VSE applications and DB2 UDB on Linux on System z

Available Options

z/VSE Server

???

DB2 UDB

DB2

?
?
?

TCP/IP

LE/VSE

Batch

CICS

VSAM

DB2
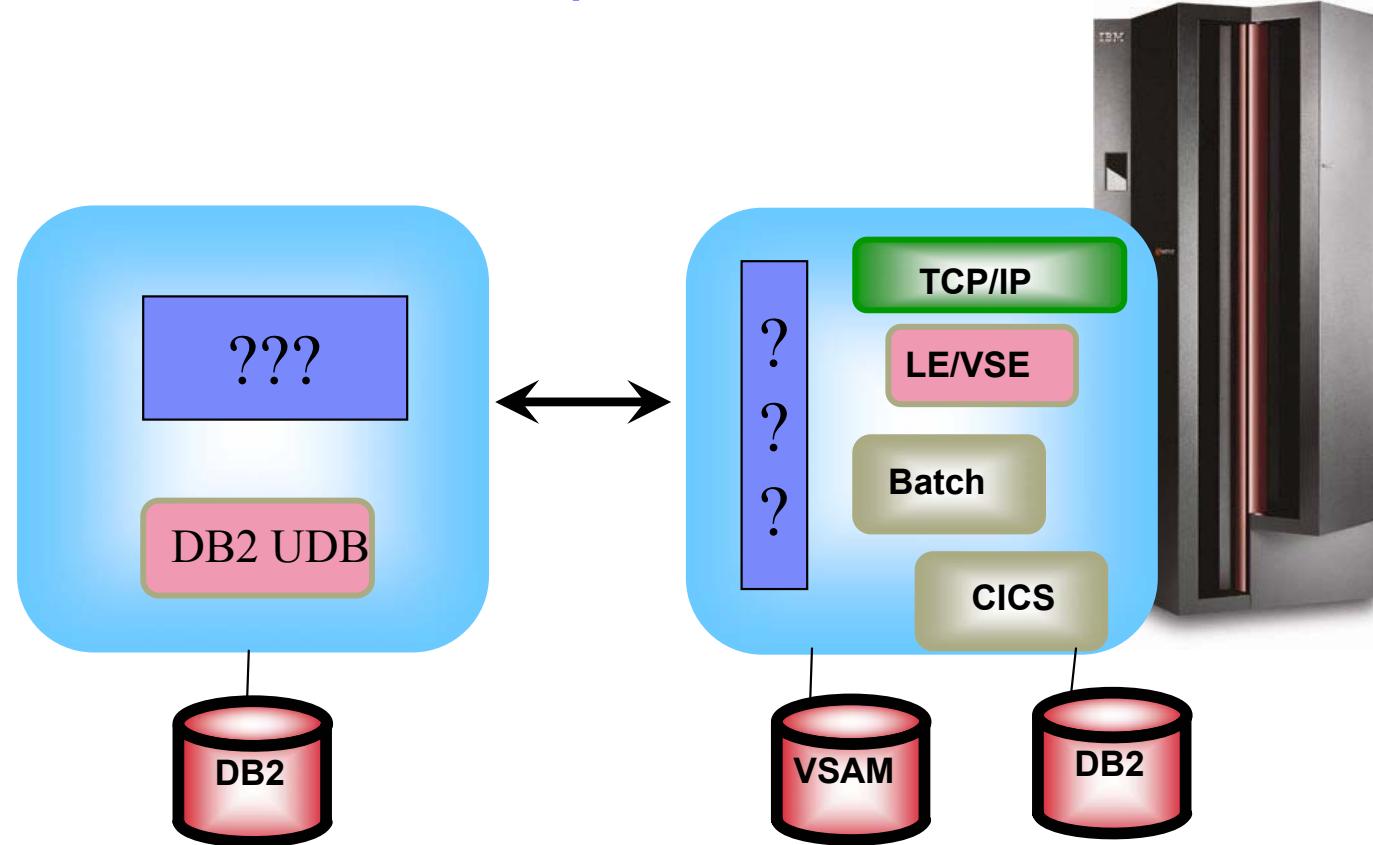
Wilhelm Mild
z/VSE Solution Architect
IBM Dev. Lab Böblingen

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DB2 Universal Database	Intelligent Miner	z/VSE
e-business logo*	Multiprise*	VisualAge*
Enterprise Storage Server	MQSeries*	VTAM*
HiperSockets	OS/390*	WebSphere*
	S/390*	xSeries
	SNAP/SHOT*	z/Architecture
		z/VM
		zSeries
		System z
		Linux on zSeries
		Linux on System z

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VSE applications and DB2 UDB on Linux on System z

➤ ❖ **VSAM Redirector scenarios**
❖ **DB2 VSE scenarios**

z/VSE Server

???

DB2 UDB

TCP/IP

?
?
?

LE/VSE

Batch

CICS

DB2

VSAM

DB2
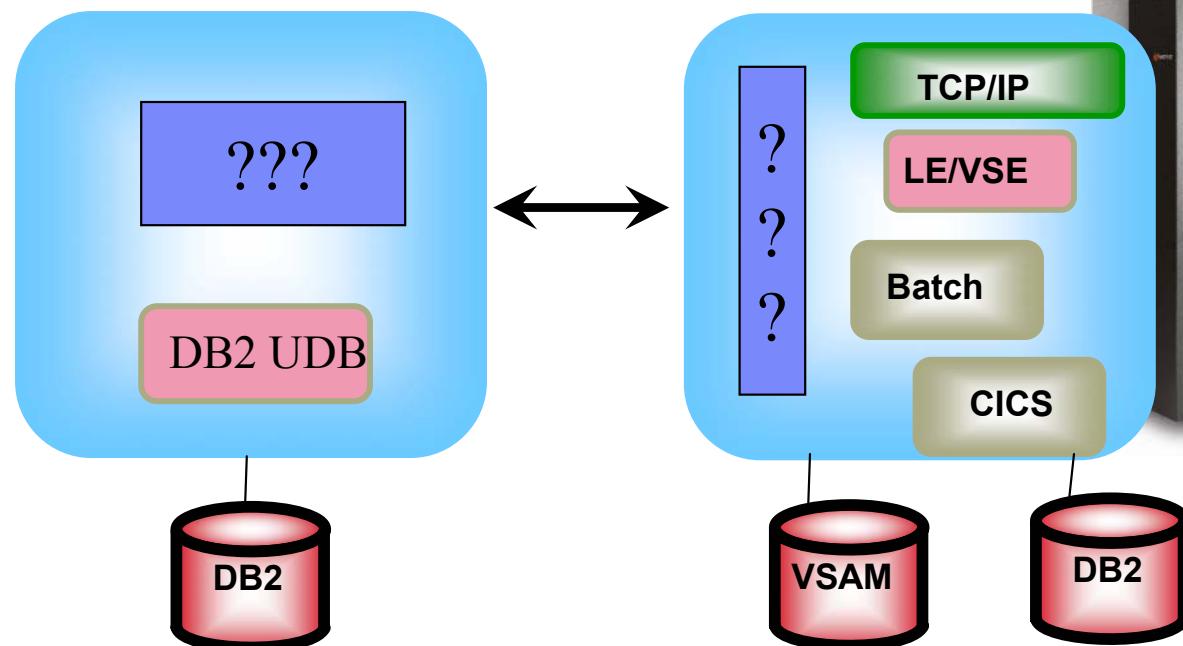
Common Data Store – Transparent Work of VSAM Programs with DB2 UDB on Linux on System z

pSeries

AIX / Linux SAP ORACLE / DB2

DB2 UDB

iSeries

AS/400 Linux DB2

DB2 UDB

Linux on System z

Software IBM Mershpere

DB2 UDB

Connection via HiperSockets

z/VSE V3.1 Production Environment

+ CICS
+ COBOL

+ VSAM
+ VSAM Redirector*

z/VSE V3.1 Test Environment

+ CICS
+ VSAM
+ COBOL

| z/VM V5	LPAR or z/VM
IFL Engine	Standard Engine

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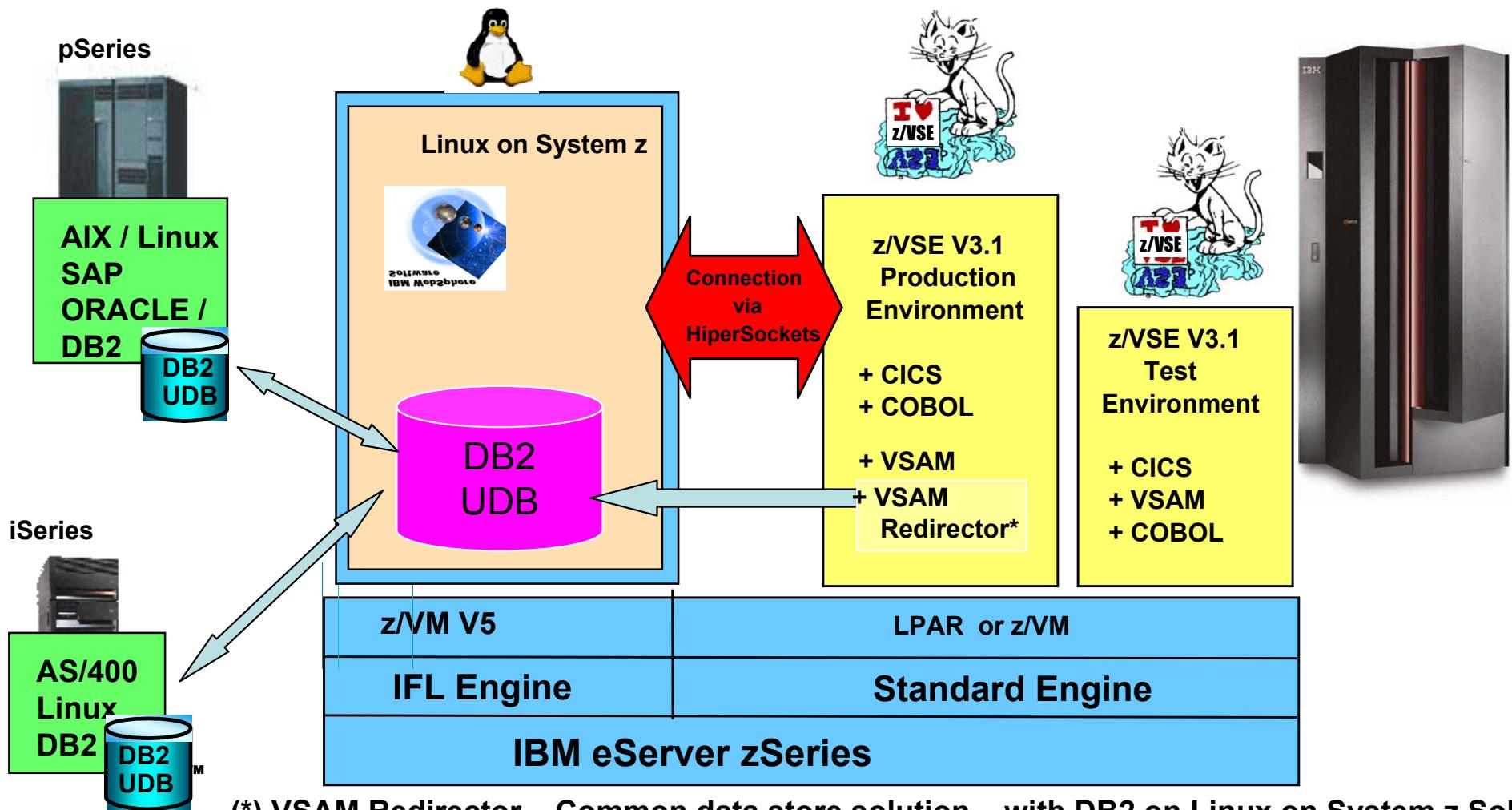
(*) VSAM Redirector – Common data store solution – with DB2 on Linux on System z Solutions without changes to VSAM programs

VSE/VSAM applications
access to
DB2 UDB on Linux on System z

z/VSE Server

VSAM Redirector Server	TCP/IP
Handler	LE/VSE
DB2 UDB	VSAM Redirector Client
	Batch
	CICS

DB2
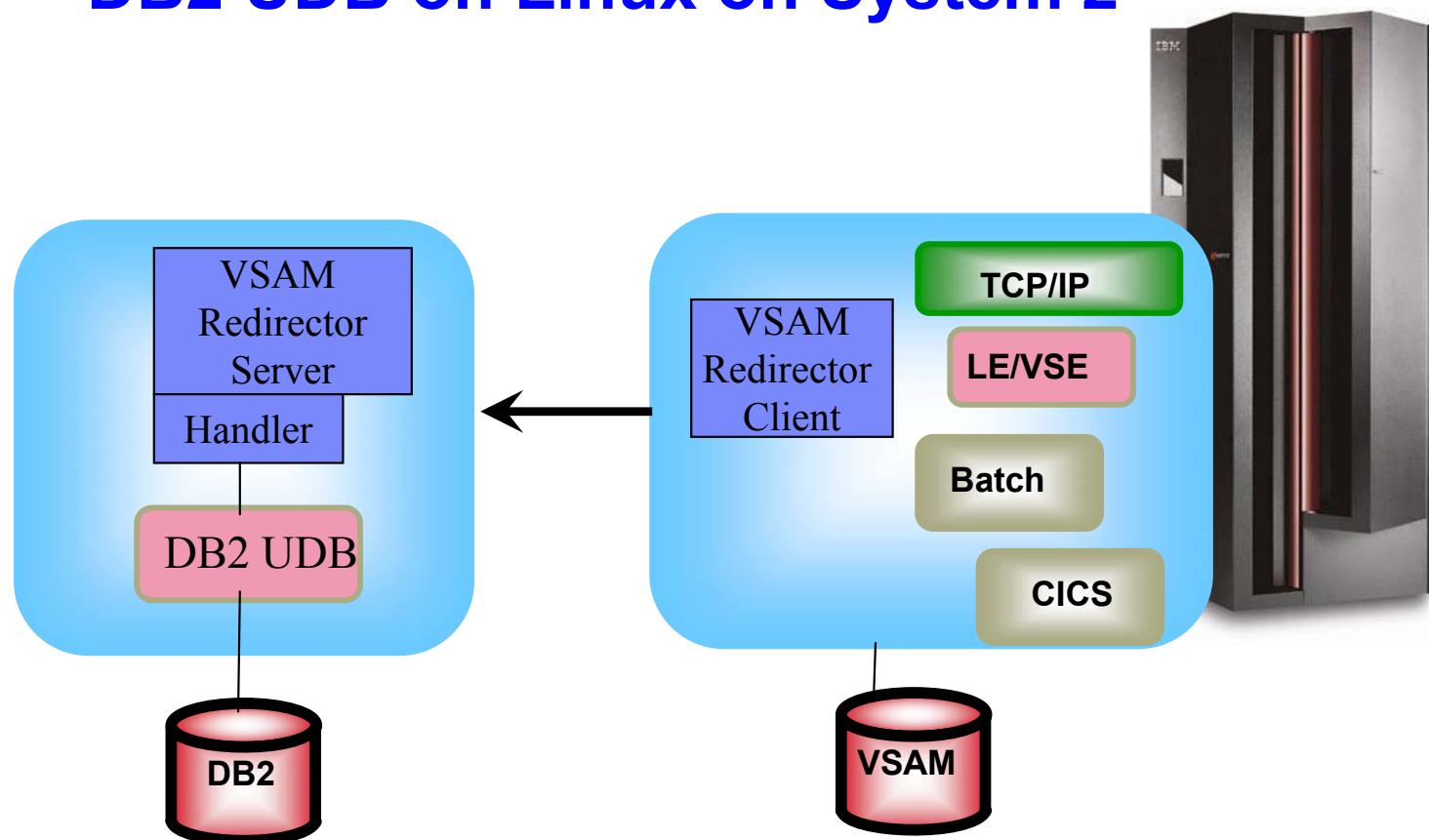
VSAM

VSE Connectors(1): Real time access to z/VSE Resources with the Java–Based Connector

PULL- scenario

web client

z/VSE

Web Application Server

TCP/IP

VSEScript

TCP/IP

Java Program

Connector Server

LIBR
Power
ICCF
Console
DL/I
VSAM

Connector Client

JDBC

mapped files

VSAM

- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized graphical tools (Navigator, Healthchecker, etc.)
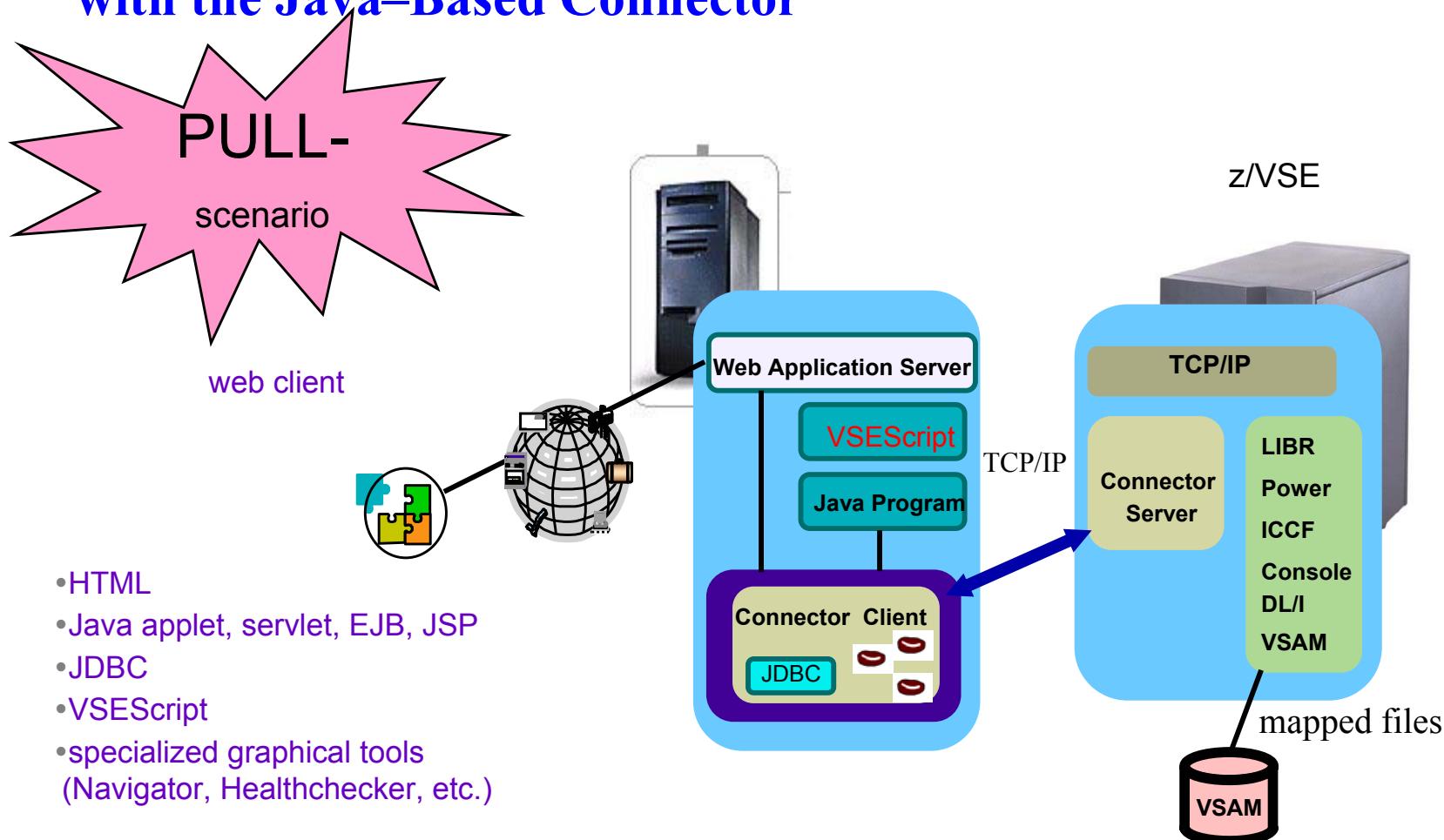
► real time access to VSE resources from remote systems ,

    ► real time access to VSAM data, Librarian

    ► monitoring and analyzing possibilities using console or statistic values

Data propagation / synchronization from VSE

VSE/VSAM Redirector

PUSH- scenario
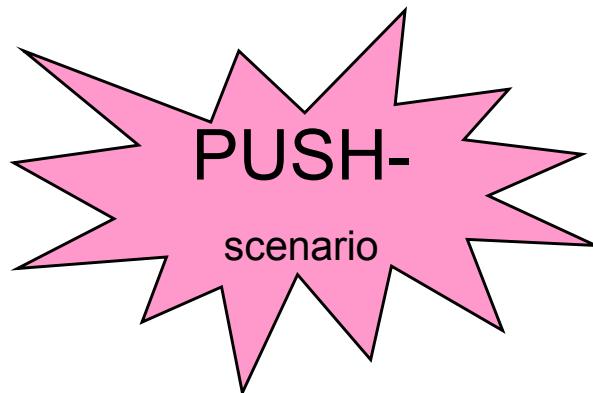
►Existing applications transparently access remote data

►No changes to the existing VSE applications
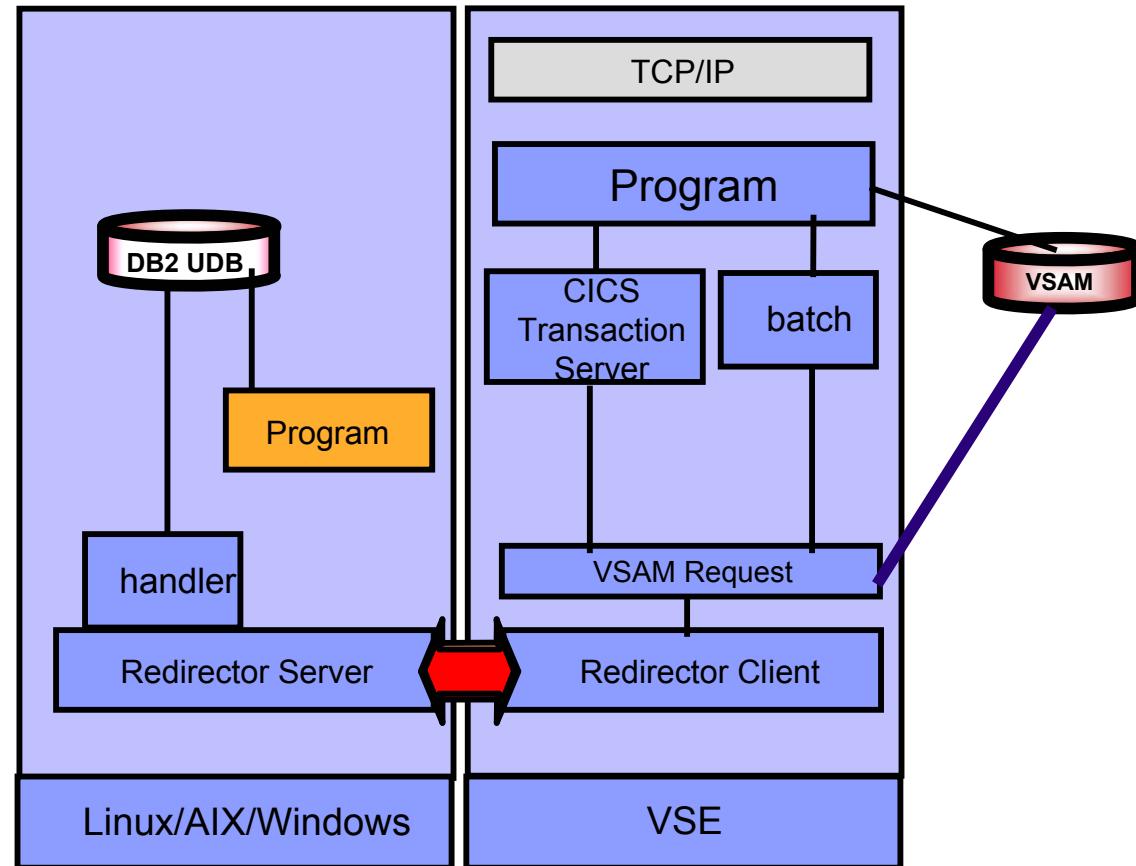
Linux/AIX/Windows	VSE
DB2 UDB	TCP/IP
Program	Program
handler	CICS Transaction Server / batch
Redirector Server	VSAM Request
	Redirector Client
	VSAM

►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)

VSE Connectors(2): VSE/VSAM applications, access remote relational databases

(1) Real time access VSAM to DB2

    a) synchronization (two phase commit of VSAM and DB2)

    b) Real time access to DB2 (no VSAM access anymore)

(2) VSE local data collection for VSAM

    a) Capture Exit and Incremental FTP, processing

    b) MQ Exit and MQ Series solutions

z/VSE Server

VSAM Redirector Server — Handler — DB2 UDB — DB2

VSAM Redirector Client — TCP/IP, LE/VSE, Batch, CICS — VSAM
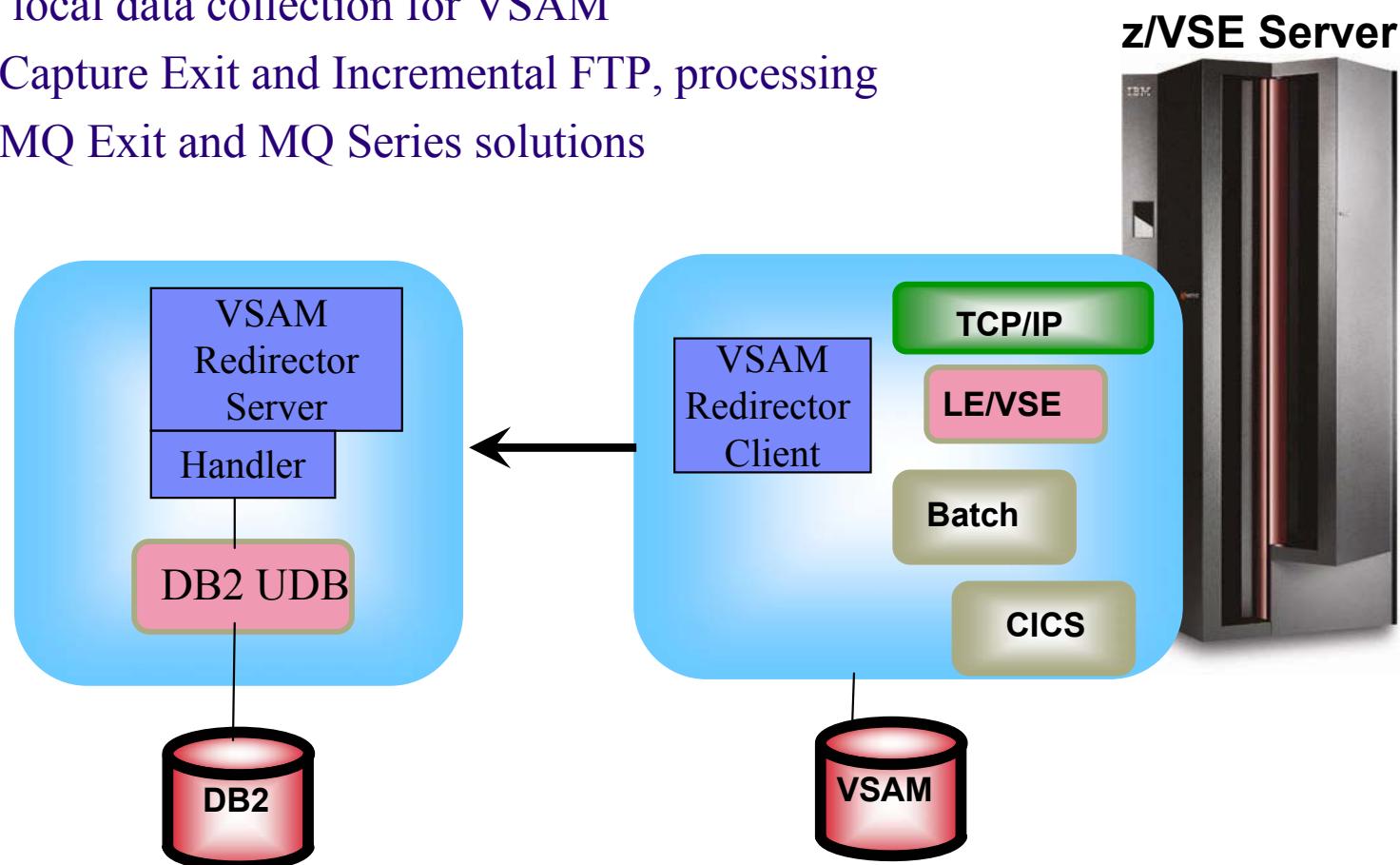
Final solution

common data store – Business intelligence

❑ Car manufacturer, paper manufacturer – Germany, insurance – US

Data mining / OLAP

AIX panel:
- WebSphere
- DB2 UDB
- Trigger
- Handler
- Redirector server
- Connector client

VSE panel:
- TCP/IP
- Application
- CICS Transaction Server
- batch
- VSAM Request
- Redirector client
- Connector server

VSAM — File A
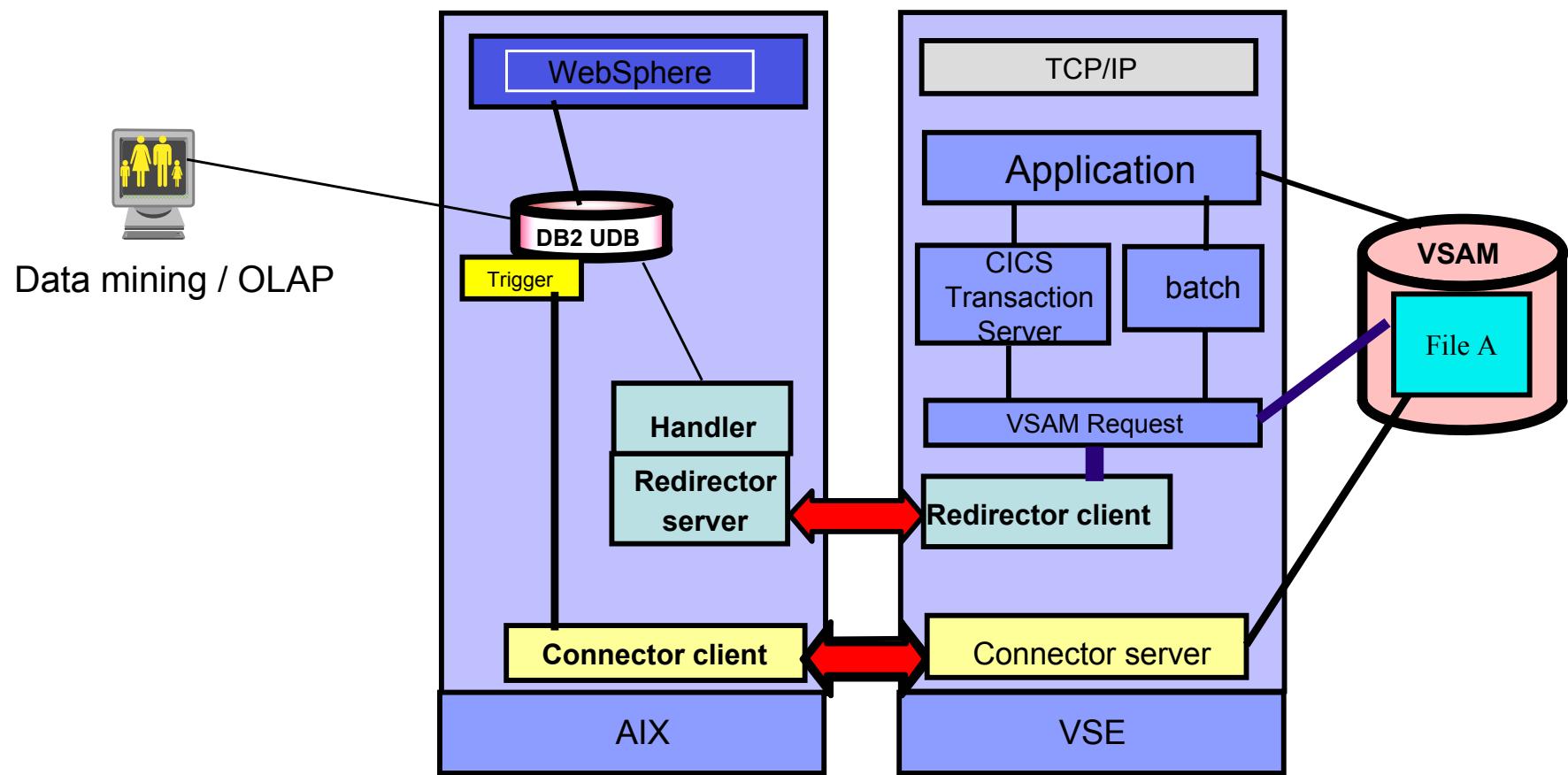
Solution with z/VSE 4.1

Incremental, Linux driven updates

❑ Energy supplier – Germany

►With VSAM Capture – the performance of the VSE production system protected

►The changes are processed asynchronously and not influenting the production system

| Linux | VSE |

WebSphere — **DB2 UDB** — **SQL Loader** / **Connector client**

TCP/IP — **Program** — **CICS Transaction Server** / **batch** — **VSAM Request** — **Generic Exit** — **Capture Exit** — **Conn. server**

VSAM: File A, File B
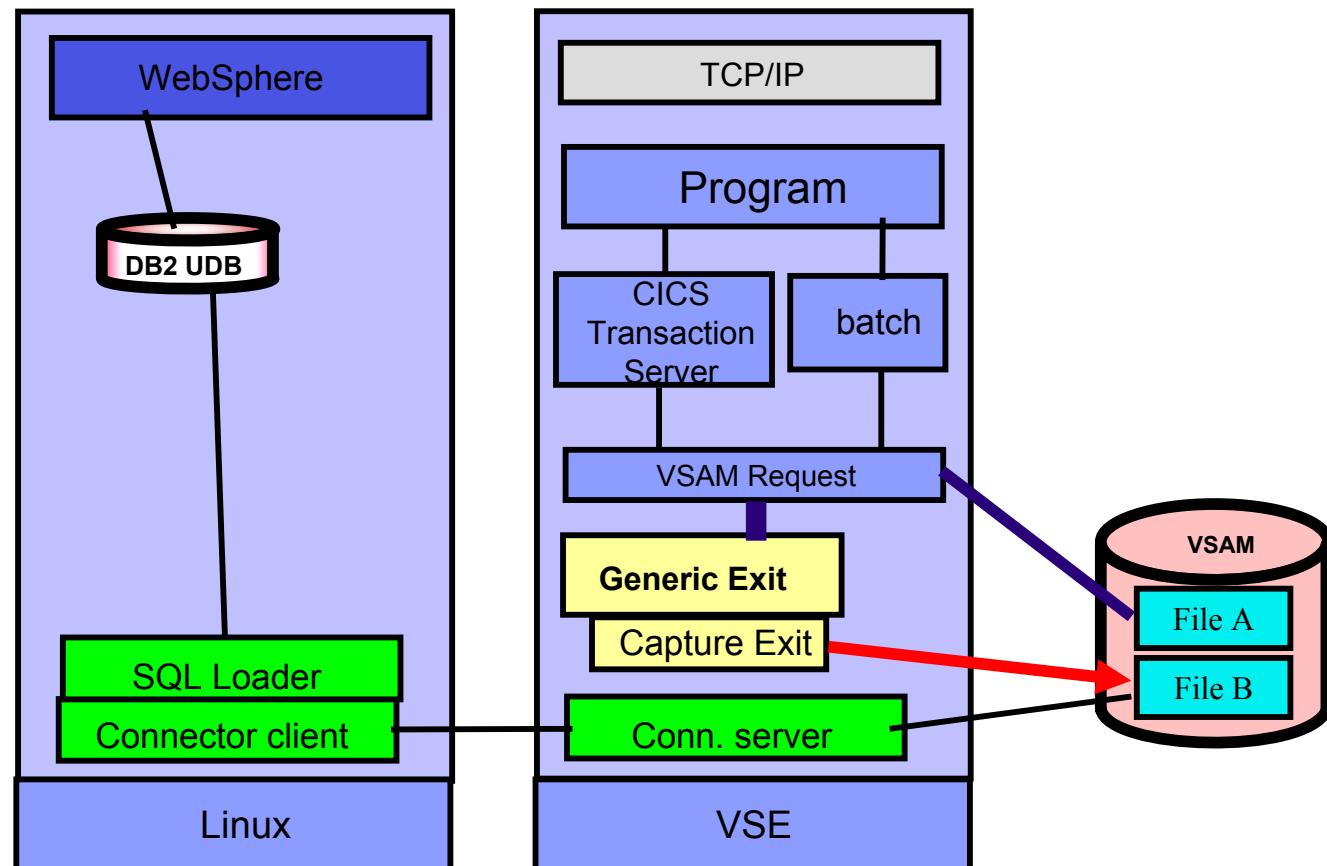
►Collect the changed records in a separate VSAM file

►Possibility of cleansing

►Process them – with the VSE Connectors

Redirector Capture.
Architectural View

New in z/VSE 4.1

Application
(i.e. in CICS or batch)

VSAM

access:
- reads records
- changes records
- inserts records
- deletes records

VSAM Redirector

Decision Exit

Vendor Exit as Capture Exit

marks the changed records

VSAM delta file

VSAM data store

z/VSE
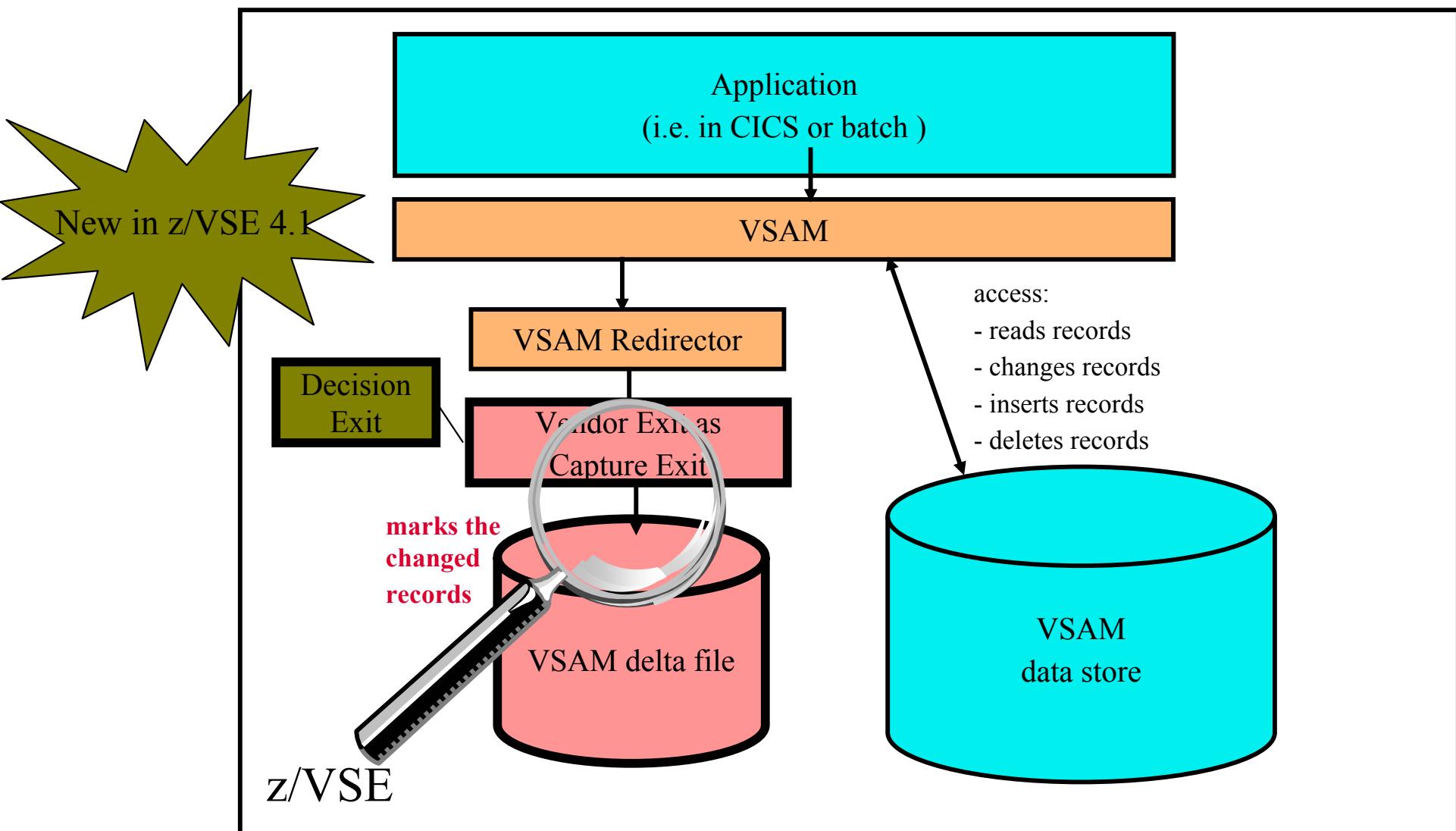
Data propagation / synchronization from VSE

VSE/VSAM Redirector can use normalized VSAM data

►No changes to the existing VSE applications

►**The new Redirector Handler can store/retrieve 'VSAM' data in multiple DB Tables .**
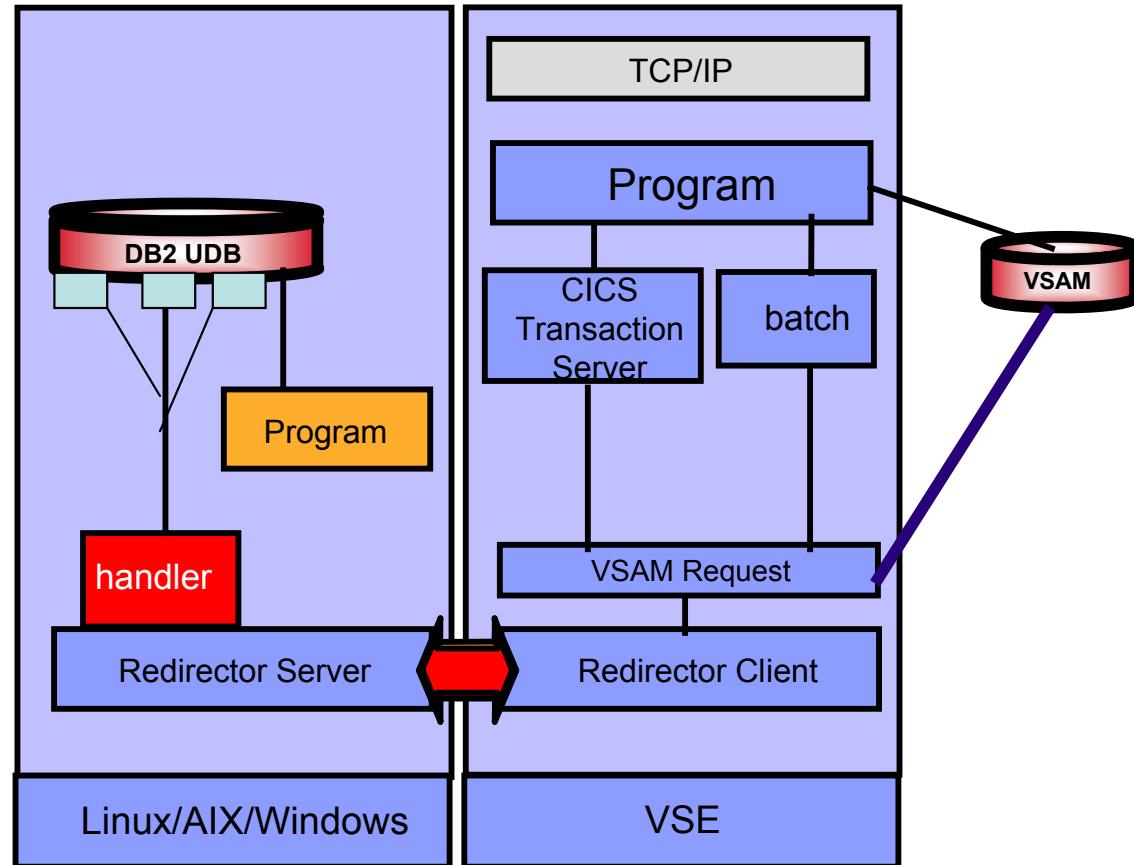
►Applications on VSE should be able to access DB2 data on Linux

►Synchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
(VSAM Redirector is part of VSE)

Final solution

common data store – Business intelligence
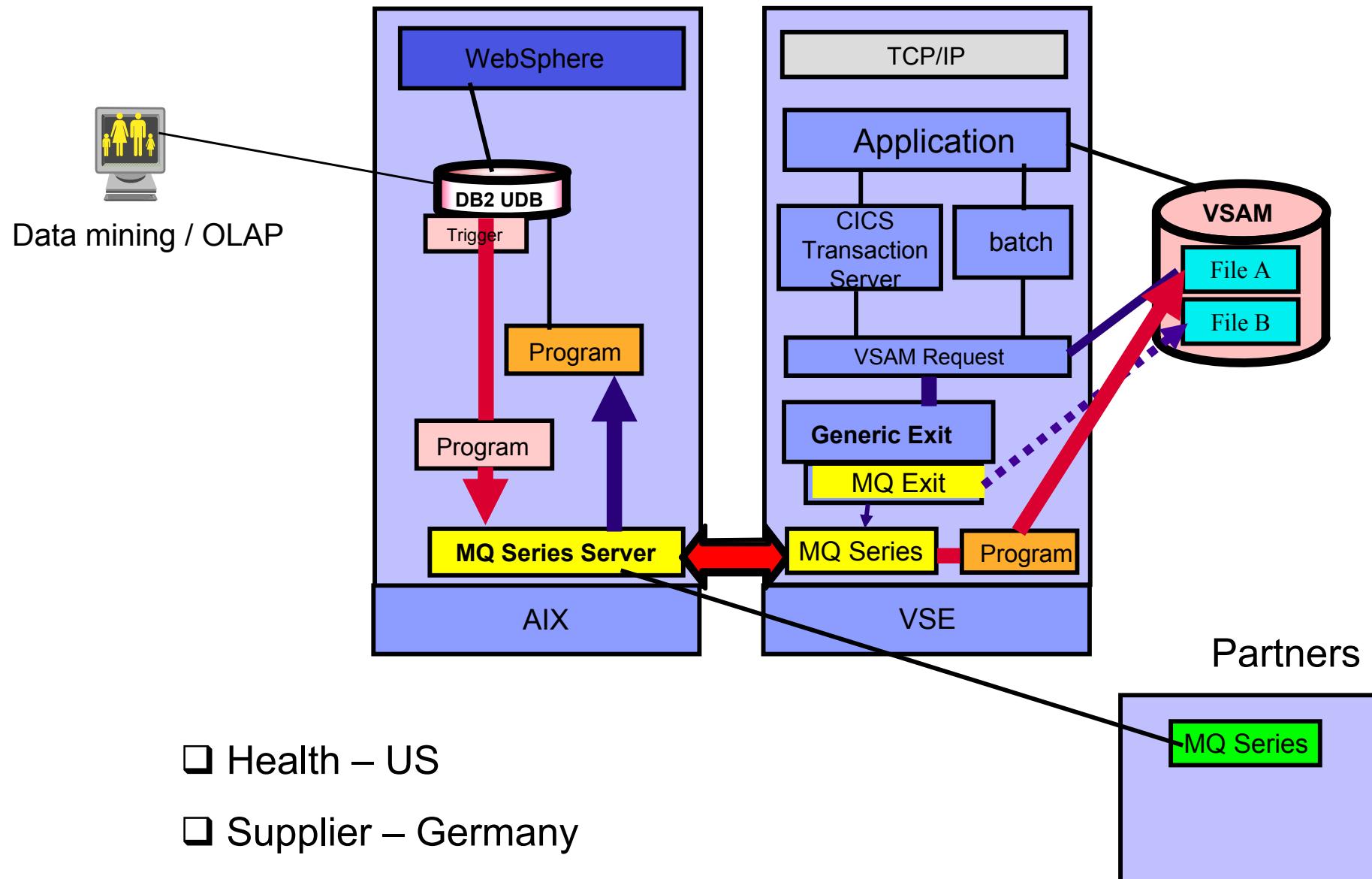
Data mining / OLAP

AIX block:
- WebSphere
- DB2 UDB
- Trigger
- Program
- Program
- MQ Series Server

VSE block:
- TCP/IP
- Application
- CICS Transaction Server
- batch
- VSAM Request
- Generic Exit
- MQ Exit
- MQ Series
- Program

VSAM:
- File A
- File B

Partners
- MQ Series

☐ Health – US

☐ Supplier – Germany

# VSE applications and DB2 UDB on Linux on System z

❖ VSAM Redirector scenarios

➡ ❖ DB2 VSE scenarios

z/VSE Server

```
???

DB2 UDB

DB2
```

```
?  TCP/IP
?  LE/VSE
?  Batch
?  CICS

VSAM   DB2
```
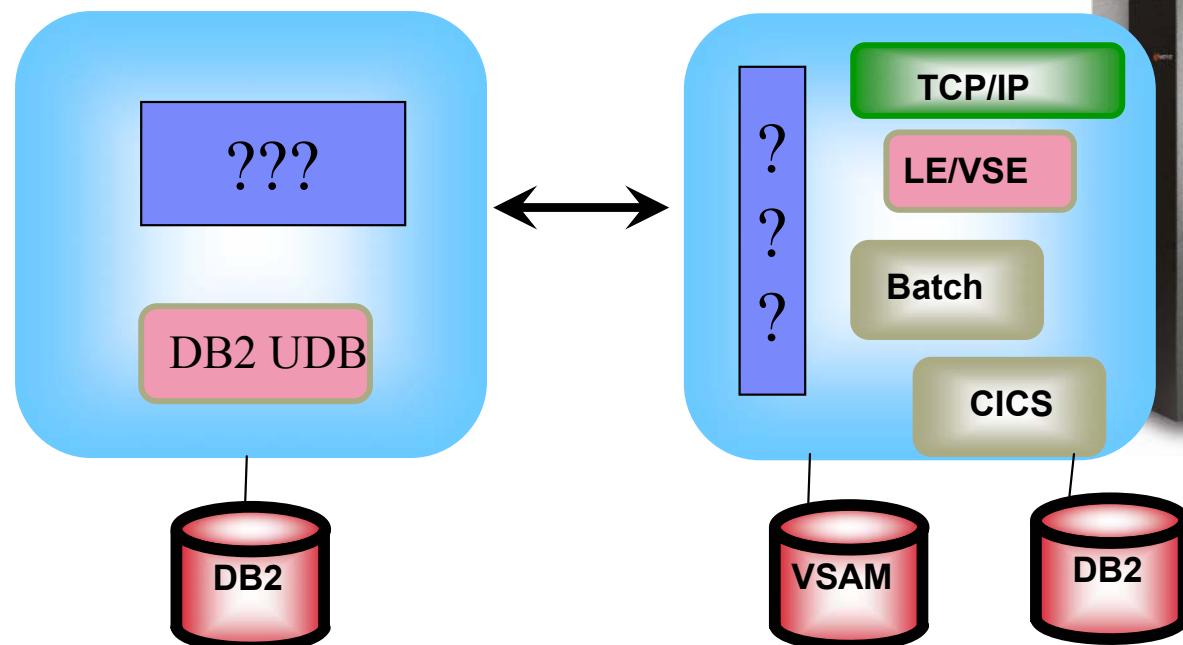
DB2 Scenarios – with DB2 UDB on Linux

pSeries

AIX / Linux SAP ORACLE / DB2

DB2 UDB

iSeries

AS/400 Linux DB2

DB2 UDB

Linux on System z

Software IBM Websphere

DB2 UDB

DB2 VSE

Connection via HiperSockets

z/VSE V3.1 Production Environment

+ CICS
+ VSAM
+ COBOL

+ DB2 VSE Client*

z/VSE V3.1 Test Environment

+ CICS
+ VSAM
+ COBOL

z/VM V5	z/VM V5	z/VSE Test System LPAR
IFL Engine	**Standard Engine**	
IBM eServer zSeries		
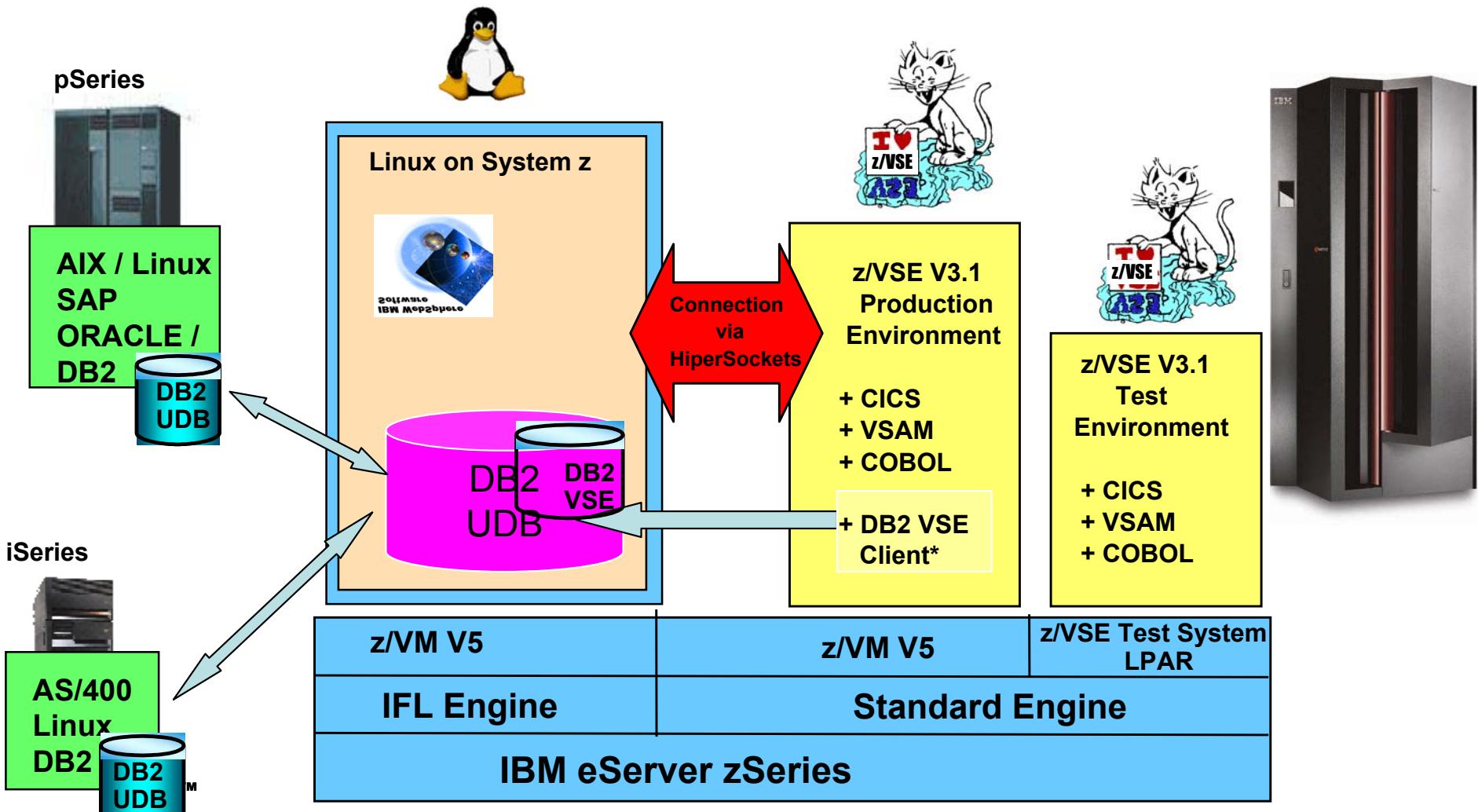
(*) DB2 VSE Client – the client functionality only, can be obtained with <u>PRPQ P10154</u>

Relational Access to DB2 VSE
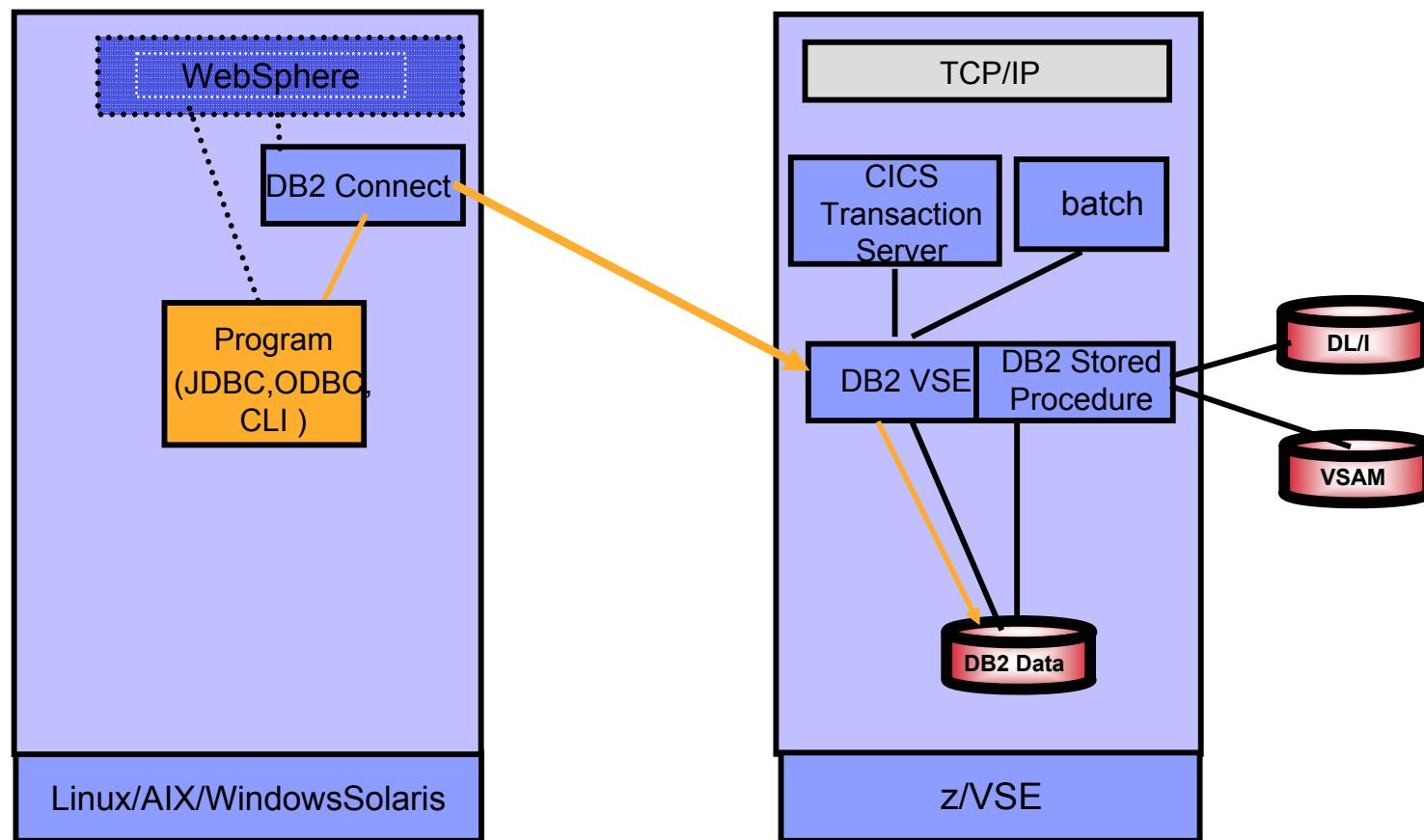
- ▶ Remote access of DB2 VSE via DB2 Connect
- ▶ Integration of non relational VSE data (i.e. VSAM, DL/I) with remote DB2 logic via Stored Procedures

Integration of DB2 UDB with DB2 VSE on Remote applications
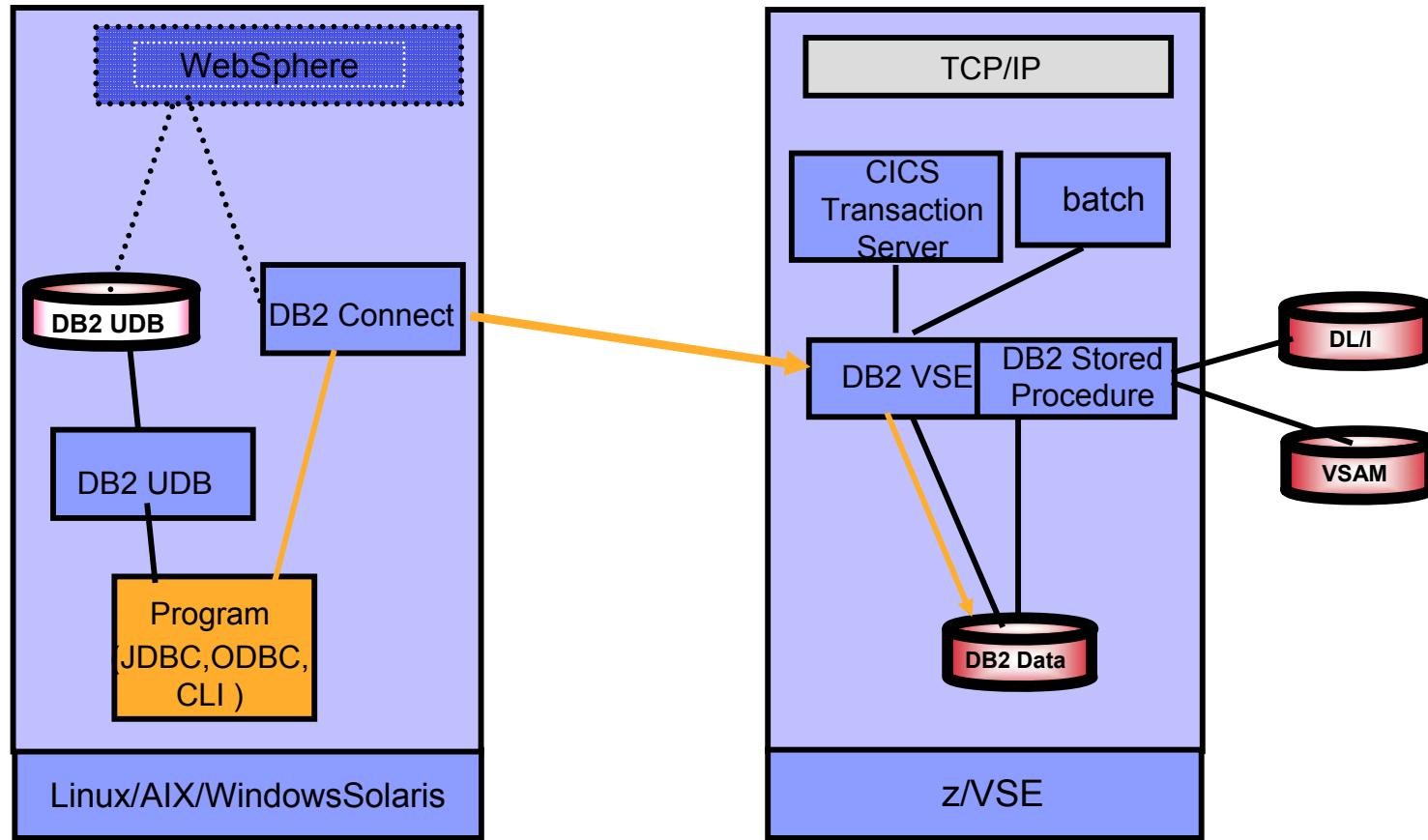
► Remote access of DB2 VSE via DB2 Connect

► Integration of non relational VSE data with DB2 logic via Stored Procedures

DB2 VM applications to access, remote DB2 UDB on Linux

z/VSE

TCP/IP

CICS Transaction Server

batch

DB2 VSE

Linux

WebSphere

DB2 Data

Program (JDBC,ODBC, CLI)

z/VM

DB2 (AR) Application requestor

DB2 VM

Application
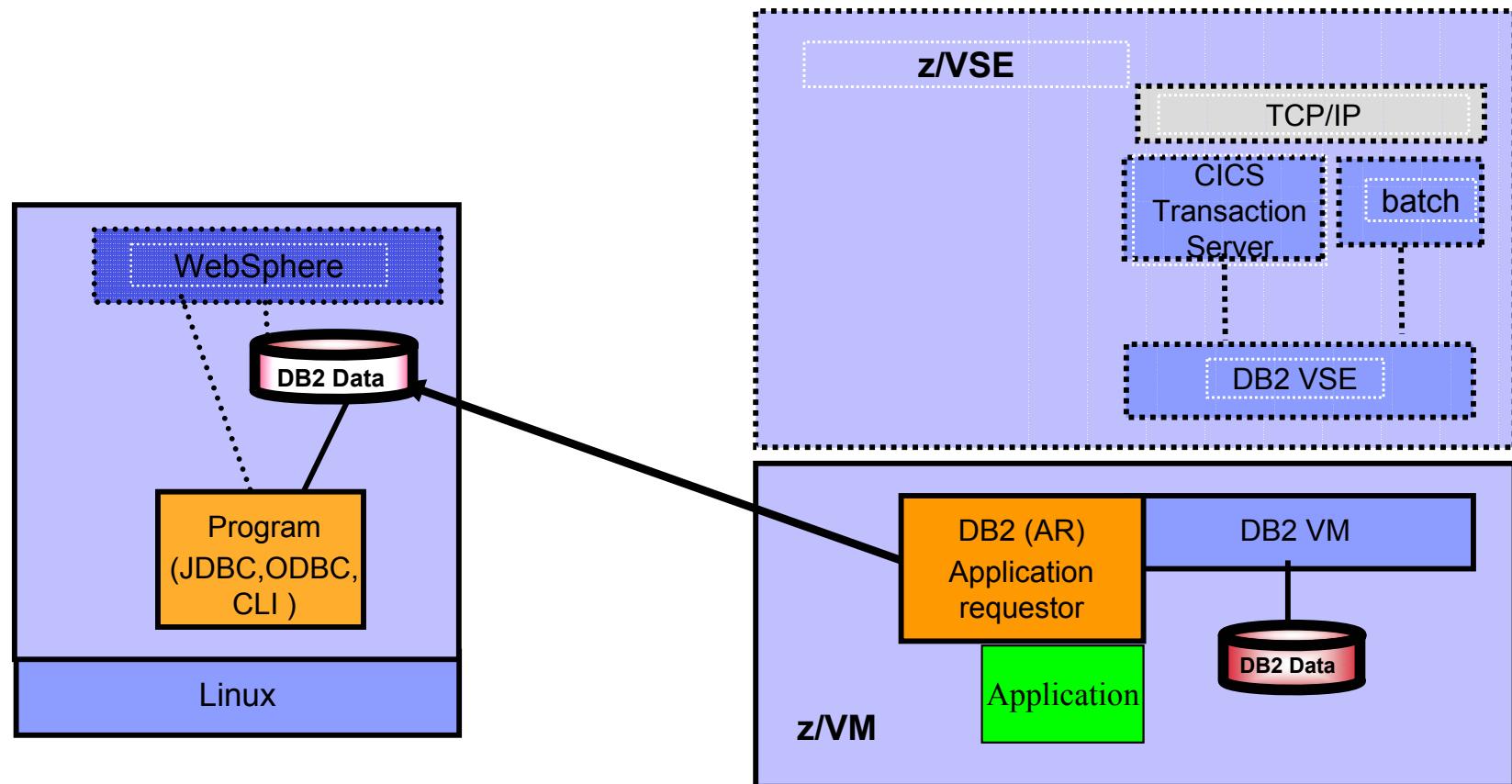
DB2 Data

► VM application accesses DB2 UDB on Linux

DB2 VSE applications to access, remote DB2 UDB on Linux (NOT possible in guest sharing via VM)
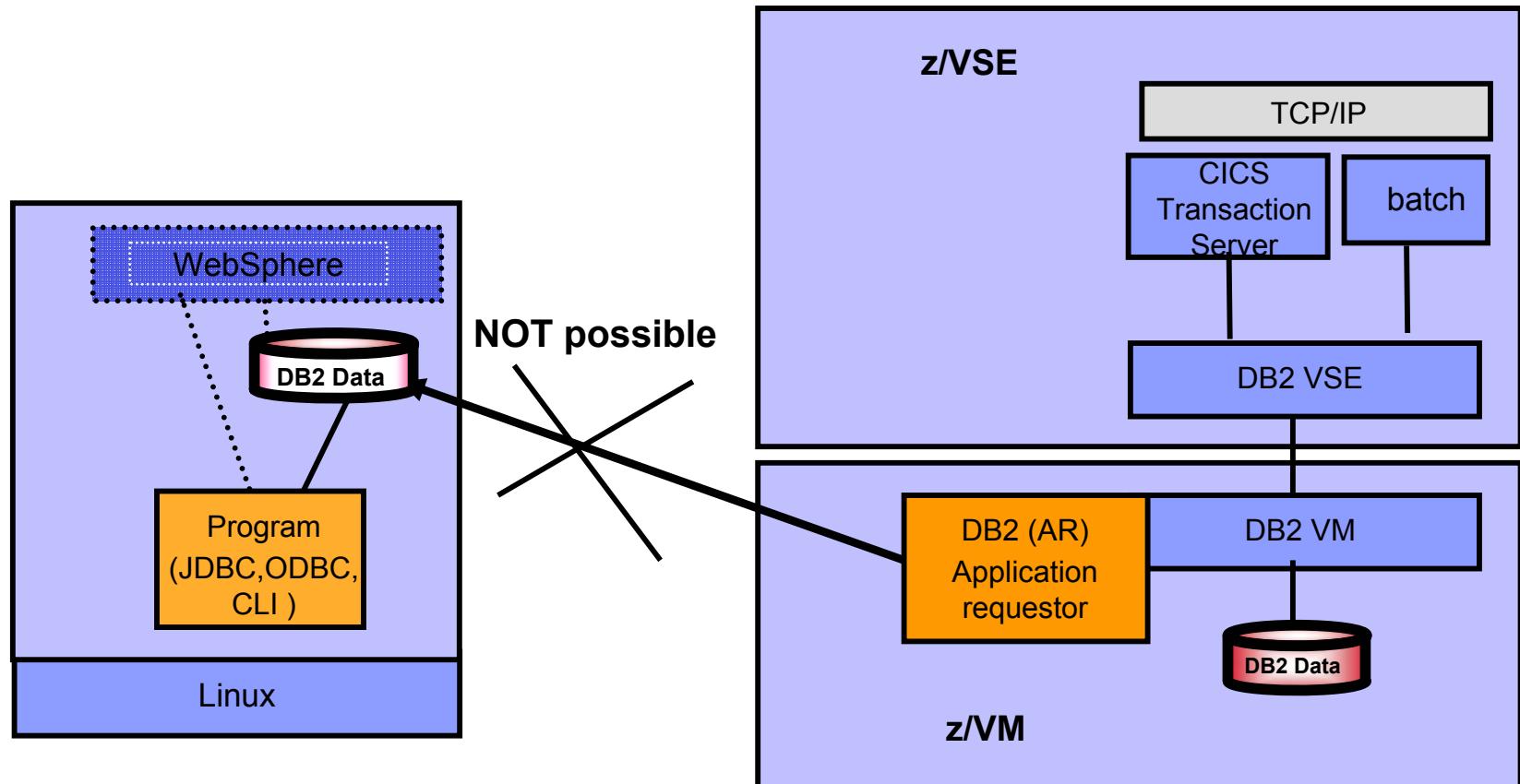
- ► VSE application access DB2 VM via Guest sharing
  - ► DB2 must be installed on both platforms
  - ► DB2 Databases on VM only
- ► **From VSE applications NO remote access via VM Application requestor possible**

DB2 VSE applications to access, remote DB2 UDB on Linux on System z - Special OFFERING
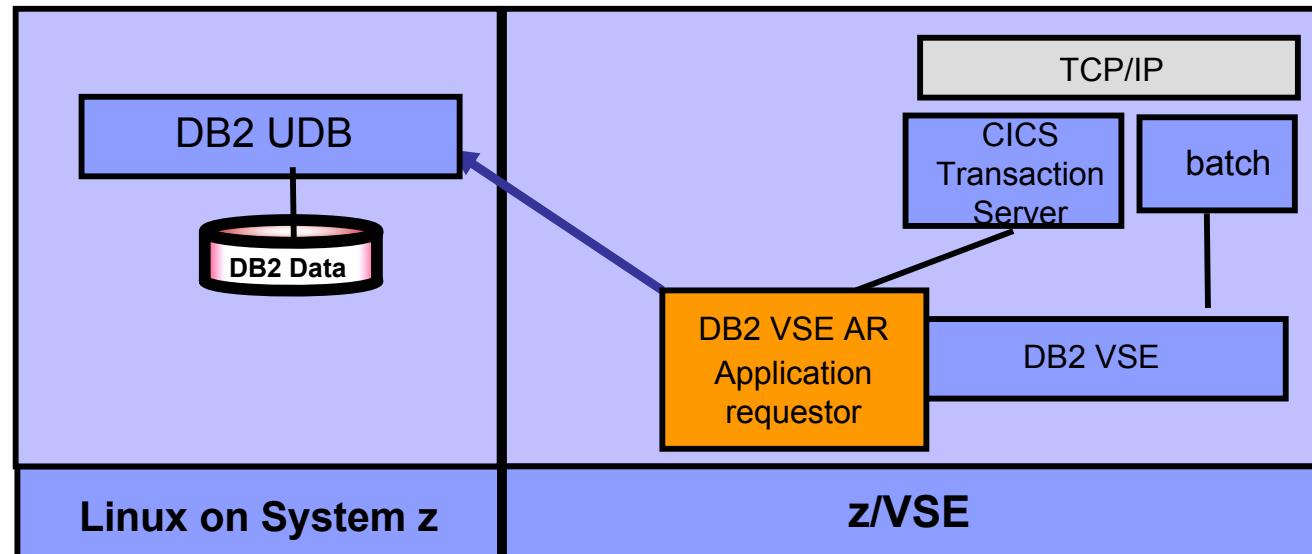
- ►Original Price Model: License for DB2 VM/VSE **AND** DB2 UDB for Linux
- ►**PRPQ: P10154 (Ordering Nr: 5799-HAQ)**
  - ►**Reduced License for DB2 VSE Client only - if NO data on VSE**
    - ►**Full Price for DB2 UDB on Linux on System z**

- ►**Special Price for DB2 UDB for Linux on System z**

- ►*Note:*
  - ►*Both Products are needed because of the Programing interface and precompiler*
  - ►*On VSE the SQL language that can be used is the DB2 VSE SQL Language – because of precompiler*

DB2 VSE and DB2 UDB on Linux on System z

Why use DB2 UDB on Linux on System z with VSE Core applications

- Modern environment in DB2 UDB on Linux on System z

- Existence of lots of tools for:
    - database management
    - Optimization and Tuning
    - Data analysis (Warehouse, Mining, OLAP)

- ASCII environment – easy integration with distributed DB2 UDBs
- Consolidation of DB2 UDB databases from distributed platforms

- **Note: DB2 CONNECT is not needed on Linux on System z**

DB2 VSE and DB2 UDB on Linux on System z

Why use DB2 UDB on Linux on System z with VSE Core applications

- VSE applications access to DB2 UDB on Linux via HiperSockets
  - reliable network – no wires
  - fast network (memory copy speed)
  - transparent

- Core applications on VSE (CICS and batch):
  - can be used unchanged with considerations of EBCDIC – ASCII code pages (i.e. sorts with low values)
  - can show performance degradations if mass single row processing is done – these applications might need adaptions

- **Note: DB2 CONNECT is not needed on Linux on System z**

Environment and Database design

Configuration for CICS applications and remote DB2 UDB database

- VSE environment
  - configure DB2 VSE database directory
    - configure ARISDIRD (IP, port, DBname of remote database)
  - enable DRDA code (batch and online)
    - configure ARIS74LD (batch), ARIS745D (AR)
    - new transaction in CICS to bind packages (CBND) to remote AS (done during program preparation)

- zLinux environment
  - configure database manager on DB2 UDB zLinux
    - change some DBM parameters to allow implicit connect from within CICS
  - configure VSE batch and ISQL options (create remote packages)
    - ARIISQL for ISQL and ARIDSQL for Batch

- **Note: DB2 CONNECT is not needed on Linux on System z**

Environment and Database design

Configuration for CICS applications and remote DB2 UDB database

Application considerations:

- migrate tables from DB2 VSE to DB2 UDB zLinux
  - UDB export/import options
  - use of federated DB2 UDB options and a cursor application

- existing CICS/DB2 VSE applications
  - no changes to the source code required (except Code page issues)
  - the SQL precompile creates new packages on the remote DB2 UDB)

- existing VSE batch DB2 VSE applications
  - no changes to source code required
  - adapt CONNECT statements to access remote DB2 UDB

DB2 UDB on Linux on System z

logical integrates

DB2 VSE

via Federated option in DB2 UDB
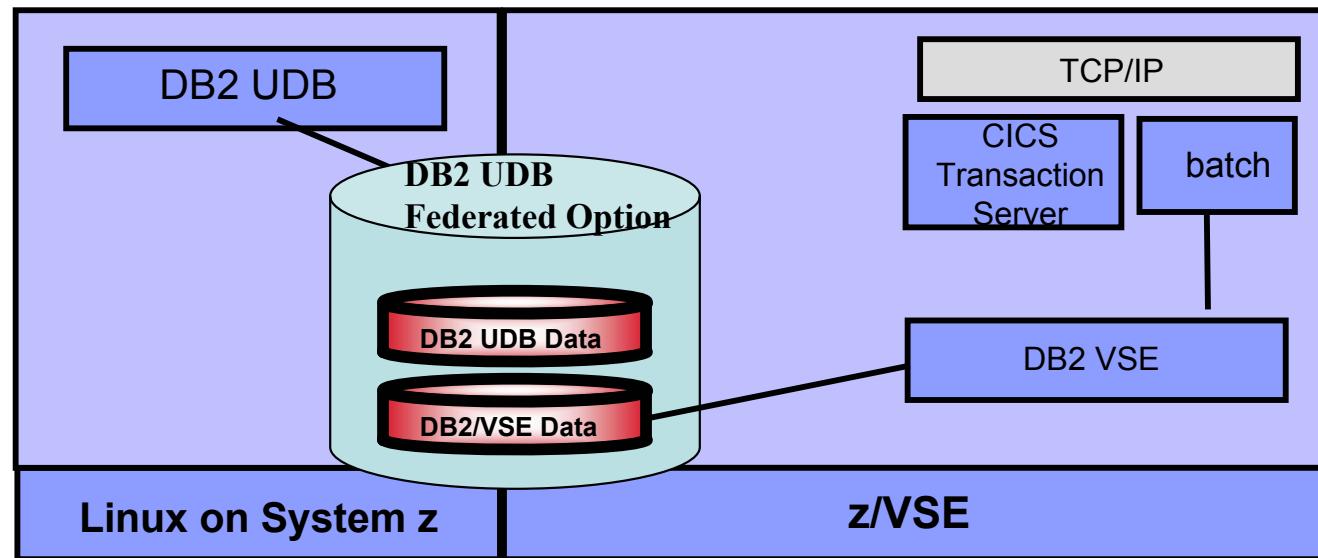
► Minimum changes – maximum combination

    ► DB2 UDB for Linux on System z with Federated Option – includes DB2 VSE logically

    ► DB2 UDB Applications have transparent access to DB2/VSE

Federated Database design
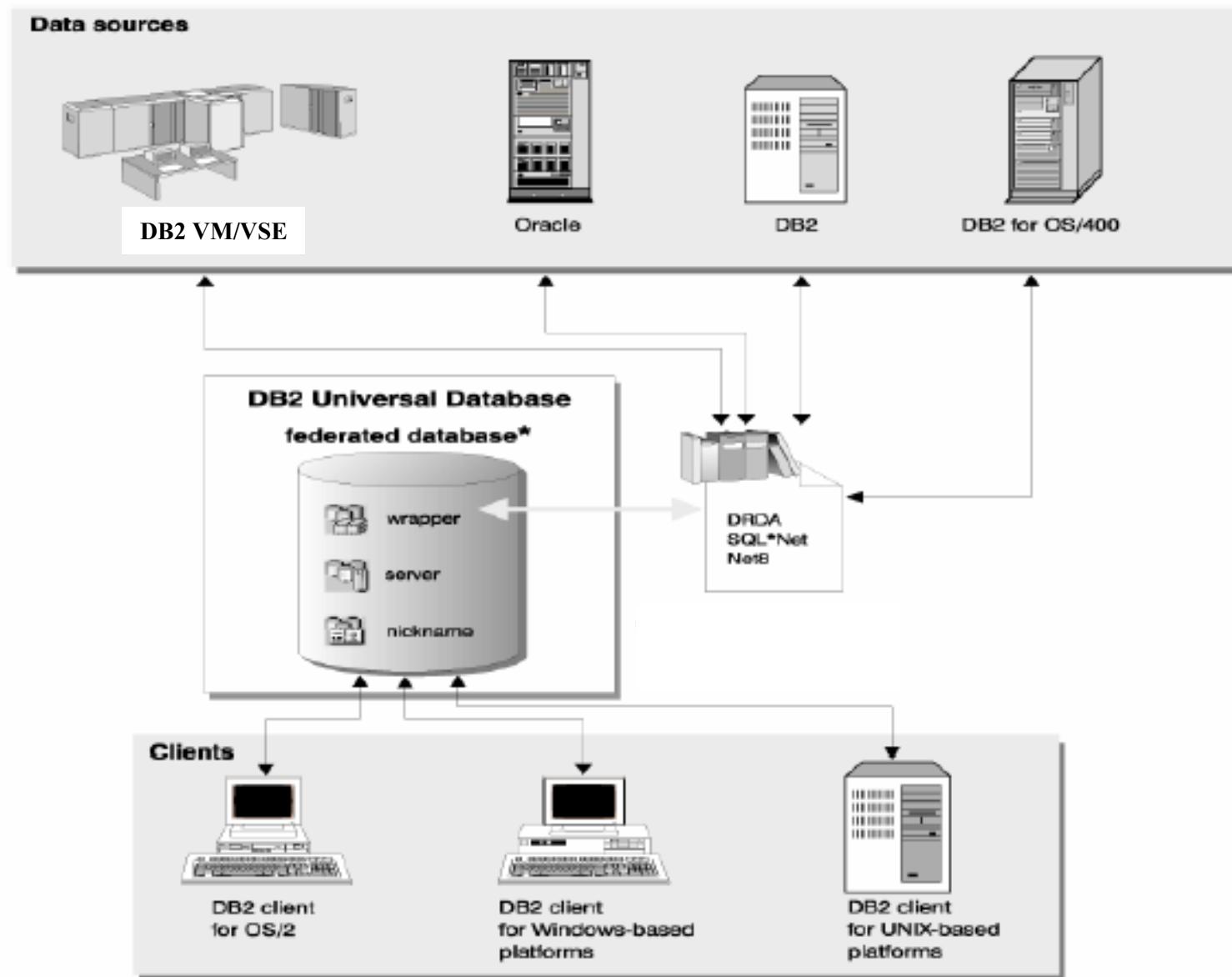
Summary

Solutions with DB2 UDB with Linux on System z enable modern possibilities with VSE:

- easy to configure environment

- easy migration from DB2 VSE to DB2 UDB zLinux

- in general, no source code change for existing VSE applications

- faster IBM development for DB2 UDB

- advanced SQL on DB2 UDB than DB2 VSE

- more option for DB2 UDB integration to other distributed environments and Development tools (Rational, WebSphere, ...)

More information about DB2 UDB and DB2/VSE

➢ **Summary of DB2 Planning and Customization Tasks (VSE)**

  http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/iespie41/10.4.5

➢ **Enabling the DB2 Server for VSE**

  http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/iespie41/10.4.4

➢ **Customizing Tasks for DB2 Server for VSE (DB2-Based Connector)**

  http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/IESWUE41/HDRINDB2BC

➢ **DB2 - Resolve Frequent Problems**
  http://publib.boulder.ibm.com/infocenter/db2help/index.jsp?topic=/com.ibm.db2.udb.doc/conn/c0005607.htm

➢ **DB2 Universal Database (UDB)**

  http://www.ibm.com/software/data/db2/udb/

➢ **Moving Data from DB2/VSE&VM to DB2 UDB**

  http://www-306.ibm.com/software/data/db2/vse-vm/support.html

IBM Education Announcement - z/VSE 4.1 Live Virtual Classes

z/VSE Version 4.1 Virtual Classes after announcement on January 9, 2007

- You must **enroll at least 1 day ahead** of the session date to enable your participation.

- The Live Virtual Classes (LVC) will be delivered using the Interwise tool that employs Voice over IP (VoIP) technology to provide both the audio as well as the visuals for the class to your Windows workstation.

- **Each call will start at 8:00 a.m. Pacific US/ 11:00 a.m. Eastern US/ 4:00 p.m. GMT/ 5:00 p.m. CET.**

- The duration for each live virtual class is 1 hour.

1) z/VSE and MWLC Announcement Overview -   February 1 (Thursday)
Content: Overview of the January 9 announcement including z/VSE 4.1 and updates to the z/VSE pricing.
Enroll via: http://ems3.intellor.com/?p=301727&do=register&t=2

2) Midrange Workload Licensing Charges for z/VSE -   February 22 (Thursday)
Content: Midrange Workload Licensing and associated sub-capacity pricing.
Register via: http://ems3.intellor.com/?p=301727&do=register&t=2

3) z/VSE 4.1 solutions based on SOA and DB2 -   March 15 (Thursday)
Content: How z/VSE can take part in modern solutions based on System Oriented Architecture (SOA), XML data interchange and Web services standards.
Enroll via: http://ems3.intellor.com/?p=301727&do=register&7=3

z/VSE, the new web presence

http://www.ibm.com/servers/eserver/zseries/zvse/

Additional Information

- z/VSE/ESA Home Page
    http://www.ibm.com/servers/eserver/zseries/zvse/

- z/VSE solutions
    http://www-1.ibm.com/servers/eserver/zseries/zvse/solutions

- e-business Connectors User's Guide   SC33-6719
    http://www-1.ibm.com/servers/eserver/zseries/zvse/documentation/#conn

Redbooks

- 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