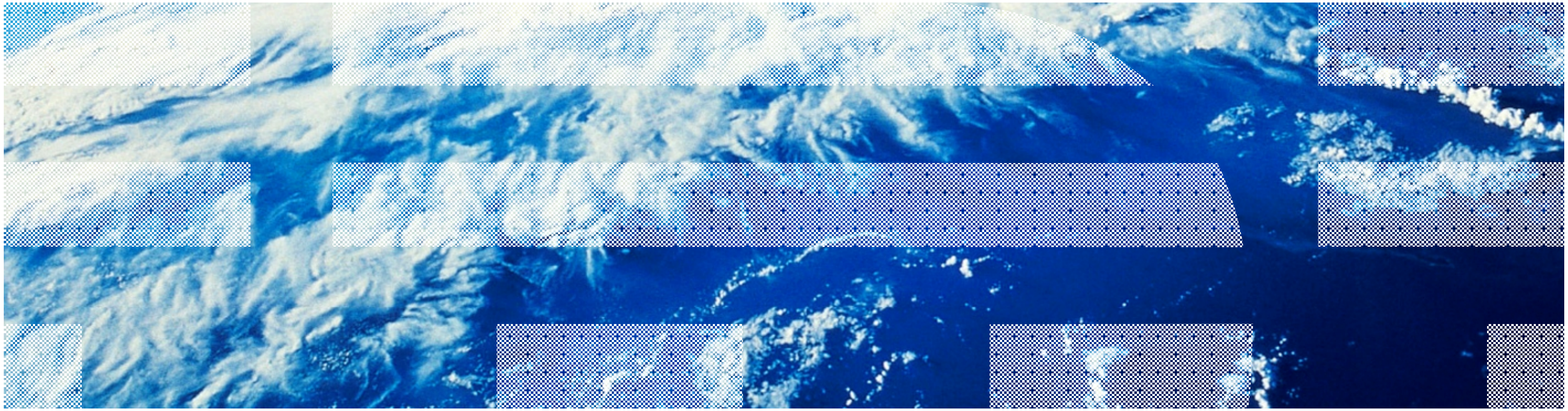
VS01 – zVSE V5.1 – Tools und neue Konnektoren

Ingo Franzki, IBM



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Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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CONNECTOR DR
STOP

Agenda

§ **z/VSE V5.1 + PTFs Connector Enhancements**

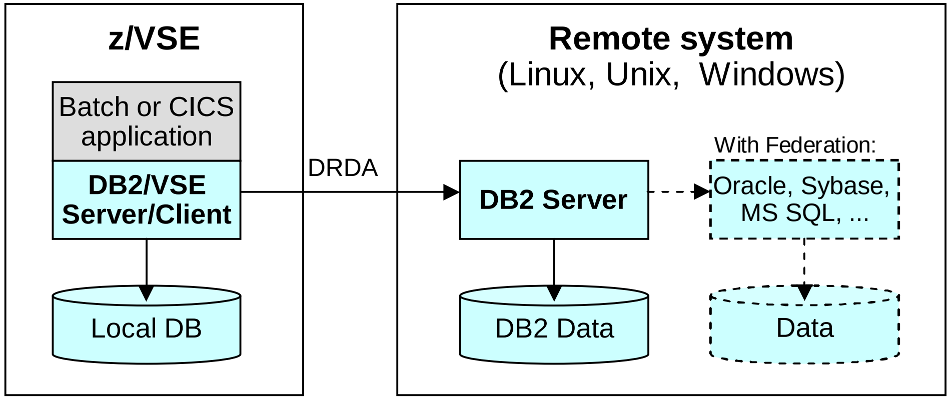
- z/VSE Database Call Level Interface

§ **z/VSE V5.1 Connector Enhancements**

- VSE Script Connector: SYSIPT Variables Support
- VSE Script Connector: New functions
- VSE Script Connector: Logging of script input and output
- VSAM Redirector: MapperConfigGUI Enhancements
- VSE Connector Client & Server: LDAP signon support
- VSE Connector Client & Server: LIBR DATA=YES

§ **New and updated Tools**

Options for using Databases with z/VSE applications



§ DB2/VSE or DB2/VM Server

- Local database residing in z/VSE or z/VM
- Lacks support of modern SQL functionality
- Only quite old SQL level supported

§ DB2/VSE Client Edition

- Remote database (on Linux, Windows, Unix)
- Communication via DRDA protocol
- Same old SQL level supported as DB2/VSE Server
- Can not use modern SQL functionality provided by DB2 LUW
- Can only access remote DB2 databases
  - Other databases (e.g. MS SQL Server, Oracle, etc) can only be accessed through IBM InfoSphere Federation Server

§ VSAM Redirector

- Primarily used to keep Databases in sync with VSAM data
- Also allows migration from VSAM to database

§ New: z/VSE Database Call Level Interface

- Allows z/VSE applications to access a relational database on any suitable database server
  - IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.
- Utilize advanced database functions and use SQL statements provided by modern database products

NEW!

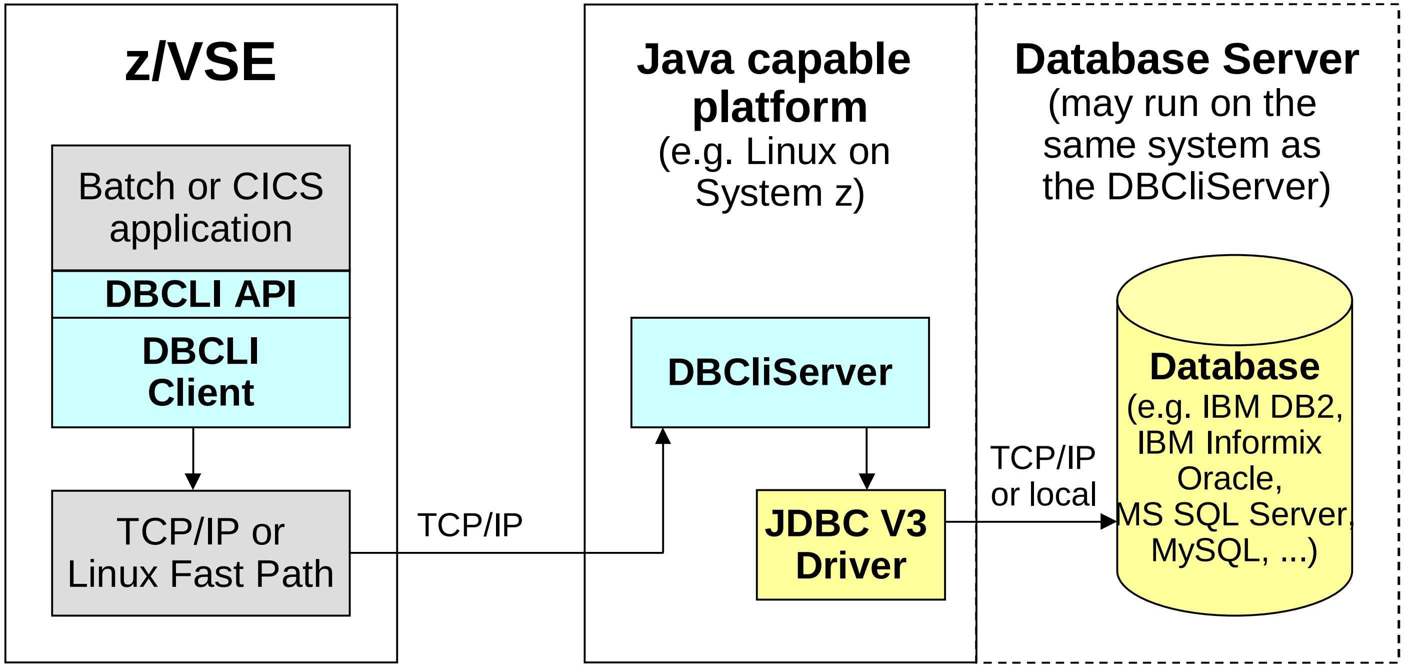
z/VSE V5.1 + PTFs: z/VSE Database Call Level Interface (DBCLI)

§ **Allows z/VSE applications to access a relational database on any suitable database server**

– IBM DB2, IBM Informix, Oracle, MS SQL Server, MySQL, etc.

à The database product must provide a JDBC driver that supports JDBC V3.0 or later

à **Utilize advanced database functions and use SQL statements provided by modern database products**


z/VSE
Batch or CICS application
DBCLI API
DBCLI Client
TCP/IP or Linux Fast Path
TCP/IP
Java capable platform
(e.g. Linux on System z)
DBCliServer
JDBC V3 Driver
TCP/IP or local
Database Server
(may run on the same system as the DBCliServer)
Database
(e.g. IBM DB2, IBM Informix Oracle, MS SQL Server, MySQL, ...)

z/VSE V5.1 + PTFs: z/VSE Database Call Level Interface (DBCLI)

§ **The z/VSE Database Call Level Interface provides a programming interface (API)**

- Call interface for use with COBOL, PL/1, Assembler, C and REXX
- Can be used in Batch as well as in CICS TS applications
- Supports LE enabled as well as non-LE environments (Assembler, REXX)

NEW!

§ **It provides callable functions for**

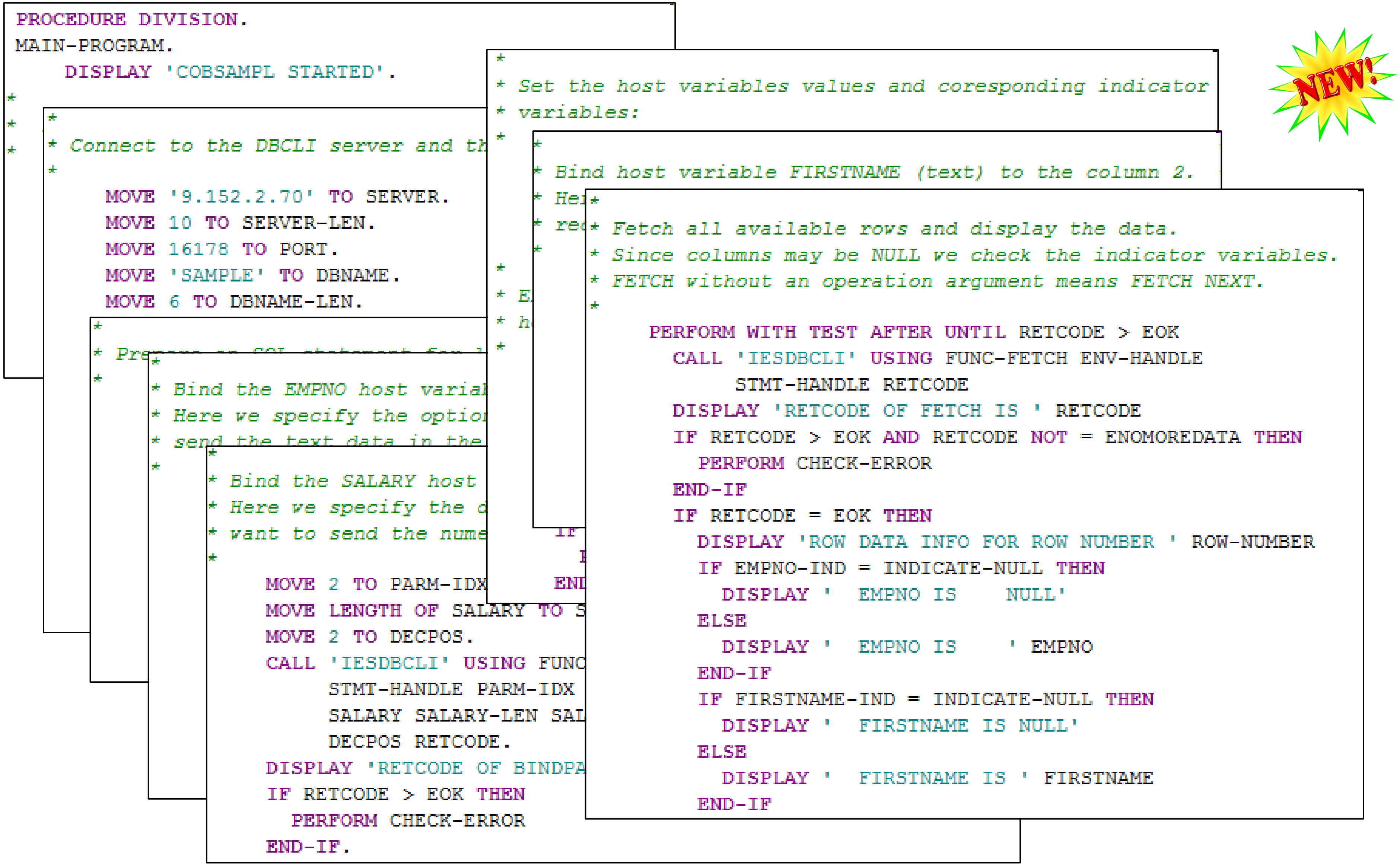
- Initializing and Terminating the API Environment
- Connecting and Disconnecting to/from the DBCLI Server and the Database
- Executing SQL Statements
- Retrieving query results through cursors
- Handling of Logical Units of Work (Transactions)
- Retrieving Database Meta Data

§ **The API is not compatible with DB2/VSE’s EXEC DB2 preprocessor interface**

- But it provides similar functions
- The API is similar to the ODBC programming interface

§ **A COBOL example is provided to show how DBCLI can be used in your applications**

z/VSE V5.1 + PTFs: z/VSE Database Call Level Interface (DBCLI)



```
PROCEDURE DIVISION.
MAIN-PROGRAM.
     DISPLAY 'COBSAMPL STARTED'.
*
*
*
```

```
*
* Connect to the DBCLI server and th
*
     MOVE '9.152.2.70' TO SERVER.
     MOVE 10 TO SERVER-LEN.
     MOVE 16178 TO PORT.
     MOVE 'SAMPLE' TO DBNAME.
     MOVE 6 TO DBNAME-LEN.
```

```
*
* Pre
*
```

```
*
* Bind the EMPNO host varial
* Here we specify the optio
* send the text data in the
*
```

```
*
* Bind the SALARY host
* Here we specify the c
* want to send the nume
*
     MOVE 2 TO PARM-IDX
     MOVE LENGTH OF SALARY TO S
     MOVE 2 TO DECPOS.
     CALL 'IESDBCLI' USING FUNC
          STMT-HANDLE PARM-IDX
          SALARY SALARY-LEN SAL
          DECPOS RETCODE.
     DISPLAY 'RETCODE OF BINDPA
     IF RETCODE > EOK THEN
       PERFORM CHECK-ERROR
     END-IF.
```

```
*
* Set the host variables values and coresponding indicator
* variables:
*
*
* E
* h
*
```

```
*
* Bind host variable FIRSTNAME (text) to the column 2.
* He
* re
*
   IF
     P
   END
```

```
*
* Fetch all available rows and display the data.
* Since columns may be NULL we check the indicator variables.
* FETCH without an operation argument means FETCH NEXT.
*
     PERFORM WITH TEST AFTER UNTIL RETCODE > EOK
       CALL 'IESDBCLI' USING FUNC-FETCH ENV-HANDLE
            STMT-HANDLE RETCODE
       DISPLAY 'RETCODE OF FETCH IS ' RETCODE
       IF RETCODE > EOK AND RETCODE NOT = ENOMOREDATA THEN
         PERFORM CHECK-ERROR
       END-IF
       IF RETCODE = EOK THEN
         DISPLAY 'ROW DATA INFO FOR ROW NUMBER ' ROW-NUMBER
         IF EMPNO-IND = INDICATE-NULL THEN
           DISPLAY '  EMPNO IS    NULL'
         ELSE
           DISPLAY '  EMPNO IS    ' EMPNO
         END-IF
         IF FIRSTNAME-IND = INDICATE-NULL THEN
           DISPLAY '  FIRSTNAME IS NULL'
         ELSE
           DISPLAY '  FIRSTNAME IS ' FIRSTNAME
         END-IF
```

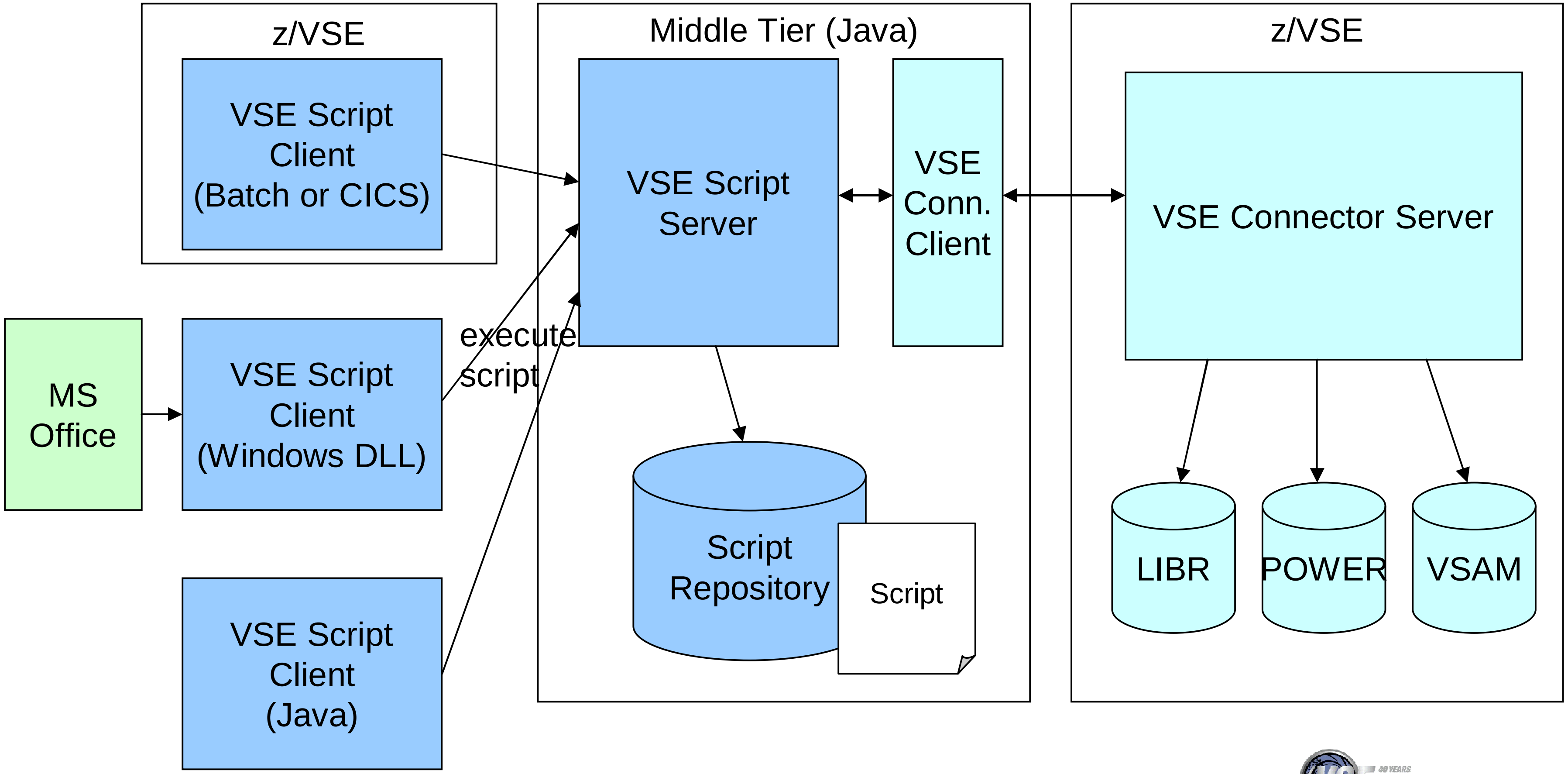
NEW!

Agenda

- **z/VSE V5.1 + PTFs Connector Enhancements**
  - z/VSE Database Call Level Interface
- **z/VSE V5.1 Connector Enhancements**
  - VSE Script Connector: SYSIPT Variables Support
  - VSE Script Connector: New functions
  - VSE Script Connector: Logging of script input and output
  - VSAM Redirector: MapperConfigGUI Enhancements
  - VSE Connector Client & Server: LDAP signon support
  - VSE Connector Client & Server: LIBR DATA=YES
- **New and updated Tools**

z/VSE V5.1: VSE Script Connector Overview

- Part of the z/VSE Connectors since z/VSE V3.1
- Allows remote access to z/VSE resources and data from non-Java platforms



z/VSE V5.1: VSE Script Connector: SYSIPT Variables Support

- The SYSIPT variables support extends the VSE Script BATCH client programs by adding support for symbolic variables
- Customers can assign the variables dynamically in JCL before they invoke the VSE Script batch client
- Usage examples:
  - Feed in data from previous job steps
  - Centralize often used settings, such as IP address
- Example: sets the target host and the script to execute using variables:

```
* $$ JOB JNM=START,DISP=L,CLASS=A
// JOB START
// LIBDEF *,SEARCH=(PRD1.BASE,PRD2.SCEEBASE,PRD2.DBASE)
// SETPARM DESTIP='10.31.0.1'
// SETPARM SCRIPT='testscript.src'
// SETPARM HELLO='HELLO '
// SETPARM WORLD='WORLD'
// EXEC IESSCBAT,PARM='CODEPAGE=CP1047 SHOWERROR=YES SYMBOLS=YES'
&DESTIP:4711
&SCRIPT
Script input …
&HELLO&WORLD.!
/*
/&
* $$ EOJ
```

z/VSE V5.1: VSE Script Connector: SYSIPT Variables Support

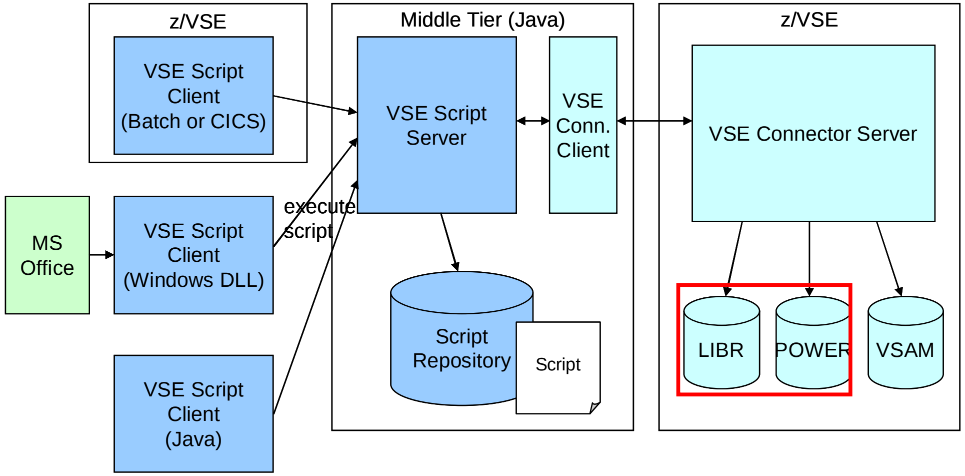
- **The support must be enabled by setting the new PARMS parameter SYMBOLS=YES**
  - The default for this new parameter is SYMBOLS=NO to ensure backward compatibility.
- **The defined format of the variables specified in SYSIPT will be the same format that is described in “System Control Statements” manual, Job Controls 'Symbolic Parameters' chapter, available here:**
  http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/IESSOE51/3.7?SHELF=IESVSE71&DT=20090403085040
  - A symbolic variable starts with '&'
  - When a '&' is needed in the input, write it as '&&'
  - Symbolic variable name contains of characters [0-9][A-Z] (yes, uppercase!) (this is not checked by the library, but the symbol would be not found)
  - Any other character beside [0-9][A-Z] marks the end of the current symbol
  - A '.' after the symbol name marks the end of the symbol without printing a character, for example '&SYMBOL.ALL' where SYMBOL='HELLO' will result in 'HELLOALL' without a '.'
  - The maximum final line length is not limited
- **A symbolic variable can be defined in JCL using**

```
// SETPARM [SYSTEM] VARIABLE='VALUE'
```

z/VSE V5.1: VSE Script Connector: New functions

§ New LIBR functions

- List libraries, sub libraries, members
- Create/delete sub library
- Copy/move member
- Delete/rename member
- Download member (binary and text)
- Upload member (binary and text)
- Put member on POWER queue
- Get member from POWER queue



§ New POWER functions

- Get entry in binary
- Put entry in binary

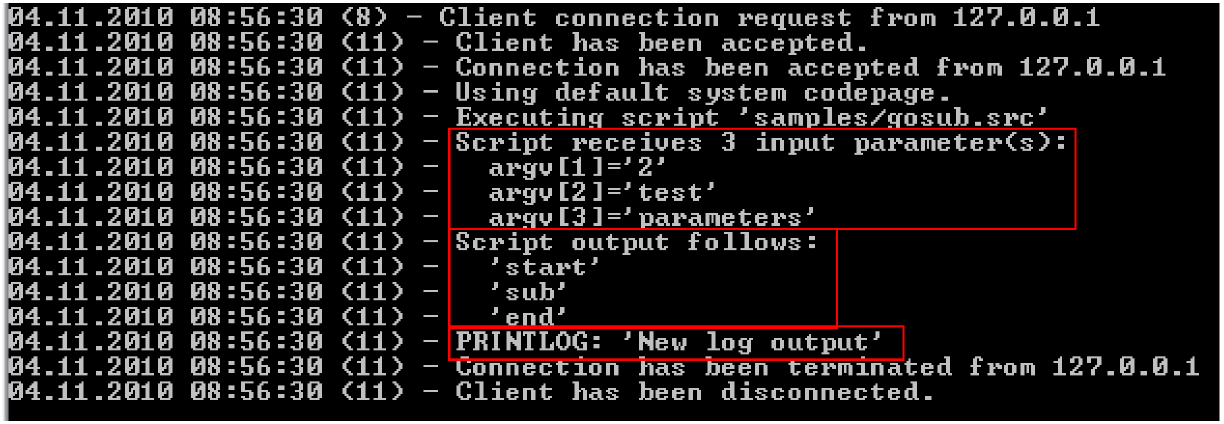
§ Codepage related functions

- Convert a string to binary and vice versa, using a specific codepage
- Write/read a local file in binary

à Support for Binary data and Codepage tools allow to use VSE Script Connector with Double Byte Characters Set (DBCS) and Unicode data

z/VSE V5.1: VSE Script Connector: Logging of script input/output

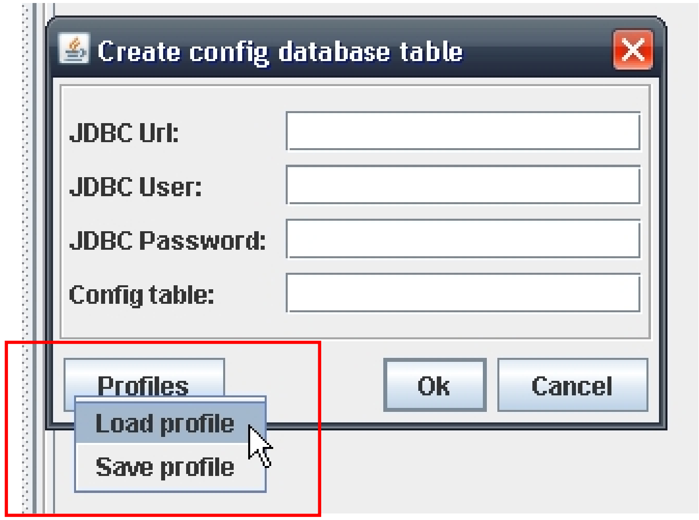
- The VSE Script Server now optionally prints all input and output data into the server log
- This new feature can be used for audit purposes
- The logging can be enabled using the new optional configuration parameters
  - logscriptinputparams
  - logscriptoutput
- Additionally a script function was added to print directly into the server log:
  - PRINTLOG()
- This function can be exploited by user scripts to print audit-relevant messages to the server log



```
04.11.2010 08:56:30 (8) - Client connection request from 127.0.0.1
04.11.2010 08:56:30 (11) - Client has been accepted.
04.11.2010 08:56:30 (11) - Connection has been accepted from 127.0.0.1
04.11.2010 08:56:30 (11) - Using default system codepage.
04.11.2010 08:56:30 (11) - Executing script 'samples/gosub.src'
04.11.2010 08:56:30 (11) - Script receives 3 input parameter(s):
04.11.2010 08:56:30 (11) -   argv[1]='2'
04.11.2010 08:56:30 (11) -   argv[2]='test'
04.11.2010 08:56:30 (11) -   argv[3]='parameters'
04.11.2010 08:56:30 (11) - Script output follows:
04.11.2010 08:56:30 (11) -   'start'
04.11.2010 08:56:30 (11) -   'sub'
04.11.2010 08:56:30 (11) -   'end'
04.11.2010 08:56:30 (11) - PRINTLOG: 'New log output'
04.11.2010 08:56:30 (11) - Connection has been terminated from 127.0.0.1
04.11.2010 08:56:30 (11) - Client has been disconnected.
```

z/VSE V5.1: VSAM Redirector: MapperConfigGUI Enhancements

- MapperConfigGui is part of VSE VSAM Redirectors DBHandler
- The MapperConfigGui now allows to save profiles which contain the information needed to access a database target
- The user don't have to enter them again and again when he switches between different JDBC targets, e.g. a test database system and the production database system
- For security reasons the password is never saved in the profile



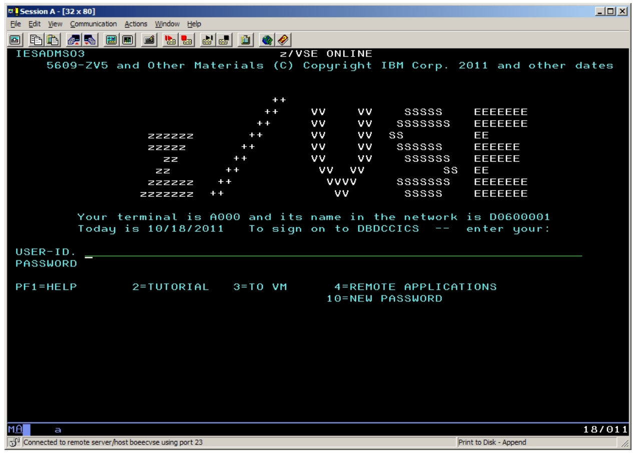
z/VSE V5.1: VSE Connector Client & Server: LDAP signon support

§ z/VSE V4.2 added support for LDAP Signon

- Authenticate against a corporate wide Identity Management System (using LDAP)
- Single Signon/Simplified Signon by using the same user-ID and password
- User-ID & passwords up to 64 characters

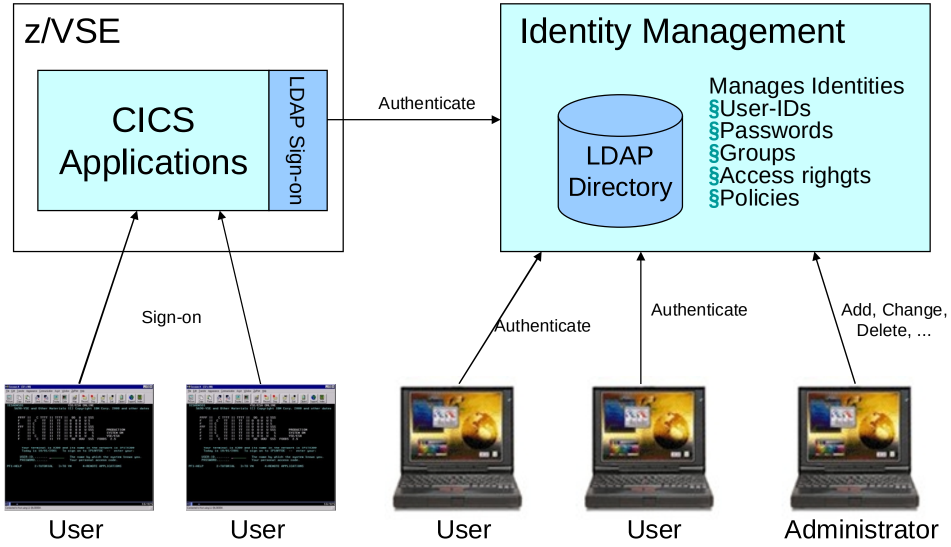
§ z/VSE V5.1 adds LDAP signon support for the VSE Connector Client & Server

- A Java based application can now use the same corporate user-ID and password as for IUI signon

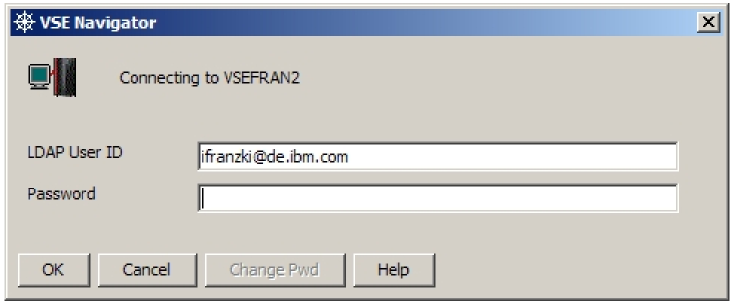


```
 IESADMS03                         z/VSE ONLINE
     5609-ZV5 and Other Materials (C) Copyright IBM Corp. 2011 and other dates

                                  ++
                                 ++    VV    VV    SSSSS    EEEEEEE
                                ++     VV    VV   SSSSSSS   EEEEEEE
                  zzzzzz       ++      VV    VV  SS         EE
                  zzzzz       ++       VV    VV   SSSSSS    EEEEEE
                    zz       ++        VV    VV    SSSSSS   EEEEEE
                   zz       ++          VV  VV          SS  EE
                  zzzzzz   ++            VVVV     SSSSSSS   EEEEEEE
                 zzzzzzz  ++              VV       SSSSS    EEEEEEE

         Your terminal is A000 and its name in the network is D0600001
         Today is 10/18/2011   To sign on to DBDCCICS  --  enter your:

 USER-ID.
 PASSWORD

 PF1=HELP       2=TUTORIAL   3=TO VM       4=REMOTE APPLICATIONS
                                         10=NEW PASSWORD

MA      a                                                                18/011
```

Connected to remote server/host boeecvse using port 23   Print to Disk - Append



Example: VSE Navigator



Connecting to VSEFRAN2

LDAP User ID: ifranzki@de.ibm.com

Password:

z/VSE V5.1: VSE Connector Client & Server: LIBR DATA=YES

- **VSE Connector Client & Server supports access to LIBR members since VSE/ESA 2.5**
  - Download LIBR members
  - Upload LIBR members
- **Also access of .PROC members (procedures) is possible**
- **Procedures may be cataloged with the DATA=YES attribute, if they contain SYSIPT data**

```
// EXEC LIBR
 ACCESS S=lib.sublib
 CATALOG member.type DATA=YES
 ....
 /*
```

- **Prior to z/VSE V5.1, any members created by the VSE Connector Server used DATA=NO**
  - You could damage an procedure that was previously cataloged with DATA=YES
- **Since z/VSE V5.1, the VSE Connector Client & Server support the DATA=YES attribute**
  - You can store a member with DATA=YES
  - Use method `VSELibraryMember.setSYSIPTDataInProcedure(boolean sysiptdata)`
- **Example: VSE Navigator**
  - Double-click on a member to edit it
  - Member automatically retains its DATA=YES attribute

Agenda

§ **z/VSE V5.1 + PTFs Connector Enhancements**

- z/VSE Database Call Level Interface

§ **z/VSE V5.1 Connector Enhancements**

- VSE Script Connector: SYSIPT Variables Support
- VSE Script Connector: New functions
- VSE Script Connector: Logging of script input and output
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- VSE Connector Client & Server: LDAP signon support
- VSE Connector Client & Server: LIBR DATA=YES

§ **New and updated Tools**

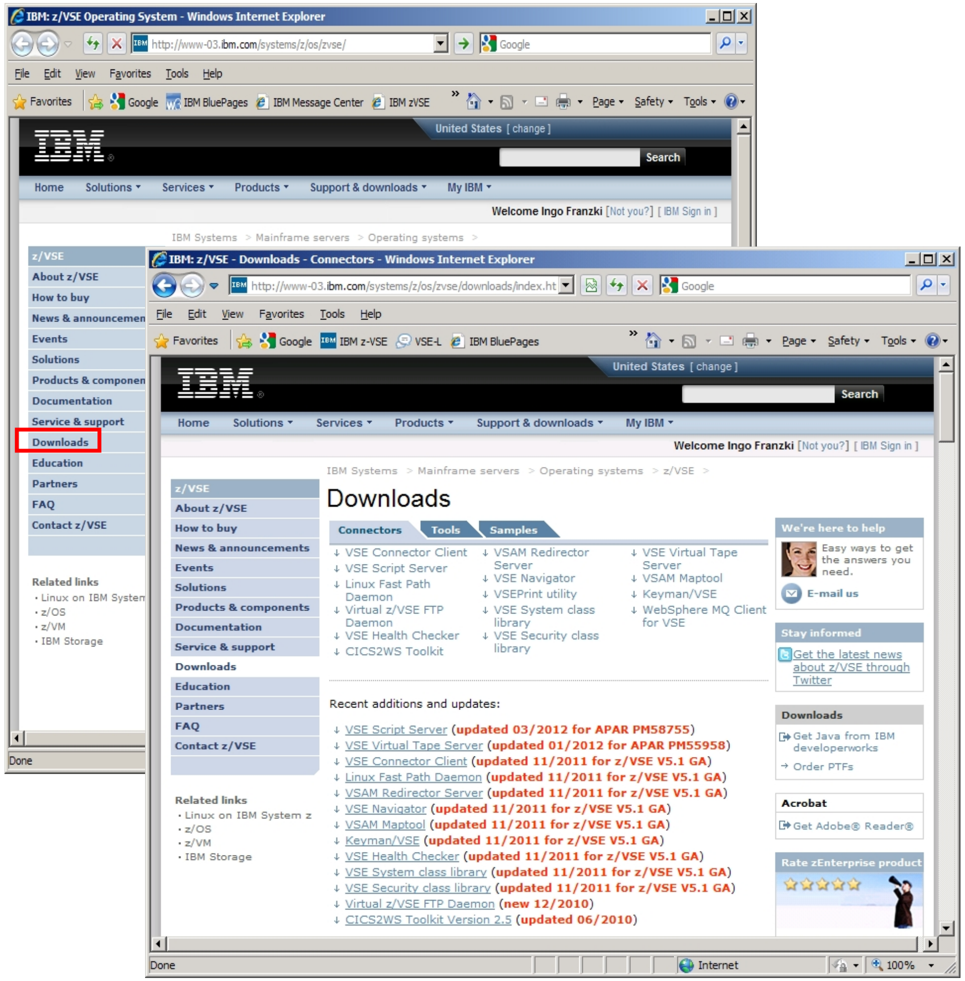
z/VSE Tools - Overview

- § IBM offers are a huge set of tools available on the z/VSE Homepage

  http://ibm.com/zvse/downloads

- § Most tools are 'as is', at no additional charge.

- § Connector components (part of z/VSE and officially supported) are also available here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Downloads

Connectors | Tools | Samples

- VSE Connector Client
- VSE Script Server
- Linux Fast Path Daemon
- Virtual z/VSE FTP Daemon
- VSE Health Checker
- CICS2WS Toolkit
- VSAM Redirector Server
- VSE Navigator
- VSEPrint utility
- VSE System class library
- VSE Security class library
- VSE Virtual Tape Server
- VSAM Maptool
- Keyman/VSE
- WebSphere MQ Client for VSE

Recent additions and updates:

- VSE Script Server (updated 03/2012 for APAR PM58755)
- VSE Virtual Tape Server (updated 01/2012 for APAR PM55958)
- VSE Connector Client (updated 11/2011 for z/VSE V5.1 GA)
- Linux Fast Path Daemon (updated 11/2011 for z/VSE V5.1 GA)
- VSAM Redirector Server (updated 11/2011 for z/VSE V5.1 GA)
- VSE Navigator (updated 11/2011 for z/VSE V5.1 GA)
- VSAM Maptool (updated 11/2011 for z/VSE V5.1 GA)
- Keyman/VSE (updated 11/2011 for z/VSE V5.1 GA)
- VSE Health Checker (updated 11/2011 for z/VSE V5.1 GA)
- VSE System class library (updated 11/2011 for z/VSE V5.1 GA)
- VSE Security class library (updated 11/2011 for z/VSE V5.1 GA)
- Virtual z/VSE FTP Daemon (new 12/2010)
- CICS2WS Toolkit Version 2.5 (updated 06/2010)

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Virtual z/VSE FTP Daemon

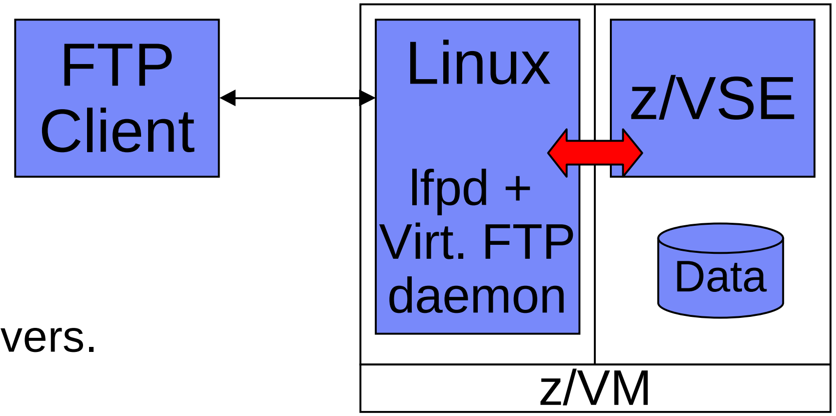
More details:
VS04 – z/VSE:
Hints & Tipps
Tuesday 11:15

§ **The Virtual z/VSE FTP Daemon can be installed on any Java-enabled platform and emulates an FTP server**

– The actual access to z/VSE resources is done using the VSE Connector Server.

§ **Download:** http://ibm.com/zvse/download

à **Fits perfectly to Linux Fast Path**



§ **The Virtual z/VSE FTP Daemon:**

– Handles all incoming FTP clients.

– Connects to one or multiple VSE Connector Servers.

– Is responsible for connection-handling.

– Is responsible for data translation (ASCII-EBCDIC).

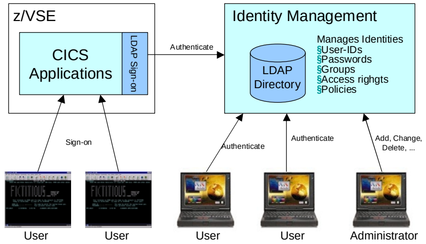
– Is IPv6 ready

- You can connect FTP clients using IPv6, the Virtual z/VSE FTP Daemon connects to the VSE Connector Server using IPv4.

– Supports SSL

- both for the FTP connection (between FTP client and Virtual z/VSE FTP Daemon, using implicit SSL (FTPS)),
- and for the connection to the VSE Connector Server (between Virtual z/VSE FTP Daemon and z/VSE host).

LDAP Query Callable Module



- **The z/VSE LDAP Query Callable Module allows you to programmatically query an LDAP server from within your programs to retrieve attributes of an LDAP user**
  - You can either call the z/VSE LDAP Query Callable Module directly (i.e. via an COBOL external call), or via EXEC CICS LINK when running under CICS
- **The z/VSE LDAP Query Callable Module can be used on z/VSE 4.2 or later**
  - Extends the z/VSE LDAP Sign-on Support

```
01 LDGA-AREA.
    03 AREA-LENGTH    PIC S9(9) BINARY. <-- In: Length of the Area in Bytes
    03 USER-ID        PIC X(64).        <-- In: LDAP user ID to get attributes for
    03 SEARCH-FILTER  PIC X(128).       <-- In: Additional Search filter or blanks
    03 RET-CODE       PIC S9(9) BINARY. <-- Out: Return code
    03 LDAP-CODE      PIC S9(9) BINARY. <-- Out: LDAP Return code
    03 ATTR-COUNT     PIC S9(4) BINARY. <-- In: Number of attr entries following
    03 ATTR-ENTRY OCCURS x TIMES.
      05 ATTR-NAME    PIC X(64).        <-- In: Name of Attribute to get
      05 VALUE-LENGTH PIC S9(4) BINARY. <-- In: Length of ATTR-VALUE
      05 VALUE-COUNT  PIC S9(4) BINARY. <-- In/out: Number of Values following
      05 VALUE-ENTRY OCCURS y TIMES.
        07 ATTR-VALUE PIC X(n).         <-- Out: Attribue Values(s).
                                                 Length (n) must match the VALUE-LENGTH
01 IESLDGAB PIC X(8) VALUE 'IESLDGAB‘
  …
  Fill the parameter area here
  …
  CALL IESLDGAB USING BY REFERENCE LDGA-AREA.
```

Questions ?

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