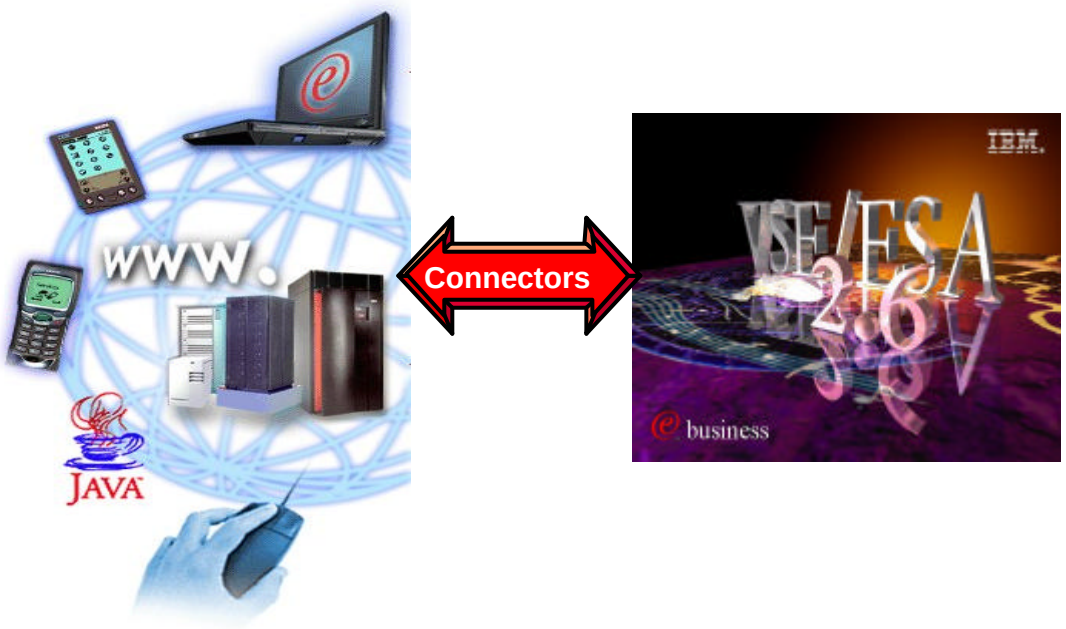
VSE/ESA
e-business Connectors
Lab

Setup of
VSAM Redirector

z/VM, VSE, and Linux on WAVV Conference
Winston-Salem, NC - April 25-29,2003



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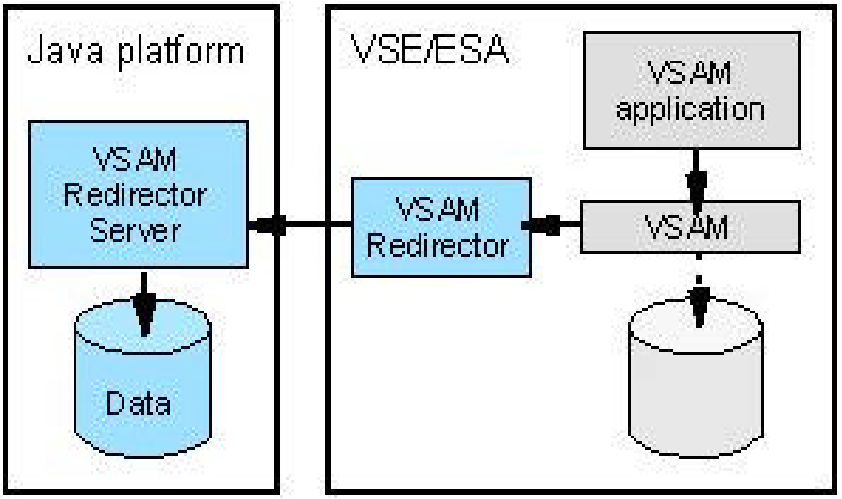
VSE/ESA 2.6/2.7
VSAM Redirector

The VSAM Redirector is a new VSE/ESA connector, introduced with VSE/ESA 2.6. The VSAM Redirector allows you to redirect all accesses to a certain VSAM file into any other file system or database on any other (Java-enabled) platform. Here, VSE/ESA is the client, while the server part runs on any other Java-enabled platform.



For example you could use the VSAM Redirector to migrate a VSAM file to a DB2 database running on a Linux for S/390 or zSeries. By using the VSAM Redirector your existing VSAM programs doesn't require any revisions.

The VSAM Redirector makes use of a so called VSAM Data Access Exit (VDA). This exit intercepts all VSAM requests. The exit gets control at OPEN, CLOSE, and for all data requests (GET, PUT, ...).

A configuration table is used to define which VSAM files are being "redirected". The VSAM Redirector Client forwards all requests against a redirected file to the VSAM Redirector Server which then handles the request.

The VSAM Redirector Server is a Java application. It can run on any Java enabled platform.

Steps for installation on a workstation

STEP1:

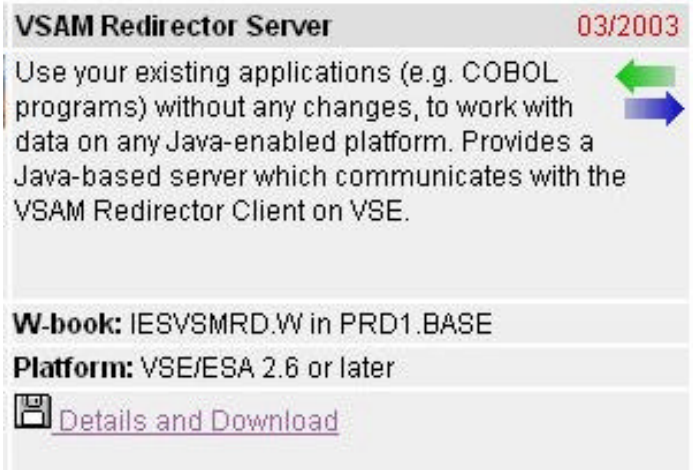
Open the VSE Homepage with a web browser:

http://www-1.ibm.com/servers/eserver/zseries/os/vse/

Click on "Service and Support" on the left side
and then on "e-business connectors and utilities".

The page you see contains the VSAM Redirector Server and some tools that can be downloaded for free.

Navigate to the **VSAM Redirector Server** which represents the remote component of the VSAM Redirector.



Click on:
Details and Download

The page explains the most important functions of the VSAM Redirector Server, which is the Java part of the VSAM Redirector.

Steps for installation on a workstation (2)

STEP2:

To install the VSAM Redirector a Java Virtual Machine must be installed on your PC.

- To just run Java programs, the JRE 1.3.x or later is needed (Java Runtime Environment),
- to develop/compile Java programs, JDK 1.3.x or later is needed (Java Developer Kit, which includes the JRE).

To verify if a Java Virtual Machine is installed,
open a command prompt (DOS Window) and hit command:

java -version

You should see something like:

Java version "1.3.1"
Java(TM) 2 Runtime Environment, Standard Edition

If the messages above are shown go to *STEP4*.

STEP3:

If following message is shown:
'Java' is not recognized as an internal or external command, operable program or batch file.

- > your system has no Java virtual machine (Runtime Environment) installed

To install a Java Virtual machine on the PC do:
On the same HTML page (*Service and Support -> VSE e-business Connectors*):
VSAM Redirector Server -> Details and Download
in section: **Installation** you will find a link were you can download the Java Developer Kit from IBM.
http://www.ibm.com/java/jdk/download/index.html
or you can download a SUN Version from http://www.sun.com
Install the downloaded JDK 1.3.x. and reboot the workstation.

Steps for installation on a workstation (3)

STEP4:

With Java installed, navigate on **VSAM Redirector Server -> Details and Download** to:

Download latest Code

and click on: **redir270-pq71095.zip** (VSE 2.6 and 2.7). The file name may vary since it contains an APAR number. Please make sure you have applied the corresponding APAR on your VSE system.

The download process will be started. You will be prompted to specify where to save the code. *Save it in a place you remember later on*.

After the code is *downloaded it must be unzipped.* The ZIP file contains the following files:

install.class, install.bat, install.cmd, install.sh

Note: The VSE Connector client is also shipped and installed with the VSE base product in Library PRD1.BASE as member *iesvsmrd.w*

You can download it from there in binary format and rename it to *install.class (VSE 2.6) or redir27.zip (VSE 2.7).* But the newest level will always be on the Internet.

STEP5:

To install the VSE Connector Client, open a *Command prompt* (DOS window) and change current directory to the one where *install.class* resides.

Enter **java install** or start one of the **install batch files** (e.g. install.bat).

This will guide you trough the installation process of the VSAM Redirector Server. The VSAM Redirector Server consists of:

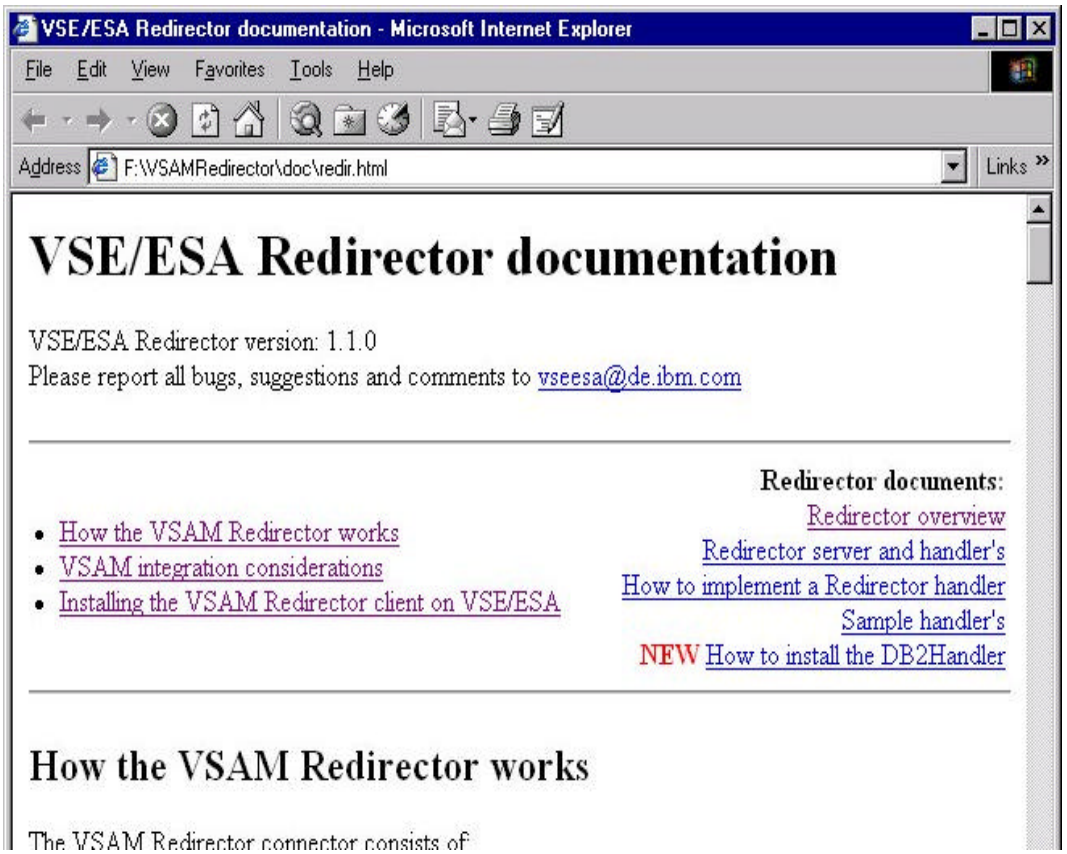
- the VSAM Redirector Server code
- a detailed HTML documentation about the functions and possibilities
- two sample handlers (DB2 and HTML)
- documentation how to develop own handlers.

Verify installation of VSAM Redirector Server

STEP6:

To verify that the VSAM Redirector Server is installed properly, open the HTML Documentation (<redir>\doc\redir.html).
(For Windows:
START -> Programs -> VSAM Redirector -> Help)

The Help HTML page will be opened.



STEP7:

To start the VSAM Redirector Server, execute run.bat or run.sh in the redirector directory.
(For Windows: **START -> Programs -> VSAM Redirector -> Start Server**)

Redirect a VSAM file to DB2

Initial state:

➔You have a VSAM file that contains data

(i.e. FFSTORES.DEMO.CLUSTER)

➔You have applications that work with that VSAM file

(i.e. FFST CICS Application)

Goal:

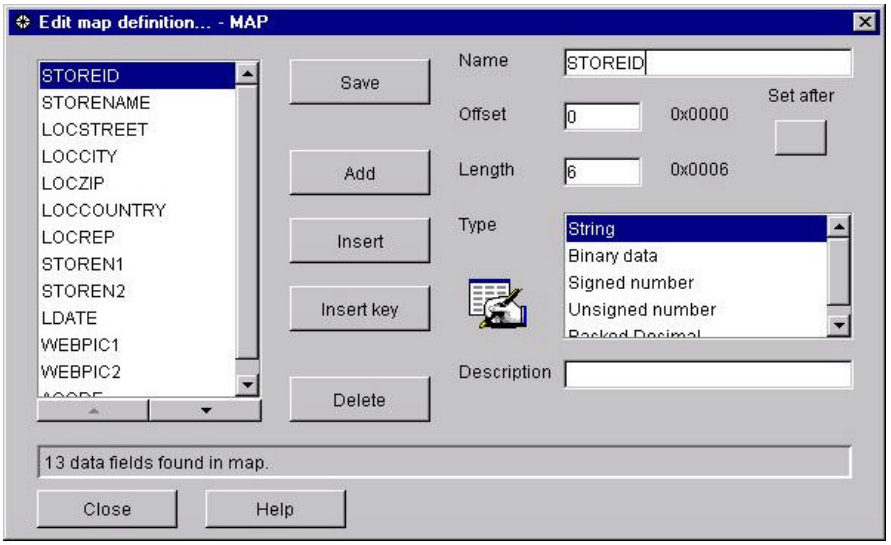
➔Move the data into a Database (i.e. DB2)

➔Access the data with existing applications (without changing them)

STEP1: Define a map

To move the data into a database, you must know the format of the records. Therefore you must do a mapping containing all fields including their offset in the record, length and type.

- Start the VSE Navigator, connect to the VSAM host, and navigate to the VSAM cluster FFSTORES.DEMO.CLUSTER.
- Right click the Cluster, choose "Create map definition". Enter a name for the map, e.g. "MAP"
- Right click on the map, choose "Change map definition":



Redirect a VSAM file to DB2 (2)

Mapping of FFSTORES.DEMO.CLUSTER:

Field name	Type	Length	Offset
STOREID	STRING	0	6
STORENAME	STRING	6	25
LOCSTREET	STRING	31	25
LOCCITY	STRING	56	25
LOCZIP	STRING	81	10
LOCCOUNTRY	STRING	91	25
LOCREP	STRING	116	20
STOREN1	UNSIGNED	136	4
STOREN2	UNSIGNED	140	4
LDATE	STRING	144	10
WEBPIC1	STRING	154	20
WEBPIC2	STRING	174	20
ACODE	STRING	194	10

To verify the mapping, use the VSE Navigator to display the VSAM data.

Right click on the map, choose "Display VSAM Data". On the "Display Filter" dialog box, press "OK" to display all records (no filter).

STO...	STORENAME	LOCSTREET	
000001	Frechdax	Elbeplatz 2	Boeblingen
000002	Cafe Keese	Reeperbahn 15	Hamburg
000003	Hotel Sacher	Hauptstr. 15	Wien
000004	Cafe Frech	Postplatz 3	Boeblingen
000005	Cafe Frech Filiale 1	Seestrasse 2	Boeblingen
000006	Cafe Frech Filiale 2	Schoenaicherstrasse	Boeblingen
000007	Cafe Frech Filiale 3	Blumenstrasse	Boeblingen

STEP2: Export the mapping to a XML File

The VSAM Redirector "Create DB2 Tables" tool reads the mapping from a XML file.

Right click on the map and choose "Export map to XML". Enter a filename (e.g. ffstores.xml). You will need this file in the next step.

Redirect a VSAM file to DB2 (3)

STEP3: Create the tables in the database

To continue with the next steps

- you must have installed a database management system (i.e. DB2).
- you must have a JDBC Driver for it (i.e. db2java.zip in <db2>\java\).
- you must be able to connect to the database (userid/password)

Make sure the JDBC driver is in the CLASSPATH. You may have to edit the create.bat/create.cmd/create.sh batch files as well as the run.bat/run.cmd/run.sh batch files and add the JDBC Driver Archive to the classpath:

```
set CLASSPATH=.;xerces.jar;db2java.zip;%CLASSPATH%
```

Start the "Create DB2 Tables" utility (create.bat/create.sh or START - Programs - VSAM Redirector - Create DB2 Tables).

The tool prompts you for the following:

- **XML Filename**: enter the name of the XML File you exported in the last step (i.e. ffstores.xml)
- **DB url**: enter a JDBC URL for your database, i.e. jdbc:db2:sample
- **DB user:** enter a user id you use for accessing the database
- **DB password:** enter the users password
- **DB table name**: Enter the name of the data table, i.e. FFSTORES. This table will later contain the VSAM data.
- **Map table name:** Enter the name of the table that contains the mapping information, i.e. FFSTORES_MAP. You can use the same map table for several clusters.
- **Map name:** Enter the name of the map, i.e. FFSTORES. This name is independent from the map defined with the VSE Navigator.
- **DB system**: Enter 1 for DB/2, 2 for Oracle.
- The tool now imports the XML file and tries to connect to the database.
- Next, the map info table is created (FFSTORES_MAP). Enter "Yes" to continue.
- Then, the data table is created (FFSTORES). Enter "Yes" to continue.
- **Cluster Type**: Enter 1 (KSDS without AIX).
- **Primary key field:** Enter the name of the key field: STOREID. Press enter to create the table and indexes.

Redirect a VSAM file to DB2 (4)

Before we can work with the data in the database, we have to load the data from VSAM into the database. To do this we define a second cluster, redirect this cluster and copy (repro) the original cluster into the redirected one.

STEP4: Define cluster FFSTORES.REPRO.CLUSTER with the same attributes as FFSTORES.DEMO.CLUSTER:

- KSDS
- Max/Avg. record length: 210
- Key Position: 0, Keylength: 6

STEP5: Configure the Redirector for FFSTORES.REPRO.CLUSTER:

Copy skeleton SKRDCFG from ICCF Library 59 to your primary library.

Edit/add a entry to the configuration table. Enter CASE M in the command line to switch to mixed case mode before editing.

```
IESRDENT CATALOG='VSESP.USER.CATALOG',                    X
      CLUSTER='FFSTORES.REPRO.CLUSTER',                   X
      EXIT='IESREDIR',                                    X
      OWNER=REDIRECTOR,                                   X
      IP='<ip-addr>',                                     X
      HANDLER='com.ibm.vse.db2handler.DB2Handler',        X
      OPTIONS='dburl=jdbc:db2:<db>;dbuser=<userid>        X
               maptable=FFSTORES_MAP;map=FFSTORES;        X
               dbpassword=<password>;dbtable=FFSTORES'
```

- let the job load IESRDCFG into the SVA (Step 2)
- let the job copy IESVEX01 to IKQVEX01 in PRD2.CONFIG (Step 3)
- let the job load IKQVEX01 into the SVA (Step 4)
- let the job load IESRDANC into the SVA, if not already done (Step 5)
- let the job execute IESRDLDA to register the new configuration (Step 6)
- submit and check for RC=0000

Redirect a VSAM file to DB2 (5)

STEP6: Copy FFSTORES.DEMO.CLUSTER into FFSTORES.REPRO.CLUSTER:

Use the IDCAMS REPRO function to copy the contents of FFSTORES.DEMO.CLUSTER into the redirected FFSTORES.REPRO.CLUSTER:

```
* $$ JOB JNM=REPRO,CLASS=A,DISP=L
// JOB REPRO COPY FILE
// DLBL COPYIN,'FFSTORES.DEMO.CLUSTER',,VSAM,CAT=VSESPUC
// DLBL COPYOUT,'FFSTORES.REPRO.CLUSTER',,VSAM,CAT=VSESPUC
// EXEC IDCAMS,SIZE=AUTO
 REPRO INFILE (COPYIN) -
       OUTFILE (COPYOUT) -
       NOREUSE
/*
/&
* $$ EOJ
```

During the copy process, the VSAM Redirector Client will get control (at open time of FFSTORES.REPRO.CLUSTER) and will connect to the VSAM Redirector Server. In case this fails, a VSAM open error message will be displayed.

To verify the data in the DB/2 table, issue the following SQL statement, or use the DB/2 Control Center:

SELECT * FROM FFSTORES

UNIQRBAC...	STOREID	STORENA...	LOCSTREET	LOCCITY	LOCZIP	LOCCOUN...	LOCREP	STORE
0	000001	Frechdax ...	Elbeplatz 2...	Boeblinge...	71032	Germany ...	Hiller	3
1	000002	Cafe Kees...	Reeperbah...	Hamburg ...	20000	Germany ...	Domina ...	3
2	000003	Hotel Sach...	Hauptstr. 1...	Wien ...	11111	Austria ...	Arnold S ...	3
3	000004	Cafe Frech...	Postplatz 3...	Boeblinge...	71032	Germany ...	Hiller	3
4	000005	Cafe Frech...	Seestrass...	Boeblinge...	71032	Germany ...	Hiller	3
5	000006	Cafe Frech...	Schoenaic...	Boeblinge...	71032	Germany ...	Hiller	3
6	000007	Cafe Frech...	Blumenstr...	Boeblinge...	71034	Germany ...	Hiller	3
7	000008	Cafe Frech...	Dahlienstr...	Boeblinge...	71034	Germany ...	Hiller	3
8	000009	Cafe Frech...	Rosenstra...	Boeblinge...	71034	Germany ...	Hiller	3
9	000010	Cafe Muell...	Marienplatz...	Munich ...	0000080000	Germany ...	Hiller	3
10	000011	McDonalds...	Main Street...	Melbourne ...	20000	Australia ...	Hiller	3
11	000012	Cafe Howa...	Harbor Ro...	Sydney ...	10000	Australia ...	Hiller	3
12	000013	McDonlads...	Main Street...	Perth ...	30000	Australia ...	Hiller	3

Redirect a VSAM file to DB2 (6)

STEP7: Configure the Redirector for FFSTORES.DEMO.CLUSTER:

Edit skeleton SKRDCFG:

Change the previously created entry in the configuration table. Enter CASE M in the command line to switch to mixed case mode before editing. Change FFSTORES.REPRO.CLUSTER to FFSTORES.DEMO.CLUSTER

```
IESRDENT CATALOG='VSESP.USER.CATALOG',                          X
      CLUSTER='FFSTORES.DEMO.CLUSTER',                          X
      EXIT='IESREDIR',                                          X
      OWNER=REDIRECTOR,                                         X
      IP='<ip-addr>',                                           X
      HANDLER='com.ibm.vse.db2handler.DB2Handler',              X
      OPTIONS='dburl=jdbc:db2:<db>;dbuser=<userid>;             X
               maptable=FFSTORES_MAP;map=FFSTORES;              X
               dbpassword=<password>;dbtable=FFSTORES'
```

- let the job load IESRDCFG into the SVA (Step 2)
- let the job copy IESVEX01 to IKQVEX01 in PRD2.CONFIG (Step 3)
- let the job load IKQVEX01 into the SVA (Step 4)
- do NOT let the job load IESRDANC into the SVA, because it has already be done (Step 5)
- let the job execute IESRDLDA to register the new configuration

(Step 6)

- submit and check for RC=0000

STEP8: Finished.

You may have to reopen the VSAM file in CICS, since the VSAM Redirector configuration becomes active at open time. You can now work with your VSAM data and applications.

Summary

Major Steps to install VSAM Redirector Server on a workstation

- ✓install Java Runtime Environment (JRE) or
- ✓Java Developer Kit (JDK)
  - ✓free download from SUN or IBM
    - ✓version 1.3.x

    http://www.ibm.com/java/jdk/download/index.html

- ✓download VSAM Redirector Server

http://www-1.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/redir.html

- ✓install VSAM Redirector Server
  - ✓at a command prompt enter: java install

- ✓define a mapping using the VSE Navigator

http://www-1.ibm.com/servers/eserver/zseries/os/vse/support/vseconn/vsenavi.html

- ✓Configure the Redirector on the VSE side
- ✓Load the VSAM data into a Database using a Copy (Repro) job

Additional Information

- **VSE/ESA Home Page**
  http://www.ibm.com/servers/eserver/zseries/os/vse/

- **e-business Connectors User's Guide**
  SC33-6719
  http://www-1.ibm.com/servers/eserver/zseries/os/vse/pdf/ieswue20.pdf

- **e-business connectors tools**
- **http://www.ibm.com/servers/eserver/zseries/os/vse/ebus/home.html**

e-business Connectivity for VSE/ESA	**SG24-5950**
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