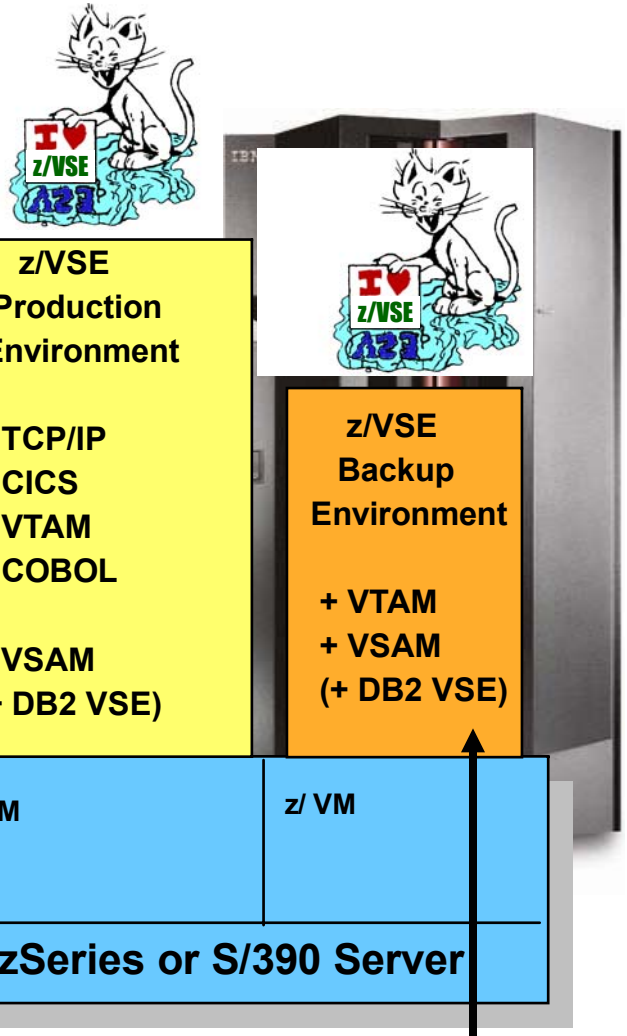
Disaster Recovery Site - IBM Storage System



PPRC
(Peer to Peer Remote Copy)

IBM Storage System
ESS, DS6000, DS8000





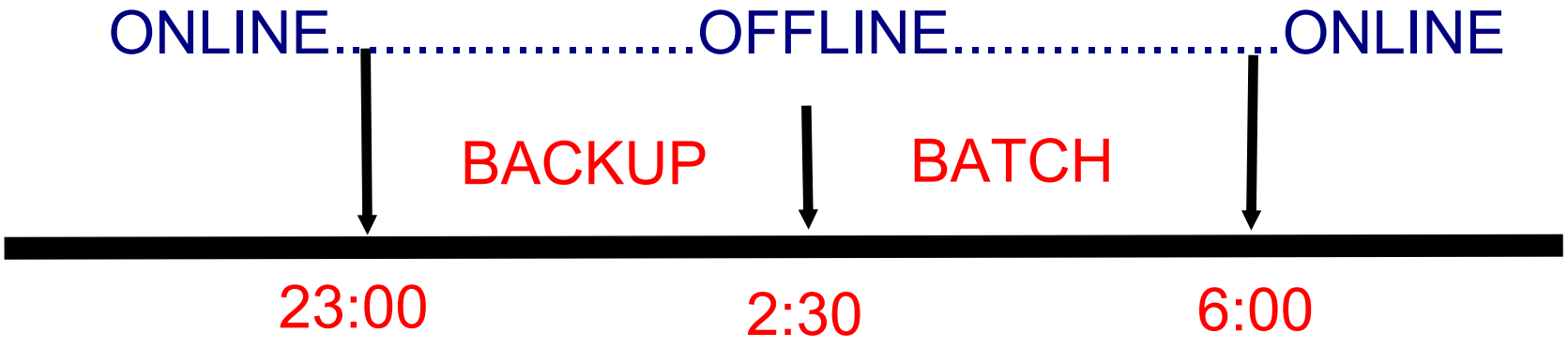
- minimal interruption,
- immediate access to source and target
- feature available for zSeries and the open system servers

(offline backup process)

IT Environment Needs for 24x7 Availability

- inhibitors of online processing time
  - backup-window
  - batch-window

Typical processing time-line:

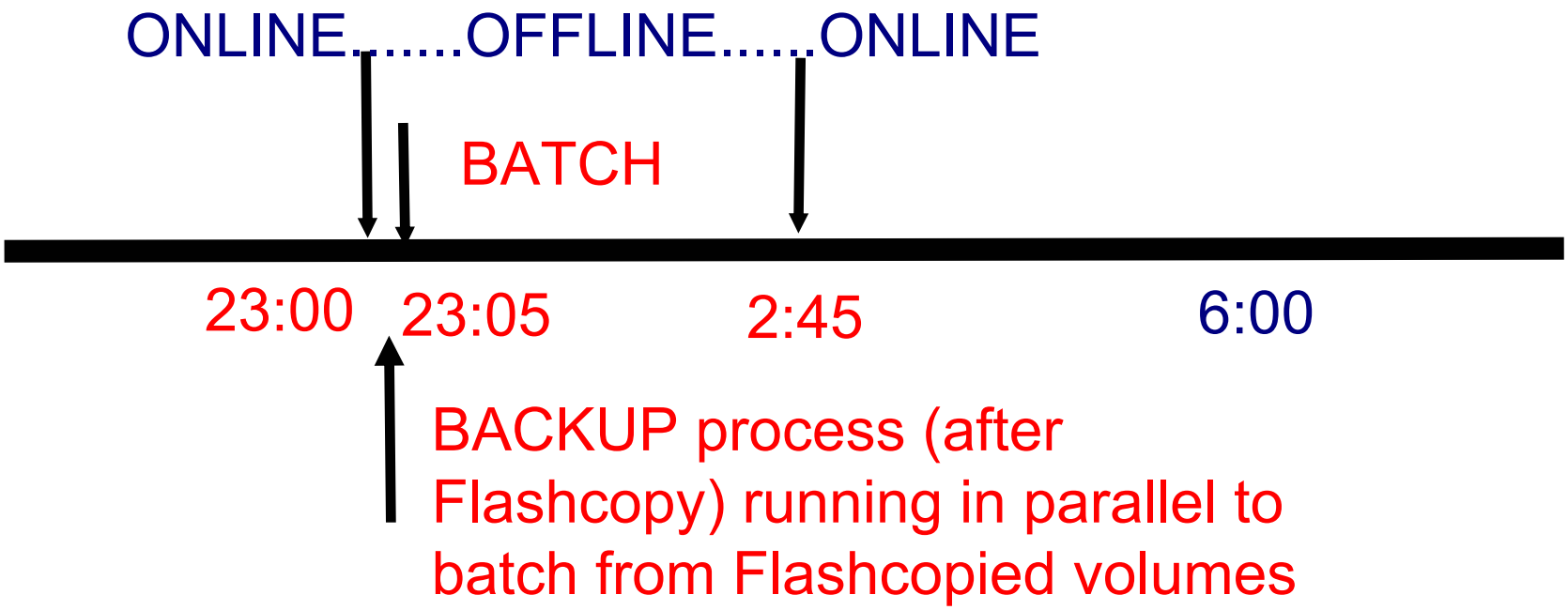


- modern Storage solutions can reduce OFFLINE time:
  - eliminate backup window – using FLASHCOPY
  - disaster recovery solution with PPRC

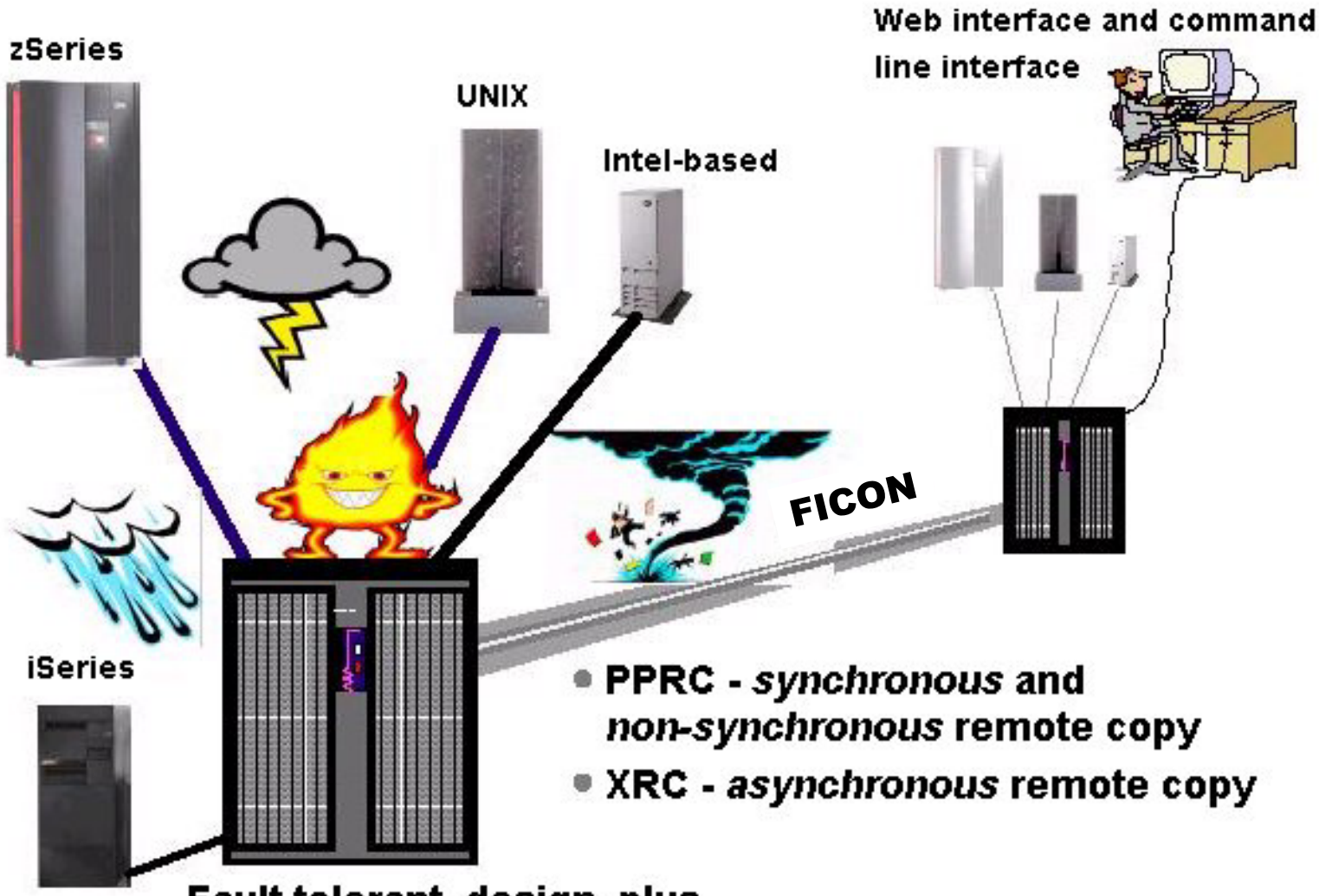
IT Environment Needs for 24x7 Availability

- modern Storage solutions can reduce OFFLINE time:
  - eliminate backup window – using FLASHCOPY

Typical processing time-line:



Enterprise Storage solutions – disaster recovery (Peer to Peer remote Copy - PPRC)

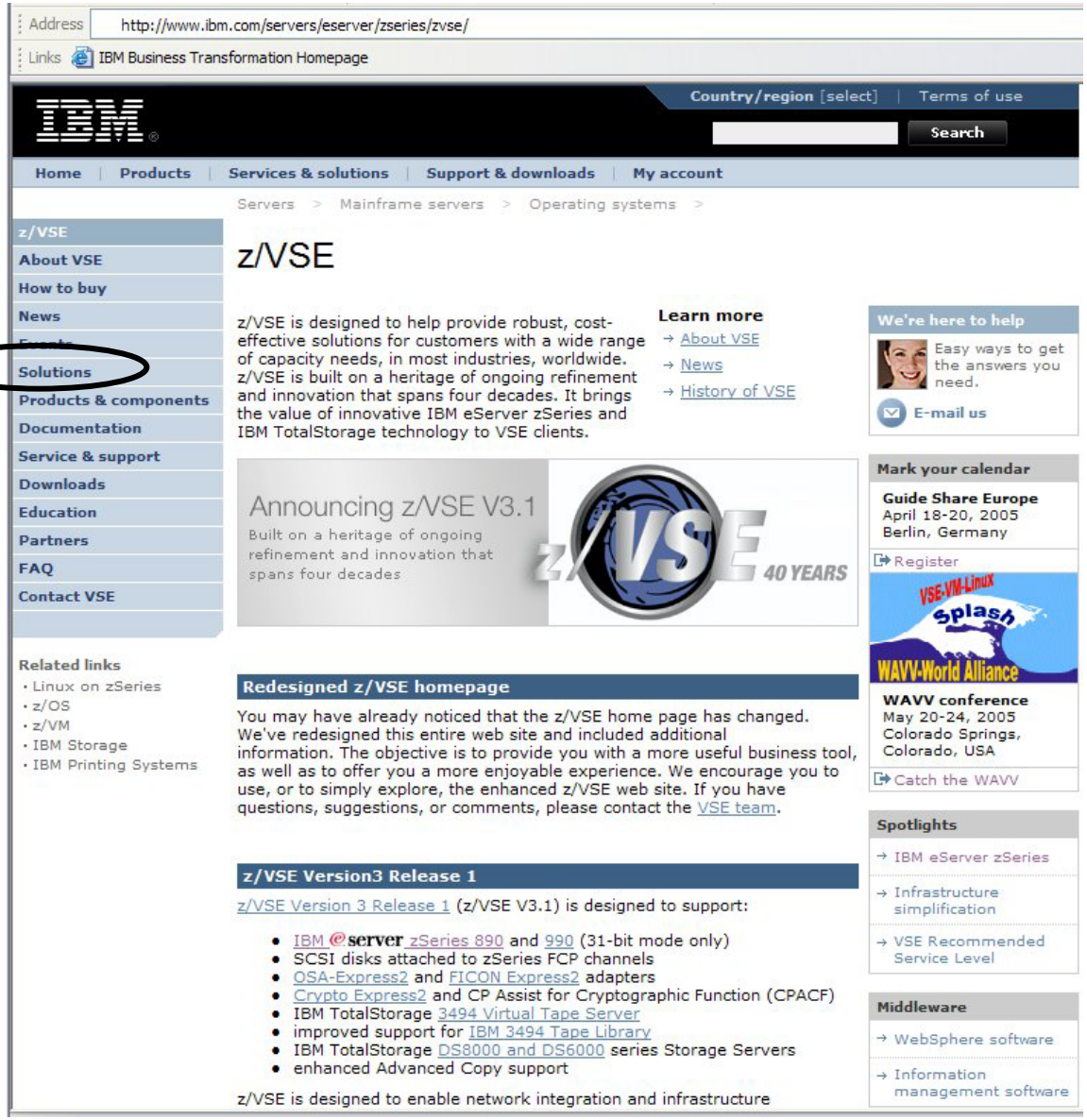


IT Environment Needs for 24x7 Availability

Considerations	Description
zSeries workload	▪ mass parallel Online transactions and user interactions ▪ fast batch processing workload ▪ regular backup processes ▪ batch workload mostly requires Online systems down
24x7 availability	▪ stable, reliable HW needed ▪ perfect interaction of zSeries processes with Storage subsystems ▪ minimize or eliminate nightly backup window ▪ disaster recovery considerations
Storage solution FLASHCOPY	▪ provides a point-in-time copy for the ESS, DS6000, DS8000 volumes ▪ minimal interruption to applications, ▪ access to source and target copies immediately ▪ feature for the open system servers, zSeries and iSeries
Storage solutions - PPRC (Peer to Peer Remote Copy)	▪ solution for disaster recovery ▪ synchronous and non-synchronous remote copy
Solution requirements	▪IFL processor(s) and Linux on zSeries ▪IBM Storage subsystem and corresponding function

For more Information - z/VSE Web Site

z/VSE Solutions



☞ **New Web presence: ibm.com/servers/eserver/zseries/zvse/solutions**

Tools available in the VSE download area

- z/VSE/ESA Home Page – downloads for **FREE**
  http://www.ibm.com/servers/eserver/zseries/zvse/downloads

- System management:
  - VSE CPU Monitoring tool
  - VSE Installed Software Report tool
  - TCP/IP Configuration
  - IP Trace tool
  - Keyman/VSE (SSL)
  - VSE Health Checker
  - Multi Instant Logic analyser for VSAM
  - JCalc, JLink, JRun (/LE VSE)

- Connector tools
  - *VSE Connector Client*
  - *VSE Navigator*
  - *VSE Maptool*
  - *VSEPrint*
  - *CICS2WS (SOA, WebServices)*

- *Connector Components*
  - *VSE Connector Client*
  - *VSE Redirector server*
  - *VSE Virtual Tape server*
  - *VSE Script server*

We appreciate your comments at : zvse@de.ibm.com

Additional Information

- z/VSE/ESA Home Page
  http://www.ibm.com/servers/eserver/zseries/zvse/

- z/VSE solutions
  http://www-1.ibm.com/servers/eserver/zseries/zvse/solutions

- e-business Connectors User's Guide SC33-6719
  http://www-1.ibm.com/servers/eserver/zseries/zvse/documentation/#conn

- 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*

- WebSphere V5 for Linux on zSeries Connectivity Handbook

We appreciate your comments at : zvse@de.ibm.com

Question & Answer

Thank you!

You can contact the VSE team in the Lab in Böblingen via:
boebc@de.ibm.com – for briefings and proof-of-concept
zvse@de.ibm.com – for VSE consulting and Q&A