VSE/ESA 2.7
in a heterogeneous Environment
(Customer Scenarios)

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Wilhelm Mild
IBM Boeblingen Laboratory

mildw@de.ibm.com

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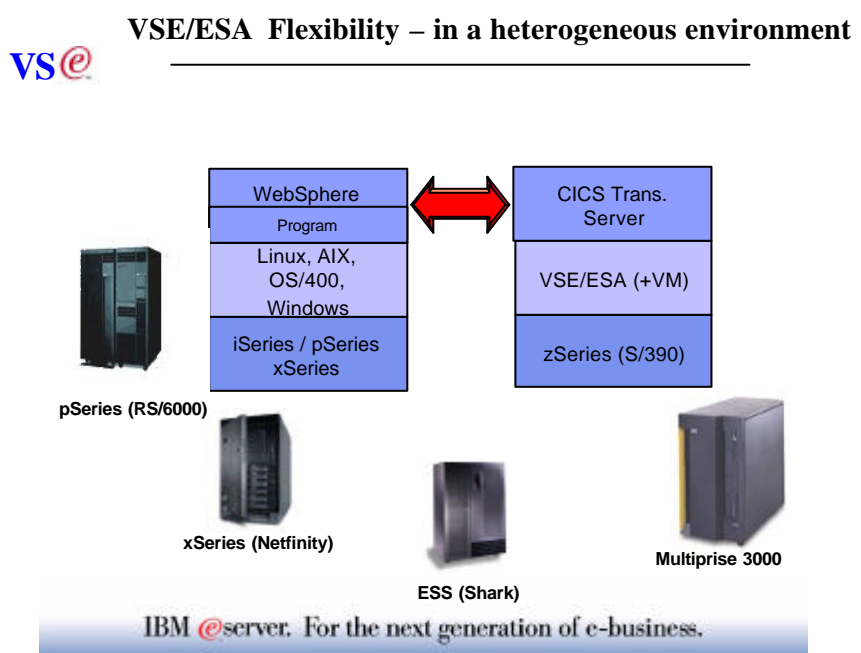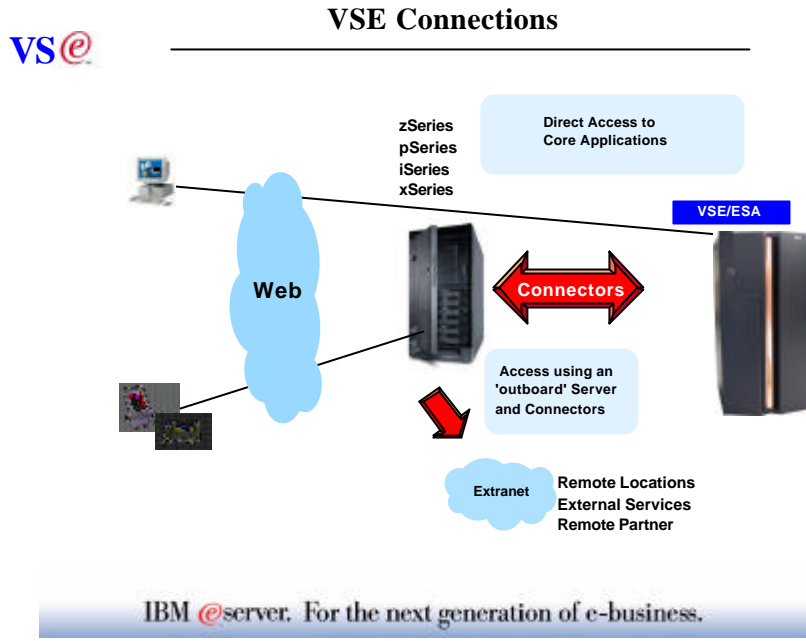Tivoli is a Trademark of Tivoli Systems Inc.
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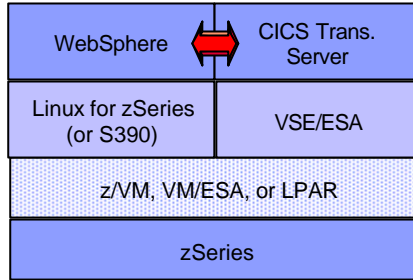Intel is a registered Trademark of Intel Corporation.

VSE Connections

VS@

zSeries
pSeries
iSeries
xSeries

Direct Access to
Core Applications

VSE/ESA

Web

Connectors

Access using an
'outboard' Server
and Connectors

Extranet

Remote Locations
External Services
Remote Partner

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VSE/ESA Flexibility – in a heterogeneous environment

VS@

WebSphere		CICS Trans. Server
Program		
Linux, AIX, OS/400, Windows		VSE/ESA (+VM)
iSeries / pSeries xSeries		zSeries (S/390)

pSeries (RS/6000)

xSeries (Netfinity)

ESS (Shark)

Multiprise 3000

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VS@

Linux for zSeries

3-tier logical / 2-tier physical

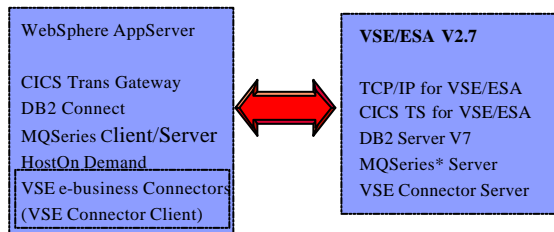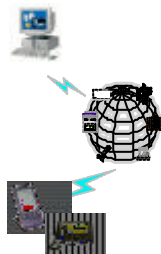| WebSphere	⟷	CICS Trans. Server
Linux for zSeries (or S390)		VSE/ESA
z/VM, VM/ESA, or LPAR		
zSeries		

i.e. Multiprise 3000 or 9672 or z800

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VS@

Connectors for a 3-tier model

IBM WebSphere

WebSphere AppServer CICS Trans Gateway DB2 Connect MQSeries Client/Server HostOn Demand VSE e-business Connectors (VSE Connector Client)	⟷	VSE/ESA V2.7 TCP/IP for VSE/ESA CICS TS for VSE/ESA DB2 Server V7 MQSeries* Server VSE Connector Server

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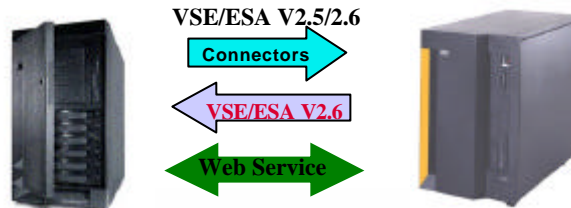**VSE/ESA integrated Connectors**

VS@

VSE/ESA V2.5/2.6 - VSE as Server
ƒ remote access to VSE Resources
ƒ e-business Connectors

VSE/ESA V2.6 - VSE as Client
ƒ access to remote data from VSE programs
ƒ VSAM Redirector
ƒ Virtual Tape Support

VSE/ESA V2.7 - VSE Web Services
ƒ Access VSE transactions as Web Service
ƒ Access Web Services from VSE Transactions

New

VSE/ESA V2.5/2.6
Connectors
VSE/ESA V2.6
Web Service

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Agenda: Customer Scenarios

VS@

ƒReal time access to VSE/VSAM Data from remote systems

ƒIntegrate CICS transactions in distributed processes

ƒDB2 – The technology for cross platform data stores

ƒTransparent access from VSE programs to remote systems and data

ƒMQ Series – integration of asynchronous, distributed processes

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Real time access to VSAM Data from remote systems

VS@

Industry: Financial, Car Manufacturer

ƒInitial problematic:
  ƒOld-technology: 3270 screens to CICS transactions are used as interface for Consultations

  ƒInflexible: Product information are collected via functions in 3270 mask

ƒGoal:
  ƒuse of modern technologies,
  ƒBrowser as interaction interface to CICS applications
  ƒSeparation of presentation logic from business logic

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Real time access to VSAM data from remote systems

VS@

ƒPossible solutions:

  ƒWeb-enable CICS transactions via CICS Web Support (CWS) or other vendor products

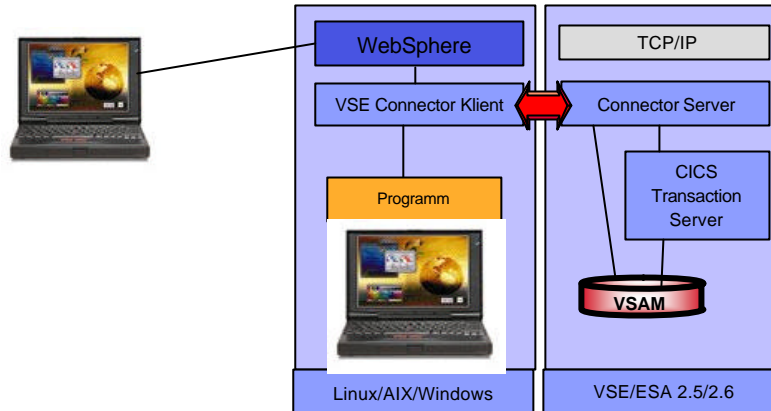 ƒDirect access VSE/VSAM data and enable the flexibility in the representation of these data

    ƒPossibility to integrate the solution with WebSphere Application Server

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Real time access to VSE data from remote systems

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WebSphere		TCP/IP
VSE Connector Klient	⟷	Connector Server
Programm		CICS Transaction Server
		VSAM
Linux/AIX/Windows		VSE/ESA 2.5/2.6

ƒ real time access to mapped VSE/VSAM data from remote systems
ƒ i.e. READ in batch Mode and UPDATE via CICS

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Real time access to VSE data from remote systems

VS@

Software Requirements

ƒ VSE/ESA 2.5-2.7
ƒ TCP/IP for VSE/ESA
  ƒ Connector Server – to be started on VSE
  ƒ Define maps for the VSAM files
    (with the standalone MAPTOOL, or IDCAMS RECMAP, or
    with a Java program, or VSE Navigator)

ƒ Linux (AIX, Windows, any Java environment…)
  ƒ VSE Connector Client Software on the Client or Requester
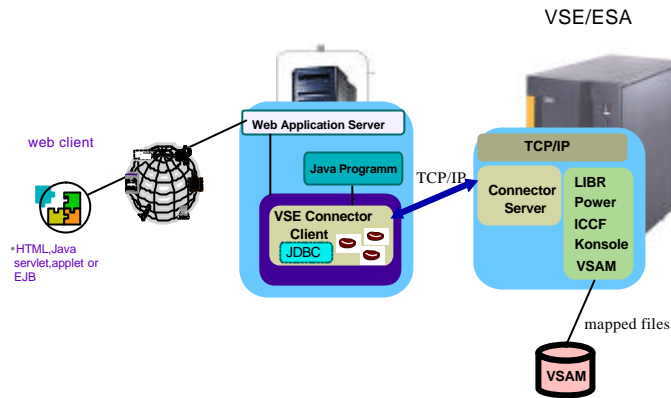   machine (Java Class Library) – packaged with VSE
  ƒ Program (In Java or Java callable Programming language) that
    will work with the data

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Remote VSE access: the technology

VS@

Java-Based Connector

VSE/ESA

web client

Web Application Server

Java Programm

TCP/IP

TCP/IP

Connector Server

LIBR
Power
ICCF
Konsole
VSAM

VSE Connector Client
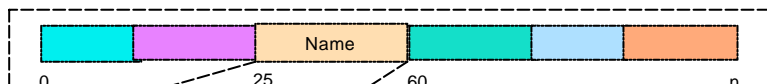
JDBC

*HTML,Java servlet,applet or EJB

mapped files

VSAM

ƒ real time access to VSE resources from remote systems

ƒ Lots of new possibilities for VSE/ESA
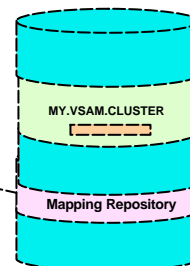
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VSAM Record Mapping

VS@

VSE/VSAM Record structure from EMPPROG.COBOL

Name

0   25   60   n

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

MY.VSAM.CLUSTER

Mapping Repository

Possibilities to do mapping:
ƒ **IDCAMS Command RECMAP**
ƒ **Java Beans (Function integrated in VSE Navigator)**
ƒ **Maptool (Java Tool, free download from VSE/ESA home Page)**
  ƒ **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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VS@   **VSAM JDBC Driver**
_____

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

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

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VS@   **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
  - ƒ VSE/ESA 2.5 - 2.7
    - – VSE Connector Server
  - ƒ TCP/IP for VSE/ESA
  - ƒ Java (Version 1.1.8 / 1.3x)

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Agenda: Customer Scenarios

VS@

ƒ Real time access to VSE/VSAM Data from remote
   systems

ƒ Integrate CICS transactions in distributed processes

ƒ DB2 – The technology for cross platform data stores

ƒ Transparent access from VSE programs to remote
   systems and data

ƒ MQ Series – integration of asynchronous, distributed
   processes

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Integration of CICS transactions

VS@

Industry: e-commerce, Finance

ƒ Initial problematic:
   ƒ Integration in distributed transactions : CICS
     transactions are called with a parameter list in Job
     (streams).

ƒ Goal:
   ƒ Use of modern technologies
   ƒ Primary application interface is a Browser
   ƒ Overall transaction security

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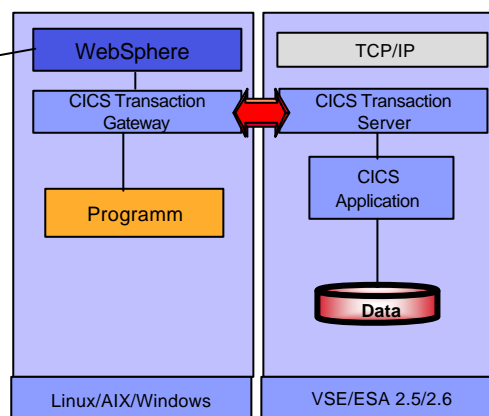**Integration of CICS transactions**

VS@

ƒ Possible Solution scenarios:

ƒ Web-enable CICS transactions via CICS Web
Support (CWS) or other vendor products

ƒ CICS Transactions will be integrated in distributed
transaction processes via a Connector

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Integration of CICS transactions

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WebSphere	TCP/IP
CICS Transaction Gateway	CICS Transaction Server
Programm	CICS Application
	Data
Linux/AIX/Windows	VSE/ESA 2.5/2.6

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Integration of CICS transactions

Software Requirements
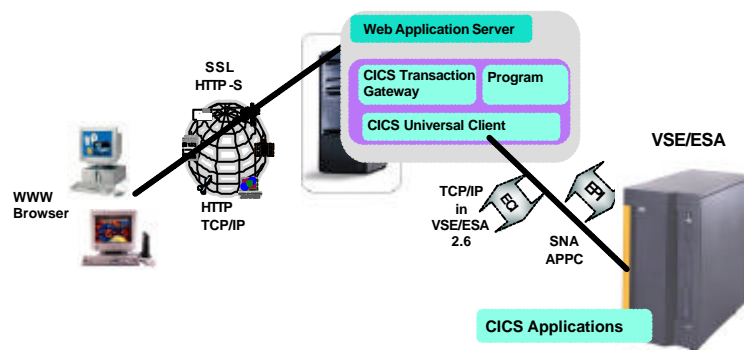
ƒ VSE/ESA 2.6/2.7 (for TCP/IP support in CICS)

ƒ CICS Applications/transactions

ƒ CICS Transaction Gateway on the Client or Requester

ƒ Program that will call VSE transactions and will work with that data (these data can be used for e-commerce or other transactions on the remote platform)

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CICS Transaction Gateway

Web Application Server

| CICS Transaction Gateway | Program |

CICS Universal Client

VSE/ESA

SSL
HTTP-S

WWW
Browser

HTTP
TCP/IP

TCP/IP
in
VSE/ESA
2.6

SNA
APPC

CICS Applications

ƒ Contains CICS Universal Klient
ƒ Synchronous transaction security
ƒ Allows secure communications

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CICS Transaction Gateway

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

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

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Agenda: Customer Scenarios

VS@

ƒ Real time access to VSE/VSAM Data from remote systems

ƒ Integrate CICS transactions in distributed processes

ƒ DB2 – The technology for cross platform data stores

ƒ Transparent access from VSE programs to remote systems and data

ƒ MQ Series – integration of asynchronous, distributed processes

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DB2 – distributed data

VS@

Industry: e-commerce, Finance, Reseller

ƒ Initial problematic:
   ƒ DB2 data and non relational data exist on VSE
   ƒ Need of integration via standard interfaces
   ƒ Distributed environment

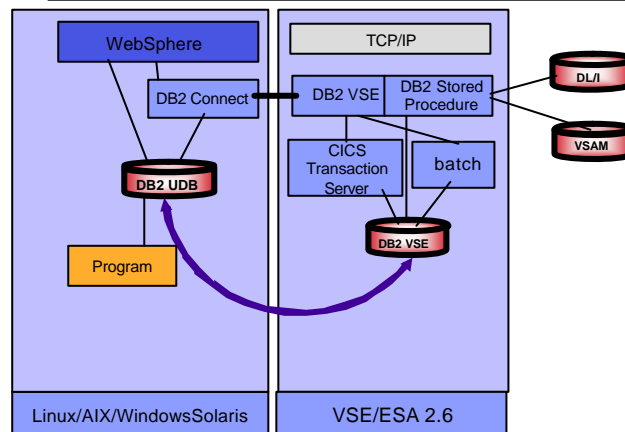ƒ Goal:
   ƒ Integration of all VSE data in distributed processes
   ƒ Integration of distributed DB2 data into VSE
    applications
   ƒ Use of standard Interfaces

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Integration of DB2 UDB with DB2 VSE

VS@

WebSphere		TCP/IP		
DB2 Connect	DB2 VSE	DB2 Stored Procedure	DL/I
DB2 UDB	CICS Transaction Server	batch	VSAM
Program		DB2 VSE	
Linux/AIX/WindowsSolaris	VSE/ESA 2.6	

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

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Integration of DB2 UDB with DB2 VSE

VS@

Software requirements

ƒ VSE/ESA 2.6/2.7

   ƒ DB2 VSE 7.x

   ƒ (optional) Programs that contain business logic and will be defined as Stored Procedure in DB2 VSE

ƒ Software on the Requester

   ƒ DB2 Connect (relational access to DB2 VSE data)

   ƒ DB2 UDB **(optional)**
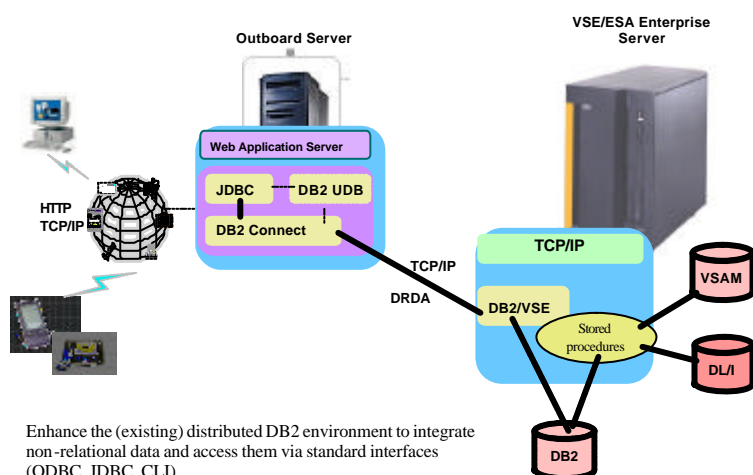
   ƒ Programs to:

      ƒ Access data using relational interfaces, or

      ƒ call Stored Procedures on DB2 VSE

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DB2-Based Connector

VS@

Enhance the (existing) distributed DB2 environment to integrate non-relational data and access them via standard interfaces (ODBC, JDBC, CLI).

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Agenda: Customer Scenarios

VS@

ƒReal time access to VSE/VSAM Data from remote
systems

ƒIntegrate CICS transactions in distributed processes

ƒDB2 – The technology for cross platform data stores

ƒTransparent access from VSE programs to remote
systems and data

ƒMQ Series – integration of asynchronous, distributed
processes

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VS@ **Transparent access from VSE programs to
remote systems and data**
Industry: Finance

ƒInitial problematic:
  ƒIntegrate remote data in existing VSE processes
  ƒExisting processes will be extended with new functions on
  remote systems.
  ƒData stored in VSAM
    ƒdata, to be consolidated on a remote platform (optional)

ƒGoal:
  ƒExisting applications should transparently access remote data
  ƒNo changes to the existing VSE applications

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VS@ **Transparent access from VSE programs to remote systems and data**
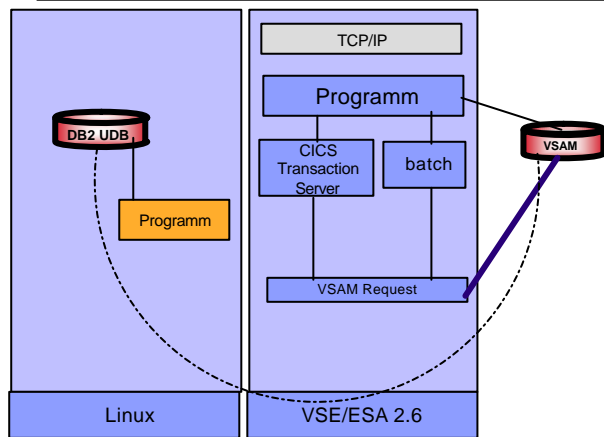
ƒPossible solutions:

ƒAll data will be in DB2 (on VSE and DB2 UDB on the distributed platform) and the client function of DB2 VSE, accesses DB2 data from remote platforms

ƒImpact: changes in the applications on VSE, if VSAM was prior data access method

ƒUse of the VSAM Redirector function in VSE to access remote

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VS@ **Integration of VSE applications with DB2 UDB**


```
                          TCP/IP
                        Programm
   DB2 UDB        CICS            VSAM
                  Transaction    batch
                  Server
              Programm
                        VSAM Request
   Linux             VSE/ESA 2.6
```
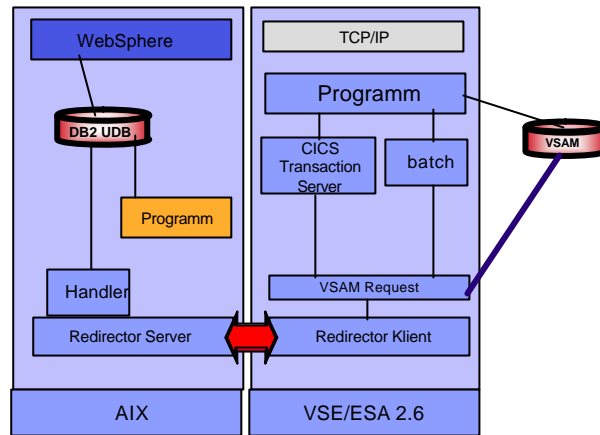
ƒApplications on VSE should be able to access DB2 data on Linux

ƒSynchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
 (VSAM Redirector is part of VSE/ESA 2.6/2.7)

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Integration of VSE applications with DB2 UDB

VS@

WebSphere		TCP/IP

DB2 UDB

Programm

Programm

CICS Transaction Server

batch

VSAM

Handler

VSAM Request

Redirector Server

Redirector Klient

AIX	VSE/ESA 2.6

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

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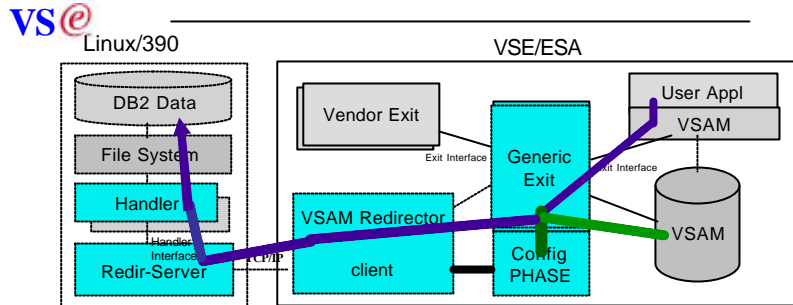

Integration of VSE applications with DB2 UDB

VS@

Software requirements

ƒ For VSE/ESA :
  ƒ VSE/ESA 2.6/2.7
    ƒ enable VSAM Redirector function
    ƒ Enable the redirection of VSAM Cluster

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

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VSAM Redirector –functional overview

VS@

Linux/390   VSE/ESA

- DB2 Data
- File System
- Handler
- Redir-Server
- Vendor Exit
- VSAM Redirector client
- Generic Exit
- Config PHASE
- User Appl
- VSAM
- VSAM

Exit Interface   Exit Interface

Handler Interface   TCP/IP

Config PHASE:

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

ƒ **Customer Benefits:**

ƒ **Redirect VSAM access to a remote system without changes to existing VSE applications**

ƒ **Synchronisation, migration or remote operation with data on remote systems**

ƒ **transparent for batch and CICS processing**

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Agenda: Customer Scenarios

VS@

ƒ Real time access to VSE/VSAM Data from remote systems

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ƒ Transparent access from VSE programs to remote systems and data

ƒ MQ Series – integration of asynchronous, distributed processes

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VS@ **Asynchronous data interchange in a
heterogeneous environment**

Industry: Finance

ƒ Initial problematic:
  ƒ Need of automatic data interchange between VSAM and
    other systems

ƒ Goal:
  ƒ Secure data interchange (no data loss)
  ƒ No changes to the existing VSE applications
  ƒ System independent interfaces

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VS@ **Asynchronous data interchange in a
heterogeneous environment**

ƒ Possible solutions:

  ƒ Synchronize data between DB2 VSE and DB2 on
    remote platform via the replication feature
      ƒ difficult to imbed VSAM data

  ƒ Use of the VSAM Redirector functionality in VSE
    with MQ Series for asynchronous communication

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Asynchronous data interchange in a heterogeneous environment

VS@

Software Requirements

ƒ For VSE/ESA :
  ƒ VSE/ESA 2.6/2.7
    ƒ enable VSAM Redirector function
    ƒ Enable the redirection of VSAM Cluster
  ƒ MQ Series Server
    ƒ Program that translates the VSAM requests into MQ Series requests
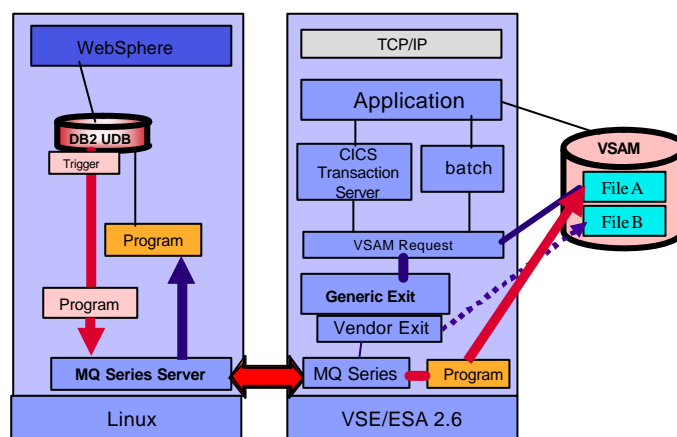
ƒ On remote system
  ƒ MQ Series Server
    ƒ Program that will work with the data coming from VSE
    ƒ Trigger to grab the data on the remote platform and send them to VSE via MQ Series

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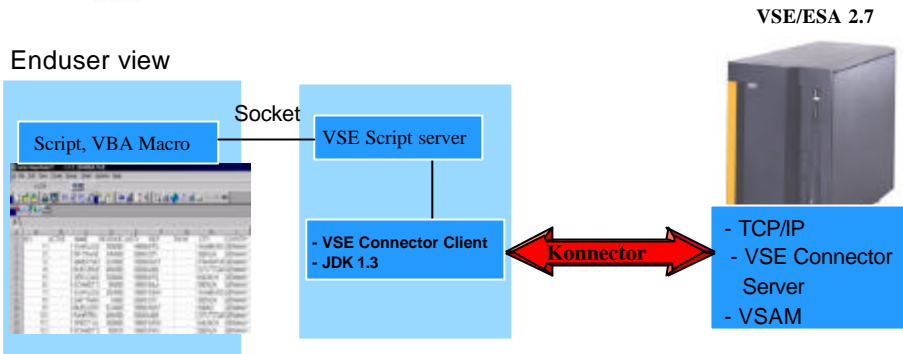

Integration of VSE Application with DB2 UDB

VS@

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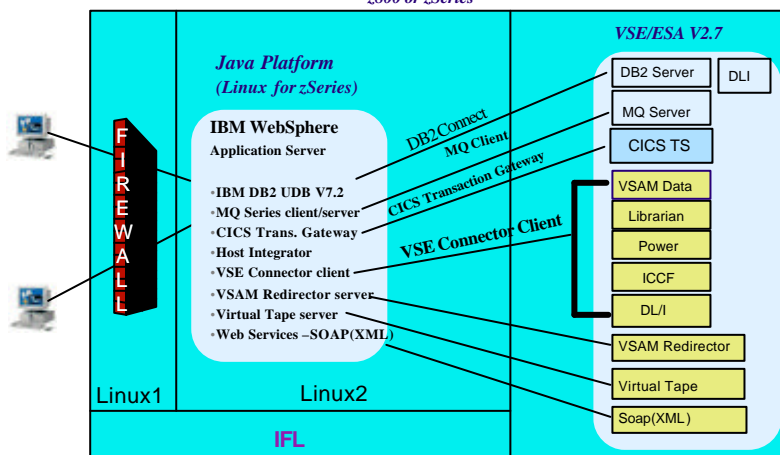**Access VSE resources from Office products using scripts**

VS@

VSE/ESA 2.7

Enduser view

Socket

Script, VBA Macro → VSE Script server

- VSE Connector Client
- JDK 1.3

Konnector

- TCP/IP
- VSE Connector Server
- VSAM

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

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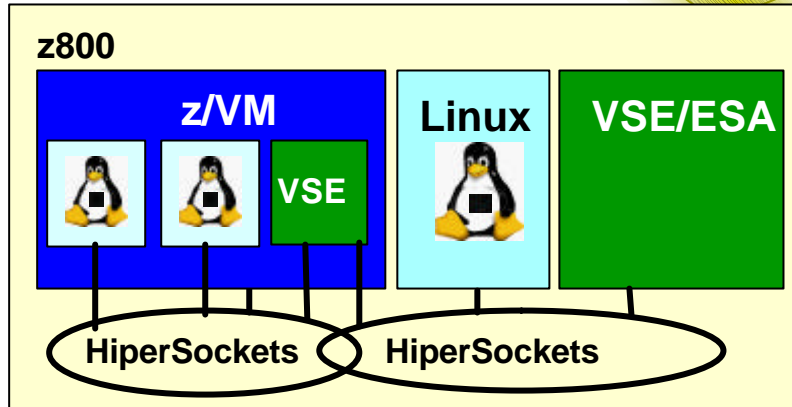

VSE/ESA Connections

VS@

z800 or zSeries

VSE/ESA V2.7

Java Platform
(Linux for zSeries)

IBM WebSphere
Application Server

DB2 Connect
MQ Client
CICS Transaction Gateway
VSE Connector Client

- IBM DB2 UDB V7.2
- MQ Series client/server
- CICS Trans. Gateway
- Host Integrator
- VSE Connector client
- VSAM Redirector server
- Virtual Tape server
- Web Services –SOAP(XML)

DB2 Server | DLI
MQ Server
CICS TS
VSAM Data
Librarian
Power
ICCF
DL/I
VSAM Redirector
Virtual Tape
Soap(XML)

F I R E W A L L

Linux1 | Linux2

IFL

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VSE/ESA Version 2 Release 7

z800

z/VM

Linux

VSE

Linux

VSE/ESA

HiperSockets

HiperSockets
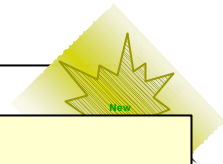
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A happy pair

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Additional Information

VS@

- **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/vsecomn/

- **e-business Connectors User's Guide**   **SC33-6719**

Redbooks

- **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,**   **SG24-6007**
    DB2, and Domino

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