



IBM IT Education Services

E10

Wilhelm Mild

IBM Boeblingen Laboratory

VSEESA@de.ibm.com

**New ways and new possibilities
with VSE/ESA V2.7**

VSE Technical Conference

November 10 - 12, 2003 | Hilton, Las Vegas, NV

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Agenda

VS@

- VSE/ESA - Milestones to a modern operating system
- VSE/ESA 2.7 Solution scenarios for FTP
- Tools for VSE/ESA



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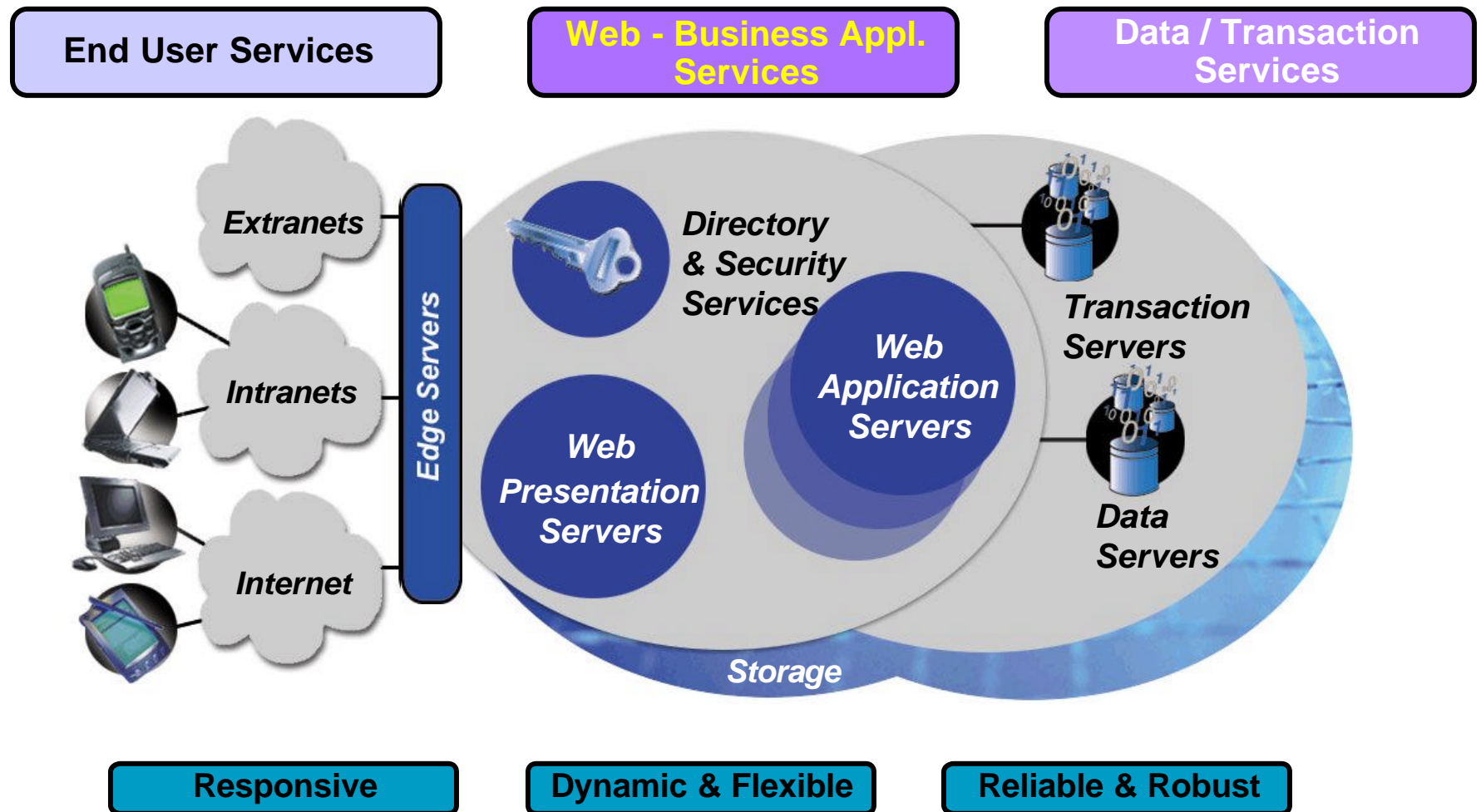
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Infrastructure

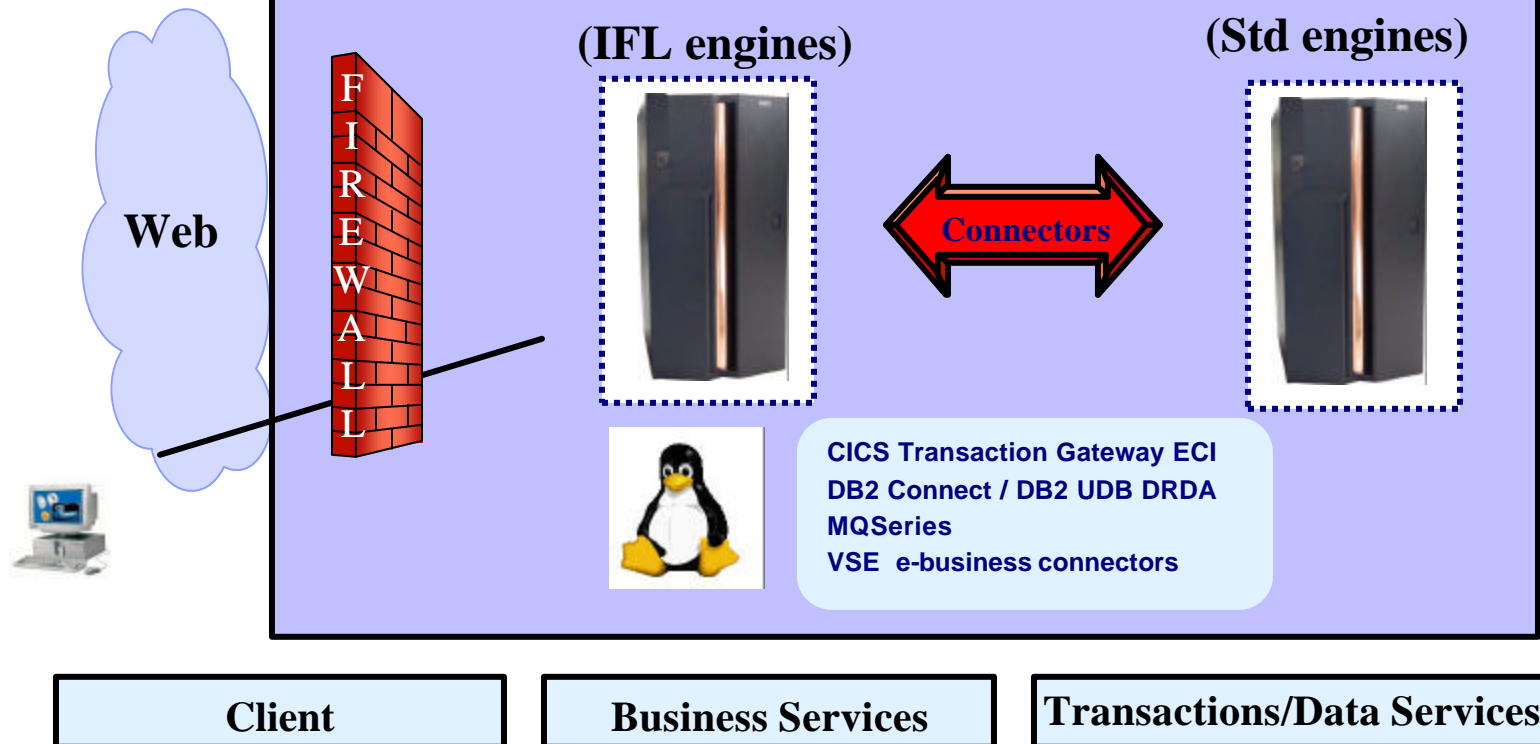


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Integrated VSE and Linux on zSeries

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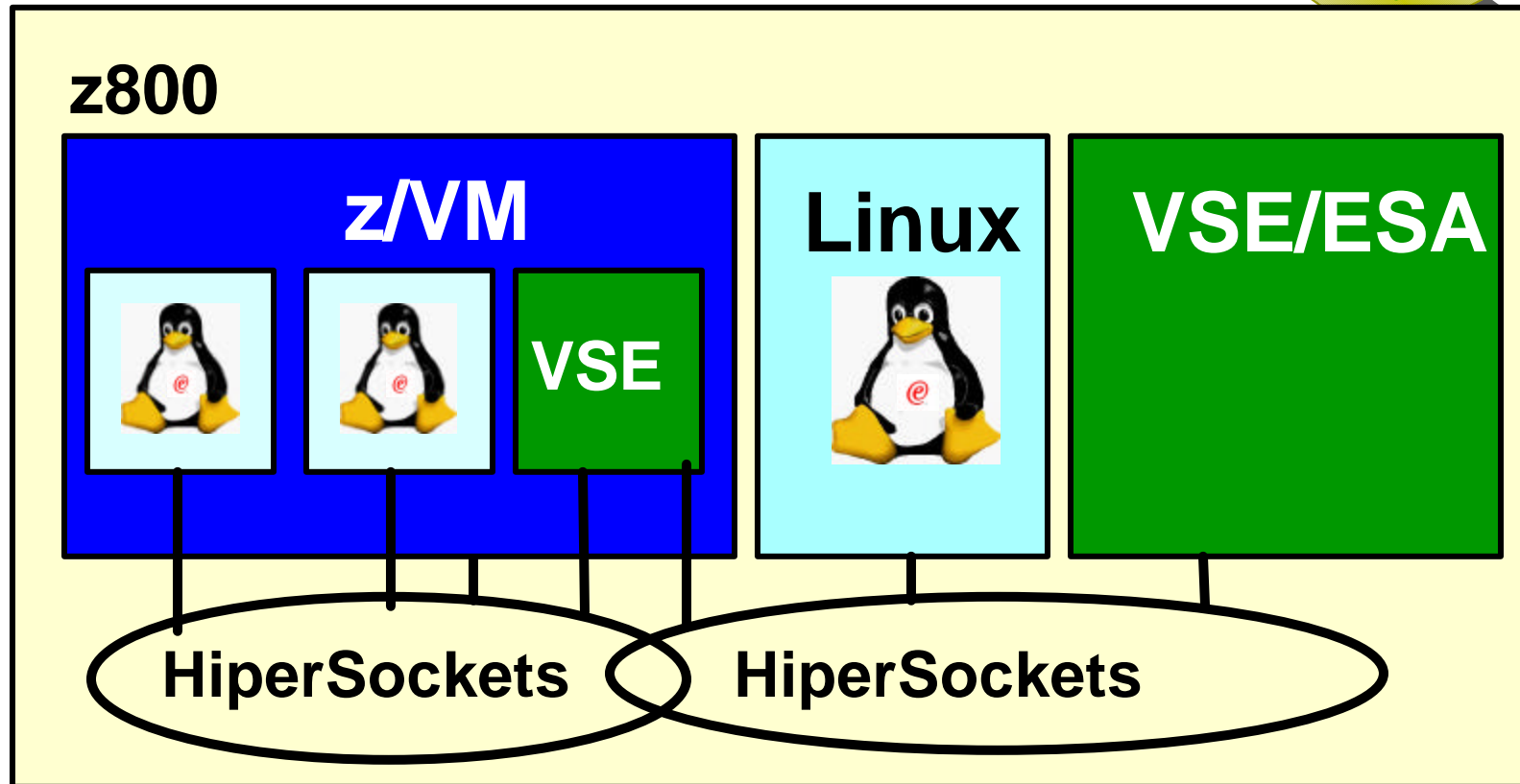
Multiprise 3000, S/390 G5/G6, zSeries 800 and 900



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VSE/ESA Version 2 Release 7



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Solutions

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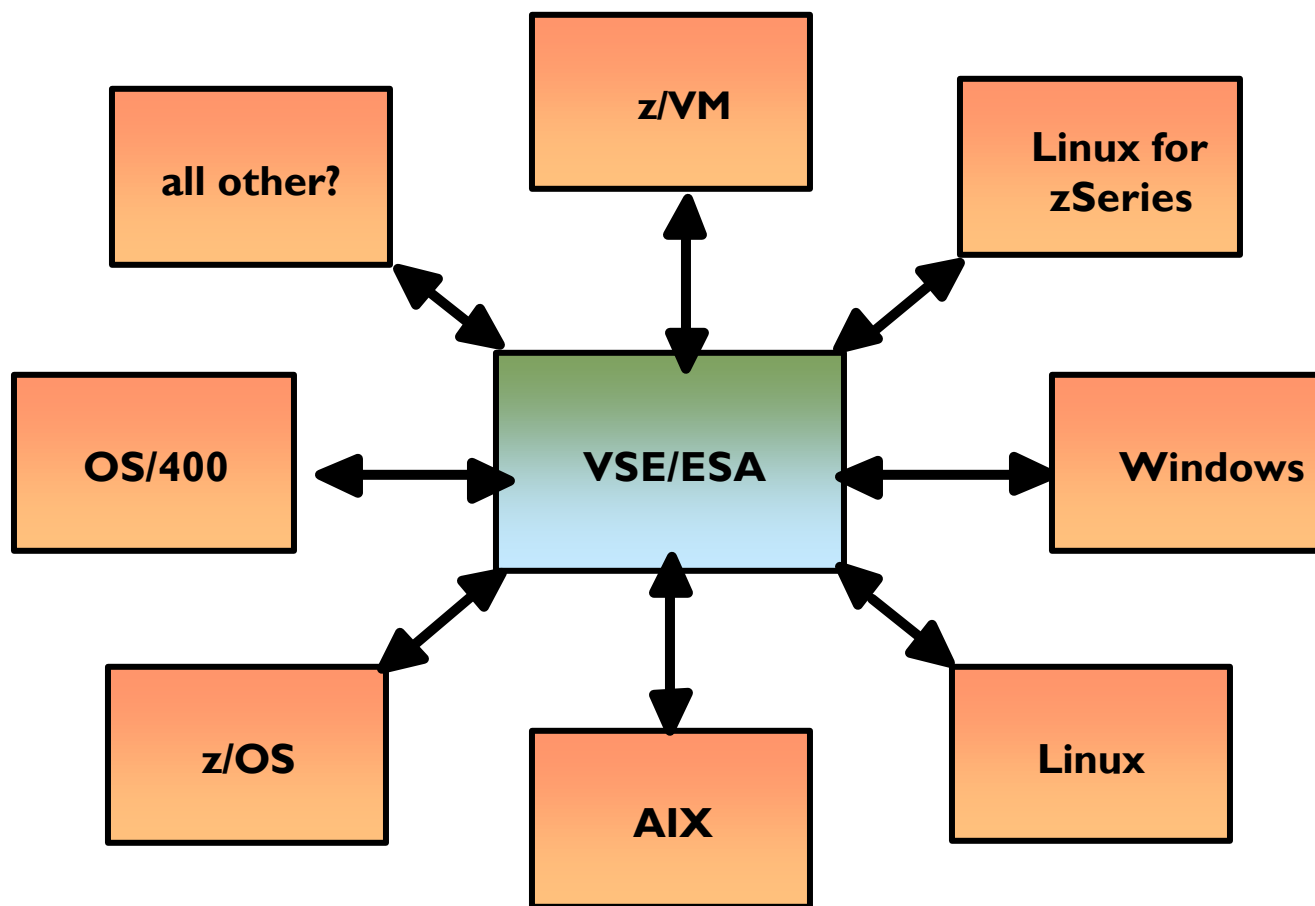
"If you don't know where you're going, you might wind up somewhere else..."

Cheshire Cat



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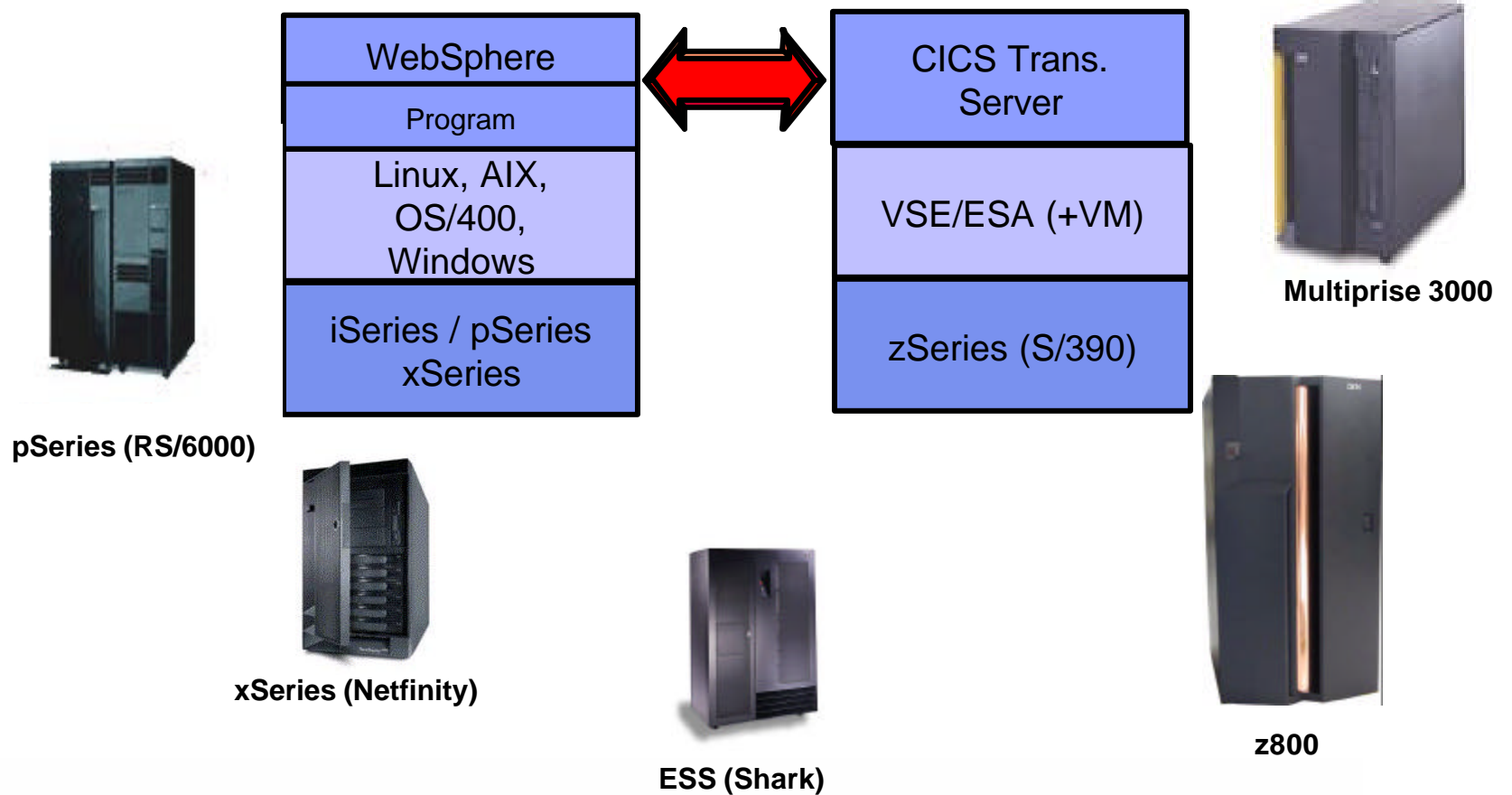
VSE/ESA plays well with others



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VSE/ESA Flexibility – in a heterogeneous environment

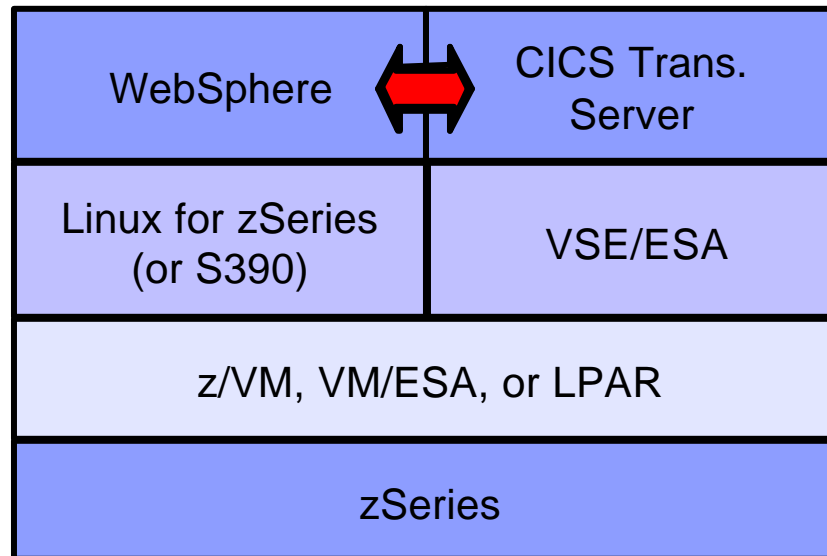


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Linux for zSeries

3-tier logical / 2-tier physical



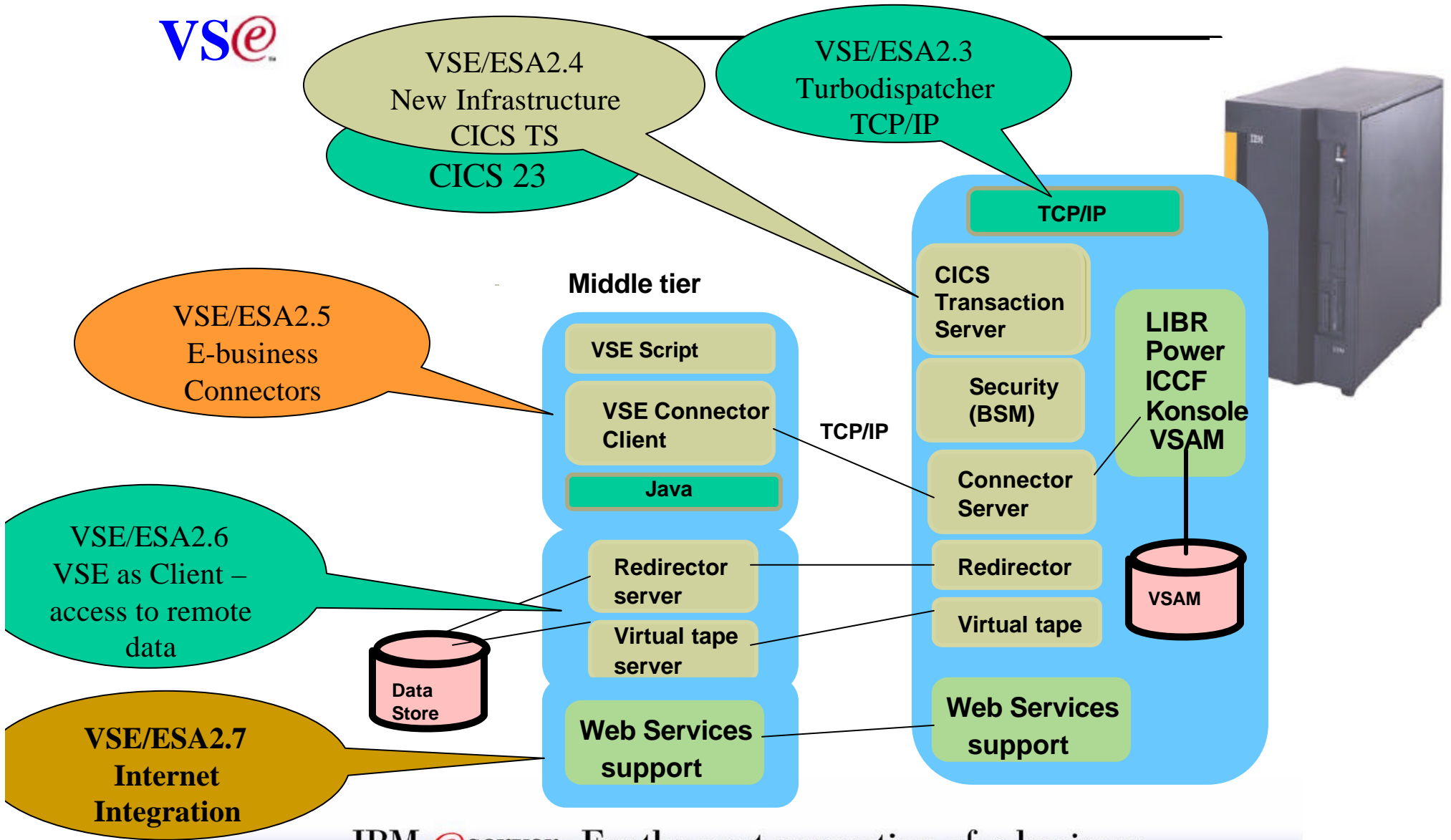
i.e. Multiprise 3000 or 9672 or zSeries



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VSE/ESA - Milestones to a modern operating system

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VSE/ESA integrated Connectors

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VSE/ESA V2.5/2.6 - VSE as Server

- ▶ remote access to VSE Resources
 - ▶ e-business Connectors

VSE/ESA V2.6 - VSE as Client

- ▶ **access to remote data from VSE programs**
 - ▶ **VSAM Redirector**
 - ▶ **Virtual Tape Support**

VSE/ESA V2.7 - VSE Web Services

- ▶ **Access VSE transactions as Web Service**
- ▶ **Access Web Services from VSE Transactions**



VSE/ESA V2.5/2.6

Connectors

VSE/ESA V2.6

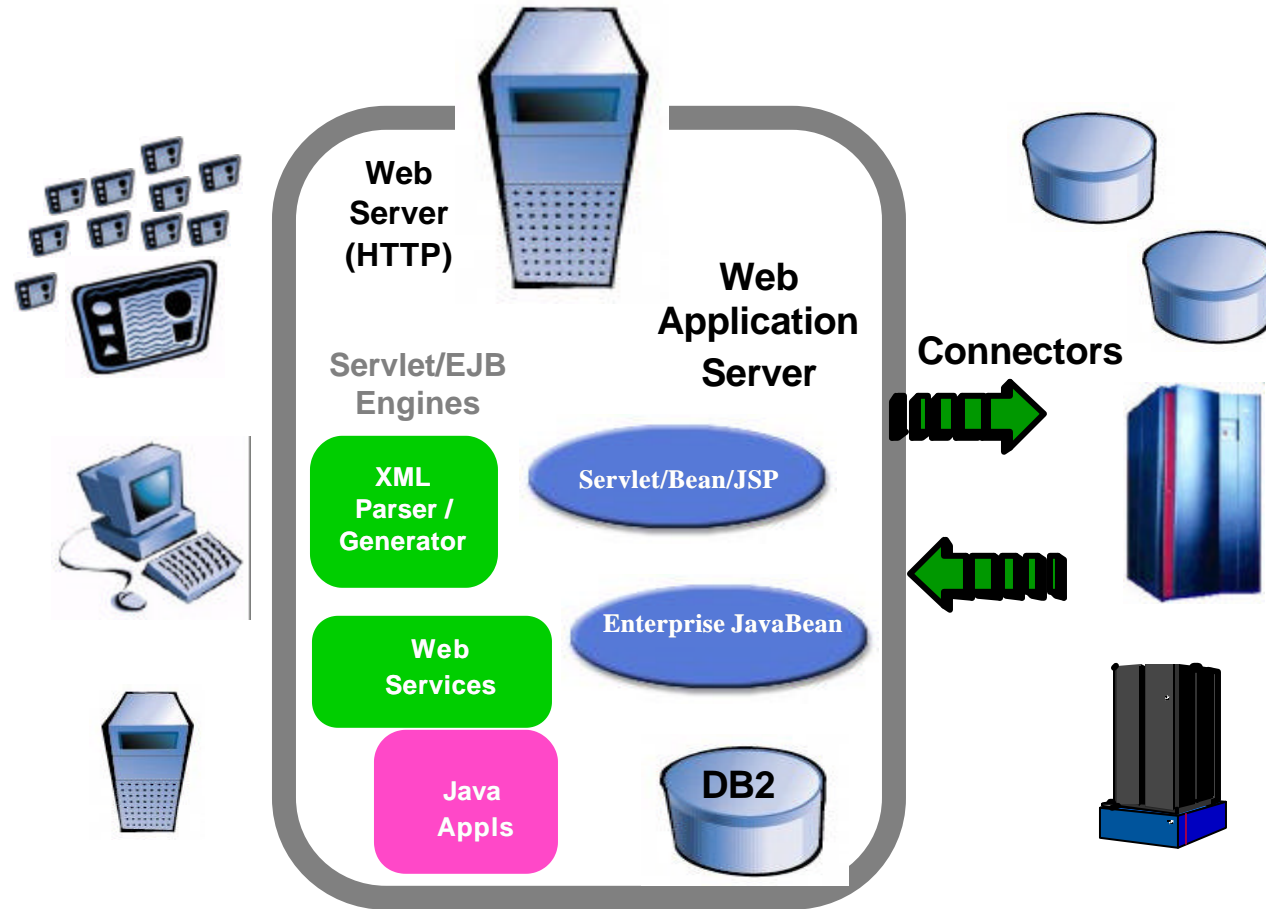
Web Service



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WebSphere Application Model

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► The VSE/ESA Connectors support the WebSphere Technology

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Requirements for today's distributed processes with VSE/ESA

- data exchange via FTP
- access to data on remote platforms
- VSE Applications need access to remote data
- synchronization of data on different platforms
- access VSE applications from remote platforms
- access remote applications from VSE
- access VSE applications via modern, standard internet technologies

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Additional functions needed for VSE/ESA in heterogeneous Processes

- Incremental Backup
- Journaling possibilities independent of applications
 - protocols for changes
- Work with VSE data from the workstation with the security of VSE
 - via standalone programs
 - with Office environments
 - via browser interfaces



FTP – the daily mass data transfer

FTP advantages

- ▶ the use of FTP is wide spread
- ▶ it's a fast data transfer
- ▶ present on all platforms
- ▶ data transfer can be initiated from both sites
- ▶ nearly no additional software needed

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FTP – the daily mass data transfer

FTP disadvantages

- ▶ each time the whole file will be transferred – even if an average of 10% is changed
- ▶ therefore – high traffic on the network
- ▶ the protocol doesn't guarantee data integrity and there is no guarantee that all data are transferred
- ▶ data are never actual
- ▶ FTP is mostly an interim step before the data will be extracted and changed before they will be inserted in another data format (i.e. inserted in relational databases, ...)

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FTP – the daily mass data transfer

FTP alternatives

- ▶(1) Avoid the transfer of the whole file – incremental FTP
- ▶(2) Real time synchronization of data
- ▶(3) Real time access – to just needed data
- ▶(4) Web services - End to end integration of data interchange
- ▶ For all cases:
 - ▶ The best performance is achieved with a fast network;
That is VSE/ESA 2.7 and hipersockets and Linux for zSeries on a zSeries hardware

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FTP – the daily mass data transfer

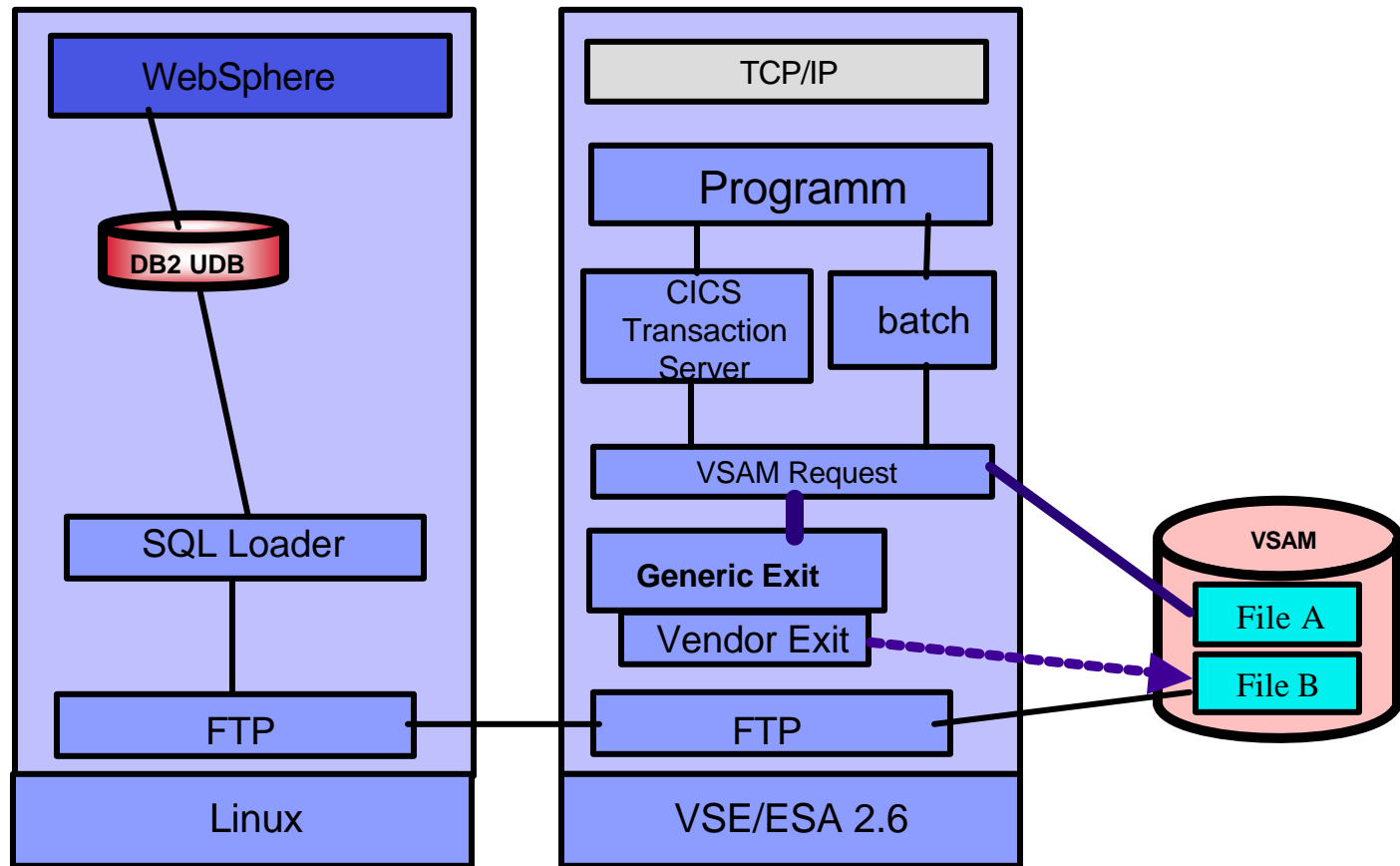
(1) Avoid the transfer of the whole file – incremental FTP

Advantages:

- ▶ Time-saving
- ▶ Significant reduce of network traffic
- ▶ Faster Recovery in case of errors

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(1) Incremental FTP



- ▶ 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)

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FTP – the daily mass data transfer

(1) Avoid the transfer of the whole file –Incremental FTP

Additional possibilities:

- ▶ Change/add information (i.e. timestamp) before storing the data
- ▶ Possibility of journaling
- ▶ Possibility of incremental Backup
- ▶ This process is similar to the capture function for relational data and data can be stored separately without touching the original ('base') data
- ▶ In some cases it would be very helpful to save in this mode the index part only – to know very fast which record did change in a certain time.

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FTP – the daily mass data transfer

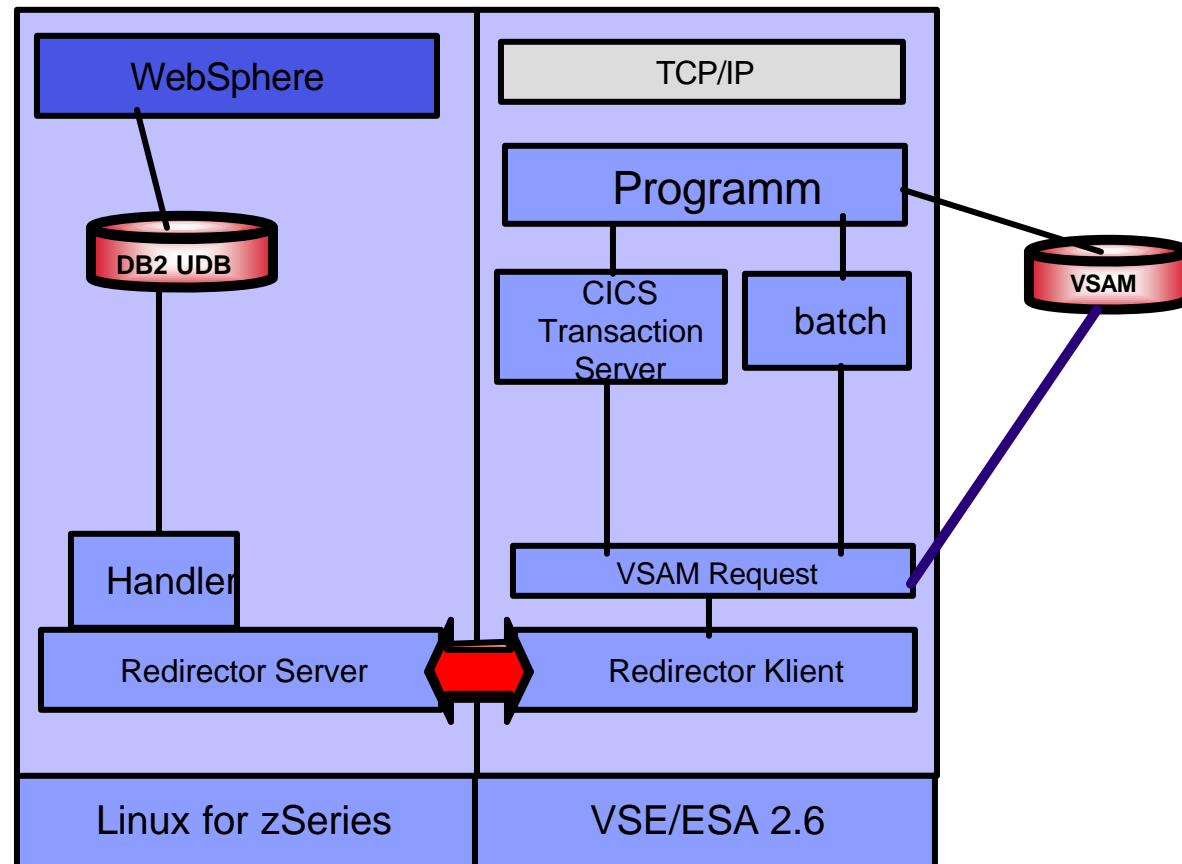
(2) Real time synchronization of data

- ▶ Very helpful and recommendable for Online application
- ▶ For a single, secure delivery in a real distributed environment MQ Series is the solution (VSAM Redirector can then be used to leave VSE applications unchanged)
- ▶ In a virtual network – i.e. z800 with **Hipersockets** (in **VSE/ESA 2.7**, or Z/VM) the use of the VSAM Redirector function is recommended

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(2) Real time synchronization of data

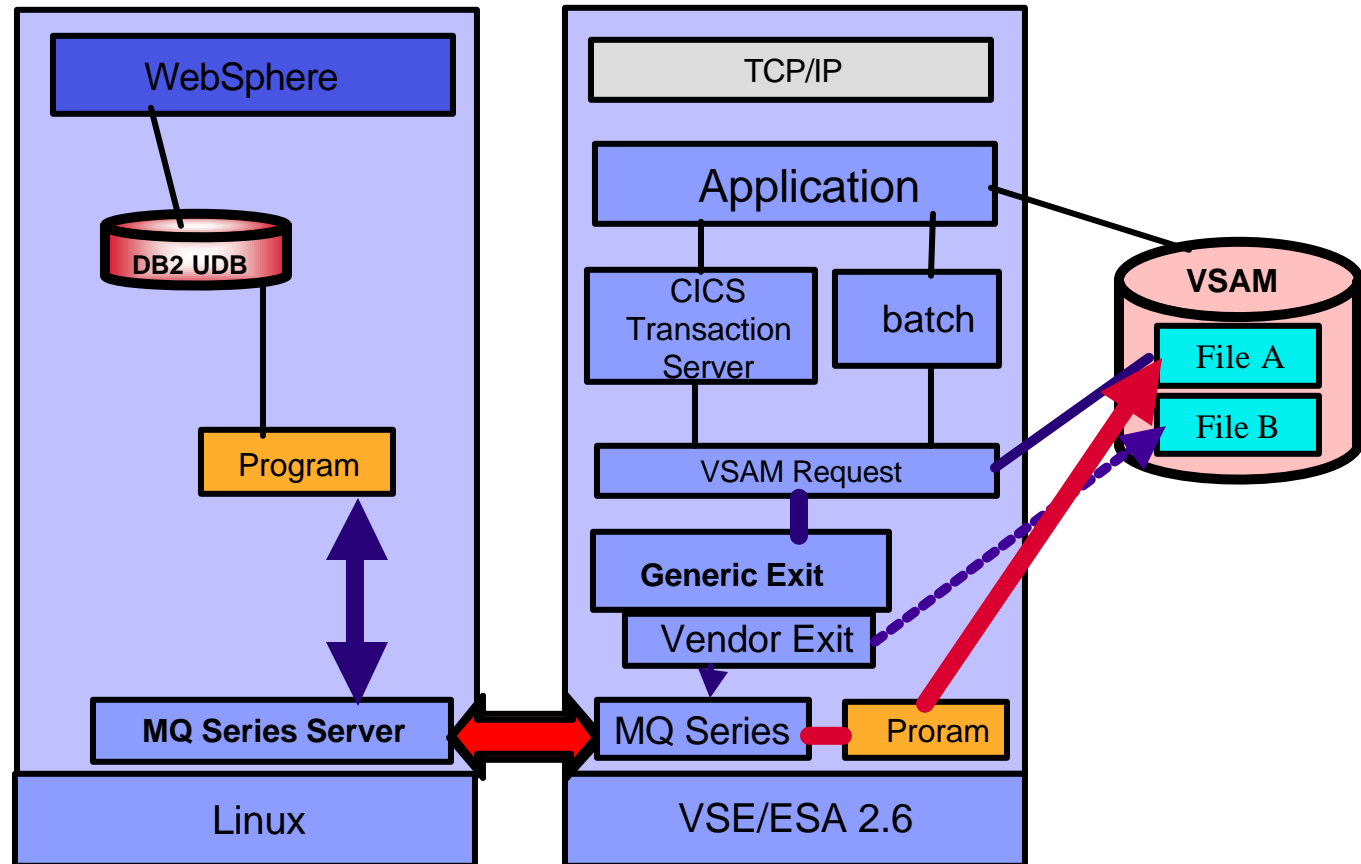


- Synchronization of DB2 UDB in Linux with VSAM, using VSAM Redirector.
(The VSAM Redirector is part of VSE/ESA 2.6)

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Integration of VSE Application with DB2 UDB



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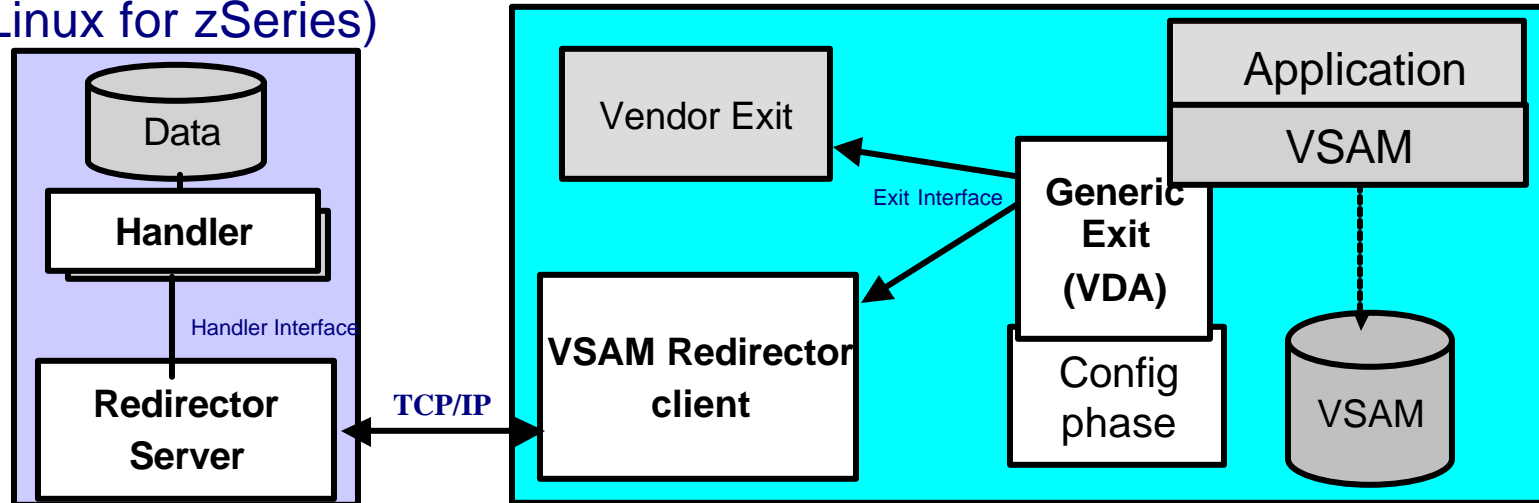
The technology for Solution (1) and (2): VSAM Redirector – functional view

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Java Platform

(Linux for zSeries)

VSE/ESA V2.6



Config PHASE:

Catalog	Cluster	OWNER	IP	Port	Handler-Name	option-string
MY.USER.CAT	MY.VSAM.FILE	REDIR	19.164.155.2	4711	DB2Handler	user=xxx,pw=xxx,...
VENDOR.CAT	VENDOR.CLUSTER	VENDEXIT	n/a	n/a	n/a	n/a
USER.CAT	KSDS.CLUSTER	VSAM	12.100.121.1	1211	HTMLHandler	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

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VSAM Redirector

■ benefits

- ▶ access remote data from VSE applications
- ▶ synchronization of VSAM data with a remote data store (database)
- ▶ transparent for batch and CICS

■ requirements

- ▶ VSE/ESA 2.6 and above
 - ▶ Customization of Redirector client in VSE
- ▶ Setup of redirector server on remote platform
 - ▶ Adoptions to the redirector handler

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FTP – the daily mass data transfer

(3)Real time access – to just needed data

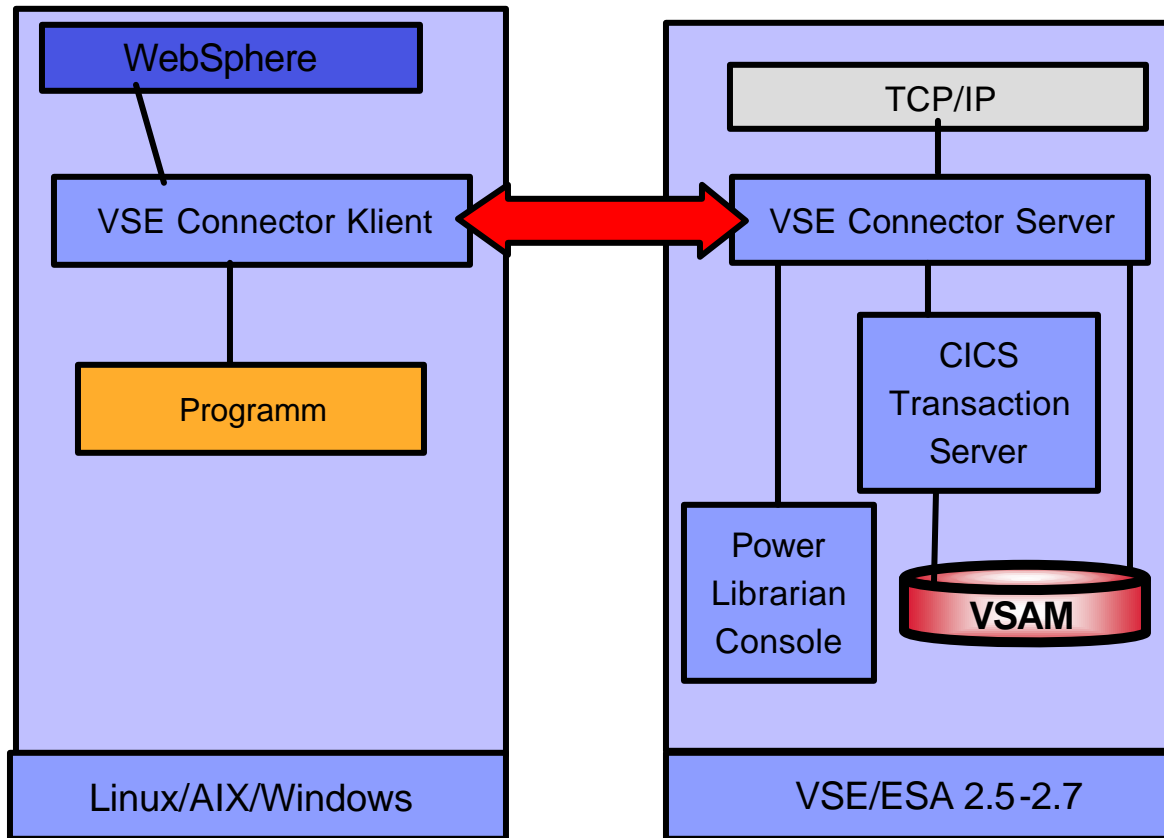
Advantages:

- ▶ Constantly real time data
- ▶ No need for a full file transfer
 - ▶ Low network traffic
- ▶ Advantage for spontaneous needed data
 - ▶ Faster decisions possible
- ▶ Very good Integration possibilities in heterogeneous environments
- ▶ With Java technologies or with VSE/ESA 2.7 using scripts (i.e. Visual Basic)

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(3) Real time access – to just needed data from a Java platform



► real time integration of VSE resources

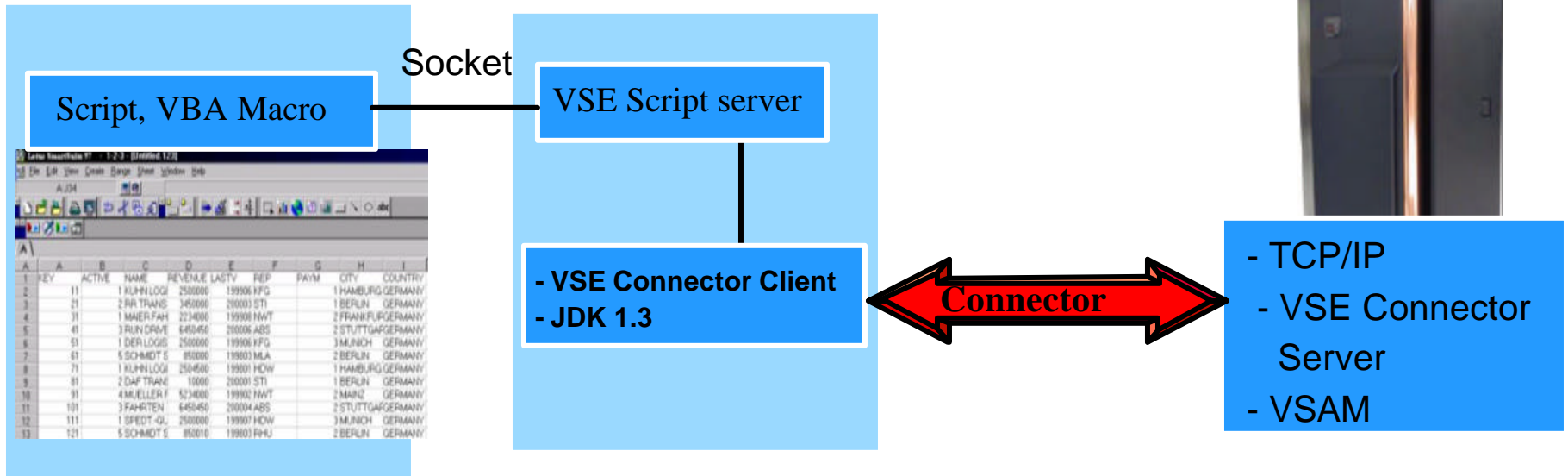
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(3) Real time access – to just needed data from scripts and Office products

VSE/ESA 2.7

End-user view



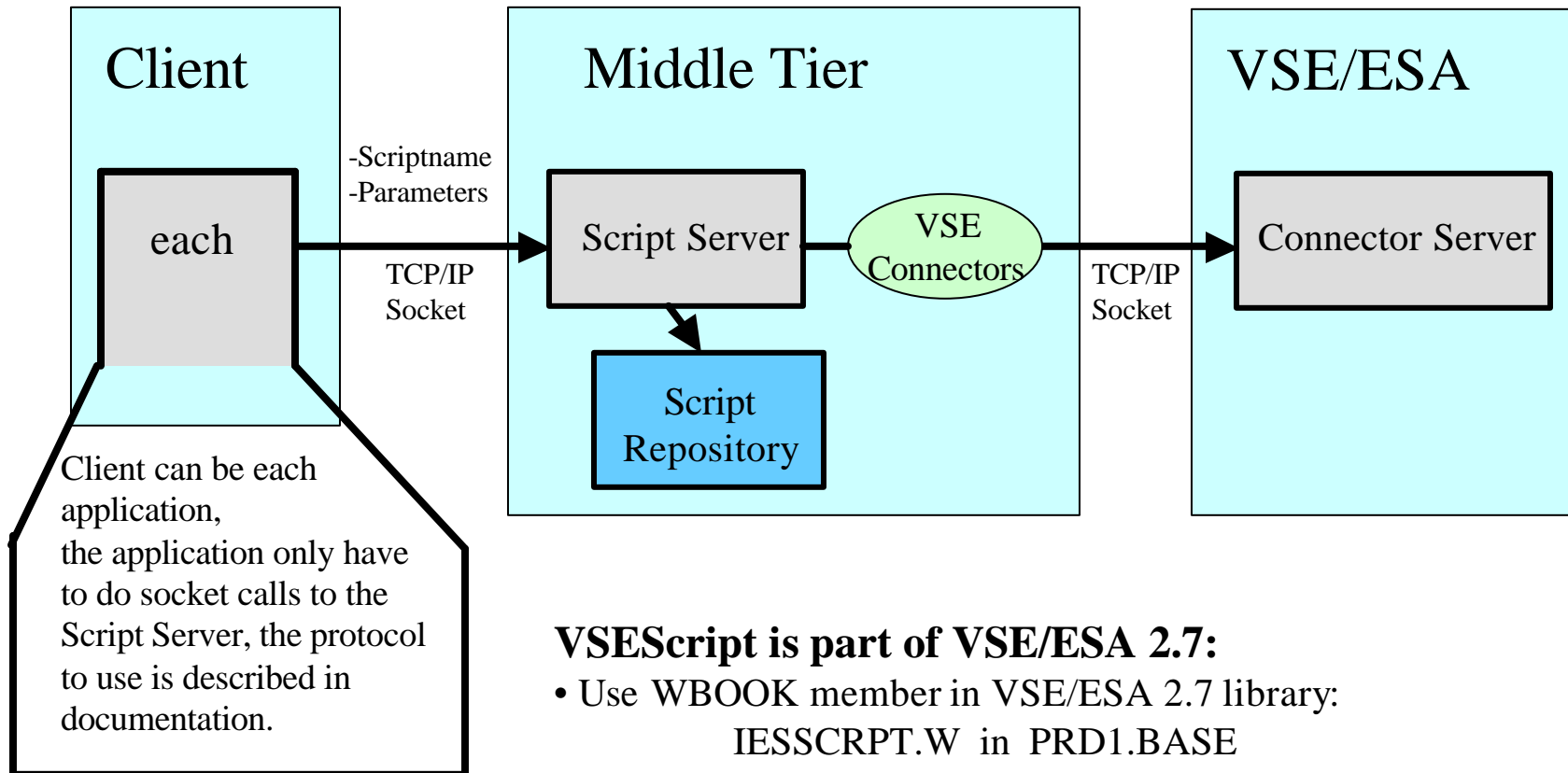
Advantages:

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

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VSEScript

Overview and Control Flow



VSEScript is part of VSE/ESA 2.7:

- Use WBOOK member in VSE/ESA 2.7 library:
IESSCRPT.W in PRD1.BASE

- Download from the web (*always newest version*):

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

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Overview cont.



Benefits

- Use the VSE Connectors client without programming Java, you only need to write a script using a simple script language.
- The Scripts on ScriptServer can be invoked by any client or existing application (which e.g. could use the shipped DLL), or using a socket connection.
- The VSEScript script language offers the following functionality of the VSE Connector client:
 - Full access to VSAM with data mapping (read, insert, ...)
 - Full access to POWER (job submission, ...)
 - Full access to VSE console (issue commands, ...)

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Sample script



```

//*****
/* This script executes a POWER job that is read from a file (test.job)      *
/* on the local hard disk and prints out the LIST output of the job.        *
//*****

string jin, jout;
int rc;
// read the local file into variable jin
readFile(".\\Scripts\\samples\\test.job", &jin, &rc);

// execute the job in jin and store the joboutput in jout
// host config (ip,user,pw) for „vsefran“ is taken from config file
executePowerJob("vse27",&jin,&jout,&rc);

if(rc!=0) do;
    exit(2);
endif;

int y,z;
// store size of array jout into int variable y (=number of lines)
arraysize(&jout, &y);
z=0;
// print the job output line by line
while(z<y) do;
    println(jout[z]);
    z=z+1;
endwhile;

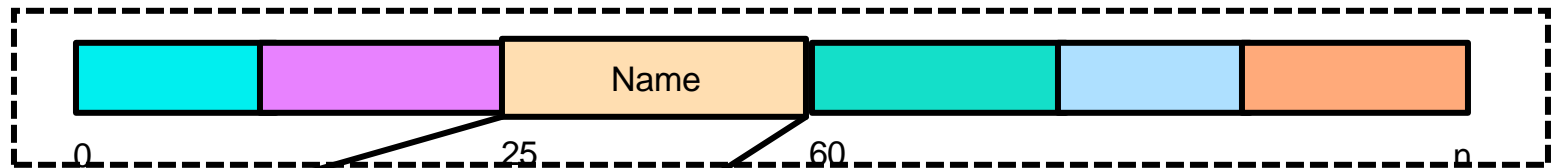
```

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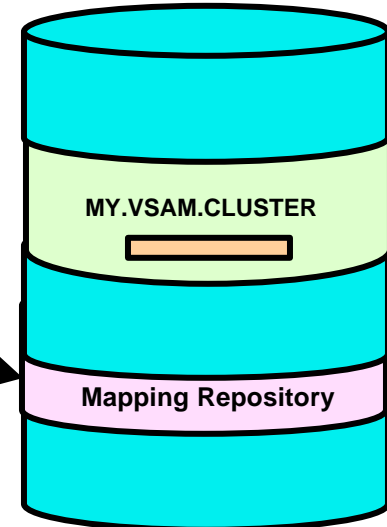


VSAM Record Mapping

VSE/VSAM Record structure from EMPPROG.COBOL



Column:
→ title: Name
→ Offset:25
→ length:35
→ type: STRING



Possibilities to do mapping:

- ▶ IDCAMS Command RECMAP
- ▶ Java Beans (Function integrated in VSE Navigator)
- ▶ Maptool (Java Tool, free download from VSE/ESA home Page)
 - ▶ Allows the import of XML, COBOL, PL/I structures (Copy Books) and generates the MAP definitions (in VSE) or XML definitions (locally)

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VSAM JDBC Driver



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

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



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)



FTP – the daily mass data transfer

(4) End to end integration with SOAP(XML)

Most modern solution:

- ▶ Instead of:
 - ▶ Initiation of FTP process
 - ▶ Wait until whole file is transferred
 - ▶ Start application and cleans/transform data on remote
 - ▶ Insert data in the new data store (i.e. relational database)

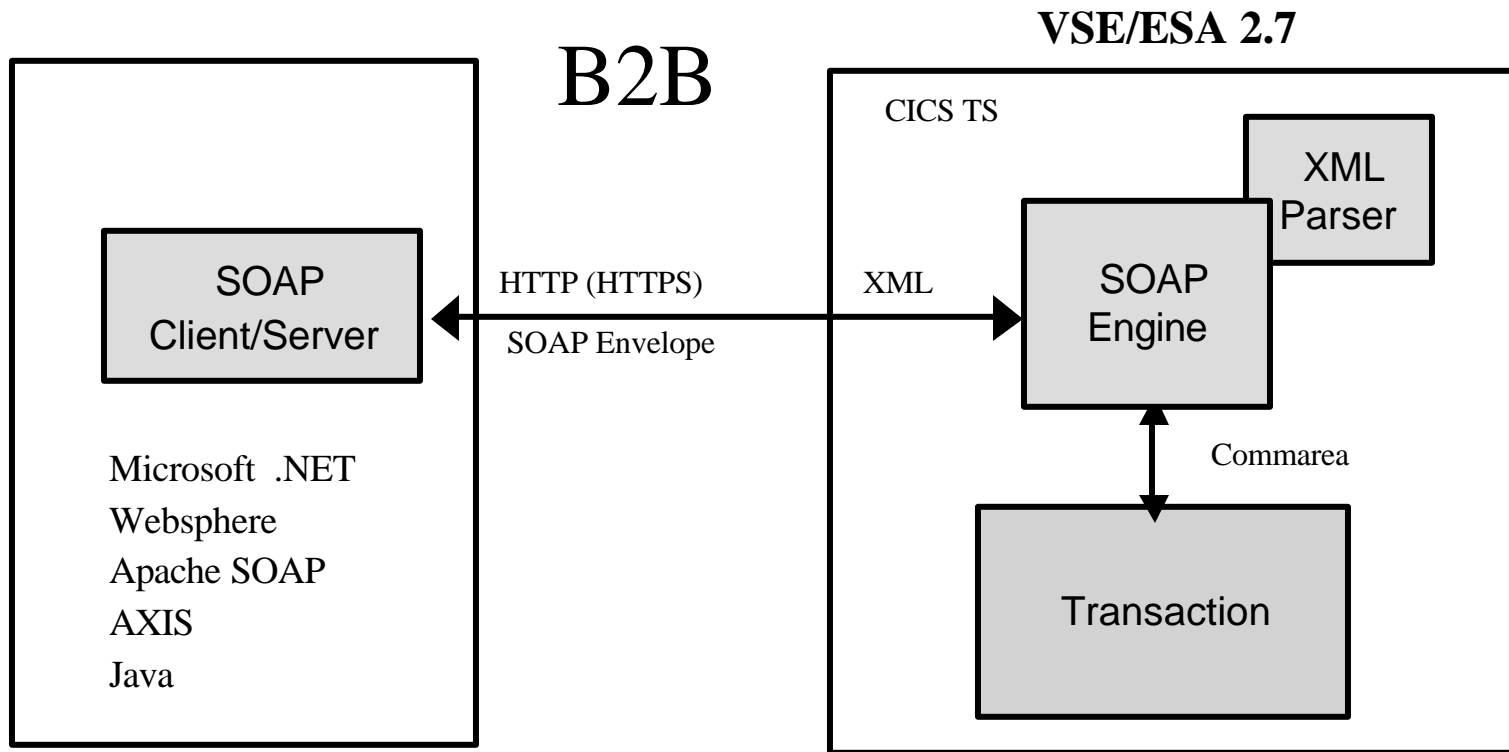
- ▶ Use of Internet technology – Web Services
 - ▶ Applications can communicate to each other (i.e. VSE application with the ‘SQL Load’ application on the remote platform)
 - ▶ Only needed data will be send over the net – in XML format
 - ▶ Standard applications can be used for manipulation
 - ▶ Service can be initiated from both sites

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(4) VSE/ESA 2.7 - End to end integration with SOAP(XML)

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CICS Transactions as Web Services (XML data interchange with SOAP)



★ VSE/ESA Transactions as Web Service

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Integration of VSE/ESA 2.7 in dynamic e-business

- VSE can act as
 - SOAP server
 - Driven through CICS Web Support
 - Allows to invoke a CICS program from remote
 - Transport protocol is HTTP (and HTTPS)
 - SOAP client
 - A CICS program can invoke a WebService
 - Transport protocol is HTTP
 - Connection possible through firewalls
 - HTTP Proxy
 - Socks V4/V5

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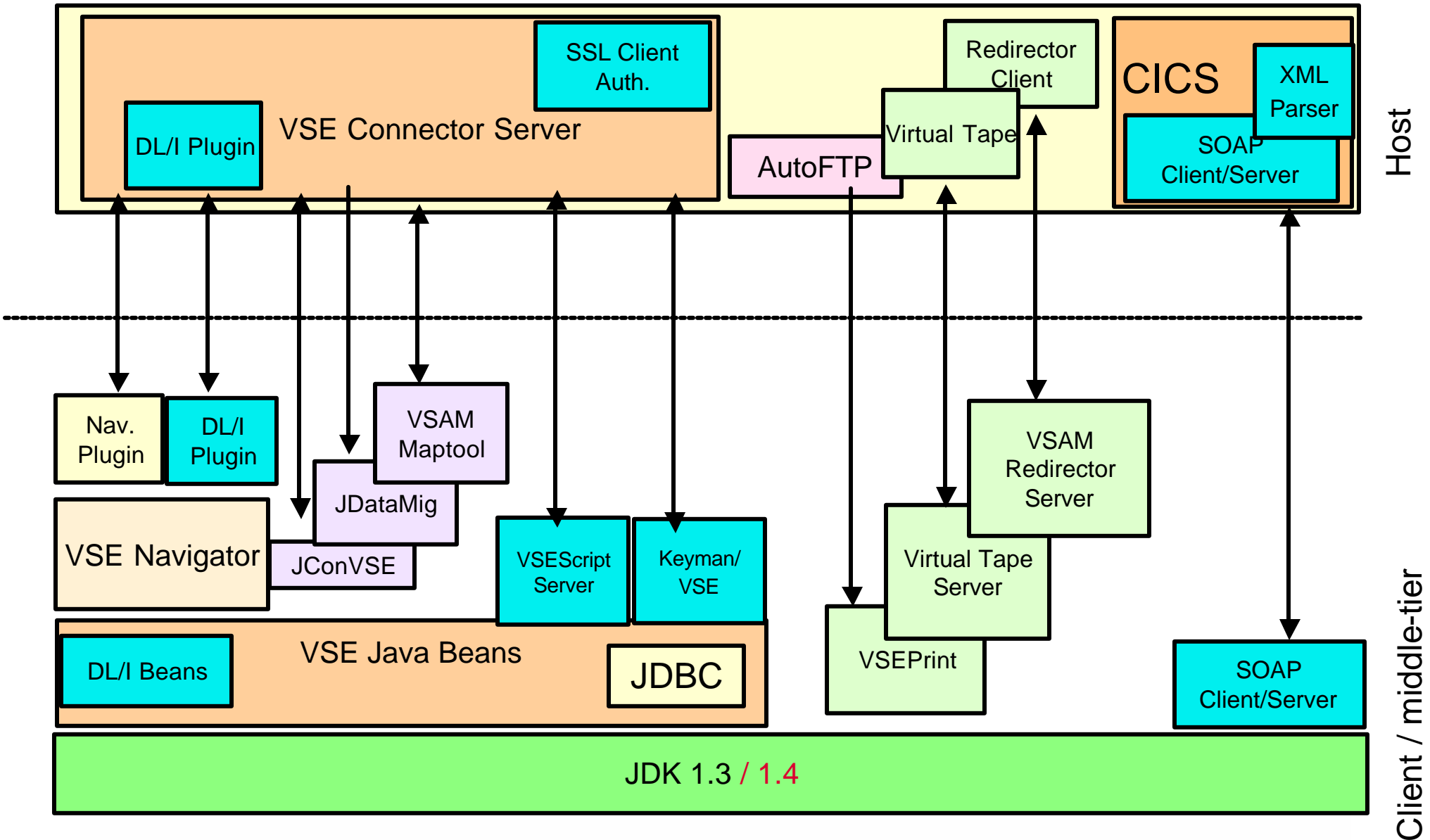
Requirements for today's distributed processes with VSE/ESA



- ✓ data exchange via FTP
 - ✓ Vendor Exit from 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)

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Changes with VSE 2.7



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VSE Tools and utilities on the VSE/ESA home page



The screenshot shows a Mozilla browser window with the address bar containing 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 options like 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 is titled 'e-business connectors and utilities' and includes a list of links: Connector components, Utilities, and Online books. Below this, there is a section for 'Connector Components' with a table listing 'VSE Connector Client' and 'VSE/VSAM JDBC Driver'.

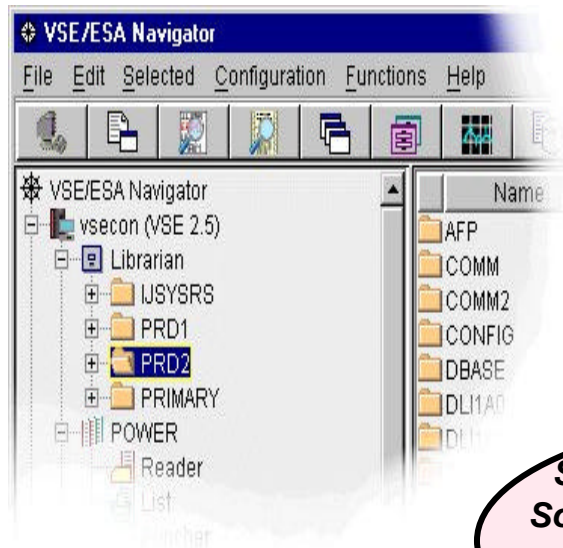
Connector Components		
VSE Connector Client	11/2002	VSE/VSAM JDBC Driver
Provides the VSE Java Beans class library, together with extensive online doc, Javadoc, and coding samples for all kinds of Java programs, like small applications, servlets, applets, and EJBs.		Provides a JDBC driver to issue SQL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

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



VSE Navigator

(100% pure Java Anwendung)



- VSE Connector Klient
- Java Runtime (JRE)
- VSE Navigator



- TCP/IP
- VSE Connector Server



☞ A graphical interface to VSE resources – implementation based on the Java-Based Connectors

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Java-based consol support for VSE/ESA

JConVSE - mild@ffdemo

BG F1 F2 F3 F4 F5 F6 F7 F8 F9 FA FB

```
R1 0045 IESC1024I CLIENT DISCONNECTED FROM IP: 9.164.185.90
R1 0045 IESC1024I CLIENT DISCONNECTED FROM IP: 9.164.185.90
AR 0015 SPACE AREA V-SIZE GETVIS V-ADDR UNUSED NAME
AR 0015 S SUP 664K 0 $$$A$SUPX
AR 0015 S SVA-24 1684K 1748K A6000 OK
AR 0015 0 BG V 1280K 4864K 400000 45056K
AR 0015 1 F1 V 1024K 1024K 400000 OK POWSTART
AR 0015 2 F2 V 2048K 49152K 400000 OK CICSICCP
AR 0015 3 F3 V 600K 14760K 400000 OK VTAMSTRT
AR 0015 4 F4 V 2048K 18432K 400000 OK DB2START
AR 0015 5 F5 V 768K 256K 400000 OK
AR 0015 6 F6 V 256K 256K 400000 OK
AR 0015 7 F7 V 1024K 19456K 400000 OK TCPSTART
AR 0015 8 F8 V 2048K 49152K 400000 OK
AR 0015 9 F9 V 256K 256K 400000
AR 0015 A FA V 256K 256K 400000
AR 0015 B FB V 256K 256K 400000
AR 0015 S SVA-31 7156K 7180K 3600000
AR 0015 DYN-PA 16384K
AR 0015 DSPACE 5472K
AR 0015 SYSTEM 1088K
AR 0015 AVAIL 58976K
AR 0015 TOTAL 270336K <-----
AR 0015 1140I READY
```

Working, please wait...

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VSE/ESA JAVA

PF1 PF2 PF3 PF4 PF5 PF6 PF7 PF8 PF9 PF10 PF11 PF12

ready... 08:28:44

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user views

KEY	ACTIVE	NAME	REVENUE	LASTV	REP	PAYM	CITY	COUNTRY
1	11	1 KUHN LOGI	2500000	19906	KFG		1 HAMBURG	GERMANY
2	21	2 RA TRANE	3450000	20000	STI		1 BERLIN	GERMANY
3	31	1 MAER FAH	2234000	19908	NWT		2 FRANKFUR	GERMANY
4	41	3 RULN DRIV	6450450	20008	ABS		2 STUTTGAR	GERMANY
5	51	1 DER LOGIS	2500000	19906	KFG		3 MUNICH	GERMANY
6	61	5 SCHMOT E	850000	19903	MLA		2 BERLIN	GERMANY
7	71	1 KUHN LOGI	2504500	19901	HOW		1 HAMBURG	GERMANY
8	81	2 DAF TRANE	10000	20000	STI		1 BERLIN	GERMANY
9	91	4 MUELLER F	5234000	19902	NAV		2 HAMBURG	GERMANY
10	101	3 FAHRTEN	6450450	20004	ABS		2 STUTTGAR	GERMANY
11	111	1 SPEDT-GL	2500000	19907	HOW		3 MUNICH	GERMANY
12	121	5 SCHMOT E	850010	19903	PHJ		2 BERLIN	GERMANY

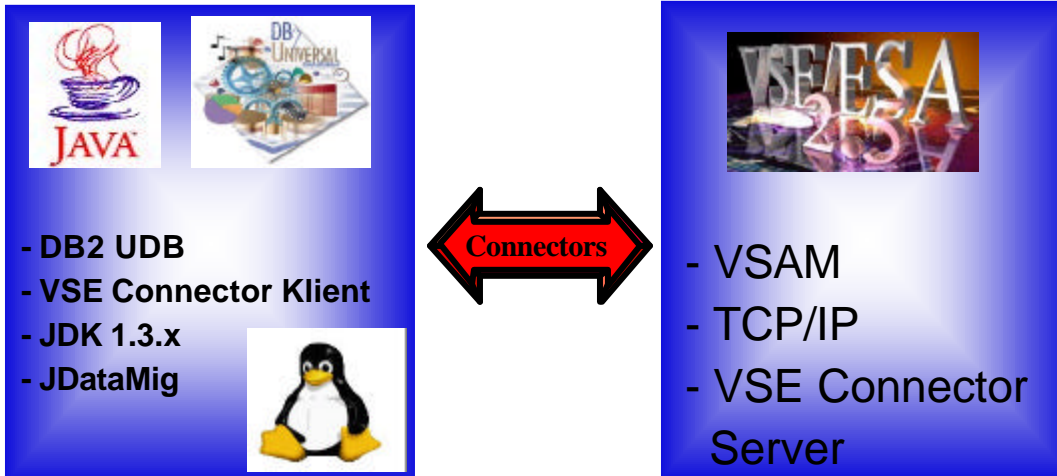
Lotus 1-2-3

ACTIVE	NAME	REVENUE	PAYM	COUNTRY
01	MUHL LOGISTIK	2500000	01	GERMANY
02	RR TRANSPORT	3450000	01	GERMANY
03	MAER FAHRT	2234000	02	GERMANY
04	MUHL DRIVE	6450450	02	GERMANY
05	DER LOGISTIK	2500000	03	GERMANY
06	SCHMIDT SPEDIT	8500000	02	GERMANY
07	MUHL LOGISTIK	2504500	01	GERMANY
08	DAF TRANSPORT	10010000	01	GERMANY
09	MUELLER FAHRT	5234000	02	GERMANY
10	FAHRTEN	6450450	02	GERMANY
11	SPEDIT-GL	2500000	02	GERMANY
12	SCHMIDT SPEDIT E	8500010	02	GERMANY
13	MUHL LOGISTIK	2300000	02	FRANCE
14	RR TRANSPORT	3450000	01	FRANCE
15	MAER FAHRT	2234000	02	FRANCE
16	MUHL DRIVE	6450450	02	FRANCE
17	DER LOGISTIK	2500000	02	FRANCE
18	SCHMIDT SPEDIT	8500000	02	FRANCE
19	MUHL LOGISTIK	1500000	01	FRANCE
20	DAF TRANSPORT	10010000	02	FRANCE
21	MUELLER FAHRT	5234000	02	FRANCE

DB2 & QMF

Sample: JDataMig

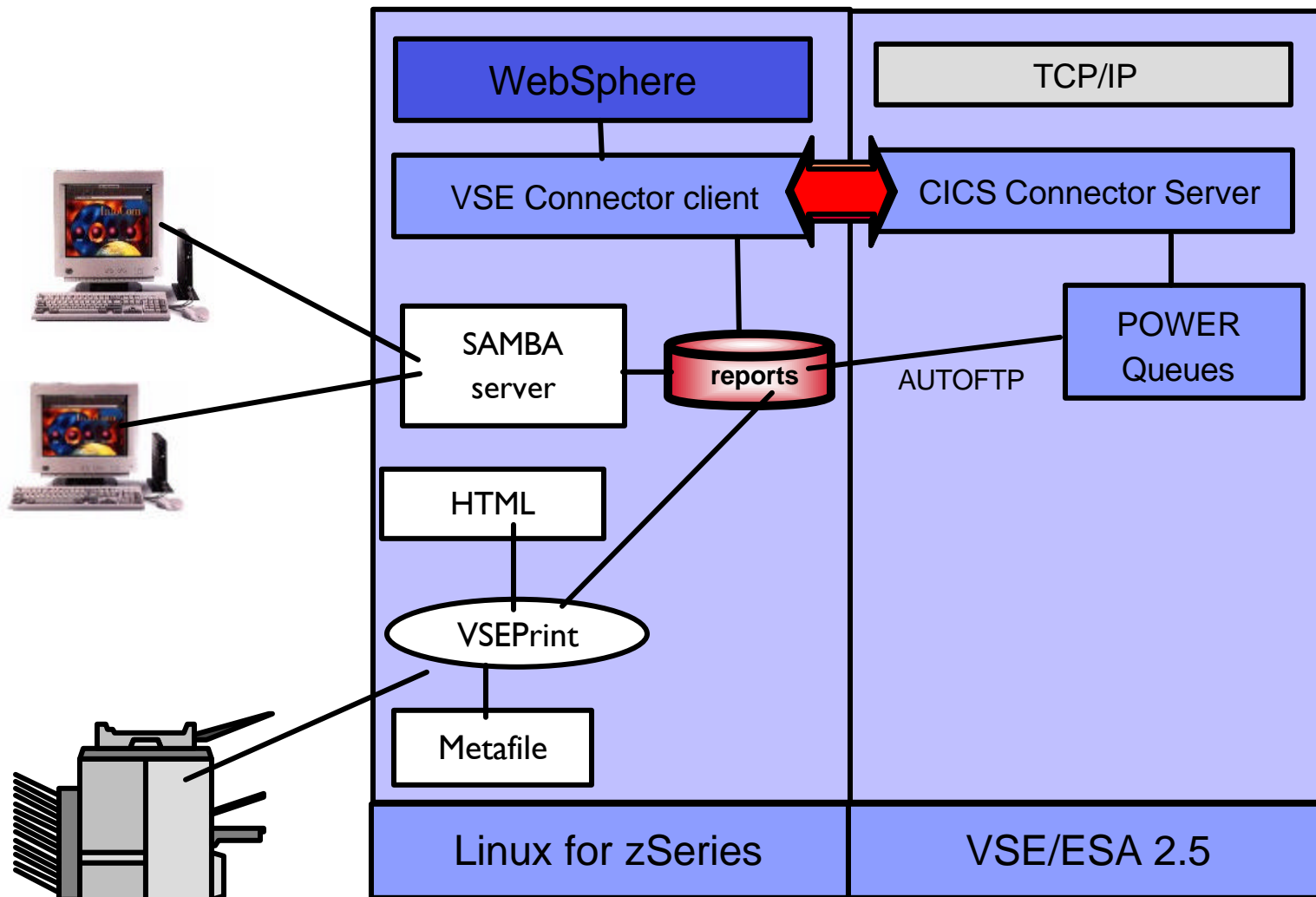
Von Front-end Tools to VSE/ESA Data



JDataMig – is a ready to run tool to import VSAM Data into a spreadsheet or DB2 table.

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Integration of batch processes with the web



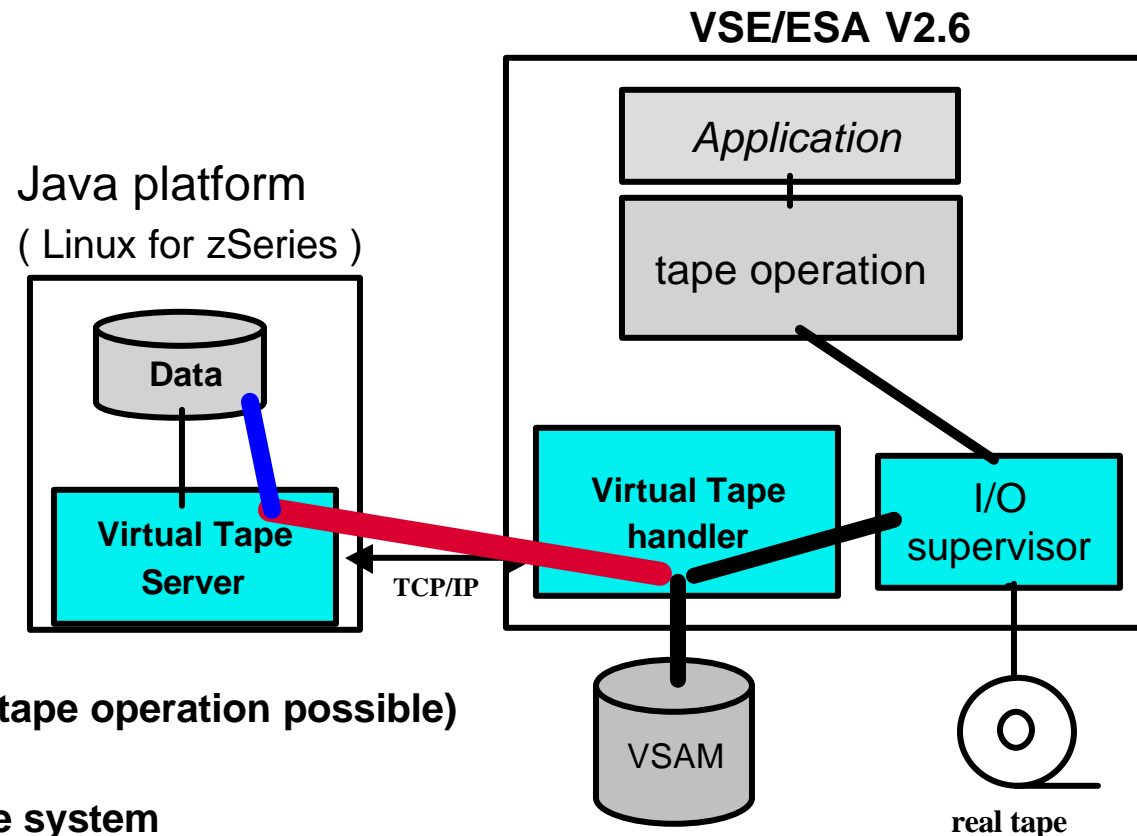
- ▶ access to VSE Power Queues via internet
- ▶ dynamic generated jobs via Websphere Technologies
- ▶ transfer of job output (reaction of job results)
- ▶ **VSEPRINT- VSE tool for data formatting**

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VSE as a Client – Virtual tape support



VSE/ESA Virtual Tape support – VSE/ESA 2.6



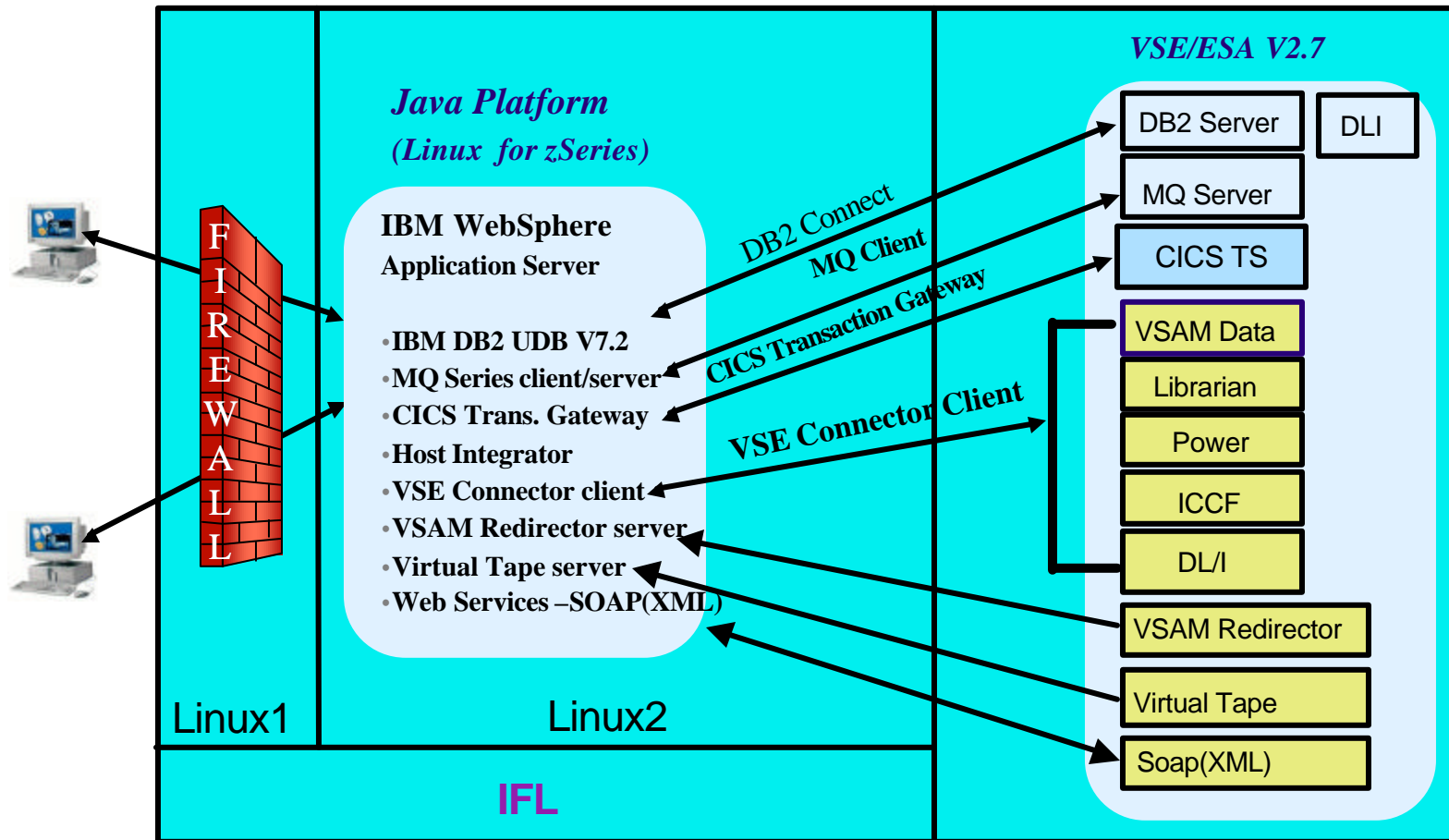
- ▶ it simulates a real tape (tape operation possible)
 - ▶ in a VSAM file
 - ▶ in a file on a remote system
- ▶ transparent for applications
- ▶ Possibility to integrate VSE backups in distributed (Tivoli controlled) backup procedures

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VSE/ESA Connections

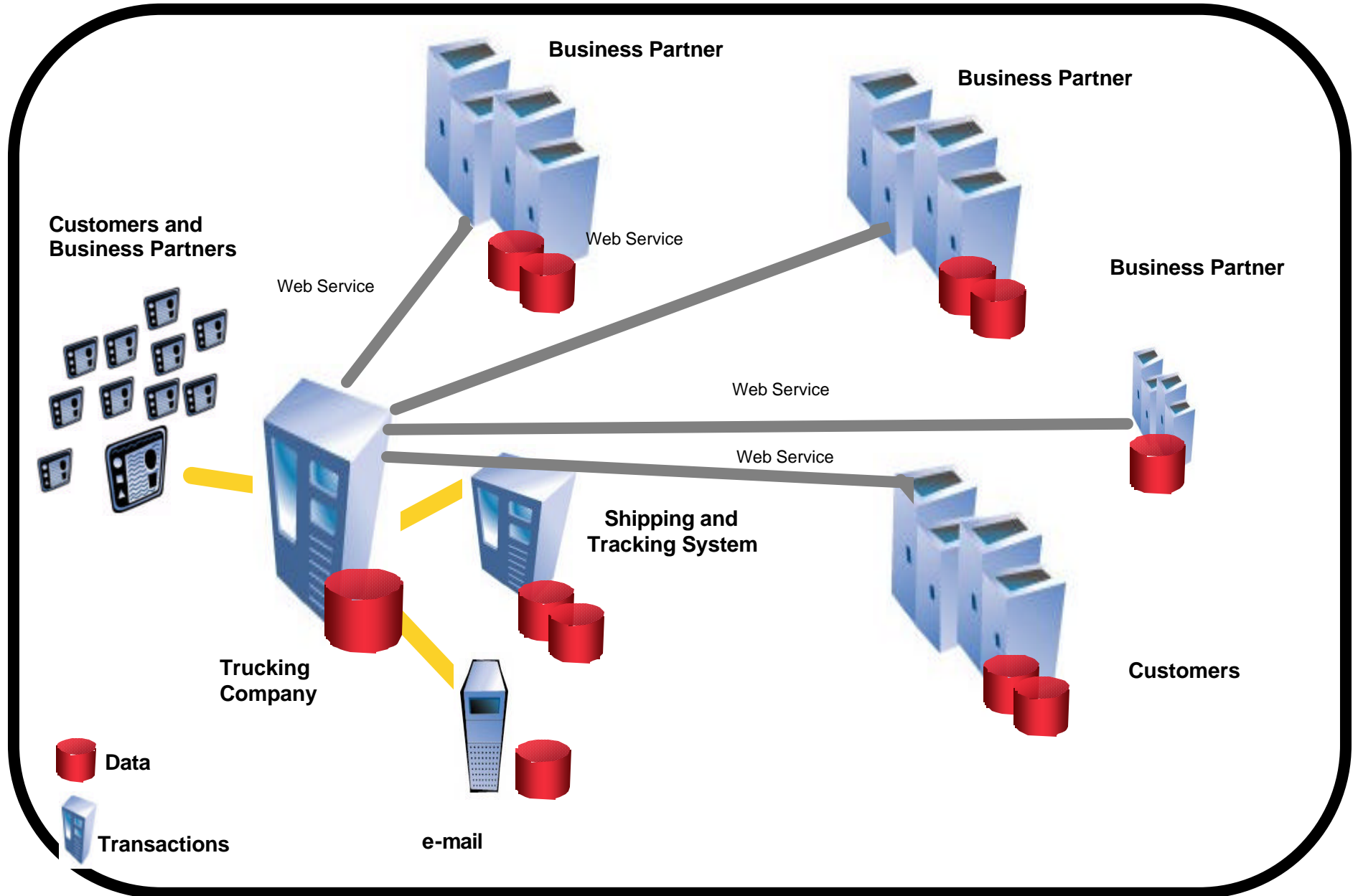


z800 or zSeries



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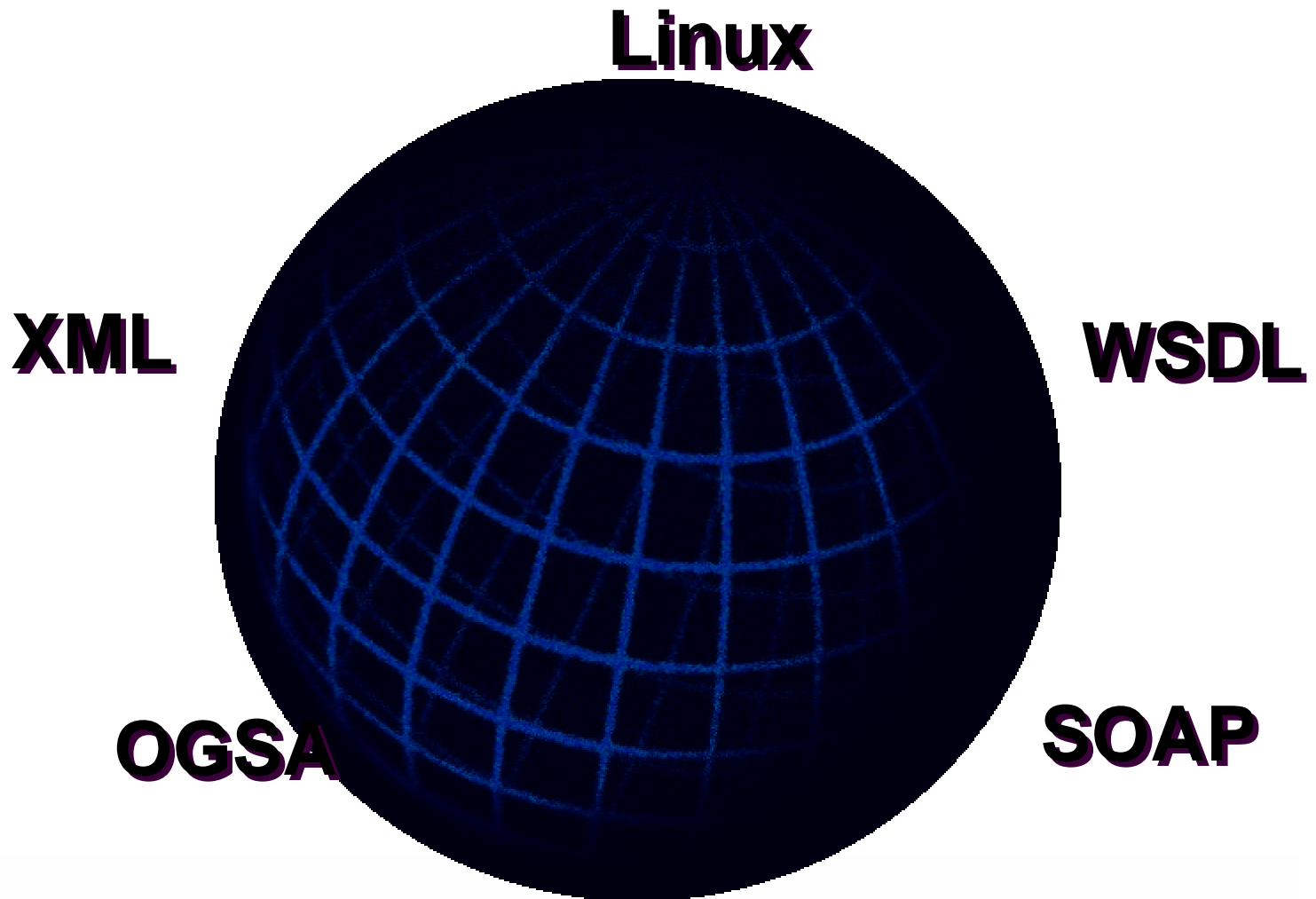
Roadmap for dynamic e-business



On Demand Operating Environment

VS@

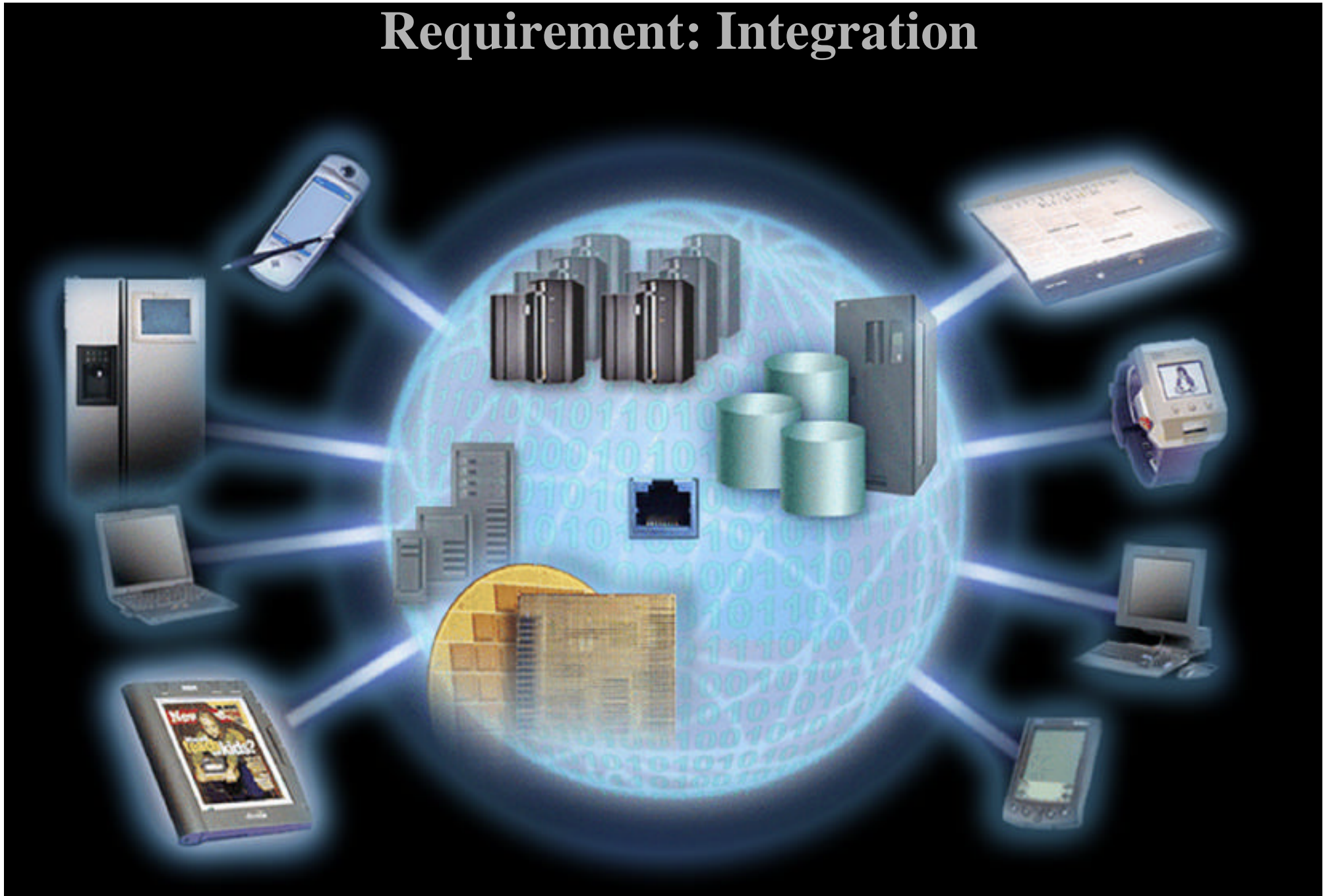
Requirement: Open Standards



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On Demand Operating Environment

Requirement: Integration



On Demand Operating Environment

Requirement: Virtualized



VS@

An always happy pair !



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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**



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

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