



IBM Systems Group

Connectors Exploitation with VSE/ESA 2.7

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WAVV 2004, Chattanooga, TN



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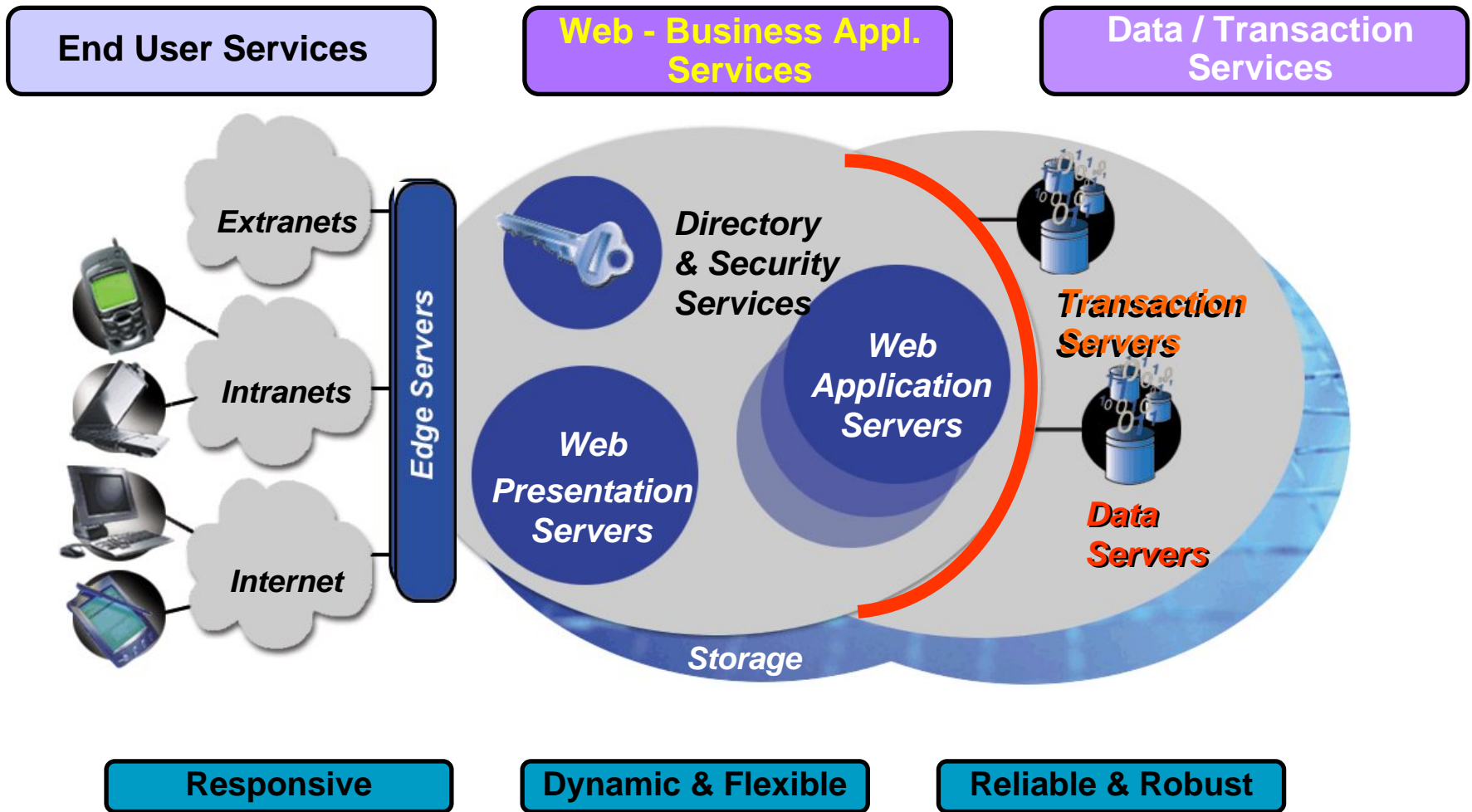
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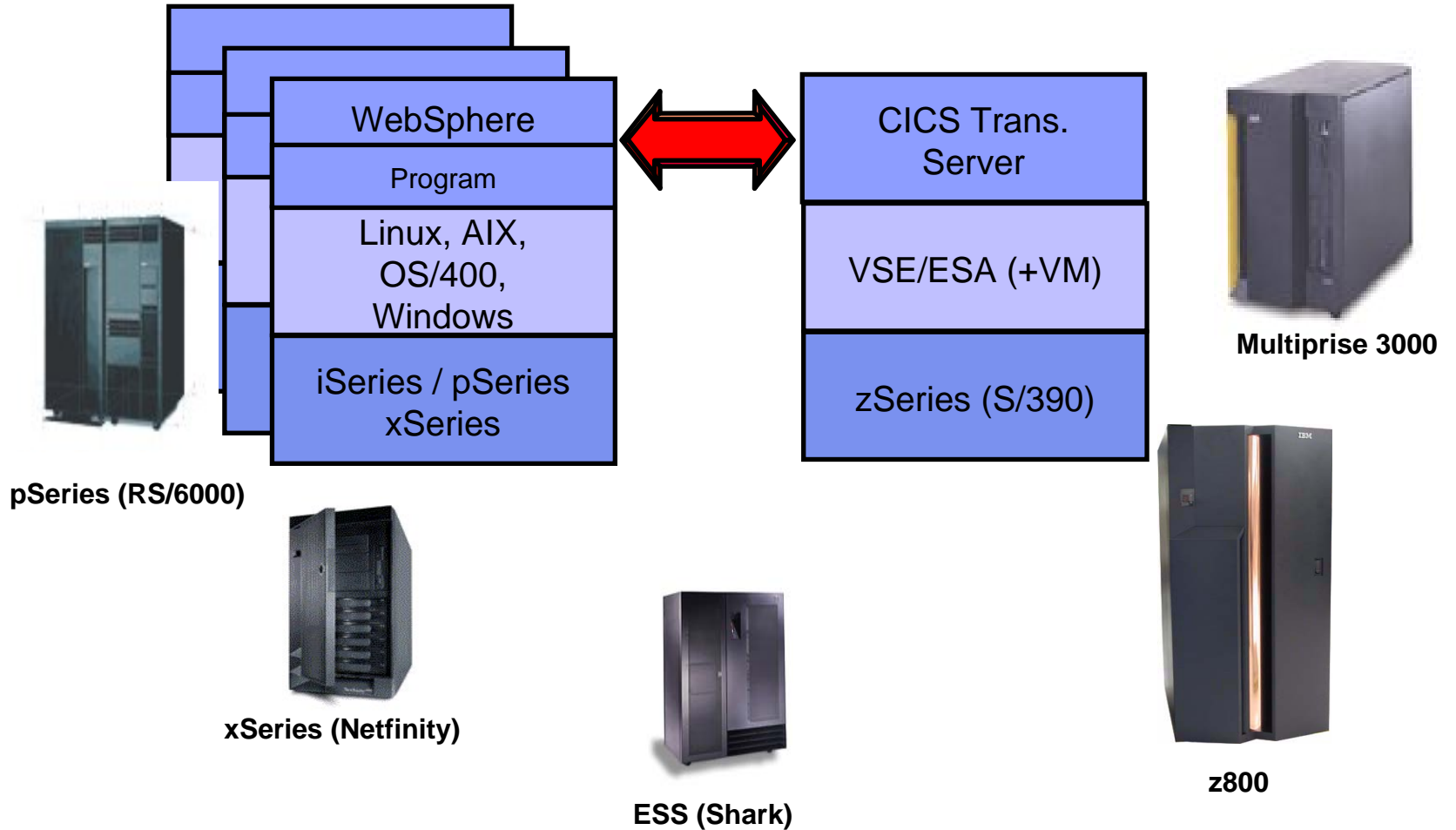
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Infrastructure

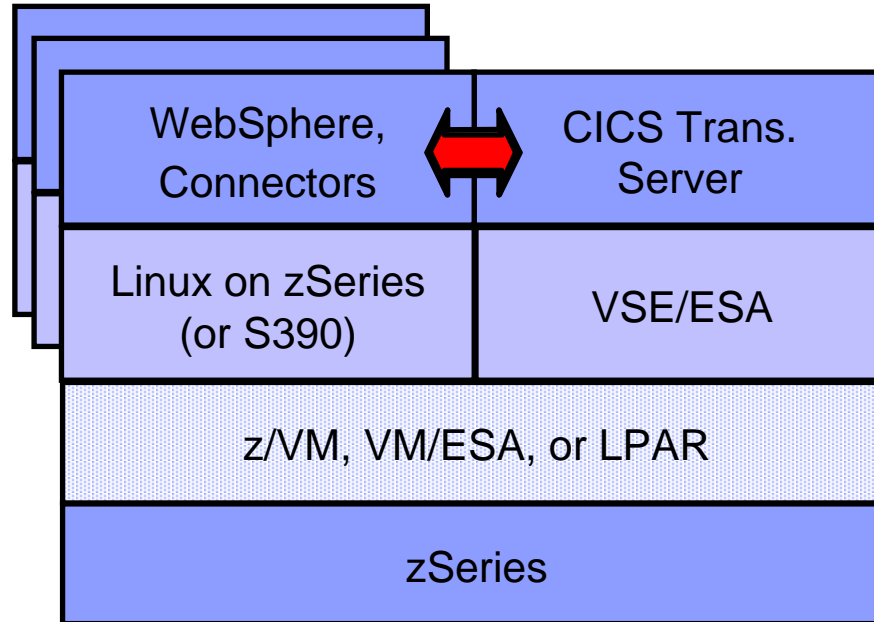


VSE/ESA Flexibility – in a heterogeneous environment



Linux for zSeries

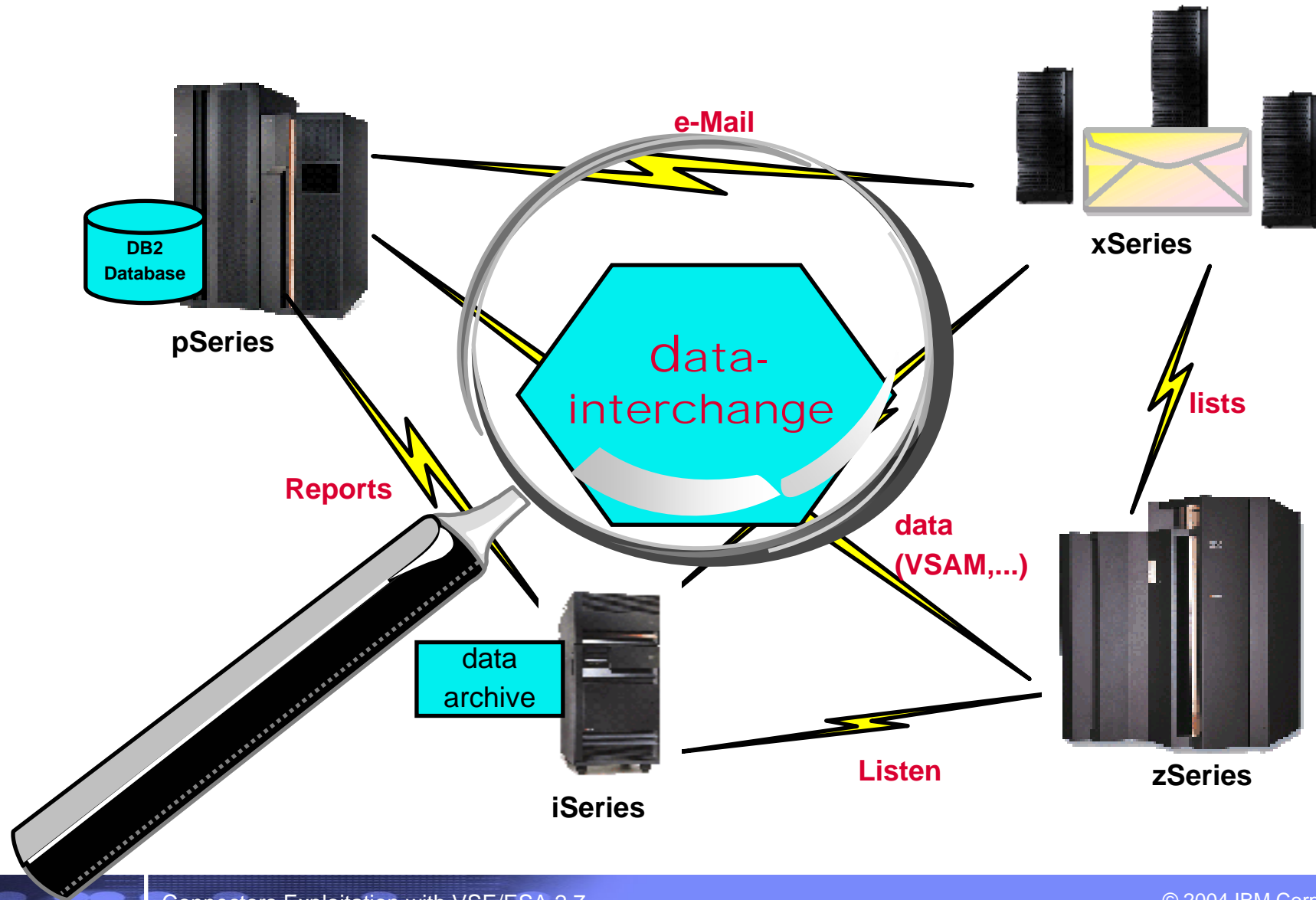
3-tier logical / 2-tier physical



i.e. Multiprise 3000 or 9672 or zSeries



Data interchange implementations

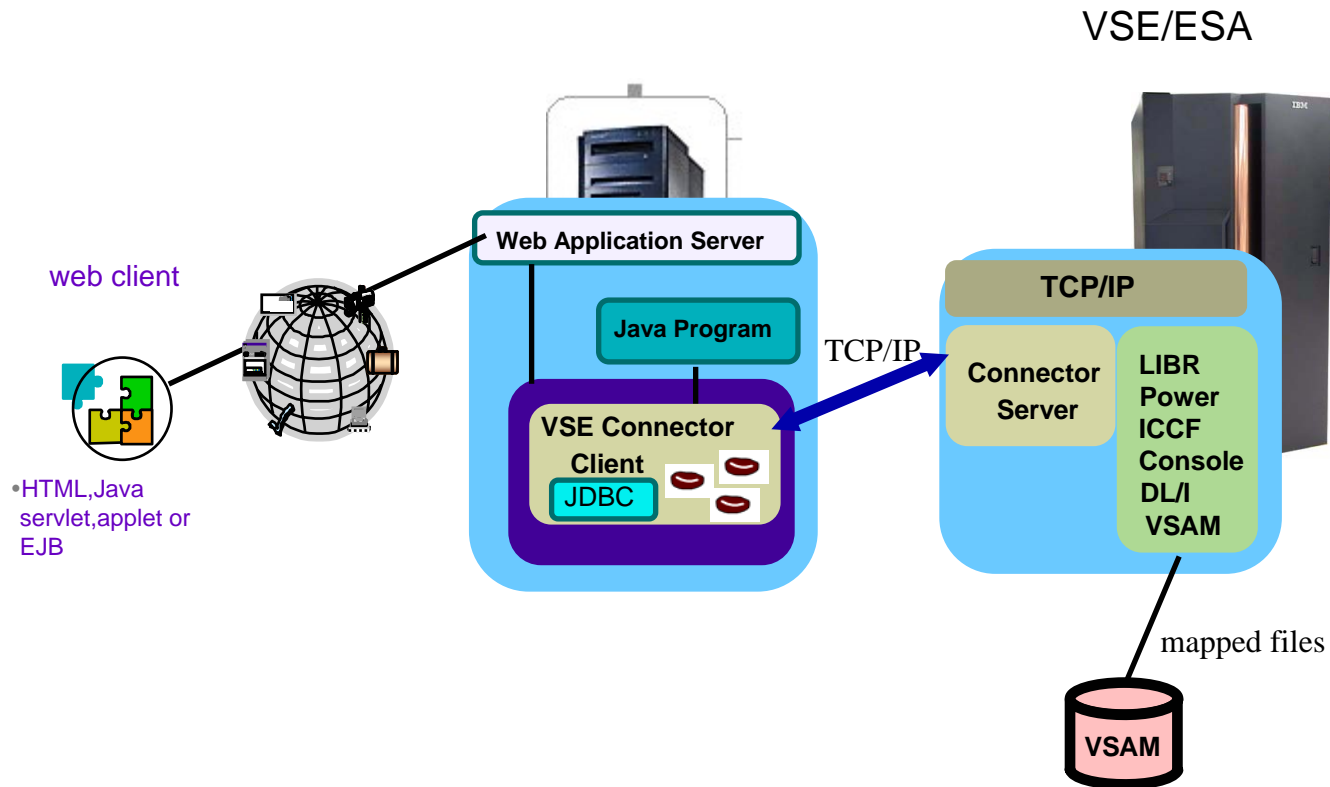


Agenda: Customer Scenarios

- ▶ Real time access to VSE/VSAM Data from remote systems
- ▶ DB2 data interchange - cross platform data stores
- ▶ Transparent access from VSE programs to remote data
- ▶ Tape operations with VSE Virtual Tape

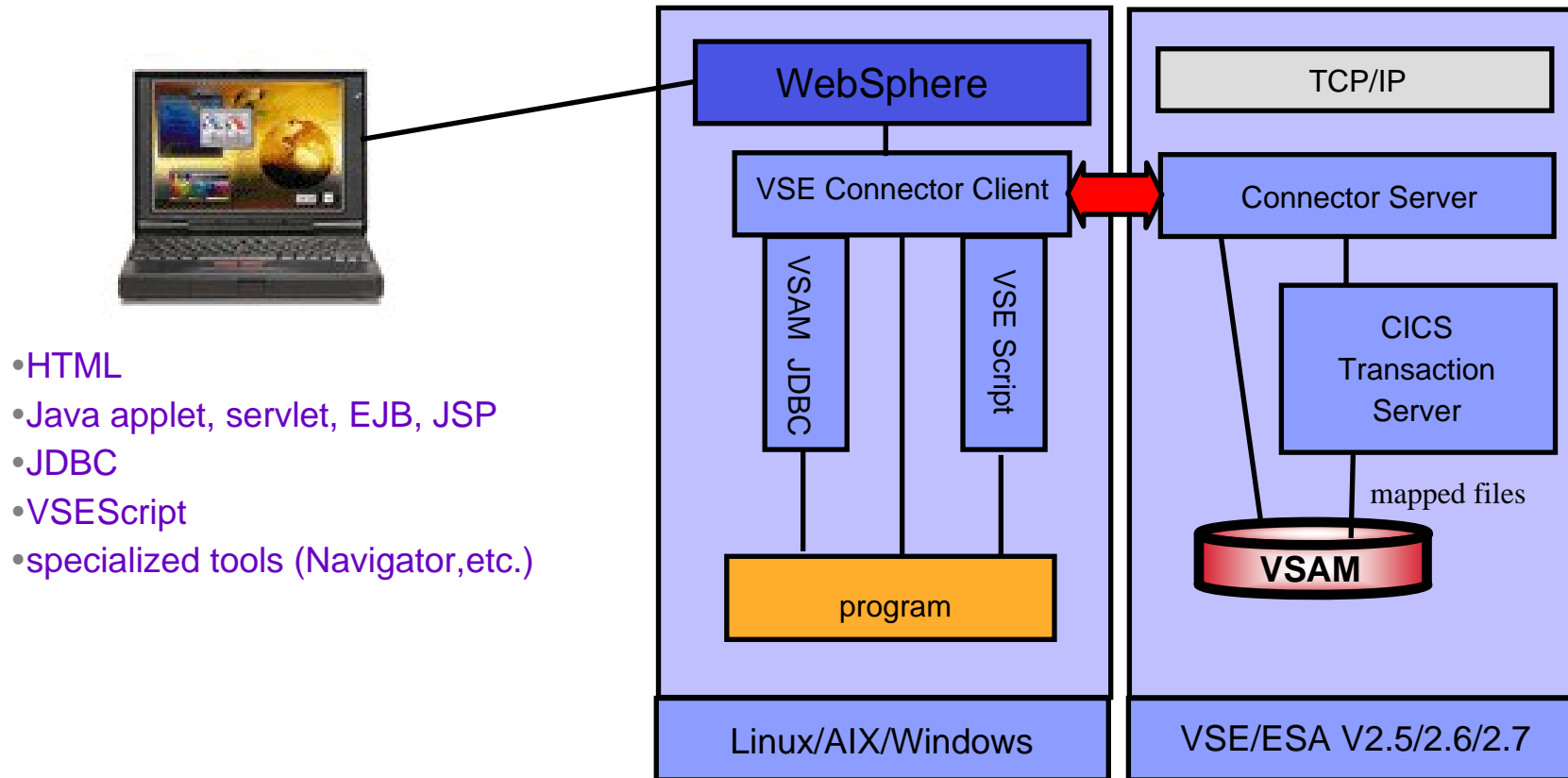
Access to VSE resources from remote

Java-Based Connector



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

Accessing 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**

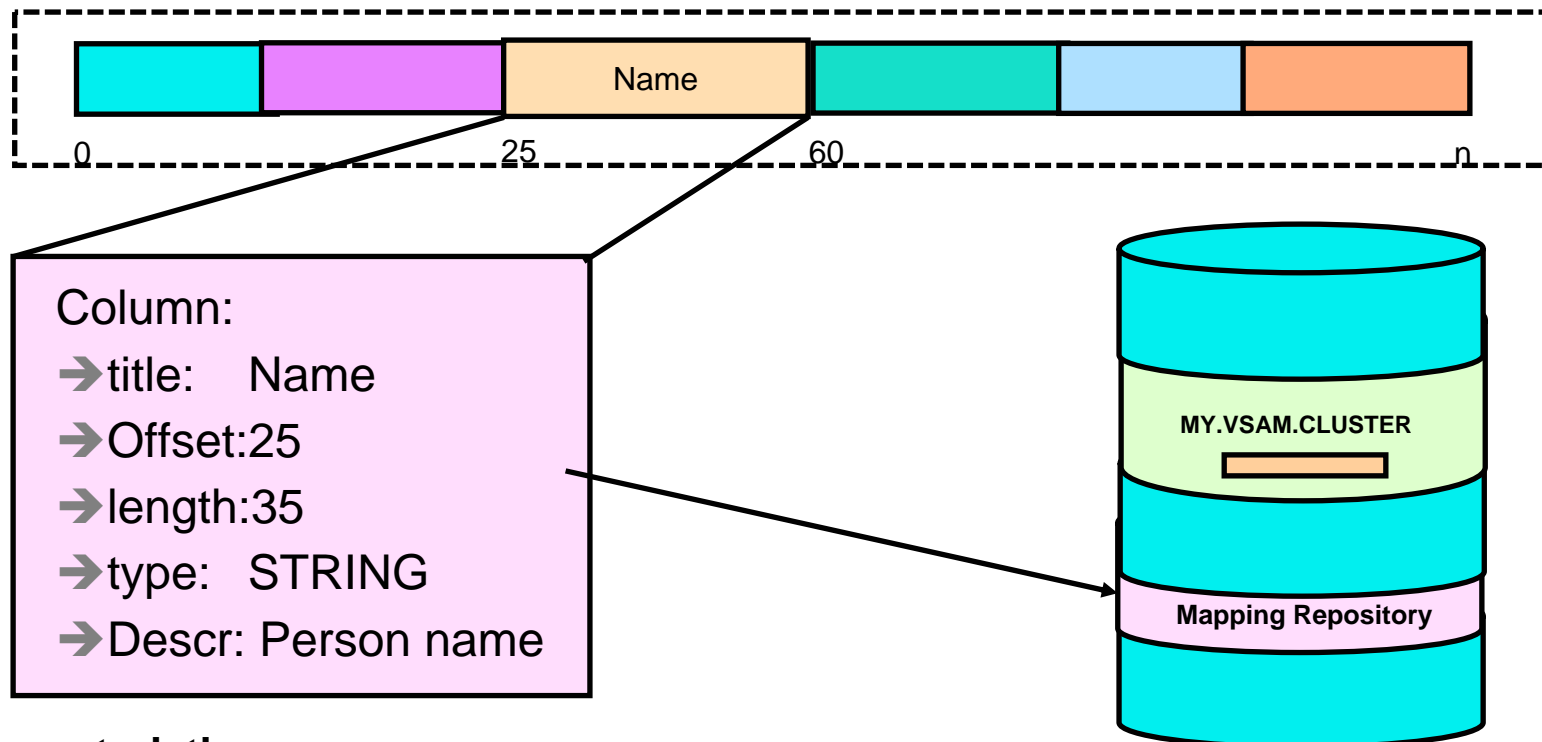
Real time access to VSE data from remote systems

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

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

(1) using Java Beans

- ▶ Programs use the Java Beans packaged with VSE Connector Client to directly access VSAM data (read and write mode)
 - ▶ **Any** language able to call Java methods can be used
- ▶ Access can be via batch or CICS
- ▶ Specify catalog, cluster, and map:
 - ▶ Batch: `MY.USER.CATALOG\MY.VSAM.CLISTER\MY_MAP`
 - ▶ access using 'MY_MAP' Field/Column definitions
 - ▶ CICS: `#VSAM.#CICS.DBDCICS\CLUNAME\MY_MAP`
 - ▶ access using DBDCICS and 'MY_MAP' Field/Column definitions

Accessing VSAM data from remote systems

(2) 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

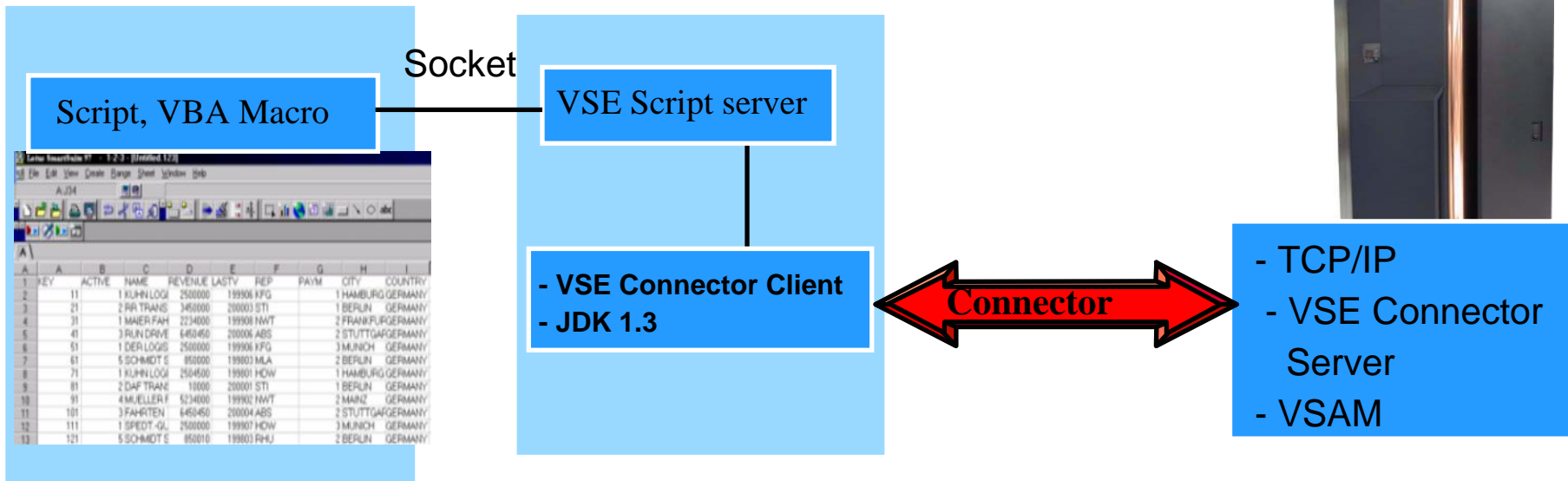
```
SELECT NAME,STREET,CITY FROM  
#VSAM.#CICS.DBDCCICS\CLUNAME\MY_MAP  
WHERE PERSNR=4711  
ORDER BY NAME
```

Accessing VSAM data from remote systems

(3) 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)

Java-based Connector

■ Benefits:

Real-time access to VSE data

- ❖ Web Applications (WebSphere)
 - Servlets, EJBs, JSPs, Applets, ...
- ❖ Standalone Programs (Tools)
 - VSE Navigator, Tool, JConVSE, ...

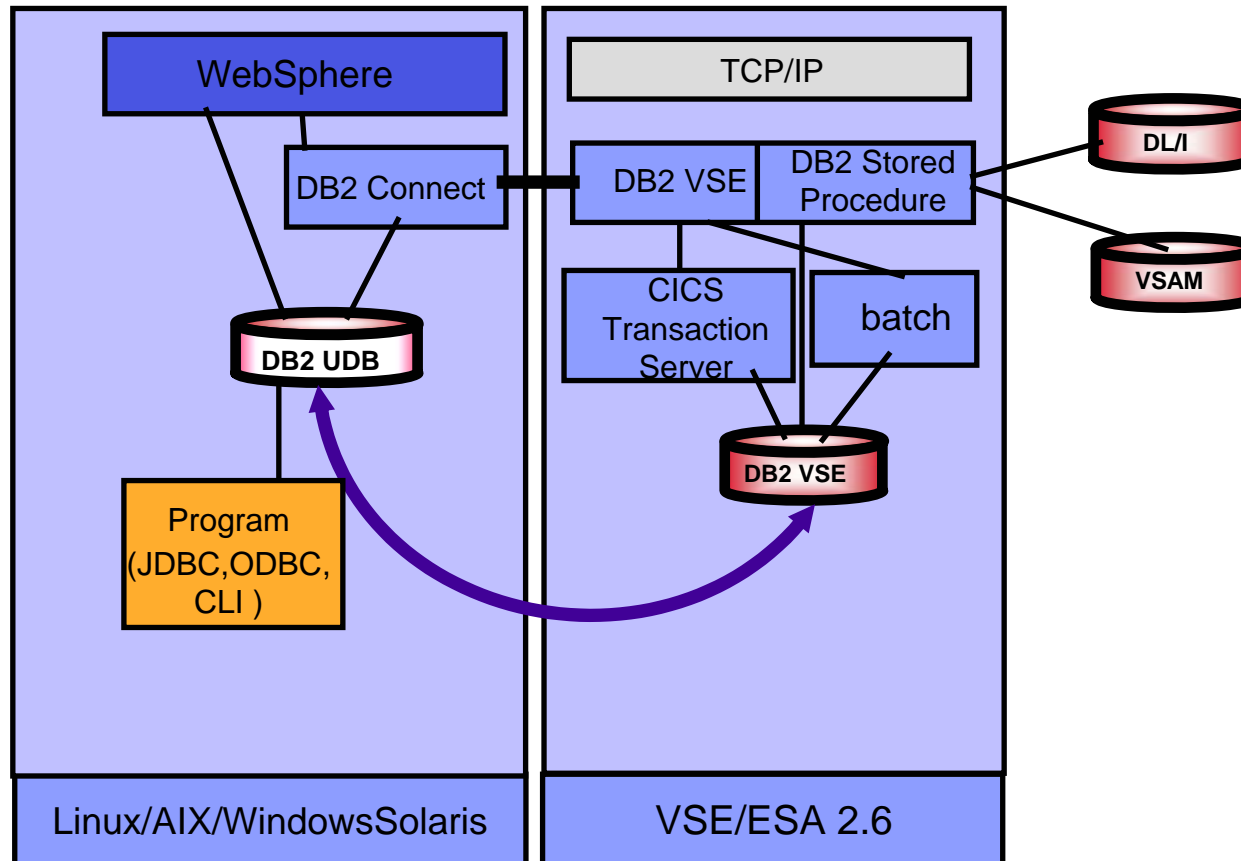
■ Requirements

- ▶ VSE/ESA 2.5 - 2.7
 - VSE Connector Server
- ▶ TCP/IP for VSE/ESA
- ▶ Java (Version 1.1.8 / 1.3x – 1.4x)

Agenda: Customer Scenarios

- ▶ Real time access to VSE/VSAM Data from remote systems
- ▶ DB2 data interchange - cross platform data stores
- ▶ Transparent access from VSE programs to remote data
- ▶ Tape operations with VSE Virtual Tape

DB2 UDB and DB2 VSE data interchange



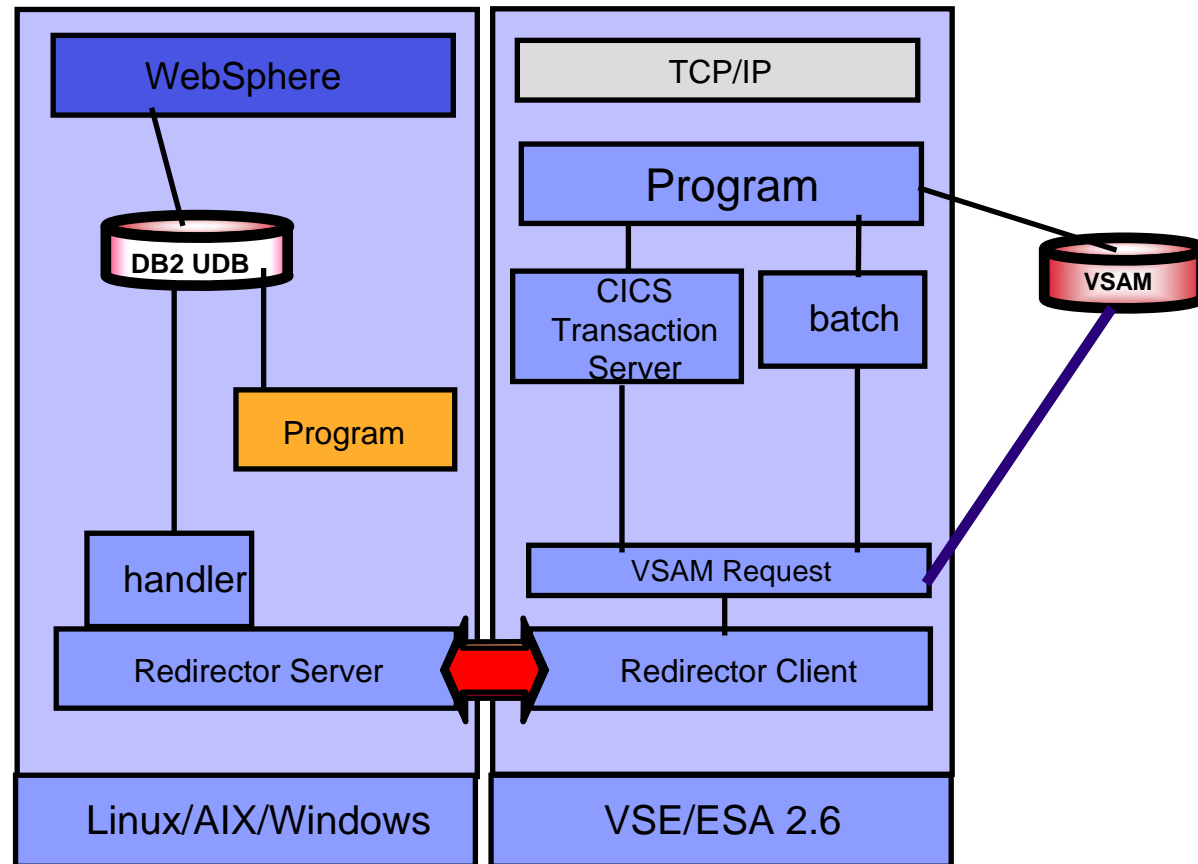
- ▶ Remote access of DB2 VSE via DB2 Connect
- ▶ Integration of non relational VSE data with DB2 logic via Stored Procedures
- ▶ Remote access of DB2 UDB from DB2 VSE via DB2 VSE Client functionality on VSE.

Agenda: Customer Scenarios

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VSE applications to transparently access remote data

- ▶ Existing applications transparently access remote data
- ▶ No changes to the existing VSE applications

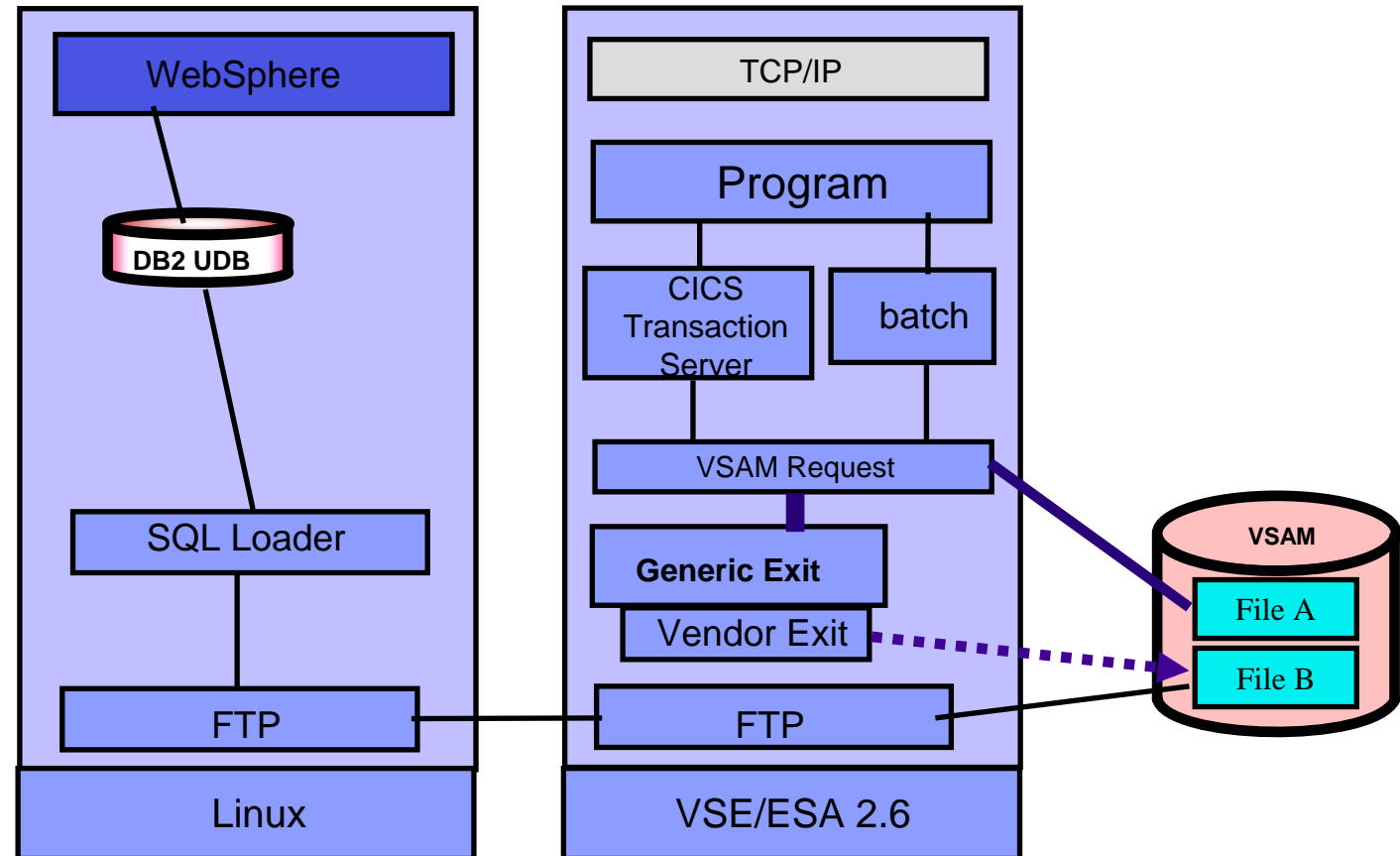


- ▶ Applications on VSE should be able to access DB2 data on Linux
- ▶ Synchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
(VSAM Redirector is part of VSE/ESA 2.6/2.7)

Incremental data interchange / backup

Reduce network traffic, save time

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

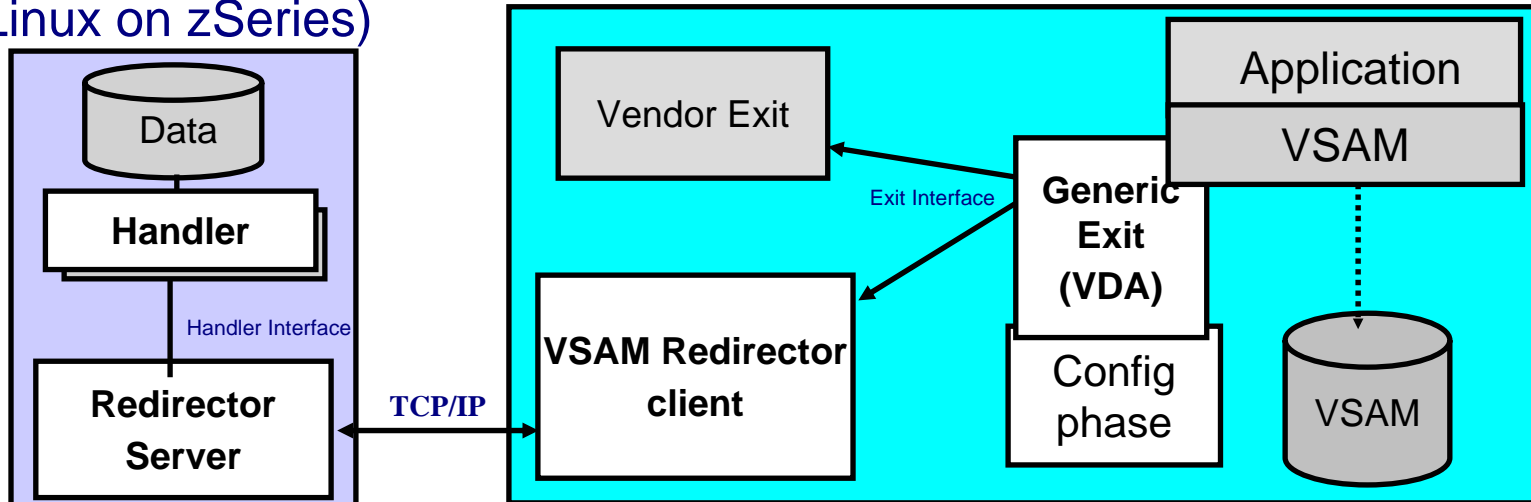


- ▶ Collect the changed records in a separate VSAM file
 - ▶ Possibility of cleansing
- ▶ FTP – as before, with a much smaller file
 - ▶ (The VSAM Redirector is part of VSE/ESA 2.6)

VSAM Redirector – functional view

Java Platform
(Linux on zSeries)

VSE/ESA V2.6



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

- ▶ Redirection of VSAM Requests to any remote system without changes to VSE applications
- ▶ Synchronization, migration or remote operation with data on remote systems
- ▶ transparent for Batch or CICS

Transparent access from VSE programs to remote systems and data

Software requirements

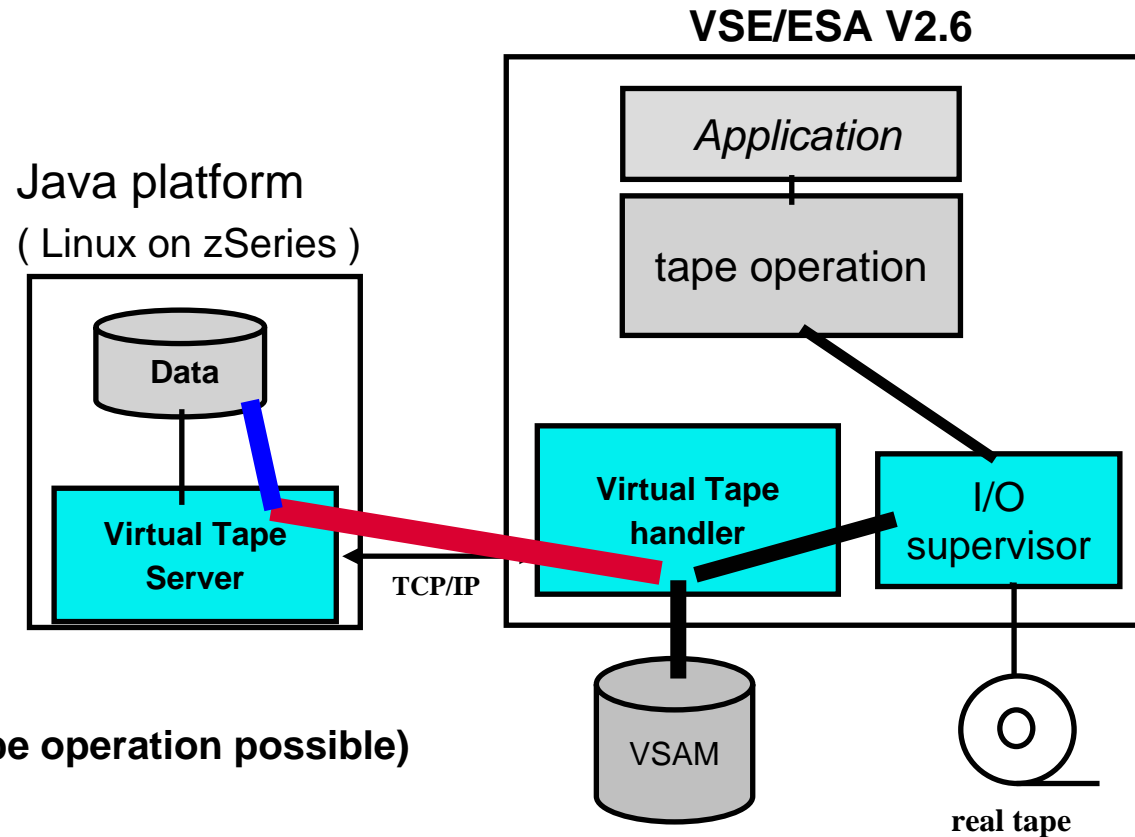
- ▶ For VSE/ESA :
 - ▶ VSE/ESA 2.6/2.7
 - ▶ enable VSAM Redirector function
 - ▶ Vendor Exit phase if local processing used
 - ▶ Enable the redirection of VSAM Cluster to remote

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

Agenda: Customer Scenarios

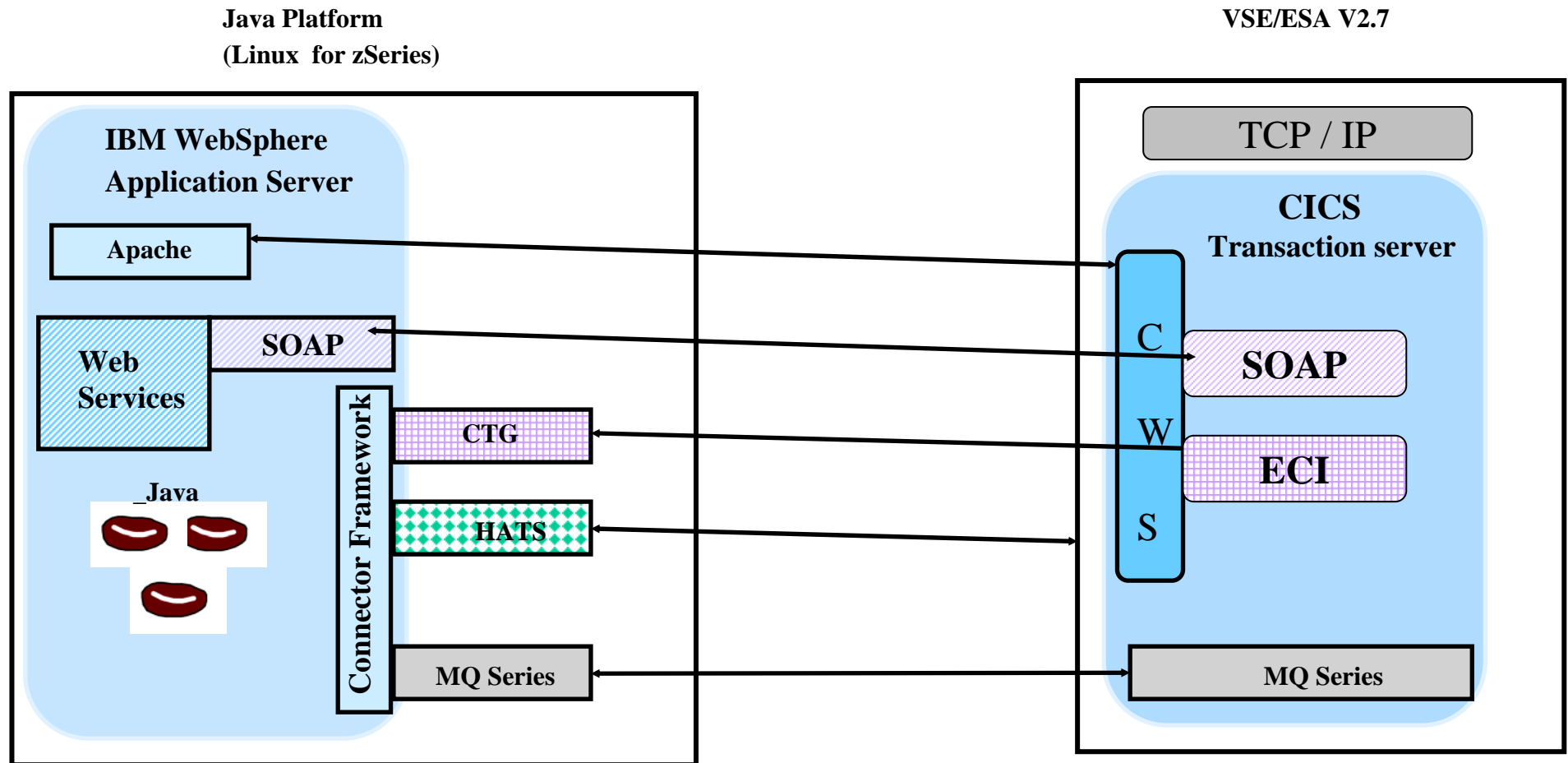
- ▶ Real time access to VSE/VSAM Data from remote systems
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Virtual tape support in VSE/ESA



- ▶ it simulates a real tape (tape operation possible)
 - ▶ in a VSAM file
 - ▶ in a file on a remote system
- ▶ transparent for applications
- ▶ Nightly Backups for batch recovery purposes can be done without physical tapes
- ▶ Possibility to integrate VSE backups in distributed (Tivoli controlled) backup procedures

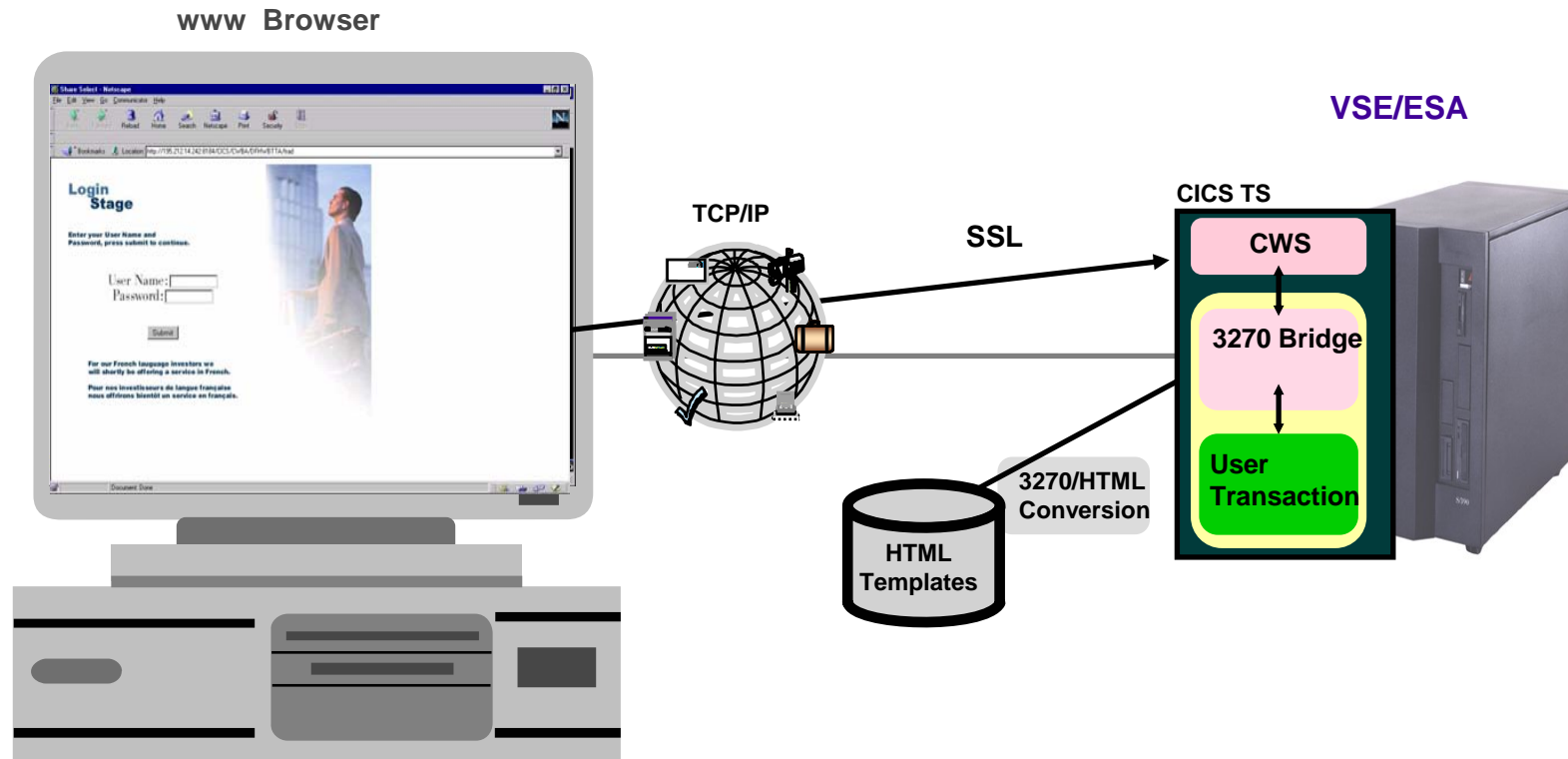
Access to CICS TS in VSE/ESA V2.7



- CWS - CICS Web support (within CICS Transaction server 1.1 for VSE)
- CTG - CICS Transaction Gateway (Websphere CICS Connector)
- ECI - External Call Interface
- HOD - Host OnDemand (Websphere Host Integrator)
- SOAP - Simple Object Access Protocol

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

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

CICS Web Support BMS screen emulation - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Real.com

Address <http://9.23.37.206:1080/CICS/CWBA/DFHWTBTA/VSAMTEST> Go Links



Picture above: Karlstor/Stachus in Munich

CICS Web Support BMS screen emulation

VSAM

Accessing FILEA

R Read
U Read for update + rewrite
A Add
D Read for update + delete
B Browse
L Long browse

Function

Recordkey

Recorddata

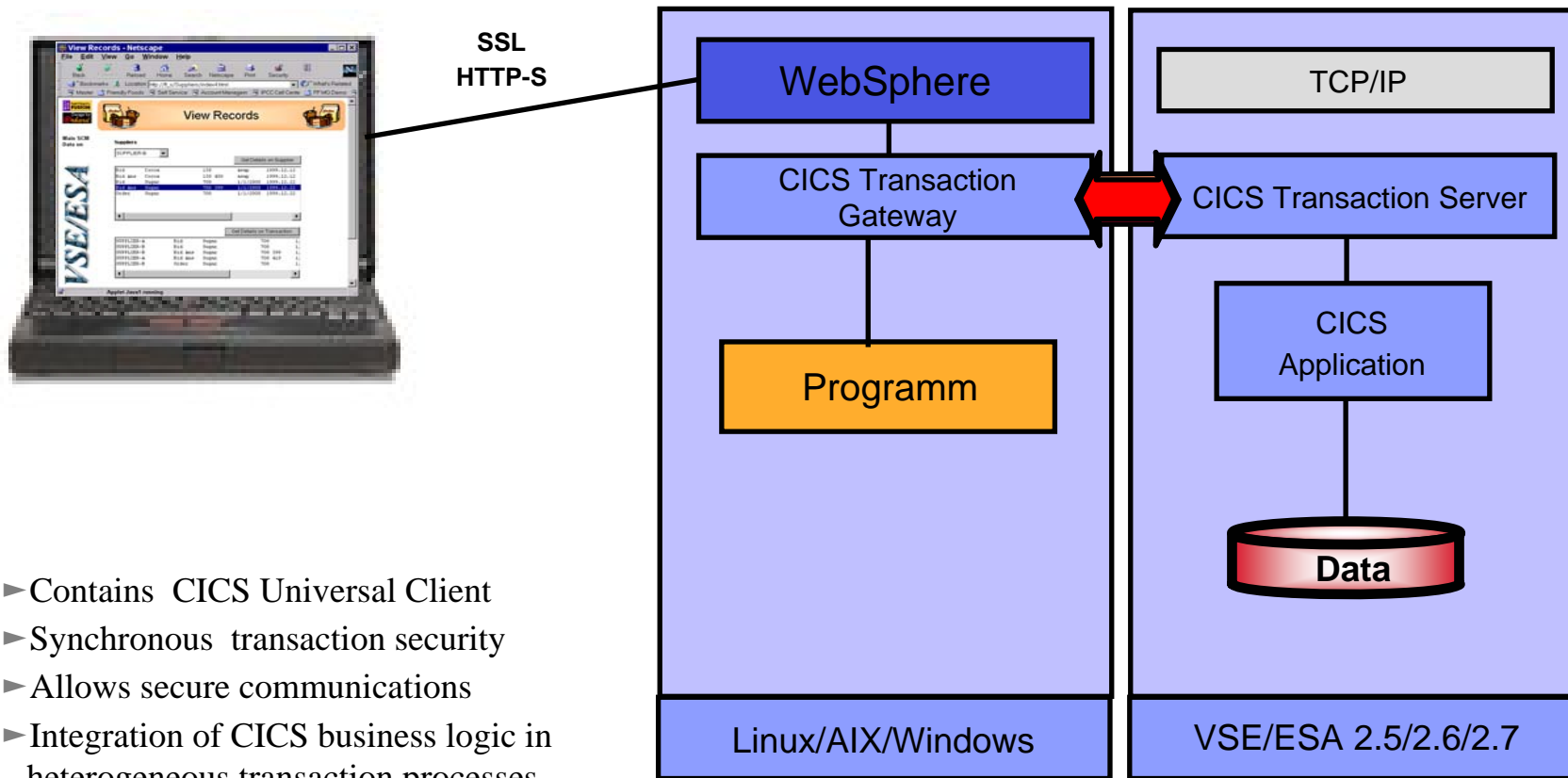
Milliseconds runtime

Enter

Done Internet

Integration of VSE/ESA transaction processes

CICS Transaction Gateway - Implementation



- ▶ Contains CICS Universal Client
- ▶ Synchronous transaction security
- ▶ Allows secure communications
- ▶ Integration of CICS business logic in heterogeneous transaction processes

- ▶ Java skill required

CICS Transaction Gateway

- functional characteristics
 - ▶ access to VSE transactions from a remote platform (program communication)
 - ▶ transaction security for the called transaction therefore, good integration in e-business Processes and WebSphere Application Server.
 - ▶ secured connections (SSL) to CICS Transaction Gateway

- software requirements
 - ▶ VSE/ESA and the Product: CICS Transaction Gateway (CTG)
 - ▶ for External CICS Interface (ECI) with TCP/IP, VSE/ESA 2.6 and later is required with CICS Transaction Gateway Version 4 or later

Consolidation of VSE/ESA transaction processes

View Records - Netscape

File Edit View Go Window Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: http://ff_s/Suppliers/index4.html

Master Friendly Foods Self Service Account Managem IPCC Call Cente FF MQ Demo

View Records

Main SCM Data on

VSE/ESA

Suppliers

SUPPLIER-B

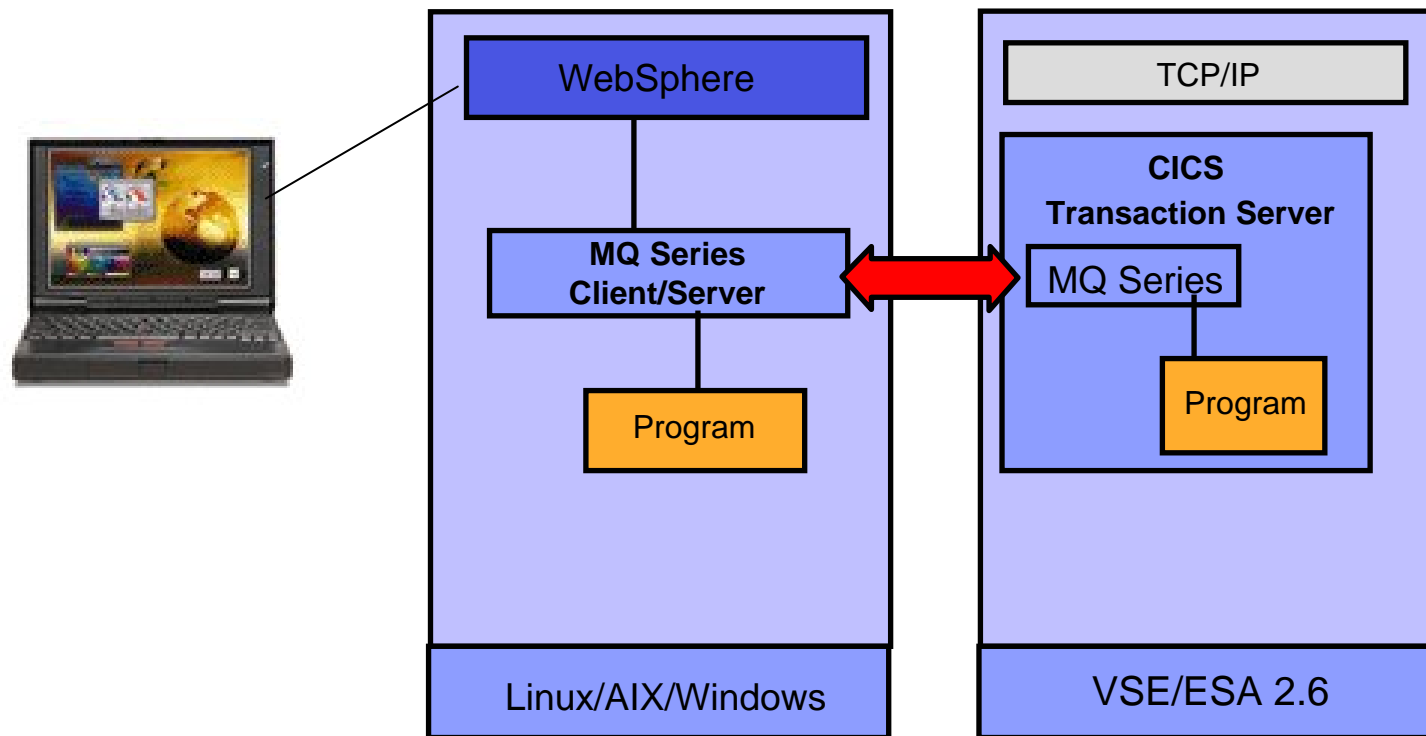
Bid	Cocoa	150		asap	1999.12.12
Bid Ans	Cocoa	150 450		asap	1999.12.12
Bid	Sugar	700		1/1/2000	1999.12.22
Bid Ans	Sugar	700 399		1/1/2000	1999.12.22
Order	Sugar	700		1/1/2000	1999.12.22

SUPPLIER-A	Bid	Sugar	700	1,
SUPPLIER-B	Bid	Sugar	700	1,
SUPPLIER-B	Bid Ans	Sugar	700 399	1,
SUPPLIER-A	Bid Ans	Sugar	700 419	1,
SUPPLIER-B	Order	Sugar	700	1,

Applet Java1 running

Asynchronous work with CICS transactions

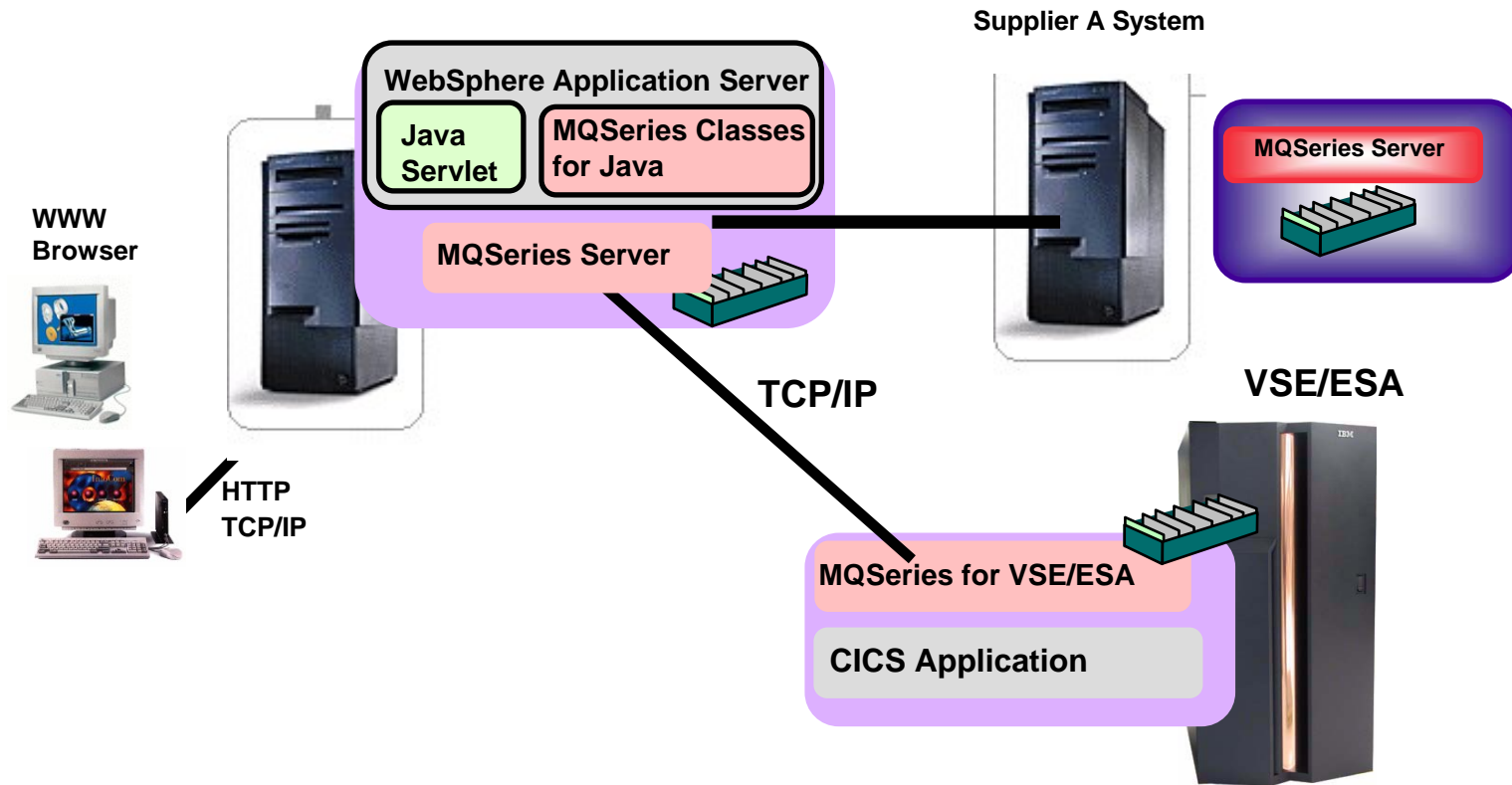
MQ Series - Implementation



- ▶ asynchronous data exchange using message queuing
- ▶ guaranteed and 'only once' delivery
- ▶ integration into Web Application servers (WebSphere)

Asynchronous work with CICS transactions

MQ Series - Components



- ▶ asynchronous data exchange using message queuing
- ▶ Various platforms supported
- ▶ integration into Web Application servers (WebSphere)

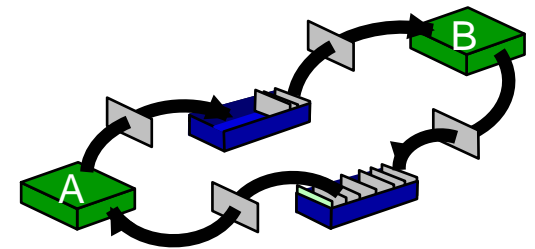
MQ Series - asynchronous transactions

■ functional characteristics

- ▶ guaranteed, secured asynchronous data access for remote systems
- ▶ same API for all supported MQ Series platforms
- ▶ transaction security, therefore appropriate for e-business processes
- ▶ integration with WebSphere Application Server
- ▶ works well for Business-to-Business (B2B) environments

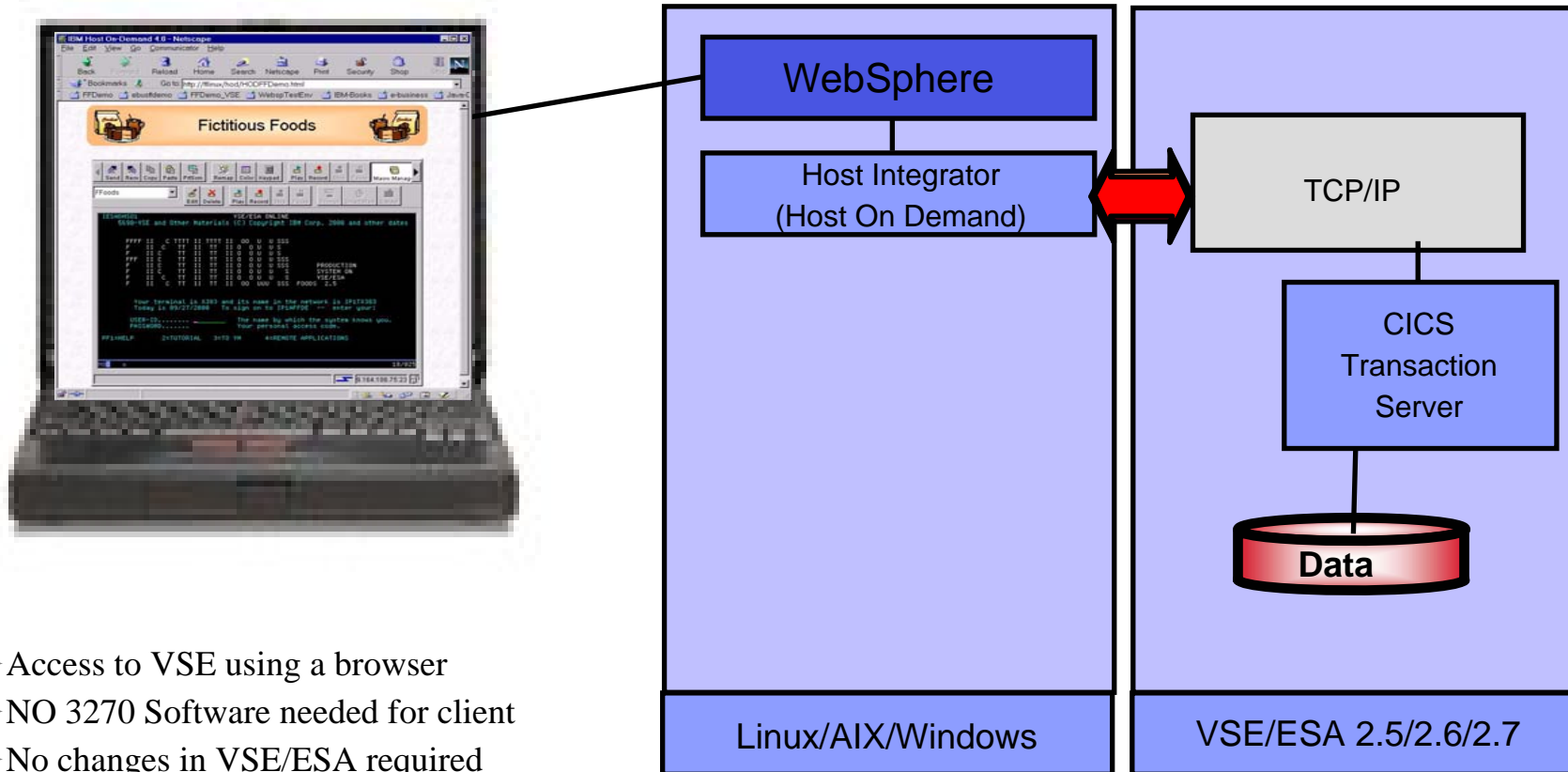
■ software requirements

- ▶ For VSE/ESA :
 - ▶ VSE/ESA 2.6/2.7
 - ▶ MQ Series Server
 - ▶ Program that interfaces with MQ Series server on VSE/ESA
- ▶ On the remote system:
 - ▶ MQ Series Client / Server
 - ▶ Program that interface with MQ Series



General access to VSE/ESA via browser

Host Access Transformation Server (HATS)



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

NEW!: Available for Linux for zSeries

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

Interaction with VSE/ESA via browser

The screenshot shows a terminal window on the left and a Microsoft Internet Explorer browser window on the right. The terminal displays a list of menu items for 'JK Enterprises' with their respective widths, columns, and control codes. The browser displays the website's main page, which includes a navigation menu, a list of sports equipment, an inventory graph, and a delivery schedule calendar.

Terminal Window Content:

```

Width . . . :
Column . . . :
Control . . . :
Line . . . . :
-----
PART
-----
000001
000002
000003
000004
000005
000006
000007
000008
000009
***** * * * *
F3=Exit  F12=C
MA* a
PF1 PF2 PF3
PF7 PF8 PF9
    
```

Browser Window Content:

JK Enterprises Your Sports

Home Link

[Information on JK Enterprises](#)

- JK Enterprises Home Page
- SiteMap
- Employees
- Jobs at JK Enterprises
- Press Articles
- Support

Inventory Table

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

Delivery Schedule

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

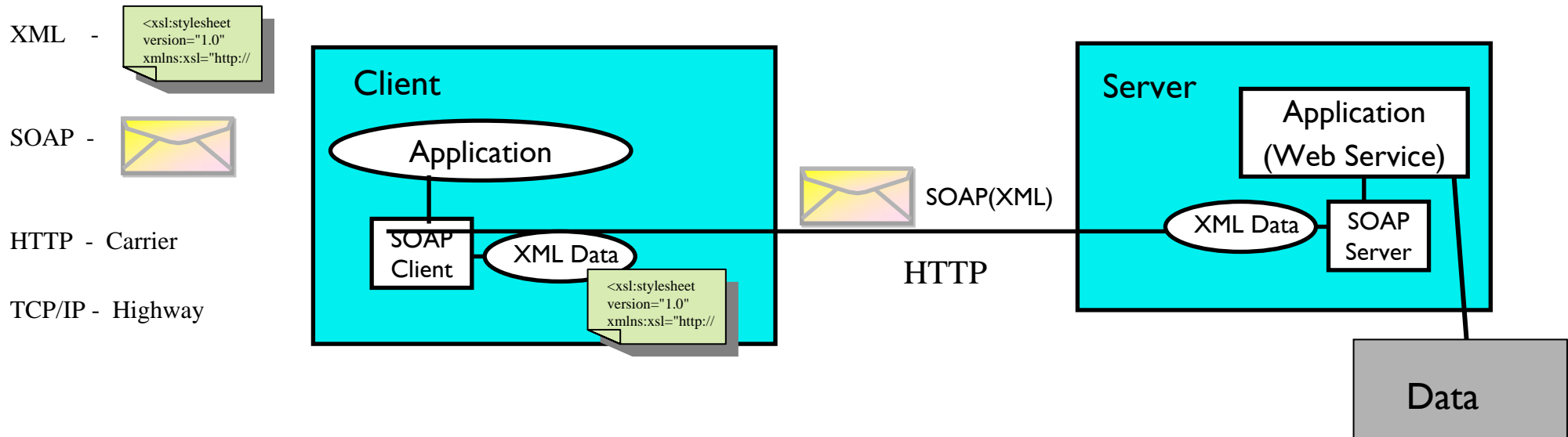
Submit Order

Current Order

Current Order	Quantity	Image
Catcher's mit	10	Photo
Baseball bat	20	Photo
Football	10	Photo
Basketball	10	Photo

Web Services

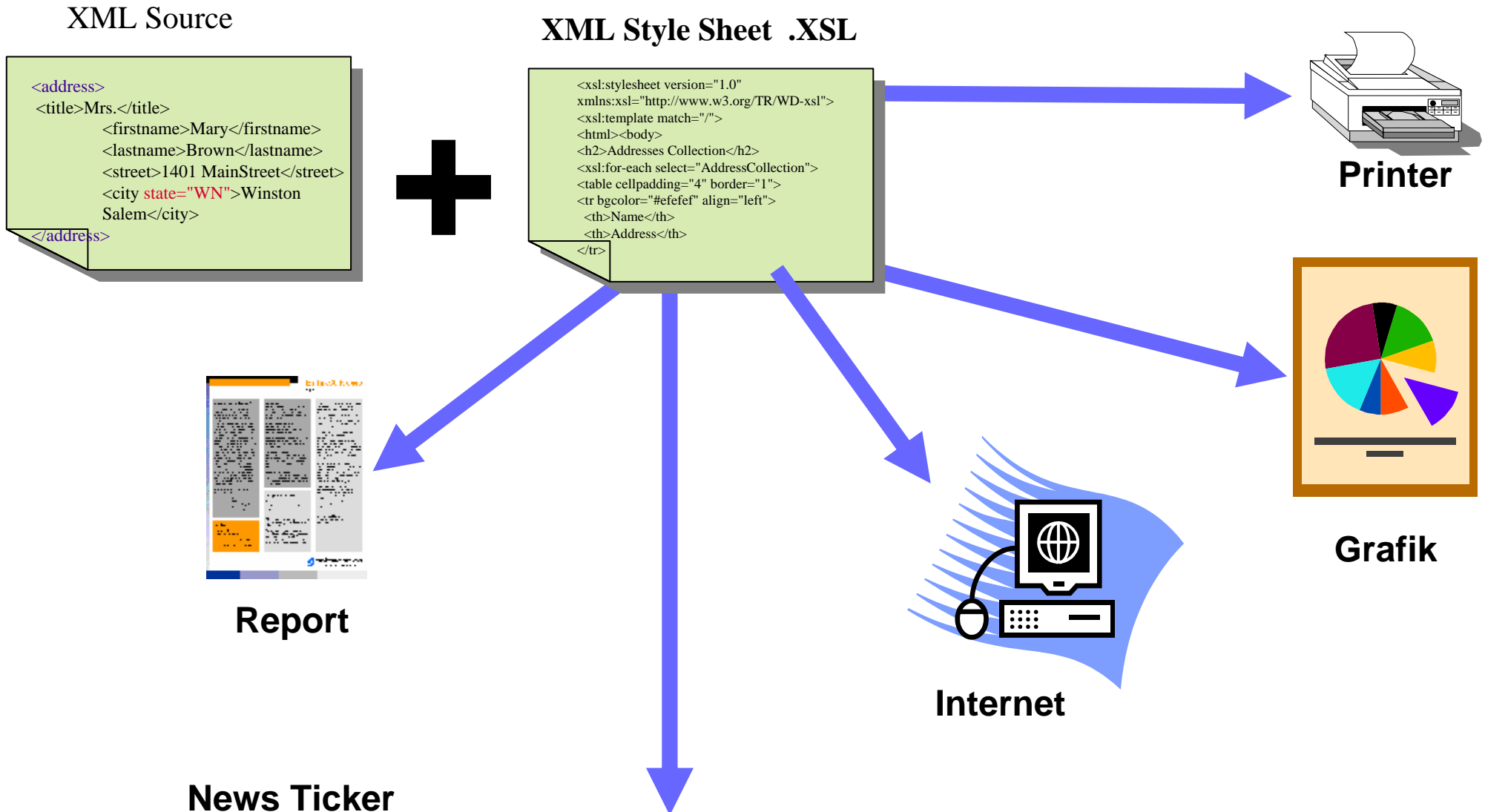
XML Document + SOAP Protocol = Web Services



A web service

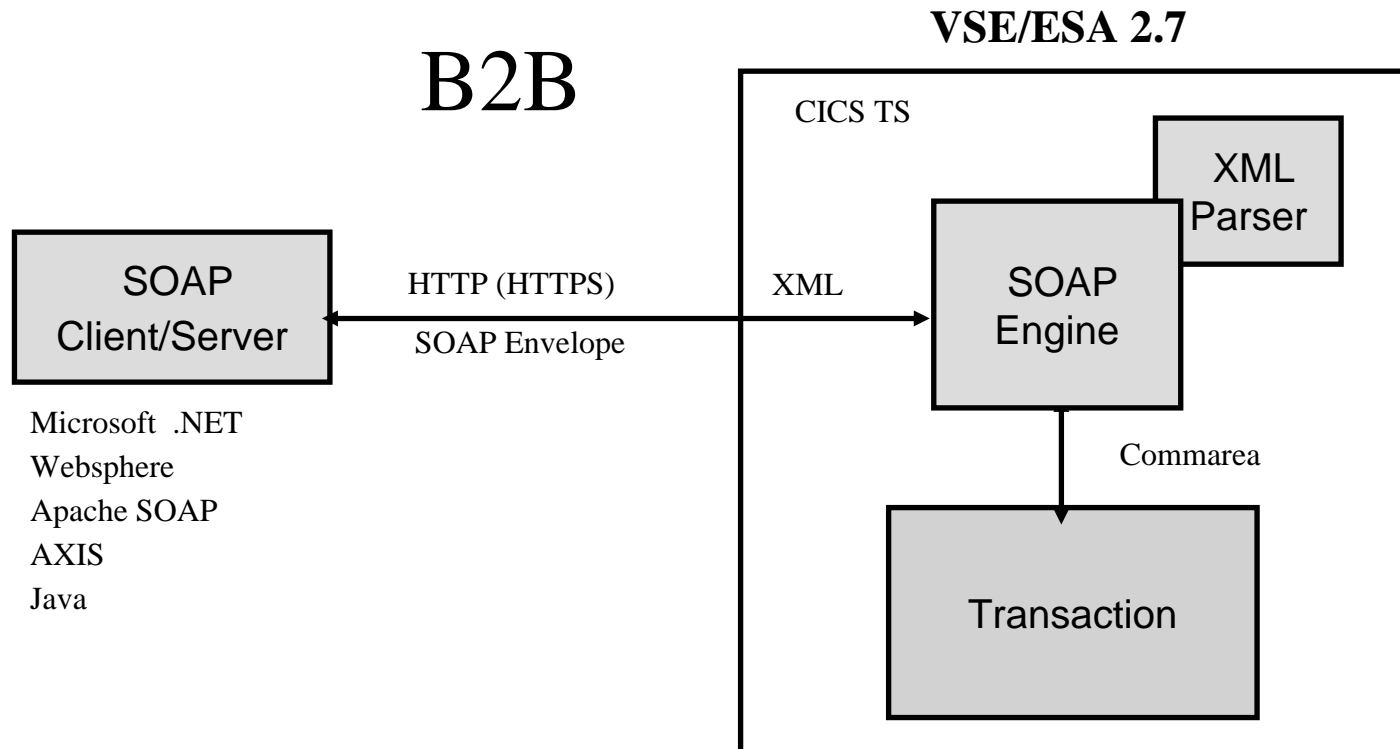
- ☞ implements a business, application or system functionality
- ☞ is intended for application communication
- ☞ is useable in internet, intranet, extranet
- ☞ is useable for browser-based solutions up to the B2B integration between companies
- ☞ uses only standard internet technologies

XSL – formatting of XML documents



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**

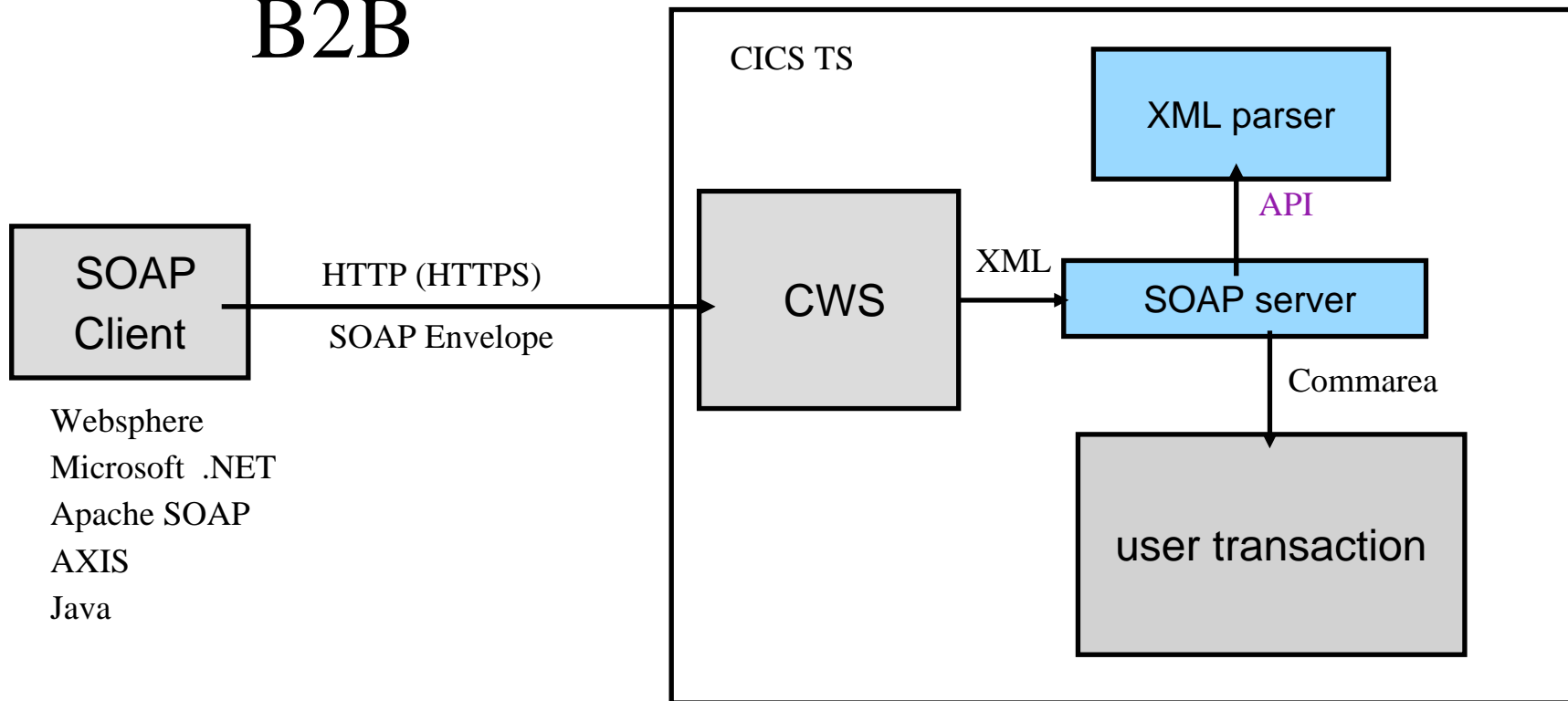
VSE/ESA as SOAP server

Web Services (SOAP)

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

VSE/ESA 2.7

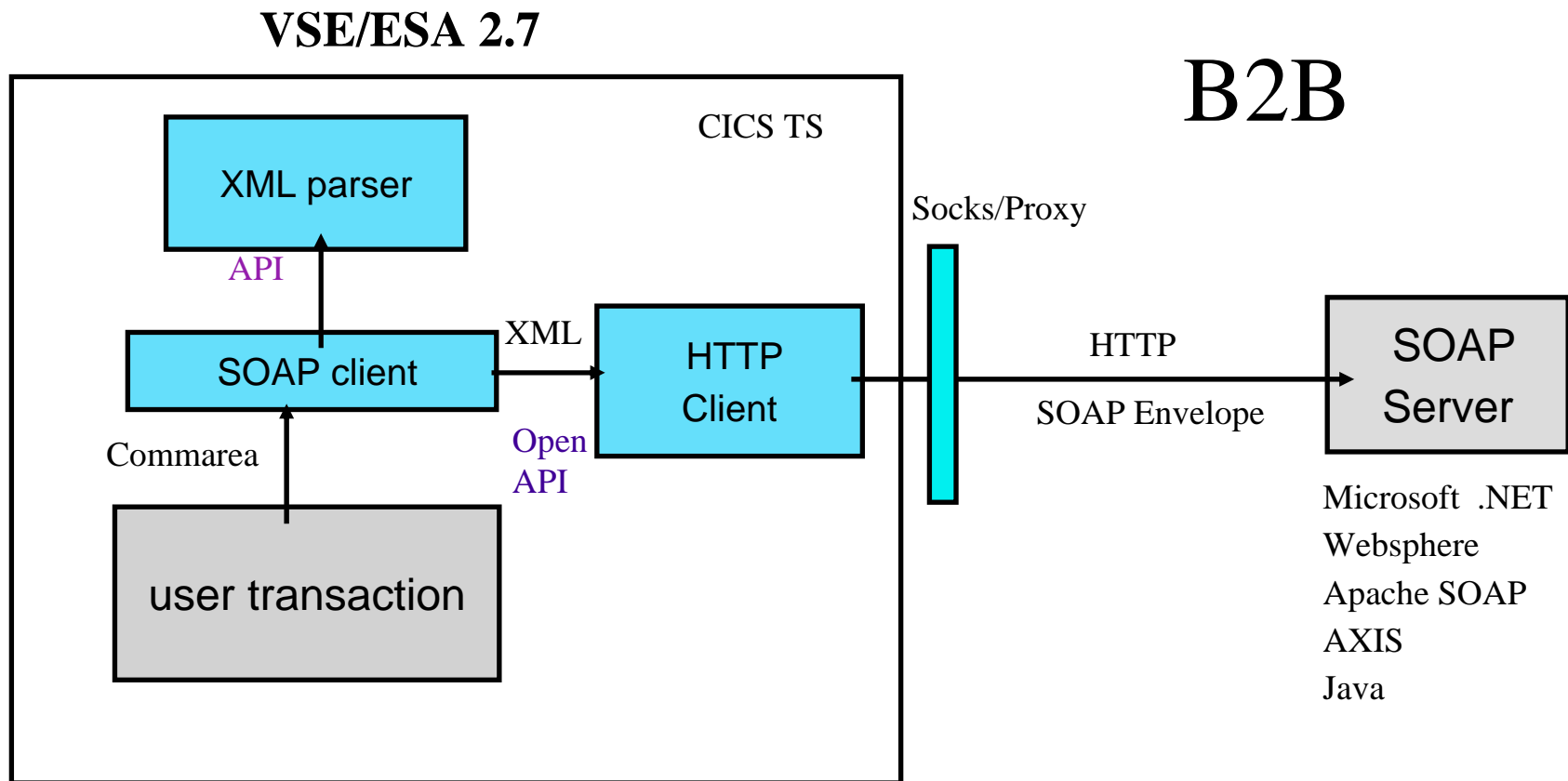
B2B



VSE/ESA 2.7 as SOAP client

Web Services (SOAP)

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

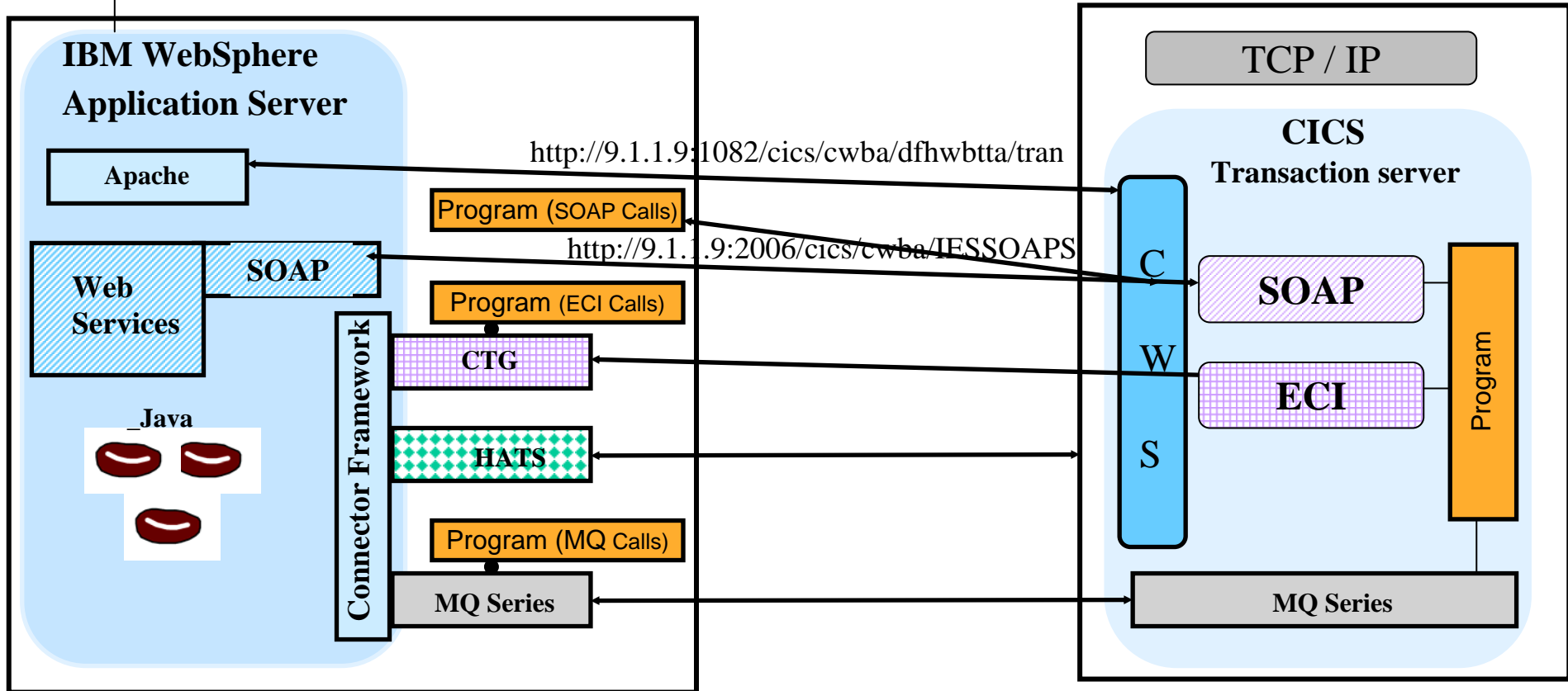


Access to CICS TS in VSE/ESA V2.7




Java Platform
(Linux for zSeries)

VSE/ESA V2.7



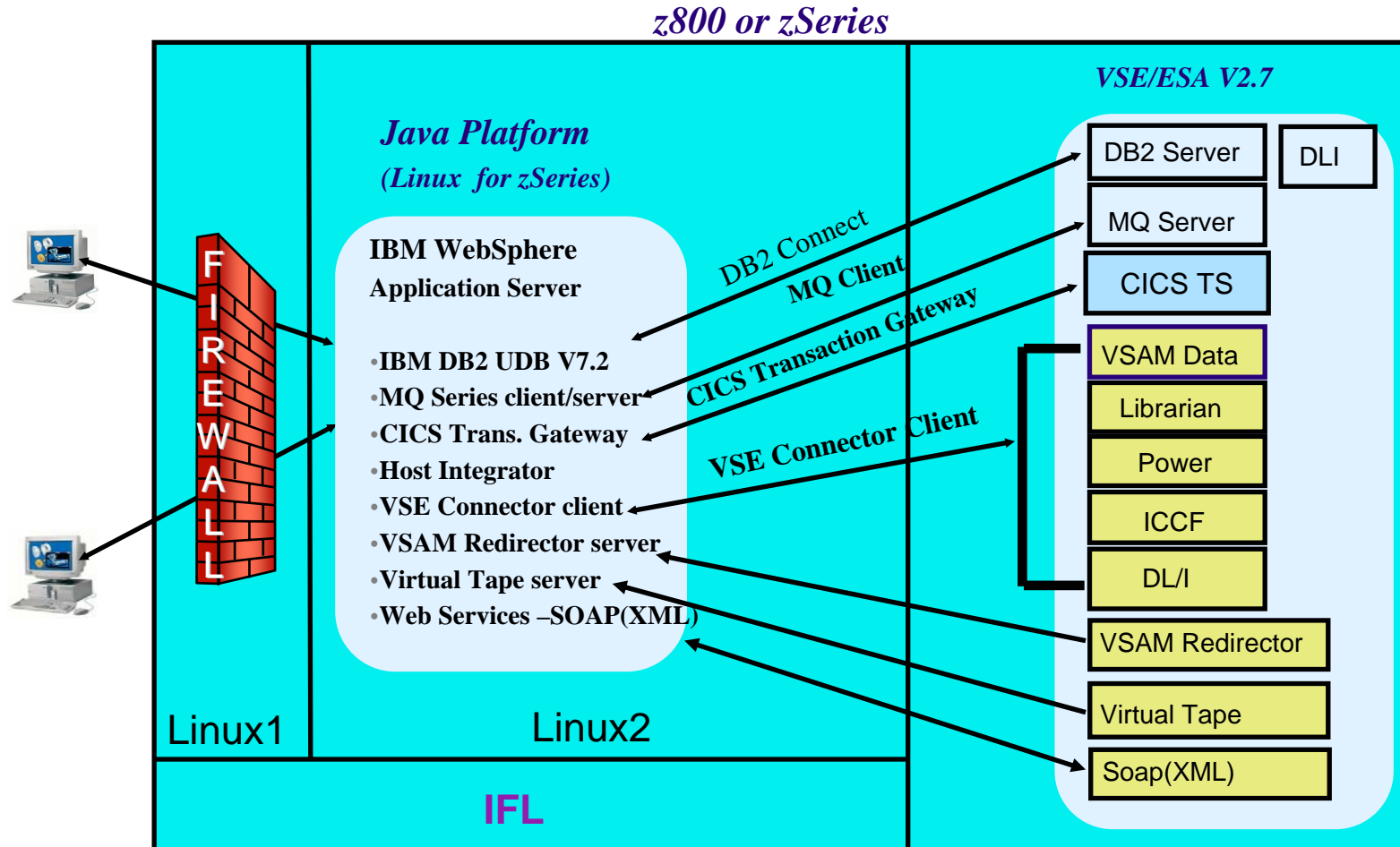
VSE Tools and utilities on the VSE/ESA home page

The screenshot shows a Mozilla browser window titled "VSE/ESA e-business connectors and utilites - Mozilla". The address bar contains the URL: <http://www-1.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/>. The page features the IBM logo and a navigation menu with links for Home, Products & services, Support & downloads, and My account. A sidebar on the left lists various categories, with "Service and support" and "e-business connectors and utilities" highlighted. The main content area displays the heading "e-business connectors and utilites" and provides an overview of the downloadable connectors and utilities. It lists three sections: Connector components, Utilities, and Online books. Below this, there is a table of Connector Components.

Connector Components		
VSE Connector Client	11/2002	VSE/VSAM JDBC Driver
Provides the VSE Java Beans class library, together with extensive online doc, Javadoc, and coding samples for all kinds of Java programs, like small applications, servlets, applets, and EJBs.		Provides a JDBC driver to issue SQL queries to VSAM files. Is part of the VSE Connector VSE/ESA 2.6.

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

VSE/ESA Connections



Additional Information



- **VSE/ESA Home Page**
<http://www.ibm.com/servers/eserver/zseries/os/vse/>
- **Connectors for VSE/ESA**
<http://www.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/>
- **e-business Connectors User's Guide** **SC33-6719**
<http://www.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/>



- **e-business Connectivity for VSE/ESA** **SG24-5950**
- **e-business Solutions for VSE/ESA** **SG24-5662**
- **Servlet and JSP Programming** **SG24-5755**
- **Linux Web Hosting with WebSphere, DB2, and Domino** **SG24-6007**
- ***NEW: Linux on zSeries: Connectors to z/OS and VSE*** ***SG24-7042 (April 2004)***

We appreciate your comments at VSEESA@de.ibm.com