CICS und die Web Services
- ein langer Weg, in moderne Strukturen -

z/VSE

Integration

IBM zSeries and System z
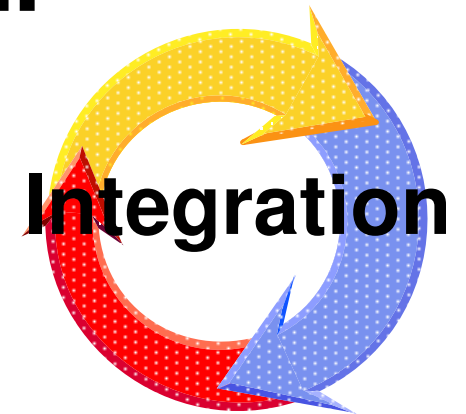
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z/VSE Solution Architect

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Wie die Geschichte begann ....

After the success of the airline reservation systems, the idea of a centralized repository became very appealing to utility companies in the US to help them find customer records. If all the customer data could be put on a computer for everyone to interrogate, that would be great.

In the 1960s, many, many electricity companies all over the country set up projects to create these Customer Information Systems, usually with two teams:
(1) application programmers familiar with the business, and
(2) system programmers, familiar with OS/MFT, and access methods like BTAM, QTAM, BDAM, BISAM, and so on.

The two teams typically **spent a couple of years defining their needs**, the system, defining (and redefining) their interfaces, writing (and rewriting) their programs.
Someone in IBM noticed that the development on the system side was like rediscovering sliced bread, and decided, after visiting nine or so existing installations all over the country, to write, once and for all, the system code. He decided to call it the
Customer Information Control System (CICS). That *someone* was **Ben Riggins**.

Die Schlagzeilen der Zeit ....

"On 8 July 1969, the first version of IBM's Customer Information Control System (CICS) was released.

The Hursley laboratory has world-wide responsibility for CICS. The number of licences for CICS products has grown from 4,000 to 30,000. CICS is today used in over 90 countries around the world, at more than 22,000 sites and from over 5 million terminals. For many modern commercial enterprises, business without CICS would be simply impossible.

What does CICS stand for?

Customer

Information

Control

System

How do I pronounce CICS?

It's really up to you! Here are a few of the pronunciations used around the world, as the home of CICS is Hursley, UK, we like to use the first one

KICKS	in the UK
SEE EYE SEE ESS	in the US
SICKS	in Spain
CHICKS	in Italy
SAY EEE SAY ESS	in France
ZICKS	**in Germany**

IBM

Einschlägige Veränderungen am Anfang schon ....

Among them was the idea of
        '*unbundling*' and fee software.
In **1969**, IBM introduced the idea of Program Products, for a fee. Gone were the days of free software and Type 2 Application Programs. The free copies of CICS distributed in 1968 were honored for the life of that 'version', and it took until about 1972 before the last of the freebies 'died'.

The **Hursley laboratory has world-wide responsibility for CICS**.

During that time, the number of licences for CICS products has grown from 4,000 to 30,000. CICS is today used in over 90 countries around the world, at more than 22,000 sites and from over 5 million terminals. For many modern commercial enterprises, business without CICS would be simply impossible.

CICS History – 35 year evolution

CICS was first released to the world as a gram Product in 1969 when:
- We had S/360, 64K storage and Rolling Stones were touring

CICS OS V1 released 8th July 1969, 100 KLOC and cost $600/Mth

Continually developed to support the latest industry technologies from then to the current day with:
- Early 3270, virtual storage systems, database and recovery/restart support in the 1970s
- Client/Server support
- Support on multiple platforms z/OS (OS/390), VSE, AIX, AS/400, OS/2, NT
- Exploiting latest mainframe features – high scalability, availability, managability, parallel systems etc.

What is CICS?

CICS is a transaction management system that can be used on a variety of operating systems – not only OS/390, but MVS. VSE, UNIX, Windows and others too.

CICS can be classed as middleware, or acting as an "application server" to user applications. Providing the customer services to help them implement online business applications.

It is a data (base) communications system that provides the user access to online business systems and data with security.

CICS – What Does It Do?

Transactions Defined - What we do every day

e.g. buy a train ticket

short conversation, hand over money, take ticket

Transaction:

- Handling the user interface
- Data retrieval and modification
- Communications with other applications
- Communications with network attached devices

= Unit of Work

Unit of Work = a Transaction

CICS

Welcome to the CICS 35th Anniversary site

"I'm thrilled to join the CICS team, past and present, in celebrating the milestone of 35 years as one of IBM's most popular and successful products. CICS has a long and proud history ofdelivering value and quality to our clients. I know I can rely on the current team to build on this fine heritage and continue the innovation in the on demand era."

Steve Mills
Senior Vice President and Group Executive
IBM Software Group

35 years as one of IBM's most popular and successful products iscertainly a great achievement, and on July 8th 2004 the CICS team, past and present, throughout the world are celebrating just that! CICS forms the heart of many of the worlds major enterprise business systems - upwards of 300 billion transactions flow through CICS systems each day. CICS has been at the forefront of innovation throughout its life - initially bringing access to computing function out of the machine room and on tousers desks, enabling distributed computing, exploiting the scalability and power of zSeries Sysplex technology, and providing modern application capability through support for Java, SOAP and Web Services.Customers know that CICS applications will continue to provide excellent value as IBM takes CICS forward as a key component of our on demand solutions. The outstanding success of the product comes not only from the rich and reliable capabilities delivered by the development and test teams in Hursley, but is also thanks to the superb team from all around the world providing education, consultancy and support. Join us as we celebrate this momentous event and gain a unique insight into CICS and the people who make it at IBM Hursley.

Introduction to CICS
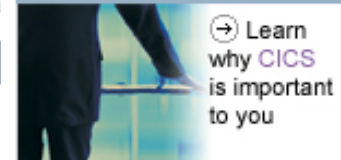
→ Learn why CICS is important to you

Customer Testimonials

→ See what CICS has done for these businesses

Learn More

→ Hursley Park

→ Download: CICS an introduction (640k)

→ Get Adobe® Reader®

Latest CICS Products

→ CIC S Transaction Server V2.3

→ CICS Business Event Publisher for MQSeries V1.2

→ CICS Transaction Gateway V5.1

CICS: 35 Years

A Short Introduction to CICS

Short for Customer Information Control System, a TP monitor from IBM that was originally developed to provide transaction processing for IBM mainframes. It controls the interaction between applications and users and lets programmers develop screen displays without detailed knowledge of the terminals being used.

CICS, Customer Information Control System, is the premier OLTP (On-Line Transaction Processing) product family from IBM. CICS (pronounced "KIX" or "KICKS" by many, including the IBM CICS developers in Hursley, England) is sometimes referred to as a DB/DC (Data Base/Data Communication) system and recently celebrated its 35th birthday. With over 30,000 CICS licenses in over 20,000 businesses, CICS offers solutions to many businesses to solve complicated computing problems and offers many employment opportunities to CICS knowledgeable professionals. Over 90% of the fortune 500 companies run CICS.

Typical CICS applications include bank ATM transaction processing, library applications, student registration, airline reservations, etc.

The original design intent of CICS was to support a varied and large number of terminals and a large transaction volume with fast and consistent response time. CICS has occasionally been referred to as an operating system within an operating system, because it has a dispatcher, storage control, task control, file control, etc. It was designed to allow application programmers to devote their time and effort to the application solution, instead of dwelling on difficult technical issues. CICS can be described as an interface between the CICS applications and the operating system.

To find out more about CICS please use the links on the right.

Introduction to CICS
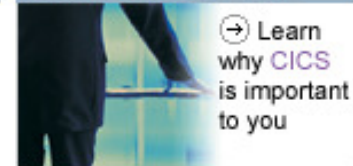
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Latest CICS Products

→ CIC S Transaction Server V2.3

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→ CICS Transaction Gateway V5.1

Your *continued donations* keep Wikipedia running!

CICS

From Wikipedia, the free encyclopedia

CICS® (**Customer Information Control System**) is a transaction server that runs primarily on IBM mainframe systems under z/OS or z/VSE. CICS is available for other operating systems, notably i5/OS, OS/2, and as the closely related IBM TXSeries software on AIX, Windows, and Linux, among others. The z/OS implementation is by far the most popular and significant.

CICS is a transaction processing system (like TCAM) designed for both online and batch activity. On large IBM zSeries and System z9 servers, CICS easily supports thousands of transactions per second, making it a mainstay of enterprise computing. CICS applications can be written in numerous programming languages, including COBOL, PL/I, C, C++, Assembler, REXX, and Java.

Each CICS program is initiated using a transaction id. CICS screens are sent as maps using a programming language such as COBOL. The end user inputs data which is made accessible to the program by receiving a map. CICS screens may contain text that is highlighted, having different colors or blinking. An example of how a map can be sent through COBOL is given below.

```
    EXEC CICS
        SEND MAPSET(MPS1) MAP(MP1)
    END-EXEC.
```

CICS is one of the world's most durable software products thanks to its ever-expanding capabilities, continuous and aggressive vendor support, large installed base, exceptional reliability, high performance, and huge variety of applications and tools. It is also a very secure system and functions at a high speed. (Many of these attributes depend on the zSeries platform.) CICS is used in bank teller applications, airline reservation systems, ATM systems etc. CICS first went on sale on July 8, 1969, not long after IMS. Originally developed in the United States, CICS development shifted to IBM's programming labs in Hursley, United Kingdom, where work continues today.

While CICS has its highest profile among financial institutions such as banks and insurance companies, over 90 percent of Fortune 500 companies are reported to rely on CICS (running on z/OS) for their core business functions. Most state and national governments do as well.

Recent CICS enhancements include support for Web services and Enterprise Java Beans (EJBs). IBM began shipping the latest release, CICS Transaction Server Version 3.1 for z/OS, in early 2005.

Part of CICS was formalized using the Z notation in the 1980s and 90s in collaboration with the Oxford University Computing Laboratory, under the leadership of Sir Tony Hoare. This work won a Queen's Award for Technological Achievement.
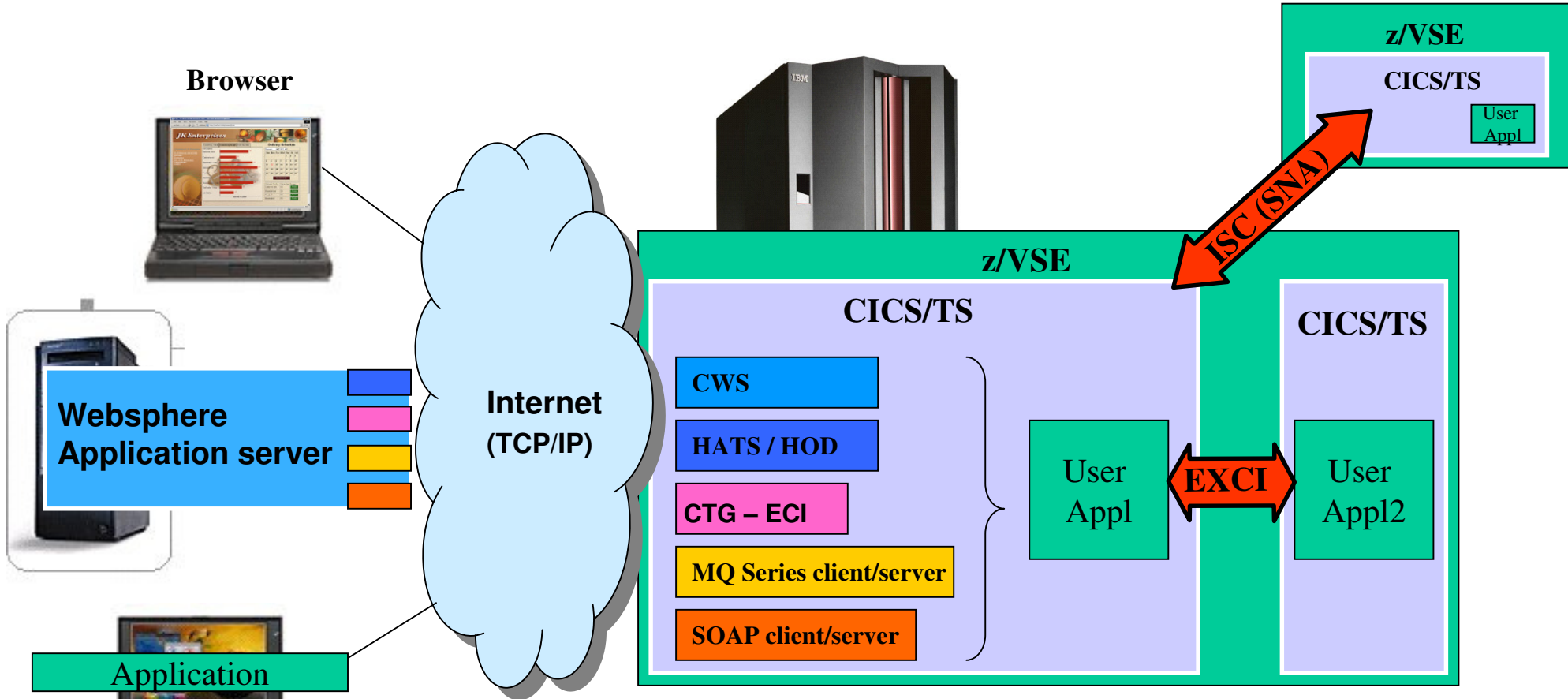
Pronunciation [edit]

- In Britain, Canada, Australia, and some other countries, CICS is pronounced the same as the word *kicks*. In the US, it is more usually pronounced by reciting each letter (*C-I-C-S*). Both pronunciations are popular.
- In Germany, it is pronounced *zicks*
- In Italy, it is pronounced *chicks*.
- In Spain it is pronounced *thicks*.

CICS - den Bedürfnissen angepasst –
modern und zeitgemäß ….

- Support of the Internet and new web browsers

- Interoperability with WebSphere

- Ability for composite CICS and WebSphere transactions

- Support of the Java and EJBs

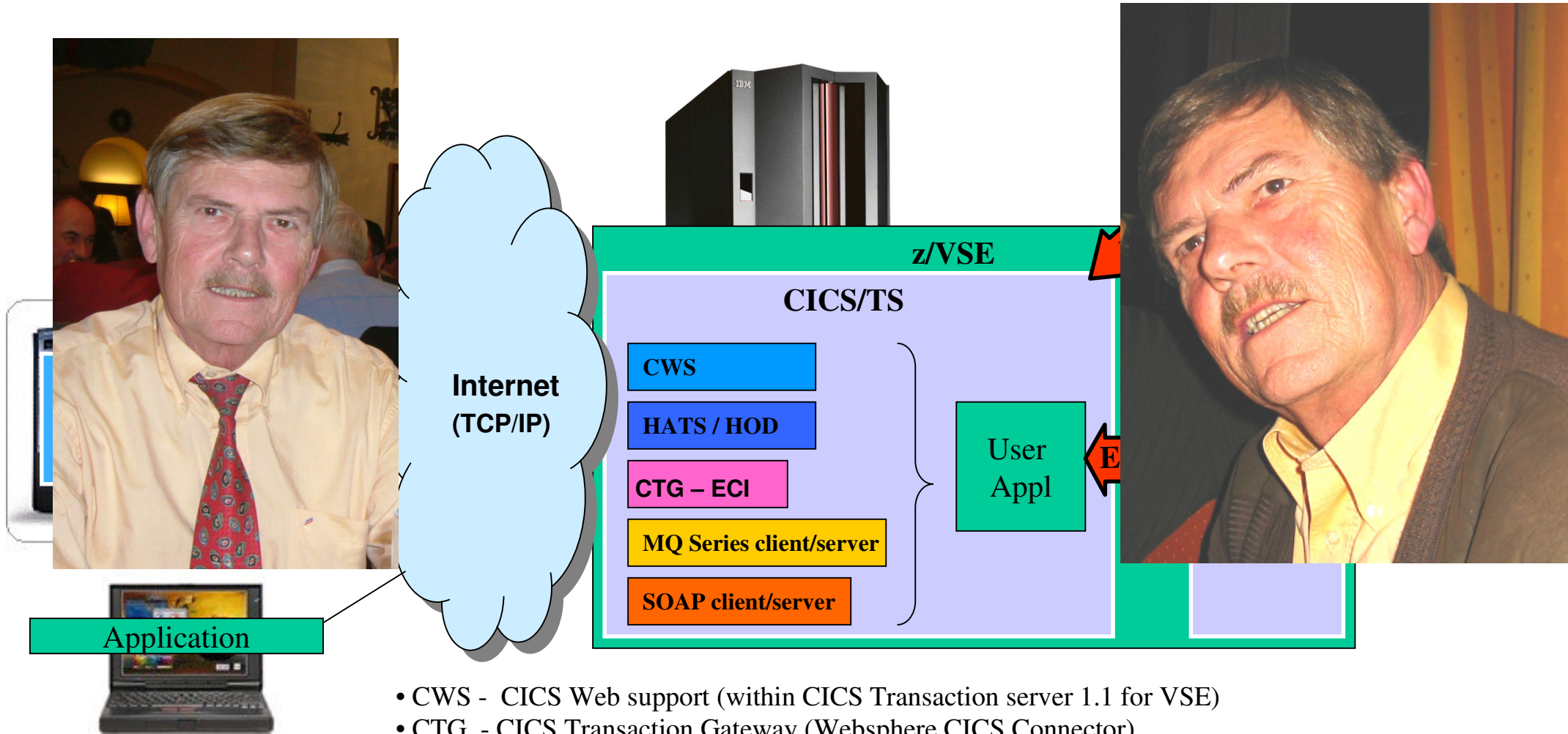- Foundation of today's enterprise-wide onDemand applications

Inter-Communication with VSE Transactions

Browser

z/VSE

CICS/TS

User
Appl

ISC (SNA)

z/VSE

CICS/TS

CICS/TS

**Websphere
Application server**

**Internet
(TCP/IP)**

CWS

HATS / HOD

CTG – ECI

MQ Series client/server

SOAP client/server

User
Appl

EXCI

User
Appl2

Application

• CWS - CICS Web support (within CICS Transaction server 1.1 for VSE)
• CTG - CICS Transaction Gateway (Websphere CICS Connector)
• HATS – Host Access Transformation Server (no VSE software component required)
• HOD - Host OnDemand (Websphere Host Integrator)
• SOAP - Simple Object Access Protocol (Web Services based with XML data)

Inter-Communication with VSE Transactions

z/VSE

CICS/TS

**Internet
(TCP/IP)**

CWS

HATS / HOD

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CICS TS

CICS Web Support (CWS)
From 3270 screens to Browser interfaces for CICS transactions

3270 Terminal

Transaction

Browser

z/VSE

TCP / IP

http://9.1.1.9:1082/cics/cwba/dfhwbtta/tran

FFSTORES Demo CICS Program - Web enabled

CICS Transaction Server

C
W
S

3270 Bridge

BMS

BMS Map

User interface

HTML Templates

Commarea

program

VSAM
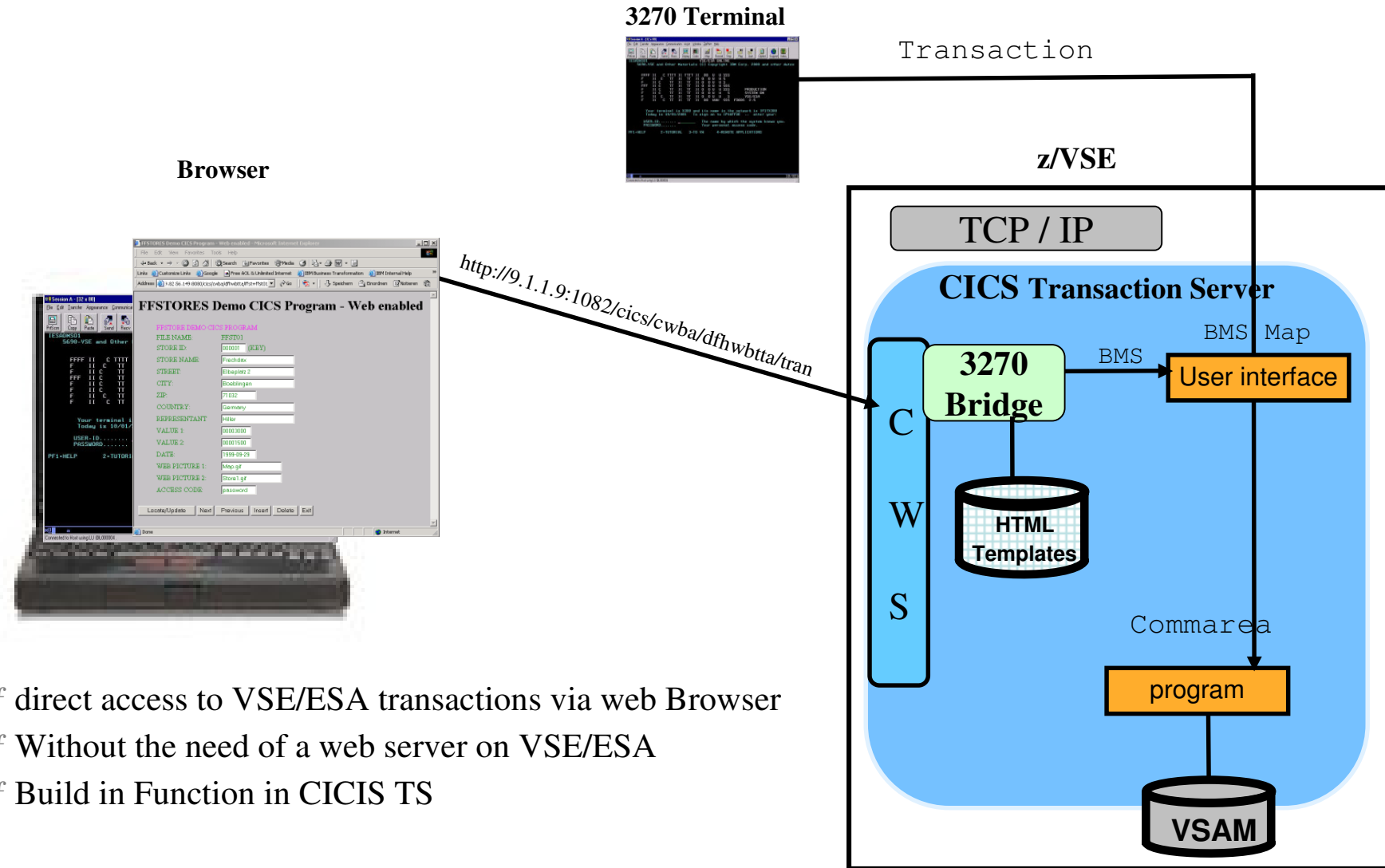
f direct access to VSE/ESA transactions via web Browser
f Without the need of a web server on VSE/ESA
f Build in Function in CICIS TS

IBM CICS Web Support

- functional characteristics
  - ƒ direct access to VSE CICS transactions via a simple web browser
  - ƒ transaction security for the called transaction
  - ƒ secured connections (SSL)

- requirements
  - ƒ VSE CICS Transaction Server

Integration of VSE transactions in distributed processes

CICS Transaction Gateway (CTG) - Components

Java Applet

Java Application

Java execution environment

TCP/IP:-

HTTP
HTTPS
SSL
TCP

ECI
EPI
ESI

Web Server
Java Servlet

Other Applications
Java, EJB

C++, C, VB, COBOL

ECI   EPI   ESI

Java Gateway

Client Daemon

CICS Transaction Gateway

Windows NT, Windows 2000, Windows XP,
AIX, Solaris, HP-UX, z/OS, OS/390, Linux
for zSeries

TCP/IP
TCP62
SNA LU6.2

CICS

APPLICATIONS

z/VSE, z/OS,
OS/400, OS/2,
AIX, Solaris, HP-UX,
Windows NT,
Windows /2000

From 3270 screens to Browser interfaces for CICS transactions

3270 Terminal

Transaction

Browser

VSE

TCP / IP

CICS Transaction Server

http://9.1.1.9:1082/cics/cwba/dfhwbtta/tran

BMS Map

3270 Bridge

BMS

user interface

C W S

Java Platform (Linux for zSeries)

IBM WebSphere Application Server

Connector Framework

_Java

HTML Templates

Program (ECI Calls)

CTG

ECI

Commarea

program

VSAM

MQ Series

Synchronous/Asynchronous data transfer and distribution

Messaging Overview

Event Notification (1 way communication), Request / Response (2 way communication)

WebSphere Message Broker

Uses rules to reformat, enhance, and route in-flight messages across differing protocols.

WebSphere MQ

Provides a simple means to reliably exchange messages between applications.

Application "A"

Application "B"
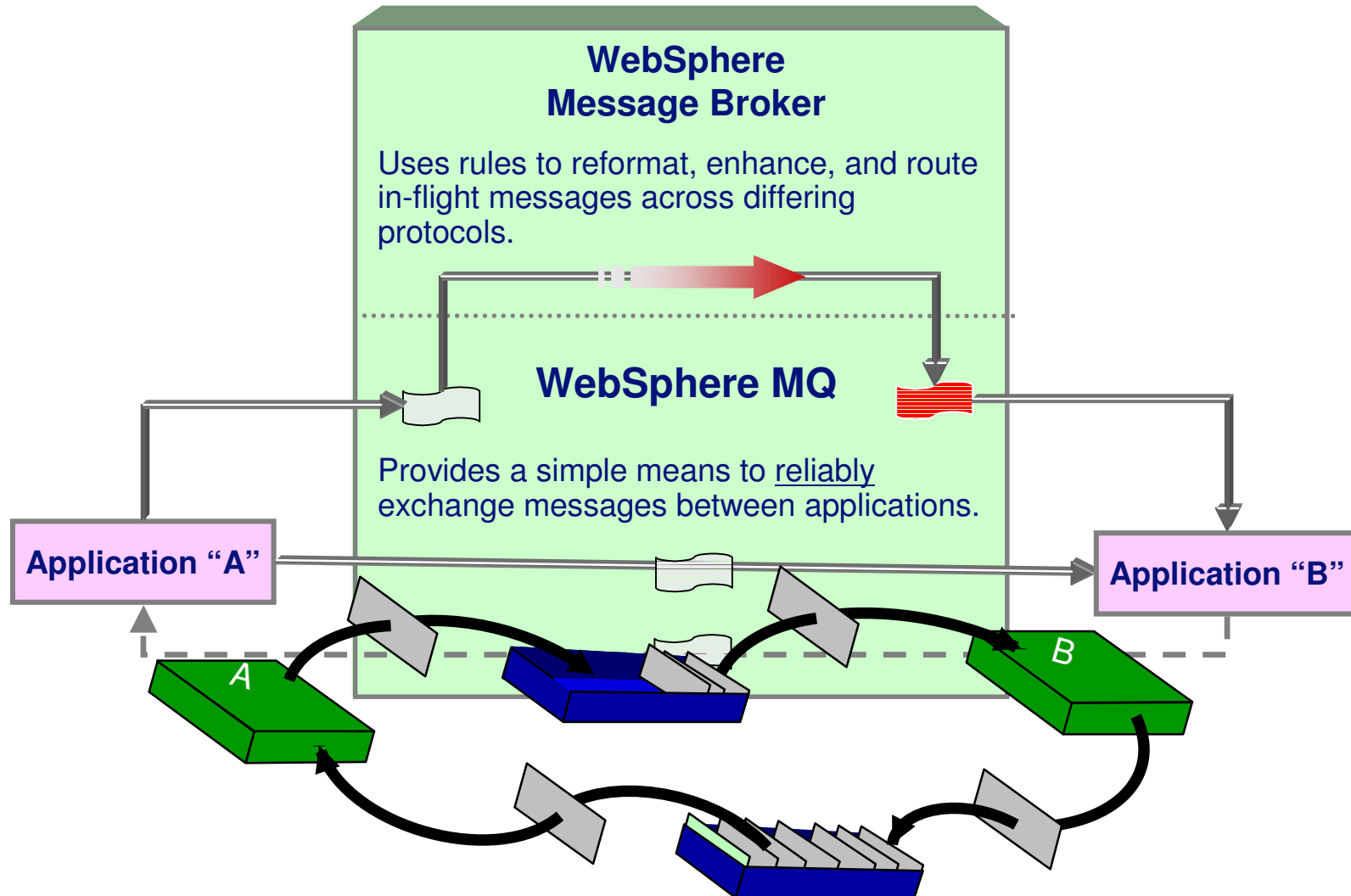
What is WebSphere Message Broker?
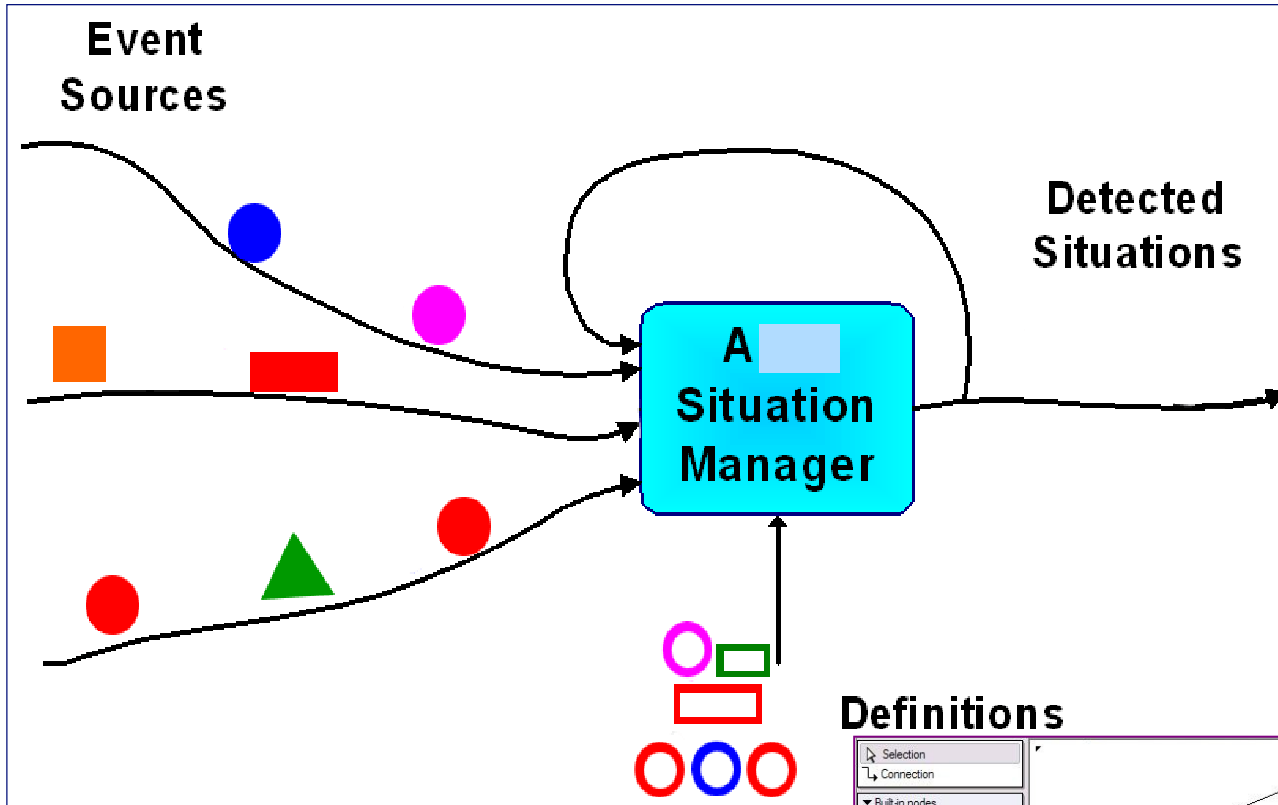
1. **A framework for processing MQ messages**

2. **A robust hosting environment for:**
   - ✓ Transforming data
   - ✓ Enriching data
   - ✓ Interacting with databases
   - ✓ Routing messages based on content
   - ✓ Detecting complex combinations of messages
   - ✓ Interacting existing applications with Web Services
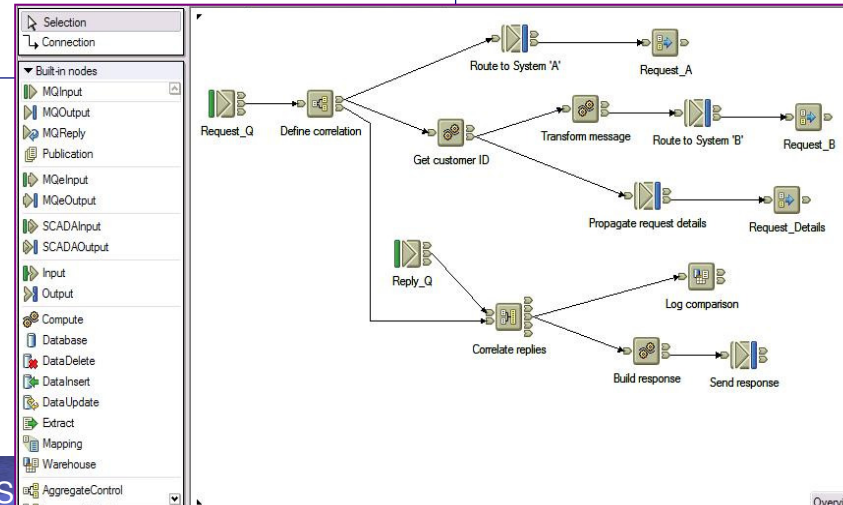
Integration of VSE Programs with MQ Series
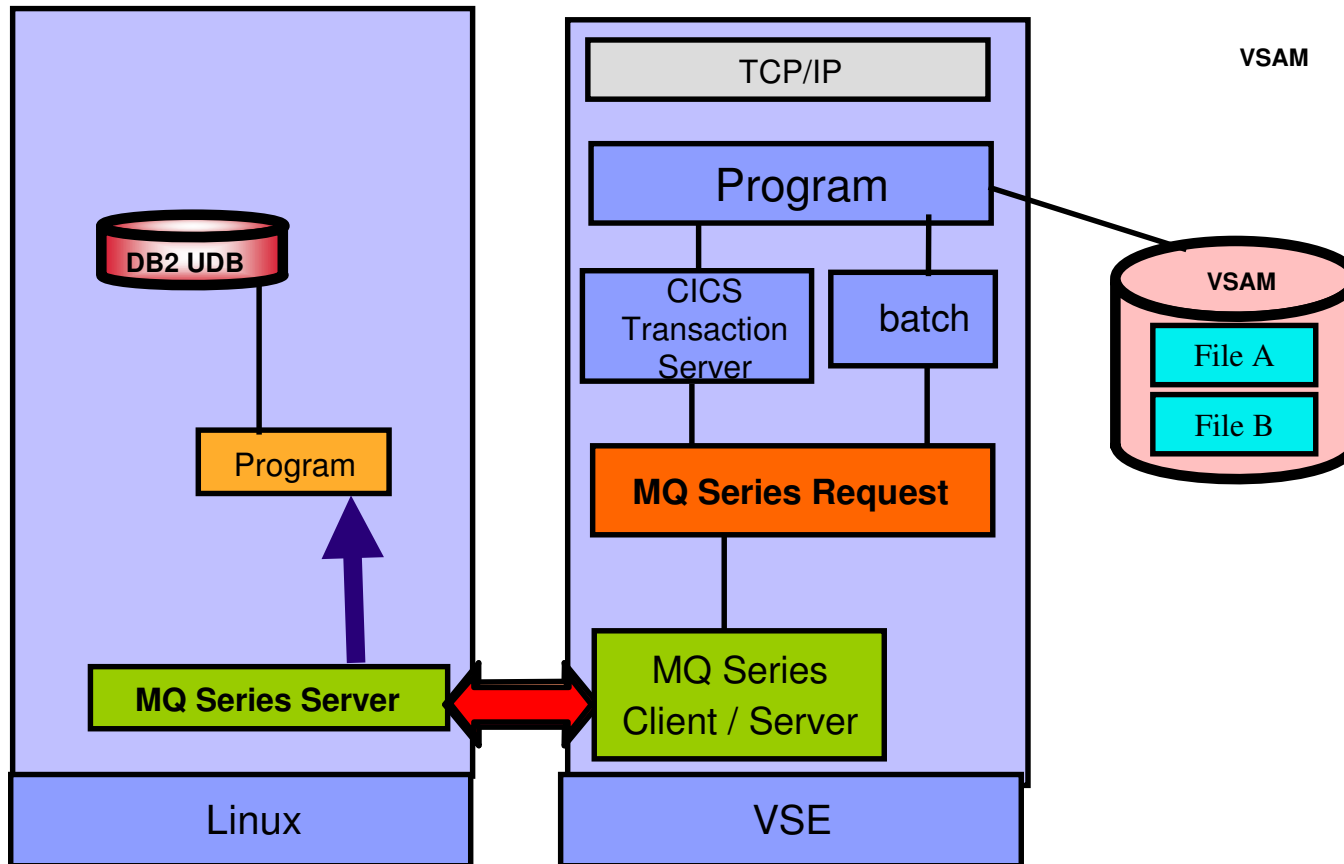
ƒ Data distribution via MQ Series technology

ƒ VSE programs have to write MQ messages – requires changes to existing applications

ƒ NEW: WebSphere MQ Series Client for VSE – free of charge – enablement for MQ
environments and modern solutions

Integration of unchanged VSE Programs with MQ Series
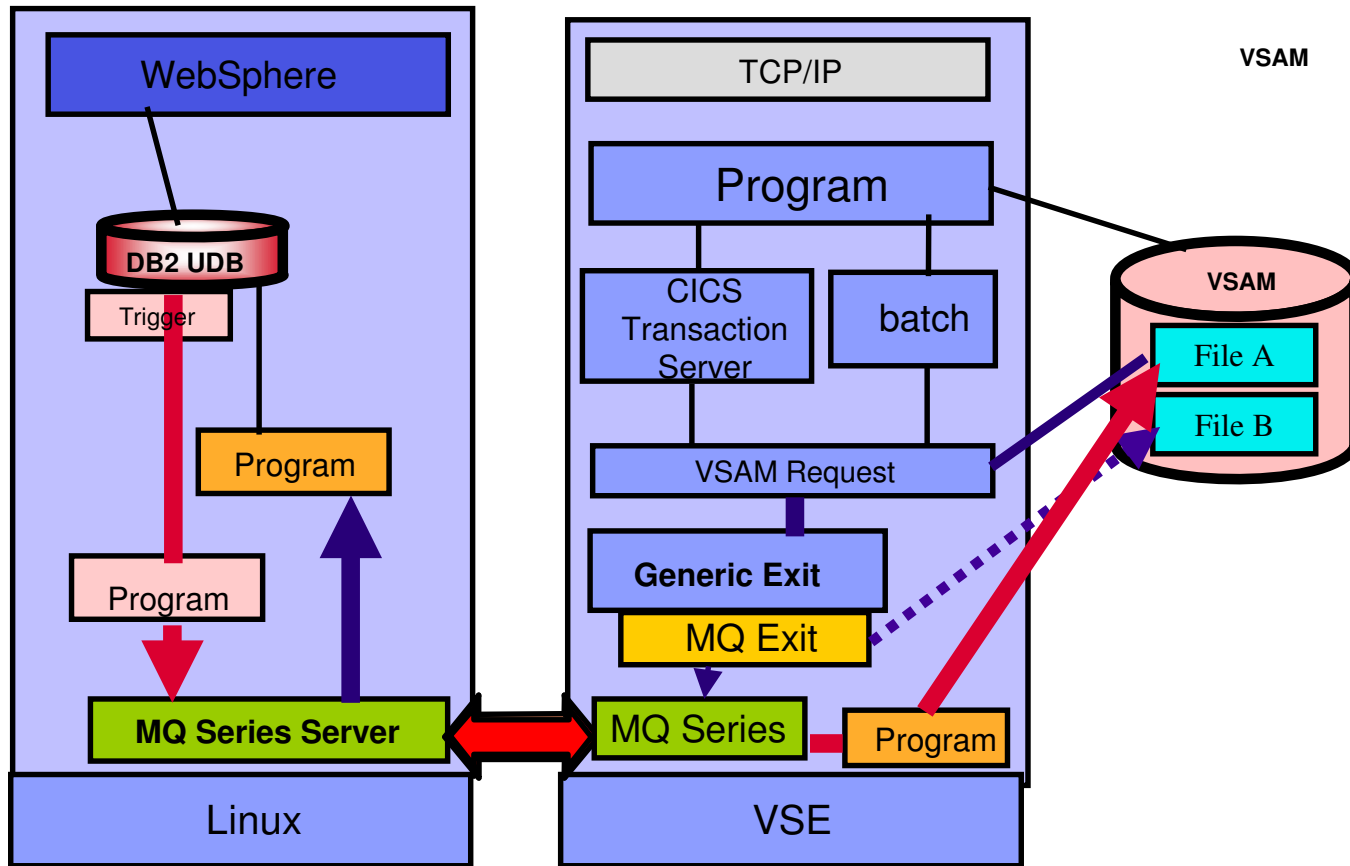
ƒ Data distribution via MQ Series technology

ƒ NO changes to VSE programs – using MQ Exit and VSE VSAM Redirector

ƒ NEW: WebSphere MQ Series Client for VSE – free of charge – enablement for
  MQ environments and modern solutions

MQ Series - asynchronous transactions

■ **functional characteristics**

ƒ **guaranteed, secured asynchronous data access for remote systems**

ƒ **same API for all supported MQ Series platforms**

ƒ **transaction security, therefore appropriate for e-business processes**

ƒ **integration with WebSphere Application Server**

ƒ **works well for Business-to-Business (B2B) environments**

■ **software requirements**

ƒ **For VSE/ESA :**

　ƒ **VSE/ESA 2.6/2.7**

　ƒ **MQ Series Server**

　ƒ **Program that interfaces with MQ on VSE or VSAM Redirector**

ƒ **On the remote system:**

　ƒ **MQ Series Client / Server**

　ƒ **Program that interface with MQ Series**
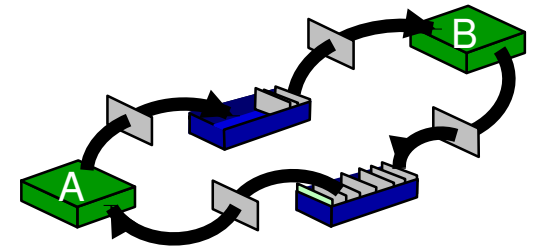
General access to VSE/ESA via browser
Websphere host Integrator - Implementation
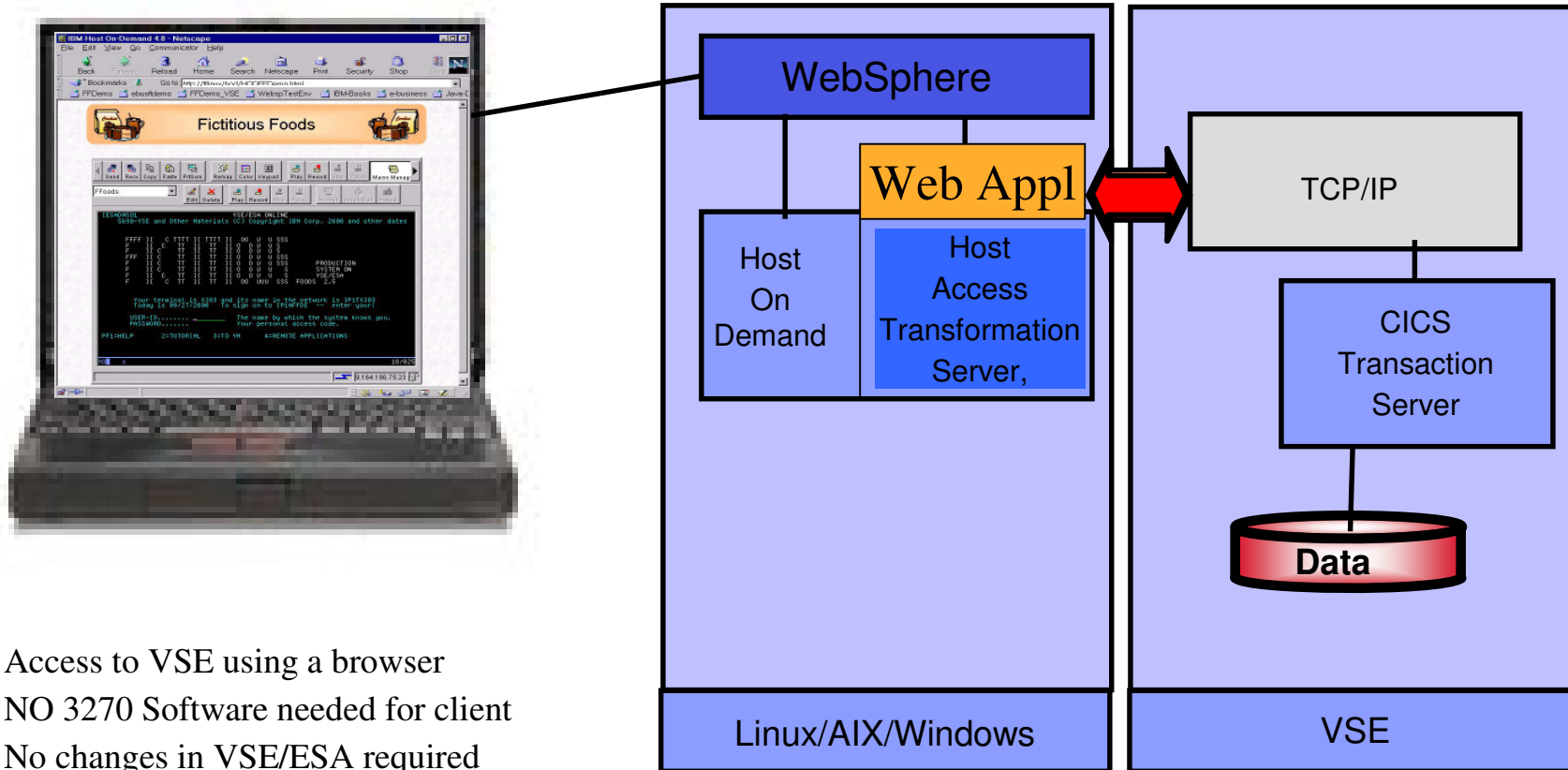
ƒ Access to VSE using a browser
ƒ NO 3270 Software needed for client
ƒ No changes in VSE/ESA required

**NEW: IBM Communication Server (TN3270, APPN) and
IBM Communication Controller (374x replacement)
-> available for Linux for zSeries**

Host Access Transformation Server

- functional characteristics
  - ƒ access to VSE/ESA via browser
  - ƒ the access is similar with a local access via 3270 emulator
  - ƒ can be used in Intranet or Internet and /or
  - ƒ integrated with WebSphere Application Server
  - ƒ support for secured connections (SSL) to the HostOnDemand Server and a redirector to mask the real IP addresses
    - ƒ Host Access Transformation Server – for 3270 screen scraping
    - ƒ Host Publisher - a bean generator to create the Java Beans (Integration Objects), to provide legacy access for new Web applications.

- Requirements
  - ƒ WebSphere Host Integration products on middle tier
  - ƒ NO additional software on VSE/ESA required

Benefit: Easily extend existing applications to the web
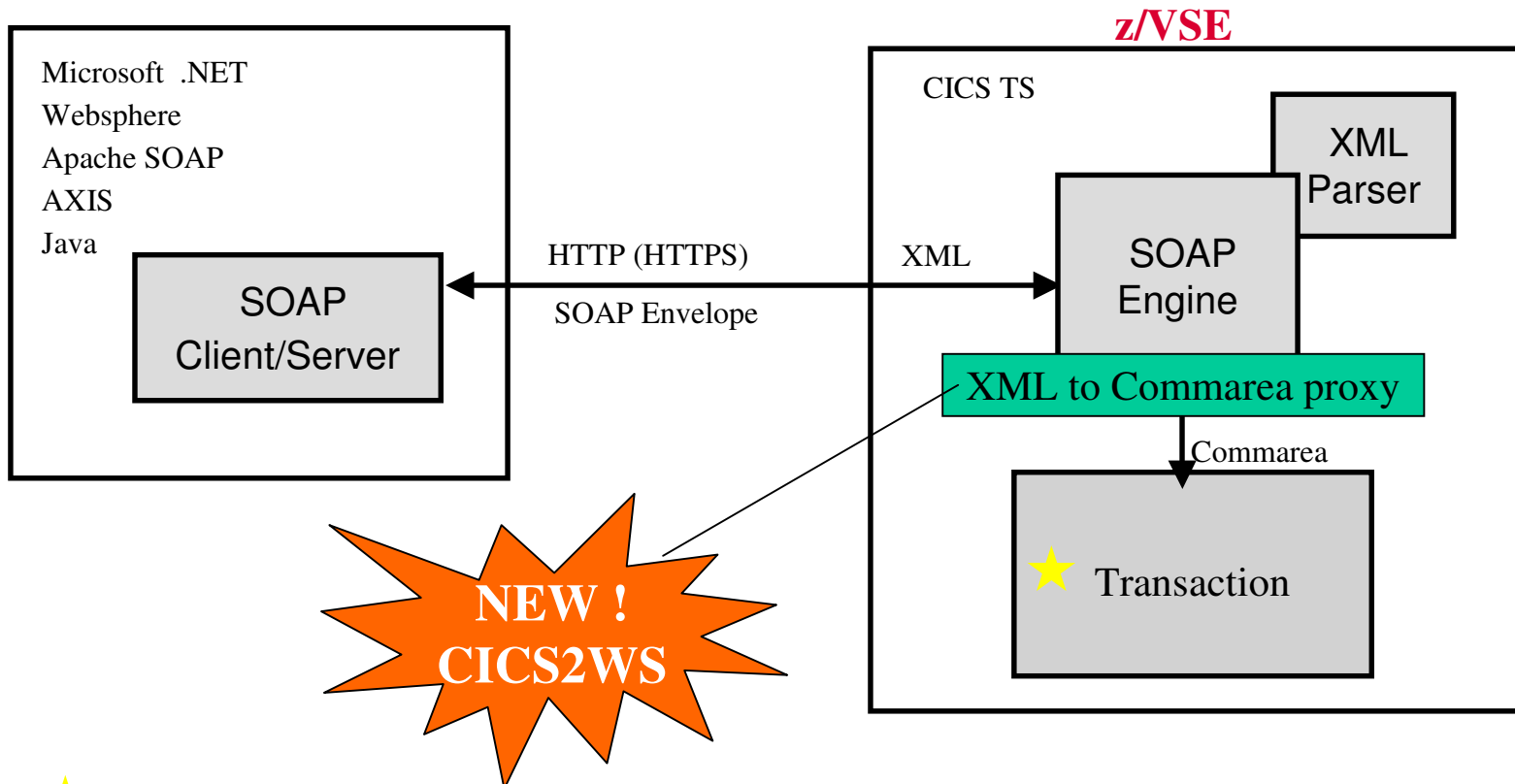
Interaction with VSE via HATS application and browser

Web Services

Modern architecture of program communication using XML data and the SOAP protocol
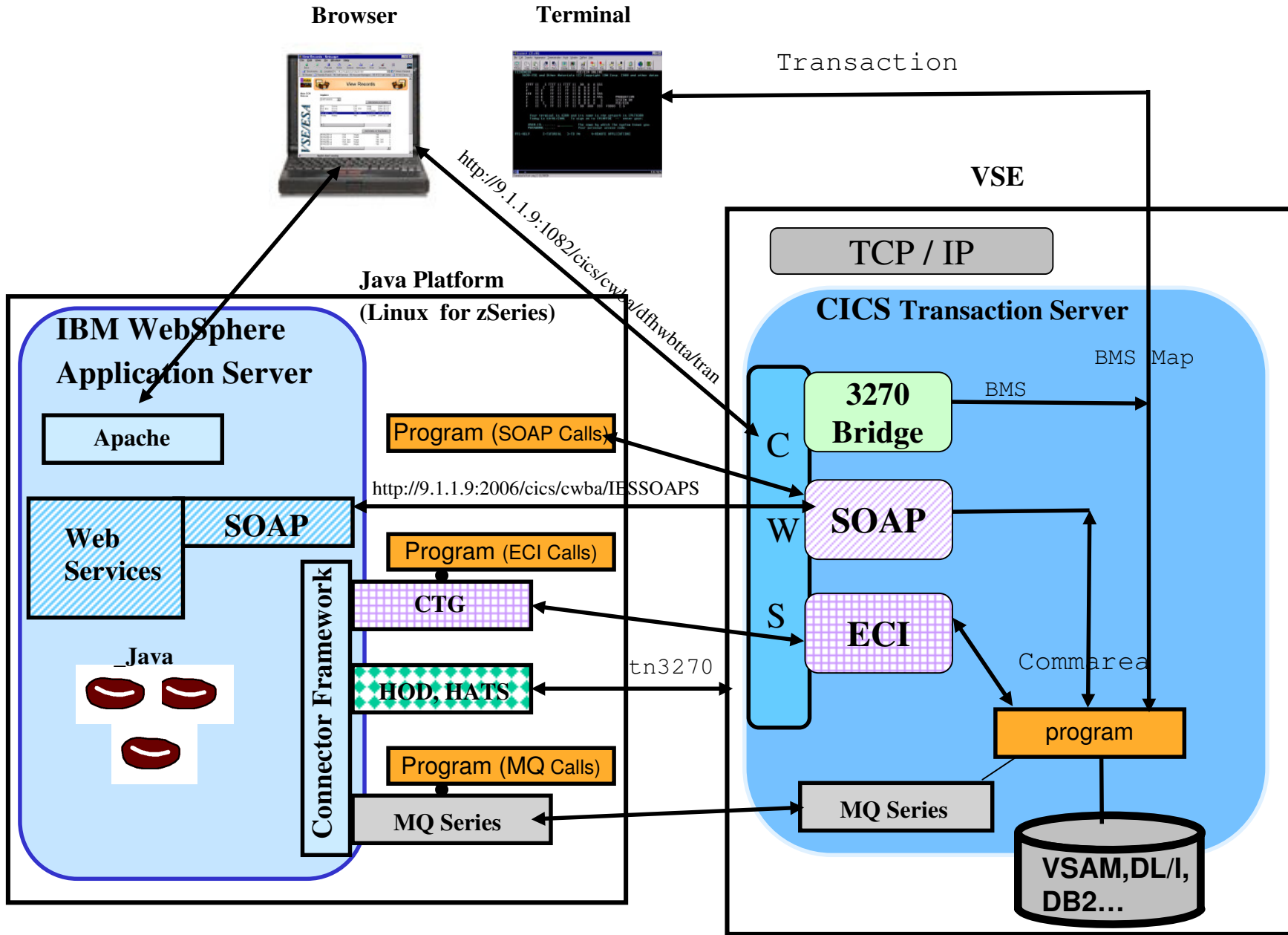
Service Oriented Architecture – Web Services

z/VSE

Business Partner

Customers and
Business Partners

Web Service

Business Partner

SOAP (XML)

Web Service

Web Service

Shipping and
Tracking System

Customers

Trucking
Company

Data

Transactions

e-mail
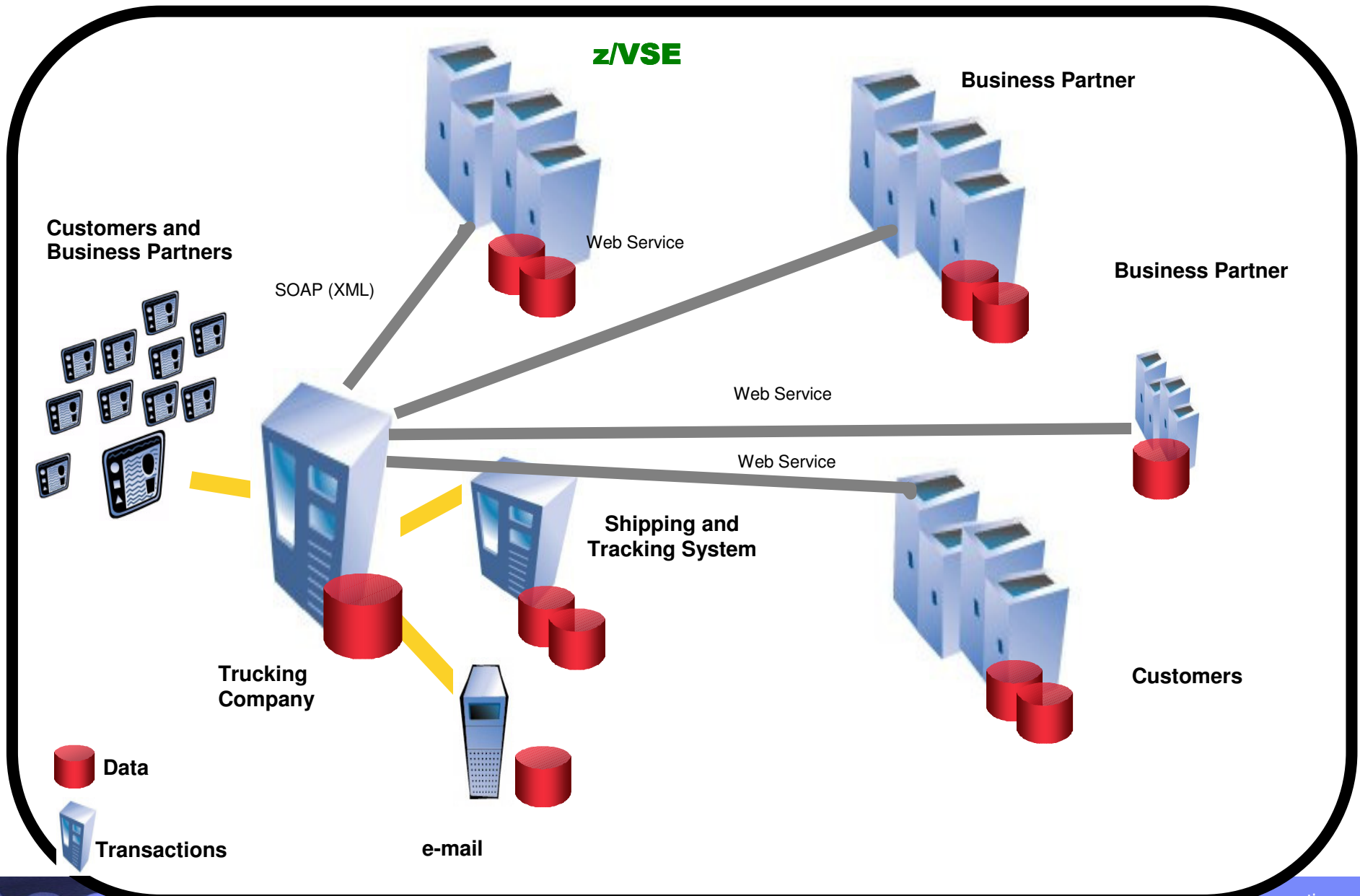
Web Services with z/VSE

XML data interchange with CICS transactions

Microsoft .NET
Websphere
Apache SOAP
AXIS
Java

SOAP
Client/Server

HTTP (HTTPS)
SOAP Envelope

XML

z/VSE

CICS TS

XML Parser

SOAP Engine

XML to Commarea proxy

Commarea

★ Transaction

NEW !
CICS2WS

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

IBM

Browser

Terminal

Transaction

http://9.1.1.9:1082/cics/cwba/dfhwbtta/tran

VSE

**Java Platform
(Linux for zSeries)**

TCP / IP

**IBM WebSphere
Application Server**

CICS Transaction Server

BMS Map

Apache

Program (SOAP Calls)

C

**3270
Bridge**

BMS

http://9.1.1.9:2006/cics/cwba/IESSOAPS

W

SOAP

**Web
Services**

SOAP

Program (ECI Calls)

S

CTG

ECI

Commarea

Connector Framework

_Java

tn3270

HOD, HATS

program

Program (MQ Calls)

MQ Series

MQ Series

**VSAM,DL/I,
DB2...**

WebSphere Application Server for VSE Customers

The possibility of application integration and Software Oriented Architecture (SOA)

Linux on zSeries

WAS
WS Portal
WS MQ

IBM WebSphere Software

Connection via HiperSockets

z/VSE V3.1 Production Environment

+ CICS
+ TCP/IP
+ VSAM
+ COBOL

z/VSE V3.1 Test Environment

+ CICS
+ VSAM
+ COBOL

z/VM V5	z/VSE Production System (z/VM guest or LPAR)	z/VSE Test System (z/VM guest or LPAR)
IFL Engine	**Standard Engine**	

IBM eServer z890 or System z9
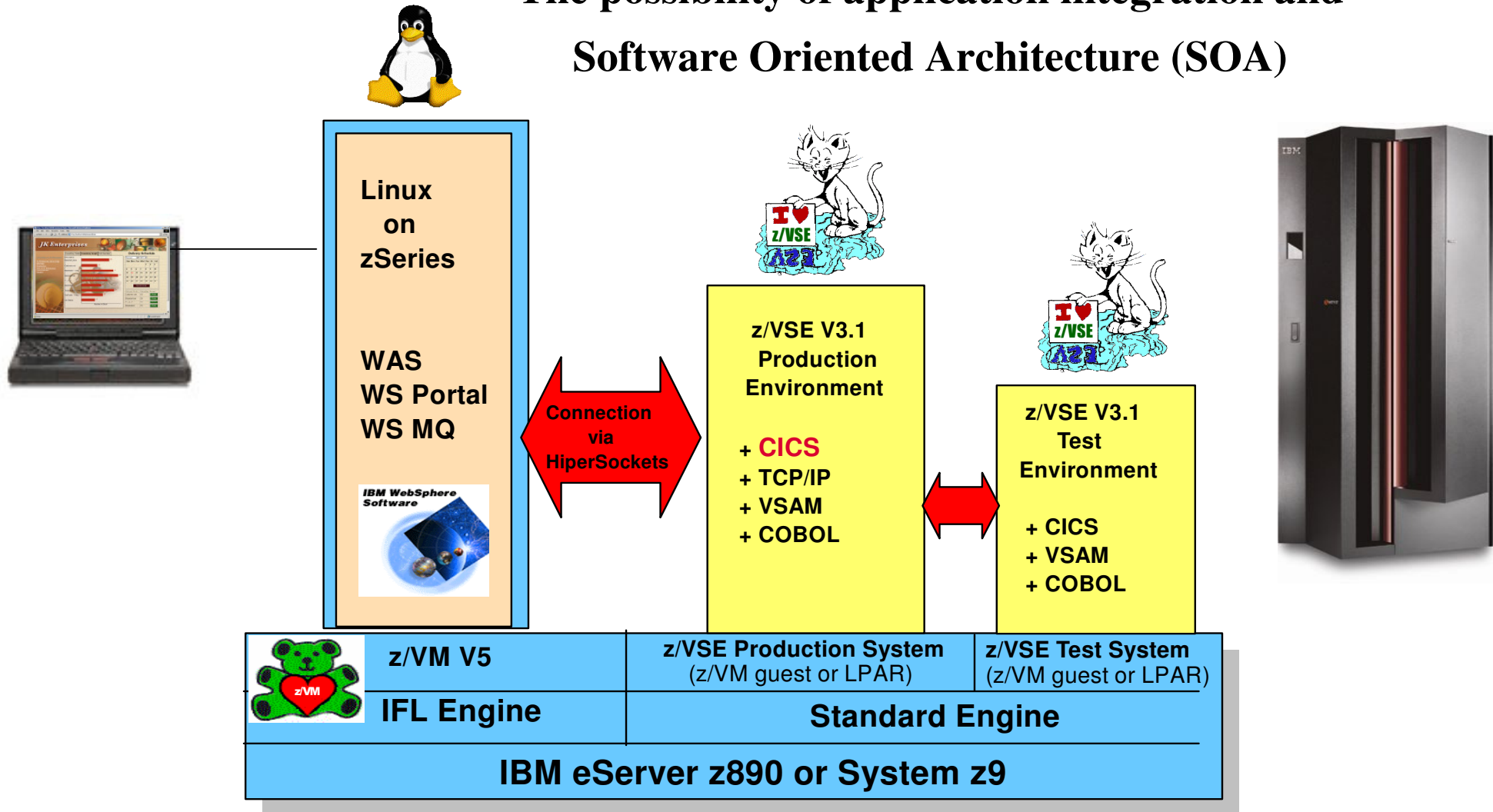
Transactional processing with CICS TS

Solution	Connector to use
Webify	▪CWS – CICS Web Support ▪HATS – Host Access Transformation server ▪HOD – Host on Demand server
CICS application access from remote	▪CTG – CICS Transaction Gateway ▪HATS – Host Access Transformation Server ▪MQ Series (Client or Server)
Flexible, platform independent, CICS application integration, the most advance Application-to-application communication Method	▪Web Services – using XML data and SOAP protocol

Solutions on the new z/VSE homepage

http://www.ibm.com/servers/eserver/zseries/zvse/

IBM

Additional Information

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

- **Solutions for VSE**
    http://www.ibm.com/servers/eserver/zseries/zvse/solutions/

Redbooks
International Technical Support Organization

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

- **e-business Solutions for VSE/ESA**   **SG24-5662**

- **Servlet and JSP Programming**   **SG24-5755**

- **Linux Web Hosting with WebSphere,**   **SG24-6007**
    DB2, and Domino

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

    We appreciate your comments at zvse@de.ibm.com