IBM zSeries Systems and Technology Group

z/VSE Connectors Overview

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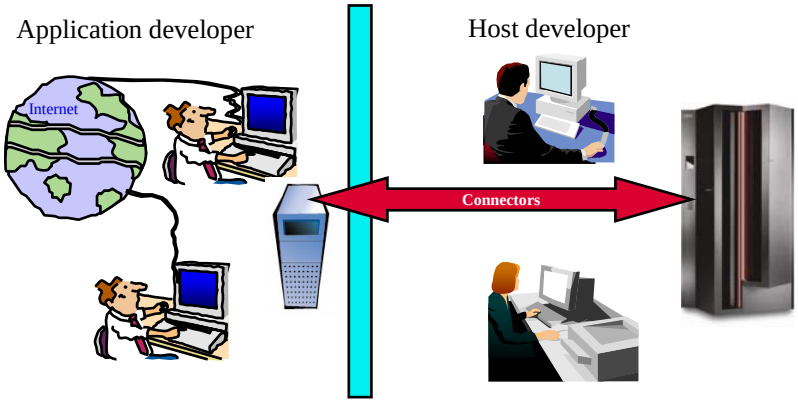
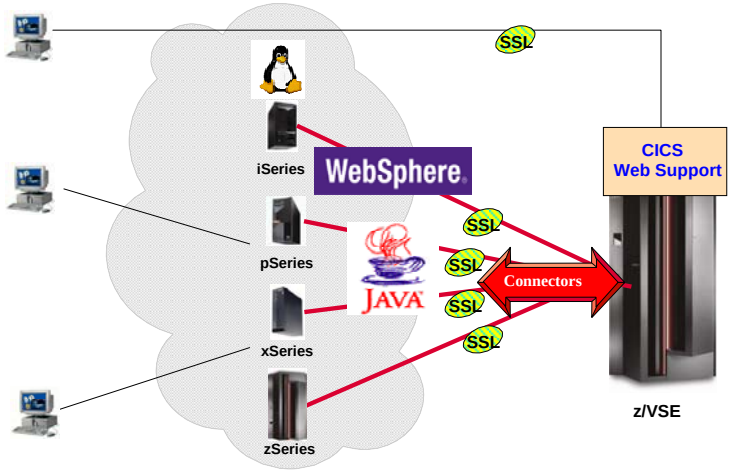
Challenges in today's IT

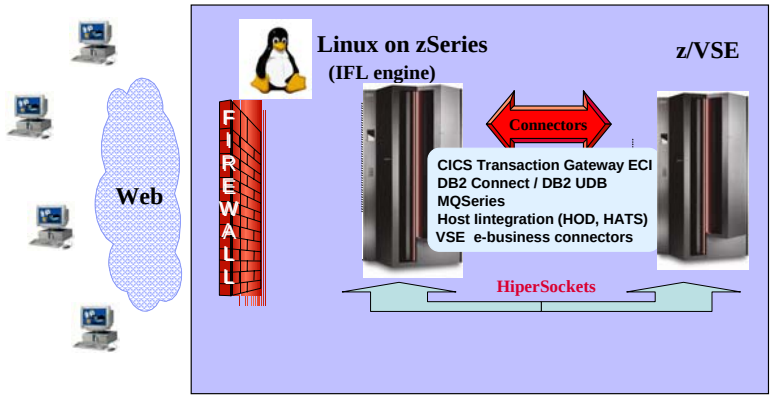
- Two Architectures, two cultures
  one goal – universal solutions



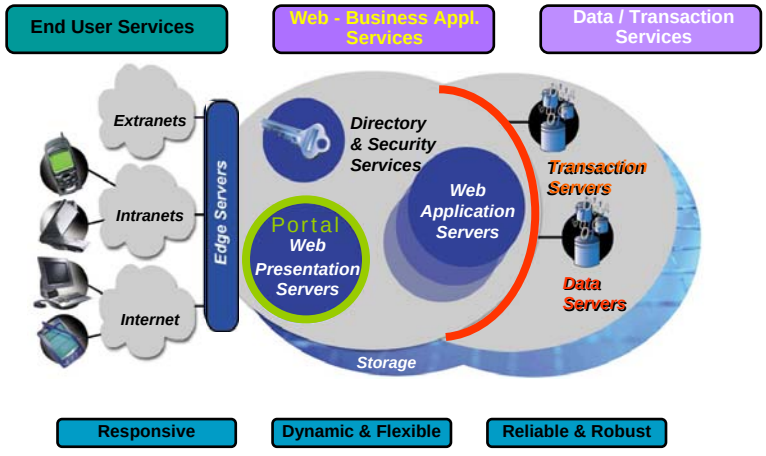
VSE Connectors – flexibe and secure



Integration of z/VSE with Linux on zSeries

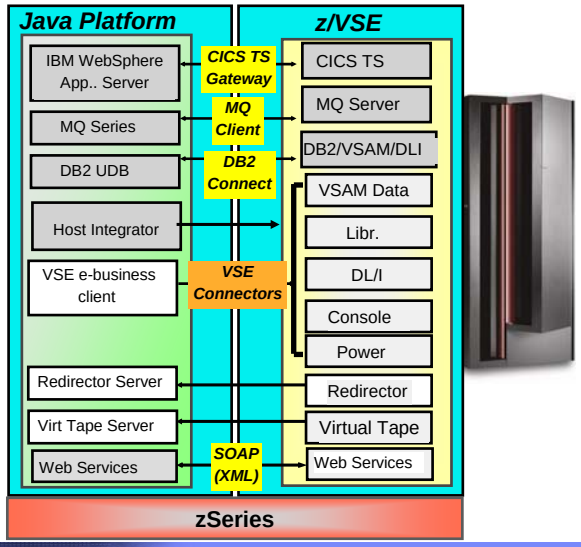


Infrastructure



Middleware Relations to z/VSE

- Modern Applications with Linux on zSeries
- Most modern Technologies interact with VSE Services
- Modernisation of IT Infrastructures using Real-time access to data



Methods Data interchange and Optimization of operations

(1) Real-time access to VSE data from remote

(2) Real time VSAM to DB2 synchronization

(3) Application integration

(4) Access VSE applications from the Web

(5) First Steps

Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

(1) Java access to VSAM data from remote

(2) Scripting access to VSE resources

(2) Real time VSAM to DB2 synchronization

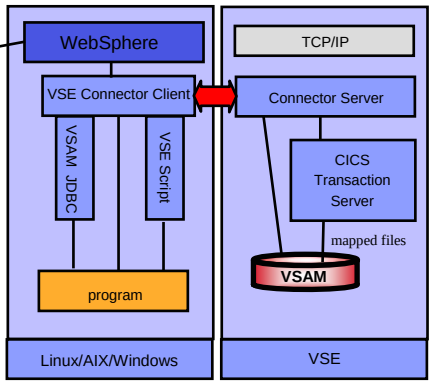
(3) Application integration

(4) Access VSE applications from the Web

(5) First Steps

Real time access to VSAM data from remote systems

- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized tools (Navigator,etc.)



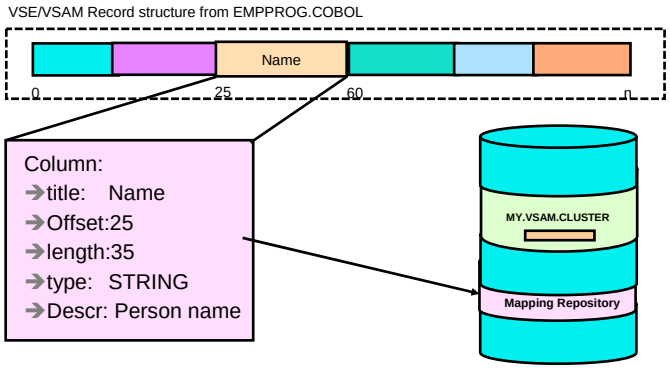
- real time access to mapped VSE/VSAM data from remote systems
  - i.e. READ in batch Mode and UPDATE via CICS
- samples and descriptions are in VSE Connector client online documentation
- **Mapping must be done prior to access VSAM data from remote**

Real time access to VSE data from remote systems

Software Requirements

- VSE/ESA 2.7 and newer
- TCP/IP for VSE/ESA
  - Connector Server – to be started on VSE
  - Define maps for the VSAM files
    (with the standalone **MAPTOOL**, or **IDCAMS RECMAP**,
    or with a **Java program**, or **VSE Navigator**)
- Linux (AIX, Windows, any Java environment…)
  - VSE Connector Client Software on the Client or Requester machine (Java Class Library) – packaged with VSE
  - Program (In Java or Java callable Programming language) that will work with the data

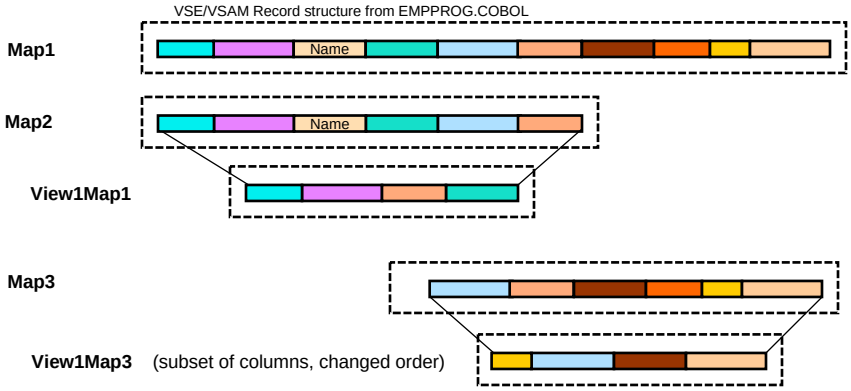
VSAM Record Mapping



Mapping characteristics:

- **No changes to VSAM data**
- **Mapping information stored in a repository in VSAM (VSE.VSAM.MAPPING.DEFS)**
- **Multiple maps and views (subset of map fields) supported**
- **Possible data types: STRING, binary, signed number, unsigned number, packed data**

VSAM Record Mapping



Mapping characteristics:

- No changes to VSAM data
- Mapping information stored in a repository in VSAM (VSE.VSAM.MAPPING.DEFS)
- Multiple maps and views (subset of map fields) supported
- Possible data types: STRING, binary, signed number, unsigned number, packed data

Accessing VSAM data from remote systems

using VSAM JDBC Driver

- Based on VSE Connector Client
- Translates SQL into VSE/VSAM calls
- Standard JDBC API
- Requires VSAM Record Mapping

Access VSAM via batch interface - read / (or SHAREOPTION 4 for write)

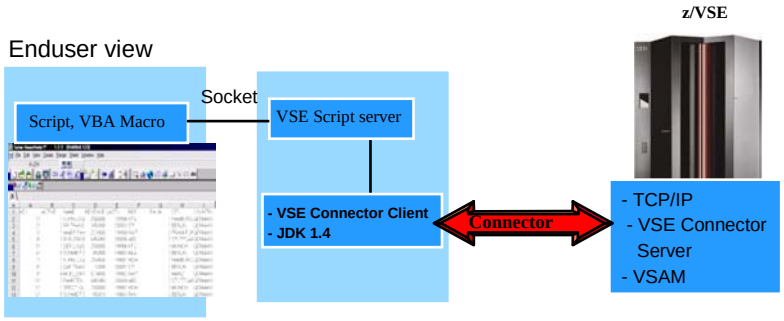
```
SELECT NAME,STREET,CITY FROM
  MY.USER.CATALOG\MY.VSAM.CLISTER\MY_MAP
  WHERE PERSNR=4711
  ORDER BY NAME
```

Access VSAM via CICS (DBDCCICS) – read/write

```
SELECT NAME,STREET,CITY FROM
  #VSAM.#CICS.DBDCCICS\CLUNAME\MY_MAP
  WHERE PERSNR=4711
  ORDER BY NAME
```

Accessing VSAM data from remote systems

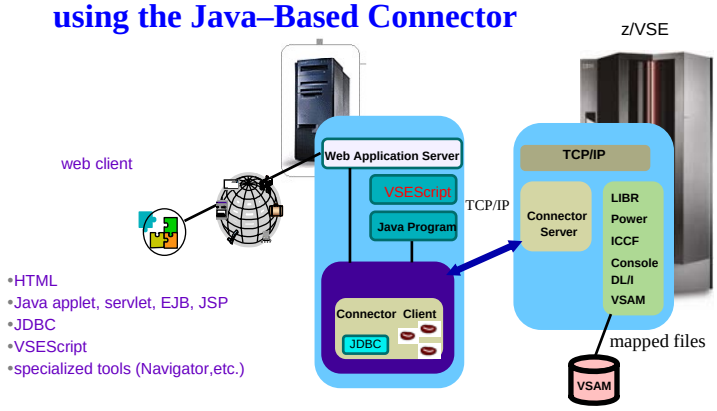
using non-Java methods, scripts



Advantages:

- Individual requests (Statistics)
  - Security: Userid/Password for VSE
- Centralization, using macros from server
- Automation (automatically create Office files/reports)

Real time access to VSE resources using the Java–Based Connector



- HTML
- Java applet, servlet, EJB, JSP
- JDBC
- VSEScript
- specialized tools (Navigator,etc.)

- real time access to VSE resources from remote systems
- new possibilities for leveraging the VSE investment

Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

(2) Real time VSAM to DB2 synchronization

(3) Application integration

(4) Access VSE applications from the Web

(5) First Steps

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Methods Data interchange and Optimization of operations

(1) Real-time access to VSE resources from remote

(2) Real time VSAM to DB2 synchronization

a) MQ Exit and MQ Series solutions

b) Capture Exit and Incremental FTP

(3) Application integration

(4) Access VSE applications from the Web

(5) First Steps

z/VSE Connectors Overview
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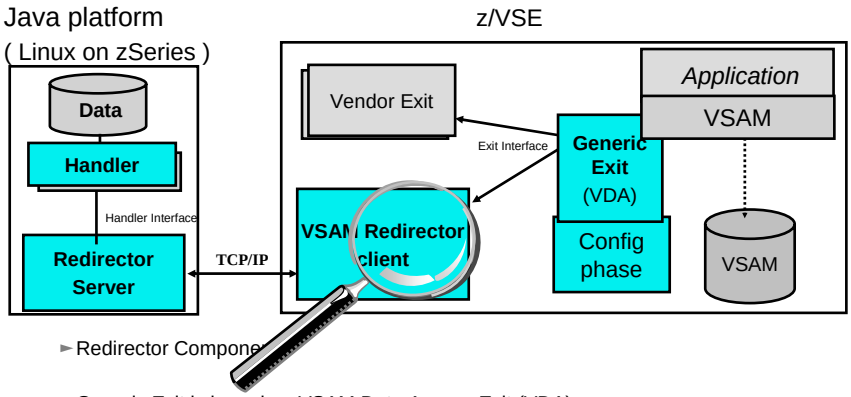
VSE/VSAM Redirector - functional view

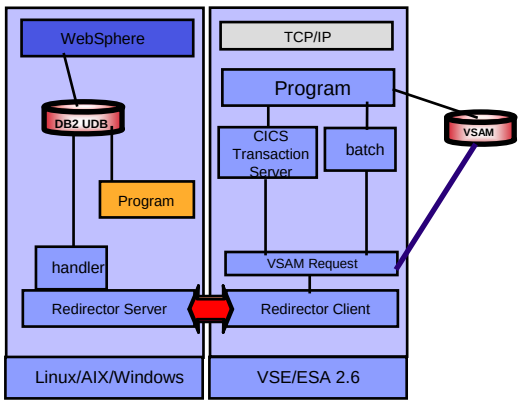


- Redirector Compone
- Generic Exit is based on VSAM Data Access Exit (VDA)
- Config phase - redirection properties
- Redirector client
- Redirector server
- Handler

Data propagation / synchronization from VSE

VSE/VSAM Redirector

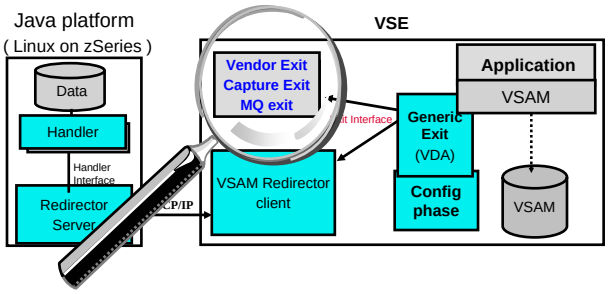
- Existing applications transparently access remote data
- No changes to the existing VSE applications



- Synchronization of DB2 UDB on Linux with VSAM using VSAM Redirector.
  (VSAM Redirector is part of VSE/ESA 2.6/2.7)

VSAM Data collection / transformation / journaling on VSE

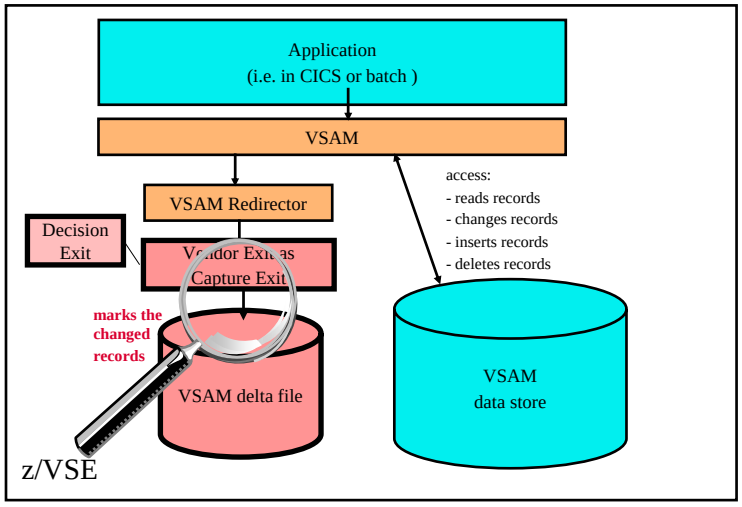
Vendor Exit



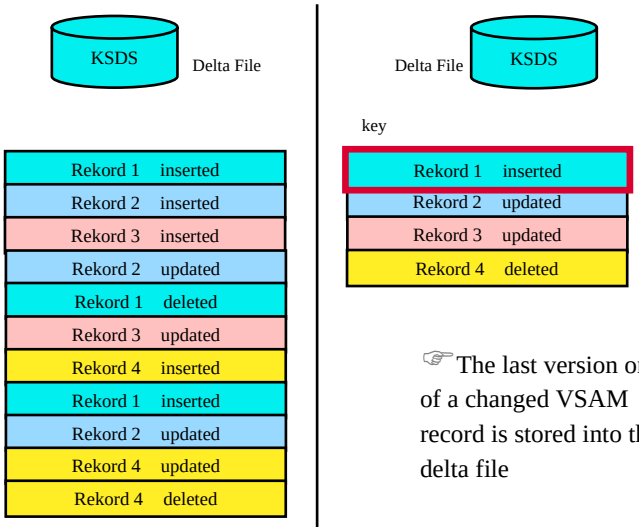
- Vendor Exit
  - user (vendor) written phase for data collection/transformation
  - has to comply with the documented Exit Interface

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

Architectural View

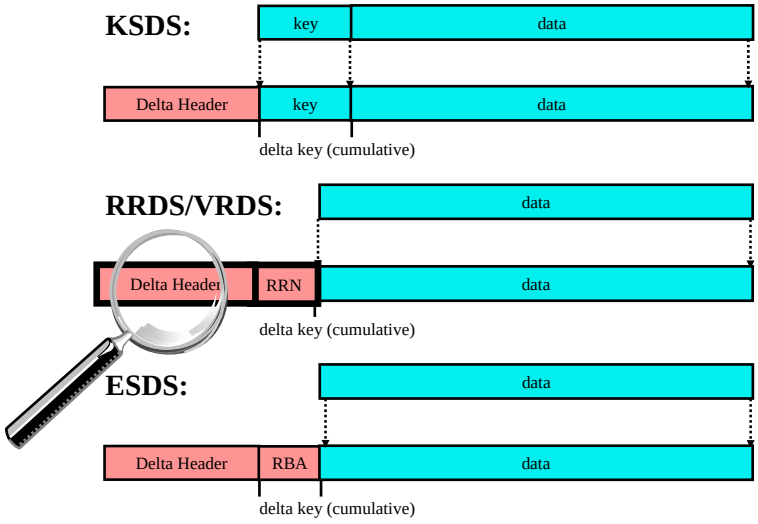


Journaling or cumulative



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

Delta Record



Delta Header

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:

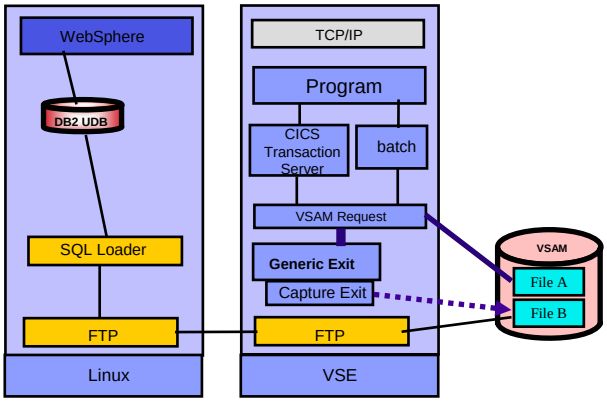
- ➔when change took place (TODCLOCK)
- ➔who did the change (Job/Phase/Partition)
- ➔request type of change (Insert/Delete/Update)
- ➔which record was affected (key/RRN/RBA)

Capture Exit

Incremental data interchange

Reduce network traffic, save time

- ► accumulation of changes of a file
- ►Incremental processing
- ►Transparent Journaling of data changes

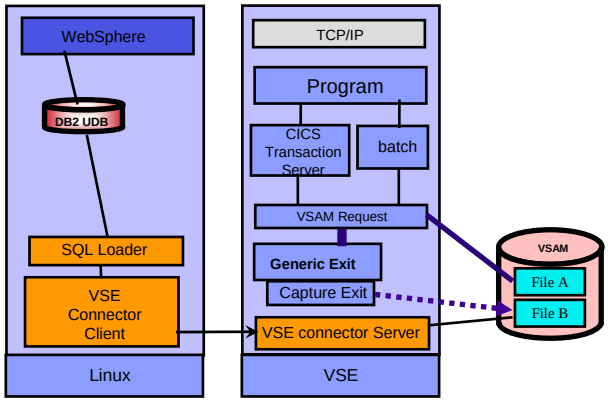


Capture Exit

Asynchronous data pull from remote

Reduce network traffic, save time

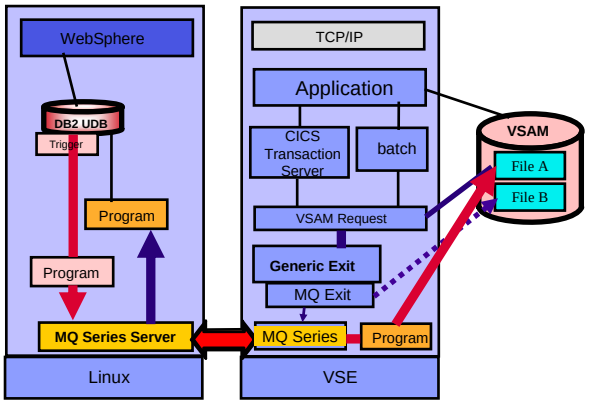
- Collect the changed records in a separate VSAM file
  - Possibility of cleansing
- Connector reads the delta file and inserts them into a database
- Transparent Journaling of data changes



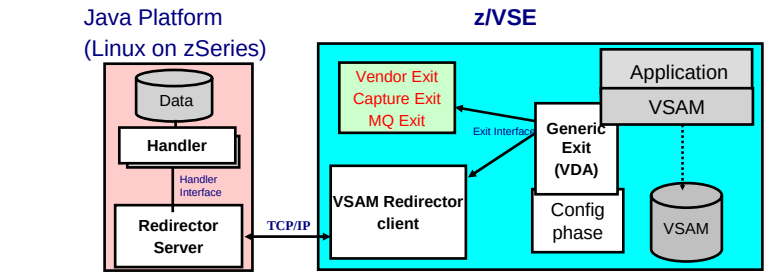
MQ Exit

Integration of VSE Application with MQ Series

- enablement for MQ Series w/o changing existing applications.
- Bidirectional processing
- Guaranteed processing using asynchroneous data tranfer method MQ



VSAM Redirector – functional view



Catalog	Cluster	Exit	Owner	IP	Port	handler-name	option-string
MY.USER.CAT	MY.VSAM.FILE	IESREDIR	VSAM	10.0.0.1	4711	DB2Handler	user=xxx,pw=xxx,...
MY.USER.CAT	MY.RD.FILE	IESREDIR	REDIR	9.164.155.2	4711	DB2Handlernam	user=xxx,pw=xxx,...
VSESP.U.CAT	TEST.CLUST2	VENDPhase	n/a	n/a	n/a	n/a	n/a

A mechanism for VSE programs working with VSAM data:

- ☞ gain transparent access to remote data (from batch or CICS applications)
- ☞ synchronize VSAM files with remote data stores
- ☞ without any changes to VSE programs

Transparent access from VSE programs to remote data

Software requirements

- ►For VSE :
  - ►VSE/ESA 2.7
    - ►enable VSAM Redirector function
    - ►Vendor Exit phase if local processing used
    - ►Enable the redirection of VSAM Cluster to remote
- ►On remote system
  - ►Java environment
    - ►Redirector server (delivered with VSE)
    - ►Setup of a Handler – responsible for data manipulation (with VSE a Database handler and a HTML handler is delivered)

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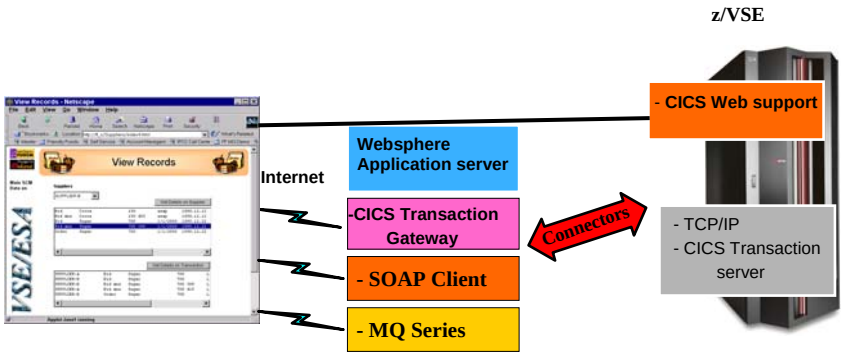
(5) First Steps

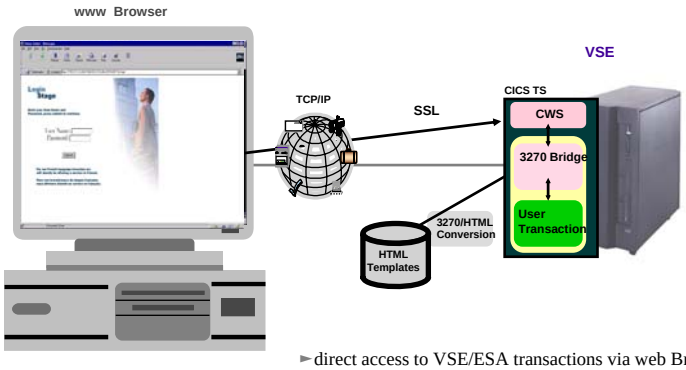
(3) Access VSE applications from the Web



- Enable the access to core applications with web technologies
- No change to the core applications
- Consistent development interfaces (Java based)

Direct access to VSE/ESA transactions via browser

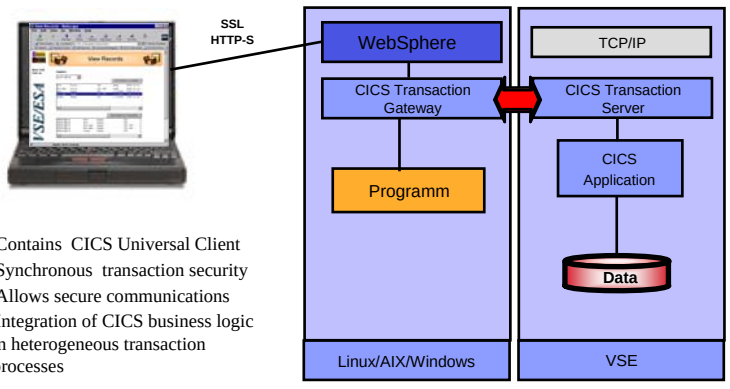
IBM CICS Web Support - Components



- direct access to VSE/ESA transactions via web Browser
- Without the need of a web server on VSE

Integration of VSE/ESA transaction processes

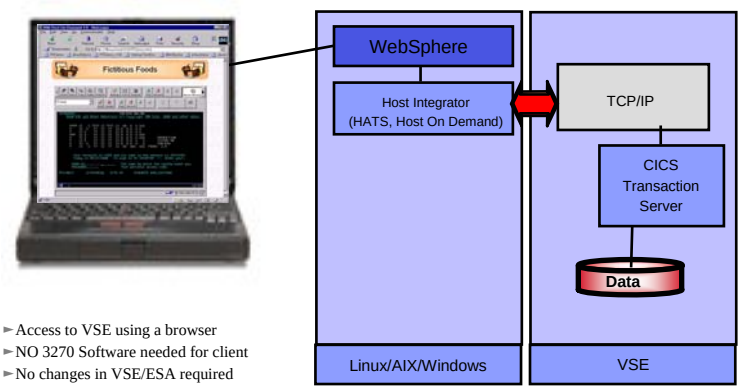
IBM CICS Transaction Gateway



- Contains CICS Universal Client
- Synchronous transaction security
- Allows secure communications
- Integration of CICS business logic in heterogeneous transaction processes

General access to VSE/ESA via browser

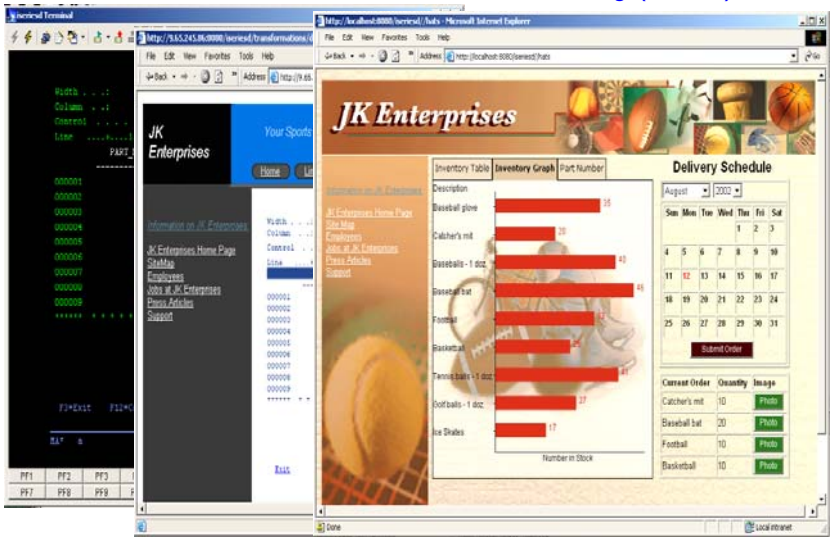
Host Access transformation Server (HATS)
and Host on Demand (HOD)



- Access to VSE using a browser
- NO 3270 Software needed for client
- No changes in VSE/ESA required

Available for Linux for zSeries too. Reduce SNA network, to Linux – VSE communication inside the zSeries box. All external communication is IP.

Interaction with VSE via browser using (HATS)



Host Access Transformation Server

- functional characteristics
  - access to VSE/ESA via browser
  - the access is similar with a local access via 3270 emulator
  - can be used in Intranet or Internet and /or
  - integrated with WebSphere Application Server
  - support for secured connections (SSL) to the HostOnDemand Server and a redirector to mask the real IP addresses
    - Host Access Transformation Server – for 3270 screen scraping
    - Host Publisher - a bean generator to create the Java Beans (Integration Objects), to provide legacy access for new Web applications.
- Requirements
  - WebSphere Host Integration products on middle tier
  - NO additional software on VSE/ESA required

Benefit: Easily extend existing applications to the web

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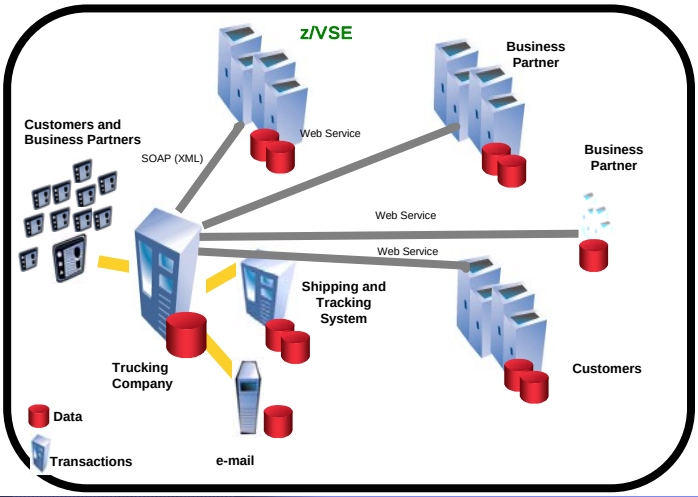
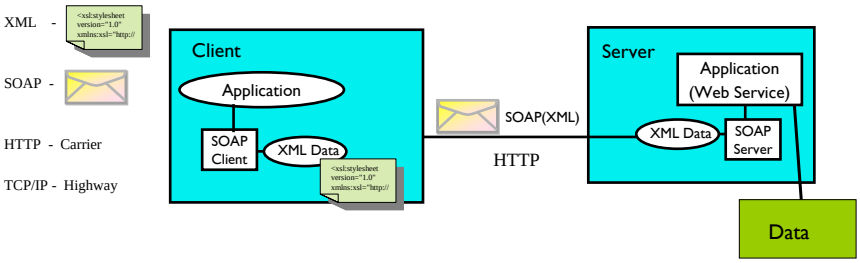
(4) Application integration
SOA and Web Services with z/VSE



Web Services

XML Document + SOAP Protocol = Web Services

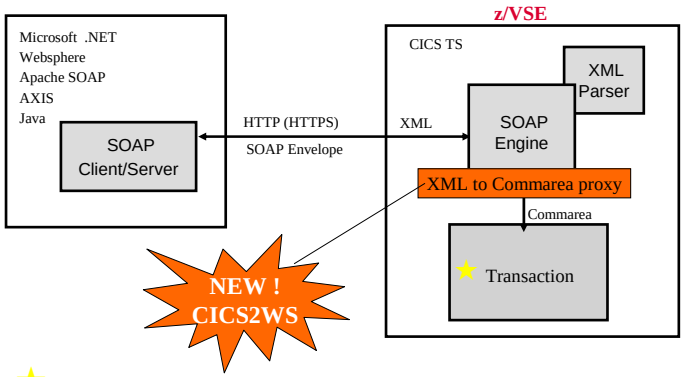


A ***web service***

- implements a business, application or system functionality
- is intended for application communication
- is useable in internet, intranet, extranet
- is useable for browser-based solutions up to the B2B integration between companies
- uses only standard internet technologies

Web Services with z/VSE

XML data interchange with CICS transactions



★ VSE Transactions as Web Service – generated with the tool CICS2WS

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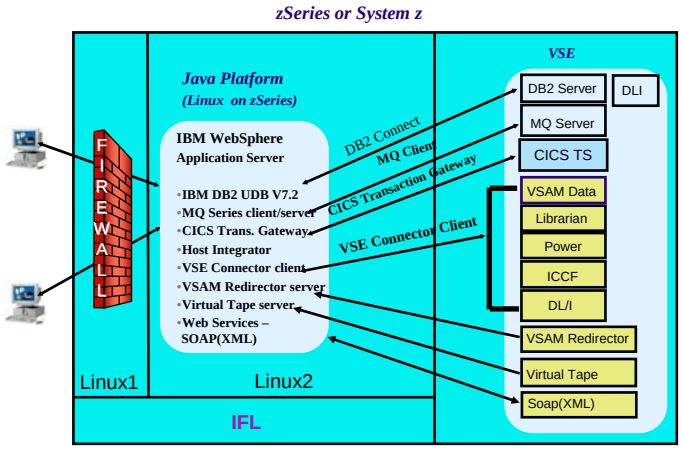
z/VSE Connections



(5) First Steps

Information to get started :
z/VSE home page -> solutions
http://www.ibm.com/servers/eserver/zseries/zvse/solutions

High potential of modernisation exists but is unused because of:

- unsufficient communication between departments of different platforms
- management structure inhibits projects in distributed environments
- lack of information about new possibilities
- first Steps are unclear (see solutions)

First Steps – modernization

Identify a process for modernisation – i.e interface modernisation

- ✓ identify processes were business logic and user interface can be separated
- ✓ Service Oriented architecture have multiple flavors
- ✓ proof of concepts can easily identify critical parts in a project and can help in decisions for multiple solutions
- ✓ alternatives should be discussed based on a proof of concept and not based on unknown thoughts and feelings

First Steps – data access

Identify process for modernization – i.e. data transfer

- ✓ identify the files that will be involved in the process
- ✓ which side is the initiator of the data transfer
  - ✓ VSE or the remote platform
- ✓ Type of data flow or program communication
  - ✓ Access VSE data and resources from remote platforms
  - ✓ access VSE applications from remote platforms
  - ✓ access remote applications from VSE
- ✓ exact description of data structures

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

Additional Information

- z/VSE Home Page
  http://www.ibm.com/servers/eserver/zseries/zvse/

- z/VSE Solutions
  http://www-1.ibm.com/servers/eserver/zseries/zvse/solutions/

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