



E10

VSE Connectors Overview

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zSeries® EXPO

**FEATURING Z/OS, Z/VM, Z/VSE
AND LINUX ON ZSERIES**

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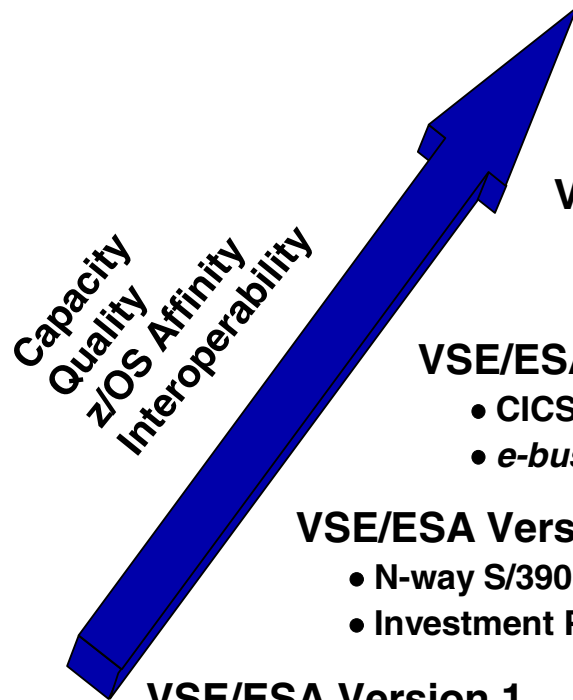
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z/VSE and VSE/ESA Roadmap



z/VSE V3.1 March 4, 2005

- zSeries features, SCSI/FCP
- 31-bit mode only



VSE/ESA V2.7 March 14, 2003

- Enhanced Interoperability
- ALS2 servers only

VSE/ESA V2.4 1999

- CICS Transaction Server for VSE/ESA
- *e-business*



VSE/ESA Version 2 1994

- N-way S/390 Servers
- Investment Protection - Year 2000

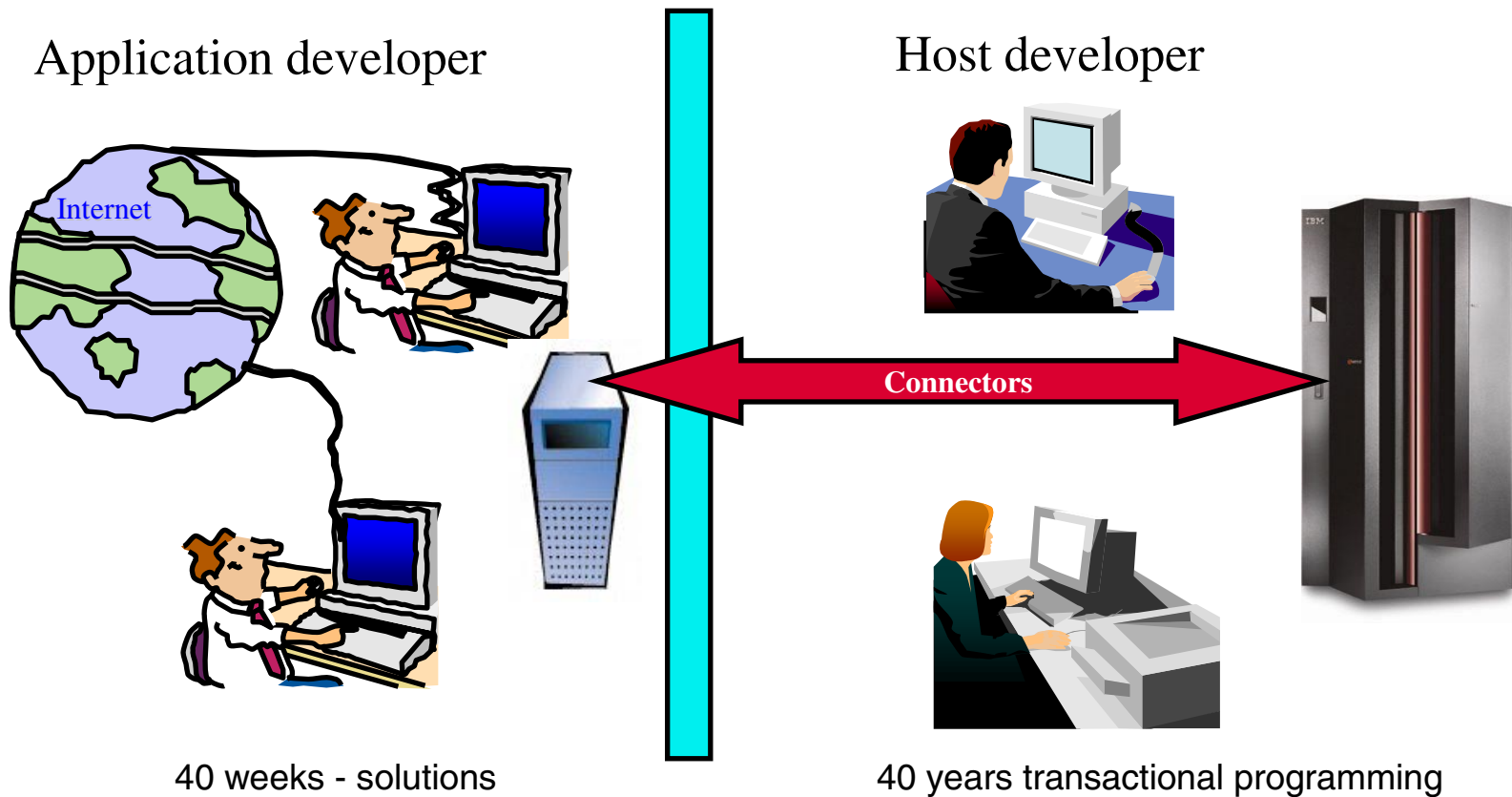
VSE/ESA Version 1 1990

- Constraint Relief
- ESA exploitation

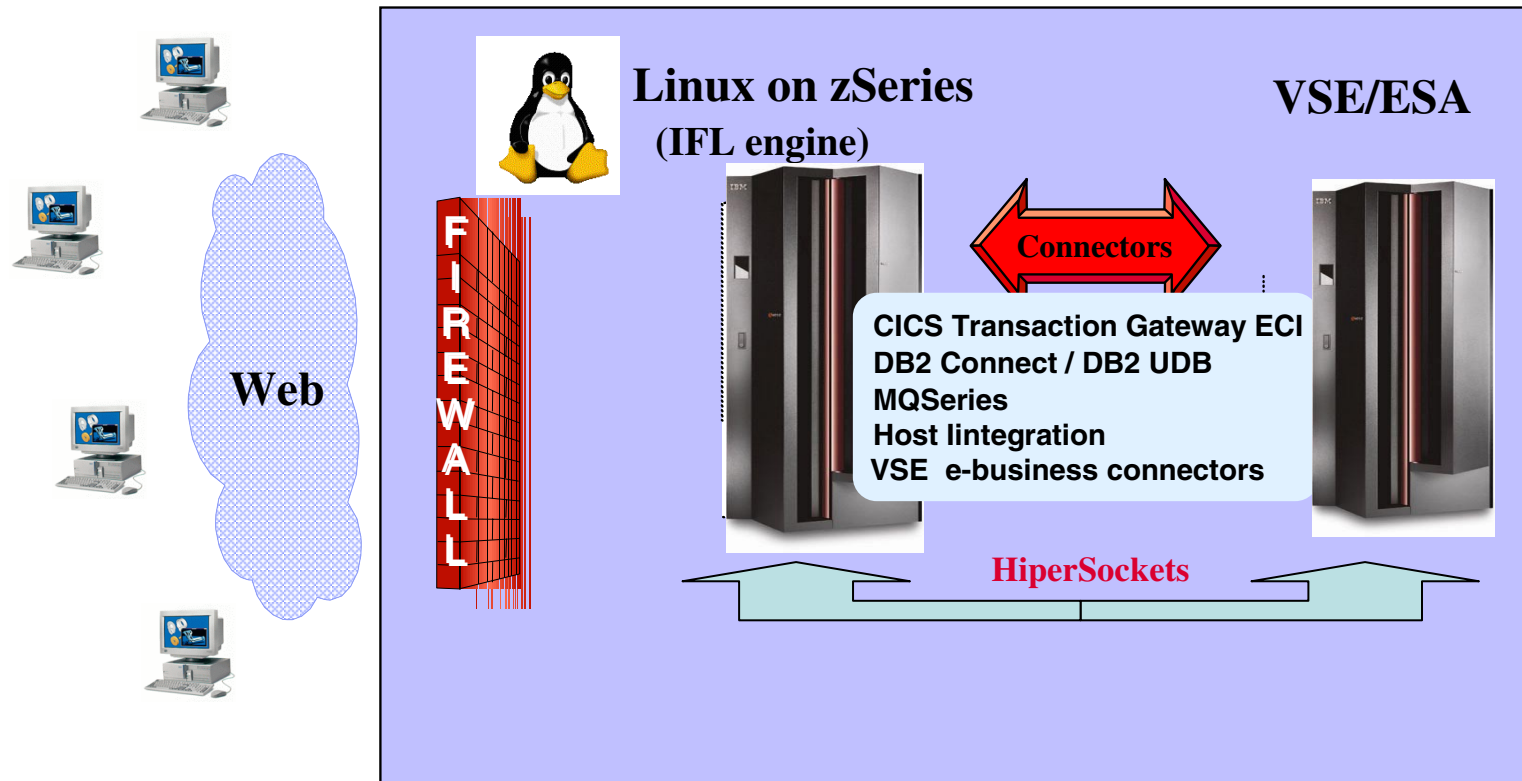


Challenges in today's IT

- ▶ **Two Architectures, two cultures**
one goal – common solution

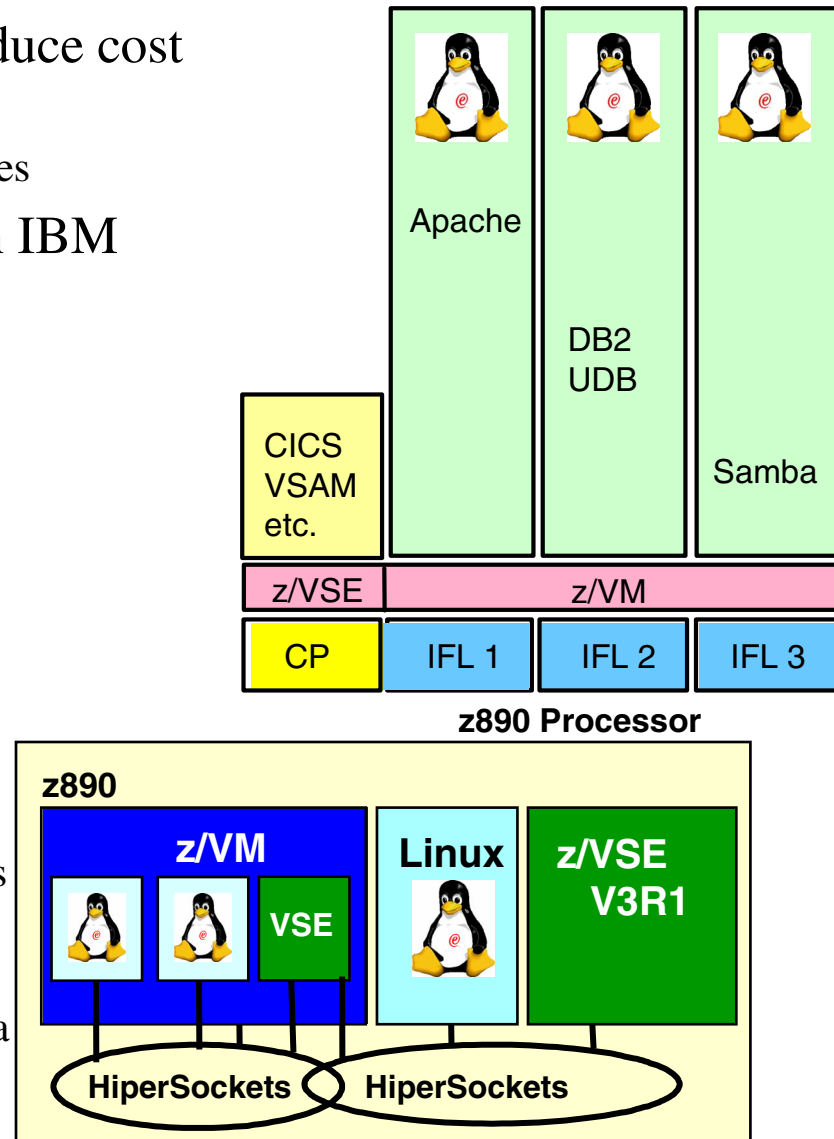


Integration of VSE/ESA with Linux for zSeries

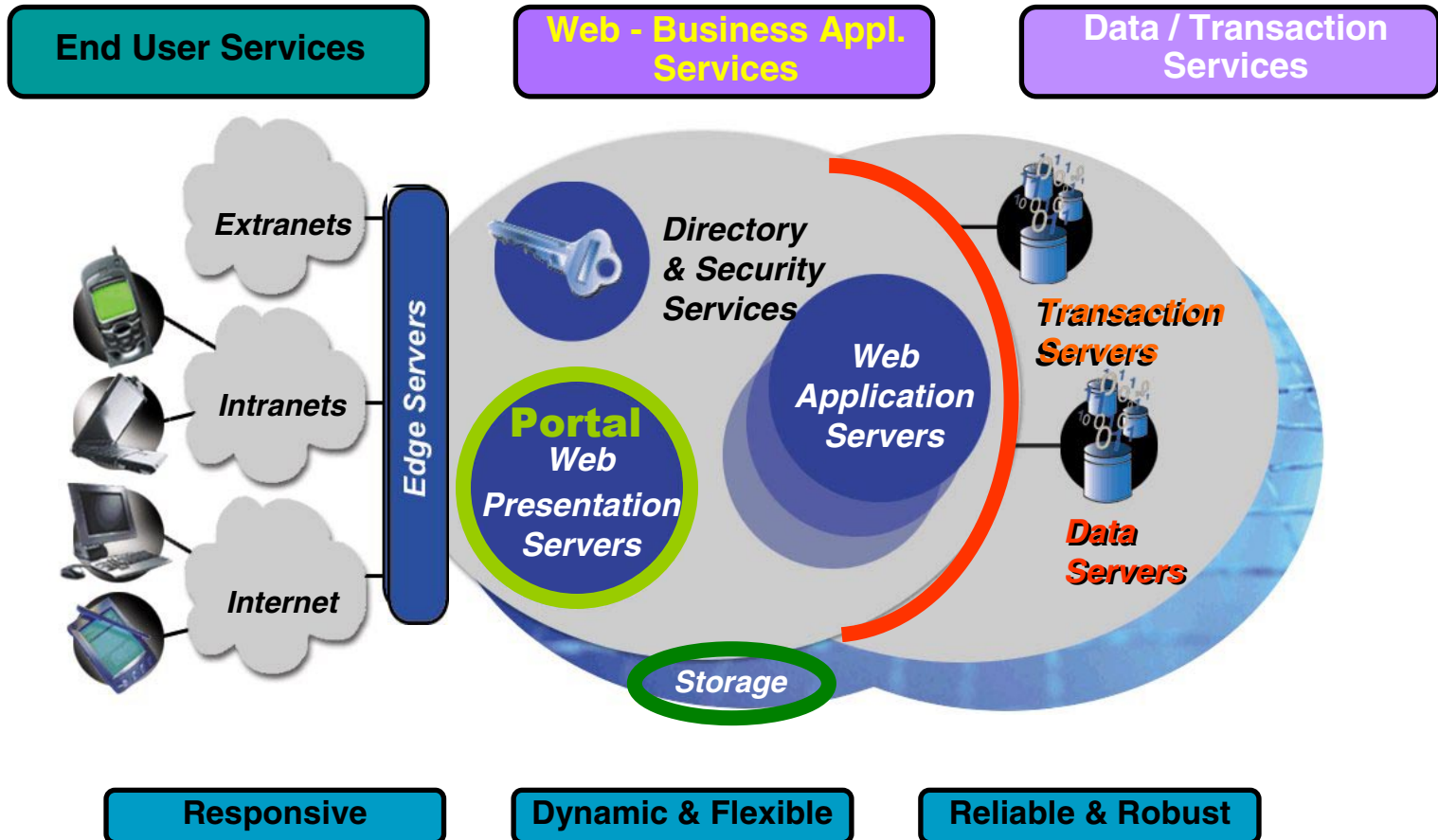


Linux on zSeries – Advantages for VSE Customers

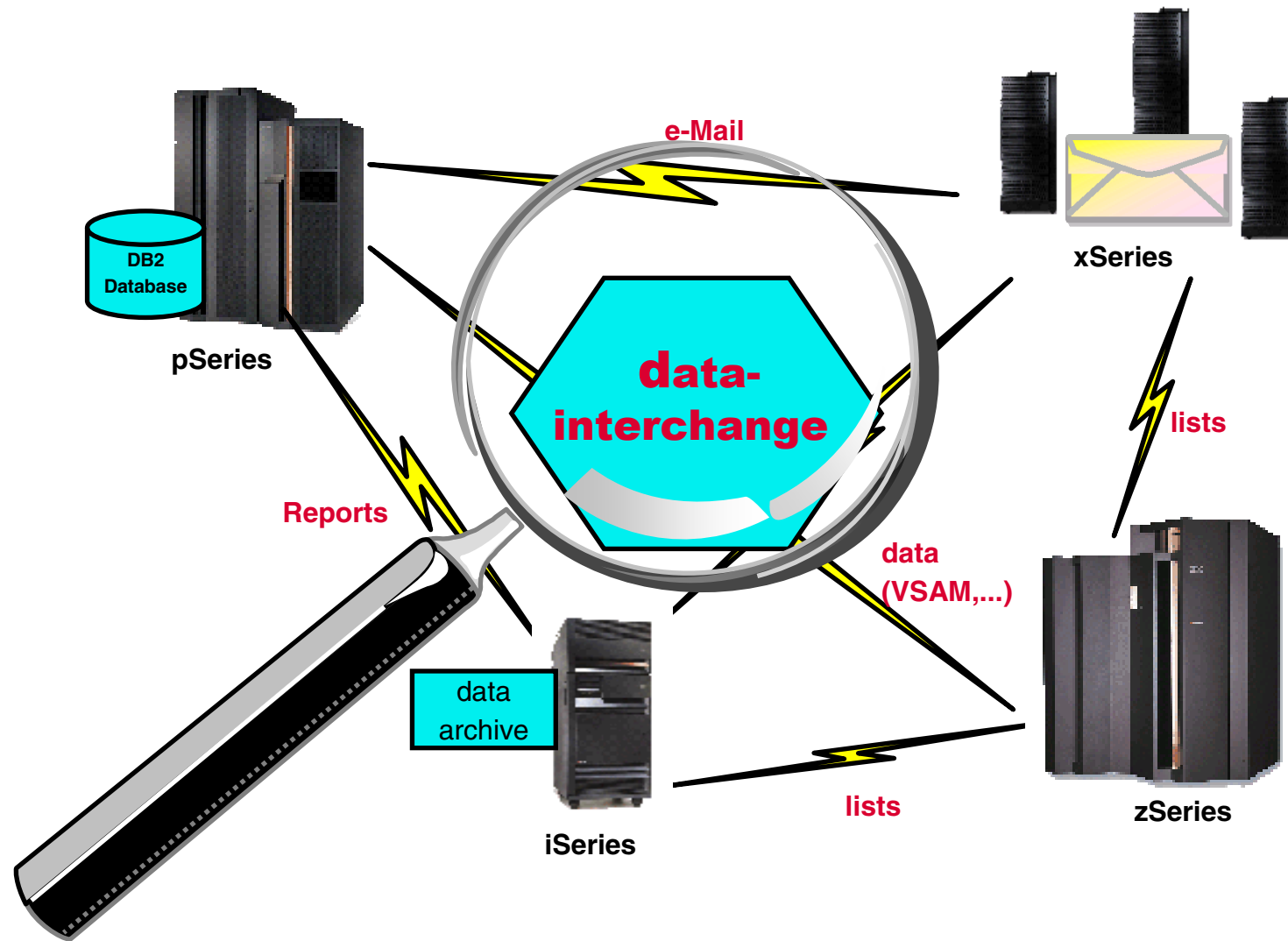
- Infrastructure simplification to help reduce cost
 - Consolidate existing distributed servers
 - Possible TCO benefits of Linux and zSeries
- Linux on zSeries applications based on IBM Middleware
 - WebSphere Application Server
 - DB2 UDB
 - Lotus® Domino™
 - Communications Server
 - Advanced application development tools
- Linux-based open source and/or ISV applications
 - Linux *for* zSeries to exploit zSeries 64-bit capabilities
 - Complement 31-bit core VSE applications
- Integrate Linux and VSE solutions
 - Linux access to VSE applications and data



Infrastructure

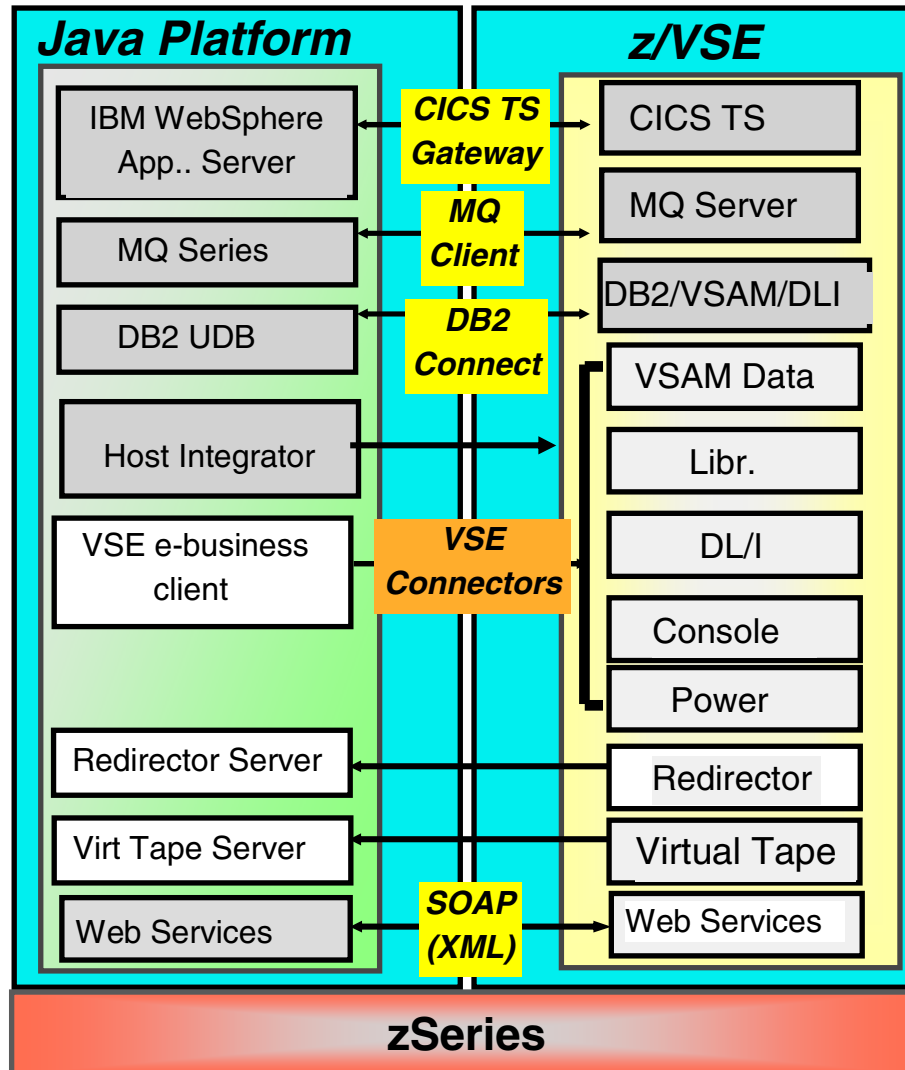


Data interchange – actual need

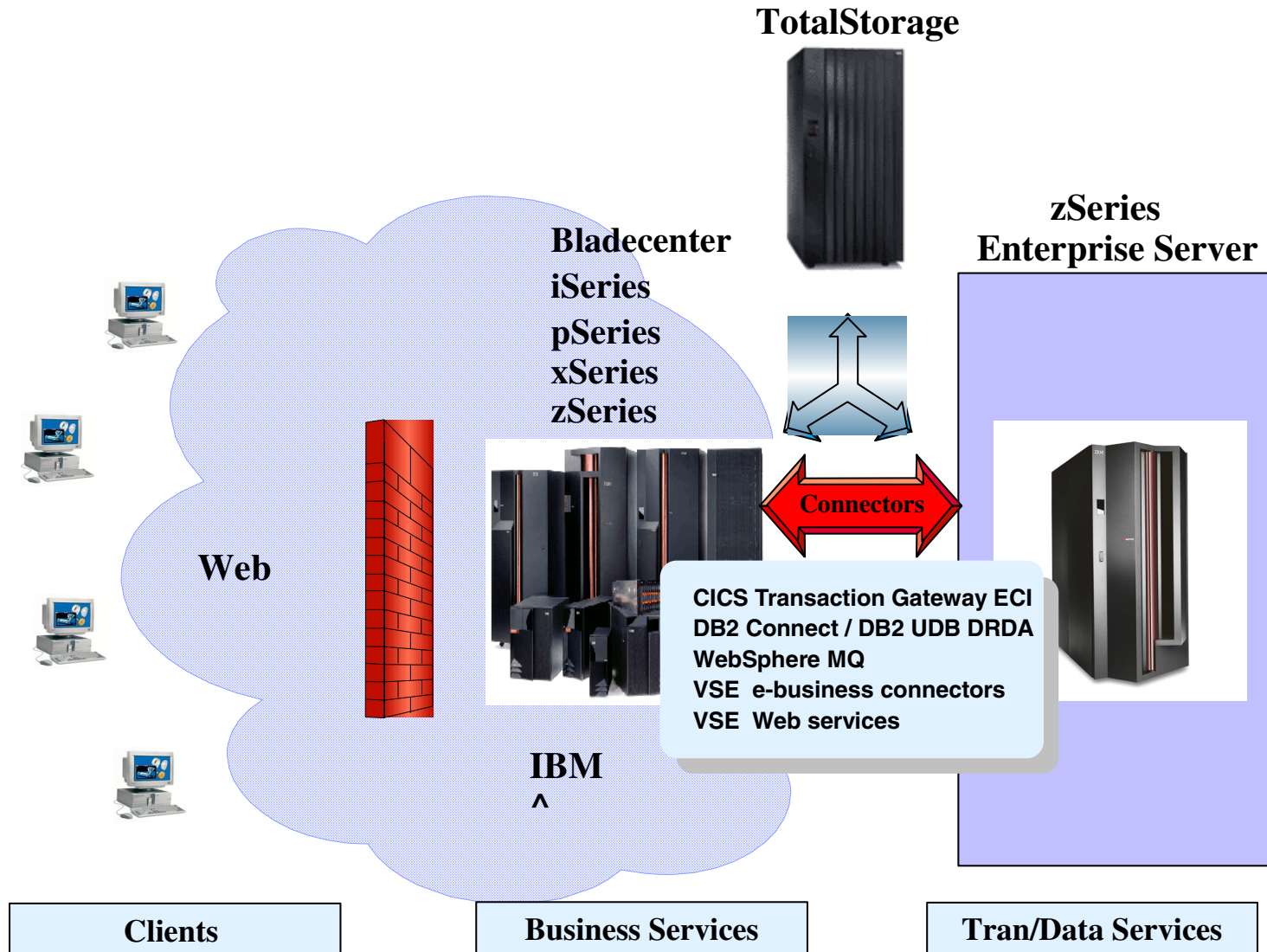


Middleware Relations to z/VSE

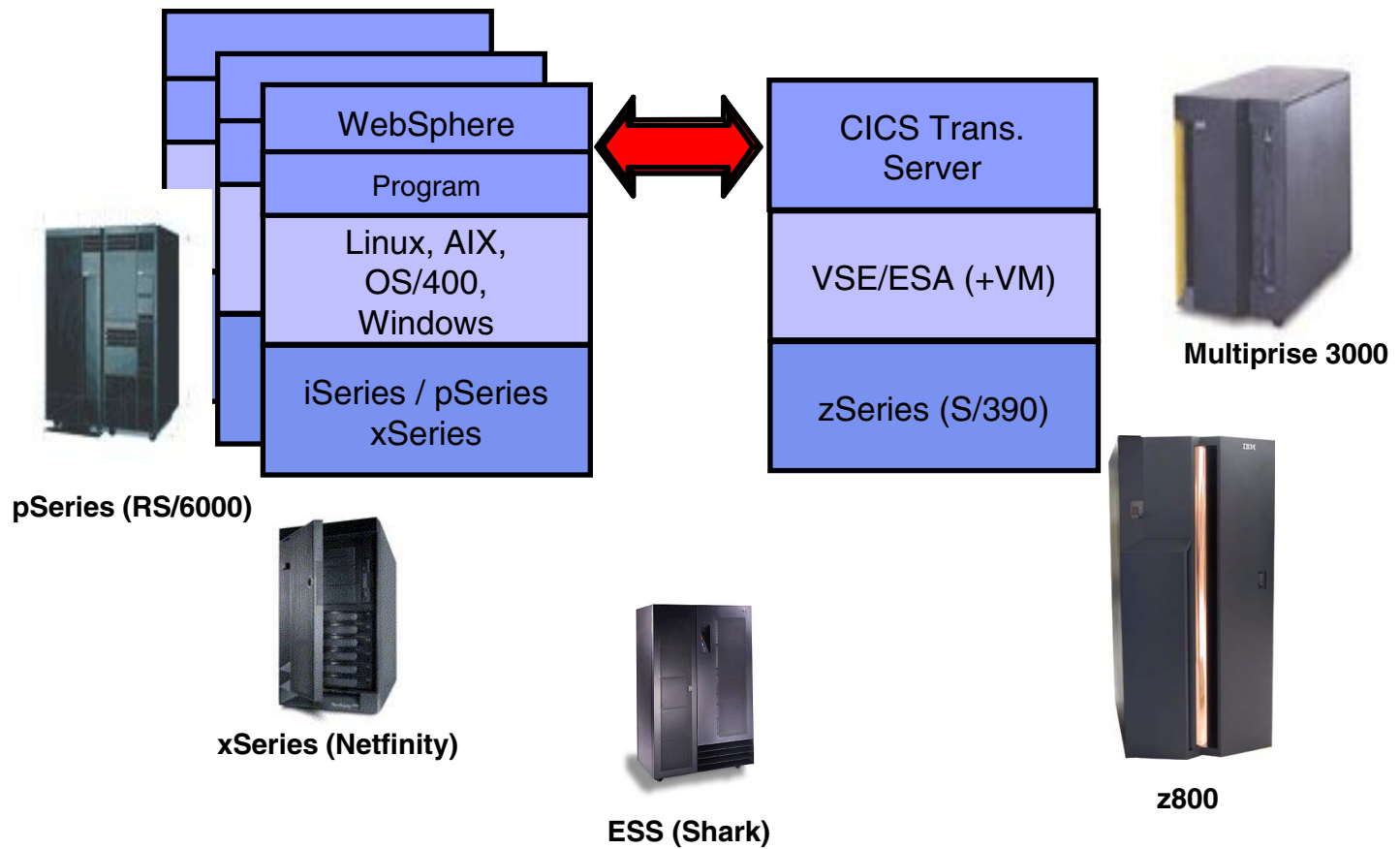
- Modern Applications with Linux on zSeries
- Most modern Technologies interact with VSE Services
- Modernisation of IT Infrastructures using Real-time access to data



VSE's Connector Flexibility

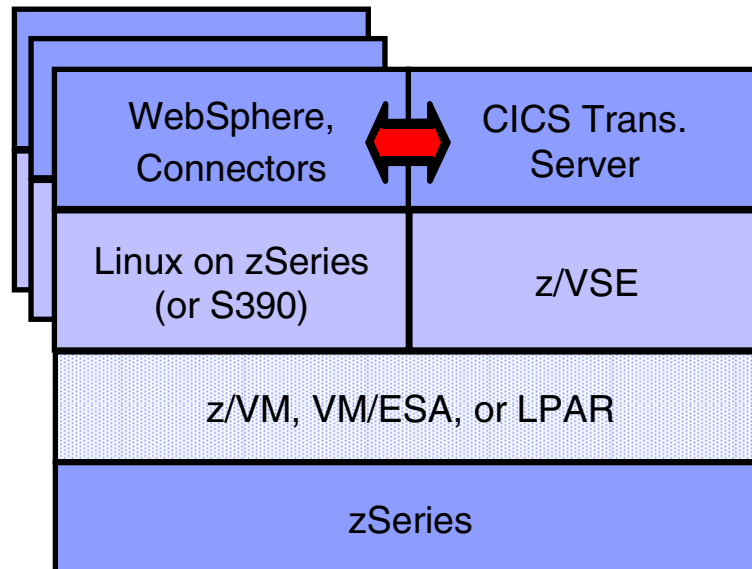


z/VSE Flexibility – in a heterogeneous environment



Linux for zSeries

3-tier logical / 2-tier physical



i.e. Multiprise 3000 or 9672 or zSeries



Methods Data interchange and Optimization of operations

(1) Real-time access to VSE data from remote

(2) Real time VSAM to DB2 synchronization

(3) Application integration

(4) Access VSE applications from the Web

(5) First Steps

Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

(1) Java access to VSAM data from remote

(2) Scripting access to VSE resources

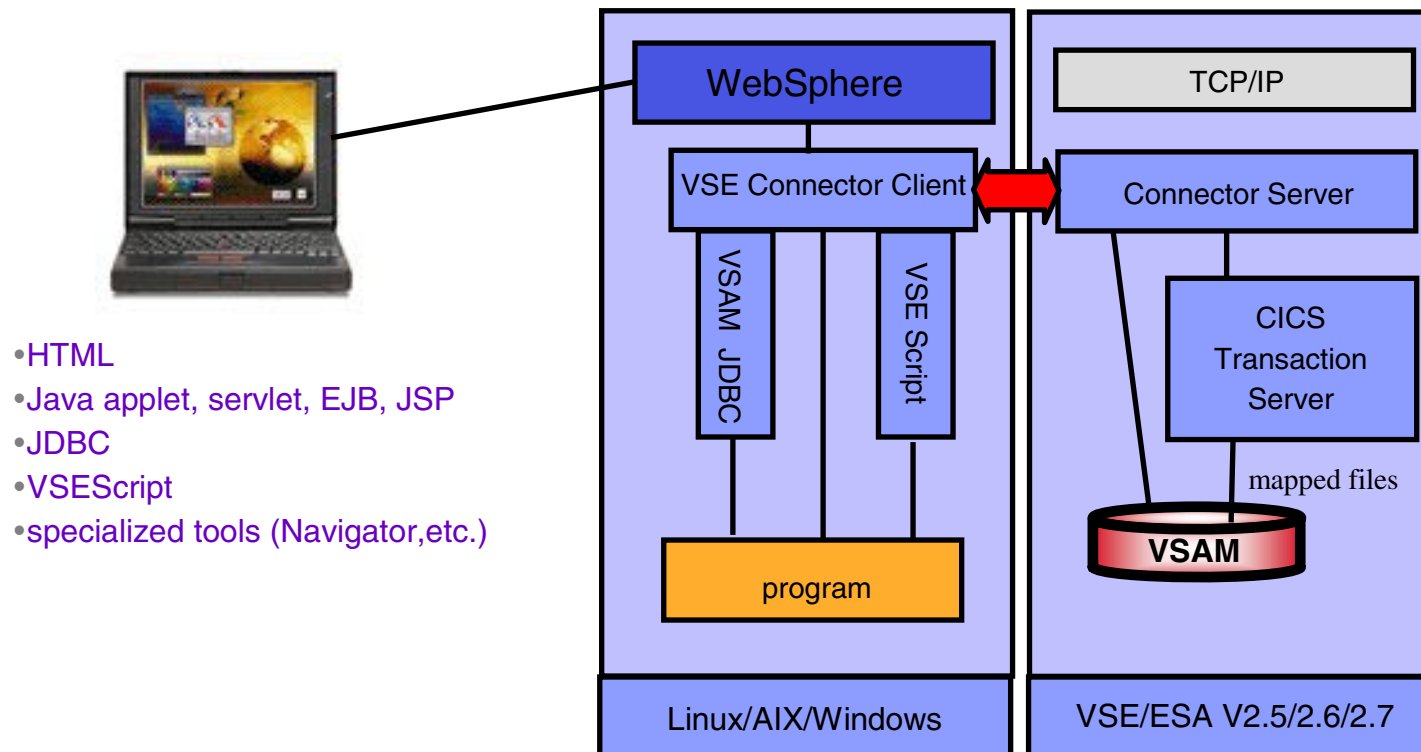
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Real time access to VSAM data from remote systems



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

- ▶ real time access to mapped VSE/VSAM data from remote systems
 - ▶ i.e. READ in batch Mode and UPDATE via CICS
- ▶ samples and descriptions are in VSE Connector client online documentation
- ▶ **Mapping must be done prior to access VSAM data from remote**

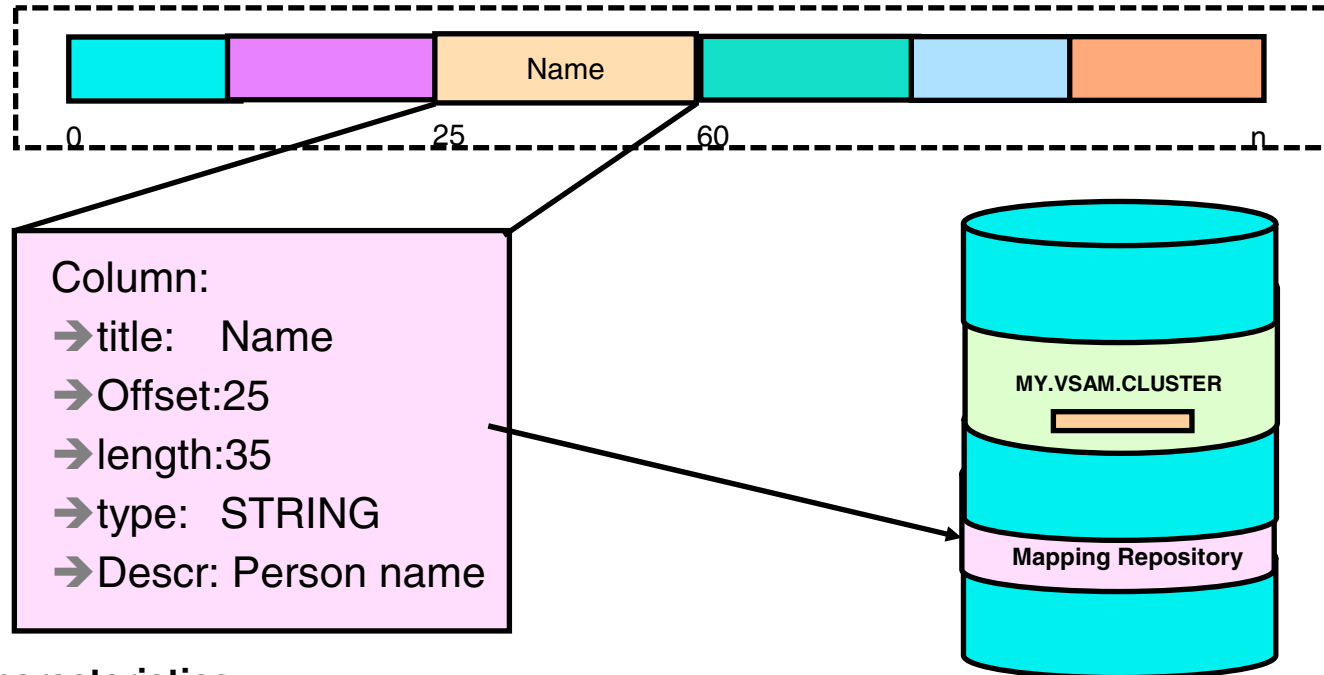
Real time access to VSE data from remote systems

Software Requirements

- ▶ VSE/ESA 2.5-2.7
- ▶ TCP/IP for VSE/ESA
 - ▶ Connector Server – to be started on VSE
 - ▶ Define maps for the VSAM files
(with the standalone **MAPTOOL**, or **IDCAMS RECMAP**, or with a **Java program**, or **VSE Navigator**)
- ▶ Linux (AIX, Windows, any Java environment...)
 - ▶ VSE Connector Client Software on the Client or Requester machine (Java Class Library) – packaged with VSE
 - ▶ Program (In Java or Java callable Programming language) that will work with the data
- ▶ Solution scenarios:
 - ▶ Real-time access to VSE data from Java or Script languages
 - ▶ Web Applications (WebSphere)
 - ▶ Servlets, EJBs, JSPs, Applets, ...
 - ▶ Standalone Programs (Tools)
 - ▶ VSE Navigator, Tool, JConVSE, ...

VSAM Record Mapping

VSE/VSAM Record structure from EMPPROG.COBOL



Mapping characteristics:

- ▶ No changes to VSAM data
- ▶ Mapping information stored in a repository in VSAM (VSE.VSAM.MAPPING.DEFS)
- ▶ Possible data types: **STRING**, binary, signed number, unsigned number, packed data
- ▶ Multiple maps and views (subset of map fields) supported

Accessing VSAM data from remote systems using VSAM JDBC Driver

- Based on VSE Connector Client
- Translates SQL into VSE/VSAM calls
- Standard JDBC API
- Requires VSAM Record Mapping

Access VSAM via batch interface - read / (or SHAREOPTION 4 for write)

```
SELECT NAME,STREET,CITY FROM  
MY.USER.CATALOG\MY.VSAM.CLISTER\MY_MAP  
WHERE PERSNR=4711  
ORDER BY NAME
```

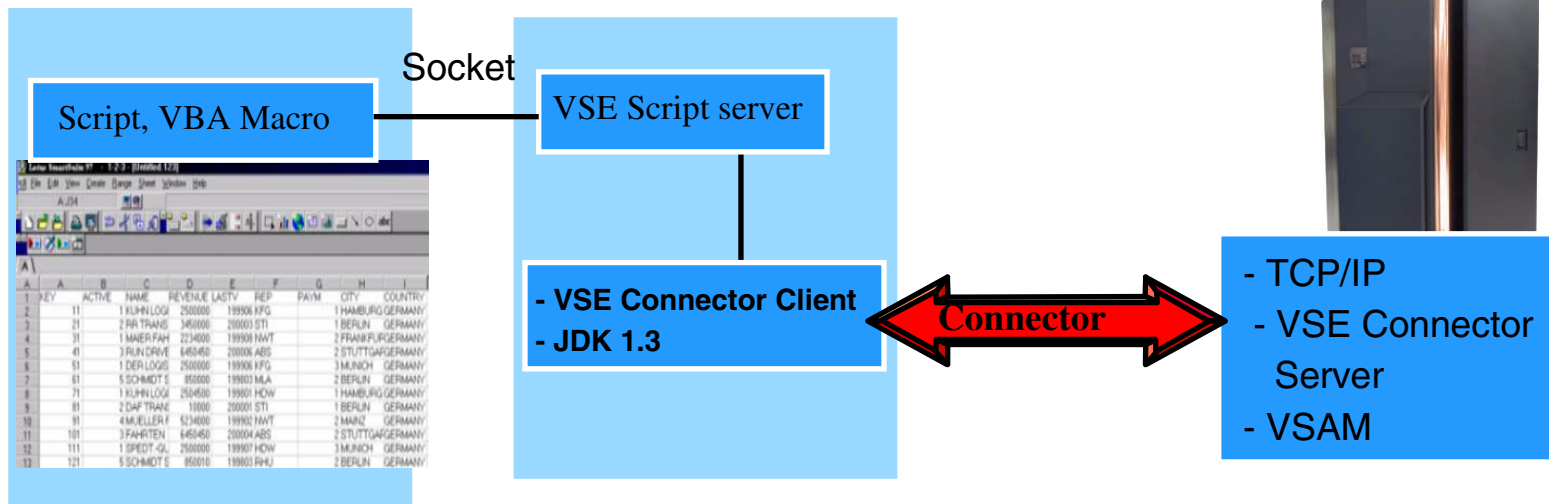
Access VSAM via CICS (DBDCCICS) – read/write

```
SELECT NAME,STREET,CITY FROM  
#VSAM.#CICS.DBDCCICS\CLUNAME\MY_MAP  
WHERE PERSNR=4711  
ORDER BY NAME
```

Accessing VSAM data from remote systems using non-Java methods, scripts

VSE/ESA 2.7

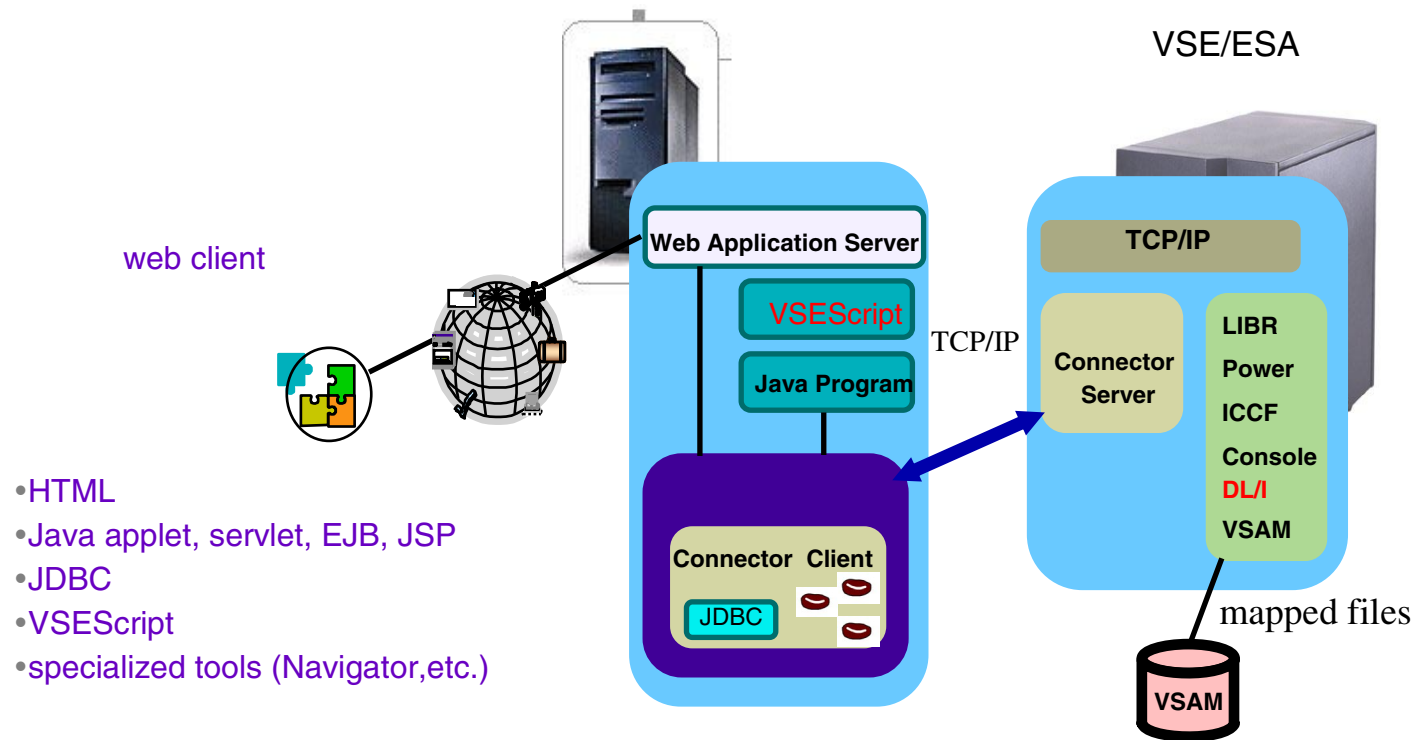
Enduser view



Advantages:

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

Real time access to VSE – Java –Based Connector



- ▶ real time access to VSE resources from remote systems
- ▶ new possibilities for leveraging VSE/ESA investment

Hands-On Lab on Tuesday 9:00 AM (E11 – Franciscan C/D Lab Room)

Methods Data interchange and Optimization of operations

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Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

(2) Real time VSAM to DB2 synchronization

a) MQ Exit and MQ Series solutions

b) Capture Exit and Incremental FTP

(3) Application integration

(4) Access VSE applications from the Web

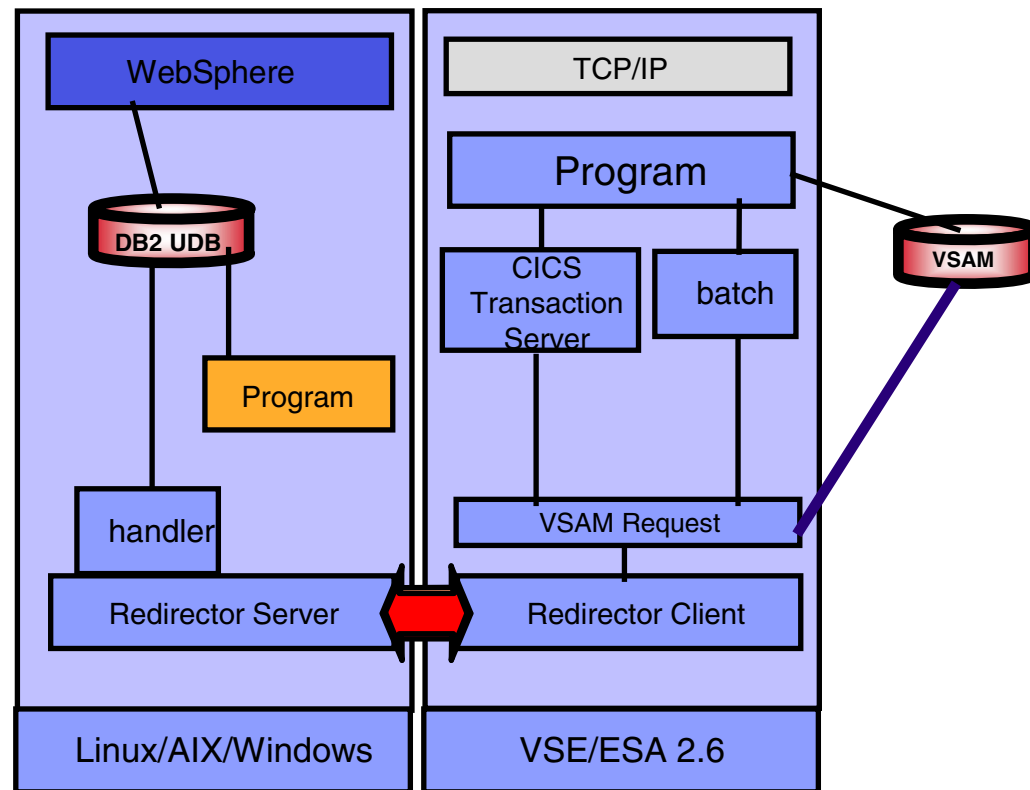
(5) First Steps

Data propagation / synchronization from VSE

VSE/VSAM Redirector

► Existing applications transparently access remote data

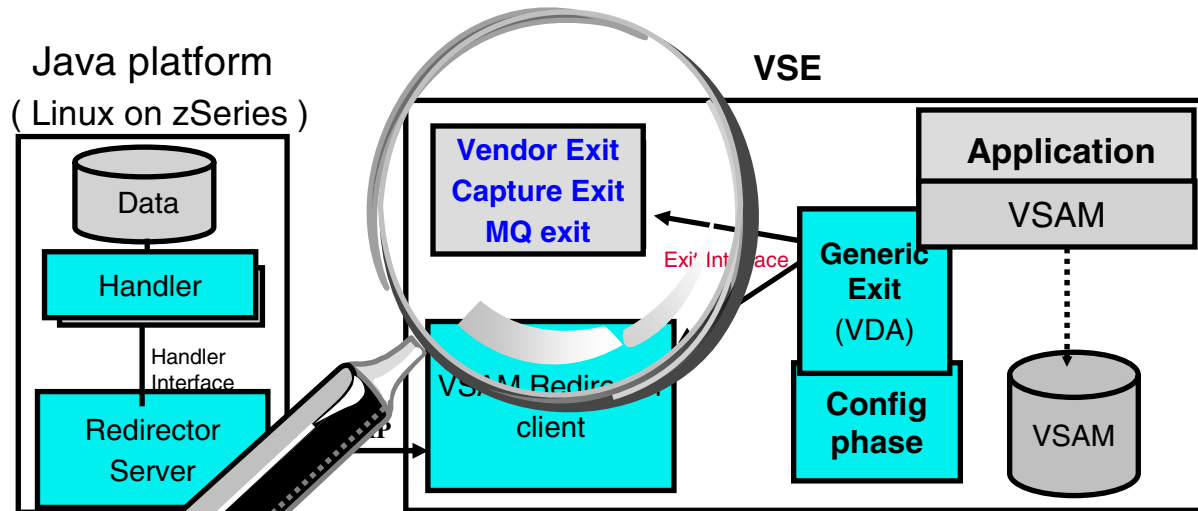
► No changes to the existing VSE applications



- Applications on VSE should be able to access DB2 data on Linux
- Synchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
(VSAM Redirector is part of VSE/ESA 2.6/2.7)

VSE/VSAM Redirector - Components

Vendor Exit



Vendor Exit

- ▶ user (vendor) written phase for data collection/transformation
- ▶ has to comply with the documented **Exit Interface**

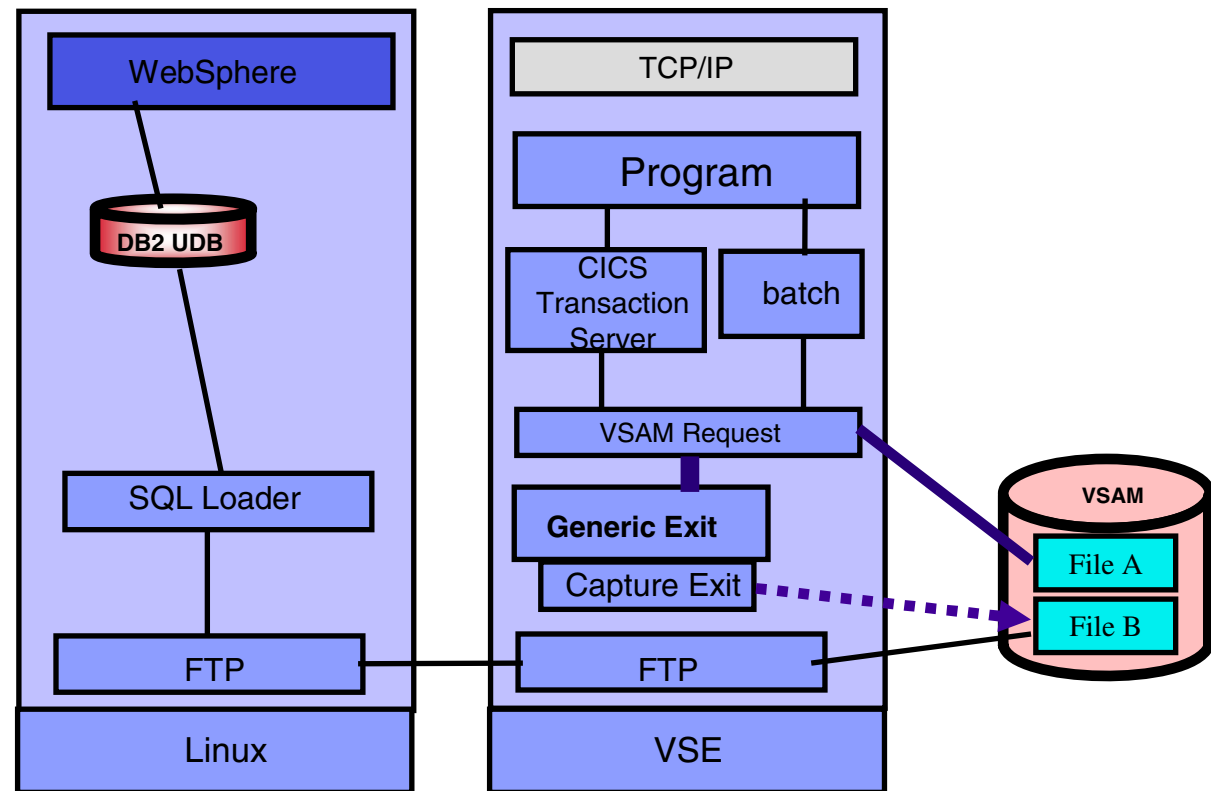
Note: No chaining of Vendor Exit with VSAM Redirector client supported

Capture Exit

Incremental data interchange / backup

Reduce network traffic, save time

- ▶ accumulation of changes of a file
- ▶ Incremental processing
- ▶ Transparent Journaling of data changes

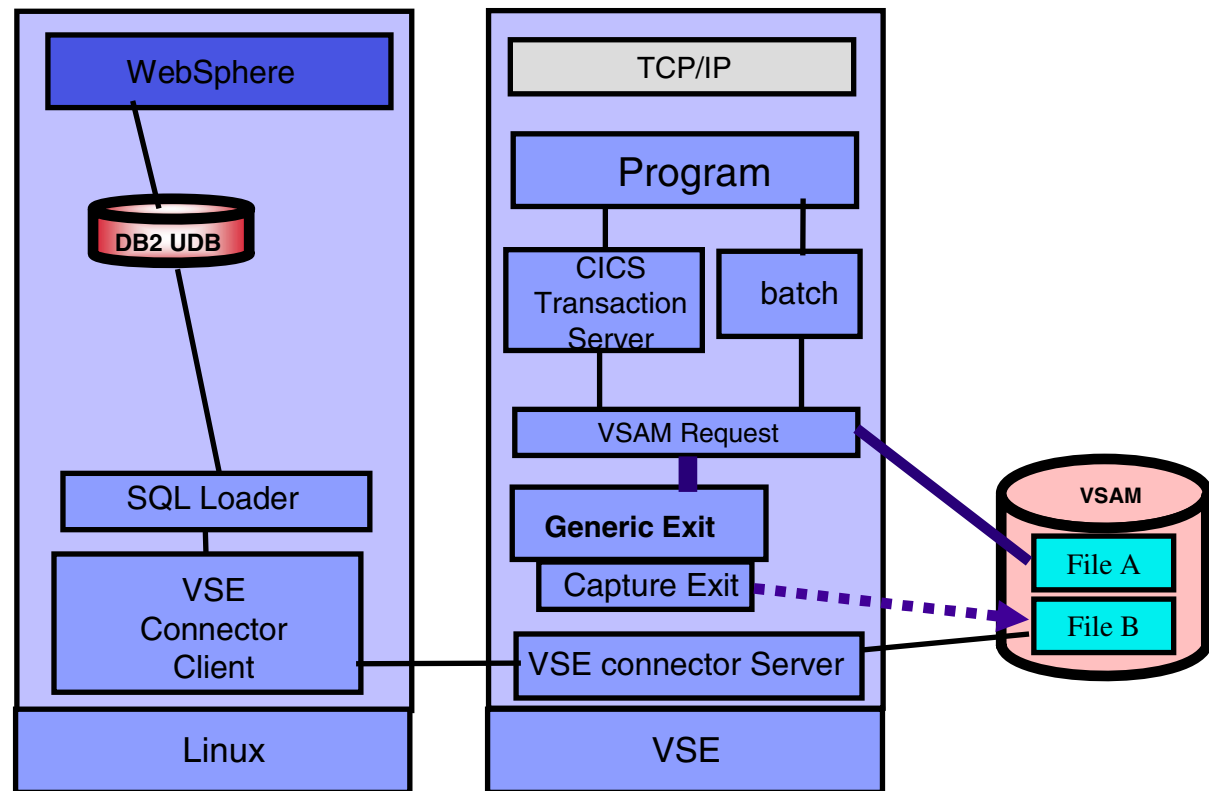


- ▶ Collect the changed records in a separate VSAM file
 - ▶ Possibility of cleansing
- ▶ FTP – as before, with a much smaller file
 - ▶ (The VSAM Redirector is part of VSE/ESA 2.6 and newer)

Capture Exit

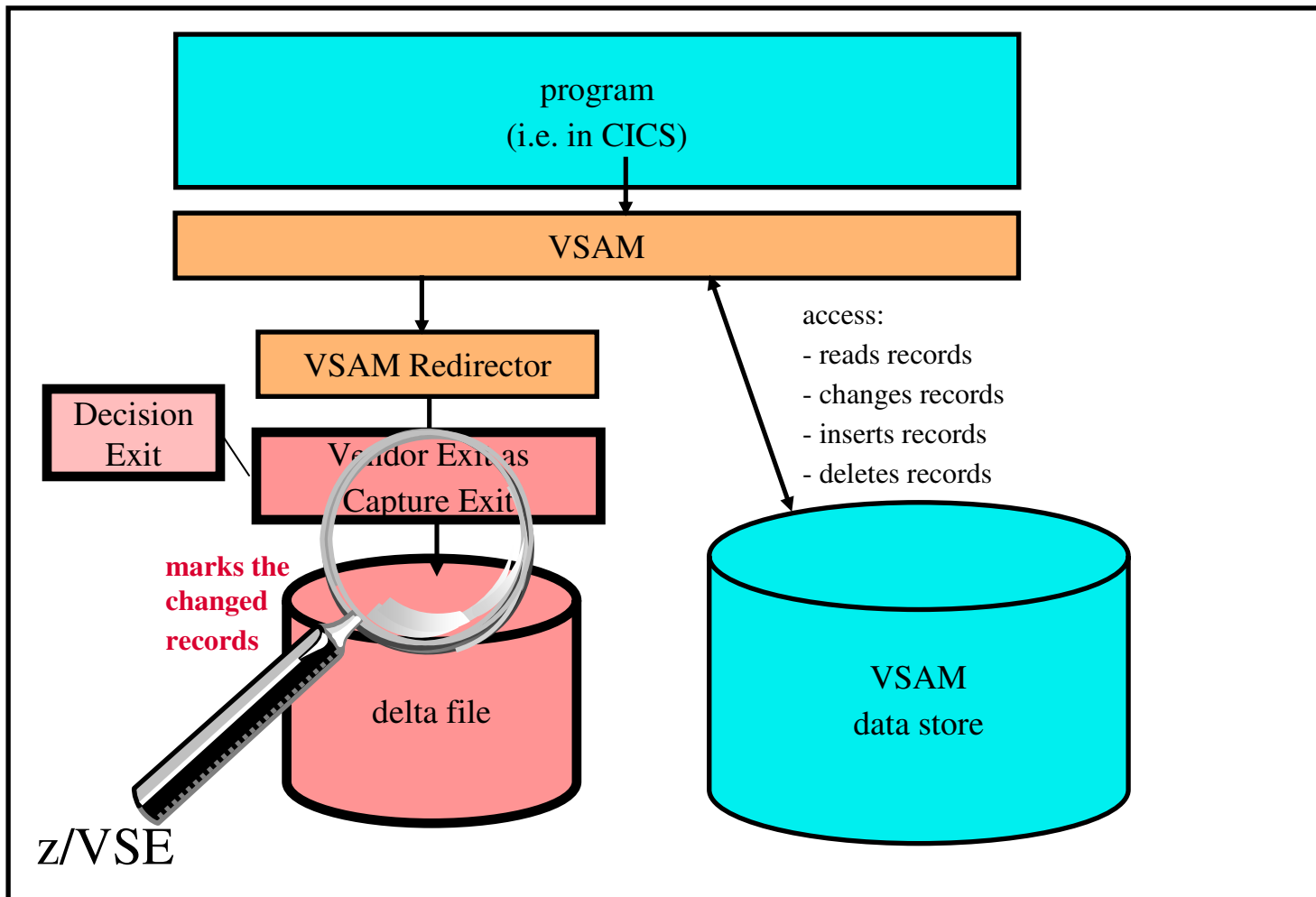
Asynchronous data pull from remote Reduce network traffic, save time

- ▶ accumulation of changes of a file
- ▶ Incremental processing
- ▶ Transparent Journaling of data changes



- ▶ Collect the changed records in a separate VSAM file
 - ▶ Possibility of cleansing
- ▶ Connector reads data and inserts them into a database
 - ▶ (The VSAM Redirector is part of VSE/ESA 2.6 and newer)

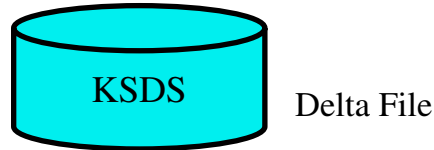
Technical look



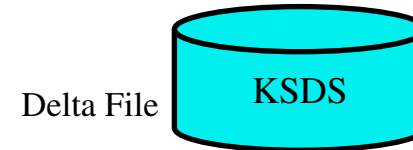
Journaling

or

cumulative



Rekord 1	inserted
Rekord 2	inserted
Rekord 3	inserted
Rekord 2	updated
Rekord 1	deleted
Rekord 3	updated
Rekord 4	inserted
Rekord 1	inserted
Rekord 2	updated
Rekord 4	updated
Rekord 4	deleted



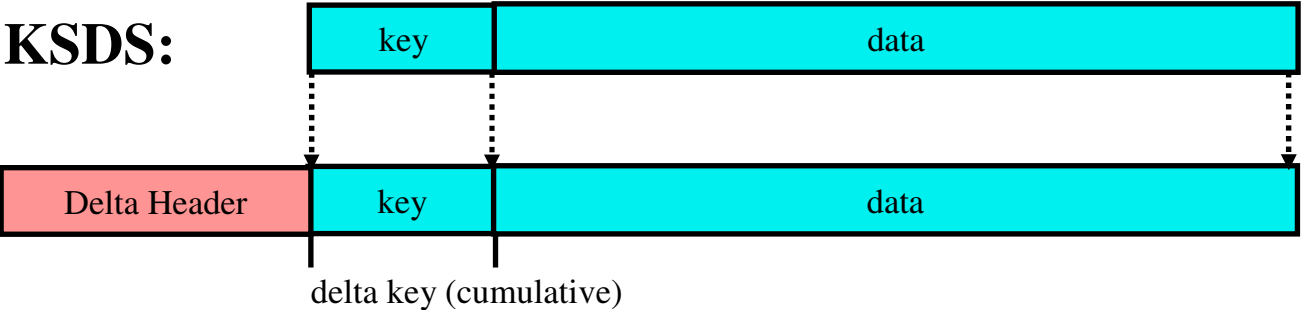
key

Rekord 1	inserted
Rekord 2	updated
Rekord 3	updated
Rekord 4	deleted

► The last version only of a changed VSAM record is stored into the delta file



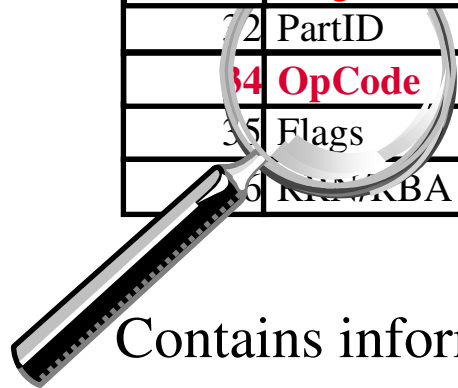
Delta Record



Delta Header (28/32 Bytes)



Offset	Parameters	Length	Description
0	TODCLOCK	8	Time of change
8	JobName	8	Job name
16	PHASEName	8	Phase name
24	Origin	8	String from Config or file Label
32	PartID	2	Partition ID (i.e. F2)
34	OpCode	1	I=Insert, D=Delete, U=Update
35	Flags	1	X'01'=RRN/RBA follows
36	RRN/RBA	4	RRN/RBA (RRDS/VRDS/ESDS)



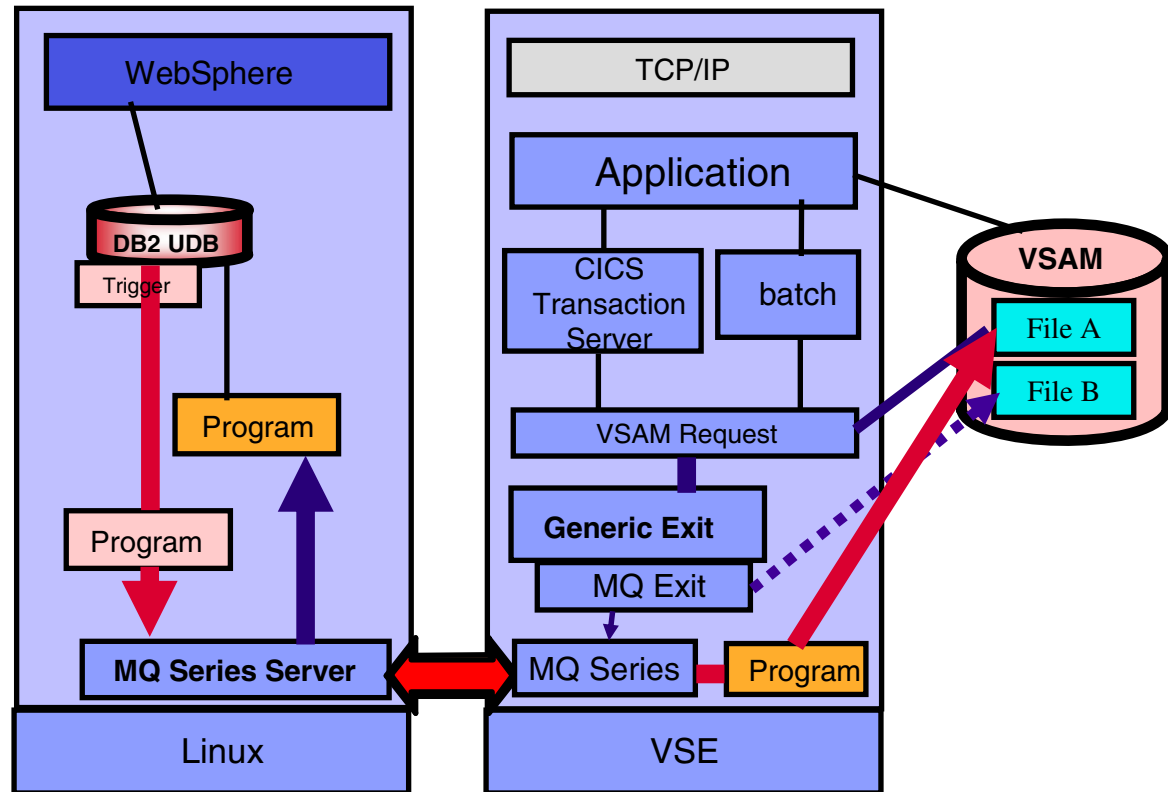
Contains information about:

- **when** changes took place (TODCLOCK)
- **who** did the changes (Job/Phase/Partition)
- **request type** of change (Insert/Delete/Update)
- **which record** was affected (key/RRN/RBA)

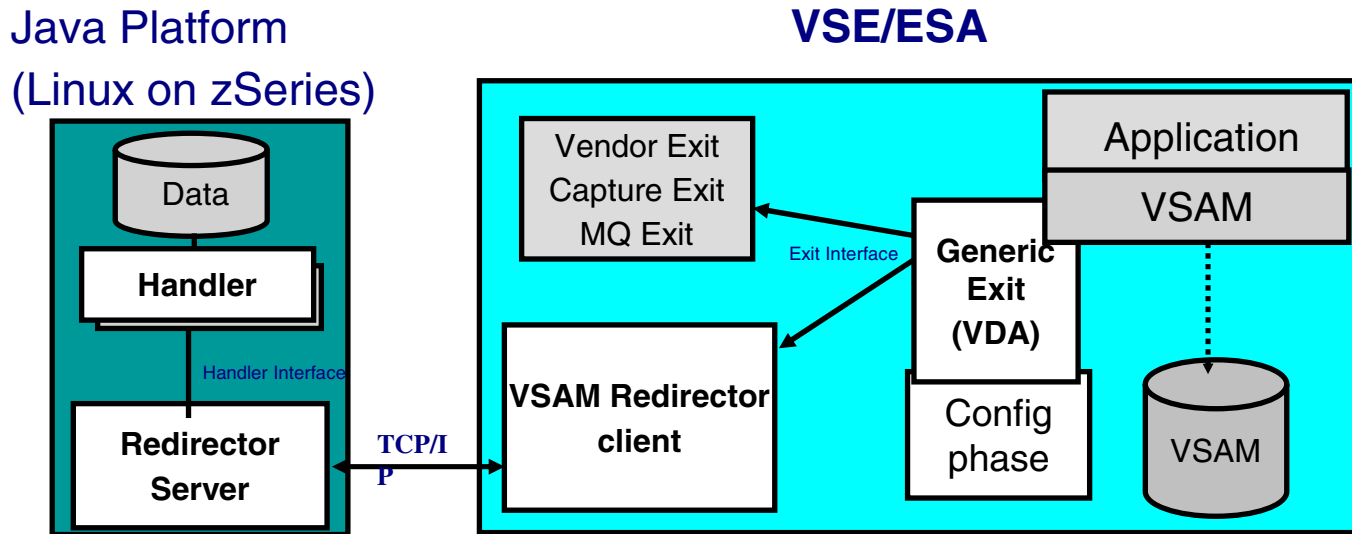
MQ Exit

Integration of VSE Application with MQ Series

- ▶ enablement for MQ Series w/o changing existing applications.
- ▶ Bidirectional processing
- ▶ Guaranteed processing using asynchronous data transfer method MQ



VSAM Redirector – functional view



Catalog	Cluster	Exit	Owner	IP	Port	handler-name	option-string
MY.USER.CAT	MY.VSAM.FILE	IESREDIR	VSAM	10.0.0.1	4711	DB2Handler	user=xxx,pw=xxx,...
MY.USER.CAT	MY.RD.FILE	IESREDIR	REDIR	9.164.155.2	4711	DB2Handlernam	user=xxx,pw=xxx,...
VSESP.U.CAT	TEST.CLUST2	VENDOREX	n/a	n/a	n/a	n/a	n/a

A mechanism for VSE programs working with VSAM data:

- ☞ gain transparent access to remote data (from batch or CICS applications)
- ☞ synchronize VSAM files with remote data stores
- ☞ without any changes to VSE programs

Hands-On Lab on Tuesday 10:35 AM (E12 – Franciscan C/D Lab Room)

Transparent access from VSE programs to remote systems and data

Software requirements

- ▶ For VSE/ESA :
 - ▶ VSE/ESA 2.6/2.7
 - ▶ enable VSAM Redirector function
 - ▶ Vendor Exit phase if local processing used
 - ▶ Enable the redirection of VSAM Cluster to remote

- ▶ On remote system
 - ▶ Java environment
 - ▶ Redirector server (delivered with VSE)
 - ▶ Setup of a Handler – responsible for data manipulation

Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

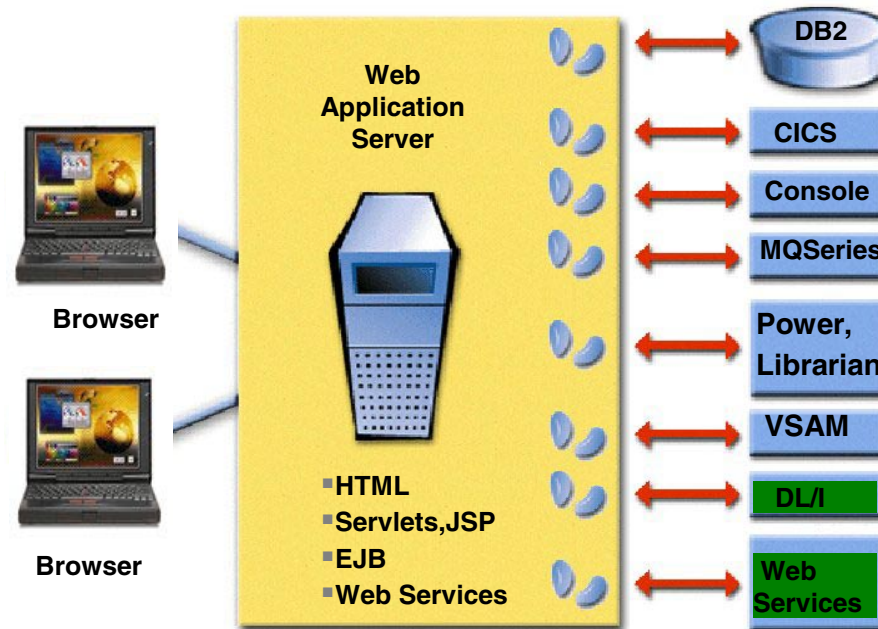
(2) Real time VSAM to DB2 synchronization

(3) Access VSE applications from the Web

(4) Application integration

(5) First Steps

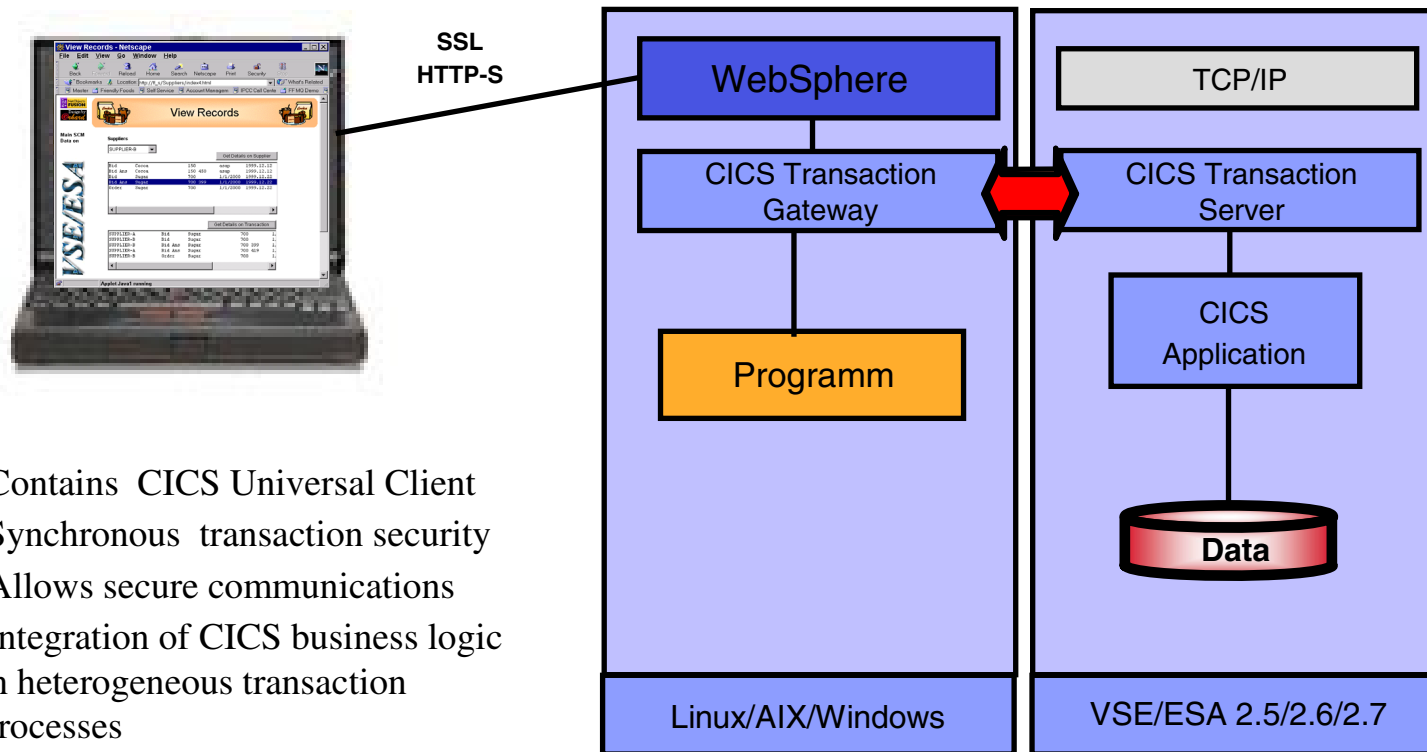
(2) Web Transaction processing (using the Websphere Software Platform and Connectors for VSE)



- ▶ Enable the access to core applications with web technologies
- ▶ No change to the core applications required
- ▶ Consistent development interfaces (Java based)

Integration of VSE/ESA transaction processes

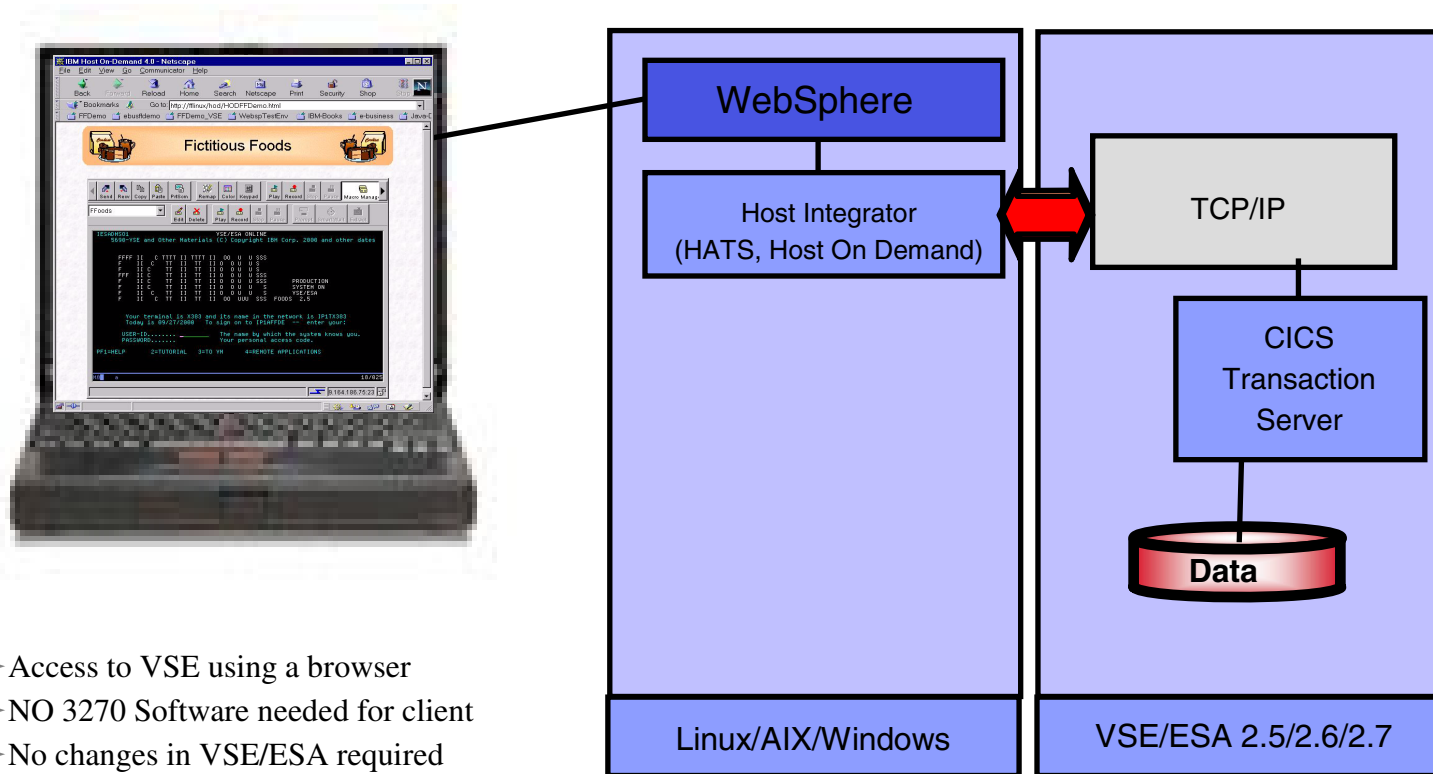
IBM CICS Transaction Gateway



Hands-On Lab on Wednesday 9:00 AM (E13 – Franciscan C/D Lab Room)

General access to VSE/ESA via browser

Host Access transformation Server (HATS)
and Host on Demand



- ▶ Access to VSE using a browser
- ▶ NO 3270 Software needed for client
- ▶ No changes in VSE/ESA required

NEW!: Available for Linux for zSeries

Interaction with VSE/ESA via browser using (HATS)

The screenshot displays a web browser window (Microsoft Internet Explorer) showing the JK Enterprises website. The browser address bar indicates the URL is `http://localhost:8080/isesied//hats`. The website features a navigation menu with links for Home, Site Map, Employees, Jobs at JK Enterprises, Press Articles, and Support. The main content area includes an "Inventory Table" with a corresponding "Inventory Graph" (a bar chart) and a "Delivery Schedule" for August 2002. The terminal window on the left shows a list of menu items and their corresponding line numbers, along with a "Exit" button.

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

August 2002						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Current Order	Quantity	Image
Catcher's mit	10	<input type="button" value="Photo"/>
Baseball bat	20	<input type="button" value="Photo"/>
Football	10	<input type="button" value="Photo"/>
Basketball	10	<input type="button" value="Photo"/>

Host Access Transformation Server

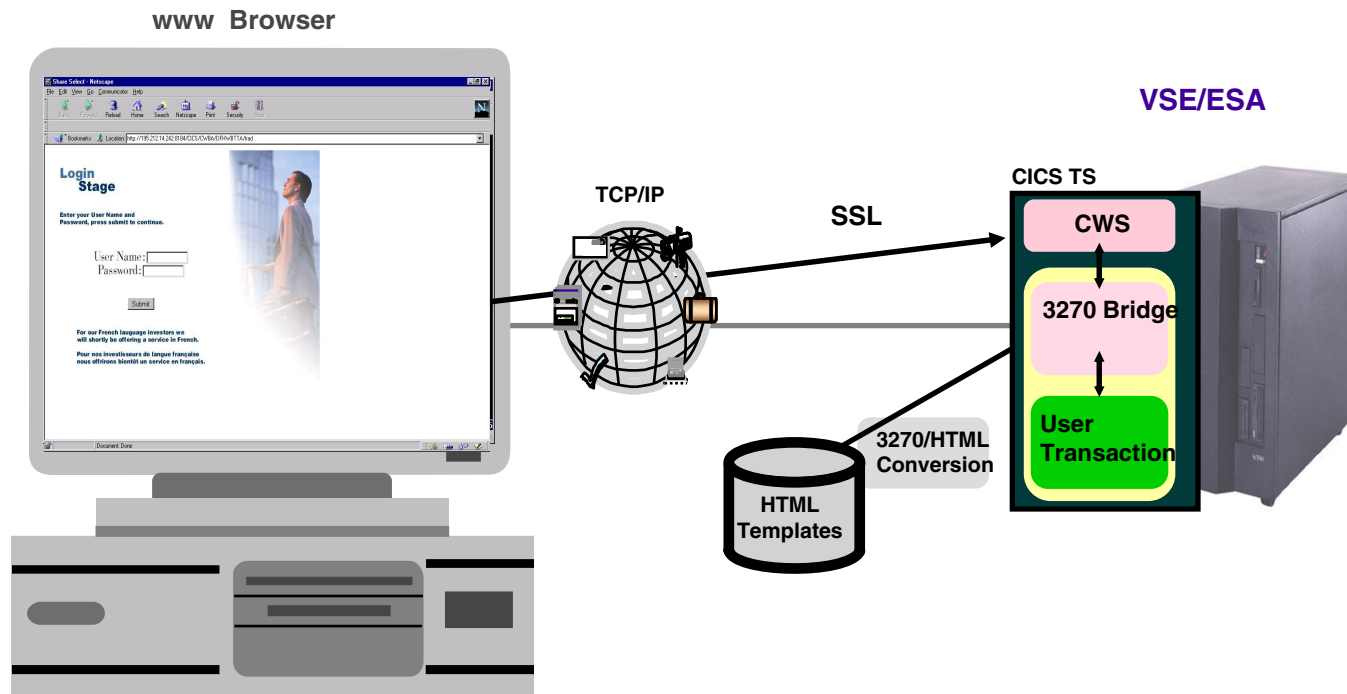
- functional characteristics
 - ▶ access to VSE/ESA via browser
 - ▶ the access is similar with a local access via 3270 emulator
 - ▶ can be used in Intranet or Internet and /or
 - ▶ integrated with WebSphere Application Server
 - ▶ support for secured connections (SSL) to the HostOnDemand Server and a redirector to mask the real IP addresses
 - ▶ Host Access Transformation Server – for 3270 screen scraping
 - ▶ Host Publisher - a bean generator to create the Java Beans (Integration Objects), to provide legacy access for new Web applications.

- Requirements
 - ▶ WebSphere Host Integration products on middle tier
 - ▶ NO additional software on VSE/ESA required

Benefit: Easily extend existing applications to the web

Direct access to VSE/ESA transactions via browser

IBM CICS Web Support - Components



- ▶ direct access to VSE/ESA transactions via web Browser
- ▶ Without the need of a web server on VSE/ESA

Hands-On Lab on Wednesday 9:00 AM (E13 – Franciscan C/D Lab Room)

IBM CICS Web Support

- functional characteristics
 - ▶ direct access to VSE CICS transactions via a simple web browser
 - ▶ transaction security for the called transaction
 - ▶ secured connections (SSL) with VSE/ESA 2.6

- requirements
 - ▶ VSE/ESA 2.5 and higher

Methods Data interchange and Optimization of operations

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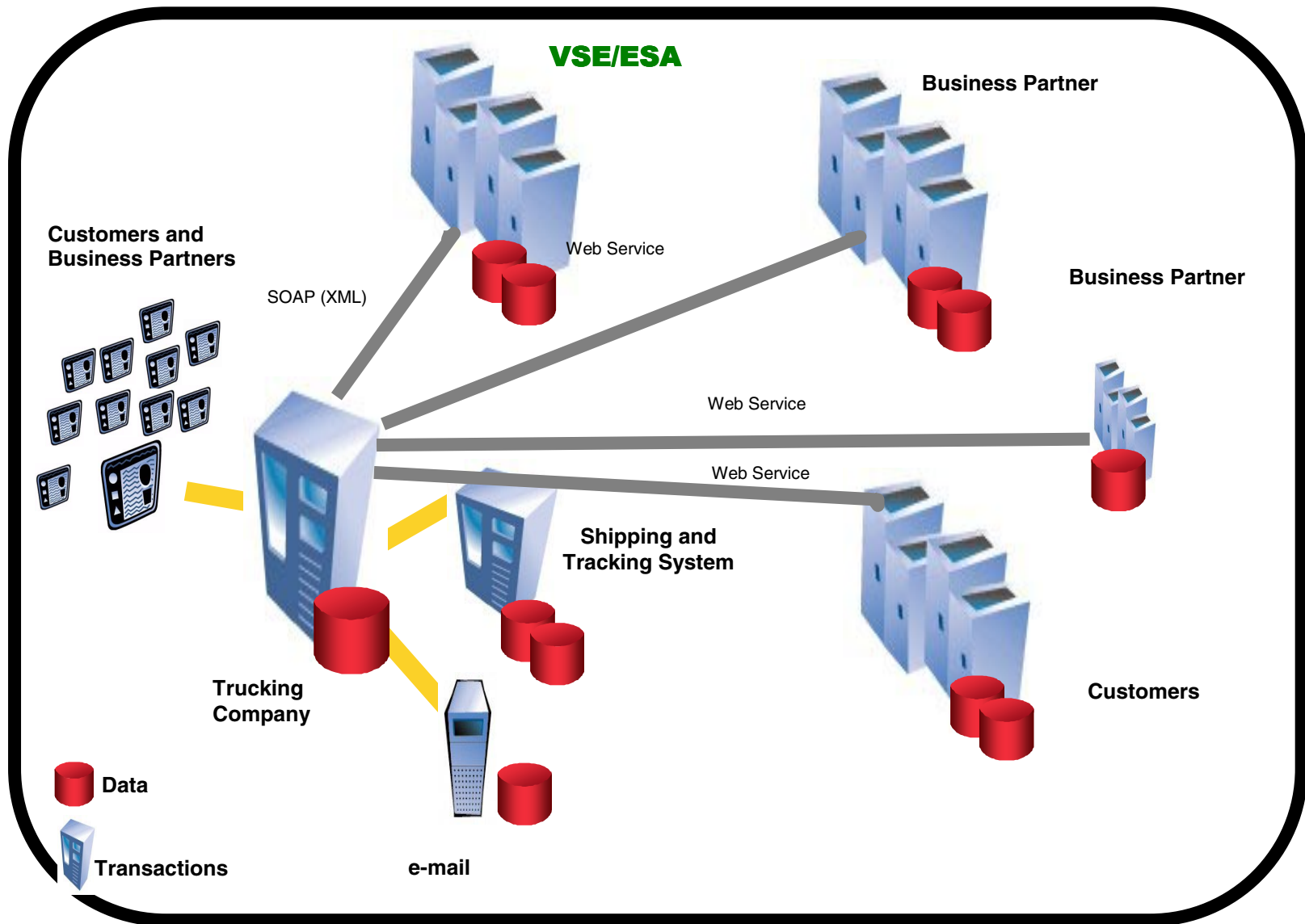
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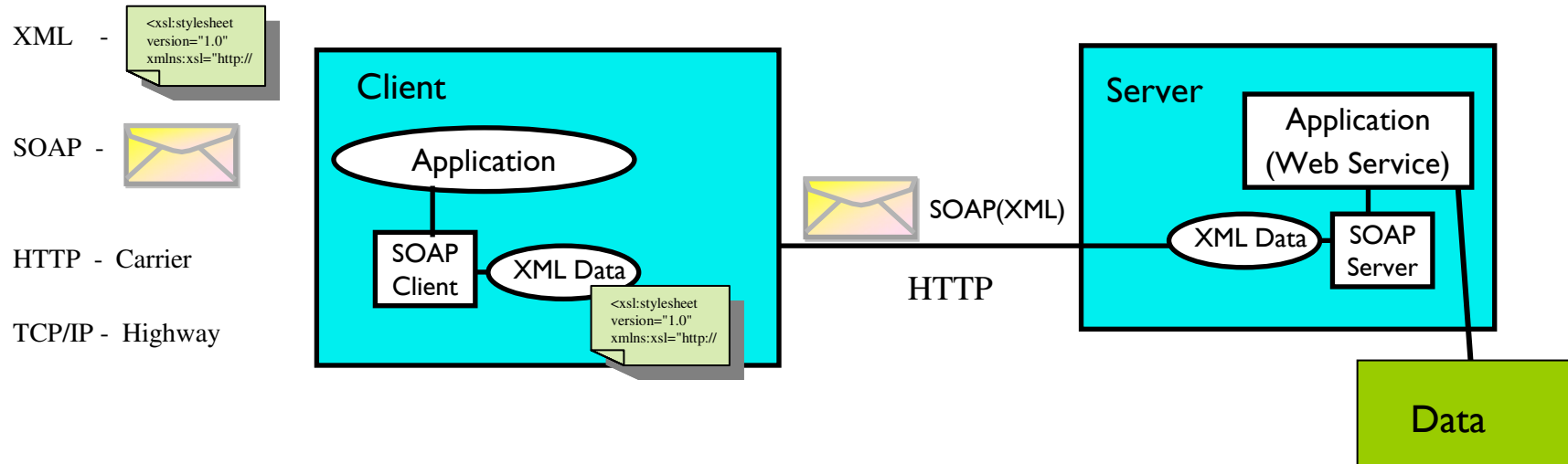
(5) First Steps

(4) Dynamic On demand business with VSE/ESA using Web Services



Web Services

XML Document + SOAP Protocol = Web Services

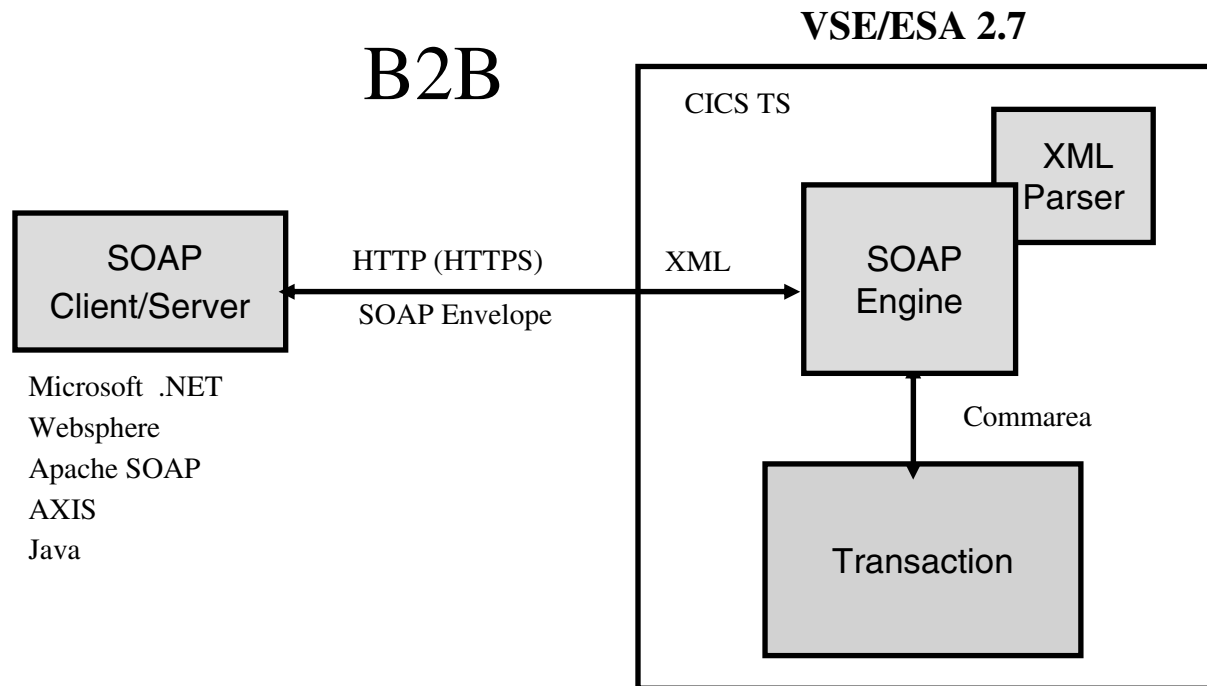


A web service

- ☞ implements a business, application or system functionality
- ☞ is intended for application communication
- ☞ is useable in internet, intranet, extranet
- ☞ is useable for browser-based solutions up to the B2B integration between companies
- ☞ uses only standard internet technologies

Web Services with VSE/ESA 2.7

XML data interchange with CICS transactions



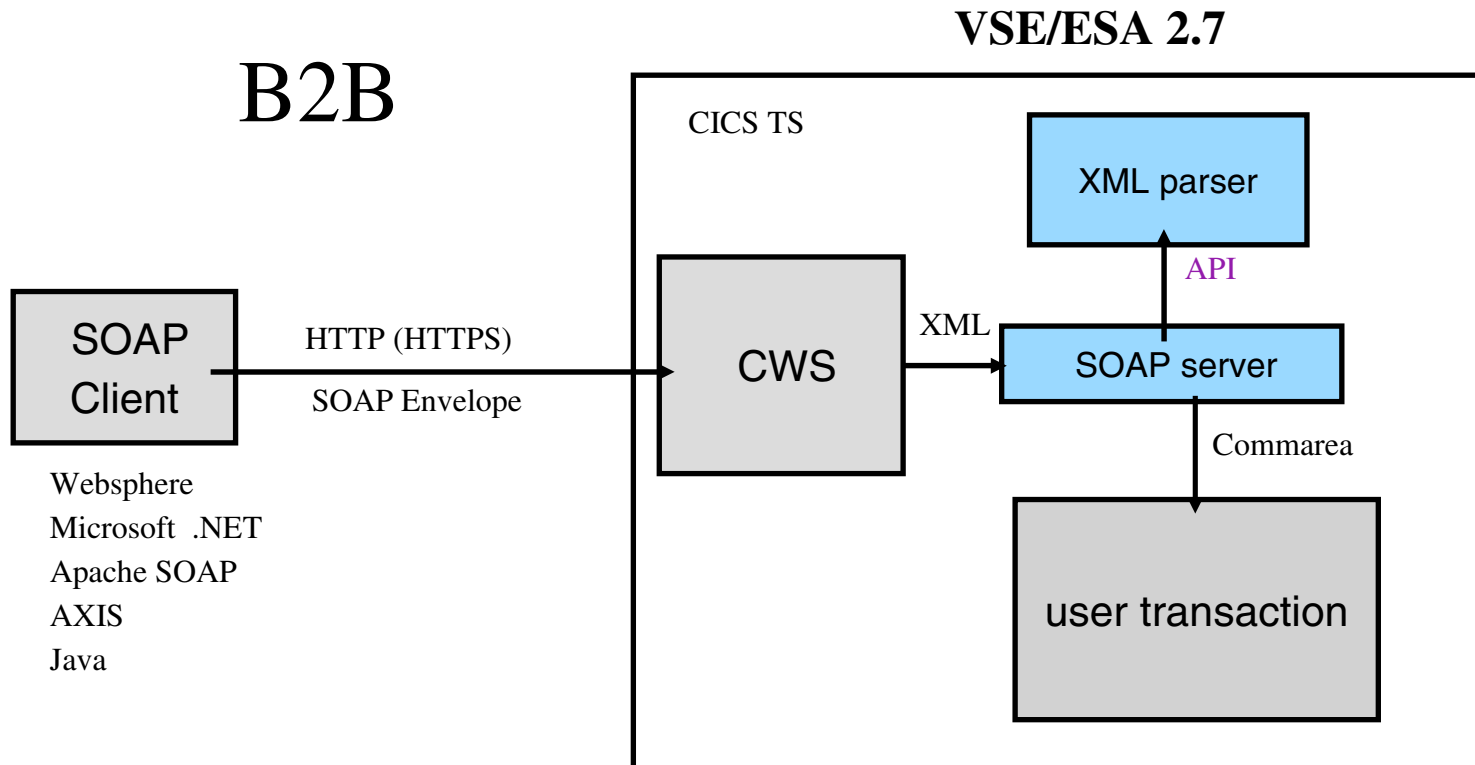
★ VSE/ESA Transactions as Web Service

► **NEW:** Also with VSE/ESA 2.6 + UQ81044

VSE/ESA as SOAP server

Web Services (SOAP)

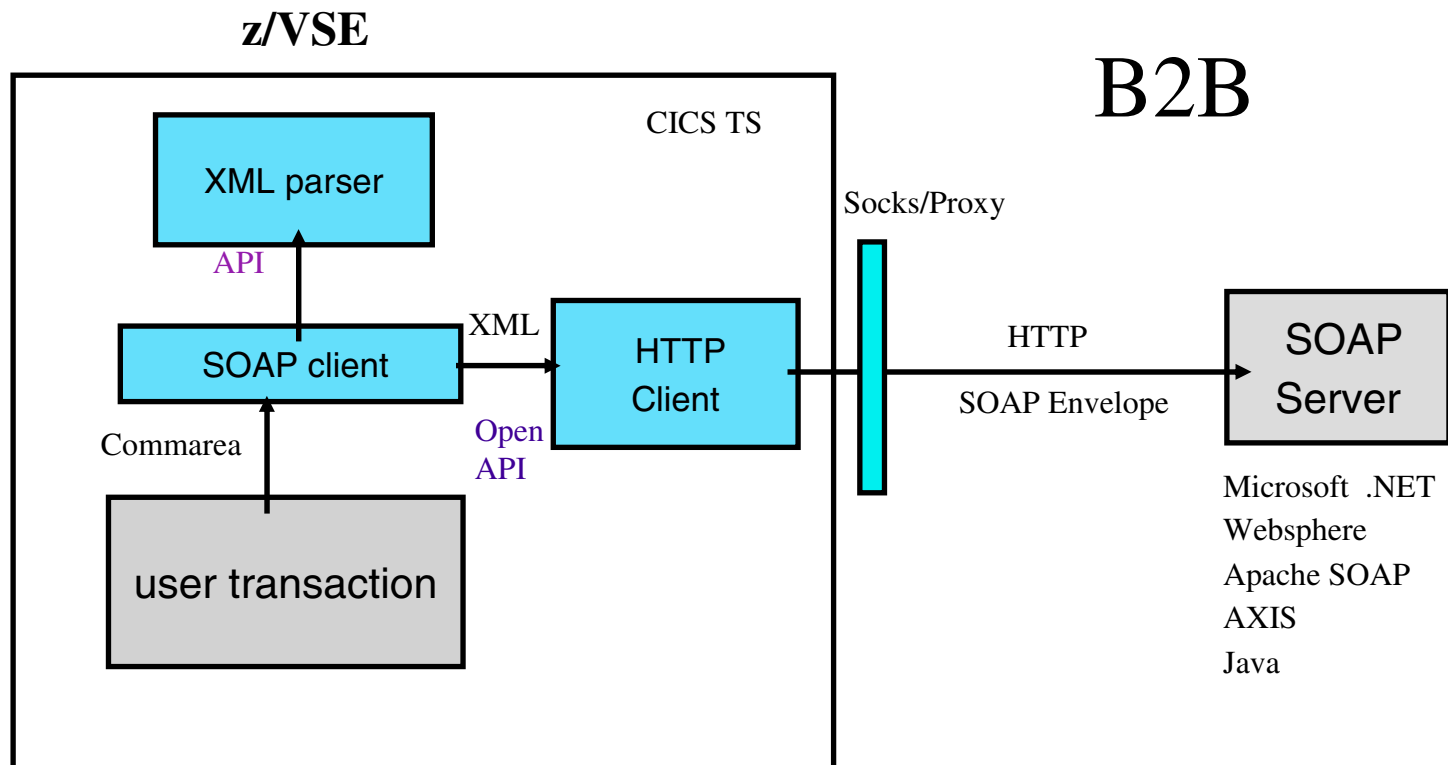
SOAP - Simple Object Access Protocol
(platform independent remote procedure call)



z/VSE as SOAP client

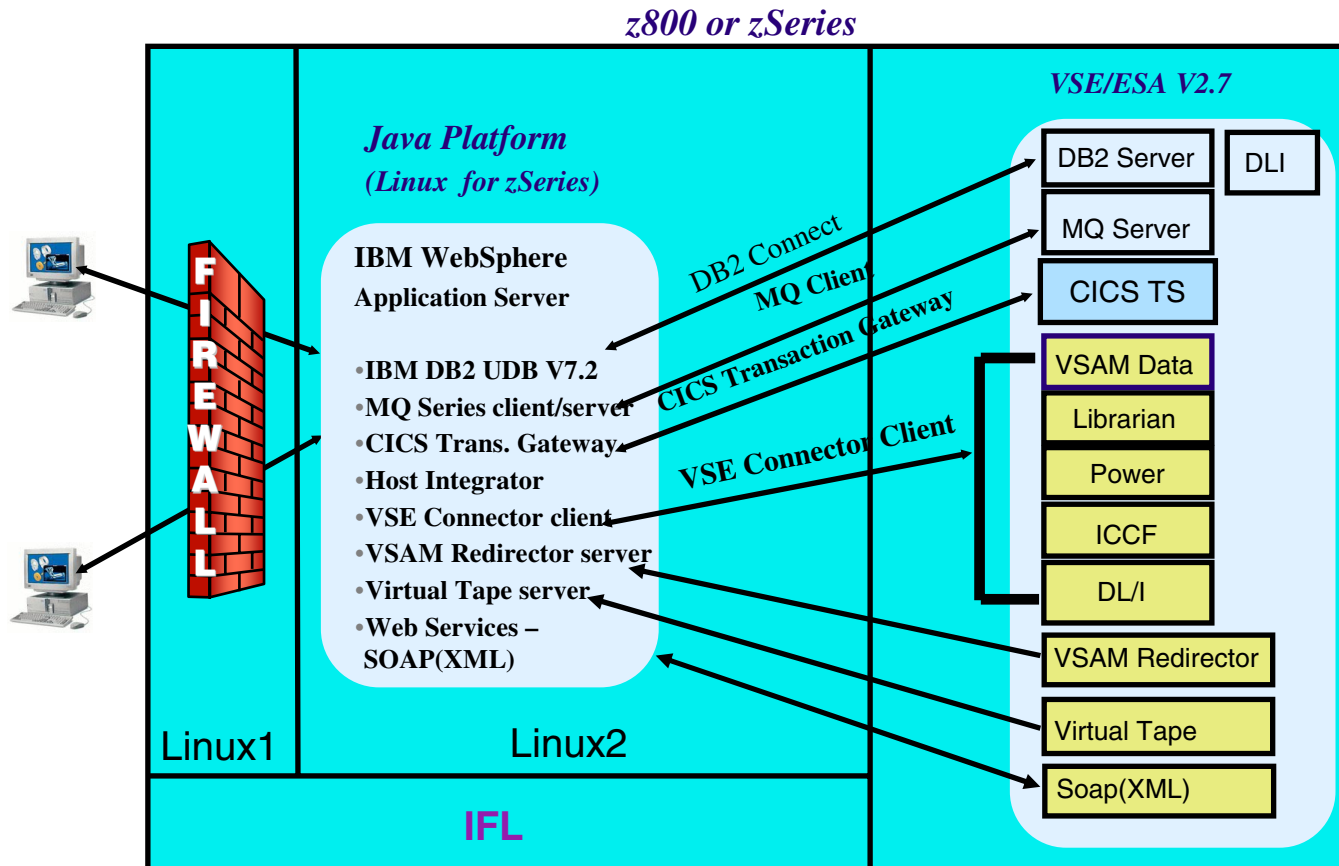
Web Services (SOAP)

SOAP - Simple Object Access Protocol
(platform independent remote procedure call)



Hands-On Lab on Wednesday 9:00 AM (E13 – Franciscan C/D Lab Room)

VSE/ESA Connections



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First Steps

Information to get started :

z/VSE home page -> solutions

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

High potential of modernisation exists but is unused because of:

- insufficient communication between departments of different platforms
- management structure inhibits to establish projects in distributed environments
- lack of information about new possibilities
- first Steps are unclear (see solutions)

First Steps – modernization

Identify a process for modernisation – i.e interface modernisation

- ✓ identify processes where business logic and user interface can be separated
- ✓ Service Oriented architecture have multiple flavors
- ✓ proof of concepts can easily identify critical parts in a project and can help in decisions for multiple solutions
- ✓ alternatives should be discussed based on a proof of concept and not based on unknown thoughts and feelings

First Steps – data access

Identify process for modernization – i.e. data transfer

- ✓ identify the files that will be involved in the process
- ✓ which side is the initiator of the data transfer
 - ✓ VSE or the remote platform
- ✓ Type of data flow or program communication
 - ✓ Access VSE data and resources from remote platforms
 - ✓ access VSE applications from remote platforms
 - ✓ access remote applications from VSE
- ✓ exact description of data structures

Modernisation possibilities for today's distributed processes with z/VSE

- ✓ data exchange via FTP
 - ✓ VSAM Redirector- modernized FTP (incremental, cleansing)
- ✓ VSE Applications need access to remote data
 - ✓ VSAM Redirector
- ✓ synchronisation of data on different platforms
 - ✓ Incremental FTP, VSAM Redirector
- ✓ Access VSE data and resources from remote platforms
 - ✓ Java-Based Connector, VSE Script
- ✓ access VSE applications from remote platforms
 - ✓ CICSTransaction Gateway, Web Services
- ✓ access remote applications from VSE
 - ✓ Web Services via SOAP(XML)

Electronic support and Ordering

PTF orders via internet:

Electronic support for zSeries and VSE/ESA:

- Order your PTF's via the internet:

URL:

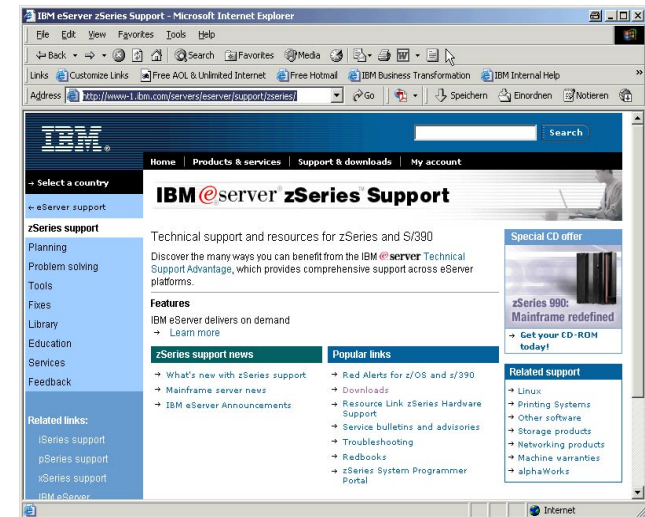
<http://www-1.ibm.com/servers/eserver/support/zseries/>

ShopZSeries:

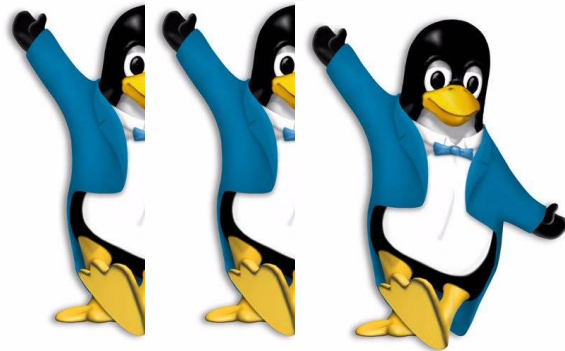
With ShopzSeries you can:

- order tailored product and service packages for z/OS, z/OS.e and OS/390
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- review your software licenses in all of these environments
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- URL: <https://www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp>

Details on Wednesday 2:35 PM (E50 – Imperial 4)



A happy pair with the stability of a dinosaur and support from a bear.



Linux for zSeries



z/VSE

z/VM – a platform, where penguins can multiply like rabbits.



IBM eServer zSeries

Software Offering for Linux on zSeries

- OPTION 1: Entry Package - 'Webify'

Value Proposition: Web-Enable existing applications through an Internet or Intranet Front-End

Products:

1. **WebSphere Application Server for Linux on zSeries**
 2. **WebSphere Host Access Transformation Services (HATS)**
 3. **WebSphere Host On-Demand**
 4. **CICS Transaction Gateway (CTG)**
- **Minimum Configuration: Customers have to choose WebSphere Application Server plus at least 1 other product from the product list above**

Software Offering for Linux on zSeries

- OPTION 2: Development Package

Value Proposition: Enhance application development on zSeries

Products:

- 1. WebSphere Application Server for Linux on zSeries**
 - 2. CICS Transaction Gateway (CTG)**
 - 3. WebSphere Studio Application Developer (WSAD)**
 - 4. WebSphere Studio Enterprise Developer (WSED)**
- **Minimum Configuration: Customers have to choose WebSphere Application Server plus at least 1 other product from the product list above**

Software Offering for Linux on zSeries

OPTION 3: Portal and Data Base Package

Value Proposition: A portal solution for effective administration and integration of employees, customers and/or suppliers.

Products:

1. **WebSphere Portal for Multi-Platforms**
2. **WebSphere Application Server for Linux on zSeries**
3. **CICS Transaction Gateway (CTG)**
4. **DB2 Connect Unlimited**
5. **DB2 Universal Database (DB2 UDB)**
6. **WebSphere MQ for Linux on zSeries**
7. **WebSphere Host Access Transformation Services (HATS)**
8. **WebSphere Host On-Demand**

- **Minimum Configuration: Customers have to choose WebSphere Portal for Multi-Platforms plus at least 1 other product from the product list above, or DB2 UDB plus at least 1 other product from the product list above.**

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

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z/VSE

z/VSE is designed to help provide robust, cost-effective solutions for customers with a wide range of capacity needs, in most industries, worldwide. z/VSE is built on a heritage of ongoing refinement and innovation that spans four decades. It brings the value of innovative IBM eServer zSeries and IBM TotalStorage technology to VSE clients.

Learn more

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- [News](#)
- [History of VSE](#)

We're here to help

Easy ways to get the answers you need.

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Guide Share Europe
April 18-20, 2005
Berlin, Germany

[Register](#)

WAVV conference
May 20-24, 2005
Colorado Springs, Colorado, USA

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- [Infrastructure simplification](#)
- [VSE Recommended Service Level](#)

Middleware

- [WebSphere software](#)
- [Information management software](#)

Announcing z/VSE V3.1

Built on a heritage of ongoing refinement and innovation that spans four decades.

Redesigned z/VSE homepage

You may have already noticed that the z/VSE home page has changed. We've redesigned this entire web site and included additional information. The objective is to provide you with a more useful business tool, as well as to offer you a more enjoyable experience. We encourage you to use, or to simply explore, the enhanced z/VSE web site. If you have questions, suggestions, or comments, please contact the [VSE team](#).

z/VSE Version3 Release 1

[z/VSE Version 3 Release 1 \(z/VSE V3.1\)](#) is designed to support:

- [IBM @server zSeries 890 and 990](#) (31-bit mode only)
- SCSI disks attached to zSeries FCP channels
- [OSA-Express2](#) and [FICON Express2](#) adapters
- [Crypto Express2](#) and CP Assist for Cryptographic Function (CPACF)
- IBM TotalStorage [3494 Virtual Tape Server](#)
- improved support for [IBM 3494 Tape Library](#)
- IBM TotalStorage [DS8000](#) and [DS6000](#) series Storage Servers
- enhanced Advanced Copy support

z/VSE is designed to enable network integration and infrastructure

Related links

- [Linux on zSeries](#)
- [z/OS](#)
- [z/VM](#)
- [IBM Storage](#)
- [IBM Printing Systems](#)

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

Additional Information

- z/VSE Home Page
<http://www.ibm.com/servers/eserver/zseries/zvse/>
- z/VSE Solutions
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- 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 SG24-7042



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