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Session Title: **VSAM Redirector between z/VSE and z/OS**

Session ID: **zEO05**

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Agenda

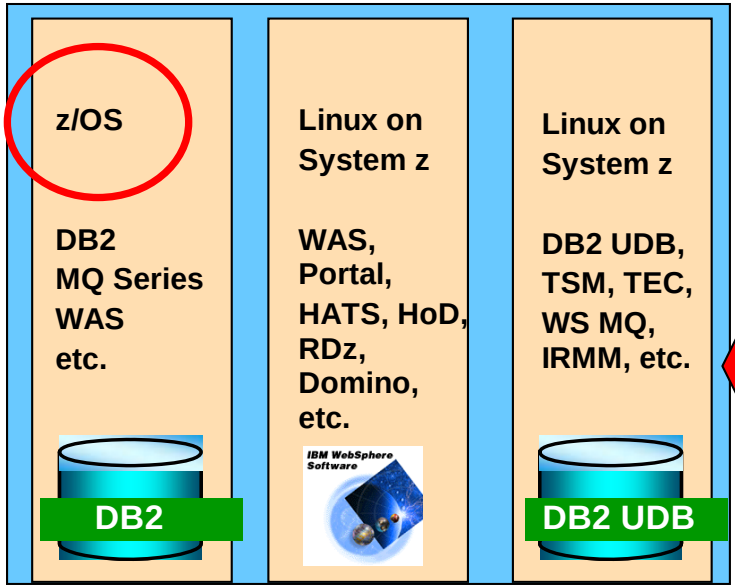
- What is VSAM Redirector?
- NEW Redirector with z/OS
- Installation of the Redirector Servers on z/OS
- Enabled redirection to DB2 on z/OS
- Examples

z/VSE's PIE Strategy on System z

Protect existing VSE investments

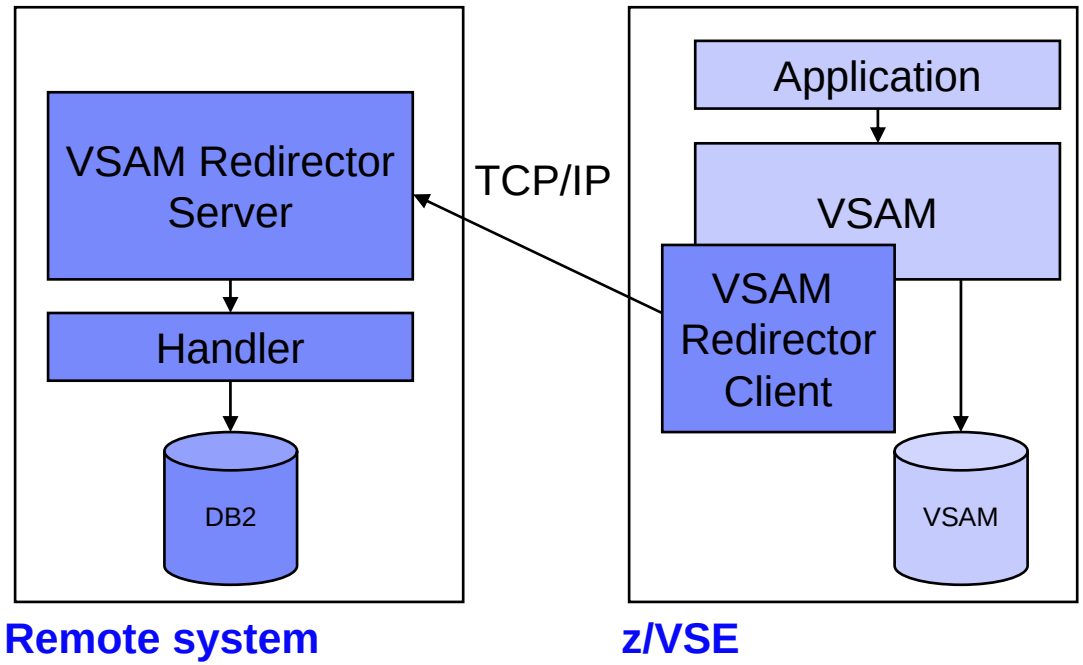
Integrate using middleware and VSE connectors

Extend with Linux on IBM System z technology & solutions



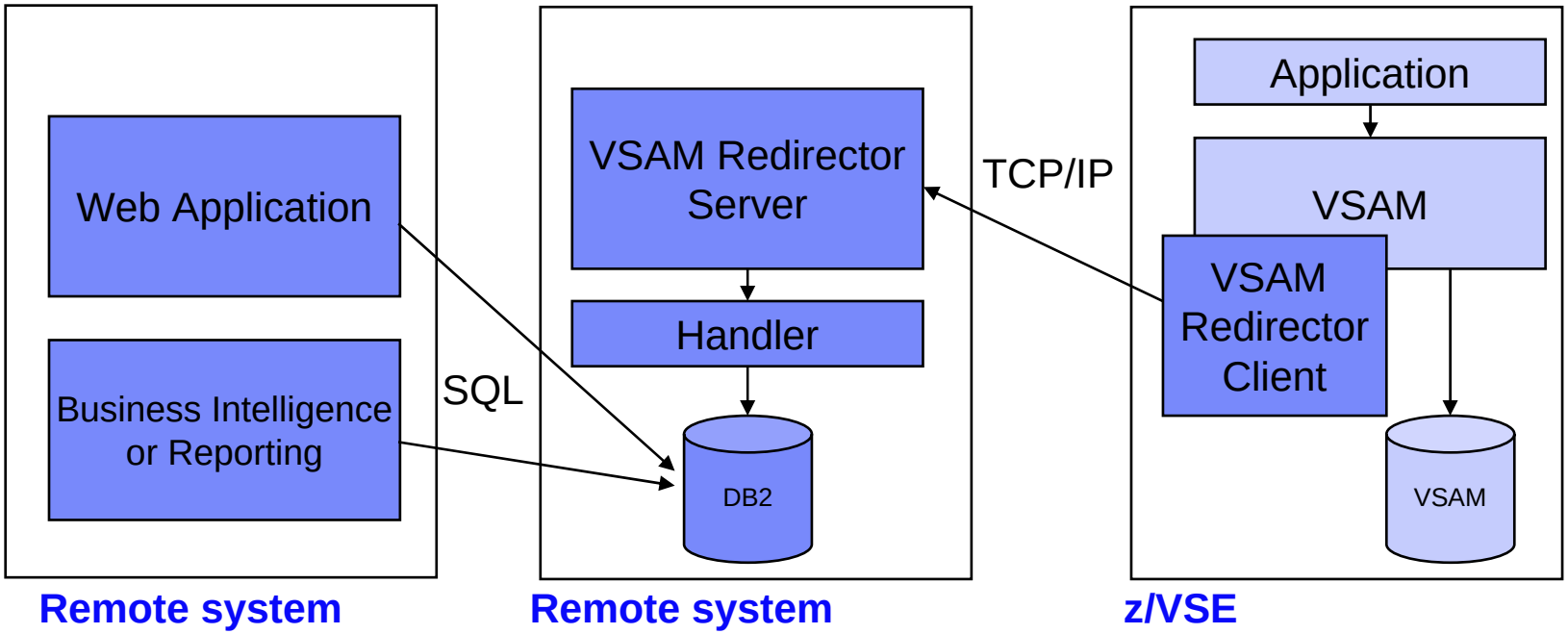
VSAM Redirector

- **Basic functionality of REDIRECTOR:**
  - Redirect VSAM accesses under z/VSE to a Java Server on your workstation.
  - VSAM Data can be moved to or synchronized with a database on a remote system
  - Transparent to user application (no need to change application)



VSAM Redirector

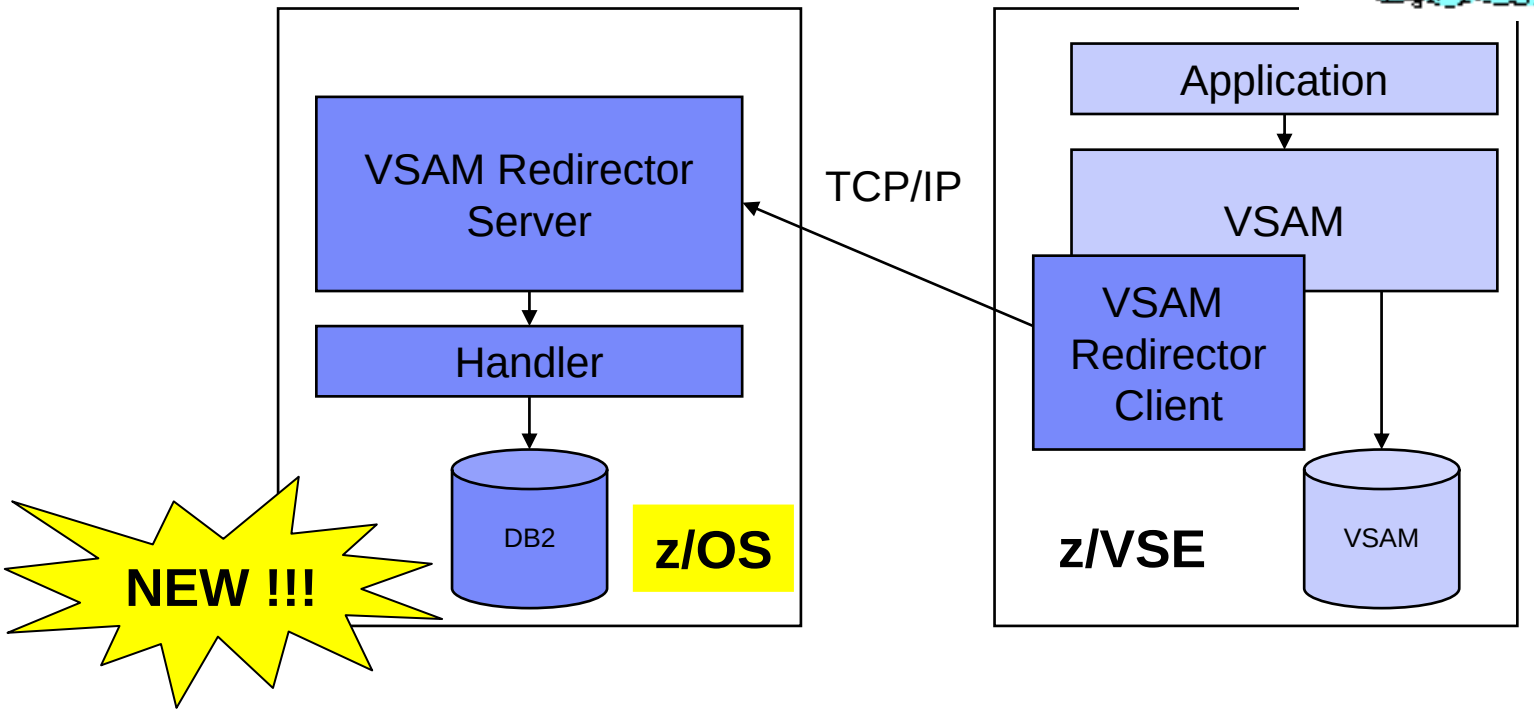
- **Benefits of using REDIRECTOR:**
  - Many tools available to work with relational data in databases
    - Business Intelligence (e.g. COGNOS), Reporting, Web frontends, SAP, ...
  - VSAM data is available to new applications outside of z/VSE
  - DB2 (or other databases) run on many different platforms



VSAM REDIRECTOR enhancements

What is NEW:

- **Installation of the VSAM Redirector Server on z/OS**
- **Redirect VSAM-File-Access on z/VSE to DB2 under z/OS**

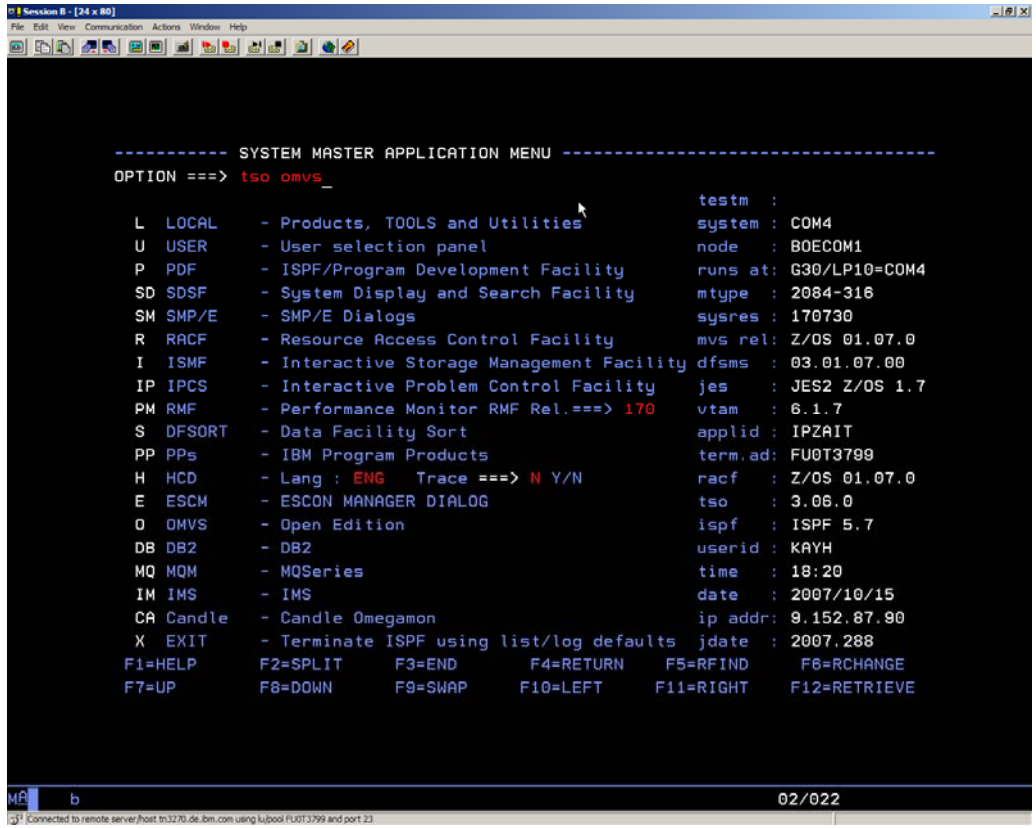


Installation of the Redirector Servers on z/OS

User should do the following steps:

STEP1 Log on to z/OS

STEP2 **Open Shell under z/OS**



Installation of the Redirector Servers on z/OS

STEP3 Provide Java Environment

This includes:

- Setting the classpath
- Setting the path
- Integrate JDBC driver (`db2jcc.jar`)

You can set the classpath in the z/OS Shell using:

`„export CLASSPATH=$CLASSPATH:/SYSTEM/XXX/XXX/db2jcc.jar“`

Alternatively all the settings could be saved in a file (*environment.sh for example)*:

Shell: ===> . environment.sh*

***** Please notice that there is a dot followed by a blank before the filename to make the file executable.

environment.sh sample

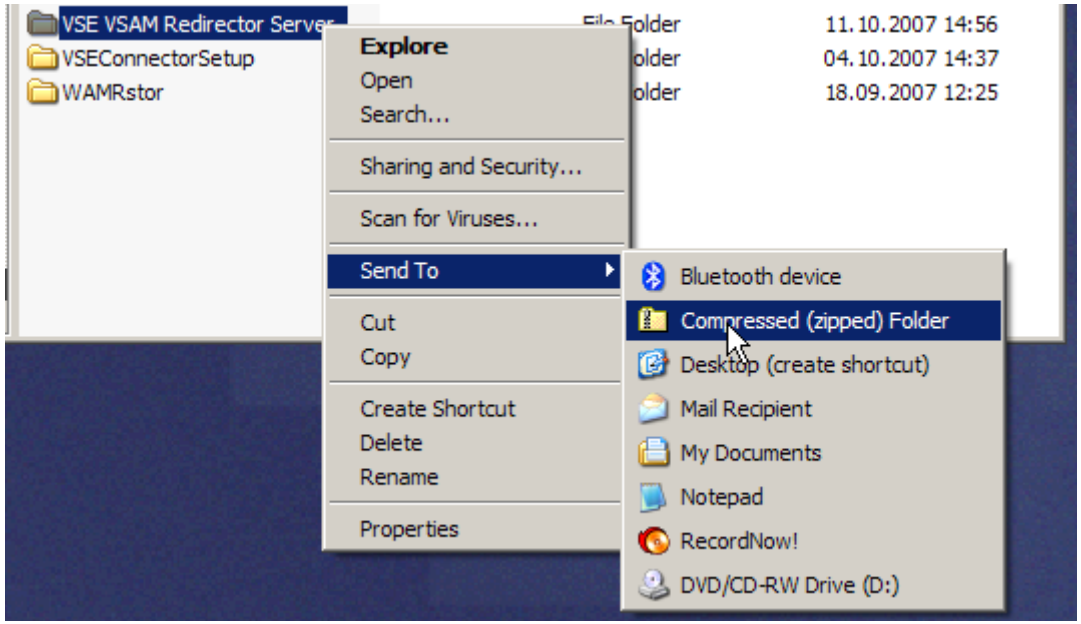
```
echo ----------------------------------------
echo This sets the DB2 Environment on z/OS
echo
cd /
#
# your directory for the redirector files
#
export STEPLIB=$STEPLIB:SYS1.DSN.D843.SDSNEXIT
export STEPLIB=$STEPLIB:SYS1.DSN.V810.SDSNLOAD
export STEPLIB=$STEPLIB:SYS1.DSN.V810.SDSNLOD2
#
echo Finished setting STEPLIB
#
export JCC_HOME="/SYSTEM/local/db2/db2v8/jcc"
export CLASSPATH=${JCC_HOME}/classes/sqlj.zip:$CLASSPATH
export CLASSPATH=${JCC_HOME}/classes/db2jcc_javax.jar:$CLASSPATH
export CLASSPATH=${JCC_HOME}/classes/db2jcc_license_cisuz.jar:$CLASSPATH
export CLASSPATH=${JCC_HOME}/classes/db2jcc.jar:$CLASSPATH
#
echo Finished setting classpath and integrating JDBC driver
#
export LD_LIBRARY_PATH=${JCC_HOME}/lib:$LD_LIBRARY_PATH
export LIBPATH=${JCC_HOME}/lib:$LIBPATH
export PATH=${JCC_HOME}/bin:$PATH
export PATH=/usr/lpp/java/a40/J1.4/bin:$PATH
#
echo Finished setting Library and Application path.
echo
echo Done with settings. Ending.
echo
```

Installation of the Redirector Servers on z/OS

STEP4 **Create Directory for Redirector Installation**

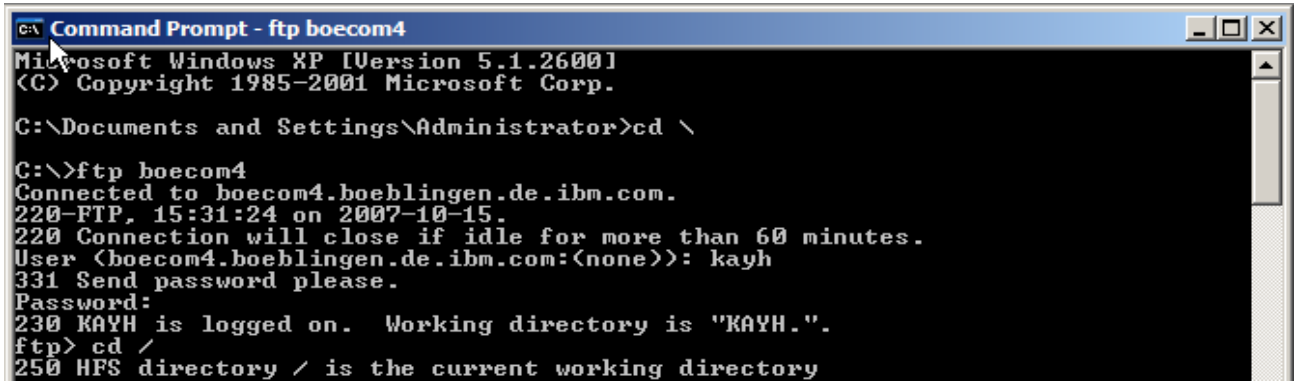
Shell: ===> mkdir redir *(redir – examaple directory name)*

STEP5 **Create Zip File from Redirector Installation under Windows**



Installation of the Redirector Servers on z/OS

STEP6 Ship the Zip File to z/OS via ftp



Please note:

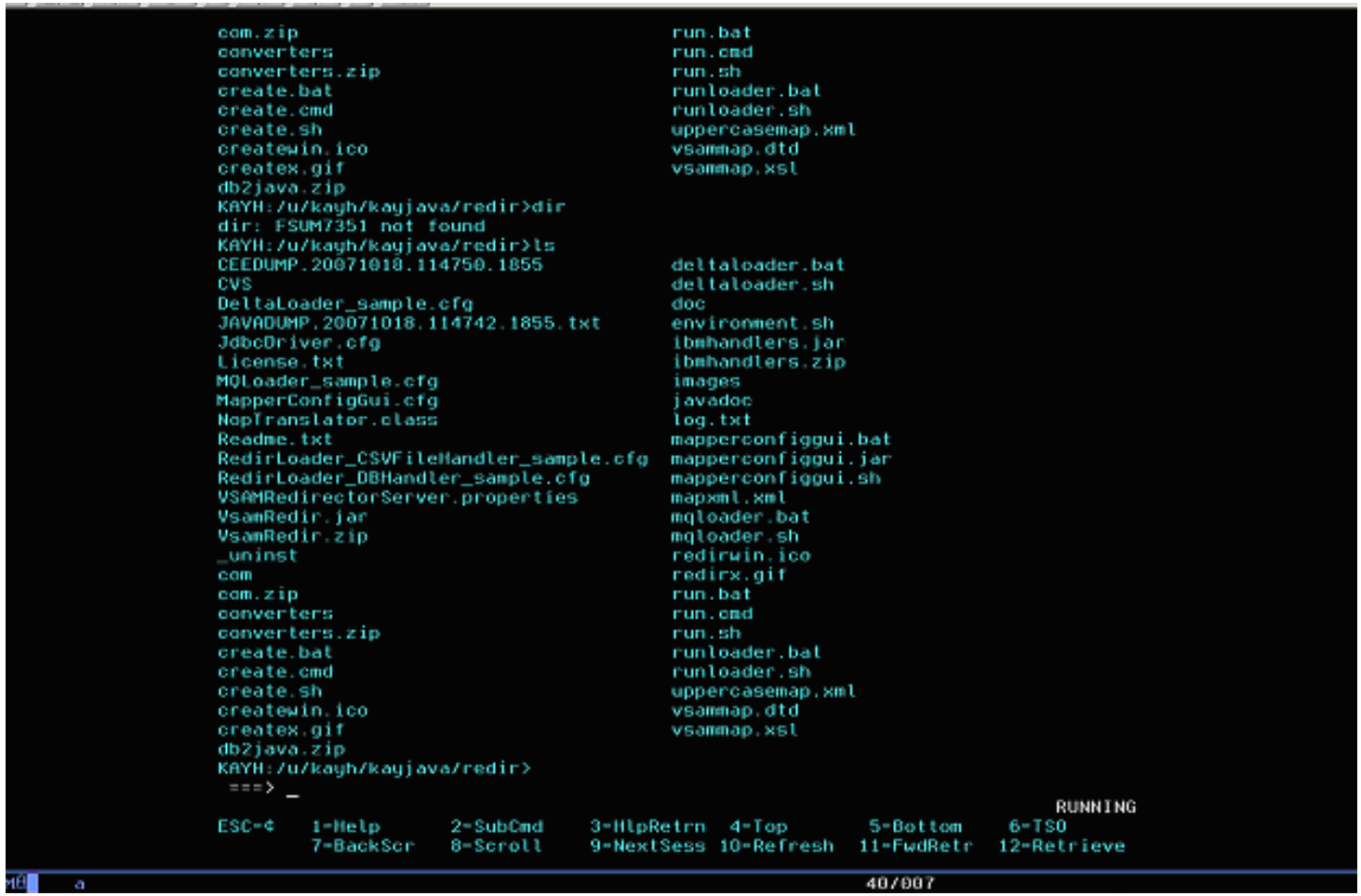
After having established an ftp connection to an account on z/OS please make sure to use the binary mode to ship the file. Otherwise, ASCII files will be converted to EBCDIC.
Enter the directory '/XXX/XXX/XXX/redir' using the 'cd' command.
After that, put the ZIPFile to the z/OS system.

ftp> bin → switch to Unix System Services → ftp> put "ZIP-Filename"
cd /u/yourhomedir

Installation of the Redirector Servers on z/OS

STEP7 Unzip ZIP-File

Shell: ===> unzip "ZIP-Filename"



Installation of the Redirector Servers on z/OS

STEP8 **Replace *.sh- and *.cfg -Files**

This can be accomblished by either FTP

- use ftp – in ASCII mode.
- "prompt off" -- to suppress repeated prompting for file upload confirmation

ftp> ASCII → ftp> prompt off → mput *.sh

ftp> ASCII → ftp> prompt off → mput *.cfg

OR convert to IBM-1047 format from ISO8859-1 format

iconv -t IBM-1047 -f ISO8859-1 runloader.sh > runloader.sh1

STEP9 **Change Access Rights for *.sh-Files to make them executable**

Shell: ===> chmod u+x *.sh

Enabled redirection to DB2 on z/OS

Mapping Information should be provided for the Redirector Server

In order to make the redirection work, the Redirector Server needs an XML map containing the information of where in your records which data is located.

This kind of map can be produced using ,for example the Maptool.

The XML map and its corresponding DTD have to be uploaded via ftp.

For the former ASCII mode has to be used.
The latter needs binary mode being turned on.

Mapname: **MapClus1**
Catalog: **CATNAME**
Cluster: **CLUSNAME**
System: **VSEXXX**

Fieldname	Type	Offset	Length
ALTKEY	STRING	0	4
KEY	STRING	4	8
DATA	STRING	12	28

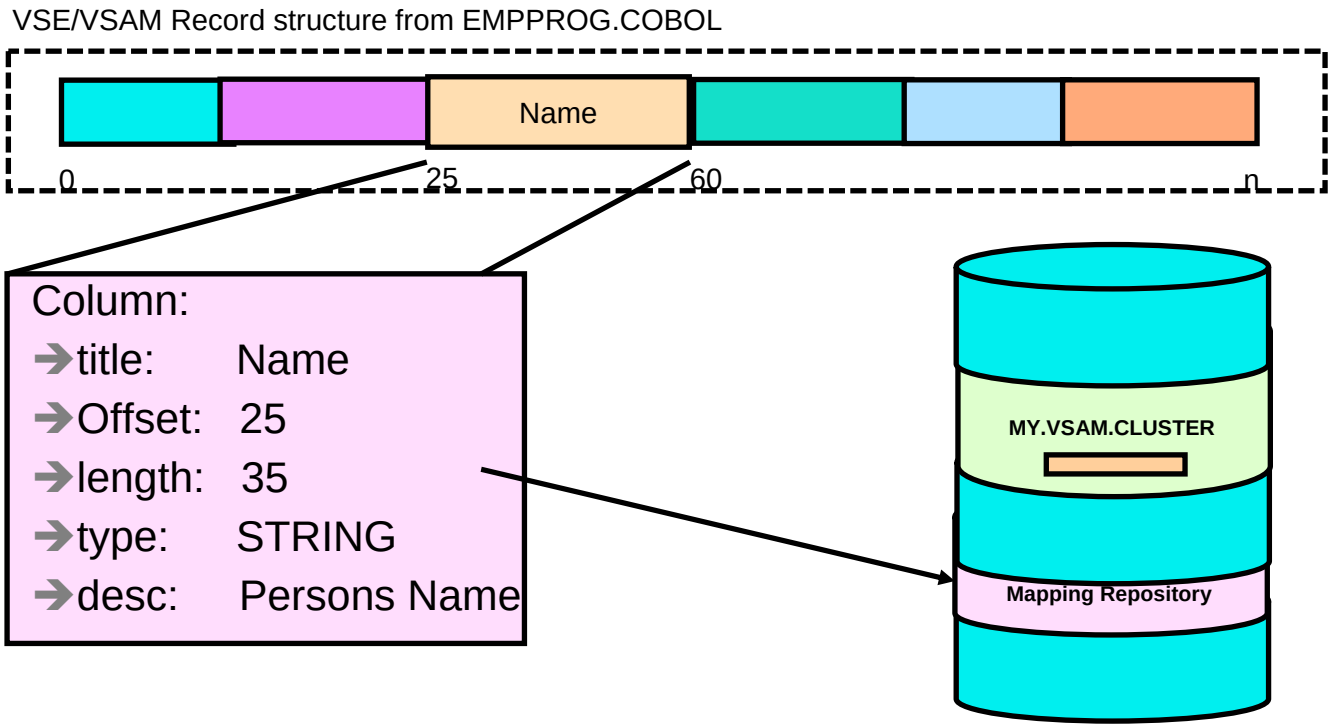
ftp> ASCII → ftp> mput „XMLMapName“ → ftp> mput „DTDFilename“

VSAM Data mapping

- VSAM does not know the structure of a record
- VSAM only knows
  - the length of a record
  - the position and length of the key (if indexed)
- User applications typically use a COBOL or PL/1 Copybook to describe the fields of a record:

```
03 FLIGHTS-RECORD.
     05 FLIGHT-NUMBER      PIC 9(8)  COMP.
     05 START              PIC X(20).
     05 DESTINATION        PIC X(20).
     05 DEPARTURE          PIC X(5).
     05 ARRIVAL            PIC X(5).
     05 SEATS              PIC 9(8)  COMP.
     05 RESERVED           PIC 9999.
     05 PRICE              PIC 9(6)  COMP-3.
     05 AIRLINE            PIC X(20).
```

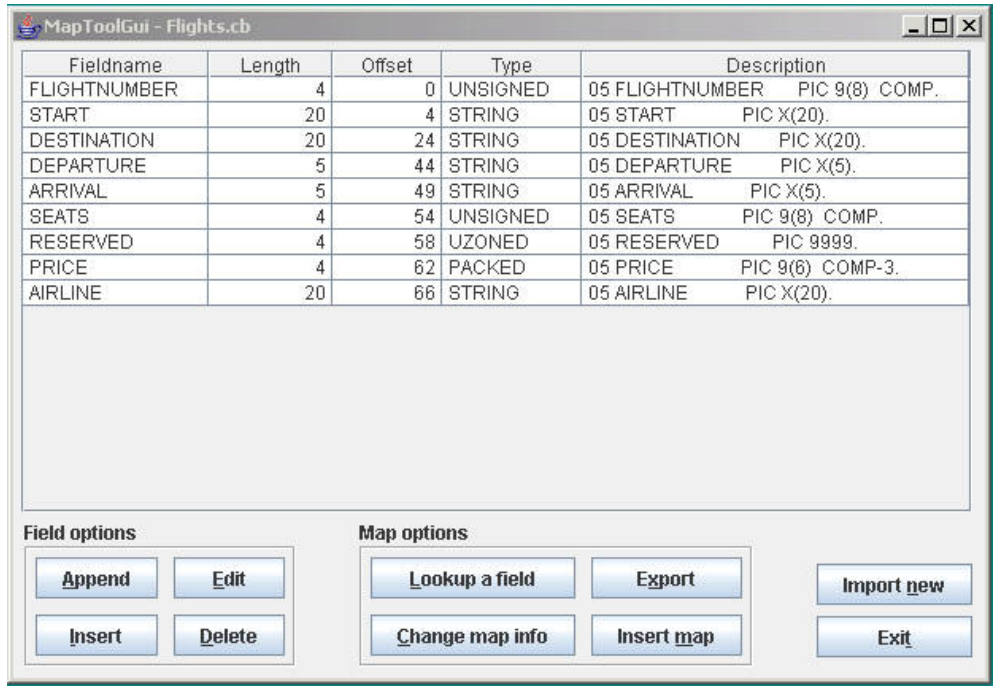
VSAM Data mapping



- VSAM Mapping repository stored in VSAM Cluster
  VSE.VSAM.RECORD.MAPPING.DEFS (IESMAPD)
- This is just meta-data, no VSAM data itself is modified

VSAM Data mapping

- Define the mapping
  - Use IDCAMS RECMAP function
  - Use Java based Connector
  - Use VSE Navigator
  - Use MapTool
- Export the XML file needed to send to z/OS

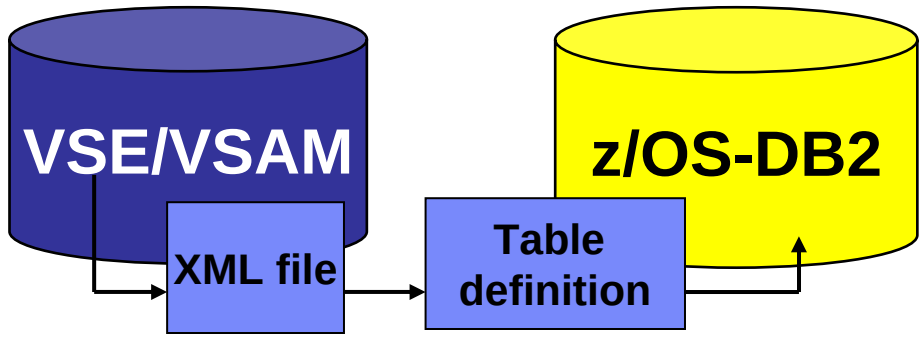


Enabled redirection to DB2 on z/OS

Run create.sh

First, start the program in the z/OS shell. Then follow its instructions.

Shell: ===> create.sh



The following information is required:

- the filename of the XML map
- the JDBC URL – for example *jdbc:db2:SAMPLE*

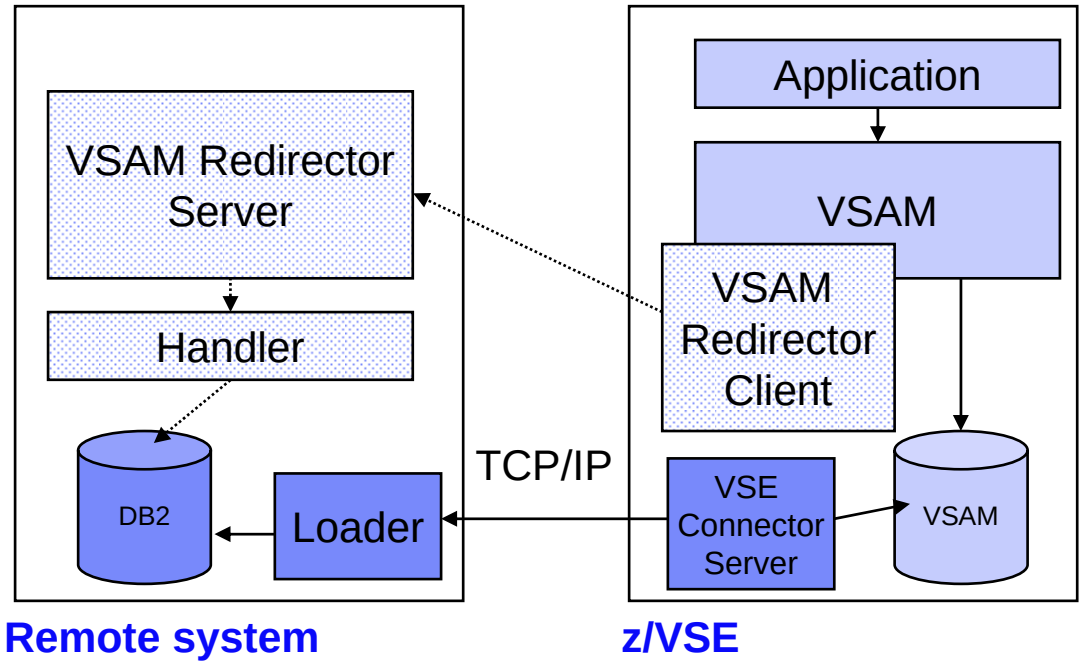
Notes:

Please make sure the name for the table that will contain the data and the name for the table containing the mapping information are uppercase.

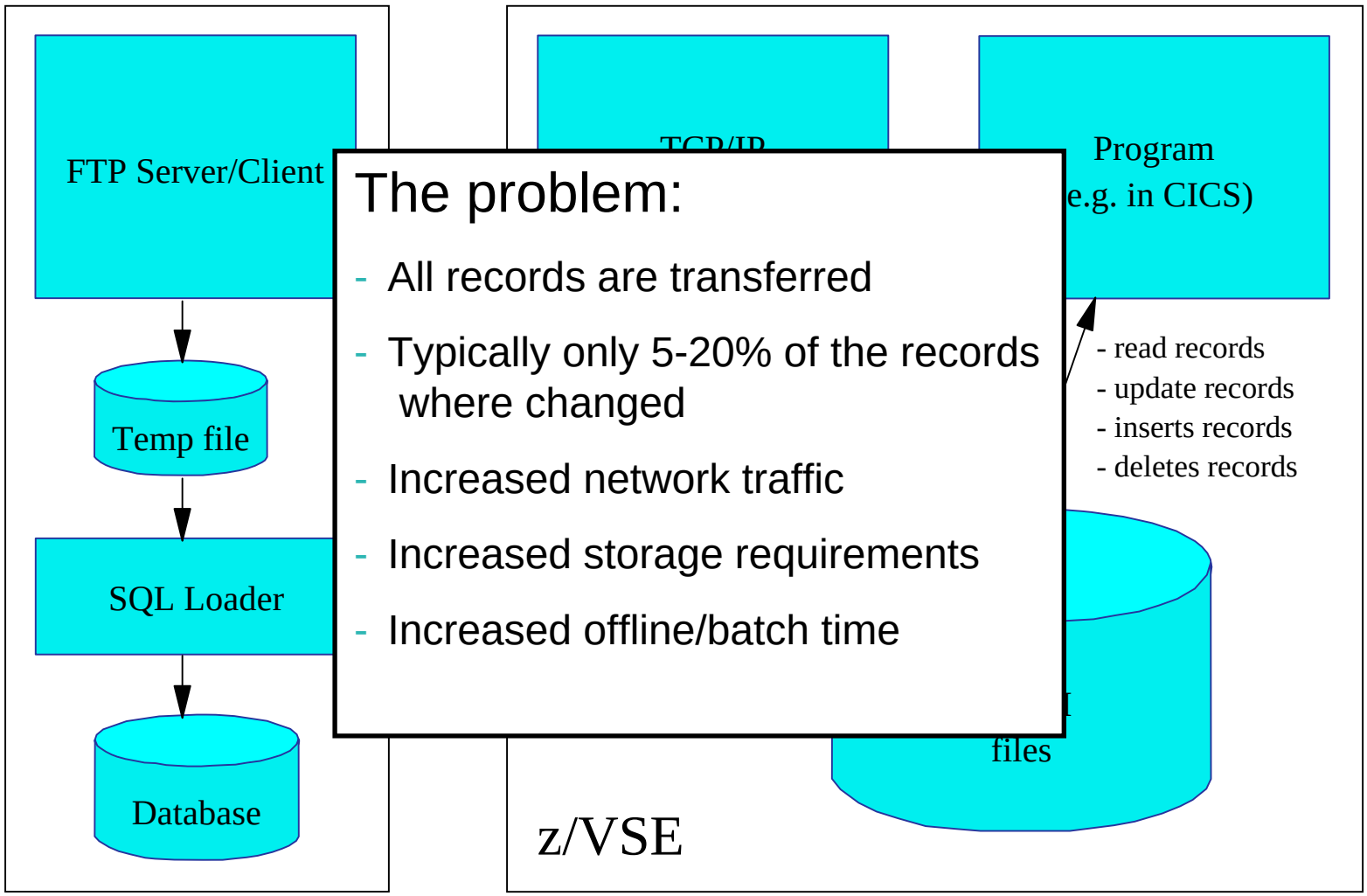
Also double check with your DB2 after completion that the table definition for both tables is complete.

VSAM Redirector – Other features

- **LOADERs**
  - For intitial load of VSAM data into DB2
  - For re-synchronisation of the data after disaster
  - For nightly batch loads



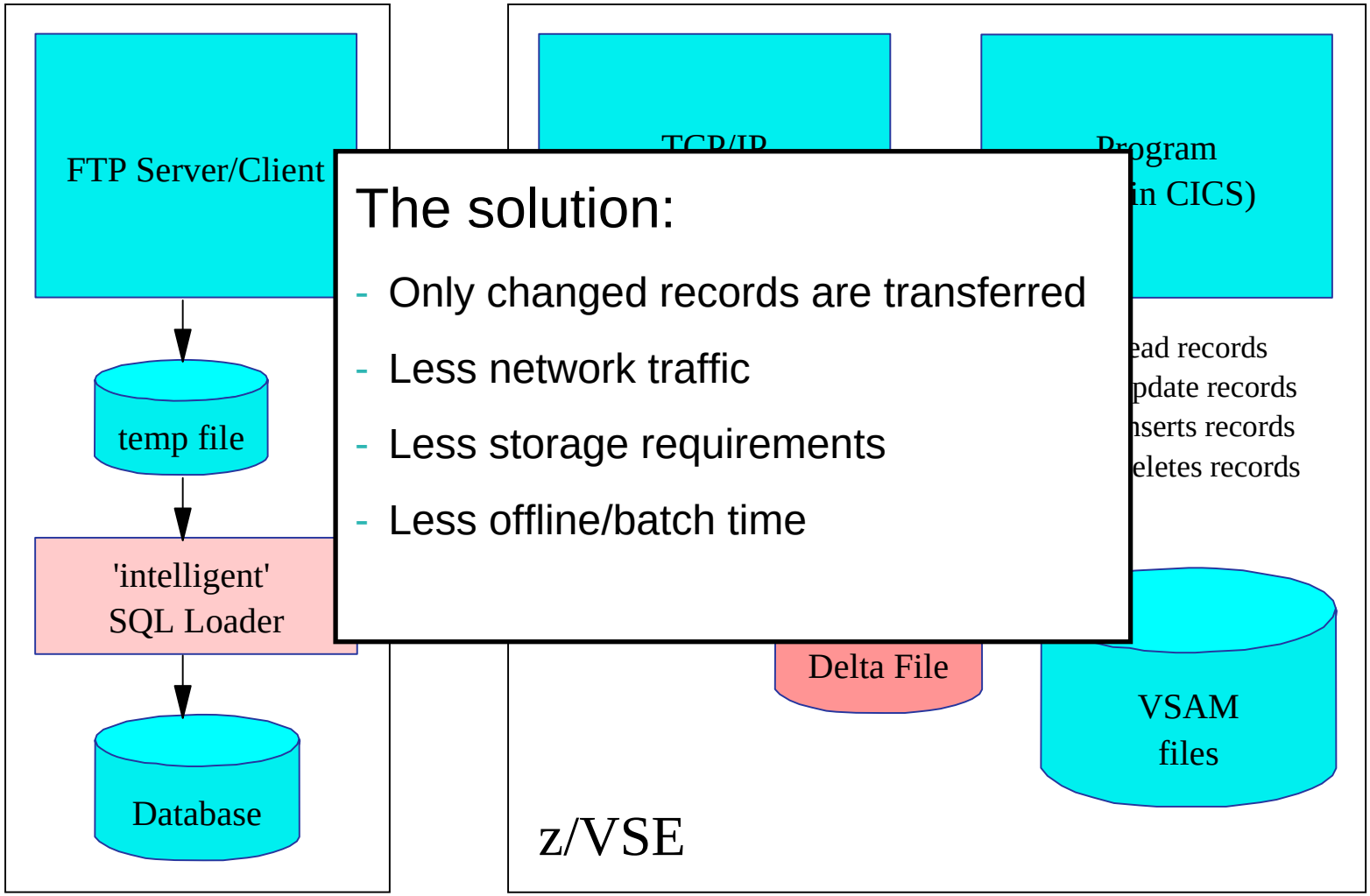
VSAM Capture Exit - Motivation - situation today



The problem:

- All records are transferred
- Typically only 5-20% of the records where changed
- Increased network traffic
- Increased storage requirements
- Increased offline/batch time

VSAM Capture Exit - Motivation – better solution

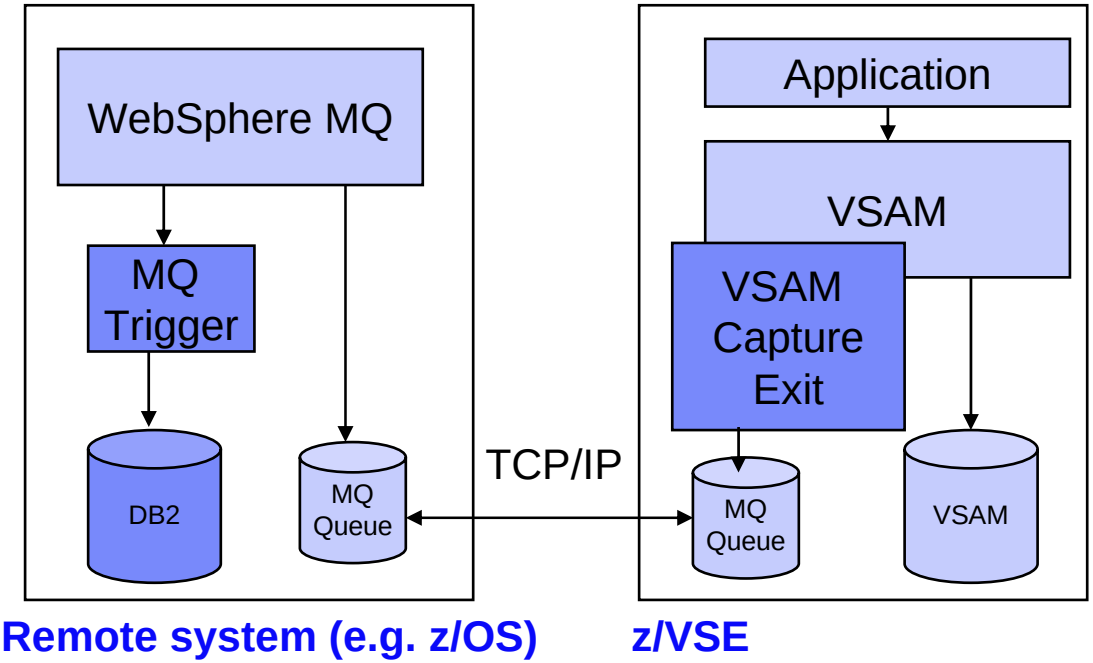


The solution:

- Only changed records are transferred
- Less network traffic
- Less storage requirements
- Less offline/batch time

VSAM Redirector – Capture Exit

- Captures all changes to a VSAM file (UPDATE, INSERT, DELETE)
- Creates delta records with header + original data
  - Stored in second VSAM file (delta file)
  - Or creates MQ Series message
- Delta record header contains information about when and by whom the record was changed, and which request
- Allows customers to download the delta file and apply it to a database



Outlook

- **YOUR Ideas**
- **YOUR Requirements**

Redirector between z/VSE and z/OS

QUESTIONS ?

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