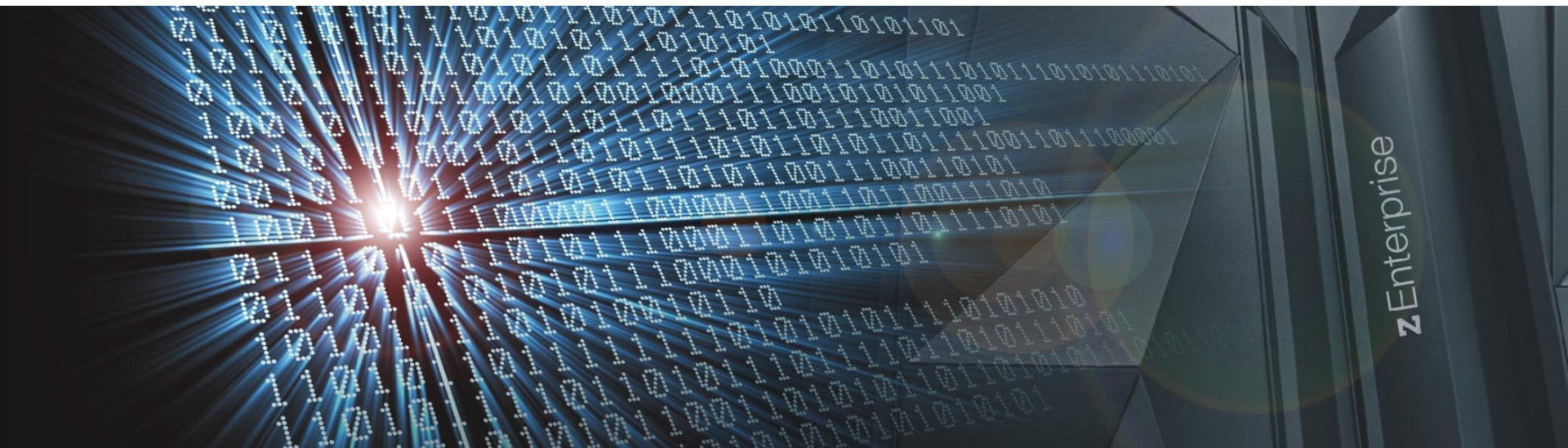


# IBM z Systems solutions to integrate z/VSE data and applications with your IT

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<http://www.ibm.com/zVSE>  
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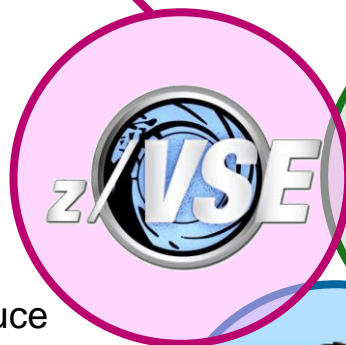
## Leveraging the successful z/VSE strategy

### Protect existing investments

*Legacy applications and data on z/VSE*

#### Key Capabilities

- 64-bit virtual addressing to reduce memory constraints through exploitation of data in memory
- Exploitation of selected zEnterprise functions and features as well as IBM System Storage options



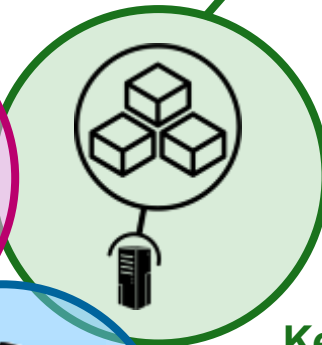
### Integrate with other Systems

*Connect to, and run backend System z applications*

*Build mobile apps*

#### Key Capabilities

- z/VSE Connectors to Java capable clients, SOAP (Web Service), Mobile
- New connector for transparent connections to relational databases outside z/VSE
- Linux Fast Path reduces CPU overhead of TCP/IP stack



### Extend for new workloads

*Use the combination of Linux on System z and z/VSE*

#### Key Capabilities

- Leverage Linux on System z for
  - ✓ Information on demand
  - ✓ z/VSE – Linux Cloud
  - ✓ Infrastructure simplification

Orange=new

## z/VSE Modernization options

### Enhance core VSE applications

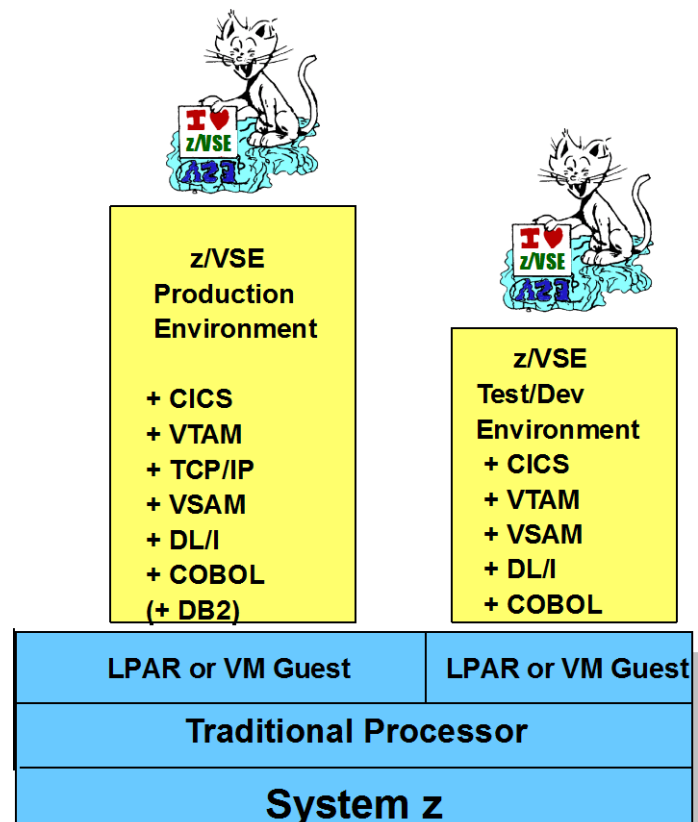
- Mobilize applications for Mobile Services
- Web enable / access
- Integrate into a Portal
- Improve user interface
- Simplify interfaces
- Extend with Java and automation

### Integrate new and existing VSE applications

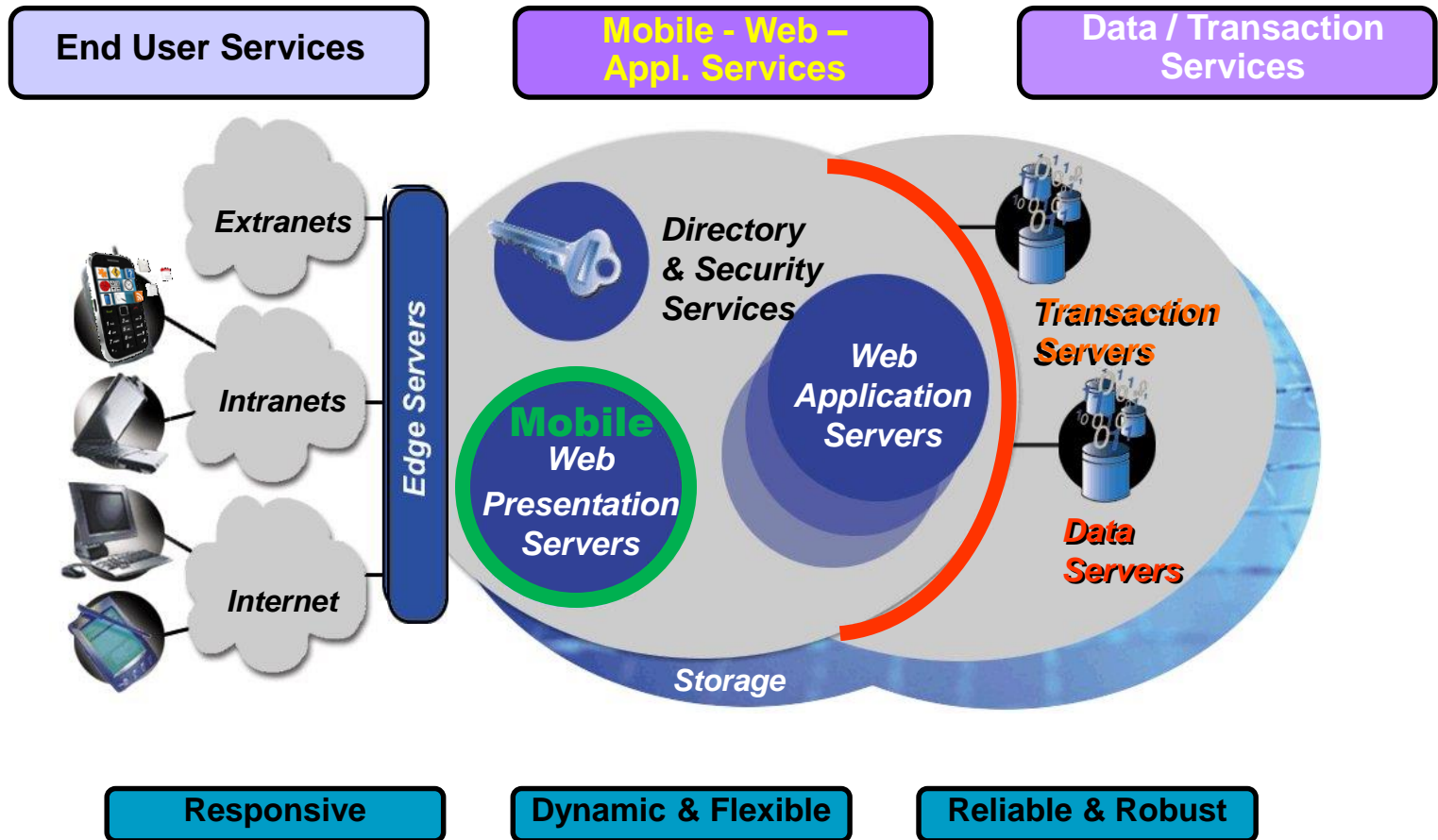
- **leverage VSE data** – *real-time access to VSAM data*
- Integrate z/VSE data in enterprise data Analytics, like Hadoop, Cognos, SPSS
- **leverage VSE logic** – *Mobile, Web Services, SOA*

### Improve Security/Auditability/Resiliency

- Integrate in LDAP environments

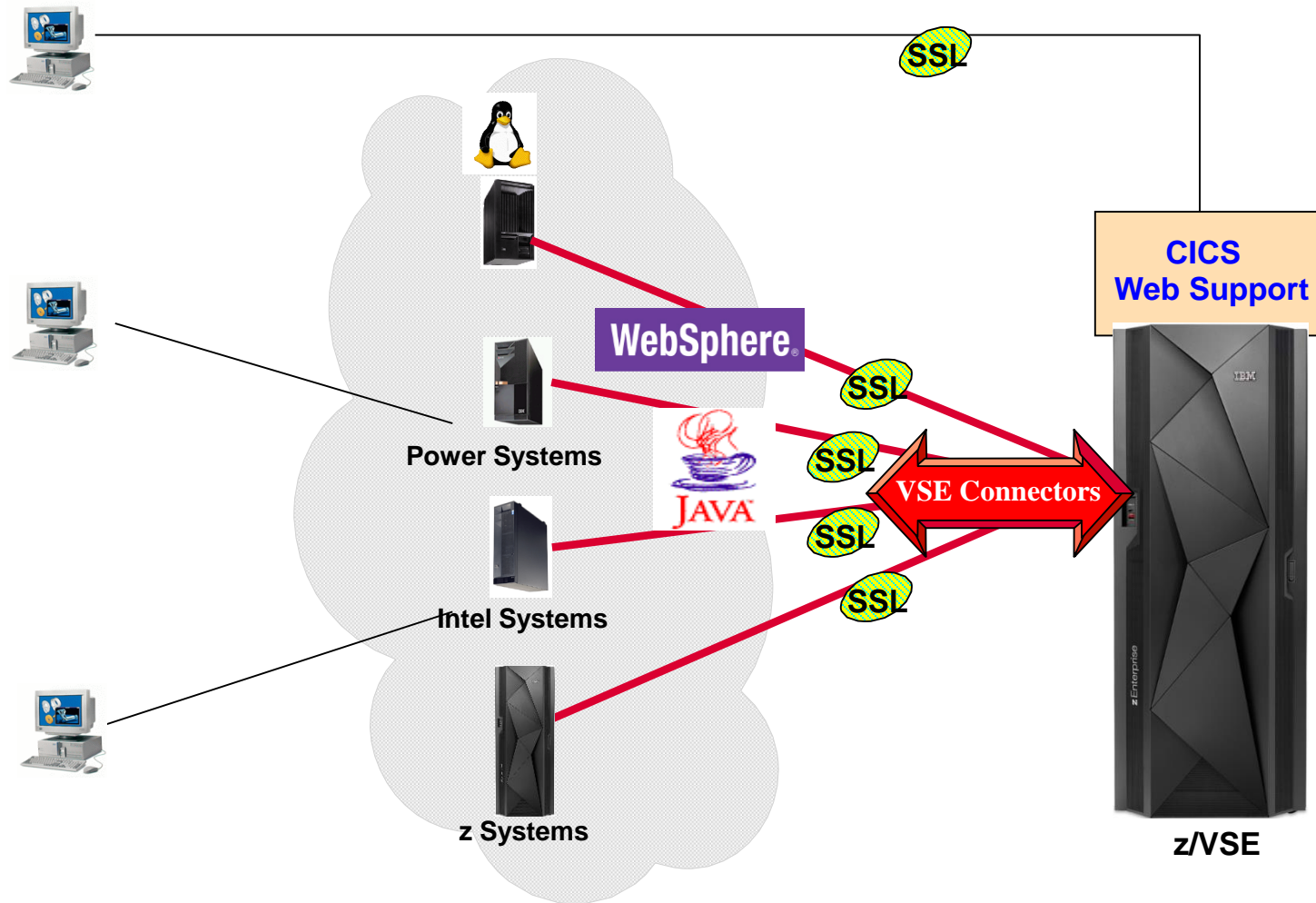


# Infrastructure matters



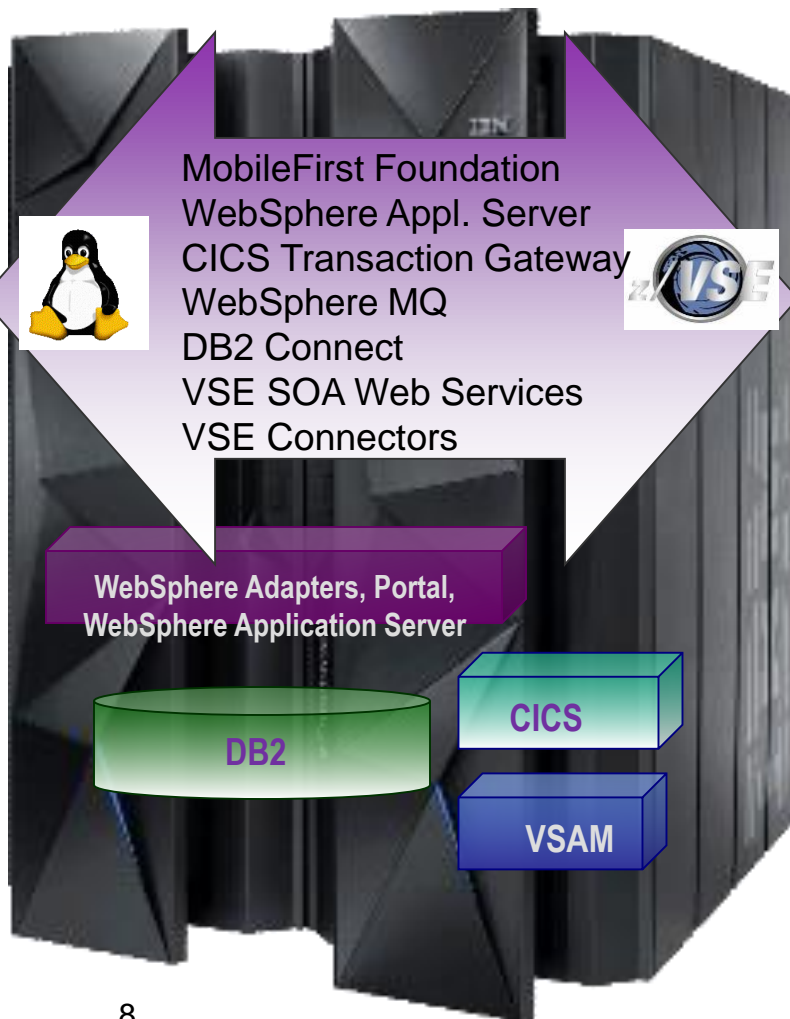


# VSE Connectors – flexible and secure



# Enterprise solutions in a z/VSE and Linux on z environment

IBM z Systems is an integration platform, with system level awareness across the SW stack, enabling you to work smarter



Benefits include:

- Easier Management
  - ✓ Fewer components to administer
  - ✓ Vertical dynamic scalability
- Stringent Security
  - ✓ Reduced interception opportunity
- Highly Available Infrastructure
- Highly Scalable
- High network Performance
  - ✓ Use of Hipersockets and Linux Fast Path
  - ✓ Reduced network time
  - ✓ No product specific network protocol construction / deconstruction





## z/VSE data access for enterprise data services



## 1. z/VSE Connectors – Data integration

### **A. PULL scenario - VSE Connector**

**- access z/VSE data and resources from remote**

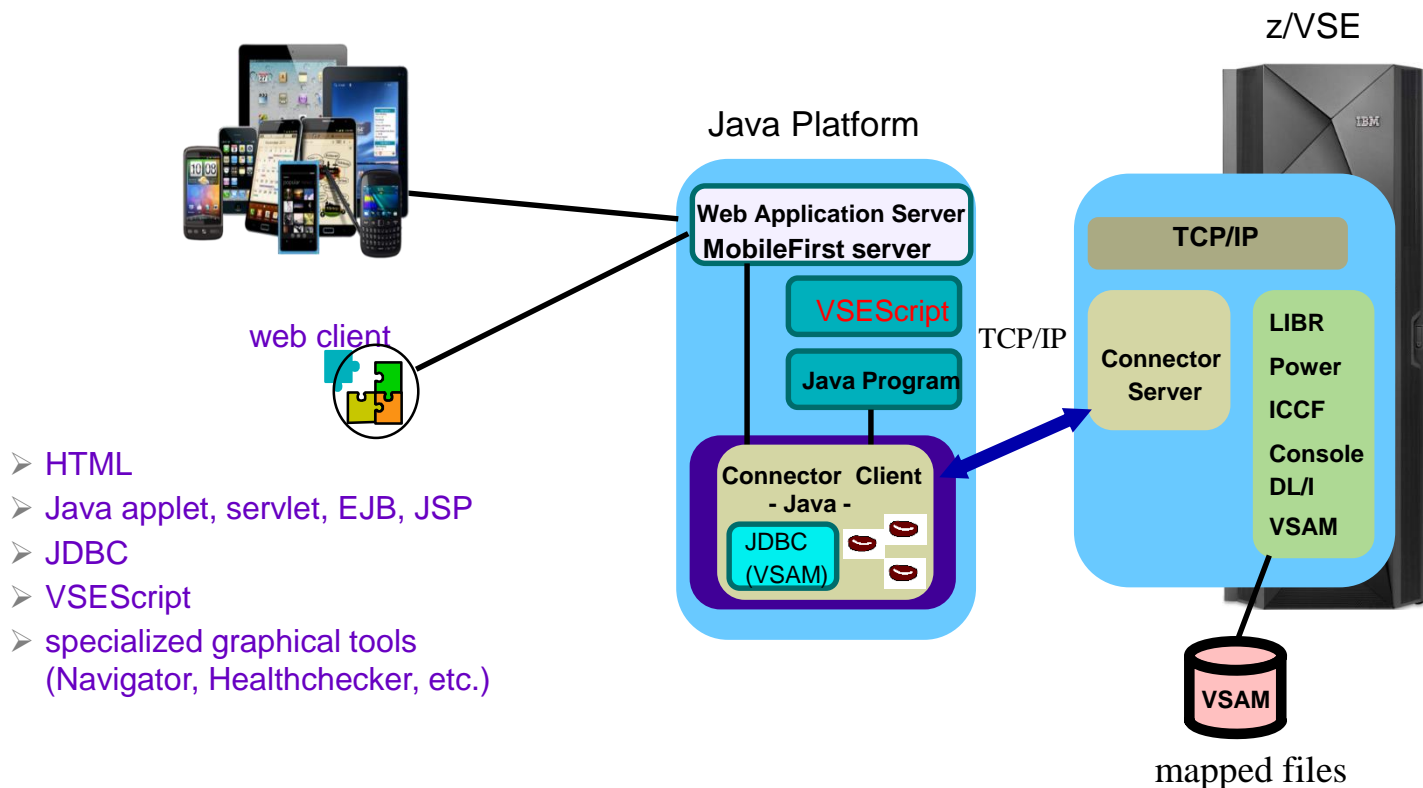
### **B. PUSH scenario – VSE VSAM Redirector**

**- VSE applications to interact with remote data**

## Solutions with the PULL scenario

- Mobile Apps, Web or Java applications access z/VSE data
- Access VSAM data from Linux/UNIX/Windows via Java or JDBC
- Access the data from Office applications via SCRIPTS
- Access DL/I data from Java applications for Mobile or Web Apps.
- Access Librarian members for editing with modern Editors
- Access POWER queues, its members and reports
- Send JOBS from a Java environment and get output back

## (A) PULL scenario: Real time access to z/VSE Resources with the Java-Based VSE Connectors

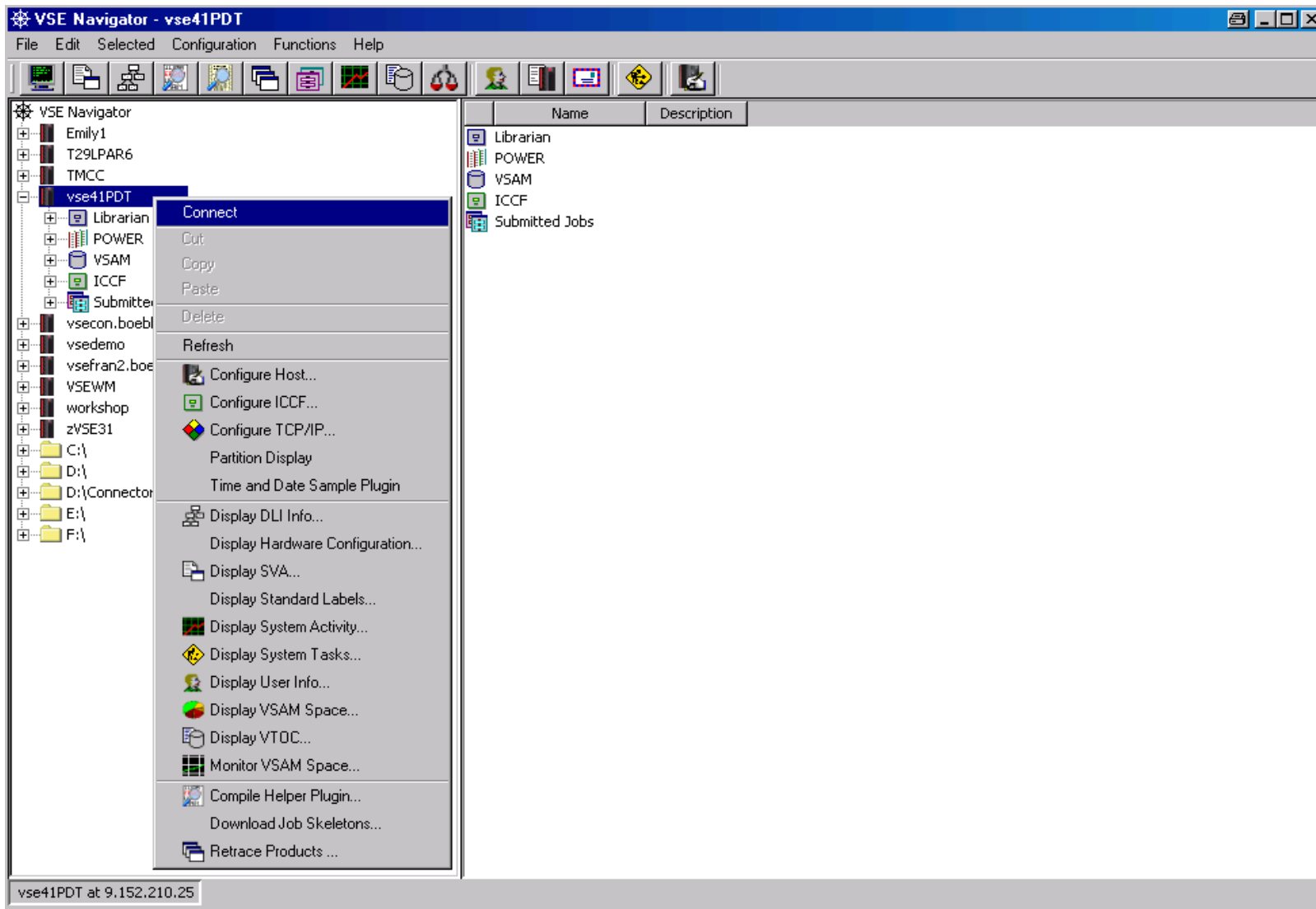


- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized graphical tools (Navigator, Healthchecker, etc.)

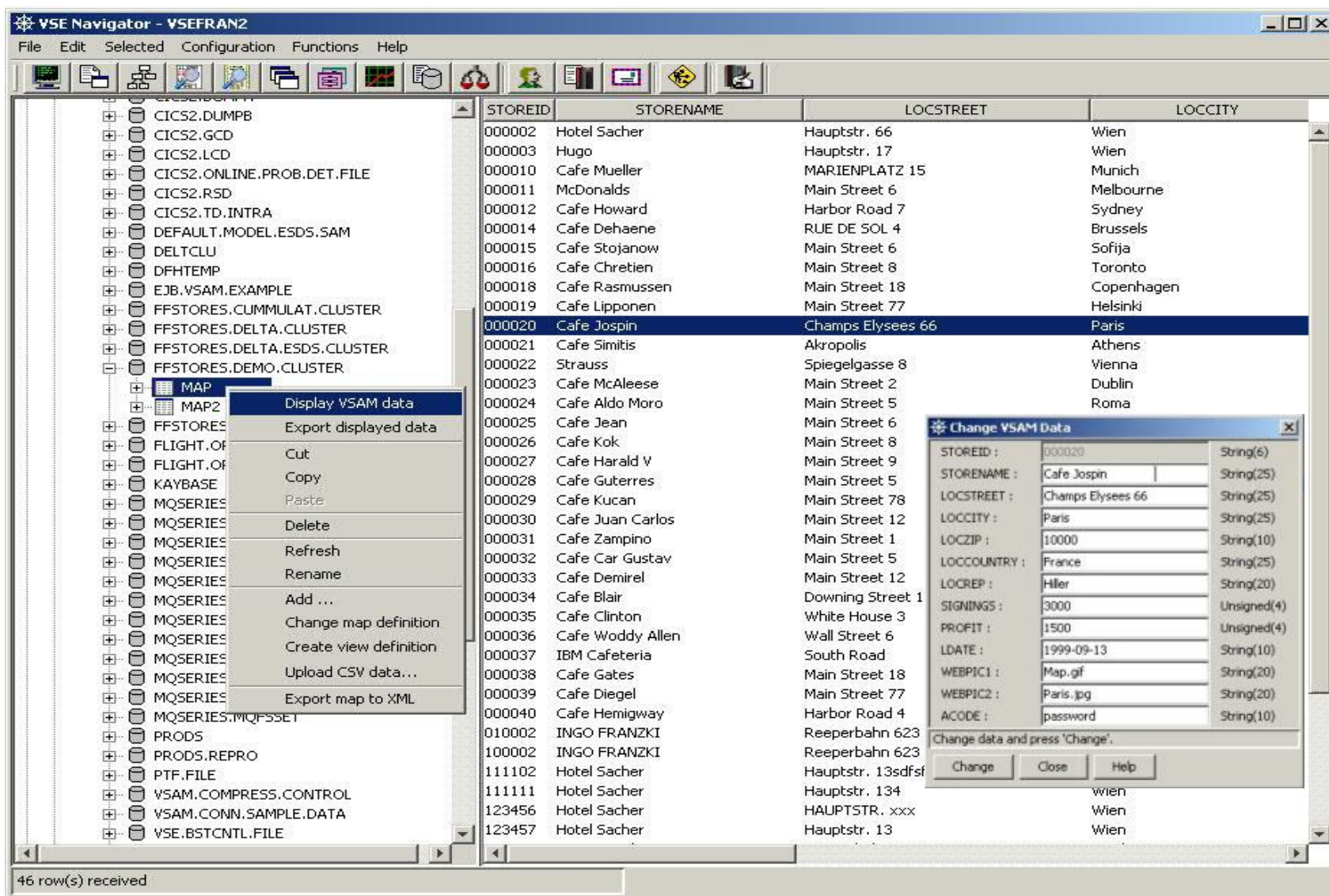
- ❖ real time access to VSE resources from remote systems ,
- ❖ real time access to VSAM data, Librarian
- ❖ monitoring and analyzing possibilities using console or statistic values

# z/VSE Navigator: Graphical z/VSE System Interface

## - based on VSE Connectors



# z/VSE Navigator: Graphical z/VSE Interface to VSAM data



The screenshot shows the VSE Navigator application window with a menu open over the 'MAP' entry in the left-hand tree view. The main window displays a table of VSAM data records. A dialog box titled 'Change VSAM Data' is open, showing the details for the selected record (STOREID: 000020).

STOREID	STORENAME	LOCSTREET	LOCCITY
000002	Hotel Sacher	Hauptstr. 66	Wien
000003	Hugo	Hauptstr. 17	Wien
000010	Cafe Mueller	MARIENPLATZ 15	Munich
000011	McDonalds	Main Street 6	Melbourne
000012	Cafe Howard	Harbor Road 7	Sydney
000014	Cafe Dehaene	RUE DE SOL 4	Brussels
000015	Cafe Stojanow	Main Street 6	Sofija
000016	Cafe Chretien	Main Street 8	Toronto
000018	Cafe Rasmussen	Main Street 18	Copenhagen
000019	Cafe Lipponen	Main Street 77	Helsinki
000020	Cafe Jospin	Champs Elysees 66	Paris
000021	Cafe Simitis	Akropolis	Athens
000022	Strauss	Spiegelgasse 8	Vienna
000023	Cafe McAleese	Main Street 2	Dublin
000024	Cafe Aldo Moro	Main Street 5	Roma
000025	Cafe Jean	Main Street 6	
000026	Cafe Kok	Main Street 8	
000027	Cafe Harald V	Main Street 9	
000028	Cafe Guterres	Main Street 5	
000029	Cafe Kucan	Main Street 78	
000030	Cafe Juan Carlos	Main Street 12	
000031	Cafe Zampino	Main Street 1	
000032	Cafe Car Gustav	Main Street 5	
000033	Cafe Demirel	Main Street 12	
000034	Cafe Blair	Downing Street 1	
000035	Cafe Clinton	White House 3	
000036	Cafe Woddy Allen	Wall Street 6	
000037	IBM Cafeteria	South Road	
000038	Cafe Gates	Main Street 18	
000039	Cafe Diegel	Main Street 77	
000040	Cafe Hemigway	Harbor Road 4	
010002	INGO FRANZKI	Reeperbahn 623	
100002	INGO FRANZKI	Reeperbahn 623	
111102	Hotel Sacher	Hauptstr. 13sdfst	
111111	Hotel Sacher	Hauptstr. 134	wien
123456	Hotel Sacher	HAUPTSTR. xxx	Wien
123457	Hotel Sacher	Hauptstr. 13	Wien

**Change VSAM Data Dialog:**

STOREID :	000020	String(6)
STORENAME :	Cafe Jospin	String(25)
LOCSTREET :	Champs Elysees 66	String(25)
LOCCITY :	Paris	String(25)
LOCZIP :	10000	String(10)
LOCOUNTRY :	France	String(25)
LOCREP :	Hiler	String(20)
SIGNINGS :	3000	Unsigned(4)
PROFIT :	1500	Unsigned(4)
LDATE :	1999-09-13	String(10)
WEBPIC1 :	Map.gf	String(20)
WEBPIC2 :	Paris.jpg	String(20)
ACODE :	password	String(10)

Change data and press 'Change'.

Buttons: Change, Close, Help

46 row(s) received



# 1. Connector Update – Data integration

## A. PULL scenario - VSE Connector

A. - access VSE resources from remote

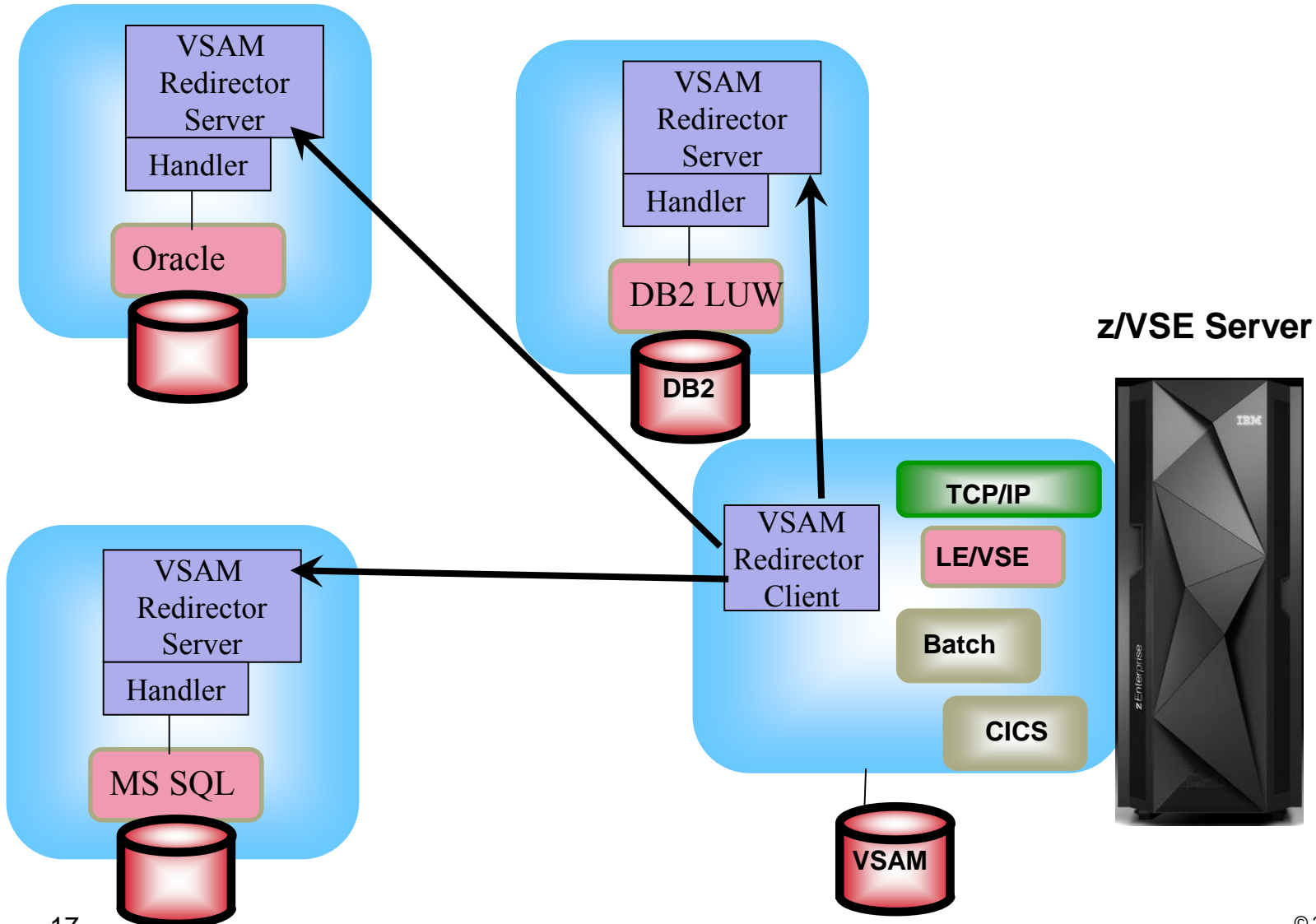
## B. PUSH scenario – VSE VSAM Redirector

A. - VSE applications to access remote data

## Solutions with PUSH scenario

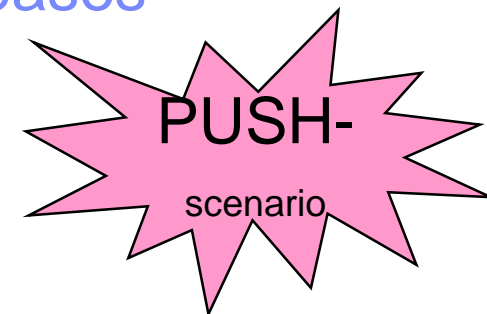
- Push VSAM data to relational databases
- Synchronize VSAM data with a Data Warehouse
- Collect changes in VSAM files with Redirector Capture
- Enable MQ Series for VSAM applications without application change
- Consolidate data on Linux on z Systems

# z/VSE applications, transparently access remote relational databases via VSAM requests

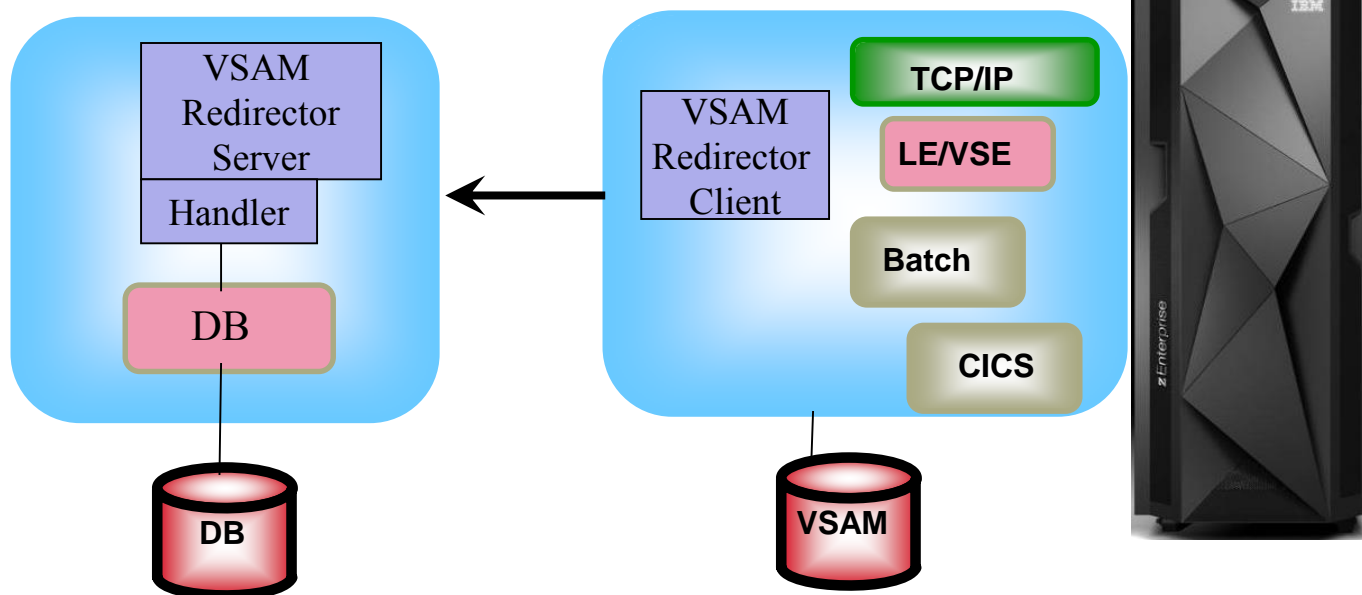


## (B)PUSH scenario: VSE/VSAM applications, push / access remote relational databases

- (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 Apply processing
  - b) MQ Exit and MQ Series solutions

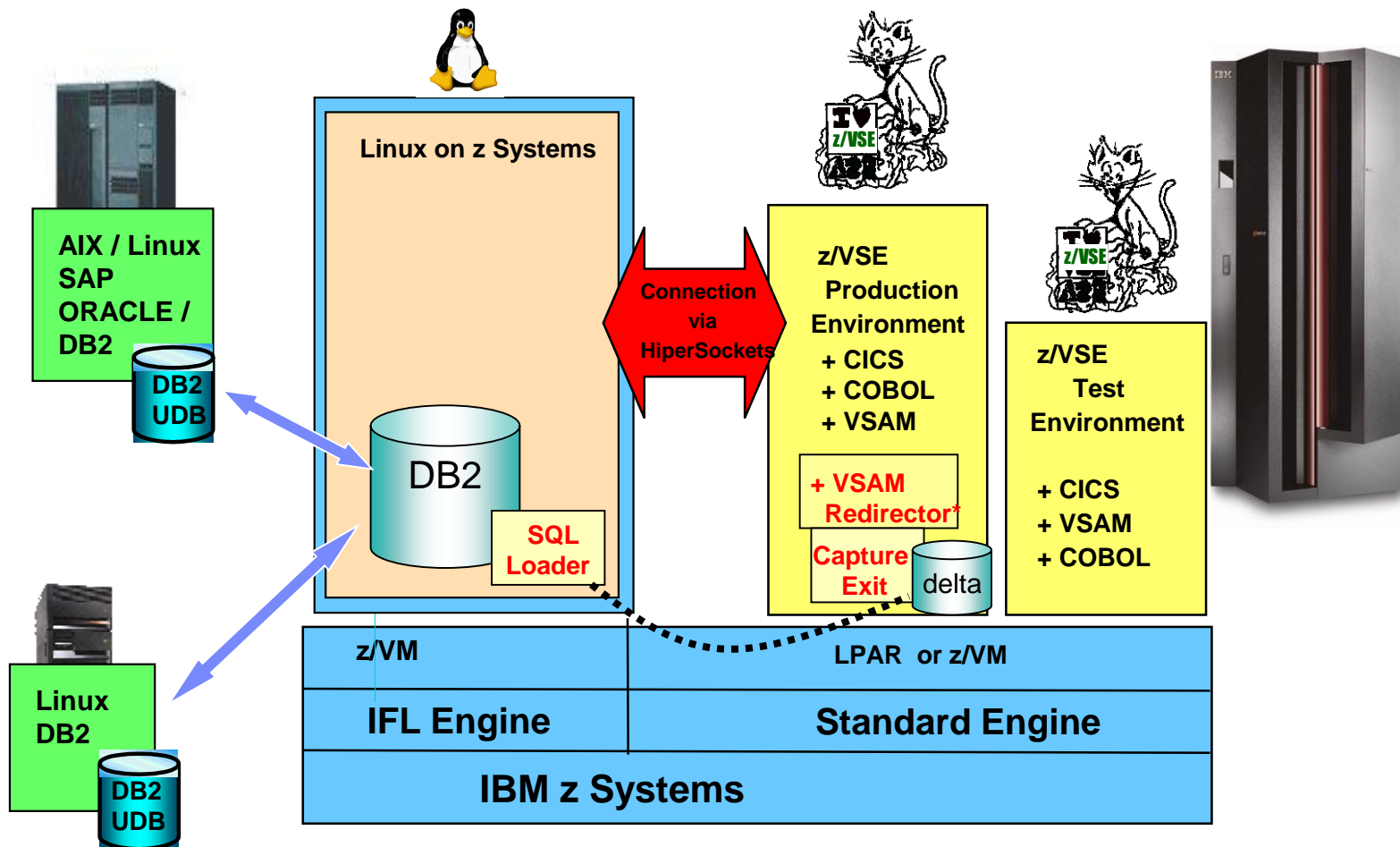


**z/VSE Server**



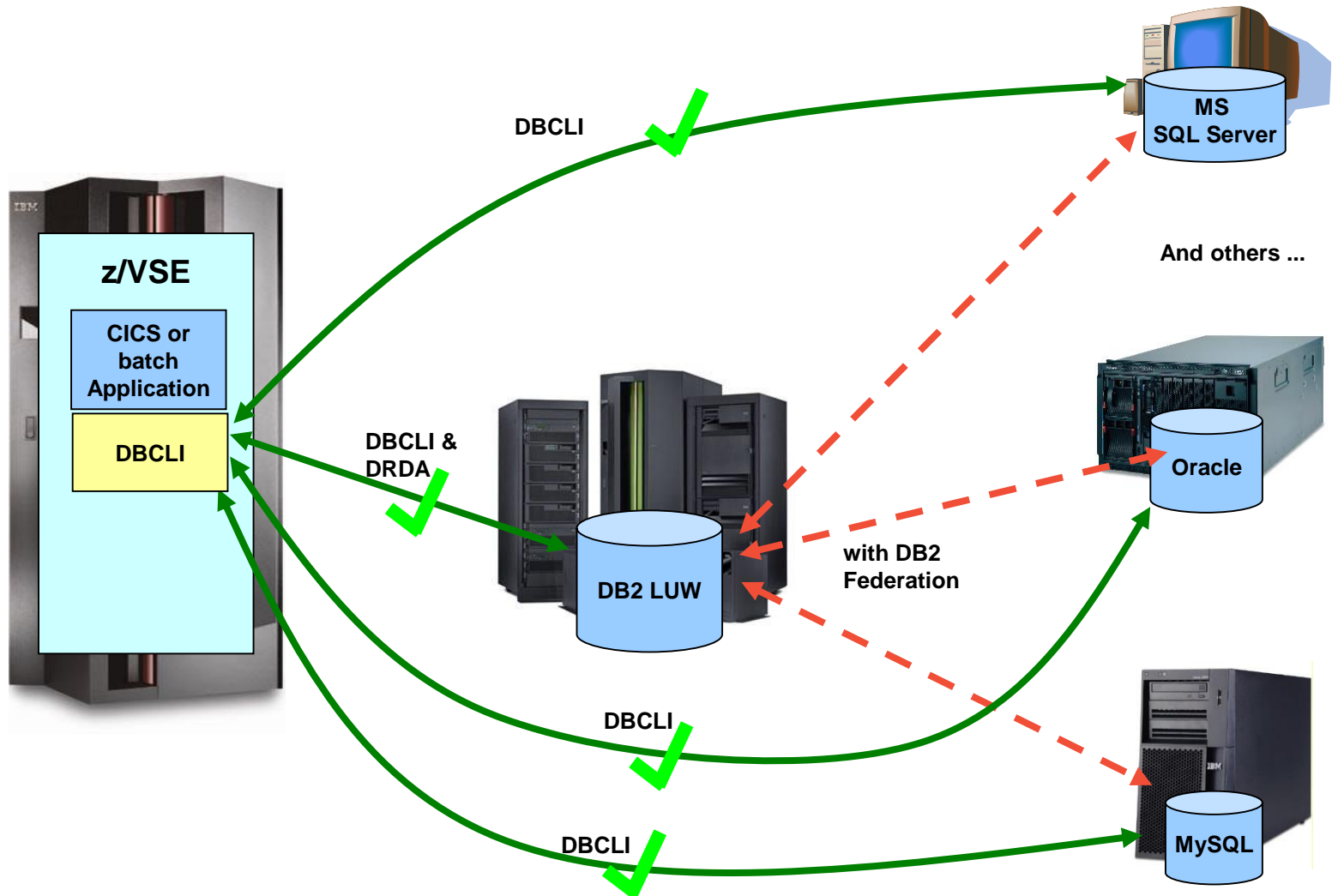
# Capture VSAM changes with DB2 LUW on Linux on z Systems

## - VSAM Redirector Capture Exit for high performance



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

# z/VSE applications accessing remote Databases using SQL

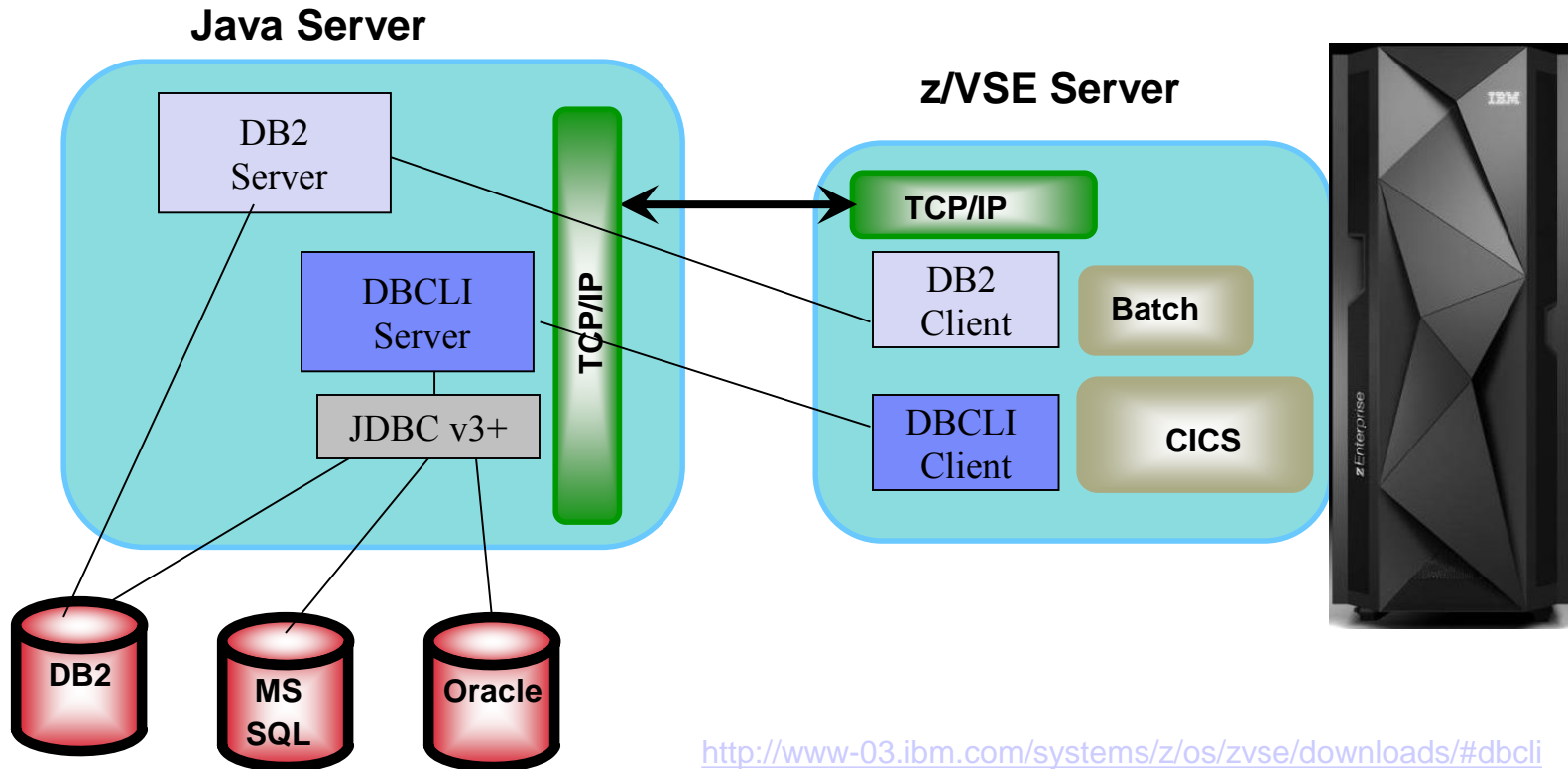




# Applications on z/VSE can access 'any' remote relational database



- Real time access to Relational databases
  - two different ways from batch and CICS
  - Access based on z/VSE DBCLI interface **AND / OR** DB2 Client



<http://www-03.ibm.com/systems/z/os/zvse/downloads/#dbcli>

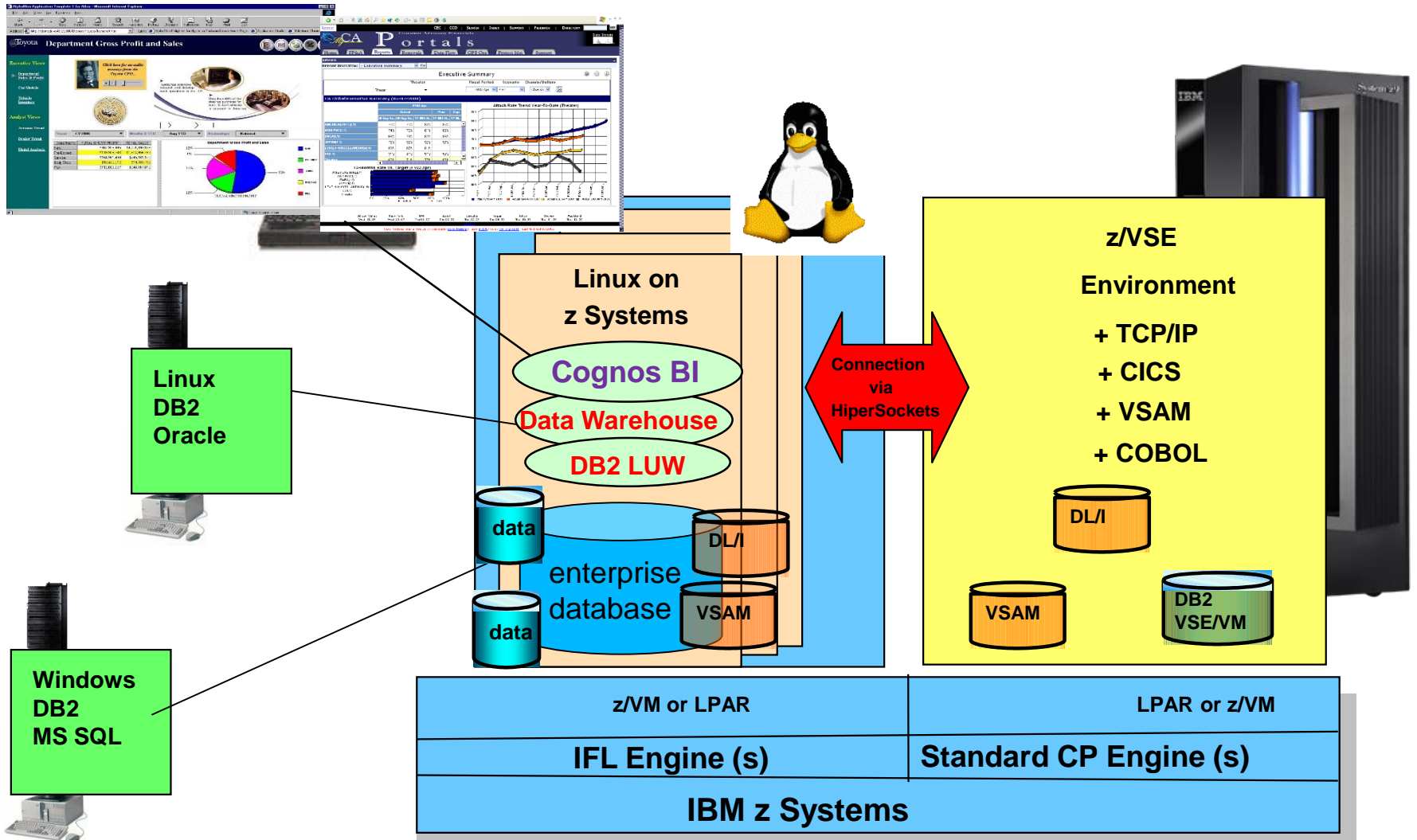


## Solutions using VSE Connectors



# The No1 Scenario: DB2 LUW for z/VSE Customers

*Analytics, Predictive Analytics, Data Warehouse and BI with Linux on z  
Consolidate, Integrate, DB2 Client, VSAM Redirector*



## Include z/VSE data with InfoSphere Federation Server

Integrating at the data layer – Federation of data

Read from and write to federated mainframe data sources using SQL Standards-based access via JDBC, ODBC, or Call Level Interface

Including for mainframe VSAM data and flat files

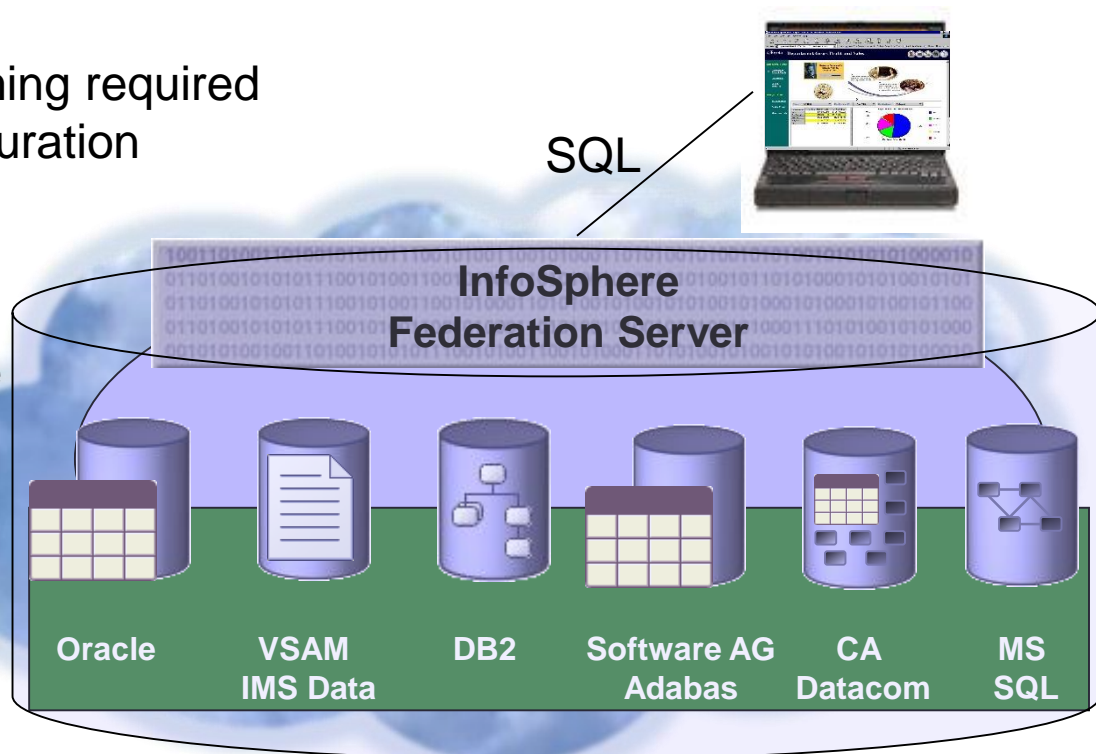
Multithreaded with native drivers for scalable performance

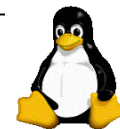
Metadata-driven means...

- No mainframe programming required
- Fast installation & configuration
- Ease of maintenance

Works with existing and new...

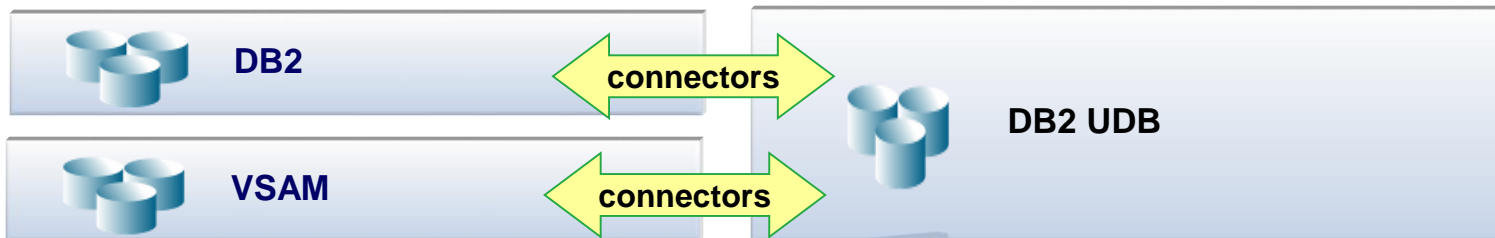
- Mainframe infrastructure
- Application infrastructure
- Toolsets





# Cognos BI with IBM z Systems and z/VSE

- Connectors like *VSAM Redirector* can replicate data into a Cognos database
- No need to touch the z/VSE application
- A remote database like IBM DB2 LUW, Oracle can be synchronized in real time with VSAM for Cognos BI Analytics



# BigData using Hadoop technology with z/VSE data: IBM InfoSphere BigInsights for Linux on z Systems

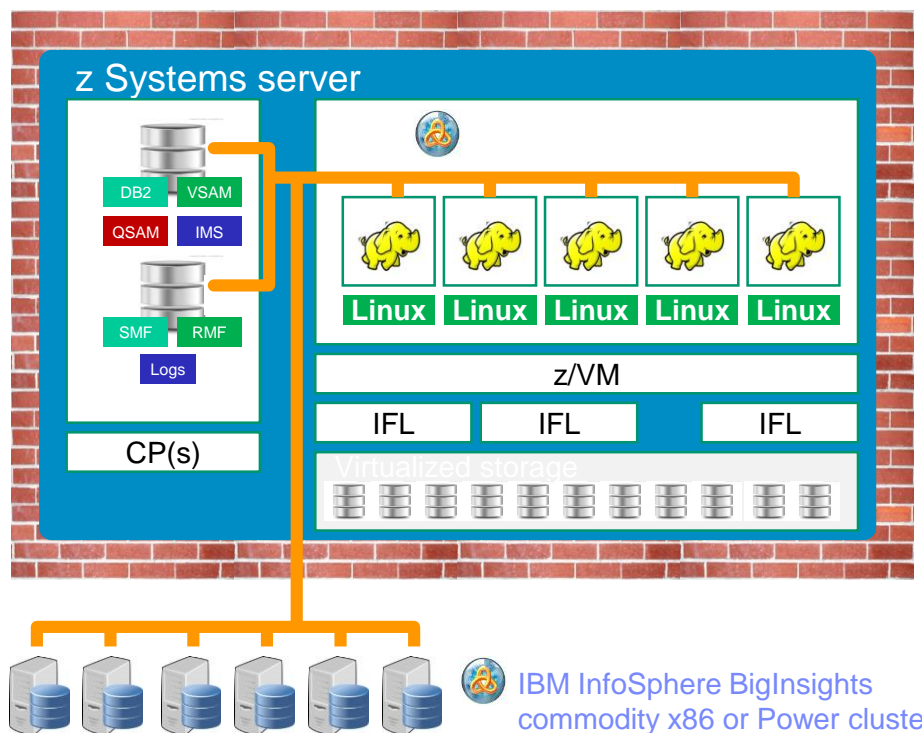
*New ways of thinking, transformative economics*

- Leverage the power of Apache™ Hadoop® Analytics on z Systems
- Use data from z Systems sources
- Protect sensitive data
- Faster application delivery
- Seamless interoperability

**New**

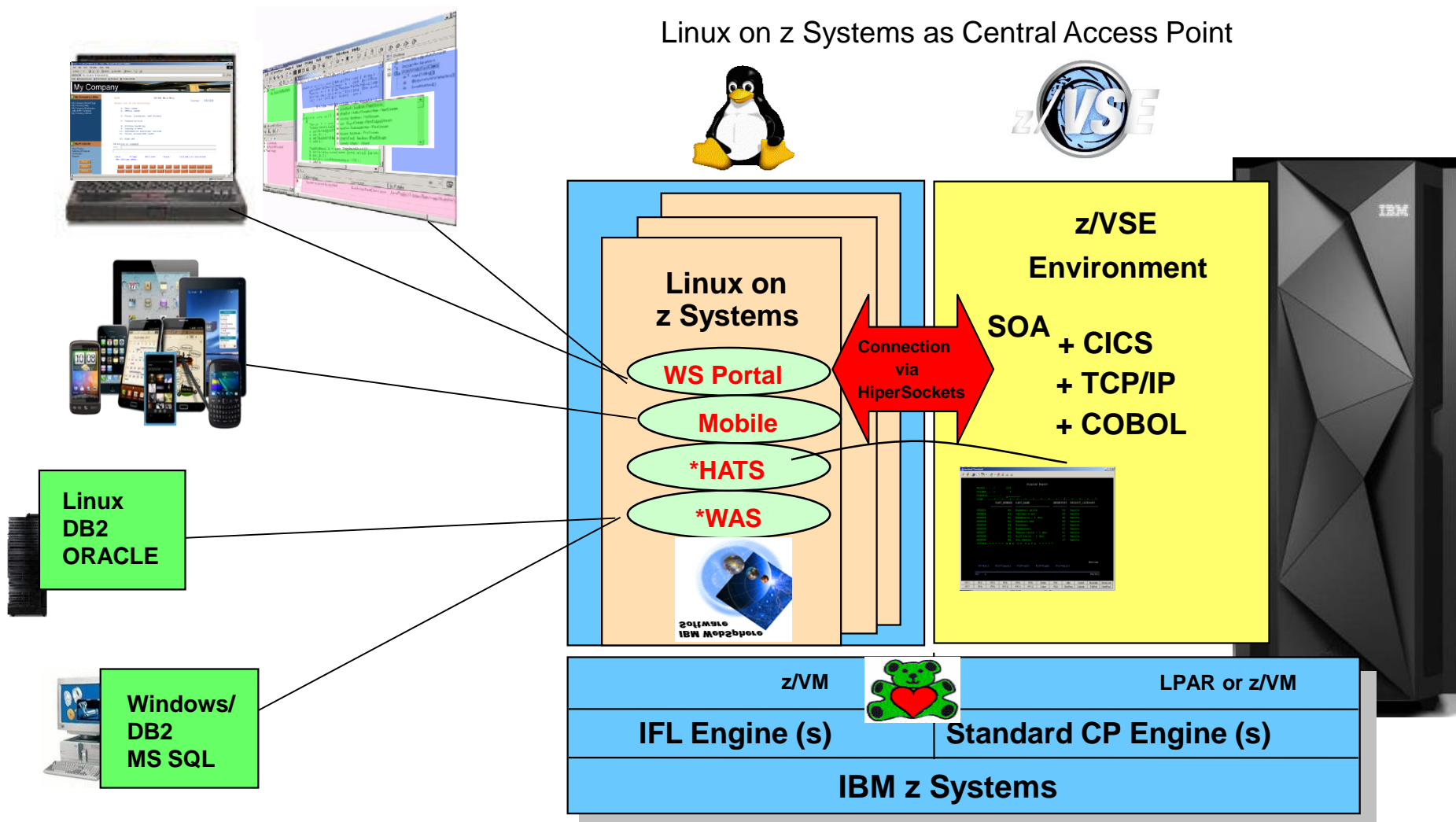
## IBM InfoSphere® System z Connector for Hadoop

*Fast and seamless data  
connectivity between a variety of  
mainframe data sources and  
IBM InfoSphere BigInsights*



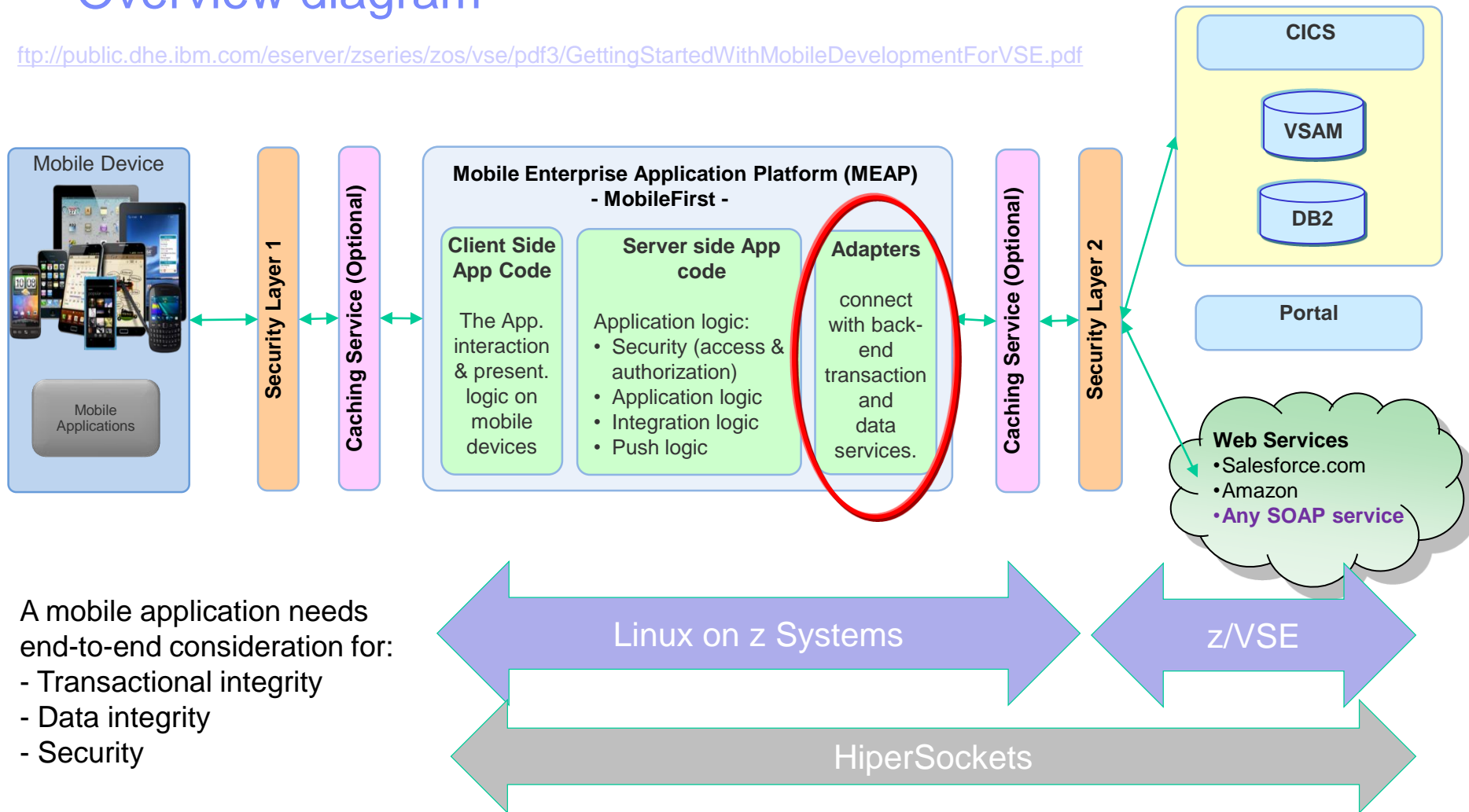


# Scenario 2: Mobile enable, Web enable, improve interface for existing applications



# Mobile application access z/VSE - Overview diagram

<ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/GettingStartedWithMobileDevelopmentForVSE.pdf>

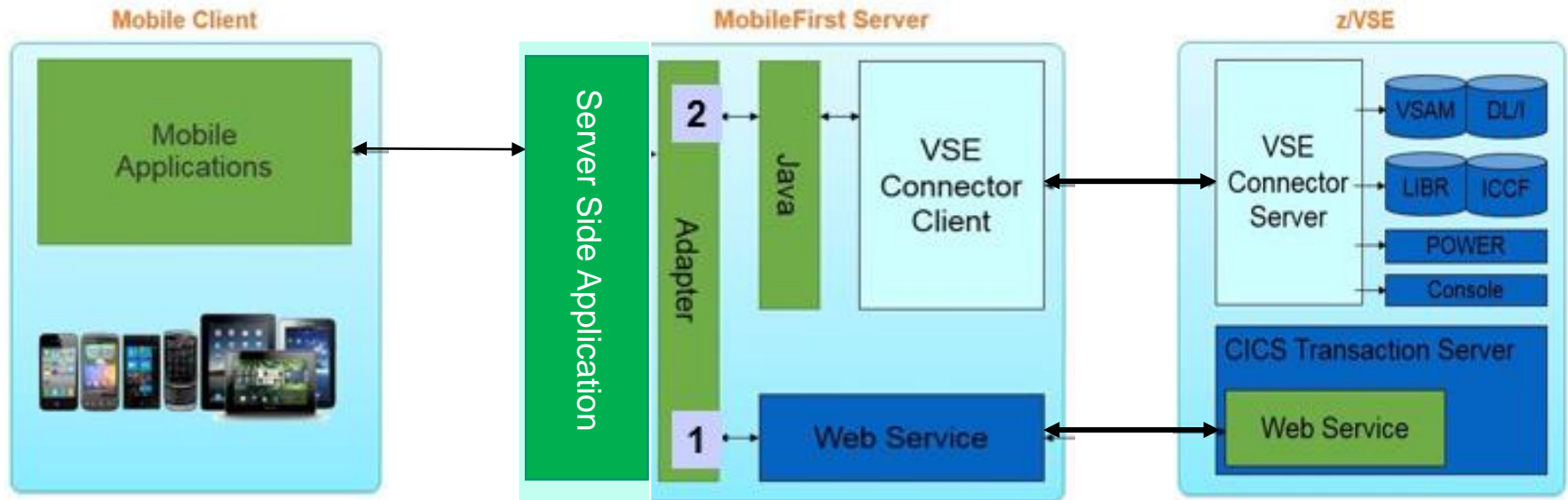


A mobile application needs end-to-end consideration for:

- Transactional integrity
- Data integrity
- Security

Mobile application integration is realized with MobileFirst Adapters

## Mobilize z/VSE applications with IBM MobileFirst



To start mobile development with z/VSE, you need to have the following applications:

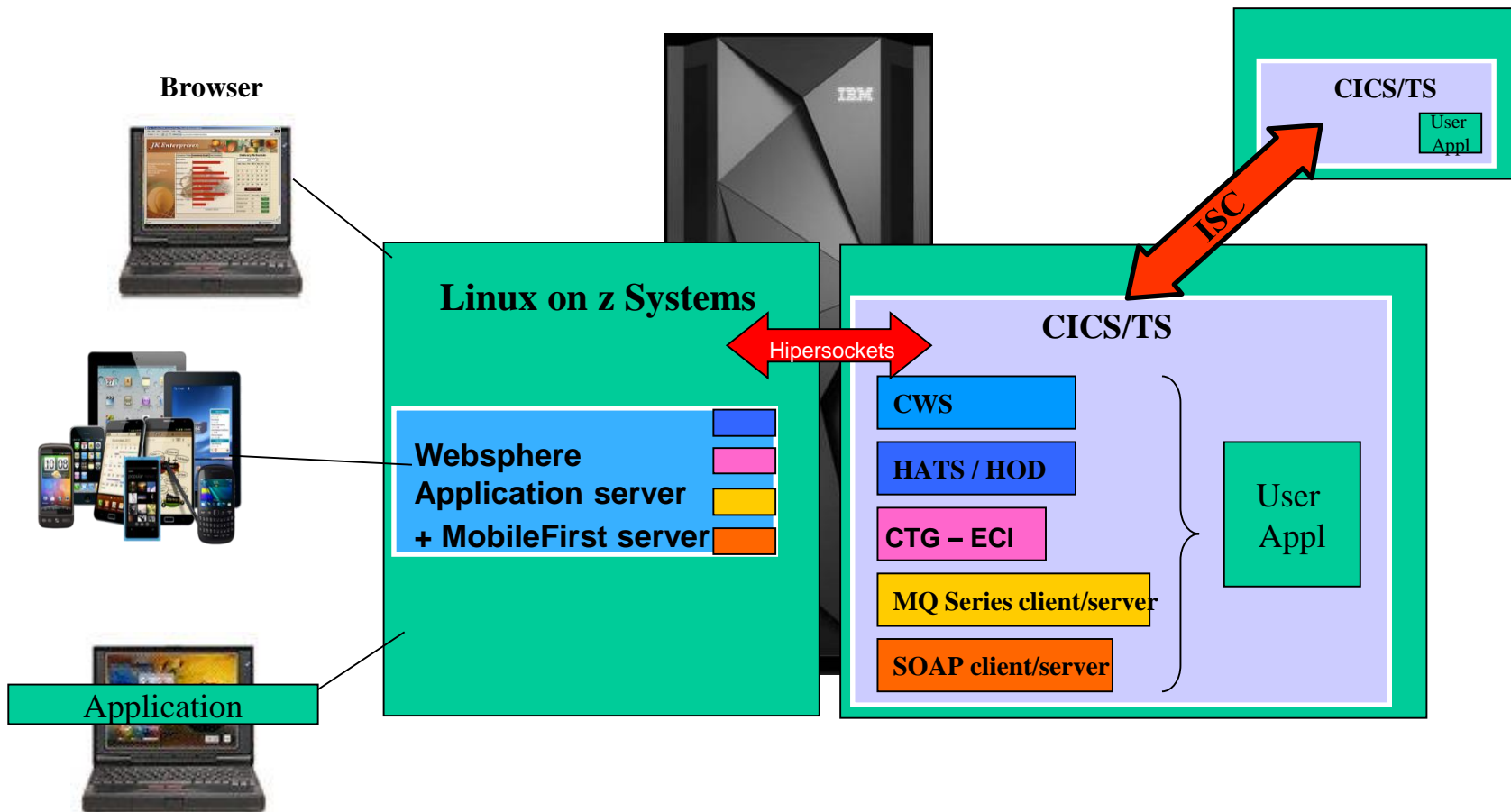
The **IBM MobileFirst Platform Studio**

The **z/VSE Connector Client**

The **z/VSE Connector Server** (part of z/VSE)

The **z/VSE Web Services implementation** (part of z/VSE)

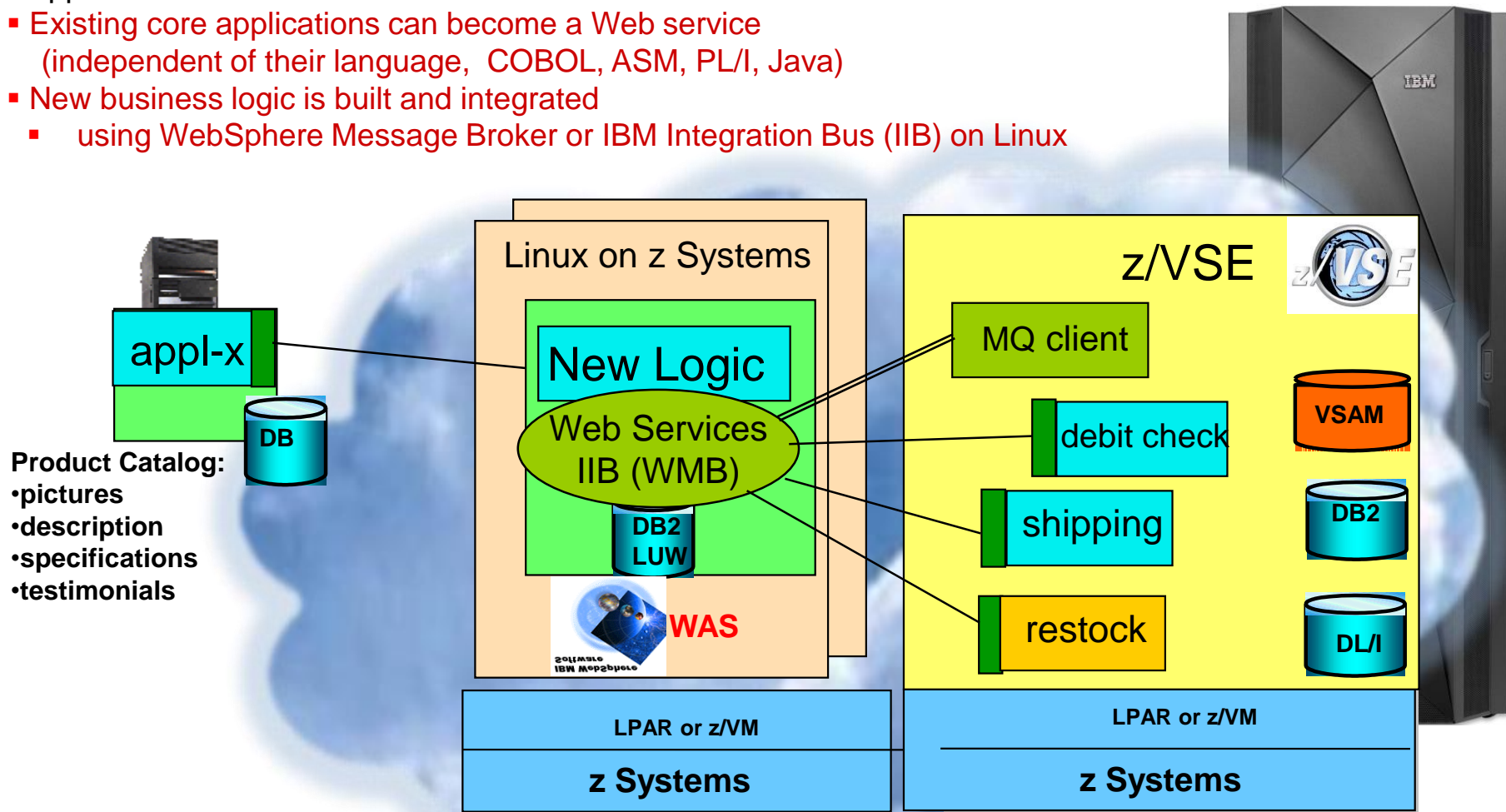
# Web Integration with traditional CICS/TS transactions in z/VSE



- CWS - CICS Web Interface / Support (function within CICS Transaction server)
- CTG - CICS Transaction Gateway (WebspHERE CICS Connector)
- HATS – Host Access Transformation Server
- HOD - Host OnDemand (WebspHERE Host Integrator)
- SOAP - Simple Object Access Protocol (Web Services based with XML data)

# Service Oriented Architecture (SOA) – the way to new solutions

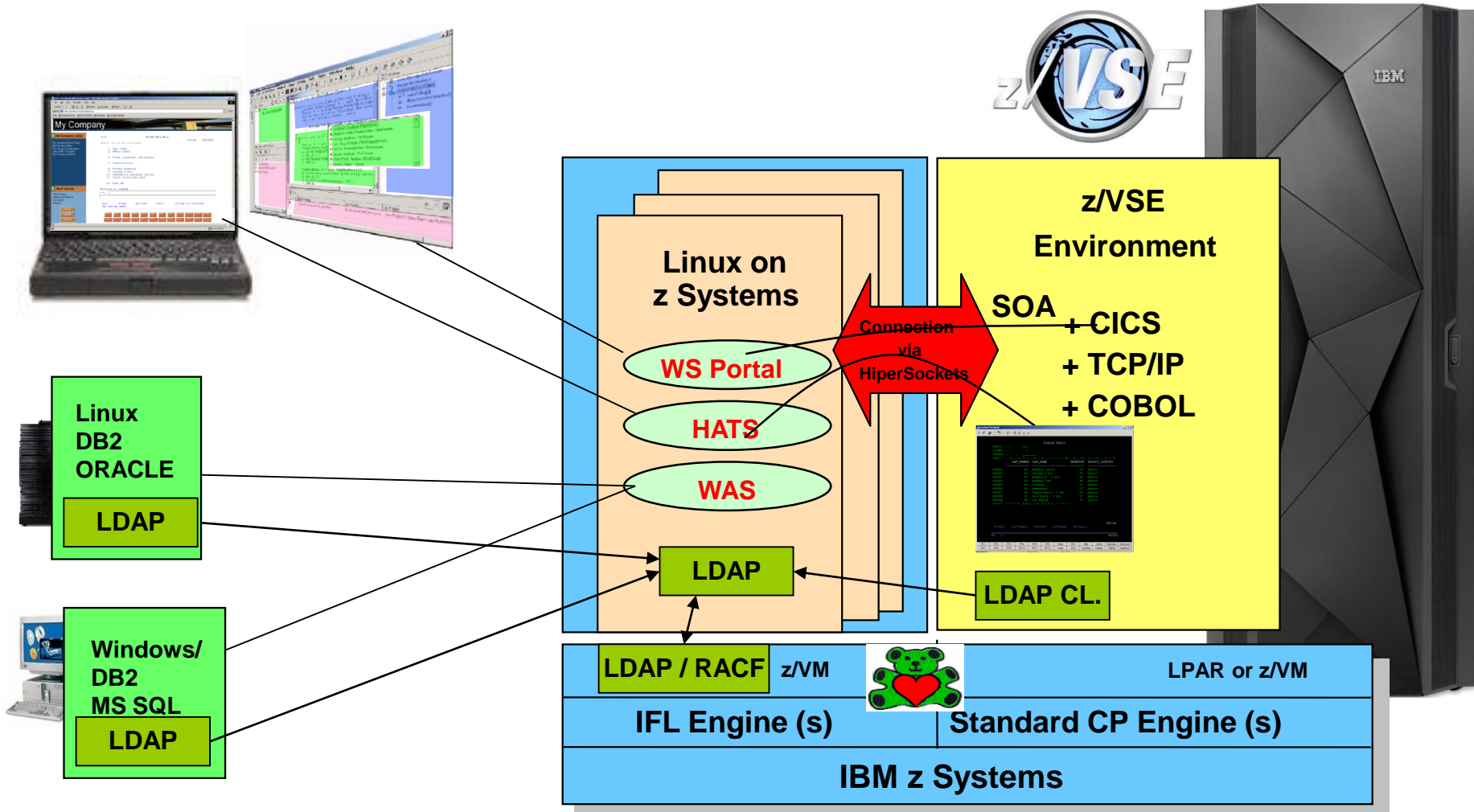
- Applications look the same for all users
- Existing core applications can become a Web service (independent of their language, COBOL, ASM, PL/I, Java)
- New business logic is built and integrated
  - using WebSphere Message Broker or IBM Integration Bus (IIB) on Linux



## Integration of Processes

# Central Authentication Options for z/VSE with LDAP in Linux on z Systems

*Single sign-on, Web enable, improve interface, simplify, extend existing applications*



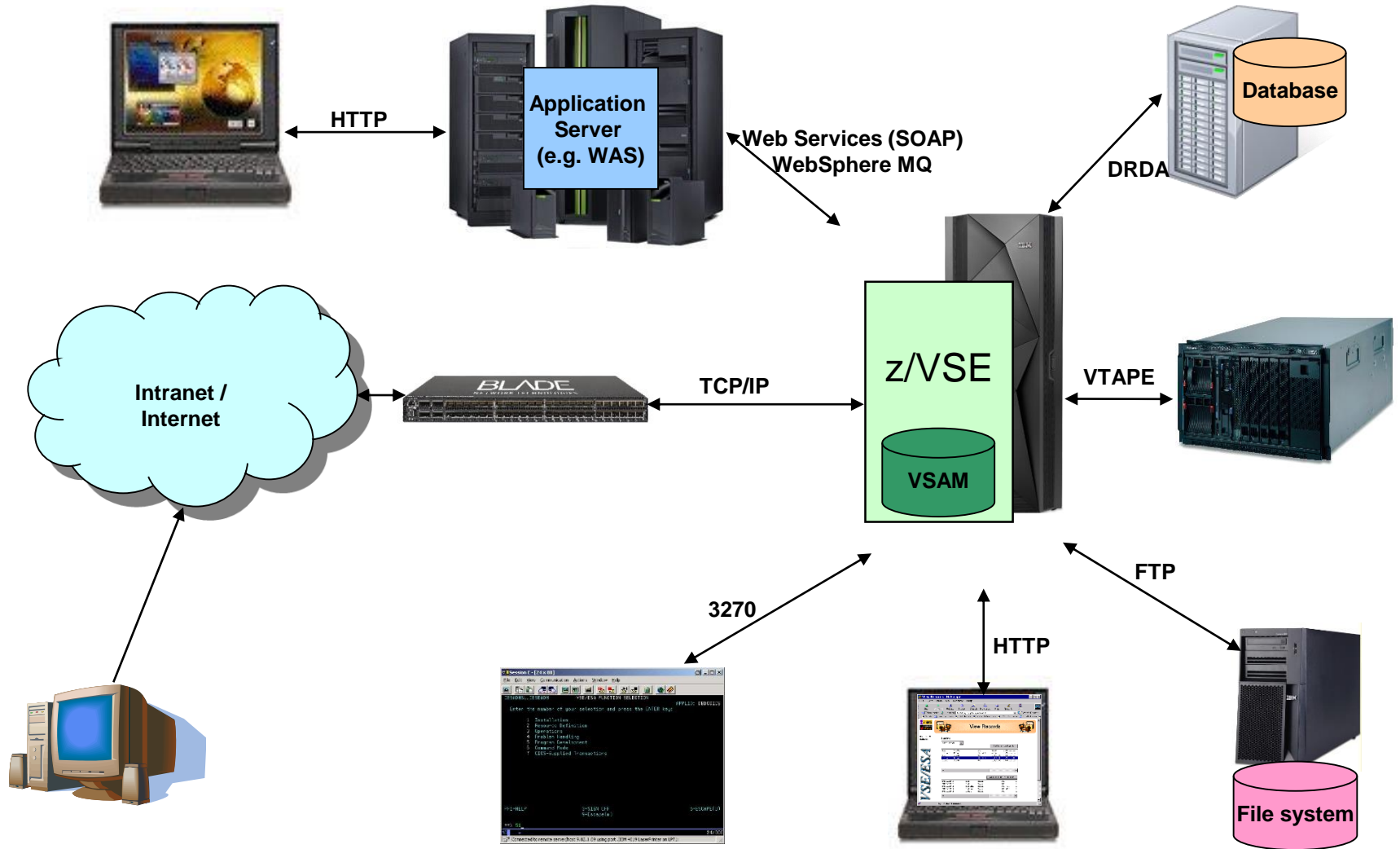




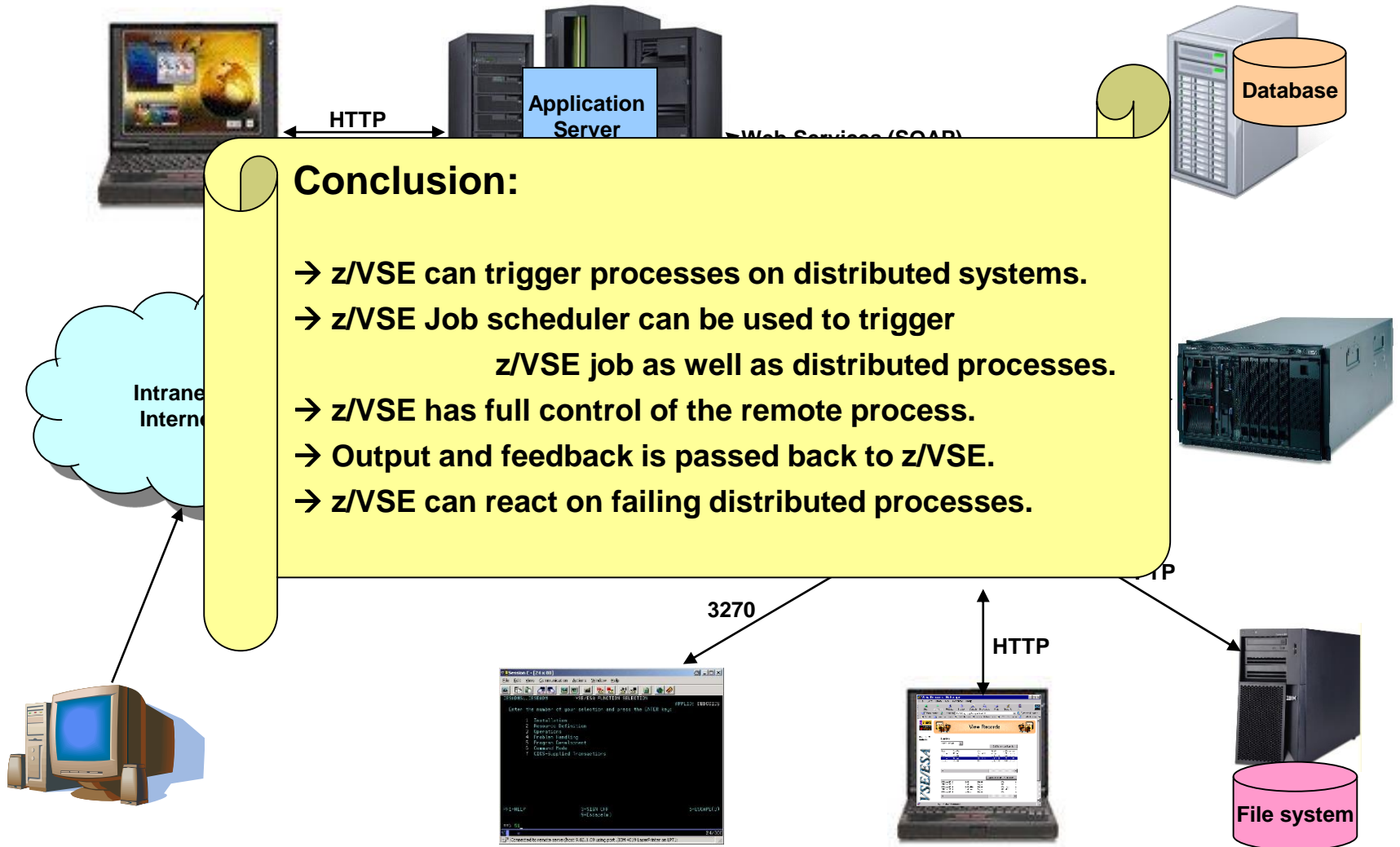
## z/VSE process control



# z/VSE controls processes in a heterogeneous IT environment



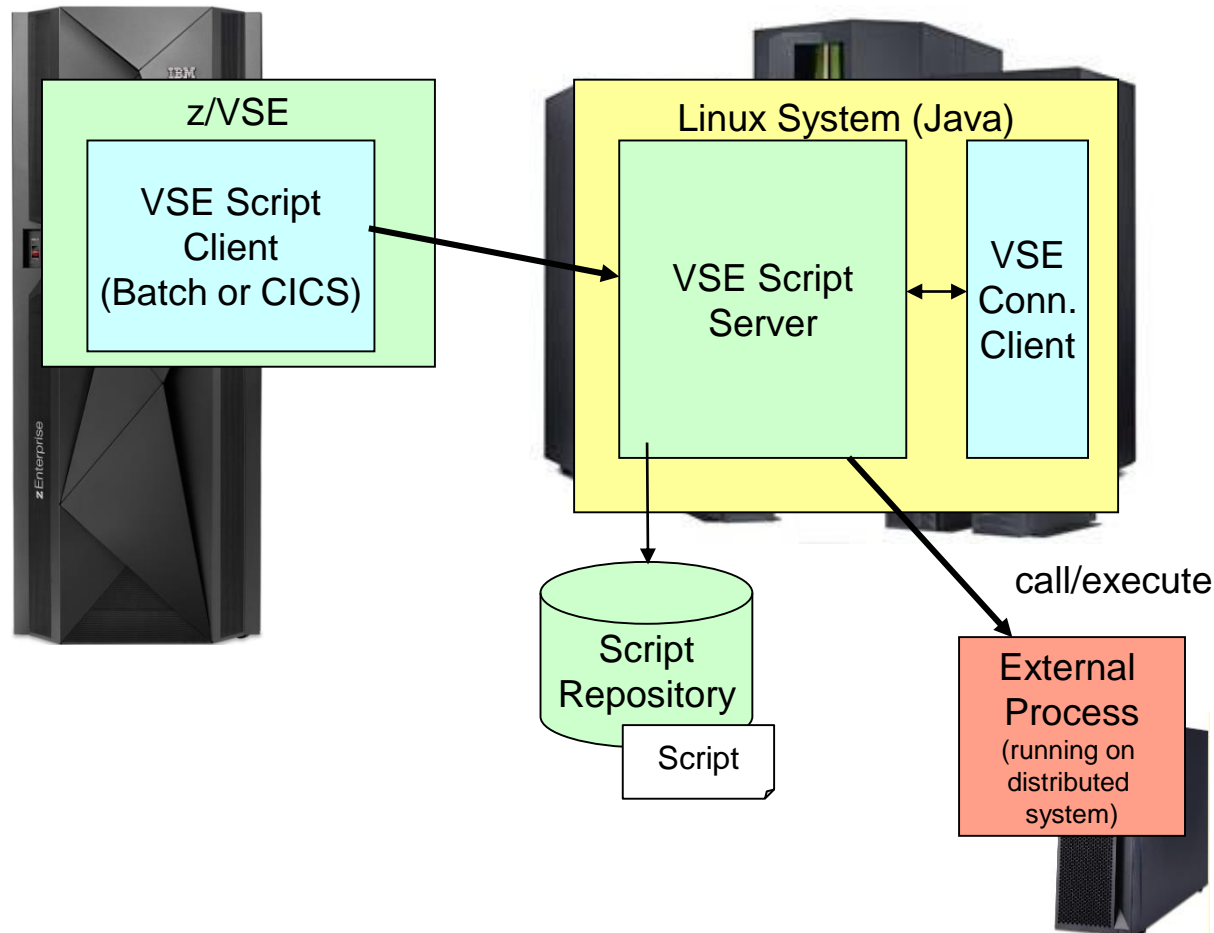
# z/VSE controls processes in a heterogeneous IT environment



# VSE Script Connector – z/VSE executes remote applications - using the Script Server on a Java platform

## VSE Script Connector used to:

- Call/Execute processes on distributed systems
- from z/VSE applications or Jobs



## Distributed systems trigger actions on z/VSE

### Submit a Job into z/VSE

- Using FTP into Reader
- Submit Job via Java Program
- ANT based automation

### Issue Console commands

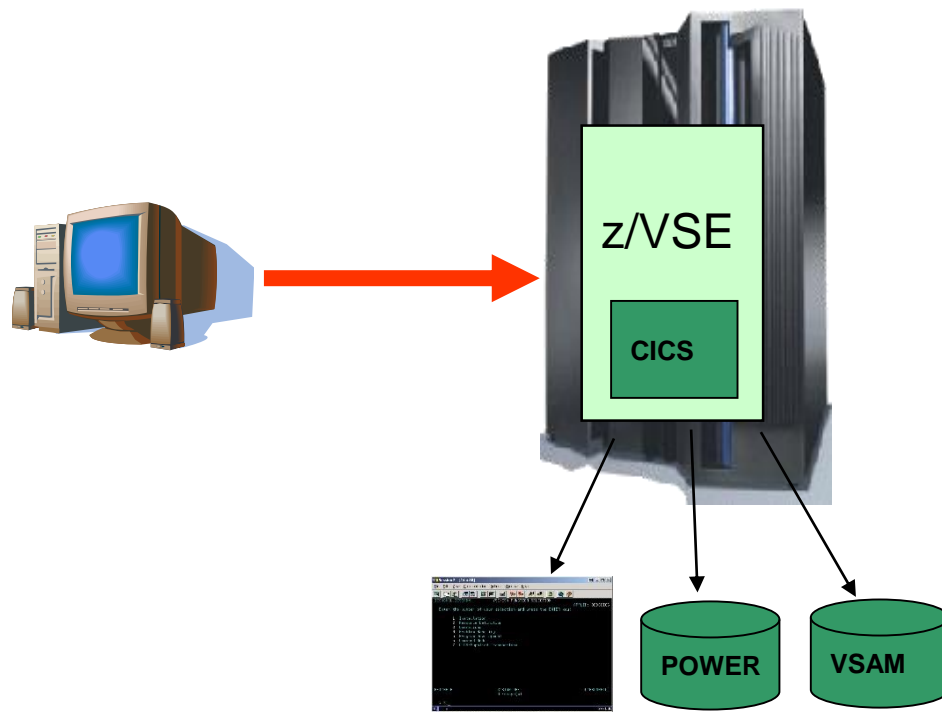
- Issue Commands via Java Program

### Trigger programs running on z/VSE

- Web Services (SOAP)
- WebSphere MQ
- CICS Transaction Gateway

### Upload data to z/VSE for processing

- FTP into VSAM
- Connectors

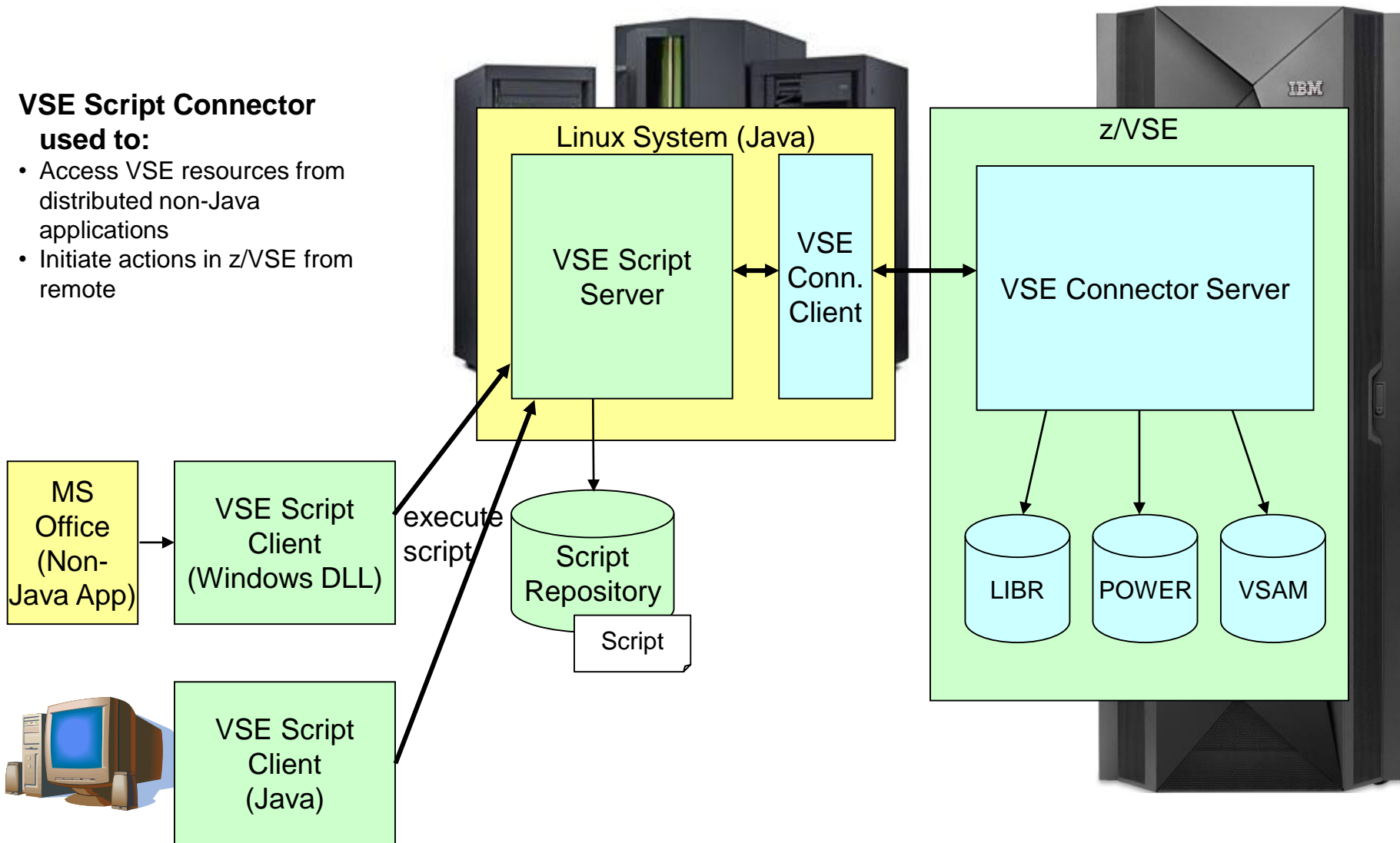


# VSE Script Connector – remote platforms initiate z/VSE actions

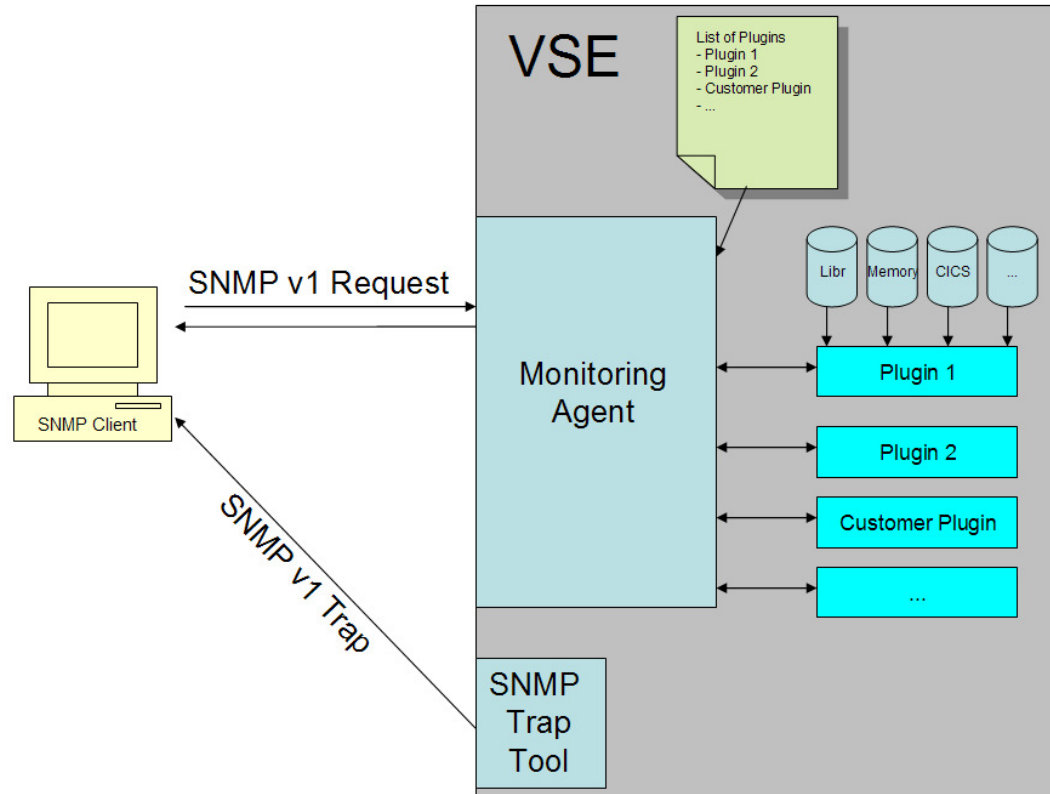
## VSE Script Connector

### used to:

- Access VSE resources from distributed non-Java applications
- Initiate actions in z/VSE from remote



## z/VSE Monitoring interfaces



Monitoring Agent based on SNMP V1

### **Real time monitoring**

retrieve z/VSE specific system and performance data

### **Event driven monitoring using SNMP Traps**

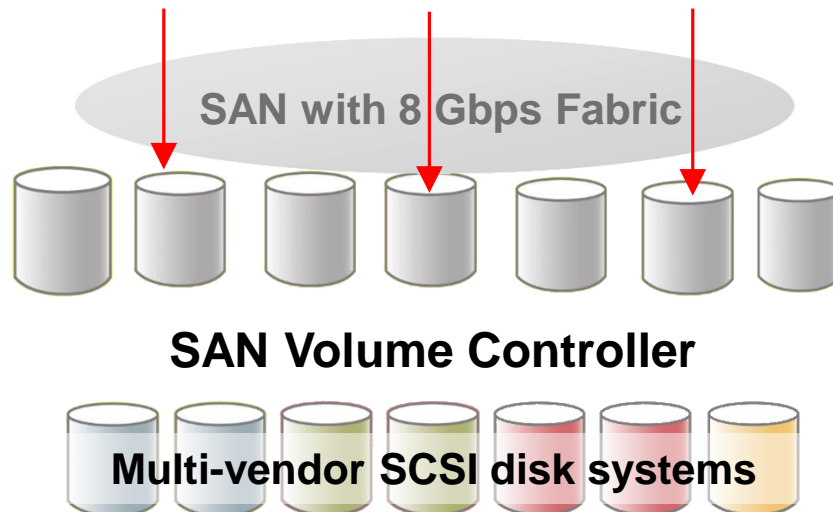
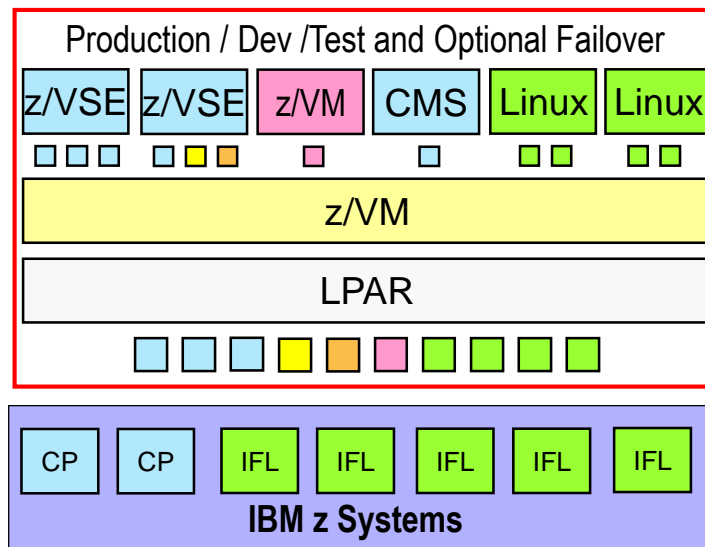
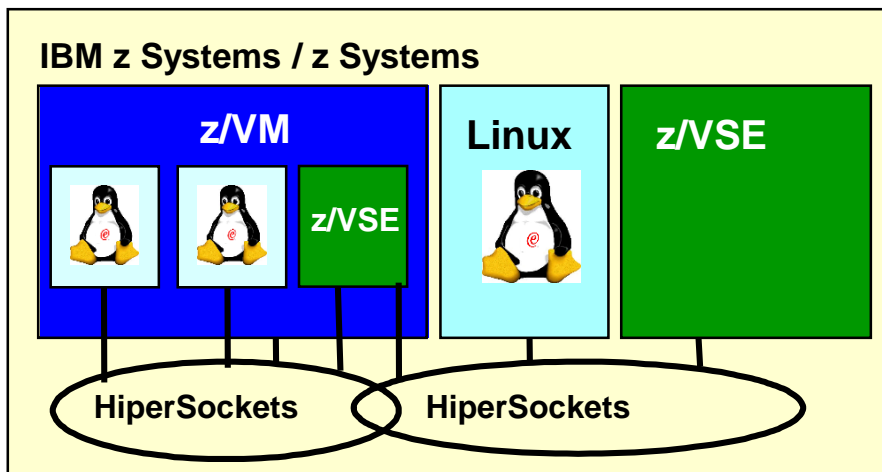
In z/VSE 5.1+ a Trap API was introduced to the Trap Tool

Helps to automate processes in z/VSE with SNMP traps



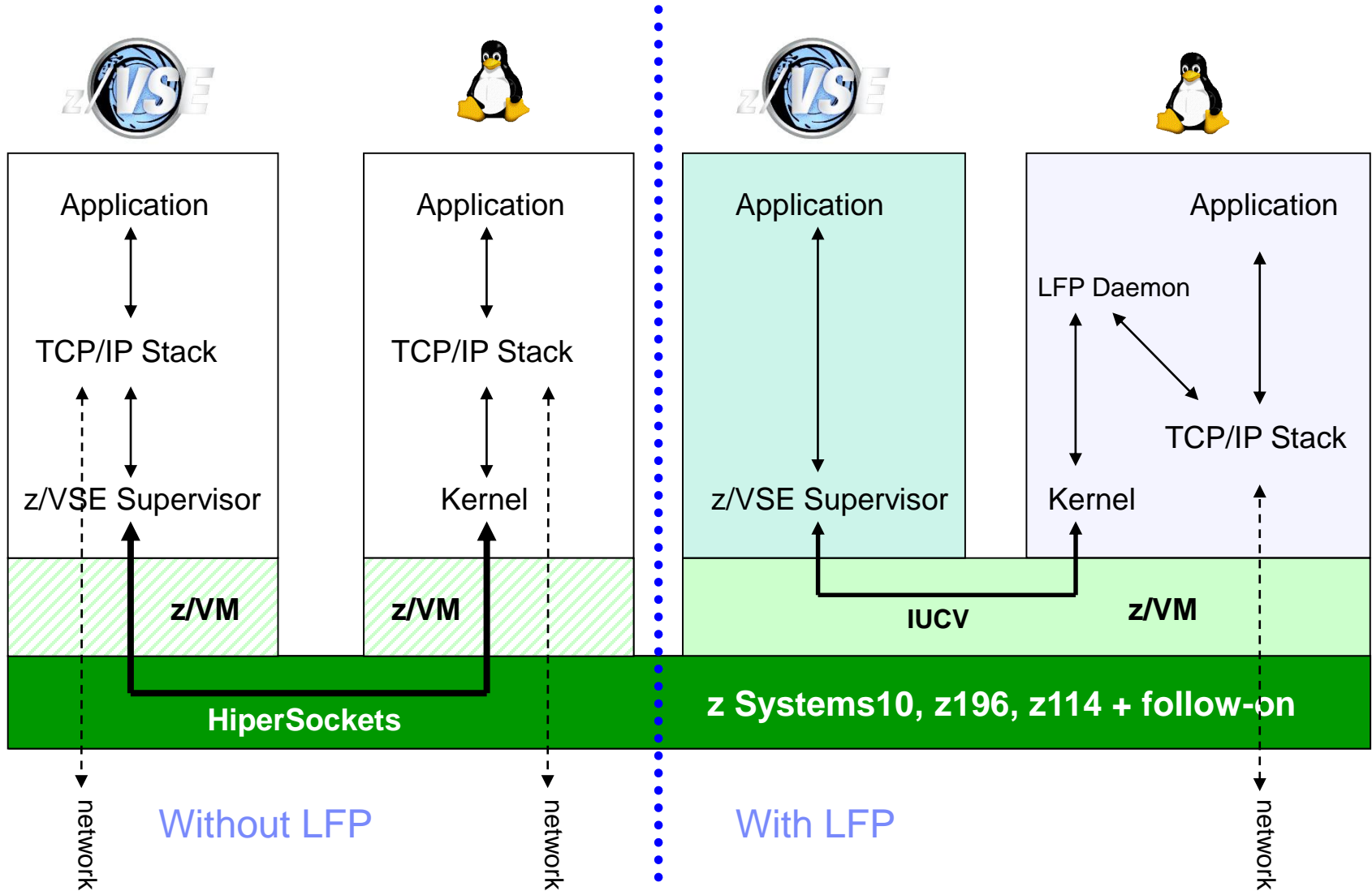
# Global Virtualization – with z Systems and z/VSE

- z/VSE can run on SCSI disks



- Network Virtualization
- Memory Virtualization
- Processor Virtualization
- System Virtualization
- Disk Virtualization

# Linux Fast Path in a z/VM-mode LPAR - Supported by z/VSE V4.3 + Faster communication between z/VSE and Linux applications under z/VM

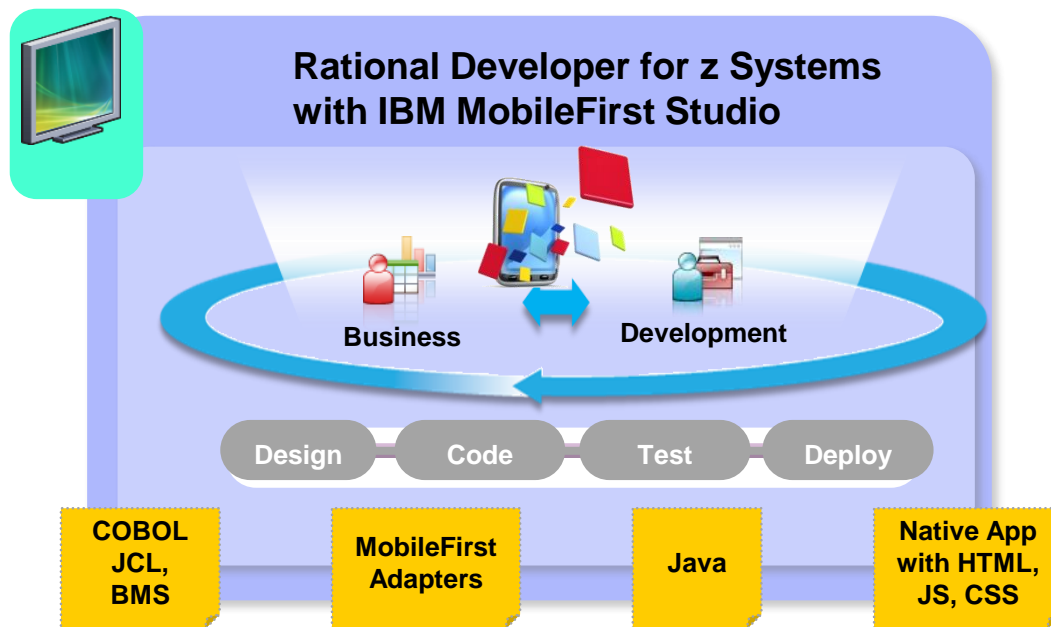




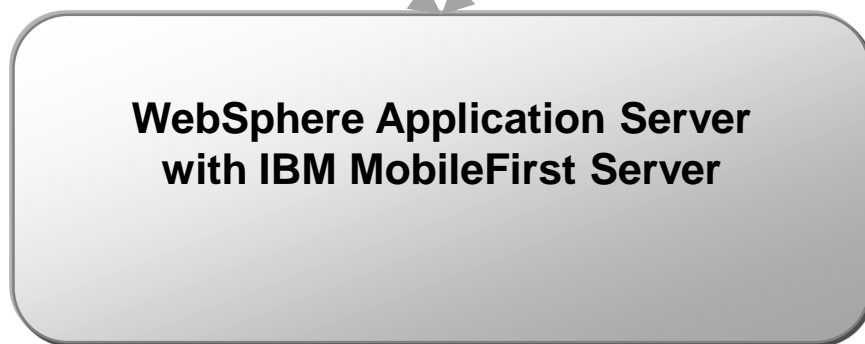
## z/VSE Graphical Development tools



# Development for z/VSE with Rational Developer for z Systems - from Mobile to COBOL



- Built on Eclipse
- MobileFirst builds on Common code base across all mobile platforms ( iOS, Android, Windows Phone, Blackberry)
- Build, preview, and deploy within the IDE
- Mobile simulator (for unit test)
- End-to-end debug
- Integrate with the back-end COBOL applications, data and transactions from CICS



# IBM Rational Developer for system z - the z/VSE Perspective

The screenshot displays the IBM Rational Developer for system z interface with several key components highlighted by red boxes and numbered callouts:

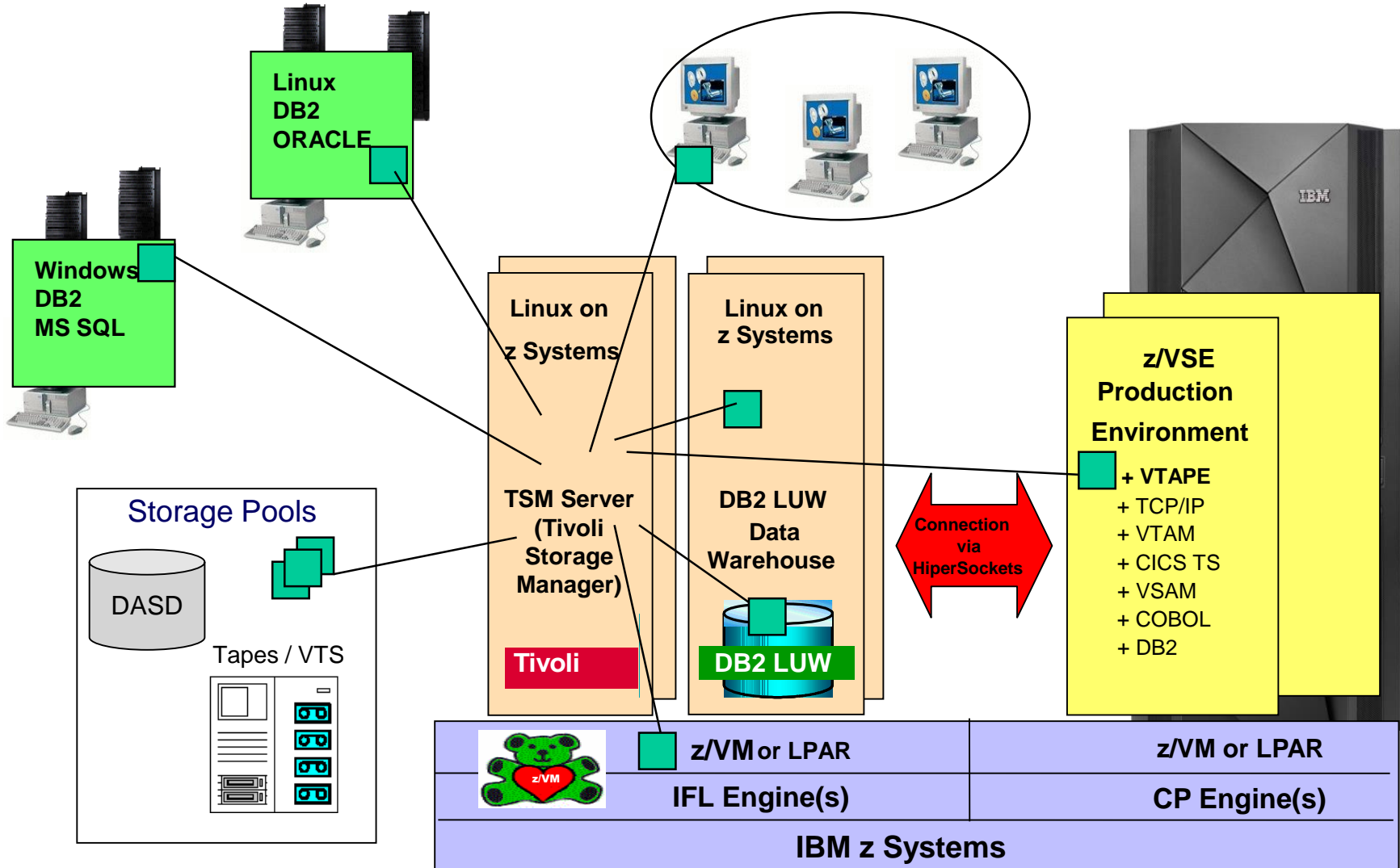
- 1. Perspective:** The top toolbar and menu bar.
- 2. View:** The VSE System View tree on the right side.
- 3. Projects:** The z/OS Projects tree on the left side.
- 4. Editor:** The central code editor window showing COBOL source code for the PRINTAPP program.
- 5. Outline View:** The Outline Properties window at the bottom left, showing a hierarchical view of the program's structure.
- 6. VSE Console:** The VSE Console window at the bottom, displaying a memory map (MAP) with columns for address, space, area, size, and name.

```
000001 Identification Division.  
000002 Program-ID. PRINTAPP.  
000003  
000004 Data Division.  
000005 Working-Storage Section.  
000006 01 Work-Parms.  
000007 05 In-Len PIC S9(4) BINARY.  
000008 05 Char-count Pic 99 Value ZEROS.  
000009 05 Out-Name PIC X(100).  
000010  
000011 Linkage Section.  
000012 01 Recvd-Parms.  
000013 05 In-name Pic x(30).  
000014  
000015  
000016 Procedure Division using Recvd-Parms.  
000017 Move spaces to Out-Name.  
000018  
000019 Move 0 to Char-count  
000020 Inspect Function Reverse(In-Name)  
000021 Tallying Char-count For Leading Spaces  
000022 Compute In-Len = 30 - Char-count  
000023  
000024 Move 'Thanks to ' to Out-Name (1:10).  
000025 Move In-name(1:In-Len) to Out-Name(11:In-Len)  
000026 Move ' for succeeding!' to Out-Name ((11 + In-Len):16).  
000027 Display Out-name.  
000028 Goback.  
000029
```

MAP	AR	0015	SPACE	AREA	V-SIZE	GETVIS	V-ADDR	UNUSED	NAME
	AR	0015	S	SUP	716K		0		**A\$SUPI
	AR	0015	S	SVA-24	1888K	1748K	B3000	768K	
	AR	0015	0	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 VTAMSTRT
	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	13456K	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
	AR	0015	S	SVA-31	7588K	6748K	3700000		OK SECSERV

# Universal Backup / Restore Concept for z/VSE

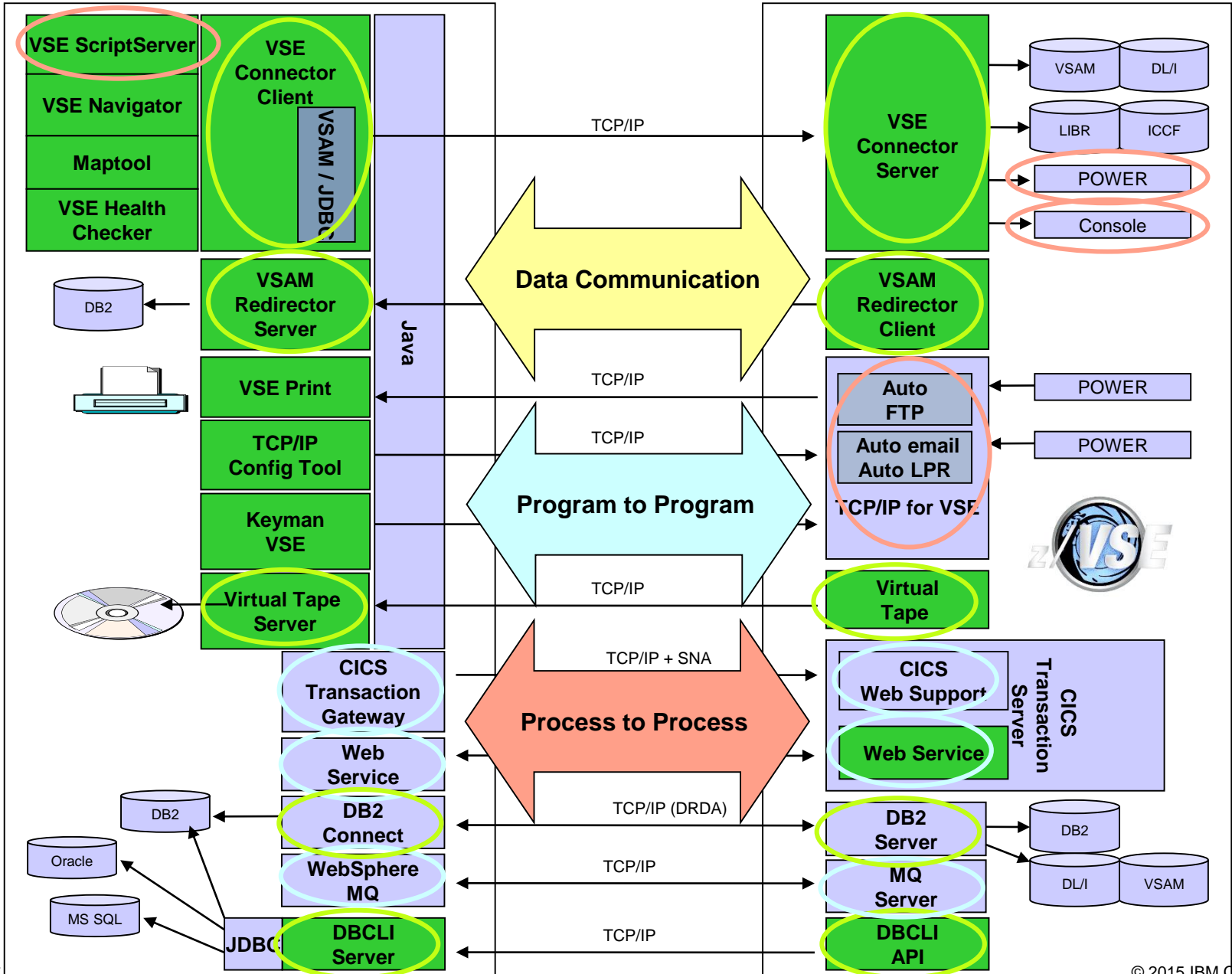
Implement TSM on Linux on z Systems as central Backup Hub for the enterprise



## Conclusion: Modernization possibilities for z/VSE processes with z/VSE

- ❖ data exchange via FTP
  - ✓ VSAM Redirector (incremental, cumulative, with cleansing)
- ❖ VSE Applications need access to remote data
  - ✓ VSAM Redirector
- ❖ Synchronization of data on different platforms
  - ✓ VSAM Redirector
- ❖ Access z/VSE data and resources from remote platforms
  - ✓ Java-Based Connectors, z/VSE Script
- ❖ access VSE applications from remote platforms
  - ✓ CICS Transaction Gateway, Web Services via SOAP
- ❖ access remote applications from VSE
  - ✓ SOA: Web Services via SOAP(XML)
- ❖ Mobilize existing z/VSE applications
  - ✓ Mobilize with SOAP, z/VSE Connectors data and applications
- ❖ BigData solutions with z/VSE data
  - ✓ Hadoop Connector for z/VSE data







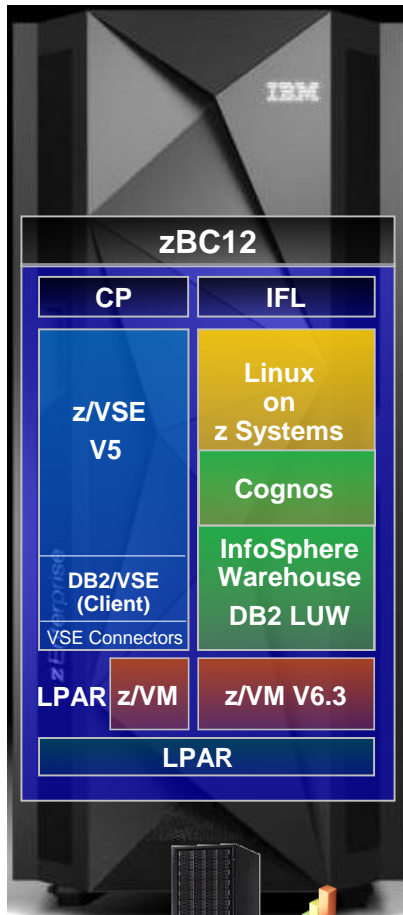
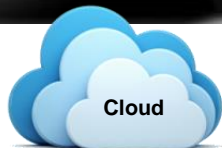
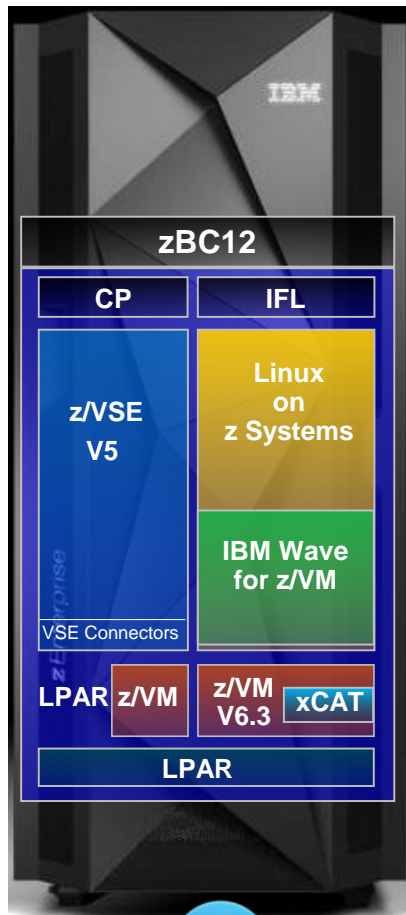
# z/VSE & Linux Modernization – CAMS Solution Examples

Cloud

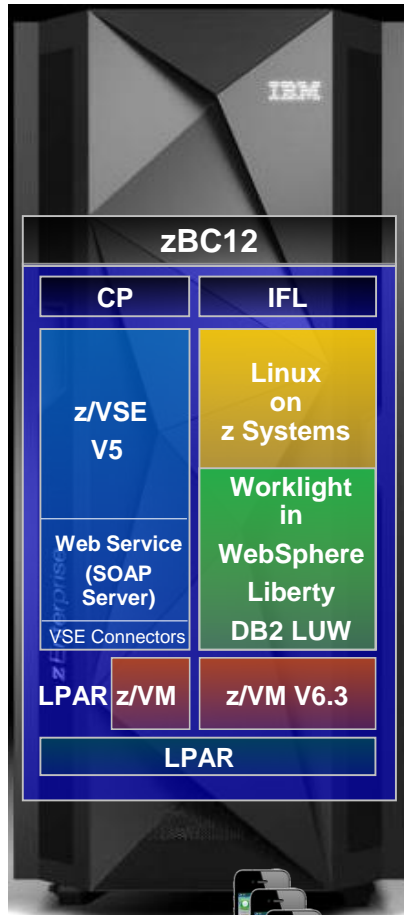
Analytics

Mobile

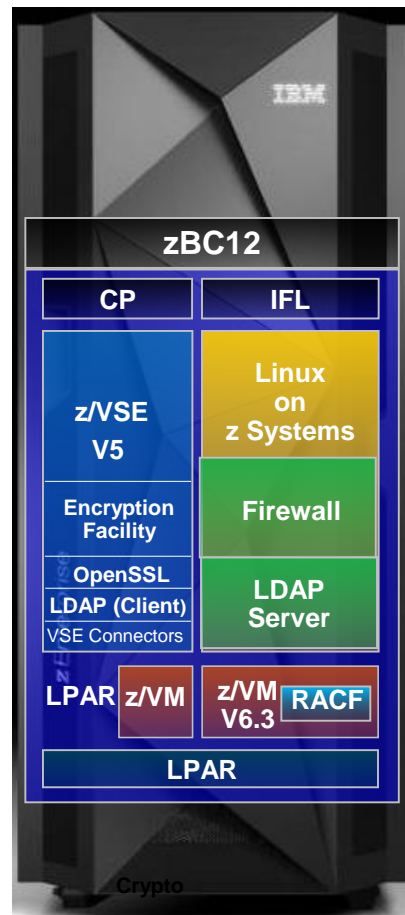
Security



XIV,  
DS8000



Mobile



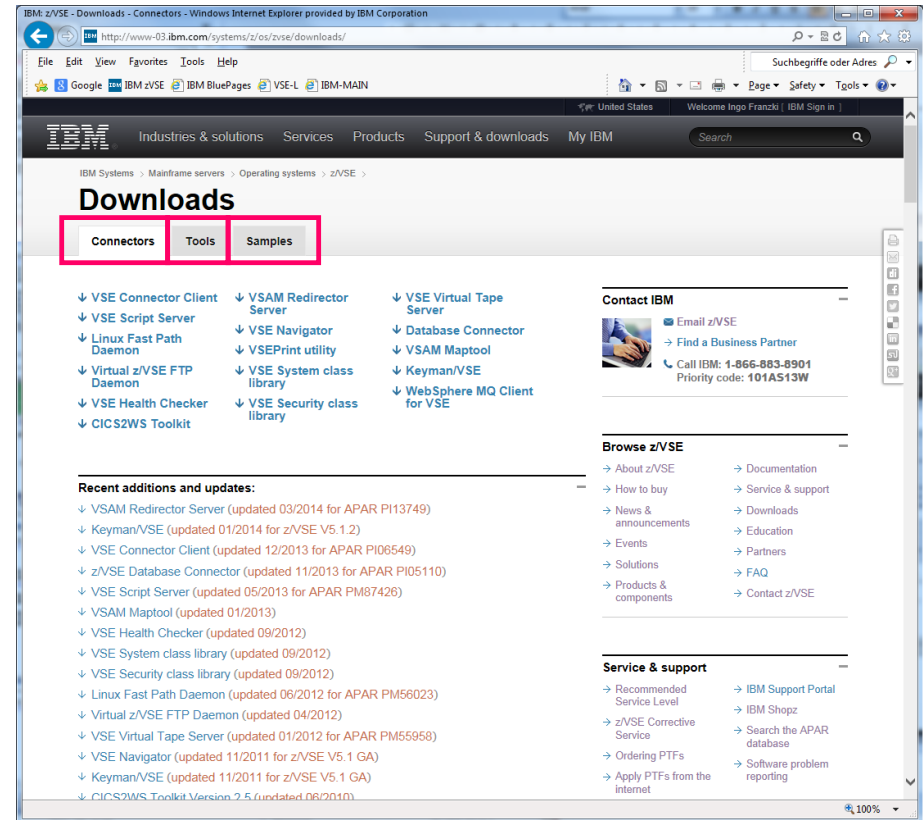
and many more ....

## z/VSE Tools & Connector - Downloads

- IBM offers a huge set of tools available on the z/VSE Homepage

<http://ibm.com/zvse/downloads>

- Most tools are 'as is', at no additional charge.
- Connector components (part of z/VSE and officially supported) are also available here
- Information about the Connector Components can be found here:



<http://ibm.com/zvse/products/connectors.html>

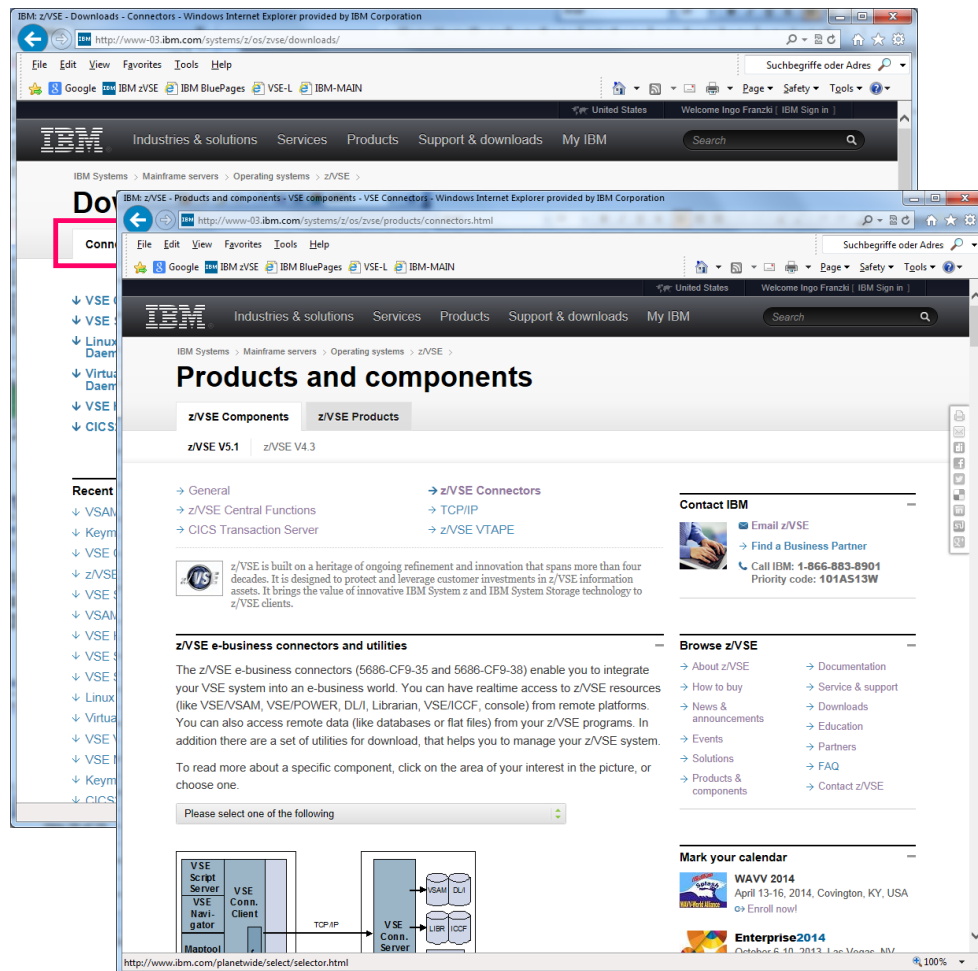
## z/VSE Tools & Connector - Downloads

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The screenshot shows two overlapping browser windows. The top window displays the main z/VSE homepage with a navigation menu and a search bar. The bottom window shows the 'Products and components' page for z/VSE Connectors. The page includes a navigation menu on the left, a main content area with a 'z/VSE Components' and 'z/VSE Products' tab, and a right sidebar with 'Contact IBM' and 'Browse z/VSE' sections. A diagram at the bottom illustrates the architecture of the z/VSE e-business connectors and utilities, showing a VSE Script Server, VSE Conn. Client, and VSE Conn. Server connected via TCP/IP to a VSE Conn. Server, which in turn connects to various databases like SAM, DLU, LIBR, and ICCF.

## Introduction to the New Mainframe: z/VSE Basics

# z/VSE Redbook

**SG24-7436-00**

Basic mainframe concepts and architecture

z/VSE fundamentals for students and beginners

Mainframe hardware and peripheral devices



Mike Ebbers  
Wolfgang Bosch  
Hans Joachim Ebert  
Helmut Hellner  
Jerry Johnston  
Wilhelm Mild  
Ingolf Salm  
Joerg Schmidbauer  
Martin Walbruehl

[ibm.com/redbooks](http://ibm.com/redbooks)

# Redbooks

## z/VSE Live Virtual Classes

z/VSE @ <http://www.ibm.com/zvse/education/>

LINUX + z/VM + z/VSE @ <http://www.vm.ibm.com/education/lvc/>

Read about upcoming LVCs on @ <http://twitter.com/IBMzVSE>

Join the LVC distribution list by sending a short mail to [zvse@de.ibm.com](mailto:zvse@de.ibm.com)





# Questions?



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