# E36

## The z/VSE Solutions that Exploit DB2 UDB on Linux

## Wilhelm Mild

## IBM System z Expo
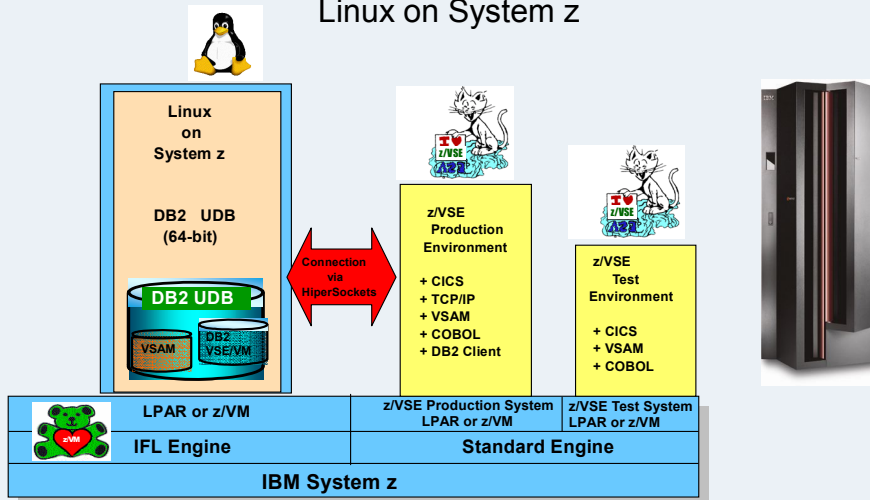September 17-21, 2007
San Antonio, TX

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## A typical VSE environment today

- Various different servers (System z, System p, System i, System x, and others )
- VSAM data on VSE (some DB2 environments, some other databases)
- Relational databases on distributed platforms (DB2, Oracle, others)
- Data exchange is primarily done via FTP
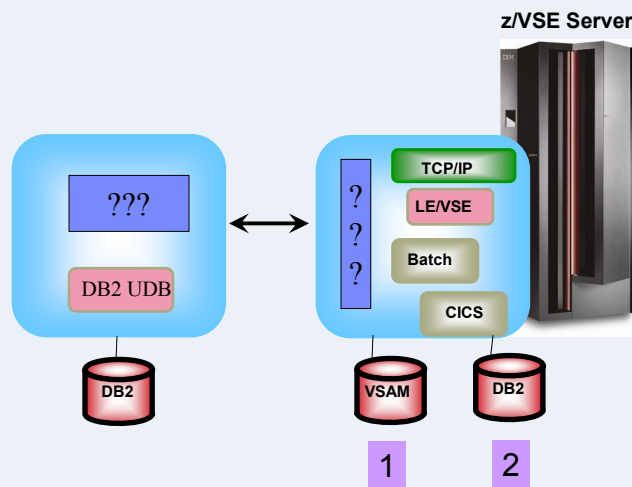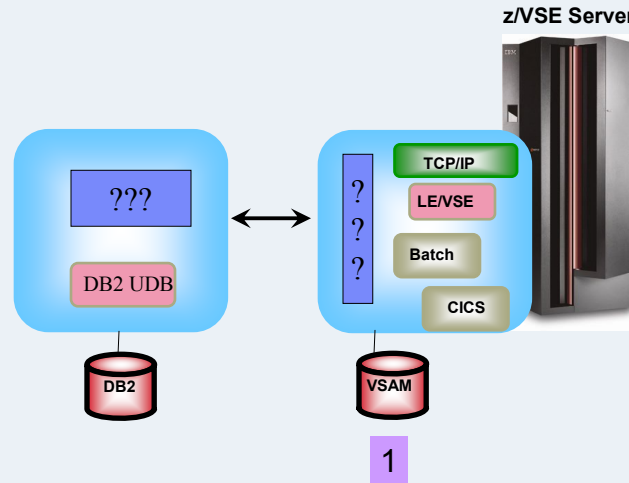- Almost NO real time data access/exchange
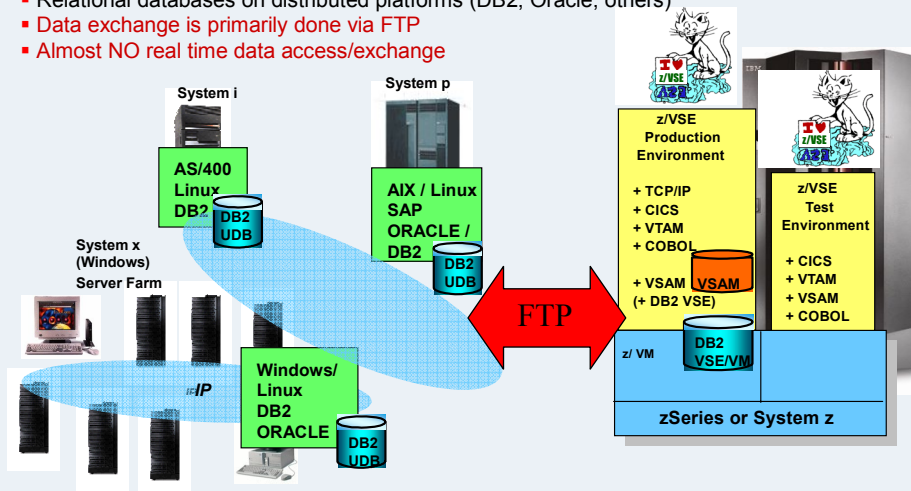
**Common data Store**

Leverage VSE/VSAM or DB2 data using shared DB2 UDB on Linux on System z

Linux on System z

DB2 UDB (64-bit)

DB2 UDB

VSAM | DB2 VSE/VM

Connection via HiperSockets

z/VSE Production Environment

+ CICS
+ TCP/IP
+ VSAM
+ COBOL
+ DB2 Client

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

| LPAR or z/VM | z/VSE Production System LPAR or z/VM | z/VSE Test System LPAR or z/VM |
|---|---|---|
| IFL Engine | Standard Engine | |
| IBM System z | | |

**VSE applications and DB2 UDB on Linux on zSeries**

z/VSE Server

???

DB2 UDB

?
?
?

TCP/IP

LE/VSE

Batch

CICS

DB2

VSAM

DB2

1

2

2

(1) VSE VSAM applications and DB2 UDB on Linux

z/VSE Server

??? 

DB2 UDB

TCP/IP
LE/VSE
Batch
CICS

DB2

VSAM

1

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

System p

Linux on System z

AIX / Linux
SAP
ORACLE /
DB2

DB2 UDB

z/VSE
Production
Environment

+ CICS
+ COBOL

+ VSAM

+ VSAM
  Redirector*

Connection
via
HiperSockets

z/VSE
Test
Environment

+ CICS
+ VSAM
+ COBOL

DB2
UDB

System i

AS/400
Linux
DB2

DB2 UDB

z/VM V5
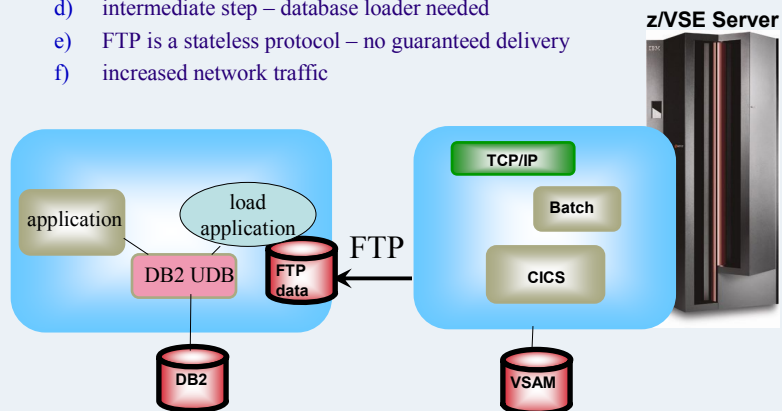
IFL Engine

LPAR or z/VM

Standard Engine

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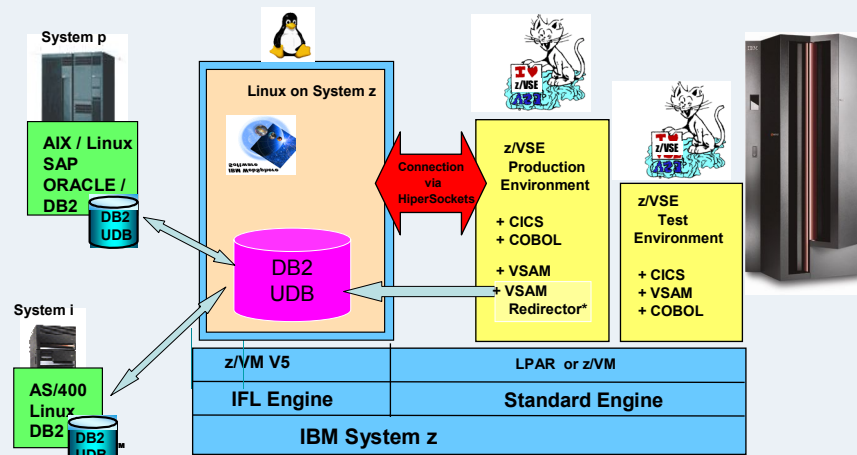
(*) VSAM Redirector – Common data store solution – with DB2 on Linux on System z
Solutions without changes to VSAM programs

# VSE/VSAM applications
## access to
## DB2 UDB on Linux on zSeries

**z/VSE Server**

VSAM Redirector Server

Handler

DB2 UDB

VSAM Redirector Client

TCP/IP

LE/VSE

Batch

CICS

DB2

VSAM

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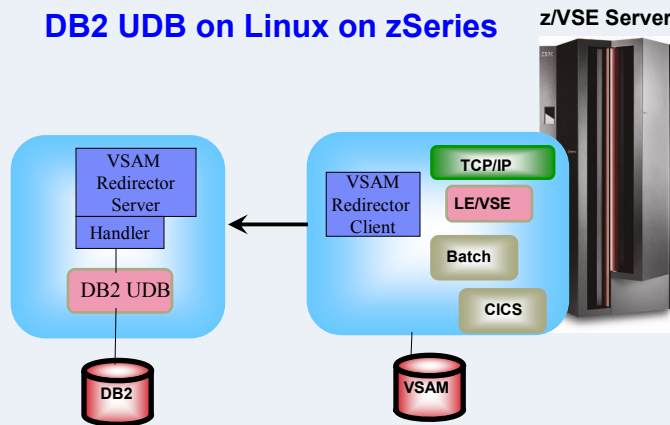
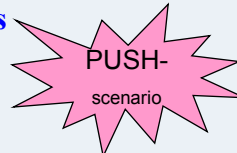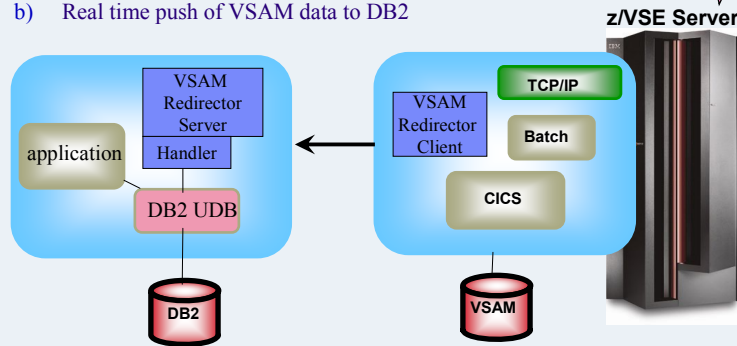## VSE/VSAM applications and FTP data transfer today

(1)   disadvantages of FTP

    a)   NO real-time access/synchronization

    b)   data immediate out of sync, till next FTP

    c)   always the whole file is transferred

    d)   intermediate step – database loader needed

    e)   FTP is a stateless protocol – no guaranteed delivery

    f)   increased network traffic
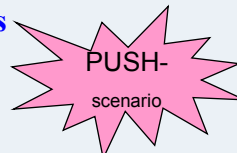
**z/VSE Server**

application

load application

FTP

DB2 UDB

FTP data

TCP/IP

Batch

CICS

DB2

VSAM

4

**VSE/VSAM applications (without any change), access remote relational databases**

PUSH-scenario

(1) Real time access VSAM to DB2
   a) synchronization (two phase commit of VSAM and DB2)
   b) Real time push of VSAM data to DB2

z/VSE Server

VSAM Redirector Server
Handler
application
DB2 UDB
DB2

VSAM Redirector Client
TCP/IP
Batch
CICS
VSAM

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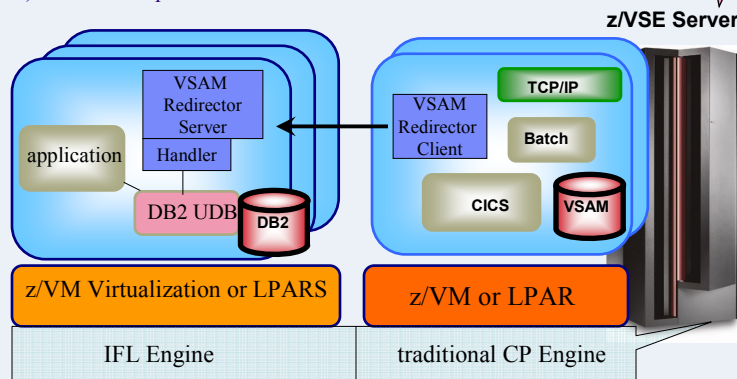**VSE/VSAM applications (without any change), access remote relational databases**

PUSH-scenario

(1) Real time access VSAM to DB2
   a) synchronization (two phase commit of VSAM and DB2)
   b) Real time push of VSAM data to DB2

z/VSE Server

VSAM Redirector Server
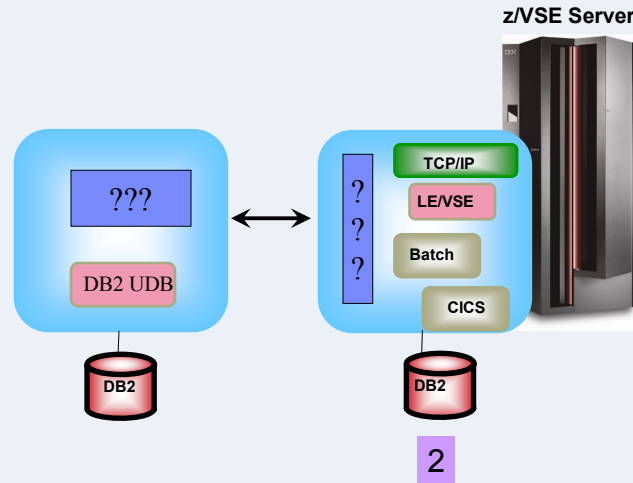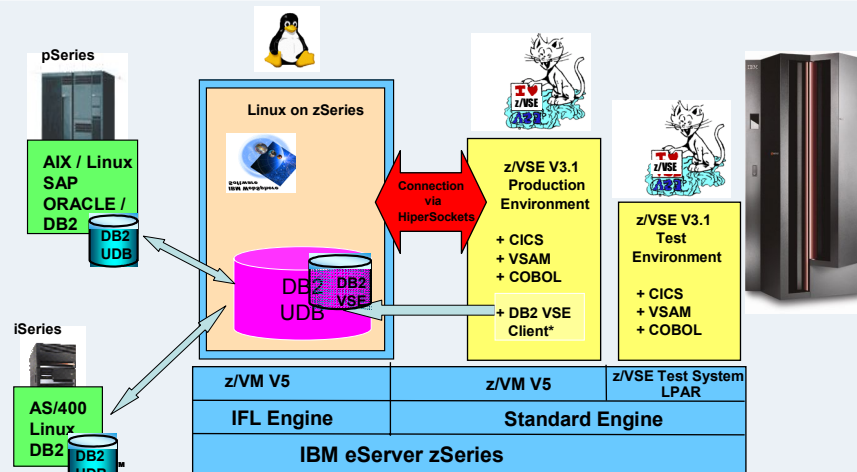Handler
application
DB2 UDB
DB2

VSAM Redirector Client
TCP/IP
Batch
CICS
VSAM

z/VM Virtualization or LPARS       z/VM or LPAR

IFL Engine       traditional CP Engine

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## (2) DB2 VSE applications and DB2 UDB on Linux

z/VSE Server

???

DB2 UDB

TCP/IP

LE/VSE

Batch

CICS

DB2

DB2

2

## DB2 Scenarios – with DB2 UDB on Linux

pSeries

Linux on zSeries

AIX / Linux
SAP
ORACLE /
DB2

DB2
UDB

z/VSE V3.1
Production
Environment

+ CICS
+ VSAM
+ COBOL

+ DB2 VSE
Client*

z/VSE V3.1
Test
Environment

+ CICS
+ VSAM
+ COBOL

Connection
via
HiperSockets

DB2
UDB

DB2
VSE

iSeries

AS/400
Linux
DB2

DB2
UDB

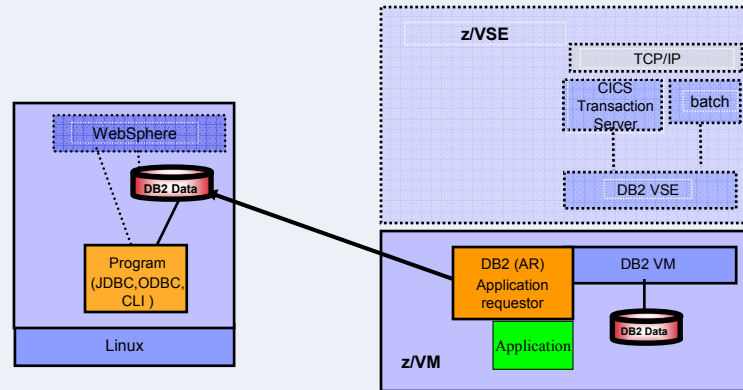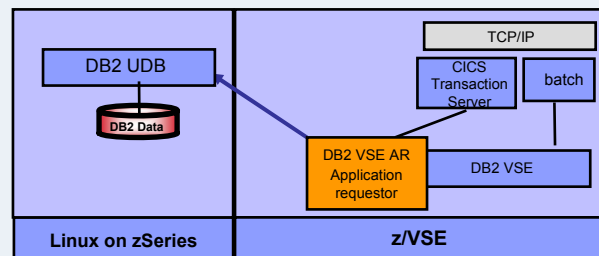| z/VM V5 | z/VM V5 | z/VSE Test System LPAR |
|---------|---------|------------------------|
| IFL Engine | Standard Engine | |
| IBM eServer zSeries | | |

(*) DB2 VSE Client – the client functionality only, can be obtained
with PRPQ P10154

## DB2 VM applications to access, remote DB2 UDB on Linux



ƒ VM application accesses DB2 UDB on Linux

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## DB2 VSE applications to access, remote DB2 UDB on Linux on zSeries - Special OFFERING



ƒ Original Price Model: License for DB2 VM/VSE **AND** DB2 UDB for Linux

ƒ **PRPQ: P10154 (Ordering Nr: 5799-HAQ )**

   ƒ**Reduced License for DB2 VSE Client only - if NO data on VSE**

      ƒ**Full Price for DB2 UDB on Linux on zSeries**

ƒ **Special Price for DB2 UDB for Linux on zSeries**

ƒ*Note:*

   ƒ*Both Products are needed because of the Programing interface and precompiler*

   ƒ*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 zSeries

**Why use DB2 UDB on Linux on zSeries with VSE Core applications**

- Modern environment in DB2 UDB on Linux on zSeries

- 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 zSeries**

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# DB2 VSE and DB2 UDB on Linux on zSeries

**Why use DB2 UDB on Linux on zSeries 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 zSeries**

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# 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

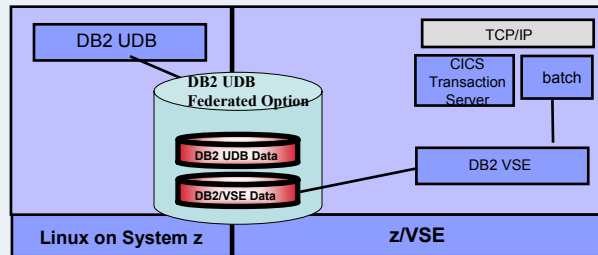- **Note: DB2 CONNECT is not needed on Linux on zSeries**

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# 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**

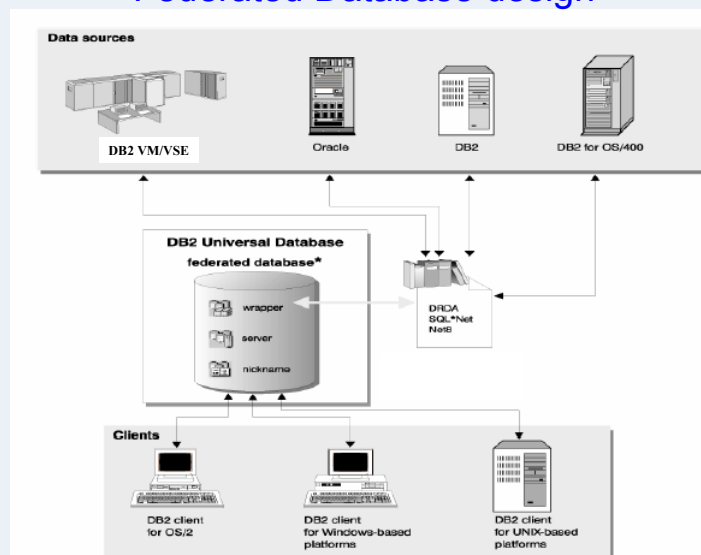| | |
|---|---|
| DB2 UDB | TCP/IP |
| DB2 UDB Federated Option | CICS Transaction Server / batch |
| DB2 UDB Data | |
| DB2/VSE Data | DB2 VSE |
| **Linux on System z** | **z/VSE** |

ƒ Minimum changes – maximum combination

    ƒDB2 UDB for Linux on System z with Federated Option – includes DB2 VSE logically

    ƒDB2 UDB Applications have transparent access to DB2/VSE

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# Federated Database design

Data sources

DB2 VM/VSE    Oracle    DB2    DB2 for OS/400

DB2 Universal Database federated database*

wrapper

server

nickname

DRDA SQL*Net Net8

Clients

DB2 client for OS/2    DB2 client for Windows-based platforms    DB2 client for UNIX-based platforms

# Summary

**Solutions with DB2 UDB with Linux on zSeries 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, ...)

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# 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

# *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