

E35

User Experience with z/VSE Connectors - VSAM Redirector with Capture Exit

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		zSeries
		System z

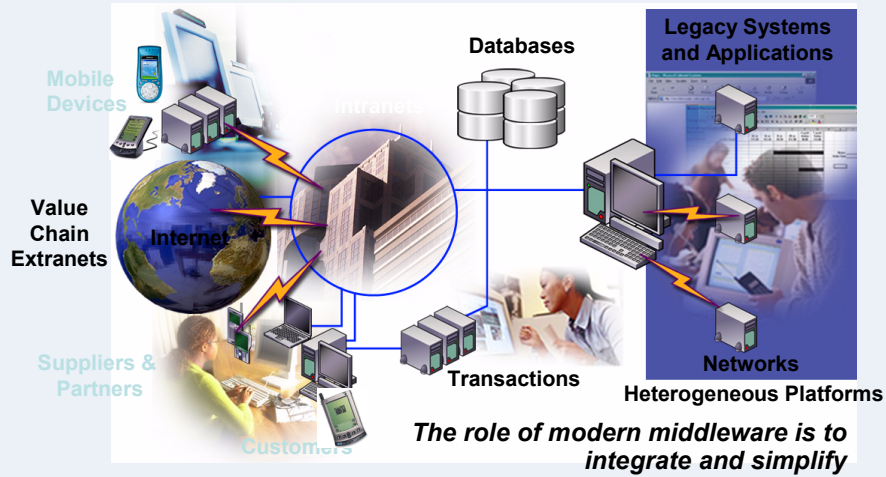
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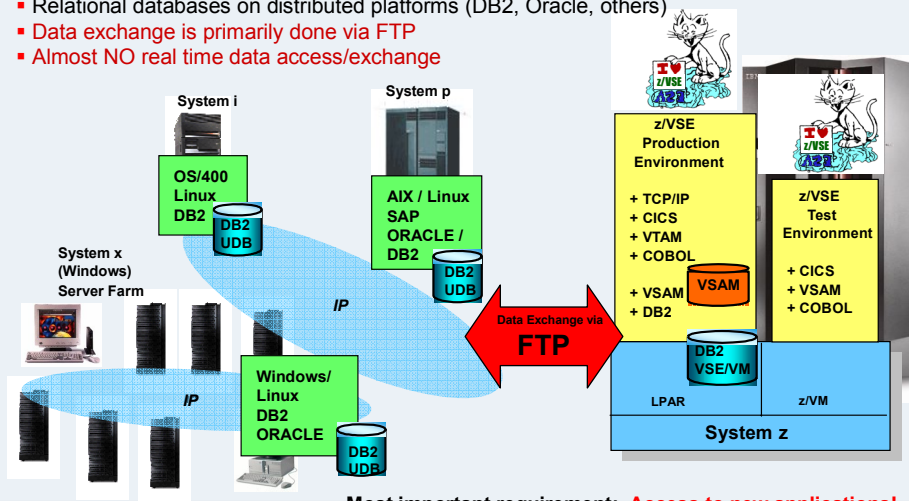
Today's IT Environment

IT environments are increasingly heterogeneous and complex



Typical VSE Customer Environment

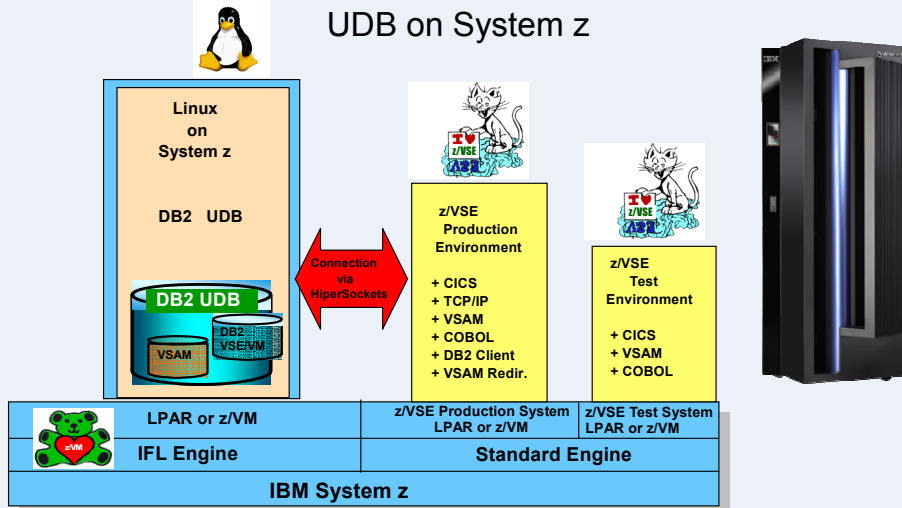
- Various different servers (System z, System p, System i, System x, and others)
- VSAM data on VSE (some DB2 environments, some other databases)
- Relational databases on distributed platforms (DB2, Oracle, others)
- Data exchange is primarily done via FTP
- Almost NO real time data access/exchange



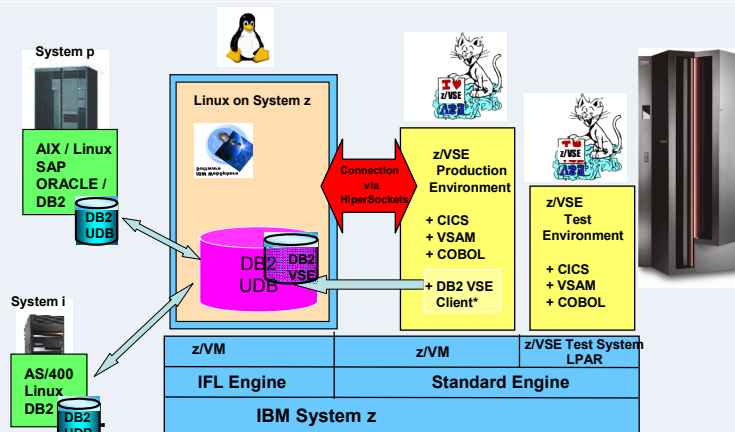
Most important requirement: Access to new applications!

Scenario 1: DB2 UDB (64-bit) for VSE Customers

Data consolidation and data warehouse solutions with DB2 UDB on System z

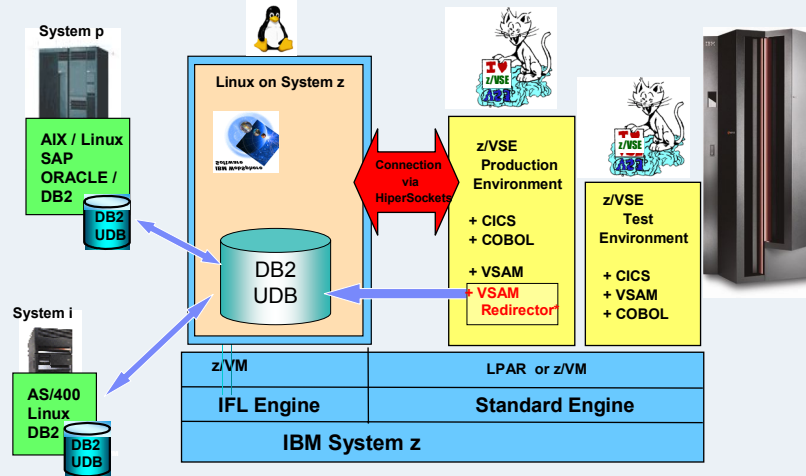


DB2 Scenario – with DB2 UDB on Linux



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

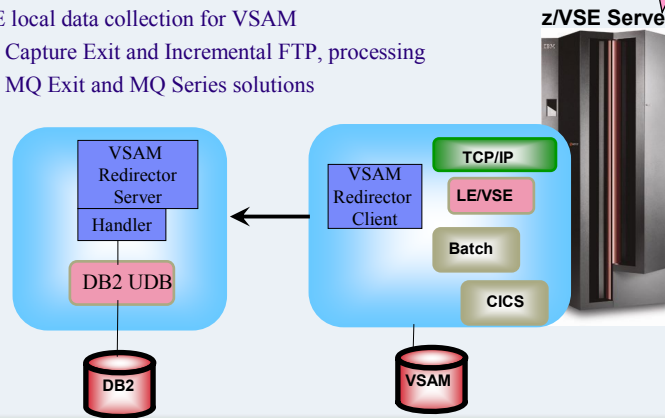
Common Data Store – Transparent Work of VSAM Programs with DB2 UDB on Linux on System z



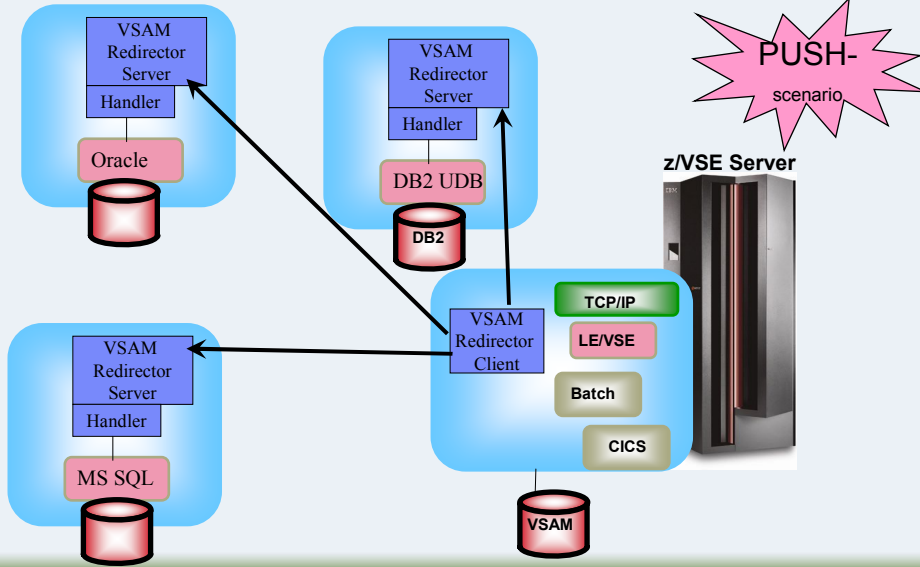
(*) VSAM Redirector – Common data store solution – with DB2 on Linux on zSeries Solutions without changes to VSAM programs

PUSH scenario: VSE/VSAM applications, access remote relational databases

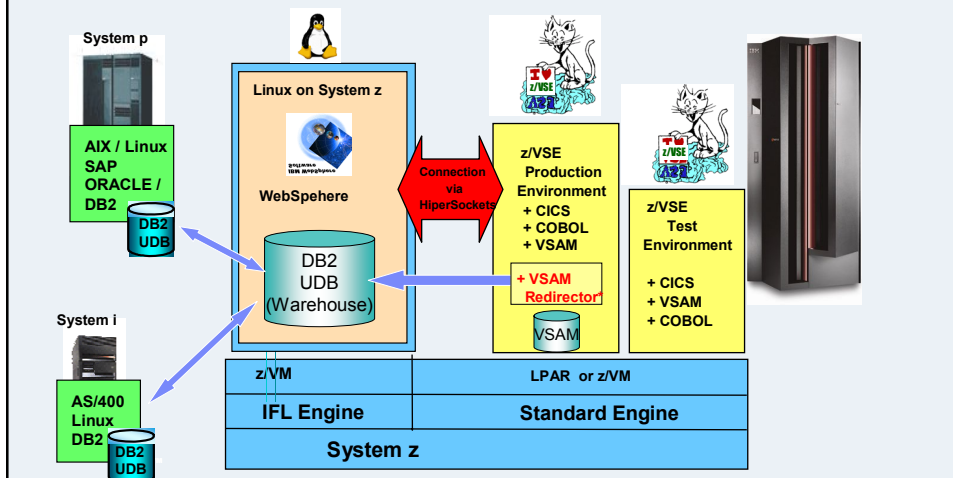
- (1) Real time access VSAM to relational databases
 - a) synchronization (two phase commit of VSAM and DB2)
 - b) Real time access to DB2 (no VSAM access anymore)
- (2) VSE local data collection for VSAM
 - a) Capture Exit and Incremental FTP, processing
 - b) MQ Exit and MQ Series solutions



VSE/VSAM applications, access remote relational databases



VSAM Programs with DB2 UDB on Linux on System z



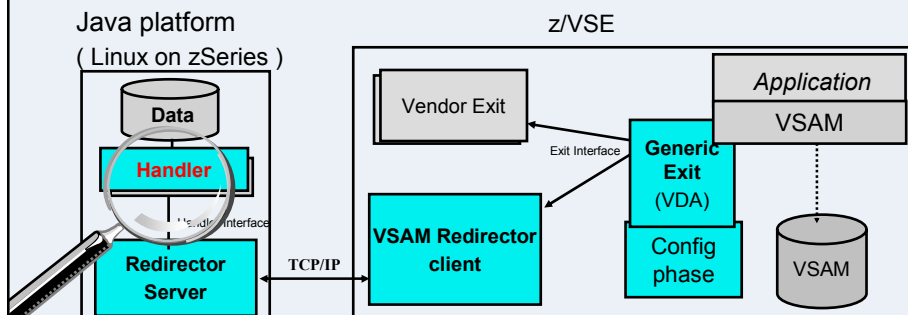
(*) VSAM Redirector – Common data store solution – with DB2 on Linux on zSeries Solutions without changes to VSAM programs

z/VSE 4.1 - Interoperability



- **Implementation of Customer Requirements**
- **VSAM to relational with VSAM Redirector**
 - **Normalizing Database handler**
 - Store VSAM data in a normalized form into a relational database
 - **VSAM Capture Exit**
 - part of the VSAM Redirector. It captures all changes done in a VSAM cluster.
 - creates a delta record in another VSAM cluster (that is a "delta file")
 - the delta record/message contains the data of the changed record and information about when (timestamp) and by whom (partition, phase name, origin value, etc.) the record was changed.
 - **These data can be processed asynchronously by another program or system.**
 - for example using the VSE Connectors can be used to read the delta cluster and process the records
 - **Alternatively, the Capture Exit can be used to create a MQ Message**

VSE/VSAM Redirector - functional view



f Redirector Components:

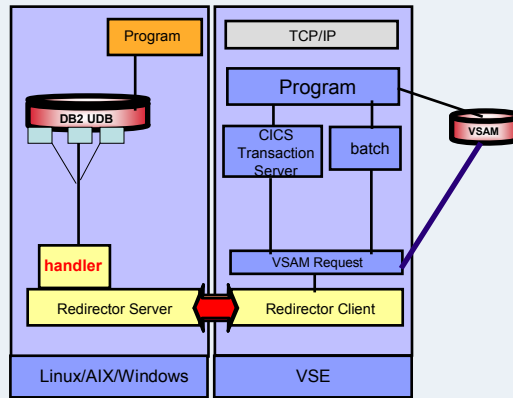
- f Generic Exit is based on VSAM Data Access Exit (VDA)
- f Config phase - redirection properties
- f Redirector client
- f Redirector server
- f Handler

Data propagation from VSE

VSE/VSAM Redirector can use normalized VSAM data

*f*No changes to the existing VSE applications

*f*The new Redirector Handler in z/VSE 4.1 can store 'VSAM' data in multiple DB Tables .



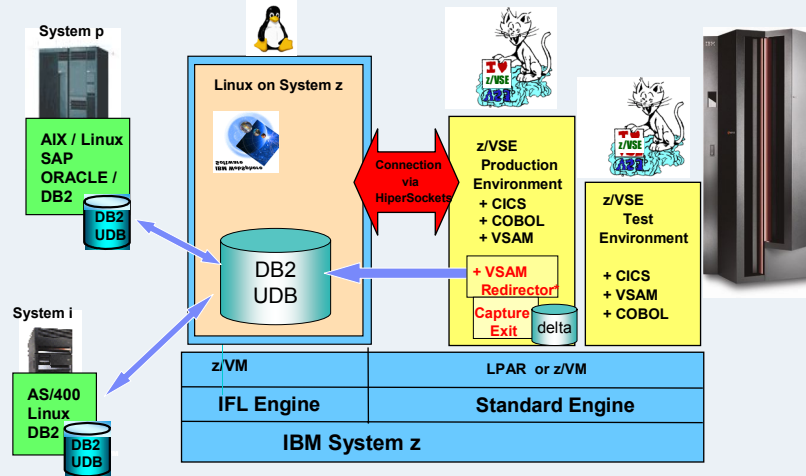
f Applications on VSE should be able to access DB2 data on Linux

f Population of DB2 UDB on Linux with VSAM using VSAM Redirector. (VSAM Redirector is part of VSE)

New Redirector handler in z/VSE 4.1

- **Handler to Normalize VSAM data**
 - store one VSAM record in multiple tables
 - based on VSAM indicator fields
 - administrator decision
 - for synchronization only (owner = VSAM) - READS are done from VSAM
 - relation between tables to be unique
 - definitions via GUI (mapping configuration)
 - SQL loader provided for database load
 - RedirLoader - fast initial LOAD of a database from VSAM
 - MQLoader - MQ trigger application
 - DeltaLoader – Processing of the Delta file – insert into the database

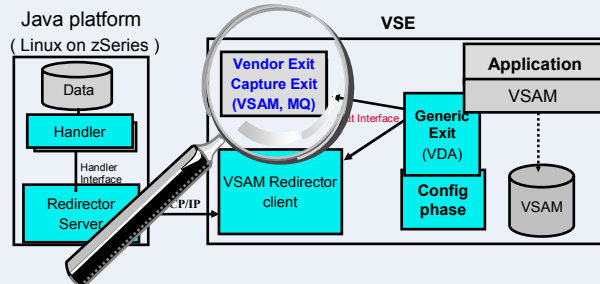
VSAM Programs with DB2 UDB on Linux on System z



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

VSAM Data collection / transformation / journaling on VSE

Vendor Exit

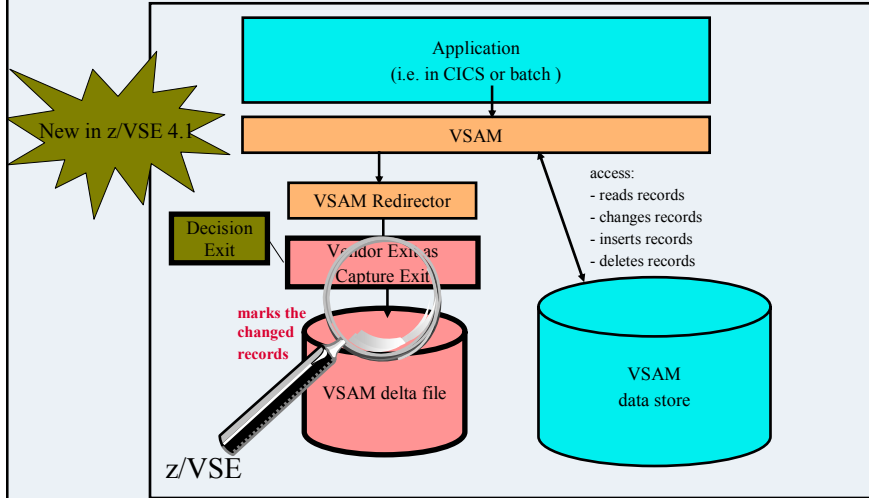


f Vendor Exit

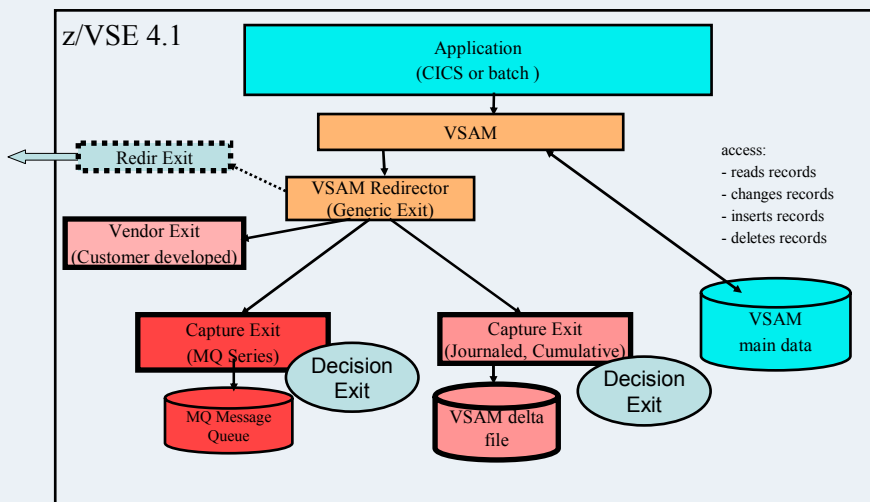
- f user (vendor) written phase for data collection/transformation
- f has to comply with the documented Exit Interface

Note: No chaining of Vendor Exit with VSAM Redirector client supported

Redirector Capture. Architectural View



VSAM Redirector Capture



Journaling



Record 1	inserted
Record 2	inserted
Record 3	inserted
Record 2	updated
Record 1	deleted
Record 3	updated
Record 4	inserted
Record 1	inserted
Record 2	updated
Record 4	updated
Record 4	deleted

or

cumulative

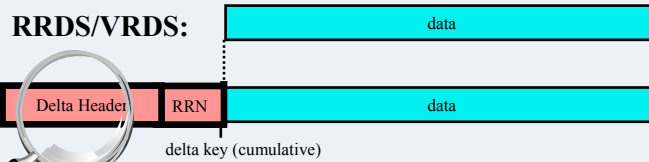
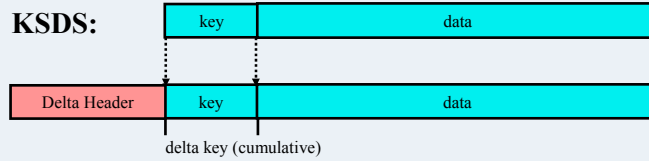


key

Record 1	inserted
Record 2	updated
Record 3	updated
Record 4	deleted

☞ The last version only of a changed VSAM record is stored into the delta file

Delta Record



Delta Header

Delta Header	RRN/RBA	Rest...
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Offset	Parameters	Length	Description
0	TODCLOCK	8	Time of change
8	JobName	8	Job name
16	PHASEName	8	Phase name
24	Origin	8	String from Config or file Label
32	PartID	2	Partition ID (i.e. F2)
34	OpCode	1	I=Insert, D=Delete, U=Update
35	Flags	1	X'01'=RRN/RBA follows
36	RRN/RBA	4	RRN/RBA (RRDS/VRDS/ESDS)

Contains information about:

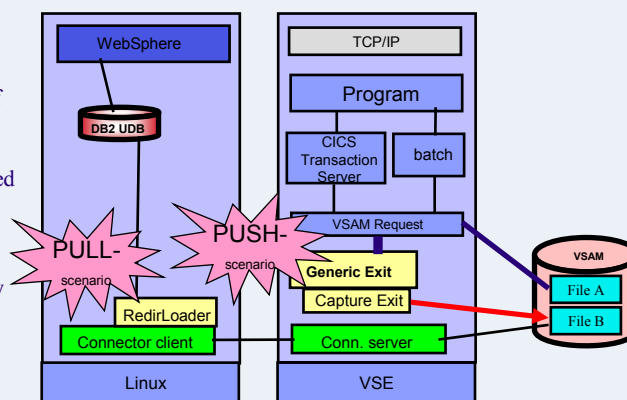
- when change took place (TODCLOCK)
- who did the change (Job/Phase/Partition)
- request type of change (Insert/Delete/Update)
- which record was affected (key/RRN/RBA)

Solution for FTP Replacement:

Incremental, Linux driven updates

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

The changes are processed asynchronously and not influencing the production system



Collect the changed records in a separate VSAM file

Possibility of cleansing

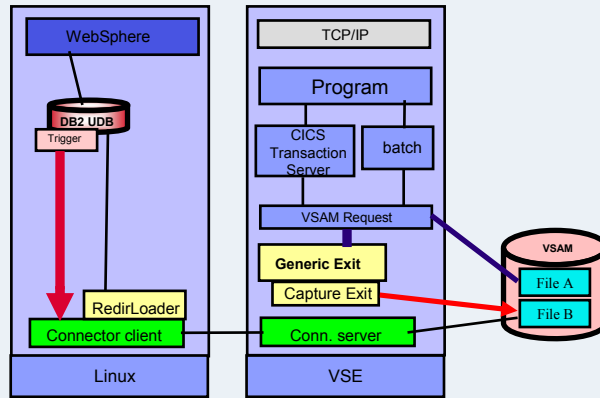
Process them – with the VSE Connectors

Solution for FTP Replacement:

Bidirectional updates with VSE connectors

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

The changes are processed asynchronously and not influencing the production system



- f Collect the changed records in a separate VSAM file
- f Possibility of cleansing
- f Process them – with the VSE Connectors

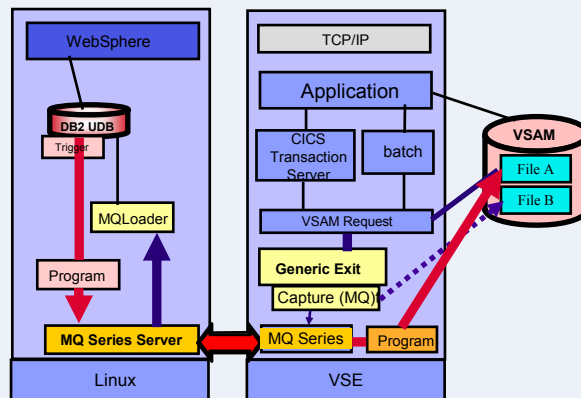
MQ Exit

Integration of VSE Application with MQ Series

enablement for MQ Series w/o changing existing applications.

Bidirectional processing

Guaranteed processing using asynchronous data transfer method MQ



Visit the z/VSE Web Site

z/VSE Solutions

The screenshot shows the IBM z/VSE website interface. At the top, there is a navigation bar with links for Home, Products, Services & solutions, Support & downloads, and My account. Below this is a search bar and a 'Country/region (select)' dropdown. The main content area features a 'z/VSE' heading, a 'Learn more' link, and a 'z/VSE V3.1' announcement. A sidebar on the left contains a 'z/VSE Solutions' menu with options like 'About VSE', 'How to buy', 'News', 'Solutions', 'Products & components', 'Documentation', 'Service & support', 'Downloads', 'Education', 'Partners', 'FAQ', and 'Contact VSE'. The 'Solutions' menu item is circled in red. The main content area also includes a 'Redesigned z/VSE homepage' announcement and a list of supported hardware and software configurations.

New Web presence: ibm.com/servers/eserver/zseries/zvse/solutions

Additional Information

- z/VSE Home Page
<http://www.ibm.com/servers/eserver/zseries/zvse/>
- z/VSE Solutions and Utilities
<http://www-1.ibm.com/servers/eserver/zseries/zvse/solutions/>



- 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 Handbook (Connectors to z/OS and VSE)** **SG24-7042**

z/VSE Contact : zvse@de.ibm.com